Dane County EMS System

Protocols, Policies & Procedures

2018-2020

Basic EMT / A-EMT / Paramedic

Approved February, 2018

Madison and Dane County Community Resources

Call 2-1-1 any time for information about almost anything related to health and human services.
You can also visit http://www.211wisconsin.org or https://www.danecountyhumanservices.org

Aging and Disability Resource Center (http://www.daneadrc.org/)..... **608-240-7400**
Free information and assistance for adults aged 60+ and people with disabilities

Drug Abuse and Addiction Resources
Parent Addiction Network of Dane County (http://www.parentaddictionnetwork.org)..... **608-441-3060**
Resources for family and friends of people battling drug addiction
Dane County Behavioral Health Specialist..... **608-242-6461**

Clothing (Free)
Community Action Coalition (http://www.cacscw.org/clothing-center.php)..... **608-246-4730, ext. 216**

Dane County Human Services (http://www.danecountyhumanservices.org/default.aspx)..... **608-242-6200**
Provides protection of children and adults at risk mental health and substance abuse services; services and transportation for older adults and people with disabilities; and financial assistance

Domestic Abuse Intervention Services (http://abuseintervention.org/)..... **608-251-4445**
Assistance for individuals in abusive relationships

Economic Assistance
Dane County Job Center (**http://www.danejobs.com/**)..... **888-794-5556** and/or **608-242-4900**

Food Pantries and Meal Locations..... **2-1-1**

Health Care Coverage
Dane County Job Center-Income Maintenance Agency (http://access.wisconsin.gov/)..... **888-794-5556**
Application assistance for BadgerCare / Medicaid and food stamps
Covering Wisconsin (http://coveringwi.org/)..... **608-261-1455**
Application assistance for Affordable Care Act ("Obamacare") health care plans

Home Health, Hospice Care, Medical Equipment and Supplies..... **2-1-1**
If you have insurance, contact your provider and/or insurance company
Aging and Disability Resource Center (http://www.daneadrc.org/)..... **608-240-7400**

Homeless Services and Shelters
Housing Crisis Hotline (Community Action Coalition)..... **855-510-2323**
Porchlight, Inc. (http://porchlightinc.org)..... **608-257-2534**
YWCA (http://www.ywcamadison.org)..... **608-257-1436**
Salvation Army (http://www.salvationarmydanecounty.org/)..... **608-256-2321**
The Road Home (family support) (http://trhome.org/)..... **608-294-7998**

Dental Care
D.A.N.E. Cares (http://danecares.org/)..... **608-957-5802**
Public Health Madison and Dane County Dental Line..... **608-243-0354**

Housing (Public and Subsidized)
Madison Housing Authority (https://www.cityofmadison.com/dpced/housing/)..... **608-266-4675**
Dane County Housing Authority (http://www.dcha.net/)..... **608-224-3636**

Mental Health Services If you have health insurance, contact your provider and/or insurance company
Recovery Dane..... **608-237-1661**
Journey Mental Health Center (http://www.journeymhc.org/)..... **608-280-2700**
Mental Health Crisis Line (24 hours per day)..... **608-280-2600**
Parental Stress Line (8am – 10pm daily)..... **608-241-2221**
Emergency and Crisis Child Care (24 hours per day)..... **608-244-5700**

Transportation
Dane County Transportation Services (http://danecountyhumanservices.org/Transportation/key_phone_numbers.aspx)..... **608-242-6486**
Madison Metro Transit and Paratransit (https://cityofmadison.com/metro/ ; https://www.cityofmadison.com/metro/paratransit/)
BadgerCare / Medicaid (https://www.dhs.wisconsin.gov/nemt/index.htm)..... **866-907-1493**

Medical Emergency : Call 9-1-1

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Authorization:
In accordance with Wisconsin Statute 256 and Chapter 110 of the Wisconsin Administrative Code, effective February 1st, 2016 the following medical protocols are authorized by the Dane County EMS Medical Director for use in the County. Changes to these protocols can be made only with the authorization of the Medical Director.

Michael T. Lohmeier, MD, FACEP
Dane County Medical Director

Michael Mancera, MD
Dane County Associate Medical Director

Introduction:
The Dane County EMS Protocols contained within this document are intended to provide and ensure uniform treatment for all patients who receive care from EMS Agencies and Providers participating in the Dane County EMS System. These protocols apply exclusively to agencies responding via the 9-1-1 System within the County. Any other use must receive prior approval from the Medical Director of Dane County EMS.

These protocols are the direct result of countless hours reviewing evidence-based guidelines, historically proven treatments and the best practices of EMS Systems recognized as leaders in the nation. We sincerely hope that this document will be viewed as an invaluable tool for learning, teaching and reference so that the Dane County EMS System may continue to provide the highest quality of out-of-hospital care. Although we have attempted to address all patient care scenarios, it is possible that unforeseen circumstances and patient care needs will arise. In these situations, the EMS Provider should rely on their education, experience and clinical judgment combined with the principle of patient centered care to achieve optimal results. As always, On-Line Medical Control is available for consultation and assistance with patients, scenarios or presentations that do not fall within the scope of this document.

Acknowledgements:
The protocols contained within this document have been extensively reviewed not only by the Dane County EMS Office, but by representatives from all aspects of the local medical community. They are intended to create a seamless and consistent treatment plan across provider levels, and have been evaluated for applicability as well as internal consistency. While they may not be perfect, it is our sincere hope that this document is viewed as the most complete and robust protocol set possible, and that they meet or exceed the standard set by the top EMS Services in the nation. The Office would like to specifically acknowledge the following individuals and groups for their contributions to this document.

Dane County EMS Commission	Dr. Michael Mancera	Dr. Megan Gussick
Dane County Medical Advisory Subcommittee	Dr. Ann O'Rourke	Dr. Hee Soo Jung
Dane County ALS Consortium	Dr. Ryan Wubben	Dr. Michael Kim
Meriter Hospital	Dr. Amish Raval	Dr. Charles Leys
St. Mary's Hospital	Dr. Lee Faucher	Dr. Hee Soo Jung
William S. Middleton Memorial Veterans Hospital	Carrie Meier	Tim Hillebrand
Stoughton Hospital	Charles Tubbs, Sr.	Dr. J. Brent Myers
University of Wisconsin Hospitals and Clinics	Dr. Azita Hamedani	Dr. Kacey Kronenfeld
University of Wisconsin Emergency Education Center	Ben Eithun	Dr. Luke Bradburry

Dane County Protocol Workgroup *(in alphabetical order)* – Angelo Aguirre, Patrick Anderson, Greg Bailey, Chris Carbon, Ryan Dockry, Jeff Dostalek, Jeff Ezzell, Kim Feiner, Kim Jack, Stephanie Lehmann, Jen Minter, Christine Randall, Jen Román, Scott Russell, Brandon Ryan, Ché Stedman, Abbey Trowbridge

"If you are going to achieve excellence in big things, you develop the habit in little matters. Excellence is not an exception, it is a prevailing attitude."

-Colin Powell

Guidelines for Use of Protocols:
In general, the protocols are divided into Adult and Pediatric sections, with subheadings for Medical and Trauma. For pediatric patients, the appropriate pediatric-specific protocol should be used if one exists. If there is no pediatric-specific protocol for a condition, use the adult protocol but use weight-based dosing for medications. The adult dose of a medication should never be exceeded for a pediatric patient.

There have been a great many changes from previous versions of the Dane County EMS Protocols. While the core of the protocols remains the same – to provide the highest level of patient centered care possible – this protocol book may almost be viewed as a completely new document. A summary of the major formatting changes appears below this paragraph, but it is not a replacement for careful study of the protocol book itself. Please take the time to orient yourself and become familiar with the look and flow of the content.

In order to make the flowcharts easier to read, a standardized presentation has been adopted. For circumstances where an EMS Provider needs to make a decision, the question appears in a diamond-shaped box with the answers coming off in separate, usually opposite directions. For simplicity, every attempt was made to make these "yes/no" or dichotomous decisions whenever possible.

When an EMS Provider is referenced to another **PROTOCOL** within the book, the name of the Protocol appears in a rectangular box, with a lime-green shadow.

If there is a bi-directional arrow referencing another **PROTOCOL**, the intention is that the EMS Provider returns to the current Protocol after a critical assessment or treatment is completed in the referenced Protocol. For example, a bi-directional arrow referencing the Airway Management, Adult Protocol would imply that after the airway has been addressed that the Provider return to the current Protocol for further evaluation and patient management.

When an EMS Provider is referenced to a **PROCEDURE** within the book, the name of the Procedure appears in a rectangular box, with a purple shadow.

When medications are referenced in the Protocol, they are coded to the level of the EMS Provider with a key attached to the left side of the medication box. Procedures and medications that are in the scope of all providers have a **CLEAR** box attached to the left side, Advanced EMTs have a **YELLOW** box with the letter A and Paramedics have a **BLUE** box with the letter P. Any time Medical Control must be contacted for approval or authorization, the key is **RED** with the letter M. The Legend appears in the top left corner of all Protocols for reference. Rather than have multiple boxes attached to each medication, the supposition is that all providers credentialed at a level *higher than the key are authorized* to administer the medication. For example, albuterol has a clear box in the key and is authorized for the Basic, Advanced EMT *and* Paramedic.

Under the heading for each Protocol, there are two sections immediately below entitled, "Pertinent Positives and Negatives" and "Differential". These boxes are meant to be a guide to assist with the pertinent historical information as well as a reminder of the multiple potential causes for a patient presentation that should be considered by the EMS Provider. It is expected that these elements be considered in the patient evaluation and appear in the documentation for the call.

Finally, the "Pearls" section at the bottom of the page provides further guidance as well as some tips to keep in mind when assessing patients and scenes. It is impossible to condense all of Emergency Medicine into a single page flow chart, but the pearls section allows for expanded medical advice, dosages and descriptions of special situations. Please study these sections along with the rest of the flowcharts – there is likely to be something new to learn on every page!

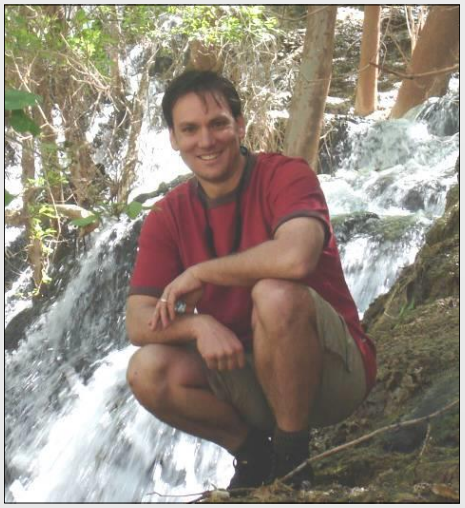
These protocols are the basis of the care we provide. Combined with your experience and education, this document should help you provide patient care that rivals the best in the world.

In Memoriam:
The Dane County Medical Director would like to acknowledge the significant work of two individuals, Dr. Darren Bean and Robert L. Brunning.

Dr. Darren Bean served as the Medical Director for the City of Madison Fire Department until 2008. His vision, dedication and drive were instrumental in the development of the current ALS System as well as the expansion of Dane County EMS. His passion was to create a unified out-of-hospital system so that the highest level of compassionate, quality medical care could be rendered to all people in Dane County. Tragically, Dr. Bean died on May 10, 2008 while transporting a patient in his capacity as a Med Flight Physician. We will never forget Dr. Bean, Pilot Steve Lipperer or Nurse Mark Coyne, RN.

Robert L. Brunning served as the first Dane County EMS System Coordinator. "Bob" was hired with the mission to transition medical care from the Dane County Traffic Police to fully trained EMS Personnel with specialized equipment and vehicles. In the 1970's he won several Federal Grants for Dane County to purchase ambulances and equipment for use by all services. He was able to successfully coordinate over 21 different EMS Agencies in the County, and it was not uncommon for him to be out at 3am helping a District in any way he could. Sadly, Bob passed away in 1995. In his memory the Dane County EMS office established the Robert L. Brunning Award of Excellence.

In memoriam, we thank Dr. Darren Bean and Robert Brunning for their vision, passion and dedication. We hope these Protocols make you proud.



Dedication:
These protocols are dedicated to ***you***, the EMS Providers of Dane County. It is your tireless dedication, commitment to continuous improvement and solemn promise to care for the sick and injured that makes Dane County, Wisconsin the special community that it is. While missed time with family and friends comes too often and the 'thank yous' come far too infrequently, please know that your time and efforts are sincerely appreciated. Some people spend a lifetime wondering if they made a difference in the world; you don't have that problem.

EMS, Fire and Law Enforcement Honor Guards:
Lastly, we would like to acknowledge all of the EMS, Fire and Law Enforcement Honor Guards within Dane County, who ensure that fallen members of the EMS profession are given the honor, respect and dignity they deserve for the vital service in public safety they so willingly provided to their communities. Thank you for honoring those who have dedicated their lives to others.

"Perfection is not attainable, but if we chase perfection we can catch excellence."
-Vince Lombardi

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Medical Transport Destination

Purpose:

To provide guidelines for the transport of patients with Time Critical Diagnoses (TCDs) to the most appropriate facility that can provide definitive level care.

Policy:

When feasible, patients AND/OR their healthcare power of attorney should be permitted to make autonomous decisions regarding their destination hospital, and given the opportunity to choose. Occasionally, patients may need to be directed away from their preferred institution in favor of a specialty resource center, which can provide advanced levels of care not available at every hospital. In those instances, the EMS Provider's decision should be calmly and respectfully communicated to the patient and their family. By keeping a patient-centered focus and always working to do what is right for the patient, transport to the most appropriate level of care will hopefully be an obvious decision. At the time of publication, the following centers have achieved the appropriate level of credentialing for each of the Time Critical Diagnoses (TCDs) and Specialty Resource Center listed:

Policies

Comprehensive Stroke Center:
UW Hospital – Main Campus

Primary Stroke Center:
Mercy Hospital – Janesville
Meriter Hospital
St. Mary's – Madison
VA Hospital

Acute Stroke Ready (CT and tPA Only):
Fort Memorial Hospital – Ft. Atkinson
The Richland Hospital – Richland Center
Stoughton Hospital
St. Clare Hospital – Baraboo
St. Mary's – Sun Prairie
St. Mary's – Janesville
Upland Hills Health – Dodgeville
UW at The American Center
Columbus Hospital

Burn Unit:
UW Hospital – Main Campus

ST-Segment Elevation MI:
Monroe Clinic
St. Mary's – Madison
UW Hospital – Main Campus
VA Hospital

Pediatric Trauma Unit:
UW Hospital – Main Campus

Level I Trauma:
UW Hospital – Main Campus

Level II Trauma:
Mercy Hospital – Janesville

Level III Trauma:
Meriter Hospital
Sauk Prairie Hospital
St. Clare Hospital - Baraboo
St. Mary's – Madison
St. Mary's – Janesville

Level IV Trauma:
Monroe Clinic
Stoughton Hospital
St. Mary's – Sun Prairie
Upland Hills Health – Dodgeville
Columbus Hospital

Pediatric Intensive Care Unit:
UW Hospital – Main Campus

Neonatal Intensive Care Unit:
Meriter Hospital
St. Mary's - Madison
UW Hospital – Main Campus

OB, Labor and Delivery Receiving:
Fort Memorial Hospital – Ft. Atkinson
Mercy Hospital – Janesville
Meriter Hospital
Monroe Clinic
The Richland Hospital – Richland Center

OB, Labor and Delivery Receiving (cont):
Sauk Prairie Hospital
St. Clare Hospital - Baraboo
St. Mary's – Madison
St. Mary's – Janesville
Upland Hills Health – Dodgeville
Columbus Hospital

Forensic Nurse Examiner (Also Known As SANE Nurse):
Meriter Hospital

Any patient who is judged to be too unstable for transfer to definitive care may be transported to the closest Emergency Department for immediate stabilization

Policies

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Request for Helicopter EMS (HEMS)

Policies

Purpose:

To provide general guidelines for the appropriate utilization of Helicopter EMS (HEMS) during routine daily operations.

Policy:

Helicopter EMS activation should be considered in Time Critical Diagnoses (TCDs) when the transport time to definitive care is prolonged, as well as situations when advanced resources and skills may help improve the patient's chances of survival. Depending on the situation and resources present, it may be prudent to begin transport by ground ambulance and arrange for a rendezvous at an existing airfield or helipad rather than establish a scene Landing Zone (LZ) and wait for HEMS. Please see the next page for a listing of local airfields and hospital-based helipads that would not require establishment of an LZ by Fire or Law Enforcement.

A helicopter may be considered for request under the following circumstances *but not limited to*:

- ❑ Patient meets Level I Trauma Center criteria under the Destination Determination Protocol AND ground transport time is estimated to be greater than 30 minutes
- ❑ Patient is critically ill or injured AND entrapped with extrication expected to last greater than 20 minutes
- ❑ Patient has unstable Vital Signs (VS) and ALS intercept would further delay arrival at definitive care
- ❑ Patient has field diagnosed ST-Segment Elevation MI and is not expected to make the goal first medical contact-to-balloon time of <90 minutes without HEMS assistance
- ❑ Patient requires specialized medical attention in the field that is beyond the scope of the EMS Providers present on scene or available at the time of the emergency (i.e. field amputation, pediatric intubation)
- ❑ Mass Casualty Incident with multiple critically ill or injured patients, when activation would not put the responding HEMS unit at increased risk (i.e. active shooter without neutralized threat)

Procedure:

- ❑ When considering air transport, the following terminology should be referenced when speaking with HEMS Dispatch:
  - **"Status Inquiry"** or **"Inquiry"** - contact asking whether HEMS is available to fly or not based on current weather conditions, aircraft availability and crew status. An aircraft will NOT be reserved based on an "Inquiry", and if another flight "Request" is received before final decision is made the second "Request" WILL be accepted by HEMS.
  - **"Stand-by"** - for all calls *within the borders of Dane County*, an aircraft will be pulled out and prepared for flight, but WILL NOT lift off until final decision is made regarding HEMS use. Anyone in Public Safety may put a helicopter on "Stand-by". If another flight request is received before final decision is made, the second "Request" will NOT be accepted by HEMS.
  - **"Request"** - final decision has been made by the EMS Provider(s) on scene to transport the patient by air, and the helicopter will launch to the scene or rendezvous point as soon as possible.
- ❑ The highest credentialed EMS Provider on scene will determine if a HEMS unit is appropriate for the patient.
- ❑ That EMS Provider will request the Dane County 9-1-1 Center to contact Helicopter EMS and "Request" dispatch of the closest, most appropriate HEMS unit.
- ❑ A safe landing zone (LZ) must be established per protocol prior to HEMS arrival.
  - **If using a landing zone (LZ) in Dane County such as a grass airstrip at night, it should be marked by flares, strobes, vehicle lights or other suitable ground based lighting.**
- ❑ The highest quality patient care should be continued per Dane County Protocols until HEMS arrival, at which time care may be transitioned to the HEMS medical crew.
- ❑ Patients coming from a Hazardous Materials (HazMat) scene need to be fully decontaminated prior to HEMS transport. This includes contamination with various fuels as well as ingestions of volatile substances which may cause off-gassing.
- ❑ **Under NO circumstances should patient transport be delayed to use a helicopter.**

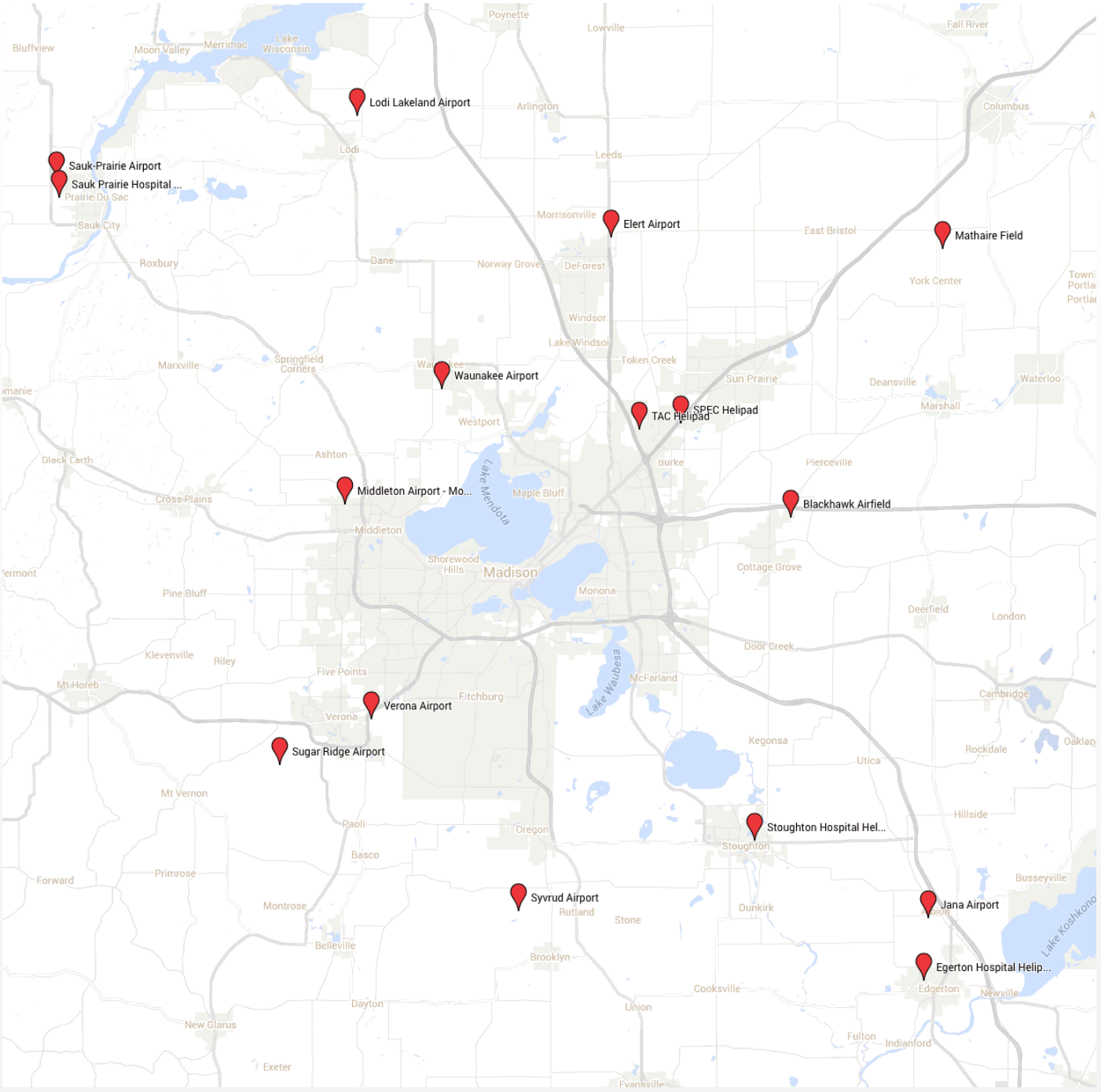
There are multiple Helicopter Landing Zones (LZs) in and around Dane County that do NOT require Fire or Law Enforcement establishment. If appropriate for the situation, weather and patient condition, these locations may be considered for rendezvous with the HEMS unit and transfer of patient care. This will take clear communication from the EMS Providers on scene and coordination through the Dane County 9-1-1 Center and the HEMS Dispatcher.

Please see the following page for a map and list of airfields and helipads in the greater Dane County area that may be considered.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Helicopter EMS (HEMS) Landing Zones

Policies



Policies

- Sauk Prairie Airport
- St. Mary's Sun Prairie Helipad
- Sugar Ridge Airport
- Elert Airport
- Middleton Airport – Morey Field
- Verona Airport
- Mathaire Field
- Blackhawk Airfield
- Sauk Prairie Hospital Helipad
- UW at The American Center Helipad
- Waunakee Airport
- Jana Airport
- Stoughton Hospital Helipad
- Stoughton Airport (Matson)
- Lodi Lakeland Airport
- Edgerton Hospital Helipad
- Syvrud Airport

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Do Not Resuscitate (DNR)

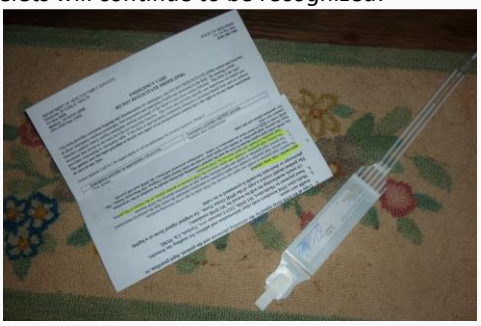
Purpose:

To clarify the State of Wisconsin Do Not Resuscitate (DNR) laws, and to provide guidance for several exceptions to the rule.

Policy:

As defined in Wisconsin Statute 154.17(2), a valid Do Not Resuscitate (DNR) order directs EMS Providers not to attempt cardiopulmonary resuscitation on the person for whom the order is issued if that person suffers cardiac or respiratory arrest. As further defined in 154.17(5), "Resuscitation" means cardiopulmonary resuscitation or any component of cardiopulmonary resuscitation, including cardiac compression, endotracheal intubation and other advanced airway management, artificial ventilation, defibrillation, administration of cardiac resuscitation medications and related procedures. "Resuscitation" does not include the Heimlich maneuver or similar procedure used to expel an obstruction from the throat or upper airway.

There are two types of DNR bracelets available to identify a person with a valid DNR order. One is a plastic ID bracelet, which looks like a hospital ID band. The other is a metal bracelet, which is currently available from StickyJ® Medical ID. Per Wisconsin Statute 154, StickyJ® is the *current* State of Wisconsin authorized vendor of the metal bracelets; however, the previous MedicAlert® bracelets *will continue to be recognized*.



DNR patients should still receive appropriate treatment from EMS Personnel under the Dane County Protocols, to include but not limited to: clearing the airway, administering supplemental O_2, positioning for comfort, splinting extremities, hemorrhage control, providing pain medications, providing emotional support and transporting to an Emergency Department for evaluation.

DNR orders shall be followed by EMS Providers, except in the following situations:

- ❑ The Do-Not-Resuscitate bracelet appears to have been tampered with or removed
- ❑ The emergency medical technician, first responder or member of the emergency health care facility knows that the patient is pregnant
- ❑ The Do-Not-Resuscitate order is revoked. Methods for revocation may occur at any time by the following (154.21):
  - The patient expresses to an emergency medical technician, first responder or to a person who serves as a member of an emergency health care facility's personnel the desire to be resuscitated. The emergency medical technician, first responder or the member of the emergency health care facility shall promptly remove the do-not-resuscitate bracelet.
  - The patient defaces, burns, cuts or otherwise destroys the do-not-resuscitate bracelet.
  - The patient removed the do-not-resuscitate bracelet or another person, at the patient's request, removed the do-not-resuscitate bracelet
- ❑ The Guardian or Health Care Agent of an incapacitated qualified patient may direct an emergency medical technician, first responder or a person who serves as a member of an emergency health care facility's personnel to resuscitate the patient. The emergency medical technician, first responder or the member of the emergency health care facility shall promptly remove the do-not-resuscitate bracelet. (154.225)

Under Wisconsin Statute 154.23, no physician, emergency medical technician, first responder, health care professional or emergency health care facility may be held criminally or civilly liable, or charged with unprofessional conduct, for any of the following:

- ❑ Under the directive of a do-not-resuscitate order, withholding or withdrawing, or causing to be withheld or withdrawn, resuscitation from a patient
- ❑ Failing to act upon the revocation of a do-not-resuscitate order unless the person or facility had actual knowledge of the revocation
- ❑ Failing to comply with a do-not-resuscitate order if the person or facility did not have actual knowledge of the do-not-resuscitate order or if the person or facility in good faith believed that the order had been revoked.

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P	Paramedic
M	Medical Control

Criteria for Death / Withholding Resuscitation

Purpose:

To provide guidelines for situations when initiation of resuscitative efforts by EMS Personnel is not appropriate. For patients with a valid Do-Not-Resuscitate (DNR) order, please refer to the Do Not Resuscitate Policy.

Policy:

Resuscitative efforts should not be undertaken for an adult patient ≥18 years of age who is pulseless and apneic IF one or more of the following criteria are met:

- ❑ Decapitation
- ❑ Incineration
- ❑ Decomposition of Body Tissue
- ❑ Rigor Mortis and/or Dependent Lividity
- ❑ Massively Deforming Head or Chest Injury
- ❑ **Freezing to the point of Rigor Mortis**

Do not initiate resuscitative measures for patients meeting the above criteria. Confirmation of asystole with a 4-lead cardiac monitor is acceptable if appropriate for the situation.

If resuscitative efforts are in progress, consider discontinuation of efforts (EMT-P only), or contact Medical Control for consultation.
If the arrest is traumatic in nature, go to the Traumatic Arrest Protocol.
If the patient is believed to have severe hypothermia (core temperature <82°F or <28°C), go to the Environmental, Hypothermia – Adult, Trauma Protocol.

If the circumstances are unknown or unclear, or if there is question about the validity of a DNR order, initiate resuscitation while simultaneously contacting On-Line Medical Control for further advice.

Notify Law Enforcement of the patient's death and involve the Dane County Medical Examiner. If the patient is in a medical facility (nursing home, physician's office, rehab facility) and under the supervision of medically trained personnel (physician or RN), you may contact the patient's primary physician directly and involve the Dane County Medical Examiner

All EMS Providers will handle the deceased subjects in a uniform, professional and timely manner. Once the determination has been made that resuscitative efforts will not be initiated, respect for the patient and family with protection of the dignity of the deceased is critically important.

As with every EMS call, situational awareness should be a high priority. Maintain vigilance and be aware that these patient calls may be investigated as a crime scene; do your best to avoid disturbing the scene or any potential evidence.

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Termination of Resuscitation

Purpose:

To provide guidelines for discontinuation of resuscitative efforts in the out-of-hospital environment, when attempts have not resulted in Return Of Spontaneous Circulation (ROSC).

Policy:

The successful resuscitation of an out-of-hospital cardiac arrest requires a very well coordinated team effort, aggressive management of malignant dysrhythmias and thoughtful consideration of the reversible causes of cardiac arrest (the proverbial H's and T's). Unfortunately, there are a significant number of patients that – despite appropriate and aggressive medical management – are not able to achieve ROSC in the field. This policy is evidence driven and based on best practice, and it is intended to provide guidance for arrests when it is more prudent to stop resuscitation efforts than to risk provider and public safety with a patient transport.

This policy may ONLY be considered by EMT-Paramedics without Medical Control contact if ALL of the criteria below are met:

- ❑ 1. The patient is an **ADULT** (≥18 years of age) and the arrest is presumed to be of a primary cardiac origin
- ❑ 2. The initial rhythm on patient contact is asystole, and is confirmed in at least two leads on a printed strip
- ❑ 3. The American Heart Association ACLS algorithm for cardiac arrest has been followed for a minimum of 20 minutes
- ❑ 4. A minimum of 4 doses of epinephrine have been administered, as per the ACLS and Dane County Cardiac Arrest algorithms
- ❑ 5. The airway has been secured with either an Endotracheal Tube (ETT) OR Blindly Inserted Airway Device (BIAD), and confirmed by digital capnography
- ❑ 6. The quantitative End-tidal CO2 (EtCO2) is <10mmHg despite effective compressions and after 20 minutes of ACLS
- ❑ 7. The final rhythm is asystole, and is again confirmed in at least two leads on a printed strip

If ALL 7 criteria above are NOT met, the ACLS algorithm must be followed for a minimum of 20 minutes and then Medical Control contacted for approval of field termination of resuscitation if the patient does not achieve ROSC.

The EMS Provider always has the discretion to continue resuscitative efforts if provider safety, scene safety, location of arrest or bystander input compels the decision.

Resuscitative efforts should not be discontinued once the patient has been moved to the ambulance or if transport has been initiated. In these instances, resuscitation should continue to be attempted as per the AHA ACLS algorithms and the Dane County Protocols, with the ultimate disposition decision determined by the receiving facility upon arrival.

As there currently are no reliable, evidence based criteria for field termination of resuscitation in the pediatric population, **this Policy is for use in the ADULT population ONLY** (defined as ≥18 years of age for this policy). All pediatric cardiac arrest cases should follow the PALS and Dane County Pediatric Cardiac Arrest algorithms, and transported in compliance with the Dane County Pediatric Destination Determination Protocol.

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Child/Elder Abuse Recognition and Reporting

Purpose:

To provide guidelines for the EMS Provider who encounters suspected and/or confirmed cases of child or elder abuse while on duty.

Policy:

Child Abuse is the physical and mental injury, sexual abuse, negligent treatment and/or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

An elderly person is defined in the State of Wisconsin as a person >60 years of age. Elder abuse is the physical and/or mental injury, sexual abuse, negligent treatment or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and well-being of senior citizens.

Effective management of a case of suspected abuse or neglect is based upon the following:

- ❑ Protect the patient from harm
- ❑ Suspect that the patient may be a victim of abuse, especially if the illness/injury is not consistent with the reported history
- ❑ Respect the privacy of the patient and the family
- ❑ Collect as much information as possible, and preserve any physical evidence

Any findings of abuse or neglect OR suspicion of abuse or neglect must be reported immediately to Law Enforcement or Protective Services upon arrival to the receiving hospital. In cases of suspected abuse or neglect where a patient contact does not result in transport, Law Enforcement or Protective Services must be notified prior to clearing the scene.

There are many subtle signs of abuse that may be missed without a high index of suspicion. ALL patients evaluated by EMS should be screened for these cues. Some include:
Psychological cues – excessively passive behavior, fearful behavior, excessive aggression, violent tendencies, excessive or inappropriate crying, substance abuse, medical noncompliance or repeat EMS requests for seemingly minor problems.
Physical cues – injuries inconsistent with the reported mechanism, defensive injuries (i.e. forearms), injuries during pregnancy are suggestive of abuse. Multiple bruises and injuries in various stages of healing may also suggest repeated violence against the victim.
Signs of neglect – inappropriate level of clothing for weather, poor hygiene, absence of and/or inattentive caregivers, poor living conditions and physical signs of malnutrition.

EMS Providers in the State of Wisconsin are required by law to report suspected cases of child abuse and neglect as well as those situations in which they have reason to believe that a child / elder has been treated with abuse or neglect or that abuse or neglect will occur.

For Suspected Elder Abuse or Neglect -

- ❑ Cases in Dane County NOT in a State-licensed facility, contact the Dane County Department of Human Services Elder Abuse/Neglect Helpline at **(608) 261-9933**.
- ❑ Cases in Dane County that ARE in a State-licensed nursing home, contact the State Division of Quality Assurance at **(608) 266-7474**.
- ❑ Cases in Dane County that ARE in a State-licensed program such as assisted living, community based residential facility (CBRF), adult family home (AFH), contact the Wisconsin State Bureau of Assisted Living at **(608) 264-9888**.
- ❑ Cases outside of Dane County, call the Elder Care Locator at **(800) 677-1116**.

See the Wisconsin Department of Health Services internet listing of County elder abuse agencies as necessary.
http://www.dhs.wisconsin.gov/aps/Contacts/eaaragencies.htm

For Suspected Child Abuse or Neglect -

- ❑ Contact the Dane County Department of Human Services Protective services:
  Mon-Fri, 7:45AM-4:30PM – **(608) 261-KIDS (5437)**
  After hours and on weekends – **(608) 255-6067**
- ❑ If caregivers are refusing the evaluation or treatment of a child that you suspect may be the victim of abuse or neglect, do not hesitate to contact Medical Control for advice. If necessary, Law Enforcement may be consulted to help settle disagreements on scene, while maintaining the effective management principles above.
- ❑ In the instance that a child has a life or limb threatening illness or injury **AND** the caregivers are refusing evaluation, the child should be transported to the closest appropriate facility, with simultaneous contact of Law Enforcement and On-Line Medical Control. If your Service Medical Director is unavailable, the Dane County Medical Director should be contacted to assist as needed.
- ❑ When abuse or suspected abuse is reported to Law Enforcement, it is required that name and badge number of the officer receiving the report be captured in your documentation.

See the Dane County Department of Human Services Protective Services website for additional information as necessary:
http://www.danecountyhumanservices.org/ProtectiveServices/Child/

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Documentation of Patient Care

Policies

Purpose:

To provide guidelines and to set best practice for documentation of patient encounters in the electronic Patient Care Report (ePCR).

Policy:

As EMS Providers and out-of-hospital care becomes increasingly more important to the healthcare community, it has brought a focus on the documentation of patient encounters and a need to have a more robust set of standards for the Patient Care Reports generated. The hospitals are sending a clear message to the EMS Providers nationally – what you **document** is almost as important as **what you see and the interventions you make** to help your sick and injured patients. To that end, these criteria should help set the standards for documentation and maximize your productivity as members of the healthcare delivery team. At a minimum, every electronic Patient Care Report (ePCR) should include:

- ❑ A clear history of the present illness with chief complaint, onset time, associated complaints, pertinent positives and negatives, mechanism of injury, etc. This should be included in the subjective portion of the PCR. The section should be sufficient to refresh the clinical situation after it has faded from memory.
  - Consider the **P-SOAP-delta** format for the narrative
    - **P** – prearrival information, including delays to scene or factors inhibiting patient access or treatment
    - **S** – subjective information (what the patient tells the EMS Provider)
    - **O** – objective information (VS, physical exam findings, etc.)
    - **A** – assessment (EMS Provider Impression of patient illness as well as differential diagnosis)
    - **P** – plan of treatment (EMS Provider interventions planned to administer)
    - **Delta** – change in patient condition due to EMS Provider interventions
- ❑ An appropriate physical assessment that includes all relevant portions of a head-to-toe physical exam. When appropriate, this information should be included in the procedures section of the PCR.
- ❑ At least two complete sets of vital signs for transported patients and one complete set for non- transported patients (pulse, respirations, auscultated blood pressure, pulse oximetry at minimum). These vital signs should be repeated and documented after drug administration, prior to patient transfer, and as needed during transport. For Children age < 3, blood pressure measurement is not required for all patients, but should be measured if possible, especially in critically ill patients in whom blood pressure measurement may guide treatment decisions.
- ❑ Only approved medical abbreviations may be used – see Appendix.
- ❑ The CAD to PCR interface embedded within the PCR system should be used to populate all PCR data fields it supplies. When 9-1-1 center times are improperly recorded, these may be edited as necessary.
- ❑ Medications administered, dosages, route, administration time, treatments delivered and patient response shall be documented.
- ❑ Extremity neurovascular status after splinting affected limb, or all limbs after spinal immobilization shall be documented.
- ❑ For IV administration, the catheter size, site, number of attempts, type of fluid, and flow rate.
- ❑ Requested Medical Control orders, whether approved or denied, should be documented clearly.
- ❑ Any waste of controlled medications should include the quantity wasted, where wasted, and name of the person who witnessed the waste. Hospital personnel should be utilized (if available) to witness.
- ❑ ALL crew members are responsible for, and should review, the content of the PCR for accuracy.
- ❑ After the ePCR is closed, patient care information may not be modified for any reason. Corrections or additions should be in the form of an addendum to the ePCR, with note for the reason of the addendum.
- ❑ When possible, all ePCRs should be completed and the report closed prior to leaving the hospital. If the ePCR cannot be completed and a copy left with a receiving caregiver before departing the hospital, a draft version of the narrative, medications administered and vital signs shall all be given to the receiving team prior to departing.
- ❑ Paper copies of the ECG, DNR paperwork, Skilled Nursing Facility documentation and - when applicable - documentation of refusal to accept an appropriate assessment, treatment, or hospital destination shall be provided to the receiving hospital.
- ❑ If patient transported from the scene with red lights and siren, be sure to document the reason for doing so.

Remember – if you didn't document it, it never happened!

Policies

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Documentation of Vital Signs

Purpose:

To provide guidelines and to set best practice for documentation of vital signs (VS) in the electronic Patient Care Report (ePCR).

Policy:

Vital Signs (VS) play a critical role in patient assessment and evaluations, and must be documented in the ePCR for any patient.

- ❑ An initial complete set of VS includes
  - Pulse Rate, Systolic AND Diastolic Blood Pressure (may substitute cap refill for children <3 years), Respiratory Rate, SpO2, Pain and GCS for trauma patients.
- ❑ If no interventions are made during EMS Provider evaluation and management (**including** IV Fluids, dextrose and naloxone), palpated Blood Pressures are acceptable for REPEAT VS.
- ❑ Based on the patient condition, complaint and/or treatment protocol used, VS may also include
  - Temperature, EtCO2, Level of Awareness

If the patient refuses EMS evaluation, an assessment of capacity must be completed AND documented in the ePCR. Detailed documentation should be captured regarding the patient's clinical presentation, reason for refusing (if known) and the refusal process in the ePRC narrative. Be sure to *capture the names of family members, Law Enforcement personnel or other EMS personnel who are present* for this conversation and evaluation.

For children, the need for Blood Pressure measurement should be determined on a case-by-case basis, considering the clinical condition of the child and the EMS Provider's rapport with the patient. Every effort should be made to document Blood Pressure, particularly in critically ill patients, or cases where treatment decisions are guided by VS and/or changes in VS.

Any abnormal VS should be followed closely, and repeated as indicated by change in patient subjective status or clinical condition.

Remember – if you didn't document it, it never happened!

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Domestic Violence (Spousal and/or Partner Abuse) Recognition and Reporting

Purpose:

To provide guidelines and resources for the EMS Provider who encounters suspected and/or confirmed cases of domestic violence while on duty.

Policy:

Domestic Violence is physical, sexual or psychological abuse and/or intimidation which attempts to control another person in a current or former family, dating or household relationship. The recognition, appropriate reporting and referral of abuse is an essential step to improving patient safety, providing quality care and preventing further abuse.

Effective management of a case of suspected abuse or neglect is based upon the following:

- ❑ Protect the patient from harm
- ❑ Suspect that the patient may be a victim of abuse, especially if the illness/injury is not consistent with the reported history
- ❑ Respect the privacy of the patient and the family
- ❑ Collect as much information as possible, and preserve physical evidence

Any findings of abuse or neglect OR suspicion of abuse or neglect must be handled with sensitivity and delicacy by the EMS Provider. Provision of emotional support is key, without passing judgment on the victim or alleged perpetrator of domestic violence. Discretion should be a high priority, and when possible questions regarding abuse and safety should be done in private. Offering the resources below to the patient may feel awkward at the time, but are excellent resources and may be used at any time in the future. Have a low threshold to transport patients of suspected or confirmed domestic violence, as they may not have other means of escaping their assailant and accessing resources that may be available at the hospital.

There are many subtle signs of abuse that may be missed without a high index of suspicion. Some include:
Psychological cues – excessively passive in nature, fearful behavior, excessive aggression, violent tendencies, excessive or inappropriate crying, substance abuse, medical noncompliance or repeat EMS requests for seemingly minor problems.
Physical cues – injuries inconsistent with the reported mechanism, defensive injuries (i.e. forearms), injuries during pregnancy are suggestive of abuse. Multiple bruises and injuries in various stages of healing may also suggest repeated violence against the victim.
Signs of neglect – inappropriate level of clothing for weather, poor hygiene, absence of and/or inattentive caregivers, poor living conditions and physical signs of malnutrition.

<u>For Suspected Domestic Violence</u> –

- ❑ EMS Providers should attempt in private to provide the victim with the Dane County Domestic Abuse Intervention Services (DAIS) helpline, (608) 251-4445 or (800) 747-4045. Both numbers are available 24 hours per day.
- ❑ EMS Providers may also provide the National Hotline (800) 799-SAFE (7233)
- ❑ Depending on the situation, transport should be considered regardless of the illness or injury, so that the victim may receive the expert consultation and additional services that are available in the Emergency Department

See the Dane County Domestic Abuse Intervention Services (DAIS) website for additional information as necessary:
http://www.abuseintervention.org

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Emergent Interhospital Transfers

Purpose:

To provide guidelines for EMS Provider expectations and medical care of patients during emergent transfer between Hospitals. This Policy does not supersede or replace existing EMTALA regulations.

This Policy is **not** intended to authorize services or care that are not part of an EMS Services' operational plan with the State of Wisconsin. Rather, it is intended to provide guidance for the rare but forseeable circumstances when a critically ill or injured patient may need to be rapidly moved to a higher level of care, and time is of the essence.

Policy:

In general, Dane County EMS Providers should only perform Emergent Interhospital Transfers for Time Critical Diagnoses (TCDs), usually involving patients requiring management at a specialty care facility (Trauma, STEMI, Stroke, Pediatrics, OB) when an authorized service is not available within a reasonable amount of time. Dane County EMS Providers may also be called upon to assist with Emergent Interhospital Movement of patients during large-scale or Mass Casualty Incidents (MCIs), or during a situation necessitating the implementation of Crisis Standards of Care – in these cases, there is likely to be heavy involvement of the Dane County Medical Director as well as each of the EMS Service Medical Directors (or their designees) to help provide real-time guidance on how to proceed.

If a Dane County EMS Provider is contacted for the Emergent Interhospital Transfer of a non-TCD patient, contact your Service EMS Supervisor for consultation prior to responding and transporting the patient.

Emergent Interhospital Transport decisions should be made based on the needs of the patient(s), any expected changes in their clinical condition and the familiarity / comfort level of the responding EMS Providers with the clinical situation as well as any medications or devices being used.

If a patient has unstable vital signs prior to departure from the sending facility, the EMS Provider responding is not knowledgeable of the medications being administered and/or the medications infusing are not in the Wisconsin Scope **OR** on an IV pump with inadequate reserve to last the anticipated duration of the transfer, it is the responsibility of the referring hospital to supply an additional provider. The additional provider shall be appropriately credentialed, familiar with the medications and devices to accompany the patient AND present for the entire transfer to the receiving facility. If there is any difficulty with this provision, the Service EMS Supervisor should be contacted immediately for guidance on how to proceed.

Communication and coordination between hospitals and EMS Providers is essential before an Emergent Interhospital Transfer is initiated to ensure patient safety and the appropriate medical management en route between the hospitals. A clear plan for responsibility of patient care while moving between facilities should be in place prior to departing the transferring hospital. In general, if the patient unexpectedly deteriorates while en route, the transferring facility should be notified, but the *receiving facility* should be contacted for additional Medical Control orders. The standing Dane County Protocols in this book may be followed as situation appropriate until Medical Control can provide further direction.

Unless there are extenuating circumstances (i.e. Mass Casualty Incident, Crisis Standards of Care), any Dane County EMS Service performing an Emergent Interhospital Transfer should only deliver patients to the Emergency Department of the receiving facility, where additional interventions and coordination of care may take place.

As with any Protocol, contact On-Line Medical Control with any questions or concerns.

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Lights and Siren During Patient Transport

Purpose:

To provide guidelines for the appropriate use of red lights and siren when transporting a patient from the scene of an emergency to the hospital. This Policy intends to help identify patients for whom safe use of red lights and siren can potentially reduce morbidity and mortality, and eliminate the unnecessary use of emergency lights and siren during transport to improve patient comfort, reduce anxiety and enhance safety for the patient, the EMS team and the Dane County community.

Policy:

- ❑ At the discretion of the ambulance crew, driving with lights and siren may be considered if the following clinical conditions or circumstances exist:
  - Difficulty in sustaining the ABCs (airway, breathing, circulation) including (but not limited to):
    - ❑ Inability to establish an adequate airway or ventilation.
    - ❑ Severe respiratory distress or respiratory injury not responsive to available field treatment.
    - ❑ Acute coronary syndrome with one or more of the following: ST elevation in two or more contiguous leads, acute congestive heart failure (CHF), hypotension, bradycardia, wide complex tachycardia, or other signs of impending deterioration.
    - ❑ Cardiac dysrhythmia accompanied by signs of potential or actual instability (hypotension, acute CHF, altered level of consciousness, syncope, angina, resuscitated cardiac arrest), which is unresponsive to available field treatment.
    - ❑ Severe uncontrolled hemorrhage.
    - ❑ Shock, unresponsive to available treatment.
  - Severe trauma including (but not limited to):
    - ❑ Penetrating wounds to head, neck, and torso.
    - ❑ Two or more proximal long bone fractures.
    - ❑ Major amputations (proximal to wrist or ankle).
    - ❑ Neurovascular compromise of an extremity.
    - ❑ Multi-system trauma.
  - Severe neurological conditions including (but not limited to):
    - ❑ Status epilepticus.
    - ❑ Substantial or rapidly deteriorating level of consciousness.
    - ❑ For a suspected stroke where a significant reduction of time to receive thrombolytic therapy can be achieved and the patient meets treatment inclusion criteria.
  - Obstetrical emergencies including (but not limited to):
    - ❑ labor complications that threaten survival of the mother or fetus, such as: prolapsed cord, breech presentation, arrested delivery, or suspected ruptured ectopic pregnancy.
- ❑ For any transport where reducing time to definitive care is clinically indicated, consider options other than emergent driving. In these cases, an alternative mode of transportation or higher level of care (such as ALS intercept or air-medical) should be considered if it is available and appropriate.
- ❑ Critical-care level emergent interhospital transport patient transports should not automatically be handled as lights and siren events. Clinical judgement and the patient criteria listed above should be applied on transfers to determine the level of urgency and transport mode.
- ❑ When a physician or nurse attempts to order lights and siren transport for a patient when it is believed by the crew to be contraindicated, attempt to resolve the issue with the ordering physician/nurse. If necessary, contact Medical Control to assist in resolving the issue.
- ❑ For any lights and siren transport, specifically document in the narrative the patient's condition, case circumstances and the rationale for choosing emergent transport.

Policies

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Non-Paramedic Transport of Patients

Purpose:

To provide guidelines for interactions of EMS Providers while on scene, and to help guide determination of the most appropriate level of service to transport patients to the Emergency Department.

This policy is intended to clarify expectations of providers on scene during situations when multiple levels of provider with transport capability arrive concurrently. It is **NOT** intended to be used as justification for refusal of transfer to a Paramedic level of service when a lower level is requesting it.

Policy:

For the purposes of this Policy, "Paramedic" refers to a Dane County EMS System credentialed Paramedic with no current restrictions on their clinical practice.

The provider with the highest level of Dane County EMS System credentialing on scene will conduct a detailed interview and physical assessment of the patient to determine the chief complaint and level of distress. If the provider determines that the patient is stable and ALL patient care needs can be managed by an EMS Provider at a lower level than Paramedic, then patient care may be transferred and transport initiated AND/OR completed by the lower level provider. All personnel are encouraged to participate in patient care while on-scene, regardless of who "attends" with the patient while en route to the hospital.

The determination of who attends should be based on the patient's immediate treatment needs and any reasonably anticipated treatment needs while en route to the hospital. The highest credentialed provider on scene retains the right to make the decision to personally attend to any patient transported based on his or her impression of the patient's clinical conditions, current needs or anticipated needs based on the EMS Provider's evaluation and experience.

The highest credentialed EMS Provider who performs the assessment and determines the appropriate level of care for transport must document the findings of their assessment. Additional documentation shall be completed by the transporting provider. As with all documentation, both providers are responsible for the content of the report.

Patients who meet the criteria below shall be attended by Paramedics (per their operational plan) in the patient care compartment, unless mass casualty incident, natural disaster or previously approved by policy or the On-Line Medical Control. The care of the following patients cannot be transferred to a lower level of credentialing:

- ❑ Any patient who requires or might reasonably require additional or ongoing medications, procedures AND/OR monitoring beyond the scope of practice of the lower credentialed provider. This includes any critically ill or unstable patient as advanced airway management may be required in any decompensating patient. EMT-Basic and EMT-Advanced providers may be credentialed to perform some but not all airway management, and medications associated with airway management are limited to the Paramedic scope of practice by the Wisconsin State Medical Board.
- ❑ Any patient for whom ALL EMS providers on scene do not agree can be safely transported without a Paramedic in attendance in the patient care compartment. As a general rule, if providers are questioning who should attend the patient, the highest credentialed level of care should attend.
- ❑ Any patient suffering from chest pain of suspected cardiac origin, cardiac dysrhythmia, moderate to severe respiratory distress, multiple trauma or imminent childbirth.
- ❑ Post-ictal patients with high probability of recurrent seizure.
- ❑ Patients who have been medicated on the scene cannot be transferred to a provider of a lower credentialing level **UNLESS** the provided medication is included in the receiving EMS Provider's scope

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Paramedic Intercept Guidelines

Purpose:

To outline circumstances in which an Advanced Life Support (ALS) Service should be requested for intercept with a non-ALS level Service.

Policy:

The situations listed below are not all-inclusive, but are intended to serve as examples of when a higher level of care would be appropriate for advanced interventions and patient safety. In addition to advanced skills and additional medication options, Paramedics also bring an experience with critically ill and injured patients, and can assist with the safe evaluation and destination determination process.

While the care of the patient should be the top priority of all providers in the Dane County System, many factors go into the decision to request an ALS intercept. Time of day, traffic conditions, weather and proximity to appropriate medical care all may be considered when making the decision. When possible, arrangements may be made to rendezvous with an ALS service while en route to the hospital, so that the delay to advanced skills and medications may be minimized.

Some examples of patients that may benefit from ALS level evaluation and management include but are not limited to;

- Sepsis
- Cardiopulmonary Arrest
- Altered Mental Status not explained by simple hypoglycemia or opiate overdose
- Severe Respiratory Distress AND/OR Impending Airway Compromise
- Multi-System Trauma
- Unstable or Deteriorating Vital Signs
- Chest Pain with Hemodynamically Compromising Dysrhythmia
- ST-Segment Elevation MI with Hypotension, Altered Mental Status or Impending Cardiac Arrest
- Complex Seizures (First Seizure without History, Seizure After Head Injury, Recurrent Seizure without Return to Baseline)
- Allergic Reaction assessed to be 'Severe' or 'Impending Cardiac Arrest'
- Asthma Exacerbation not improving after Albuterol OR Requiring Multiple Nebs
- Complications of Childbirth
- Mass Casualty Incident
- Any Situation that the Dane County EMS Provider OR Medical Control feels warrants ALS Evaluation and Management

We are all working together to get the right patient to the right level of care at the right time!

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Policies

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Patient Care During Transport

Purpose:

To provide general guidelines and to set best practice when caring for patients both on the scene of an emergency as well as in the ambulance during transport to the receiving facility.

Policy:

All sick or injured persons requesting transport shall be transported without delay to the most appropriate Emergency Department, with high consideration given to patient preference. Exceptions to this policy are as follows:

- ❑ An "appropriate local Emergency Department" includes all Dane County Emergency Departments as well as hospitals in contiguous counties as designated in this Procedures and Protocols Handbook. The ability of a patient to pay or the insurance status (if known) should not play a part in this decision. If EMS Unit availability will be a concern due to requested destination, contact your Service EMS Supervisor prior to initiating transport.
- ❑ All sick or injured persons requesting transport who *do not express a preference* or who rely on the knowledge of the EMS Provider should be transported to the closest, most appropriate local Emergency Department.
- ❑ Patients who are suffering from a Time Critical Diagnosis (TCD) or a condition covered under the Destination Determination Protocols should be transported in accordance with the specialty resource required by the treatment flowchart. All other patients should be transported per the policy statement above.
- ❑ Transport destination decisions should take into consideration the preexisting healthcare relationships that a patient may have. In general, a patient should be taken to the hospital at which they typically receive care and/or where their primary care physician has affiliation, *unless the patient expressly requests otherwise*. Providers should discuss risks and benefits of transport to a facility that has not previously cared for the patient, and document the discussion clearing in the electronic Patient Care Report (ePCR).

The following situations shall require more than one EMS Provider in the passenger compartment of the transporting vehicle, to provide adequate medical care. The additional provider(s) is/are present not only to serve as additional "hands", but to expand the critical thinking of the team and to help optimize patient outcomes. **For these circumstances, students with the current training permit may assist with patient care, but may NOT count as one of the additional EMS Providers.**

- ❑ Cardiac Arrest of Medical OR Traumatic etiology
- ❑ Post Resuscitation Return of Spontaneous Circulation (ROSC) patients, *even if Vital Signs are stable*
- ❑ Active Airway Management, *regardless of modality chosen* (Endotracheal Tube, Blindly Inserted Airway Device (BIAD) or Bag-Valve Mask (BVM)
- ❑ Impending Arrest or "Peri-Code" Situation
- ❑ Imminent Delvery
- ❑ Newly Born Patients (Mother and Newborn count as two patients, and require an attendant for each)
- ❑ At the Attending EMS Provider's Judgement, for cases not covered above

If a second EMS Provider is not available and transport would be delayed, initiation may be started under these two circumstances:

- ❑ An Advanced Care Intercept (Ground ALS or HEMS) has been contacted and arrangements made for rendezvous en route
  OR
- ❑ The case has been reviewed with On-Line Medical Control (OLMC) AND approval granted

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Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Patient Without A Protocol

Purpose:

To ensure the provision of appropriate medical care for every patient, regardless of presenting problem or medical condition.

Policy:

Any person requesting EMS service shall receive a professional evaluation, treatment and transportation as necessary in a systematic, orderly fashion regardless of the chief complaint, medical condition or ability to pay.

Medical evaluation and management for all patient encounters that can be triaged into a Dane County EMS Protocol shall be initiated and conducted as per the standing protocols.

When confronted with an emergency situation or patient condition that does not fit into an existing Dane County EMS Protocol, evaluation and management of the patient should be started under the General Approach – Adult, Medical OR General Approach – Peds, Medical Protocols, as appropriate. On-Line Medical Control should be contacted for consultation as soon as possible for further direction and instructions on patient management within your scope of practice.

Policies

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A	A-EMT
P	Paramedic
M	Medical Control

Physician On Scene

Purpose:

To define the responsibilities of EMS Providers responding to an emergency scene, to identify the chain of command and to prevent potential conflicts regarding patient care that may arise during EMS evaluation and management when a licensed physician is on scene. No other healthcare professionals are permitted to provide medical direction under this policy.

This policy is not intended to apply to Service Medical Directors.

Policy:

The medical evaluation and management of patients at the scene of an emergency is the responsibility of the person most appropriately trained in emergency medical care. As an agent of the EMS Service Medical Director and operating under the Dane County EMS Protocols, the EMS Provider routinely fills this role. Occasions may arise when a physician on scene may wish to deliver care to a sick or injured patient, or to direct EMS personnel in medical management. In order for a physician to assume care of a patient, they **MUST**:

- ❑ Provide photo identification verifying his/her current credentialing as a physician (MD/DO) AND a current copy of his/her license to practice medicine in the State of Wisconsin **AND**
- ❑ Assume care of the patient AND allow documentation of of his/her assumption of care on the electronic Patient Care Report (ePCR), as verified by his/her signature, **AND**
- ❑ Agree to accompany the patient during transport to the receiving hospital **AND**
- ❑ Not appear to be impaired or under the influence of drugs, alcohol or medical conditions **AND**
- ❑ Explicitly express willingness to accept liability for the care provided to the patient under their personal medical license

Contact with Medical Control must be established as soon as possible, and the Medical Control Physician must agree to relinquish responsibility for patient care to the Physician On Scene.

Once care has been transferred from the On-Line Medical Control to the Physician On Scene, the EMS Provider may provide care under the license and authority of the Physician On Scene. Direction provided by the Physician On Scene assuming care of the patient should be followed by the EMS Provider, granted that the interventions are not believed by the EMS Provider to endanger the well-being of the patient.

Orders received from an authorized (as determined by this Policy) Physician On Scene may be followed, even if they conflict with existing local protocols, provided the orders encompass skills AND/OR medications approved by both the Dane County Medical Advisory Subcommittee and the Wisconsin State Medical Board for a provider's level of credentialing. **Under no circumstances** shall EMS Providers perform procedures or give medications that are outside of their scope of practice AND/OR credentialing.

Conflict with Physician On Scene:

If the Physician On Scene is judged by the EMS Provider on scene to be potentially harmful or dangerous to the patient, the EMS Provider should politely voice their objection, and immediately contact On-Line Medical Control for further assistance. On-Line Medical Control should be briefed by the EMS Provider, and the Physician On Scene allowed to communicate directly with the On-Line Medical Control. When at all possible, these conversations should be held on a recorded line.

If the Physician On Scene and On-Line Medical Control are in conflict, it is the responsibility of the EMS Provider to:

- ❑ Follow the directions of On-Line Medical Control
- ❑ Enlist the aid of Law Enforcement as necessary to regain control of the emergency scene and resume authority of the scene

Documentation:

All interactions with Physicians On Scene must be thoroughly documented in the electronic Patient Care Report (ePCR), including the full name and medical license number of the Physician On Scene, as well as the interventions performed at their direction.

Policies

Legend	
	EMT
A	A-EMT
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M	Medical Control

Poison Control

Purpose:

To provide guidelines for involving Poison Control with out-of-hospital management of patients with potential or actual poisonings.

Policy:

Patients who have sustained significant poisonings, envenomations, and environmental/biochemical terrorism exposures in the out-of-hospital setting require timely and appropriate level of care, including the decisions regarding scene treatment and transport destination. By integrating the State Poison Center into the out-of-hospital response plan for HazMat and biochemical terrorism incidents, this policy aims to empower the out-of-hospital care provider and enhance the ability to deliver the most appropriate care to the patient possible.

If the patient is assessed by the EMS Provider and no immediate life threat or indication for immediate transport is identified, the EMS Provider may conference call with the Poison Center at the Wisconsin State Poison Center at **1 (800) 222-1222.**

The Poison Center will help evaluate the exposure and make recommendations regarding the need for on-site treatment and hospital transport in a timely manner. If EMS transport to the hospital is determined to be necessary, the Poison Center will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may also contact On-Line Medical Control for further instructions or for treatment options.

If EMS transport is determined to *not be* necessary, the contact phone number for the patient will be provided to the Poison Center. The Poison Center will make a minimum of one follow-up phone call to determine the status of the patient. Additionally, the EMS Provider must contact On-Line Medical Control to review the case and discuss the recommendations of the Poison Center and what is believed to be in the best interest of the patient.

As detailed elsewhere in this document, exposures and/or poisonings that are the result of suicide attempts or gestures, or children who sustain an exposure and/or poisoning due to child abuse or neglect *SHOULD NOT be allowed to refuse transport*. These are both vulnerable populations who are at an increased risk of death or permanent disability if not cared for appropriately. As always, good Provider judgment and patient advocacy will be the cornerstones of making sound, defensible patient treatment decisions.

In any cases of poisoning, whether accidental, intentional or the consequence of a bioterrorism event, the safety of the First Responders should be of the highest priority. At a minimum, the following information should be gathered so that the Poison Center can make the best recommendations for the current situation

- ❑ Age of the patient
- ❑ Substance(s) involved with the exposure (if known)
- ❑ Time and Duration of exposure (if known)
- ❑ Signs and Symptoms
- ❑ Any Treatments provided and the response to the intervention

As with many of the EMS Protocols, a significant amount of information is collected by the EMS Providers on scene and can be extremely valuable for downstream providers. Be sure to notice and document HazMat placards in cases of transportation incidents, any MSDS sheets available in the industrial / manufacturing setting, or the contents and volumes of products / substances present in the cases of household ingestion.

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Policies

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Patients in Police Custody

Purpose:

To provide guidelines for the evaluation and management of patients requiring EMS assessment while in the custody of Law Enforcement. As with every patient interaction, it is important that the EMS Provider serve as a patient advocate and use their best medical judgment to assist Law Enforcement in making safe, appropriate decisions regarding medical aid and disposition decisions.

Policy:

As a general rule, when evaluating a patient who is in the custody of Law Enforcement, the EMS Provider should approach the patient with the same respect and consideration as patients who are not being detained. While EMS is not equipped or authorized to provide "Medical Clearance" before transport to jail, it is the responsibility of the EMS Provider to provide an unbiased assessment and to make recommendations based on Dane County Protocols as well as EMS Provider experience and judgment.

These patient encounters have a higher than average incidence of scrutiny on review; as such, take steps to ensure that your documentation is clear, descriptive and complete. Law Enforcement Agent names and badge numbers are essential in the EMS Provider documentation.

- ❑ If a patient in custody of Law Enforcement is evaluated by EMS and felt to need transport to the Emergency Department and *the patient is refusing transport*:
  - Evaluate the capacity of the patient to make informed decisions as outlined in the Dane County Protocols
  - Advise the Law Enforcement Agent of the decision of the patient, and consider potential risks or hazards to Law Enforcement if the patient were to refuse (i.e. lacerations that may pose a biohazard to officers or other detainees)
    - ❑ If Law Enforcement requests transport, document their request and coordinate safe transport to the closest, most appropriate Emergency Department. In these instances, the Law Enforcement Agent must take the patient into Protective Custody and effectively making decisions as the healthcare power of attorney for the patient.
    - ❑ Document that Law Enforcement has taken Protective Custody of the patient.
    - ❑ In this instance, the Law Enforcement Agent must accompany the patient to the Emergency Department.
  - If the patient is evaluated to have capacity and does not pose an undue risk to Law Enforcement, execute a Patient Refusal as outlined in the Dane County Protocols

- ❑ If a patient in custody of Law Enforcement is evaluated by EMS and felt to need transport to the Emergency Department and the *Law Enforcement Agent is refusing transport*:
  - Advise the Law Enforcement Agent that transport is indicated by Dane County Protocols, and that medical clearance is not authorized by EMS Personnel in the field.
  - Contact On-Line Medical Control for consultation and assistance as needed.
    - ❑ If Law Enforcement continues to decline transport for medical evaluation and management, allow the patient to remain in the custody of the Law Enforcement Agent, and advise them that EMS may be re-contacted at any time to provide medical assistance as needed
    - ❑ The Law Enforcement Agent in these situations is taking the patient into Protective Custody and effectively making decisions as the healthcare power of attorney for the patient.
    - ❑ Document that Law Enforcement has taken Protective Custody of the patient.
  - Document the Law Enforcement Agency as well as the name and badge number of the responsible officer along with specifics of the discussion in your electronic Patient Care Report (ePCR).

- ❑ If a patient in custody of Law Enforcement requires transport to the Emergency Department and is *requiring physical restraint* by the Law Enforcement Agent for behavior modification:
  - Advise the Law Enforcement Agent that Dane County EMS Policy requires their accompaniment in the patient compartment of the ambulance during transport to the Emergency Department.
    - ❑ With active restraints in place, it is an issue of patient safety as well as provider safety
  - Consider the Behavioral Emergencies Protocol in the Dane County Protocol book, OR contact On-Line Medical Control for advice regarding medication management as appropriate to assist with safe and expeditious transport

Policies

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Radio Report Format

Purpose:
To provide guidelines for clear communication between EMS Providers and receiving facilities prior to delivery of the patient.

Policy:
For all patients being transported to the hospital by EMS, every effort should be made to contact the receiving facility *as early as possible* once the destination facility has been chosen and transport initiated. By making proactive contact with the receiving facility, it provides the opportunity to collect personnel, resources and equipment that may be needed to care for critically ill or injured patients, and thereby improve patient survival and realization of the EMS mission.

Procedure:
Begin each transmission with the agency name and unit number, and wait for acknowledgement from the receiving facility.

After the receiving facility acknowledges contact with your unit, give a clear, concise report which includes the following:

- ❑ Triage category and triage color

Triage Category	Triage Color	Definition	Common Examples (NOT All-Inclusive List)
Medical	Red	High acuity of illness, unstable VS or critically ill	Hypotension, Extreme Tachycardia, Multiple Medications (other than Albuterol), Airway Management, Altered Mental Status, Failure to Respond to EMS Therapy
	Yellow	Serious medical illness with potential to decompensate, but VS currently stable	COPD improving with nebs, Chest Pain with Cardiac History, Abdominal Pain in Pregnancy, Fever without hypotension or tachycardia (not believed to be sepsis)
	Green	Low acuity medical illness, VS stable	Hypoglycemia resolved with Dextrose, Intoxication without airway compromise or indication of trauma
	Peds	≤12 years of age OR absence of sigs of puberty / secondary sex characteristics	
Trauma	Red	Severe mechanism of injury, life or limb threatening injury	Traumatic injury with hypotension, tachycardia, uncontrolled/poorly controlled hemorrhage, Altered Mental Status, pain not improving with EMS Intervention
	Yellow	Serious mechanism of injury, potential for decompensation but VS currently stable	Head Injury with anticoagulant use, deformed extremities after trauma, significant pain improved after EMS intervention
	Green	Minor mechanism of injury, no outward signs of trauma, VS stable	Head Injury without LOC or Altered Mental Status, Traumatic Extremity pain with intact CMS and without deformity
	Peds	<18 years of age	
STEMI ALERT	Red	STEMI Interpretation of Field ECG (EMS or Monitor) **Call with early notification**	Goal time for first EMS Contact to balloon time <90 minutes
STROKE ALERT	Red	Focal Neurologic Deficit with Last Known Normal ≤12 Hours	Include collateral information, bring witnesses to corroborate history when/if appropriate

- ❑ Estimated time of arrival (ETA)
- ❑ Age and Chief Complaint of the patient
- ❑ Very brief background of events including:
  - Mechanism of injury and description of injuries found (if traumatic)
  - Provider Primary Impression and nature of patient complaint (if medical)
  - Treatments provided and/or underway as well as patient response
  - *Current* Vital Signs including GCS
  - Any anticipated delay in transport (i.e. extrication)

Contacting Medical Control

- ❑ Medical Control may be contacted for any additional orders, to consult as needed for patients refusing transport and for any questions regarding patient management on scene or en route to the receiving facility. Any orders given should be repeated back for clarification and patient safety.
- ❑ Make sure your request of Medical Control is clearly communicated, and be prepared to answer follow up questions regarding the protocol you are following as well as your assessment of the situation.
- ❑ Several protocols have suggested medications and dosages outlined in the protocol, to help facilitate the conversation with Medical Control
- ❑ **Remember: you are the one who has the patient in front of you – your assessment and impression matter!**

Policies

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Transfer of Care at Hospital

Purpose:

To provide guidelines for in-person communication with receiving facilities, and to clarify expectations of EMS Provider documentation.

Policy:

When delivering a patient to the receiving facility, it is imperative that a clear, concise communication happen between the EMS Provider and the emergency medical staff assuming care. In order to prevent miscommunication, a full verbal report should be communicated in a face-to-face fashion, preferably with the entire medical team assembled at the patient bedside. On the occasion that the complete team is not available, verbal report should be given to a receiving caregiver credentialed at the RN level or higher.

All treatments and interventions initiated under the Dane County Protocols may be continued after arrival in the receiving facility up until the appropriate personnel and equipment are assembled to assume care of the patient. At that time, responsibility for all medical care and continued treatment is transferred to the facility, and the Dane County EMS Protocols are no longer authorized for patient management. On-Line Medical Control should not be contacted for additional orders once this handoff has occurred. In the rare circumstance that the EMS Provider is requested/invited to participate, direction will be at the authorization and the discretion of the supervising on-scene physician. It is important that the involvement, orders received and name of the responsible physician be captured in the electronic Patient Care Report (ePCR) as part of the medical care provided by EMS.

<u>Verbal Report</u>
Verbal report at the time of handoff shall include all pertinent known information about the patient, the history of present illness or mechanism of injury, treatments administered by EMS Providers as well as the patient's responses to treatment. In addition, all prehospital ECGs and provided paper medical records should be turned over to the treatment team assuming care.

<u>Written Report</u>
Wisconsin DHS Administrative Rule 110.34(7) specifically addresses EMS responsibility for written patient report at the time of handoff at the receiving facility. The rule states:

> An emergency medical service provider shall, "...submit a written report to the receiving hospital upon delivering a patient, and a complete patient care report within 24 hours of patient delivery. A written report may be a complete patient care report or other documentation approved by the department and accepted by the receiving hospital."

The expectation is that there will be written documentation left at the receiving facility, and conveyed either in printed or electronic format *prior to your departure* and returning available to service. It is not required that the documentation left at the facility be the completed, finalized electronic Patient Care Report (ePCR). **HOWEVER**, <u>all EMS Providers in Dane County are integral members of the healthcare team</u>, and may hold key pieces of information not available to any of the downstream providers and which are at significant risk of being lost, overlooked or miscommunicated if not documented in a prompt manner.

Given the nature of EMS and out-of-hospital care, it should be the goal of every Dane County EMS Service at minimum to have a draft narrative, list of the EMS interventions, medications given and vital signs documented *prior to leaving the facility* and returning to duty.

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P	Paramedic
M	Medical Control

Persons with EMS Care Plans

Purpose:

To establish a uniform approach for the evaluation and management of persons having an established Care Plan, developed by the EMS Service and approved by the Medical Director.

Policy:

All sick or injured persons requesting transport shall be transported without delay to an appropriate local Emergency Department of the patient's preference. The only exceptions to this rule are found below:

- ❑ Patients who are suffering from a Time Critical Diagnosis (TCD) or whose condition is covered under the Destination Determination Protocols shall be transported in accordance with those specialty algorithms to the appropriate receiving facility. The presence of a Care Plan **DOES NOT** supersede the Destination Determination Protocol.
- ❑ Patients known to have been discharged from an Emergency Department within the last 48 hours should generally be transported back to the same ED, **unless** they meet specialty center destination criteria, as outlined in the Destination Determination Protocol.
- ❑ Patients who have been identified as frequent users of the EMS System may have a designated Care Plan, which has been developed with the patient and/or their healthcare providers, the EMS Service and one or more of the Dane County hospitals. If a patient has a formal Care Plan approved by the EMS Service Medical Director, the patient should be evaluated, treated and transported in accordance with the Plan, **unless** the patient meets criteria for transport to a specialty receiving center, as outlined above. Regardless of the existence of a Care Plan, all patients should be treated with respect and dignity, and fully evaluated as per the standards set forth in this Protocol Book.

There may be exceptions to this guideline, and if there are questions while evaluating a patient with a Care Plan, do not hesitate to contact the Officer In Charge (OIC) or the Medical Director or Medical Director's designee for clarification.

Policies

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Legend	
	EMT
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P	Paramedic
M	Medical Control

General Approach – Adult, Medical

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Medical Protocols - Adult

Assessment

Scene

Patient

All Patients should remain Nothing By Mouth (NPO) Unless Specified by Treatment Protocol

Safety

Unsafe

Safe

Insufficient

PPE

Sufficient

Hazmat

Yes

Notify Comm Center, Activate Hazmat Resources

Stage, Call for Law Enforcement and/or Additional Resources

Presentation **OR** Traumatic Mechanism

Yes

Go To Appropriate Adult Trauma Protocol

No

Check for Pulse

Pulseless, Apneic

Cardiac Arrest Protocol p38

Present

Minimize Scene Time, Notify Receiving Facility of Critical Patient Early

A,B,C's

Obstructed Airway, Ventilations Inadequate

Airway Management Protocol p32

Exsanguinating Hemorrhage

Hemorrhage Control Protocol p93

Ventilations Adequate, BP and RR Adequate

Support Airway, Support Oxygenation, Support Circulation

M Contact Medical Control

Doesn't Fit Protocol, Exhausted Protocol

Evaluate and Treat Per Appropriate Medical Protocol

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- 12-Lead ECG should be done early for *any* non-traumatic pain complaint between the ear lobes and the umbilicus (belly button).
- Include Blood Glucose reading for *any* patient with complaints of **weakness, altered mental status, seizure, loss of consciousness, known history of diabetes OR Cardiac Arrest**
- Measure *and document* SpO2, EtCO2 for ANY patient with complaint of weakness, altered mental status, respiratory distress, respiratory failure or EMS managed airway
- If hypotensive (Systolic BP<100mmHg) and/or clinical evidence of dehydration, consider IV Access Protocol and Shock (Non-Trauma) Adult Medical Protocol
- Any patient contact which does not result in an EMS transport must have a completed refusal form.
- Never hesitate to consult medical control for assistance with patient refusals that can't meet all required fields, clarification of protocols or for patients that make you uncomfortable.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Airway Management - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of CHF, COPD, Asthma
- Lung Sounds before *AND after* intervention
- Allergen Exposure
- Toxic / Environmental Exposure

Differential

- Head Injury
- Electrolyte Abnormality
- COPD Exacerbation
- CHF Exacerbation
- DM, CVA, Seizure, Tox
- Sepsis
- Asthma Exacerbation
- Drug Ingestion / Overdose

Medical Protocols - Adult

General Approach – Adult, Medical

Assess A,B,C's (RR, Effort, Adequacy)

Adequate → Supplemental Oxygen As Appropriate (Nasal Cannula, Facemask) → Evaluate and Treat Per Appropriate Adult, Medical Protocol

Inadequate → Basic Airway Maneuvers (Open Airway, Suction, NPA vs. OPA)

Anticipate and Prepare for the Difficult Airway
LEMON Rule

- **L**ook Externally
- **E**valuate with 3:3:2 Rule
- **M**allampati Classification
- **O**bstruction
- **N**eck Mobility (or lack thereof)

Basic Airway Maneuvers ↔ Consider Need for ALS Level Service EARLY

If obstruction suspected, Go to Airway Obstruction Procedure p149

Assess Mental Status

Altered **AND/OR** Apneic → Bag-Valve Mask → Consider Advanced Airway; Max 2 Attempts

P **x2** Consider Rapid Sequence Airway Protocol p33

Each Attempt should include change in approach, operator and/or equipment **NO MORE THAN TWO (2) ATTEMPTS TOTAL**

Awake **OR** Protecting Airway → Consider CPAP Procedure IF Awake, Following Commands **and** SBP ≥100 p163

Decomp-ensating ↔ Consider Advanced Airway; Max 2 Attempts

M **Consider Midazolam 1mg IV/IN If needed for CPAP compliance**

Assess Air Movement and Chest Rise

Poor Chest Rise **OR** Poor Air Exchange → Failed Airway Protocol p35 → Call for ALS Level Service IMMEDIATELY

Good Chest Rise **AND** Good Air Exchange → Document Response to Procedure Continuous EtCO2, SpO2 Monitoring → **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- Digital capnography is the standard of care and is to be used with all methods of advanced airway management and endotracheal intubation. If a service does not have digital capnography capabilities and an Invasive Airway Device is placed, an intercept with a capable service **MUST** be completed
- Goal $EtCO_2$ = 35-45mmHg
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO2 >93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital
- *Always* assume that patient reports of dyspnea and shortness of breath are physiologic, **NOT** psychogenic! Treatment for dyspnea is O2, not a paper bag!
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allow
- Once secured, every effort should be made to keep the endotracheal tube in the airway; commercially available tube holders and C-collars are good adjuncts
- For all protocols, an **Intubation Attempt** is defined as: passing the tip of the laryngoscope blade or Blindly Inserted Airway Device (BIAD) tube past the teeth

Legend	
	EMT
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Rapid Sequence Airway - Adult

Pertinent Positives and Negatives
- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of CHF, COPD, Asthma
- Lung Sounds before *AND after* intervention
- Allergen Exposure
- Toxic / Environmental Exposure

Differential
- Head Injury
- Electrolyte Abnormality
- COPD Exacerbation
- CHF Exacerbation
- DM, CVA, Seizure, Tox
- Sepsis
- Asthma Exacerbation
- Drug Ingestion / Overdose

Medical Protocols - Adult

Airway Management – Adult, Medical

P**x2** Consider Rapid Sequence Airway Procedure p150

Preparation (8 Minutes Before Attempt)
IV, O2, Continuous Cardiac Monitor, SpO2, EtCO2, BP
Check Laryngoscope Bulb, ETT Balloon, Stylet, Syringes
Prepare Rescue Airway Device
Medications Drawn Up and Labeled

Preoxygenate (5 Minutes Before Attempt)
100% O2 x 5 Minutes
8 Vital Capacity Breaths via BVM or NRB
Continue Until Airway Secured
Continue apneic oxygenation via high-flow Nasal Cannula throughout procedure (if available)

Pretreatment (3 Minutes Before Attempt)
Cricoid Pressure (Sellick's Maneuver)
Lidocaine 1.5mg/kg IV/IO If Head Injury (max 150mg)

Paralysis and Induction (0 Minutes Before Attempt)
Etomidate 0.3mg/kg IV/IO (max 20mg) **OR**

M **Ketamine 2mg/kg IV/IO, max 200mg**

Succinylcholine 2mg/kg IV/IO (max 200mg) **OR**
Rocuronium 1.0mg/kg (max 100mg)

Unsuccessful → Failed Airway, Adult Protocol p35

Placement with Proof (30 Seconds After Attempt)
Continuous EtCO2, Auscultation, Chest Rise, Fogging in Tube
Secure Device
Print capnography strip and document depth

Unsuccessful **OR** Poor Proof → Failed Airway, Adult Protocol p35

Post Placement Management (60 Seconds After Success)

Post-Advanced Airway Sedation Adult p34

Consider Rocuronium 1.0mg/kg IF prolonged paralysis AND transport time ≥10min

→ **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Indications for Invasive Airway Management
- Age >18 years old for Paralytic Use
- Apnea
- Decreased Level of Consciousness with Respiratory Failure
- Poor Ventilatory Effort with Hypoxia
- Unable to Maintain Airway with Noninvasive Methods
- Burns with Suspected Airway Involvement
  - Singed Facial Hair
  - Hoarseness
  - Wheezing
  - Subjective Shortness of Breath

Each Attempt should include change in approach, operator and/or equipment
NO MORE THAN TWO (2) ATTEMPTS TOTAL

Contraindications for Invasive Airway Management
- Medication Hypersensitivities
- Inability to Ventilate with BVM
- Suspected Hyperkalemia
  - History of ESRD, Burns, Crush Injury
- History Malignant Hyperthermia
- Myopathy or Neuromuscular Disease
- Recent Burn (≥48 Hours after Burn and <1 week)
- Recent Spinal Cord Injury (≥72 Hours but ≤6 Months)

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose, Lung Exam, Posterior Pharynx

- Digital capnography is the standard of care and is to be used with all methods of advanced airway management and endotracheal intubation. If a service does not have digital capnography capabilities and an Advanced Airway Device is placed, an intercept with a capable service **MUST** be completed
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO2 ≥93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allows
- Once secured, every effort should be made to keep the endotracheal tube in the airway; commercially available tube holders and C-collars are good adjuncts
- For all protocols, an Intubation Attempt is defined as passing the tip of the laryngoscope blade or Blindly Inserted Airway Device (BIAD) tube past the teeth
- Recent history of Upper Respiratory Infection, Missing / Loose Teeth or Dentures all will increase complexity of airway management

Rapid Sequence Airway - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Post Advanced Airway Sedation – Adult, Medical

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxidrome
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Medical Protocols - Adult

Rapid Sequence Airway – Adult, Medical

Successful Airway Placement

No → Failed Airway Protocol p35

Yes

Assess and Document BP, HR, SpO2, Continuous Cardiac Monitoring, EtCO2

Long Acting Paralytic Used (Roc)

Yes → Signs of Discomfort

No → **Monitor VS Closely Notify Receiving Facility, Contact Medical Control As Necessary**

Yes → Rising BP, Increasing HR, Tearing

No → Signs of Discomfort

Yes → Pulling at Lines and Tubes, Coughing or Gagging on Invasive Airway Device, Clinical Signs of Agitation

No → **Monitor VS Closely Notify Receiving Facility, Contact Medical Control As Necessary**

Systolic BP ≥90

Yes

P	Fentanyl 1mcg/kg (max 100mcg) IV/IO **AND** Midazolam 4mg IV/IO May Repeat (max 3 doses)
P	Consider Ondansetron 4mg IV/IO

No

P	Consider Ketamine 2mg/kg IV/IO (max 200mg) if patient still agitated
M	**Contact Medical Control**

Improved Comfort

Yes → **Notify Receiving Facility, Contact Medical Control As Necessary**

No

M	**Contact Medical Control**

Medical Protocols - Adult

Pearls

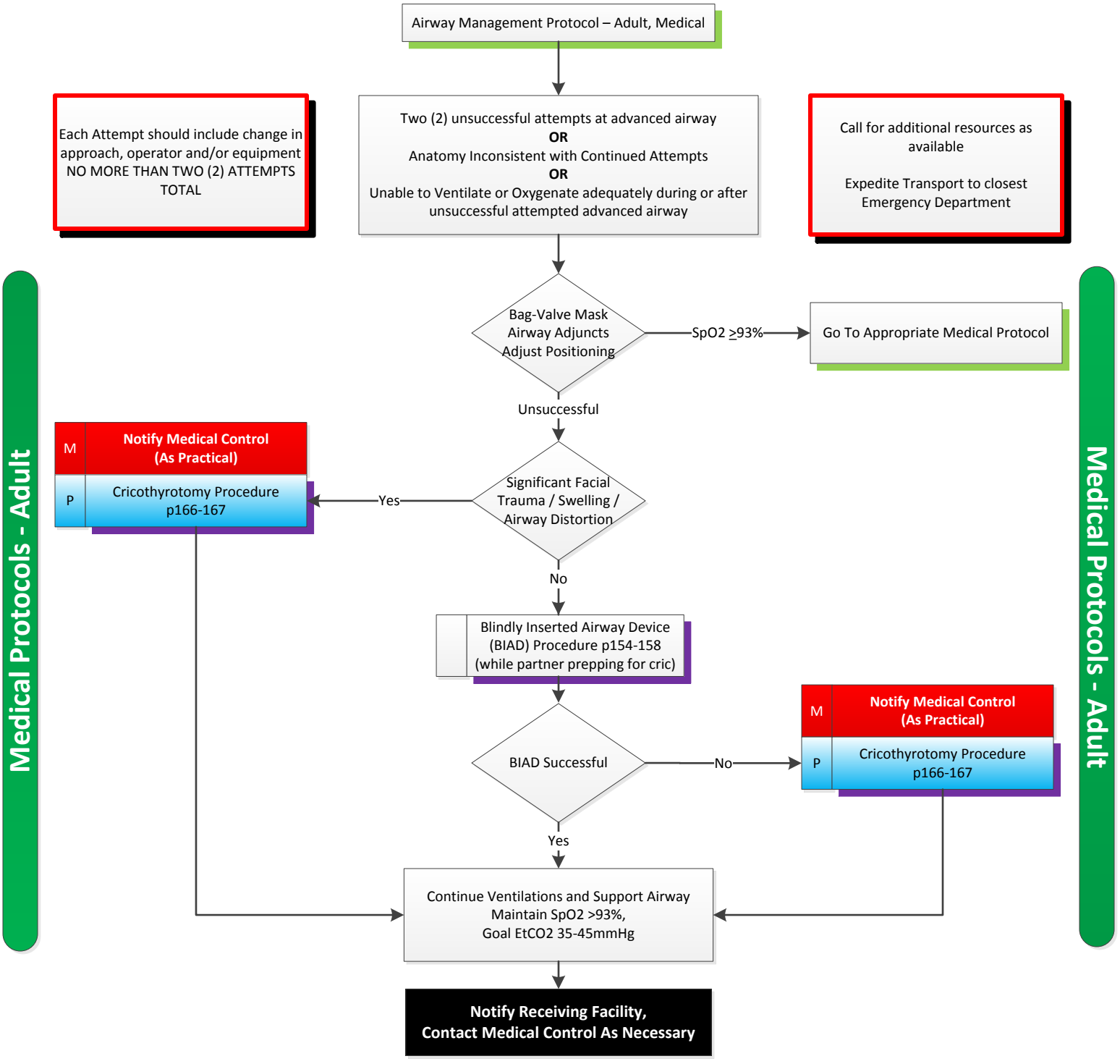
REQUIRED EXAM: VS, GCS, Nature of Complaint

- Paralytics block movement of skeletal muscle but do **NOT** change awareness. Remember that without sedation, patients may be **awake** but **paralyzed**
- Monitor Vital Signs closely when managing airways and sedation. Changes that indicate pain, anxiety ***as well as tube dislodgment*** may be subtle (at first)!!
- Document Vital Signs before and after administration of every medication to prove effectiveness
- ANY change in patient condition, reassess from the beginning. Use the mnemonic DOPE (Dislodgment, Obstruction, Pneumothorax, Equipment) to troubleshoot problems with the ET Tube
- Ketamine may be considered for sedation AFTER standard regimen exhausted AND if Ketamine **NOT** used as induction agent for intubation
- Continuous End Tidal CO2 is mandatory for all intubated patients – color change is not sufficient proof of ET Tube in the trachea

Post RSA Sedation – Adult, Medical

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Failed Airway - Adult



Pearls

REQUIRED EXAM: VS, GCS, Lung Sounds, RR, Skin, Neuro

- A patient with a "failed airway" is near death or dying, not stable or improving. Inability to pass an ET Tube or low SpO2 alone are not indications for surgical airway.
- Continuous digital capnography is the standard of care and is to be used with **ALL** methods of advanced airway management and endotracheal intubation. If a service does not have digital capnography capabilities and an Invasive Airway Device is placed, an intercept with a capable service **MUST** be completed
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO2 ≥93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allow
- Once secured, every effort should be made to keep the endotracheal tube in the airway; commercially available tube holders and C-collars are good adjuncts
- For this protocol, *an Intubation Attempt is defined as* passing the tip of the laryngoscope blade or Invasive Airway Device past the teeth

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

COPD / Asthma / Stridor - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2
- SAMPLE history
- OPQRST history
- Asthma, COPD, CHF history
- Home meds used prior to call (Nebs, Steroids, Theophylline)
- Wheezing, Rhonchi
- Accessory Muscle Use
- Decreased Ability to Speak
- History of CPAP/Intubation/ICU Admission from previous flares
- Smoke Exposure, Inhaled Toxins

Differential

- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- STEMI, CHF
- Inhaled Toxins (CO, CN, etc.)
- Anaphylaxis
- Asthma/COPD

Medical Protocols - Adult

General Approach – Adult, Medical

Airway Patent, Respirations Adequate, Apply O_2 — No → Airway Management Protocol p32

Yes

Allergic Reaction/ Anaphylaxis — Yes → Allergic Reaction Protocol p49

No

Lung Exam

- Wheezing / Lower Airway
- Stridor / Upper Airway

A — IV Access Protocol p54

Cardiac Monitor

12 Lead ECG Procedure p146

Wheezing / Lower Airway:

- Albuterol 2.5mg/3mL Neb Ipratropium 0.5mg Neb *
- P — Consider Methylprednisolone 125 mg IV/IO

Improving — No → Consider Airway Management Protocol p32; Consider CPAP Procedure IF SBP ≥100* p163

- Albuterol 2.5mg/3mL Neb Ipratropium 0.5mg Neb *
- Consider Epi 0.3mg IM (1:1000) IF HR<150, Age <50 and no CAD
- P — Consider Mag Sulfate 2g IV/IO Infuse over 10 minutes
- M — **Consider Epi 0.15 mg IM (1:1000) IF HR >150, Age >50 or CAD**

Improving — Yes →

Stridor / Upper Airway:

- Albuterol 2.5mg/3mL Neb *

Improving — No →

- P — Nebulized Epinephrine 1mg Neb (1:1000) in 2 mL NS
- P — Methylprednisolone 125 mg IV/IO

Improving — Yes →

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, 12 Lead, GCS, RR, Lung Sounds, Accessory muscle use, nasal flaring

- Do not delay inhaled meds to get extended history
- Supplemental O2 for all cases of hypoxia, tachypnea, subjective air hunger
- Keep patient in position of comfort if partial obstruction
- If COPD, monitor mental status
- Severe Asthma may restrict airway to have no wheezing
- Contact Medical Control PRIOR to IM Epi if age >50, HR >150, or history of coronary artery disease

****Contact Medical Control and request authorization for ½ of IM Epi dose (0.15mg of 1:1000) OR Epi Pen Junior.**

* Albuterol max 3 doses total, Ipratropium max 2 doses total

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

CHF / Pulmonary Edema - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- CHF, CAD, Chest Pain History
- Peripheral Edema
- Home meds used prior to call (Digoxin, Lasix, Viagra, Cialis)
- Respiratory Distress, Rales
- Orthopnea, JVD
- Pink, Frothy Sputum

Differential

- Myocardial Infarction
- Pericardial Tamponade
- Pulmonary Embolism
- Congestive Heart Failure
- Toxic Exposure
- COPD Exacerbation
- Acute Renal Failure

Medical Protocols - Adult

General Approach – Adult, Medical

Airway Patent, Respirations Adequate

No → Airway Management Protocol p32

Consider Sepsis Screening Protocol When Appropriate p74

Yes

12-Lead ECG Procedure p146

Dysrhythmia → Go To Appropriate Arrhythmia Protocol

STEMI OR **Acute MI** → STEMI Protocol p44

Aspirin 324mg PO Chewed or Powdered
IF Awake and Protecting Airway

A: IV Access Protocol p54

No Access

Continuous Cardiac Monitor

Successful Access

P: Nitroglycerin Paste (If Available)
- SBP >100, 1 inch of paste
- SBP >150, 1.5 inches of paste
- SBP >200, 2 inches of paste

M: **Nitroglycerin 0.4mg SL Repeat every 5 min., max 3 doses**

SBP >100

Repeat and Document BP

Continuous Cardiac Monitor

Severity of Symptoms

Mild

Normal HR
Normal or Elevated SBP (>100 but <180)

A: Nitroglycerin Tab/Spray 0.4mg SL Repeat every 5 min., max 3 doses

P: Nitroglycerin Paste (if available)

Improving → No → Consider CPAP Procedure IF SBP ≥100* p163

Moderate / Severe

Increased HR
Markedly Elevated SBP (>180)

A: Nitroglycerin Tab/Spray 0.4mg SL Repeat every 5 min., max 3 doses

P: Nitroglycerin Paste (if available)

Consider CPAP Procedure IF SBP ≥100* p163

M: **Consider Midazolam 1mg IV If needed for CPAP compliance**

Cardiogenic Shock

Initial Tachycardia, then later Bradycardia
Initial HTN, then progressing to Hypotension

SBP <100

P: Dopamine 5-20mcg/kg/min IV/IO **Titrate to SBP ≥100**

Consider Airway Management Protocol p32

Improving → Yes

Notify Receiving Facility, Contact Medical Control As Necessary

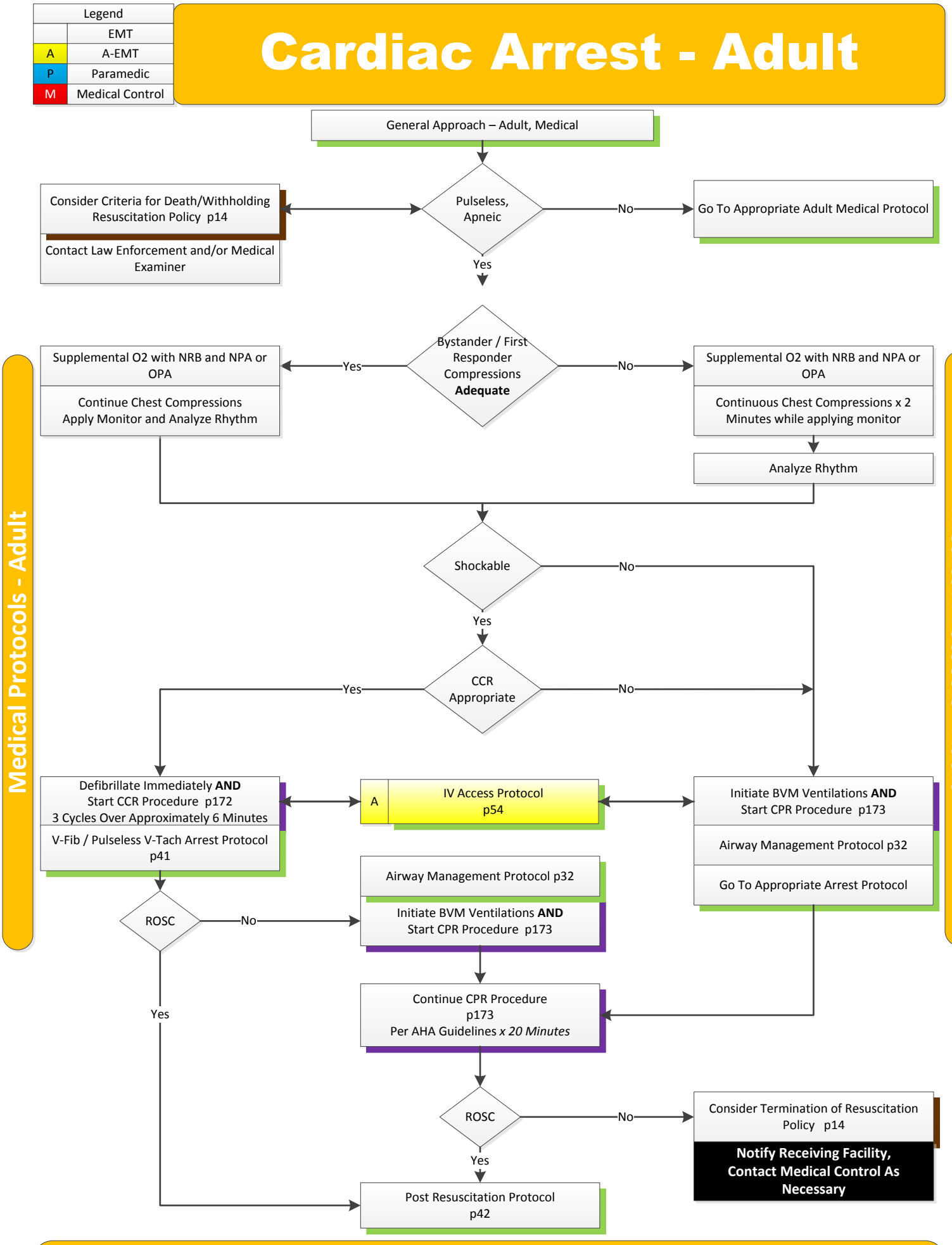
Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- If CHF / Cardiogenic Shock is from inferior MI (II, III, aVF), consider RIGHT sided ECG
- If ST Elevation in V3, V4 OR Inferior Leads (II, III, aVF), Nitroglycerin may cause severe hypotension requiring IV Fluid boluses
- If patient reports no relief with home Nitroglycerin, consider potency of medication (is the medicine expired? Would EMS supply be useful?)
- *Consider Midazolam 1mg IV to assist with CPAP compliance. **BE CAUTIOUS** – Benzodiazepines may worsen respiratory depression, altered mental status, agitation especially if recent EtOH or illicit drug use. This med should be considered with EXTREME caution. All efforts should be made to verbally coach compliance PRIOR to BZD use in respiratory distress

CHF / Pulmonary Edema - Adult


Legend
EMT
A A-EMT
P Paramedic
M Medical Control
Cardiac Arrest - Adult
General Approach – Adult, Medical
Pulseless, Apneic
No
Go To Appropriate Adult Medical Protocol
Consider Criteria for Death/Withholding Resuscitation Policy p14
Contact Law Enforcement and/or Medical Examiner
Yes
Bystander / First Responder Compressions Adequate
Yes
Supplemental O2 with NRB and NPA or OPA
Continue Chest Compressions Apply Monitor and Analyze Rhythm
No
Supplemental O2 with NRB and NPA or OPA
Continuous Chest Compressions x 2 Minutes while applying monitor
Analyze Rhythm
Shockable
No
Yes
CCR Appropriate
Yes
No
Defibrillate Immediately AND Start CCR Procedure p172
3 Cycles Over Approximately 6 Minutes
V-Fib / Pulseless V-Tach Arrest Protocol p41
A IV Access Protocol p54
Initiate BVM Ventilations AND Start CPR Procedure p173
Airway Management Protocol p32
Go To Appropriate Arrest Protocol
ROSC
No
Airway Management Protocol p32
Initiate BVM Ventilations AND Start CPR Procedure p173
Yes
Continue CPR Procedure p173
Per AHA Guidelines x 20 Minutes
ROSC
No
Consider Termination of Resuscitation Policy p14
Notify Receiving Facility, Contact Medical Control As Necessary
Yes
Post Resuscitation Protocol p42
Medical Protocols - Adult
Medical Protocols - Adult
Cardiac Arrest - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Cardiac Arrest - Adult

Pertinent Positives and Negatives

- Events leading to arrest
- Estimated downtime
- Past Medical History
- Medications
- Existence of terminal illness
- Signs of lividity, rigor mortis
- Code Status (Full Code, DNR, Partial)

Differential

- Medical or Trauma
- Vfib vs Pulseless Vtach
- Asystole
- Pulseless electrical activity (PEA)

Medical Protocols - Adult

P

CONSIDER CORRECTABLE CAUSES OF ARREST:

Hypoxia – secure airway and ventilate
Hypoglycemia – Dextrose 12.5-25g or D10W 100ml IV/IO
Hyperkalemia – Sodium Bicarbonate 50mEq IV/IO **AND**
- Calcium Chloride 1g IV/IO
Hypothermia – Active Rewarming
Hypomagnesemia / Torsades – Magnesium 2g IV/IO over 2 min
Hypovolemia – 500mL NS Bolus IV/IO
Hydrogen Ion (acidosis) – secure airway and ventilate
Tension Pneumothorax – Chest Decompression Procedure
Tamponade, Cardiac
Toxins:
Calcium Channel and B-Blocker OD – Glucagon 5mg IV/IO
Calcium Channel Blocker OD – Calcium Chloride 1g IV/IO
(contraindicated if pt. also on Digoxin/Lanoxin)
Tricyclic Antidepressant OD – Sodium Bicarb 1mEq/kg IV/IO
Narcotic OD – Naloxone 2mg IV/IO/IN/IM
Thrombosis, Pulmonary
Thrombosis, Coronary

CPR Quality

- Push Hard (at least 2 inches) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressors every 2 minutes, sooner if fatigued
- If no advanced airway, 30:2 compression: ventilation ratio
- Quantitative waveform capnography
- If EtCO2 <10mmHg, attempt to improve CPR quality

Drug Therapy

Epinephrine IV/IO dose: 1mg every 3-5 minutes
Amiodarone IV/IO dose: First dose 300mg bolus. Second dose 150mg

CONSIDER ALS *EARLY*

IF AT ANY TIME
Patient has Return of Spontaneous Circulation (ROSC)
Go to Post Resuscitation Protocol

Shock Energy for Defibrillation

- **Biphasic**: Manufacturer recommendation (i.e. initial dose of 120-200J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered
- **Monophasic**: 360J

Double Sequential Defibrillation

- Consider for cases of shock refractory V-fib or Pulseless V-tach that have not converted after 3 defibrillation attempts AND ≥1 dose of ACLS medication
- There is the potential to cause damage to equipment when performing this procedure. Therefore, it is recommended to be attempted using an AED and a monitor to minimize risk.
- Because of the potential for adverse equipment results, **it is important that your Service Director and Medical Director approve this procedure BEFORE attempting**

Advanced Airway

- Endotracheal Intubation or supraglottic airway
- Waveform capnography to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in ETCO2 (typically >40mmHg
- Spontaneous arterial pressure waves with intra-arterial monitoring

Medical Protocols - Adult

Pearls

RECOMMENDED EXAM: Mental Status, Pulse, Initial and Final Rhythm

- Immediately after defibrillation, resume chest compressions with a different operator compressing. Do not pause for post-shock rhythm analysis. Stop compressions only for signs of life (patient movement) or rhythm visible through compressions on monitor or pre-defibrillation rhythm analysis every 2 minutes and proceed to appropriate protocol
- **CCR is indicated in ADULT patients that have suffered cardiac arrest of a *presumed cardiac nature*.** CCR is NOT to be used in cardiac arrest due to overdose, hanging, drowning, trauma or individuals less than 18 years of age.
- **In the event a patient suffers cardiac arrest in the presence of EMS, the absolute highest priority is to apply the AED/Defibrillator and deliver a shock immediately if indicated.**
- Reassess airway frequently and with every patient move. Cycle compressors frequently – compression quality deteriorates before fatigue is perceived.
- Designate a "code leader" to coordinate transitions, defibrillation and pharmacological interventions. "Code Leader" ideally should have no procedural tasks.
- External Compression Devices may be considered if available and will not impede patient care.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Asystole / Pulseless Electrical Activity (PEA) Arrest - Adult

Pertinent Positives and Negatives

- Age (if known)
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
  -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Adult

Cardiac Arrest – Adult, Medical

IF AT ANY TIME
Return Of Spontaneous Circulation (ROSC)
Go To Post Resuscitation Protocol
Expedite Transport

Asystole, PEA

Consider Airway Management, Adult Protocol p32

P Epinephrine 1mg IV/IO (1:10,000)

A IV Access Protocol p54

Continue CPR Proceduren p173
(No Rhythm / No Pulse Check)

Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen Ion (acidosis)
- **H**ypoglycemia
- **H**ypo- / **H**yperkalemia
- **H**ypothermia
- **T**ension Pneumothorax
- **T**amponade, Cardiac
- **T**oxins
- **T**hrombosis, Pulmonary
- **T**hrombosis, Coronary

ROSC — Yes → Post ResuscitationProtocol p42 → **Notify Receiving Facility, Contact Medical Control As Necessary**

No

Shockable — Yes → V-Fib / Pulseless V-Tach Arrest, Adult Protocol p41

Shockable — No → P Epinephrine 1mg IV/IO (1:10,000) every 3-5 min

CPR x 2 Minutes p173
(No Rhythm / Pulse Check)

Treat Correctable Causes
(Run the H's and T's)

No

ROSC — Yes → Post Resuscitation Protocol p42

No **AND**
Resuscitation x 20min

Consider Termination of Resuscitation Policy p14

Meets Criteria for Termination — No → M **Contact Medical Control**

Meets Criteria for Termination — Yes → **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Pearls

RECOMMENDED EXAM: Mental Status

- In order to successfully resuscitate ANY cardiac arrest patient, a cause of arrest must be identified and corrected
- Airway is the most important intervention. This should be addressed immediately. Survival is often dependent on successful airway management
- Airway management with BVM is may be sufficient in the cardiac arrest patient. A single attempt at intubation may be made, if time allows. Do not prolong transport or scene time to attempt intubation.
- If evidence of tension pneumothorax - unilateral decreased or absent breath sounds, tracheal deviation, JVD, tachycardia, hypotension – consider needle thoracostomy. Chest decompression may be attempted at the 2nd intercostal space, mid clavicular line

Asystole / Pulseless Electrical Activity (PEA) Arrest - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

V-Fib / Pulseless V-Tach Arrest - Adult

Pertinent Positives and Negatives

- Age (if known)
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
  -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Adult

Cardiac Arrest – Adult, Medical

IF AT ANY TIME
Return Of Spontaneous Circulation (ROSC)
Go To Appropriate Dysrhythmia Protocol
Expedite Transport

Ventricular Fibrillation,
Pulseless Ventricular Tachycardia

Defibrillate

Double Sequential Defibrillation

- Consider for cases of shock refractory V-fib or Pulseless V-tach that have not converted after 3 defibrillation attempts AND ≥1 dose of ACLS medication
- There is the potential to cause damage to equipment when performing this procedure. Therefore, it is recommended to be attempted using an AED and a monitor to minimize risk.
- Because of the potential for adverse equipment results, **it is important that your Service Director and Medical Director approve this procedure BEFORE attempting**

Meets Criteria for CCR

Yes → Begin CCR Procedure p172

No → Begin CPR Procedure p173

After Defibrillation, resume CCR without pulse check
Continuous Chest Compression
Change Compressors every 2min
Limit pauses to <5sec

≥ 6min Compressions → Airway Management, Adult Protocol p32

After Defibrillation, resume CPR without pulse check
Continuous Chest Compression
Change Compressors every 2min
Limit pauses to <5sec

Oxygenate with 100% O2 NRB Mask at 15LPM

Ventilate with 100%O2 as per AHA Standard
8-10 Breaths per Minute

A IV Access Protocol p54

P Epinephrine (1:10,000) 1mg IV/IO
Repeat every 3-5min

A IV Access Protocol p54

ROSC

Yes → Post Resuscitation, Adult Protocol p42

No → Shockable

Shockable

Yes → Defibrillate

- P Epinephrine (1:10,000) 1mg IV/IO Repeat every 3-5min
- P Amiodarone 300mg IV/IO May repeat once at 150mg IV/IO

Resume Chest Compressions and Oxygenation as Appropriate

Persistent V-fib / P V-tach after 3 shocks
Consider Double Sequential Defib p175

No → Asystole / PEA, Adult Protocol p40

ROSC

No → Shockable

Yes → Post Resuscitation, Adult Protocol p42

No **AND** ACLS x 20min with ≥4 Epi Given → M **Contact Medical Control**

Medical Protocols - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Post Resuscitation - Adult

Pertinent Positives and Negatives

- Events leading to arrest
- Estimated downtime
- Past Medical History
- Medications
- Existence of terminal illness
- Signs of lividity, rigor mortis
- Code Status (DNR)

Differential

- Medical or Trauma
- Vfib vs Pulseless Vtach
- Asystole
- Pulseless electrical activity (PEA)

Medical Protocols - Adult

V-Fib / Pulseless V-Tach – Adult, Medical
OR
PEA / Asystole – Adult, Medical

Yes

Airway Management, Adult Protocol (if not already done) p32

A IV Access Protocol (if not already done) p54

Consider Post RSA Sedation, Adult Protocol p34 ↔ Perform and Document Complete Neurologic Exam

12-Lead ECG Procedure p146
Regardless if completed prior to arrest

Optimize Ventilation and Oxygenation
SpO2 >93%
EtCO2 goal 35-45mmHg

Monitor for Hypotension, Dysrhythmias, or Airway Compromise ↔ Consider Hypotension / Shock (Non-Trauma) Protocol p75

Appropriate Adult Protocol

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

RECOMMENDED EXAM: Mental Status, Pulse, Initial and Final Rhythm

- The American Heart Association no longer supports routine prehospital hypothermia induction for all out of hospital cardiac arrests based on the most current literature.
- Acute myocardial infarction, cardiomyopathy, and primary arrhythmia are the most common causes for cardiac arrest.
- In observational studies, $PaCO_2$ in a normal range (35 to 45 mmHg) when measured at 37°C is associated with better outcomes than higher or lower $PaCO_2$
- Antiarrhythmic drugs should be reserved for patients with recurrent or ongoing unstable arrhythmias.
- No data support the routine or prophylactic use of antiarrhythmic drugs after the return of spontaneous circulation following cardiac arrest, even if such medications were employed during the resuscitation.
- Determining and correcting the underlying cause of the arrhythmia (eg, electrolyte disturbance, acute myocardial ischemia, toxin ingestion) is the best intervention.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

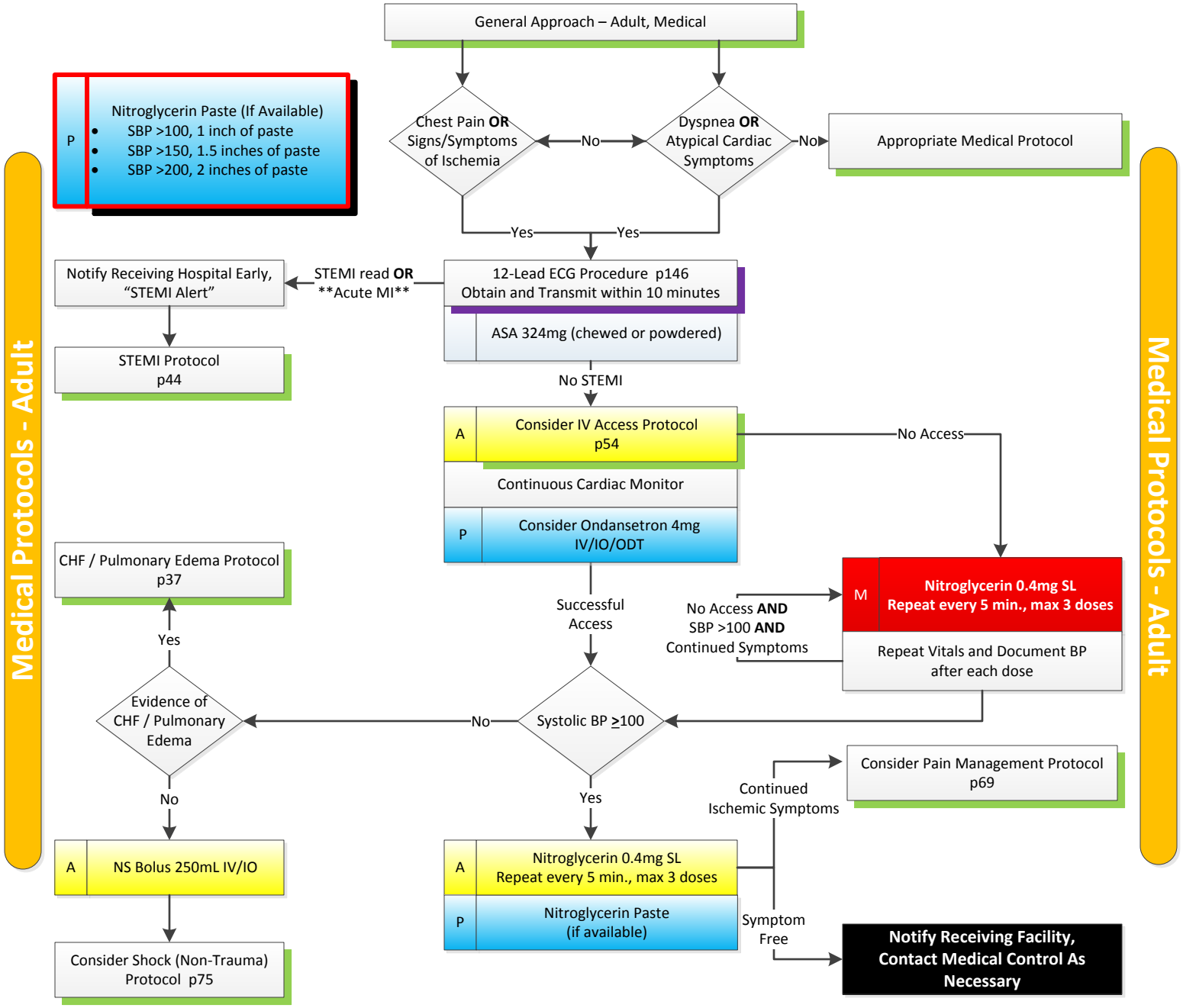
Chest Pain / Suspected Acute Coronary Syndrome - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- Home meds prior to EMS Arrival (Digoxin, Lasix, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential

- Pericardial Tamponade
- Pericarditis
- Asthma / COPD
- Aortic Dissection
- Sympathomimetic Overdose
- Pulmonary Embolism
- Esophageal Spasm
- Gastroesophageal Reflux (GERD)



Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- Avoid Nitroglycerin in any patient who has used Viagra (Sildenafil) or Levitra (Vardenafil) in the last 24 hours or Cialis (Tadalifil) in the last 36 hours
- If no IV Access, ECG MUST be obtained and reviewed by Medical Control prior to administration of Nitroglycerin (even patient supplied)
- If patient takes Aspirin immediately prior to EMS arrival, confirm the medication and expiration date. If uncertain, administer full dose aspirin
- Use Nitroglycerin and opiates / opiates with caution if Inferior, Right Ventricle or Posterior MI is suspected
- Elderly patients, diabetics and women are more likely to have atypical chest pain – SOB, fatigue, weakness, back pain, jaw pain
- Have a low threshold to get a 12-Lead ECG. They are minimally invasive, painless and can evolve with time
- If ST Elevation in V3, V4 **or** Inferior Leads (II, III, aVF), Nitroglycerin may cause hypotension requiring IV Fluid Boluses

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

ST Elevation Myocardial Infarction - Adult

Pertinent Positives and Negatives
- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- Home meds prior to EMS Arrival (Digoxin, Lasix, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential
- Pericardial Tamponade
- Pericarditis
- Asthma / COPD
- Aortic Dissection
- Sympathomimetic Overdose
- Pulmonary Embolism

Medical Protocols - Adult

General Approach – Adult, Medical

STEMI Interpretation of 12-Lead **OR** **Acute MI**

- Yes → Long Transport Time
  - Yes → Consider Air Transport
  - No → Go To Appropriate Medical Protocol
- No → Go To Appropriate Medical Protocol
- Yes

Notify Receiving Hospital Early, "STEMI Alert"

Apply Defib Pads

	ASA 324mg (chewed or powdered) *if not already done*
P	Consider Ondansetron 4mg IV/IO/ODT

ASA 324mg (chewed or powdered) *if not already done* → Thrombolytic Screening Protocol p76

P — Nitroglycerin Paste (If Available)
- SBP >100, 1 inch of paste
- SBP >150, 1.5 inches of paste
- SBP >200, 2 inches of paste

Inferior Wall MI (Elevation in II, III, aVF)
- Yes → Perform Right Sided ECG Procedure (if Time Allows) p147
  - A — IV Access Protocol p54
  - A — NS Bolus 250mL IV/IO
- No → A — Consider IV Access Protocol p54

Systolic BP ≥100
- Yes → CHF / Pulmonary Edema
  - Yes → CHF / Pulmonary Edema Protocol p37
  - No → Systolic BP ≥100
    - Yes → M — If No IV, Nitroglycerin 0.4mg SL Repeat every 5 min., max 3 doses
    - No → Shock (Non-Trauma) Protocol p75

M	If No IV, Nitroglycerin 0.4mg SL Repeat every 5 min., max 3 doses
A	Nitroglycerin 0.4mg SL Repeat every 5 min., max 3 doses
P	Nitroglycerin Paste (if available)

Continued Ischemic Symptoms → Consider Pain Management Protocol, Adult p69

Symptom Free → **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD
- Goal is First Medical Contact (YOU!!) to balloon time <90 minutes
- Goal is to limit on-scene time with a STEMI patient to <10 minutes
- If long transport time expected due to geography, traffic, etc. consider activation of Air EMS for delivery directly to cath lab
- Transmit STEMI or **Acute MI** 12-Leads early and call STEMI receiving hospital with "STEMI Alert" early; inform them of full report to follow.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Narrow Complex Tachycardia With A Pulse - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- QRS <0.12 sec (≤3 small squares)
- Home meds prior to EMS Arrival (Digoxin, Lasix, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential

- Pericardial Tamponade
- Pericarditis
- Asthma / COPD
- Aortic Dissection
- Sympathomimetic Overdose
- Pulmonary Embolism

Uncontrolled A-Fib

Patients with a history of Atrial Fibrillation may have Rapid Ventricular Response ("A-fib with RVR" or "Uncontrolled A-fib") as their response to hemorrhage, hypovolemia, sepsis or medication noncompliance.

Keep in Mind; **this may be their version of Sinus Tachycardia!**

General Approach – Adult, Medical

Unstable / Imminent Arrest

Yes → P Synchronized Cardioversion Procedure p171

No →

12-Lead ECG Procedure p146

A IV Access Protocol p54
NS Bolus 250mL IV/IO

Continuous Cardiac Monitor

QRS ≥0.12sec → Wide Complex Tachycardia With A Pulse Protocol p46
Consider Sepsis Screening Protocol When Appropriate p74

QRS <0.12sec

P Consider Sedation Before Cardioversion

P Fentanyl 1mcg/kg IV/IO (max 100mcg) **AND / OR** Midazolam 2-4mg IM/IN/IV/IO (max 4mg) **OR** Lorazepam 0.04mg/kg IV/IO (max 2mg)

Regular Rhythm

Yes → Sinus

Yes → Look for and Treat Underlying Causes → Consider Shock (Non-Trauma) Protocol p75 → Consider Pain Protocol p69

No → SVT, Rate generally >150

P Vagal Maneuvers
Improved → Notify Receiving Facility, Contact Medical Control As Necessary
No Change →

P Adenosine 6mg IV/IO Rapid Push
Improved → Notify Receiving Facility, Contact Medical Control As Necessary
No Change →

P Adenosine 12mg IV/IO Rapid Push; May repeat x1
Improved → Notify Receiving Facility, Contact Medical Control As Necessary
No Change →

M **Diltiazem 0.25mg/kg IV/IO (Max 20mg) OR Amiodarone 150mg IV/IO Over 10 Minutes** → Notify Receiving Facility, Contact Medical Control As Necessary

No → Symptomatic

Yes → A NS Bolus 250mL IV/IO
No Change →

M **Diltiazem 0.25mg/kg IV/IO (Max 20mg)**
No Change →

Consider Synchronized Cardioversion Procedure p171 → Notify Receiving Facility, Contact Medical Control As Necessary

No → Look for and Treat Underlying Causes → Consider Shock (Non-Trauma) Protocol p75 → Consider Pain Protocol p69

Medical Protocols - Adult

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- Not all cases of tachycardia need to be rate controlled; sepsis, hypovolemia, and acute hemorrhage will do *worse* if their ability to compensate is taken away
- Continually monitor for signs of decompensation and be prepared to move to synchronized cardioversion if the patient condition changes. Place the pads while reaching for the meds
- Adenosine has a very short half life (5sec or less) so it must be infused rapidly in a patent IV site that is preferably in the AC fossa or more proximal
- Elderly patients, diabetics and women are more likely to have atypical chest pain – SOB, fatigue, weakness, back pain, jaw pain
- Have a low threshold to get a 12-Lead ECG. They are minimally invasive, painless and can evolve with time

Narrow Complex Tachycardia With A Pulse - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Wide Complex Tachycardia With A Pulse - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- QRS ≥0.12 sec (>3 small squares)
- Home meds prior to EMS Arrival (Digoxin, Lasix, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential

- Pericardial Tamponade
- Pericarditis
- Asthma / COPD
- Aortic Dissection
- Sympathomimetic Overdose
- Pulmonary Embolism

Medical Protocols - Adult

General Approach – Adult, Medical

Unstable / Imminent Arrest

Yes → P Synchronized Cardioversion Procedure p171 → P Consider Sedation Before Cardioversion

No

Uncontrolled A-Fib

Patients with a history of Atrial Fibrillation may have Rapid Ventricular Response ("A-fib with RVR" or "Uncontrolled A-fib") as their response to hemorrhage, hypovolemia, sepsis or medication noncompliance.

Keep in Mind; **this may be their version of Sinus Tachycardia!**

12-Lead ECG Procedure p146

A IV Access Protocol p54

Continuous Cardiac Monitor

QRS <0.12sec → Narrow Complex Tachycardia With A Pulse Protocol p45; Consider Sepsis Screening Protocol When Appropriate p74

QRS ≥0.12sec

Torsades de Pointes

Prolonged QT may result in R-on-T phenomenon and Torsades. Congenital and Acquired etiologies include:
Amiodarone, Methadone, Lithium, Amphetamines, Procainamide, Sotalol
Hypokalemia, Hypomagnesemia, Heart Failure, Hypothermia, Subarachnoid Hemorrhage

Regular Rhythm, Monomorphic QRS

Yes → Sinus, Bundle Branch Block on ECG

- Yes → Look for and Treat Underlying Causes → Consider STEMI Protocol **IF** New or Presumably New LBBB p44 → Consider Shock (Non-Trauma) Protocol p75 → Consider Pain Management Protocol p69 → M Contact Medical Control
- No → SVT, Rate generally >150 → P Vagal Maneuvers → Improved / No Change → P Adenosine 6mg IV/IO Rapid Push → Improved / No Change → P Adenosine 12mg IV/IO Rapid Push; May repeat x1 → Improved / No Change → M **Diltiazem 0.25mg/kg IV/IO (Max 20mg) OR Amiodarone 150mg IV/IO Over 10 Minutes**

No → Torsades de Pointes

- Yes → IF Unstable, Consider Defibrillation Procedure p174 → P Mag Sulfate 2g IV/IO Infuse over 1-2min → No Change → A NS Bolus 250mL IV/IO → No Change → M Contact Medical Control
- No → Look for and Treat Underlying Causes → Consider Shock (Non-Trauma) Protocol p75 → Consider Pain Management Protocol p69 → M Contact Medical Control

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- Not all cases of tachycardia need to be rate controlled; sepsis, hypovolemia, and acute hemorrhage will do *worse* if their ability to compensate is taken away
- Temporary transvenous overdrive pacing (atrial or ventricular) at 100 beats per minute generally is reserved for patients with long QT-related TdP who do not respond to intravenous magnesium
- Continually monitor for signs of decompensation and be prepared to defibrillate if the patient condition changes. Place the pads while reaching for the meds
- Adenosine has a very short half life (5sec or less) so it must be infused rapidly in a patent IV site that is preferably in the AC fossa or more proximal
- Elderly patients, diabetics and women are more likely to have atypical chest pain – SOB, fatigue, weakness, back pain, jaw pain
- Have a low threshold to get a 12-Lead ECG. They are minimally invasive, painless and can evolve with time. **Transmit them and seek MD Consult at any time**

Wide Complex Tachycardia With A Pulse - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Bradycardia With A Pulse - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- CHF, CAD, Chest Pain History
- QRS <0.12 sec (≤3 small squares)
- Home meds prior to EMS Arrival (Digoxin, Lasix, ASA, Viagra, Cialis)
- Respiratory Distress
- Orthopnea, JVD

Differential

- Pericardial Tamponade
- Pericarditis
- Pacemaker Failure
- Hypothermia
- Sinus Bradycardia
- Head Injury
- Spinal Cord Injury
- Sick Sinus Syndrome
- Acute MI
- AV Block (1°, 2°, 3°)

Medical Protocols - Adult

General Approach – Adult, Medical

HR <60bpm **AND** Unstable / Imminent Arrest

Yes

P External Cardiac Pacing Procedure p176

No

12-Lead ECG Procedure p146

Arrhythmia/ STEMI → Go To Appropriate Cardiac Treatment Protocol

A IV Access Protocol p54

Continuous Cardiac Monitor
Supplemental O2 to maintain SpO2 ≥93%

P Consider Sedation Before Initiation of Pacing

P Fentany 1mcg/kg IV/IO (max 100mcg) **AND / OR** Midazolam 2-4mg IM/IN/IV/IO (max 4mg) **OR** Lorazepam 0.04mg/kg IV/IO (max 2mg)

Symptomatic

Yes

A NS Bolus 250mL IV/IO

P Atropine 0.5mg IV/IO
May Repeat every 3-5min; Max 3mg

Improving

Yes → Look for and Treat Underlying Causes

Consider Shock (Non-Trauma) Protocol p75

Consider Overdose and Poisoning, General Protocol p59

Consider Sepsis Screening Protocol When Appropriate p74

No

Consider Sepsis Screening Protocol When Appropriate p74

P Epinephrine 2-10 mcg/min IV/IO (1:10,000) **OR**

P Dopamine 5-20 mcg/kg/min IV/IO **OR**

P Consider External Cardiac Pacing Procedure pXXX

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, JVD

- Not all cases of bradycardia need to be treated with medicine or pacing; use good clinical judgement and follow symptoms
- Continually monitor for signs of decompensation and be prepared to move to external cardiac pacing if the patient condition changes. Place the pads while reaching for the meds
- Titrate Epinephrine OR Dopamine infusions to HR >60 AND SBP <180
- Atropine is unlikely to work in cases of complete heart block. Atropine is contraindicated in patients with narrow angle glaucoma
- Elderly patients, diabetics and women are more likely to have atypical chest pain – SOB, fatigue, weakness, back pain, jaw pain
- Have a low threshold to get a 12-Lead ECG. They are minimally invasive, painless and can evolve with time

Bradycardia With A Pulse - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

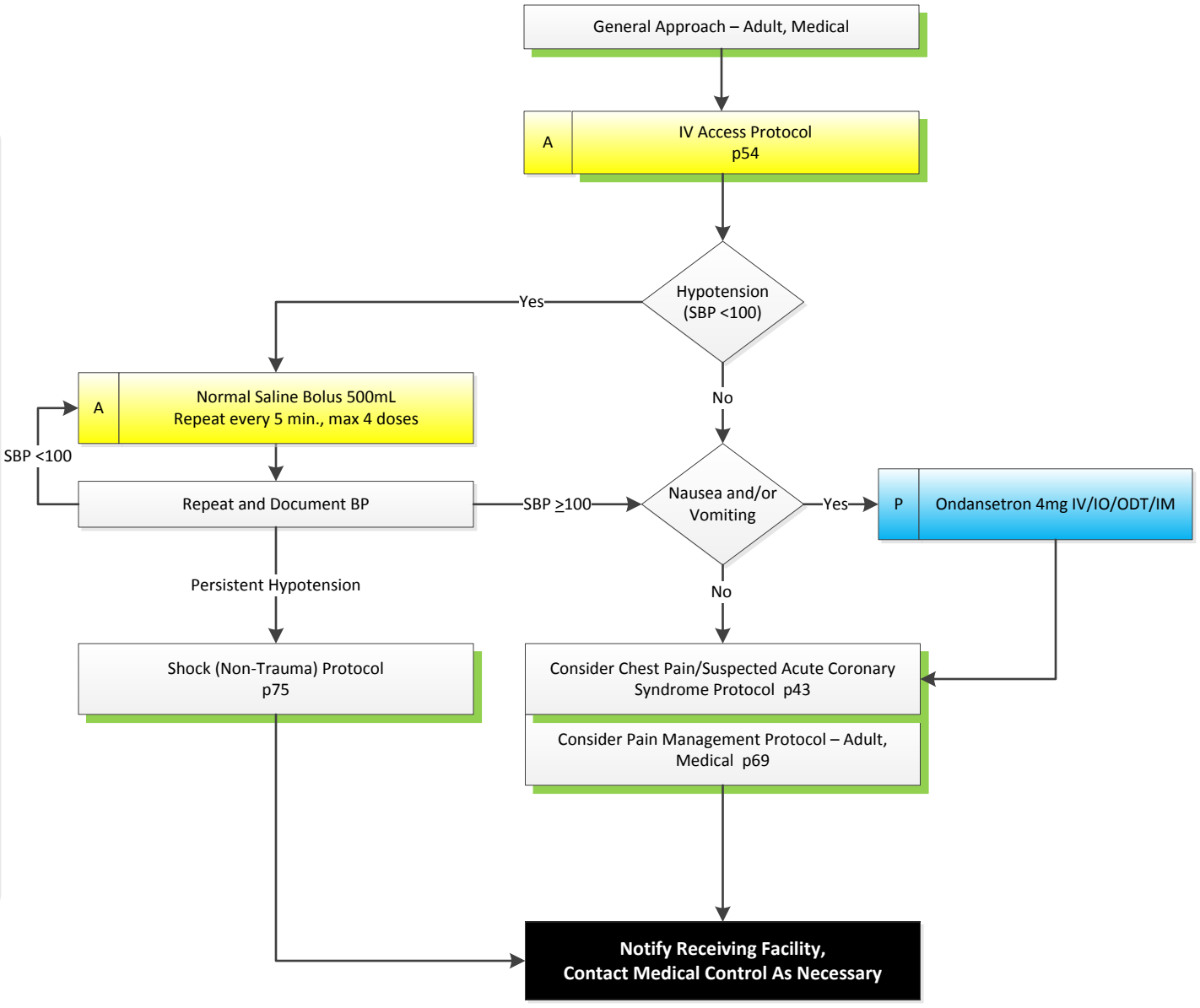
Abdominal Pain / GI Bleeding - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Last Meal / Oral Fluids
- Menstrual / Pregnancy History
- Anticoagulant Use
- Nausea, Vomiting, Diarrhea
- Constipation
- Hematochezia (Bloody Stool)
- Recent Travel
- Recent Antibiotics

Differential

- AAA +/- Rupture
- Perforated Ulcer
- Appendicitis
- Ectopic Pregnancy +/- Rupture
- Diverticulitis
- Small Bowel Obstruction
- Splenic Enlargement / Rupture



Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Focal Tenderness, Rebound Tenderness, Distal Pulses, Abdominal Masses

- Nothing by mouth (NPO) Status for all patients with abdominal pain
- If pain is above the umbilicus, perform a 12-Lead ECG. Go to Chest Pain Protocol as indicated
- Abdominal pain in women of child bearing age should be treated as an ectopic pregnancy until proven otherwise
- The diagnosis of AAA should be considered in patients >50 years old. Assess the abdomen for a midline pulsatile mass and feel for pulses in feet / legs
- Rebound tenderness is pain that is *increased* when releasing pressure from palpation
- Appendicitis may present with vague, peri-umbilical pain that slowly migrates to the Right Lower Quadrant (RLQ) over time
- Blood loss from the GI Tract has a very distinct smell; use all of your senses when evaluating your patients. GI Bleed patients have a high risk of serious hemorrhage
- **Abdominal Pain and known pregnancy, go to OB Protocol**

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Allergic Reaction - Adult

Pertinent Positives and Negatives
- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Onset and Location of Symptoms
- Lung Sounds before *AND after* intervention
- Allergen Exposure
- Toxic / Environmental Exposure
- Subjective throat "tightness" OR "closing"

Differential
- Urticaria (Rash Only)
- Anaphylaxis (Systemic Effect)
- Shock (Vascular Effect)
- Angioedema
- Aspiration / Airway Obstruction
- Vasovagal Event
- Asthma / COPD
- CHF

General Approach – Adult, Medical

Severity of Symptoms

Medical Protocols - Adult

Mild

Flushing, Hives, Itching, Erythema
Normal BP, No Respiratory Involvement

- A — IV Access Protocol p54
- P — Diphenhydramine 50mg IV/IM/IO/PO
- P — Famotidine 20mg IV/IO

Moderate

Flushing, Hives, Erythema PLUS Dyspnea, Wheezing
Chest Tightness, Angioedema

- Consider Epi 0.3mg IM (1:1000) IF HR<150, Age <50 and no CAD
- M — **Consider Epi 0.15 mg IM (1:1000) IF HR >150, Age ≥50 or CAD**
- Albuterol 2.5mg/3mL Neb May repeat Q10min, Max 3
- A — IV Access Protocol p54
- P — Diphenhydramine 50mg IV/IM/IO
- P — Famotidine 20mg IV/IO

Severe

Derm symptoms may not be present, depending on perfusion
Wheezing, Dyspnea, Hypoxia, Nausea/Vomiting, Angioedema
PLUS Hypotension

- Epi 0.3mg IM (1:1000)
- M — **Contact Medical Control (As Practical)**
- Albuterol 2.5mg/3mL Neb May repeat Q10min, Max 3
- A — IV Access Protocol p54
- P — Diphenhydramine 50mg IV/IM/IO
- P — Famotidine 20mg IV/IO
- P — Methylprednisolone, 125mg IV/IO

Imminent Cardiac Arrest

Altered Mental Status, Hypotension, Pallor, Diaphoresis, Weak Pulses

- Epi 0.3mg IM (1:1000) May repeat Q5 min, max 3 doses
- A — IV Access Protocol p54
- A — NS Bolus 500mL IV/IO
- M — **Contact Medical Control (As Practical)**
- P — Epi 0.1mg IV/IO over 5min 0.1mL of 1:1000 into 10mL NS

Improving
- Yes → Famotidine 20mg IV/IO
- Worsening / Refractory → Consider Airway Management Protocol p32

Monitor and Reassess
Document Response to Medications
- Stable / Improving → **Notify Receiving Facility, Contact Medical Control As Necessary**
- Worsening / Refractory → Consider Airway Management Protocol p32

- M — **Epi Infusion 2-10mcg/min IV/IO OR Repeat Dosing of IV Dose Epi**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardivascular, Pulmonary

- Contact Medical Control prior to administering epinephrine in patients who are ≥50 years old, have a history of CAD or if HR is >150, as epi may cause acute MI. These patients should receive a 12-Lead ECG prior to med administration, if practical given the clinical situation
- Medical Control *may* authorize Epinephrine at ½ dose (0.15mg OR EpiPen Jr.) for patients ≥50, known CAD or if HR >150
- Epinephrine Infusion: Mix 1mg (1:1,000) in 250mL NS. If worsening or refractory anaphylaxis, contact Med Control first. Start at 2mcg/min, titrate up.
- Famotidine **dilution no longer required**. Infuse over 2 minutes
- In general, the shorter the time from allergen contact to start of symptoms, the more severe the reaction
- Consider the Airway Management Protocol early in patients with Severe Allergic Reaction or subjective throat closing

Allergic Reaction - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

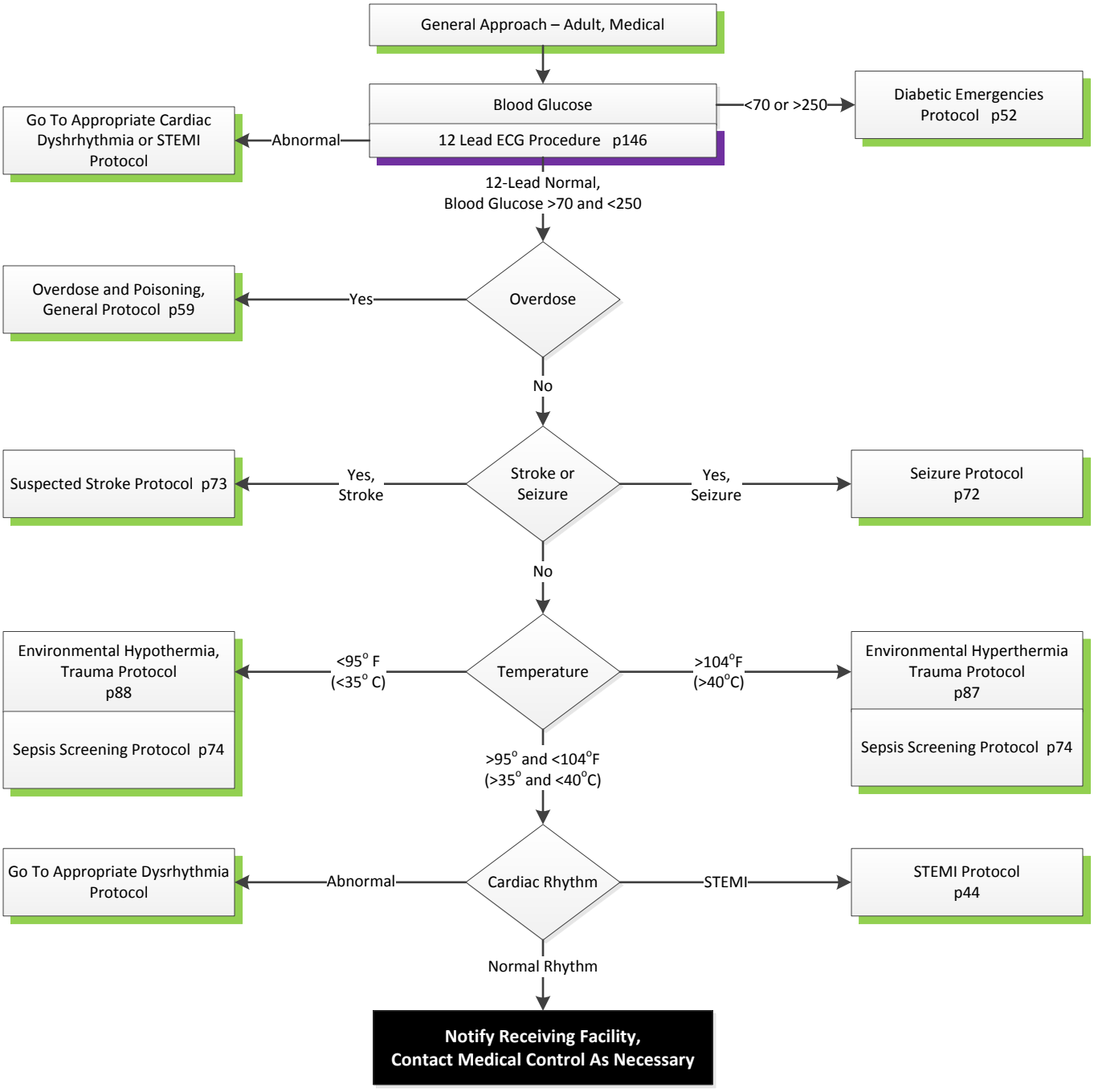
Altered Mental Status - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of DM, medic alert bracelet
- Drug paraphernalia or report of illicit drug use
- Evidence of environmental toxin / ingested toxin

Differential

- Head Injury
- Electrolyte Abnormality
- Psychiatric Disorder
- Cardiac Dysrhythmia
- DM, CVA, Seizure, Tox
- Sepsis
- Hypothermia
- Hypothyroidism
- Pulmonary



Medical Protocols - Adult

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- Pay special attention to head and neck exam for bruising or signs of injury
- Altered Mental Status may be the presenting sign of environmental hazards / toxins. Protect yourself and other providers / community if concern. Involve Hazmat early
- Safer to assume hypoglycemia if doubt exists. Recheck blood sugar after dextrose/glutose administration and reassess
- **Do not let EtOH fool you!!** Alcoholics frequently develop hypoglycemia, Alcoholic Ketoacidosis (AKA) and often hide traumatic injuries!

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Behavioral / Excited Delirium - Adult

Pertinent Positives and Negatives
- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Situational Crisis
- Psychiatric Illness / Medication History
- Medic Alert Bracelet, DM History
- Anxiety, Agitation or Confusion
- Suicidal / Homicidal Thoughts or History
- Evidence of Substance Use / Overdose

Differential
- EtOH Intoxication / Withdrawal
- Toxic Ingestion
- Substance Use / Abuse
- Schizophrenia
- Hypoglycemia
- Hypoxia
- Head Injury
- Occult Trauma
- Cerebral Hypoperfusion

Medical Protocols - Adult

General Approach – Adult, Medical

Provider Safety

No → Stage, Call for Law Enforcement and/or Additional Resources

→ Consider Altered Mental Status Protocol, As Appropriate p50

Yes

Consider Need for ALS Level Service EARLY

Consider Safety of ALL Responders including Law Enforcement

Evidence of Exposure / Toxidrome

Yes → Overdose / Poisoning General Protocol p59

No

Evidence of Head Injury

No → Remove Patient from stressful environment, use verbal calming techniques

Consider Restraints Procedure, As Appropriate p184

Yes → Head Injury, Adult Trauma Protocol p92

No

Blood Sugar

<70 → Diabetic Emergencies Protocol p52

≥70 **OR** Unobtainable Due to Condition

Uncooperative **AND** Danger To Self or Others

Severe Agitation → P Ketamine 2-4mg/kg IM (max 200mg)

Reassess. Follow Mental Status, SpO2, Respiratory Effort and Rate CLOSELY
Monitor for Laryngospasm

A IV Access Protocol (When Appropriate) p54

Moderate Agitation → P If ≤60kg: *Haloperidol 5mg IM **AND/OR** Lorazepam 1mg IM

P If >60kg: *Haloperidol 10mg IM **AND/OR** Lorazepam 1-2mg IM

A IV Access Protocol (When Appropriate) p54

No

Reassess. Follow Mental Status, SpO2, Respiratory Effort and Rate CLOSELY

Notify Receiving Facility, Contact Medical Control As Necessary

Patient Refusing → M **Contact Medical Control**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardivascular, Pulmonary

- Safety First – For Providers, Police and Patients! Never restrain any patients in the prone (face down) position
- All patients who require chemical restraint MUST be continuously monitored by ALS Personnel on scene or immediately upon their arrival
- Patients who are actively fighting physical restraints are at high risk for Excited Delirium and In-Custody Death; Have a low threshold to activate ALS for chemical restraint
- Transport of patients requiring handcuffs or Law Enforcement (LE) restraint **require** LE to ride in the ambulance to the hospital – they have the keys!
- Avoid Haloperidol in patients with known history of MAOI Antidepressant use (Phenelzine, Tranylcypromine) **OR** history of Parkinson's Disease
- If a patient with Excited Delirium suddenly becomes cooperative/quiet, *reassess them quickly*! Sudden Cardiac Death is common in this population

Behavioral / Excited Delirium - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Diabetic Emergencies - Adult

Pertinent Positives/Negatives:

- Age, VS, Blood Glucose Reading
- SAMPLE History
- OPQRST History
- Last Meal, History of Skipped Meal
- Diaphoresis
- Siezures
- Abnormal Respiratory Rate
- History of DKA

Differential

- Toxic Ingestion
- Head Injury
- Sepsis
- Stroke/TIA
- Seizure
- EtOH Abuse/Withdrawal
- Drug Abuse/Withdrawal

Medical Protocols - Adult

General Approach – Adult, Medical

Blood Glucose

<70

Mental Status

Awake
Protecting Airway

Glutose 15g PO
May repeat x1

Reassess Mental Status
Blood Glucose
within 10 minutes

Blood Sugar <70

Altered and/OR
Compromised Gag

Glucagon 1mg IM
One time

A IV Access Protocol p54

A Dextrose Dosing:
D10W 125mL IV/IO **OR**
D5W 250mL IV/IO **OR**
D50 25mL IV/IO
Titrate to effect

Blood Sugar >70

Mental Status

Altered from Baseline **OR** Unknown

Altered Mental Status Protocol p50

Sepsis Screening Protocol p74

Baseline

Taking Oral Diabetes Meds

Yes

Notify Receiving Facility, Contact Medical Control As Necessary

No

Full Assessment
Evaluate for Secondary Complaint

Issue Discovered

Go To Appropriate Adult Medical Protocol

None

Recommend Transport

Accepts

Declines

Execute and Document Refusal of Transport Protocol p71

>70 and <250

Go To Appropriate Adult Medical Protocol

>250

Hypotension

SBP >100

Clinically Dehydrated

No

Go To Appropriate Adult Medical Protocol

Sepsis Screening Protocol p74

Yes

SBP <100

A IV Access Protocol p54

Hypotension / Shock (Non-Trauma) Protocol p75

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Skin, Respiratory Rate and Effort, Neuro Exam

- Do NOT administer oral glucose to patients that can't swallow or adequately protect their airway
- It is important to have good IV access, particularly when administering D50. Dextrose is known to cause sclerosis and can be very hard on the veins.
- Simple Hypoglycemia for these protocols is defined as: hypoglycemia caused by insulin ONLY and not suspected to be due to occult infection or trauma
- Prolonged hypoglycemia may not respond to Glucagon; IF IM Glucagon fails, be prepared to start an IV and administer IV Dextrose
- Alcoholics and patients with advanced liver disease may not respond to Glucagon due to poor liver glycogen stores
- Patients on oral diabetes medications are at a very high risk of recurrent hypoglycemia and should be transported. Contact Medical Control for advice/ patient counseling if patient is refusing. See Refusal after Hypoglycemia Treatment Protocol for additional information as necessary.
- Always consider intentional insulin overdose, and ask patients / family / friends / witnesses about suicidal ideation or gestures

Diabetic Emergencies - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

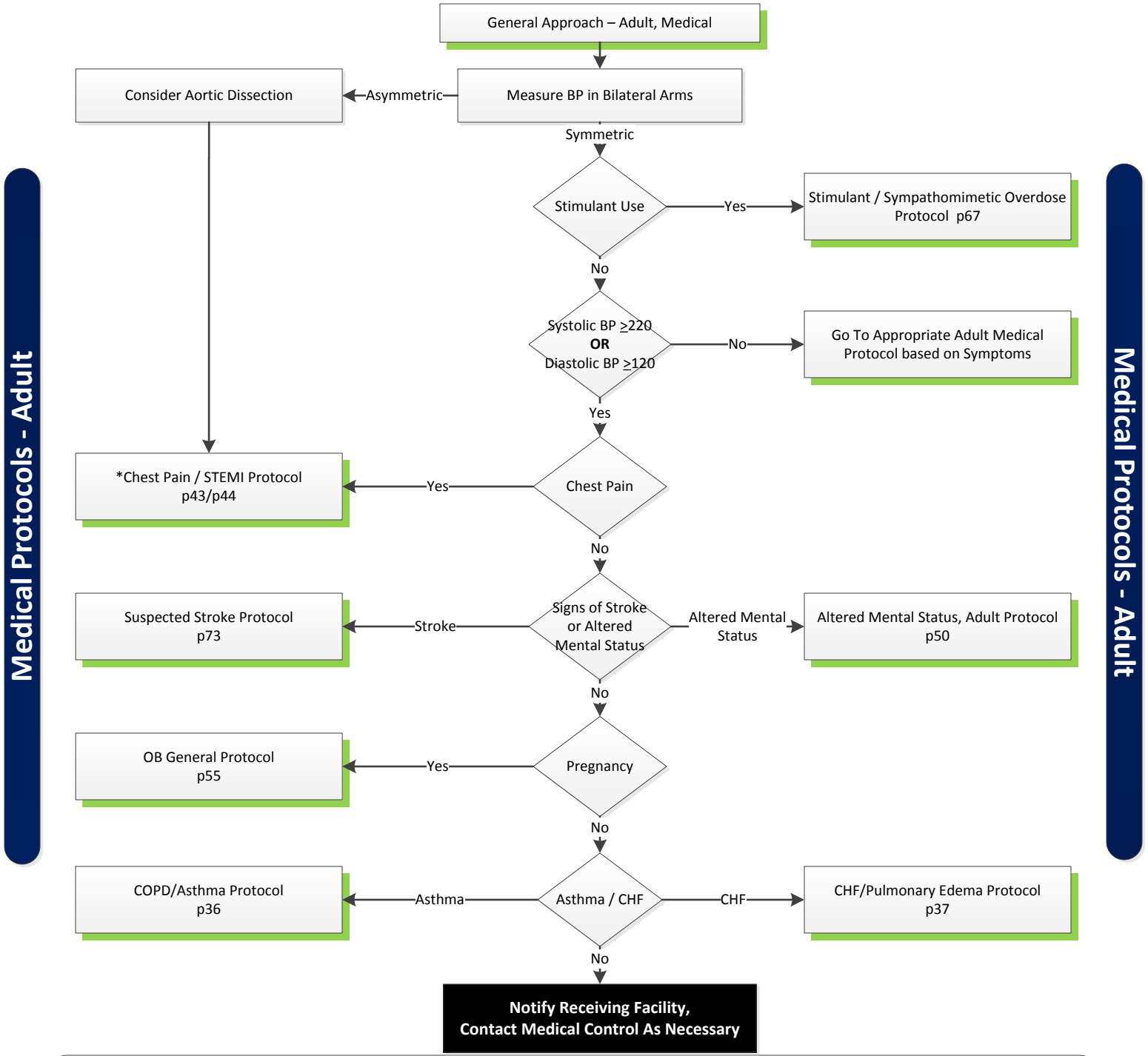
Hypertension - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Acute Pain
- Headache
- Nosebleed
- Blurred Vision
- Dizziness
- Chest Pain

Differential

- Aortic Dissection
- Pre-Eclampsia / Eclampsia
- Hypertensive Encephalopathy
- Stimulant Use / Abuse
- Acute Stroke
- Head Injury / Cushing's Reflex (Bradycardia + HTN)
- Primary HTN



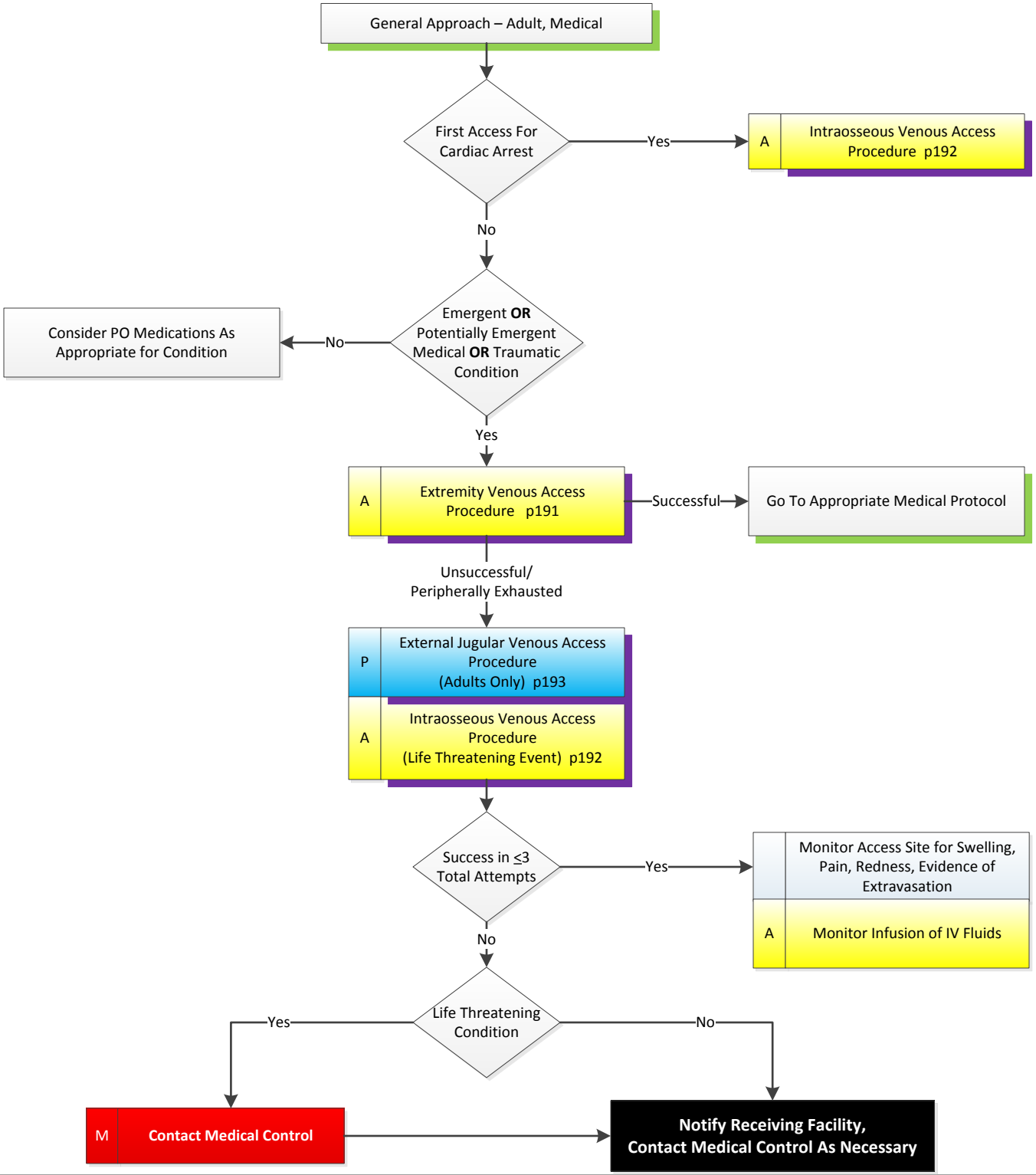
Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Hypertension based on two elevated readings taken >5 minutes apart. Never treat BP based on one set of vital signs
- Hypertensive Emergency is based on evidence of end-organ failure: STEMI/ACS, Hypertensive Encephalopathy, Renal Failure, Vision Change, Acute Stroke
- Patients with symptomatic hypertension should be transported with the head of the stretcher elevated 30 degrees
- Ensure Blood Pressure is checked with appropriate sized blood pressure cuff for patient size
- *Patients with long standing high blood pressure may have changed their "normal" set point; **do not decrease** their Systolic Blood Pressure >40 points

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

IV Access - Adult



Medical Protocols - Adult

Medical Protocols - Adult

Pearls

- In the setting of **CARDIAC ARREST ONLY**, any preexisting dialysis shunt or central line may be used by Paramedics
- For patients who are hemodynamically unstable or in extremis, Medical Control MUST be contacted prior to accessing any preexisting catheters
- Upper Extremity sites are preferred over Lower Extremity sites. Lower Extremity IVs are discouraged in patients with peripheral vascular disease or diabetes
- In post-mastectomy patients and patients with forearm dialysis fistulas, avoid IV attempts, blood draws, injections or blood pressures in the upper extremity on the affected side
- Saline Locks are acceptable in cases where access may be necessary but the patient is not volume depleted; having an IV does not mandate IV Fluid infusion
- The *preferred order* of IV Access is: Peripheral IV, External Jugular IV, Intraosseous Line **UNLESS** medical acuity or situation dictate otherwise.

IV Access - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

OB General - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Pregnancy History (G's and P's)
- Headache
- Abdominal Pain +/- Contractions
- Blurred Vision
- Vaginal Bleeding
- Chest Pain, Dyspnea, Hypoxia

Differential

- Pre-Eclampsia / Eclampsia
- Ectopic Pregnancy
- Hypertensive Encephalopathy
- Uterine Rupture
- Pulmonary Embolism
- Threatened / Impending / Missed Spontaneous Abortion
- Head Injury / Cushing's Reflex (Bradycardia + HTN)
- Domestic Abuse

Medical Protocols - Adult

General Approach – Adult, Medical

Known / Suspected Pregnancy **OR** Missed Period

No → Go To Appropriate Medical Protocol

Yes

Remember you have TWO patients during pregnancy; evaluate, treat and protect **BOTH**

Left Lateral Recumbent Position takes pressure off of the Inferior Vena Cava and prevents supine hypotension

Preeclampsia and **Eclampsia** are typically encountered in 3rd trimester, but may be in late 2nd trimester and up to 6 weeks after delivery

Left Lateral Recumbent Position

A — IV Access Protocol p54

Blood Sugar

<70 → Consider Diabetic Emergencies Protocol p52

≥70

Seizure Activity

Yes → P — If no IV, Midazolam 5mg IM/IN

No

Vaginal Bleeding / Abdominal Pain

Pain → Labor

Yes → Labor / Imminent Delivery Protocol p57

No

Bleeding

P — **Magnesium Sulfate 4g IV/IO Over 10 minutes AND**

P — Lorazepam 1-2mg IV/IO May Repeat x 1, Max 4mg **OR**

P — Midazolam 5mg IV/IO May Repeat x 1, Max 10mg

Continued Seizure Activity

No → Hypotension / Shock

Yes → A — Normal Saline Bolus 500mL Repeat every 5 min., max 2L

Consider Shock (Non-Trauma) Protocol p75

Yes → M — **Contact Medical Control**

No → **Notify Receiving Facility, Contact Medical Control As Necessary**

M — **Contact Medical Control**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Magnesium is the priority for pregnant seizures (eclampsia), but if seizing on EMS arrival give IM/IN Midazolam until IV Access achieved
- If after Magnesium 4gm IV/IO administered, continued seizure x 5 minutes OR recurrent seizure, contact Medical Control for authorization of additional Magnesium 2gm. Continuous monitoring is required, as magnesium may cause hypotension and decreased respiratory drive
- Hypertension, Severe headache, vision changes, RUQ pain, diffuse edema may indicate preeclampsia. This may progress to seizures (eclampsia).
- Any pregnant patient involved in an MVC or other trauma should be evaluated by MD for evaluation and fetal monitoring

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

OB / Vaginal Bleeding - Adult

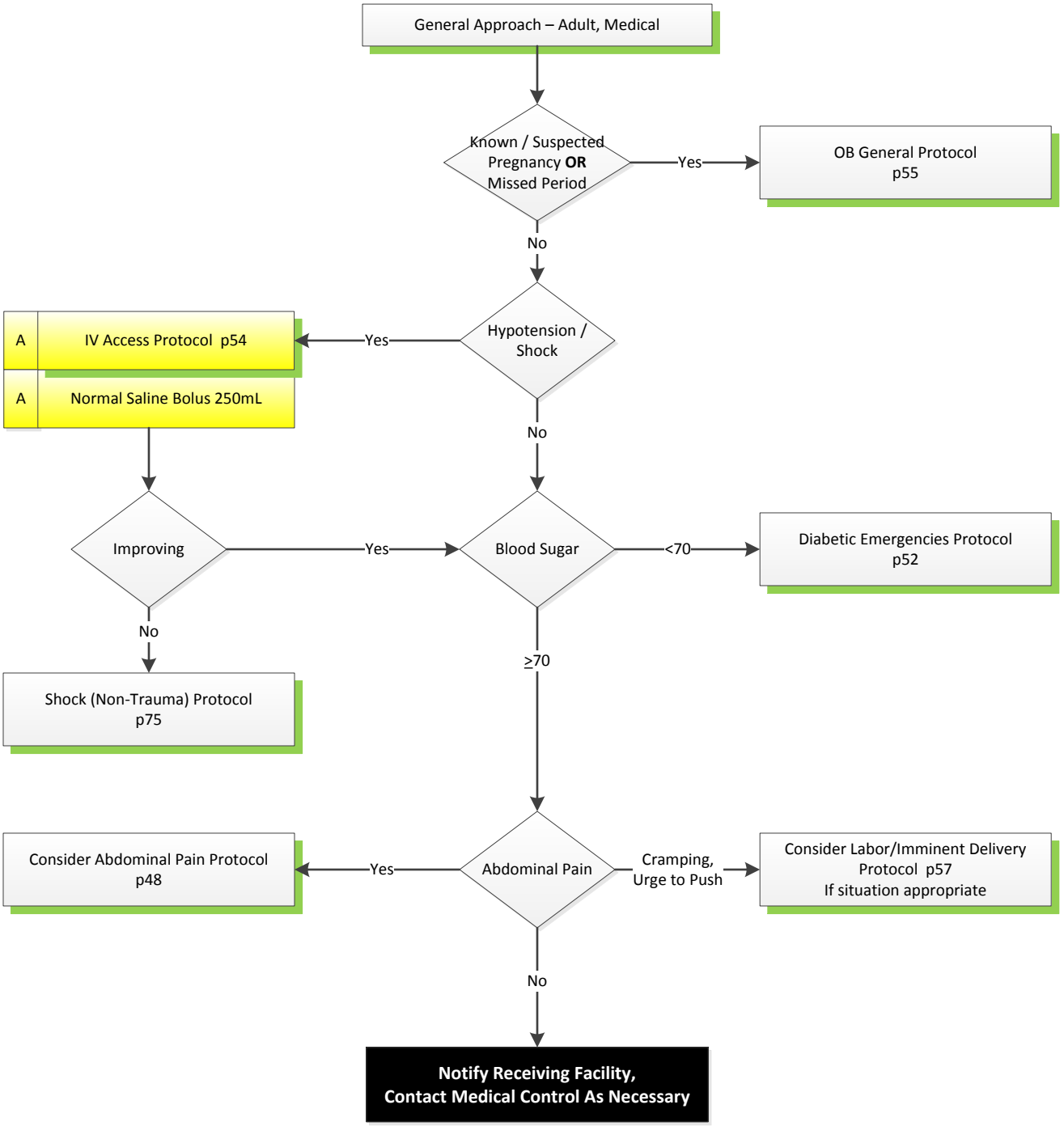
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Pregnancy History (G's and P's)
- Abdominal Pain +/- Contractions
- Blurred Vision
- Estimated Blood Loss (Pads / Tampons Per Hour)
- Chest Pain, Dyspnea, Hypoxia

Differential

- Ectopic Pregnancy
- Domestic Violence
- Sexual Assault
- Dysfunctional Uterine Bleeding
- Threatened / Impending / Missed Spontaneous Abortion
- Normal Menstrual Period

Medical Protocols - Adult



Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Always suspect pregnancy as a cause of vaginal bleeding in reproductive age women; patient report regarding menstrual history and sexual activity may not be accurate
- Ectopic pregnancy is a surgical emergency! Patients with vaginal bleeding, unstable vital signs and suspected ectopic pregnancy should be transferred to an OB receiving facility for emergent evaluation and management when possible
- Always have a high suspicion for domestic violence and /or sexual assault when evaluating a female with a reproductive or GU related complaint

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Labor / Imminent Delivery - Adult

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Pregnancy History (G's and P's)
- Estimated Due Date
- Prenatal Care / High Risk Pregnancy
- Time of Contraction Onset, Frequency
- Rupture of Membranes and Time
- Sensation of Fetal Movement

Differential

- Endometritis
- Normal Active Labor
- Abnormal Presentation
- Prolapsed Cord
- Preterm Labor
- Threatened / Impending / Missed Spontaneous Abortion
- Premature Rupture of Membranes
- Placenta Previa / Placenta Abruption

General Approach – Adult, Medical

Abnormal Vaginal Bleeding / Hypertension

Yes → OB General Protocol p55

No

Left Lateral Recumbent Position

Unable To Deliver

Create air passage by supporting presenting part of infant

Place 2 fingers alongside the nose and push away from the infant's face

Transport in Knee-Chest or Left Lateral Recumbent Position

M **Contact Medical Control**

Cord

Once the cord stops pulsating, then double-clamp approximately 10-12cm from the infant's abdomen. Cord should be cut between the two clamps.

Inspect Perineum
NO Digital Vaginal Exam

No Crowning

Monitor and Document VS
Reassess Frequently

Crowning, ≥36 Weeks Gestation → Yes

Crowning, ≥36 Weeks Gestation

Crowning, <36 Weeks Gestation
Abnormal Presentation
Severe Vaginal Bleeding
Multiple Gestation

Activate ALS

Expedite Transport to Nearest OB Receiving Facility

A **IV Access Protocol p54**

No

Prolapsed Cord / Shoulder Dystocia

- Hips Elevated, Knees to Chest
- Insert Gloved Fingers Into Vagina Relieve Pressure on Umbilical Cord
- Moist Saline Dressing Over Cord Eval Fetal Heart Rate / Cord Pulsation

Breech / Footling / Abnormal Presentation

- Transport knees to chest Unless Delivery Imminent
- Encourage Mother to Refrain from Pushing
- Support Presenting Parts, Do **NOT** Pull

Crowning, Delivery Imminent

- Control delivery with gentle support of head to prevent injury to Mother/Baby
- Check for nuchal cord; if present slip over head gently
- Gently apply downward pressure to deliver anterior shoulder, then upward to deliver posterior shoulder

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- **If Delivery is Completed, go to *Newly Born Protocol* for evaluation and management of the infant**
- Remember that you have TWO patients during Pregnancy, Labor and Delivery; be sure to monitor and protect both throughout your management
- After Delivery, massage the uterus through the anterior abdomen and wait for the placenta; **NEVER** pull on the umbilical cord to expedite the afterbirth
- Record the APGAR Scores for the infant at 1minute and 5minutes after delivery; if either in the Moderately Depressed range, continue to record and document every 5 minutes while supporting the infant per the Newly Born Protocol

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Newly Born - Peds

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Pregnancy History (G's and P's)
- Estimated Due Date
- Prenatal Care / High Risk Pregnancy
- Time of Contraction Onset, Frequency
- Rupture of Membranes and Time
- Sensation of Fetal Movement

Differential

- Maternal Medication Effect
- Hypovolemia
- Pneumothorax
- Hypoglycemia
- Congenital Heart Defect
- Maternal / Newborn Infection / Sepsis
- Airway Obstruction – Secretions
- Choanal Atresia (imperforate nares)

Airway Suctioning
Routine Suctioning of the Newborn is NO LONGER Recommended

Clear Amniotic Fluid
Suction ONLY when obstruction is present and/or BVM is required

Meconium Present
Non-Vigorous Newborns may undergo suctioning under direct laryngoscopy

M **Contact Medical Control If Any Questions**

	0 Points	1 Point	2 Points	Points Totaled
Activity (Muscle Tone)	Absent	Arms and Legs Flexed	Active Movement	
Pulse	Absent	<100 bpm	≥100 bpm Active	
Grimace (Reflexes, Irritability)	Flaccid	Some Flexion of Extremities	Motion (Sneeze, Cough, Pull	
Appearance (Skin Color)	Blue, Pale	Body Pink, Extremities Blue	Completely Pink	
Respirations	Absent	Slow, Irregular	Vigorous Cry	

Severely Depressed	0-3
Moderately Depressed	4-6
Excellent Condition	7-10

Labor / Imminent Delivery – Adult, Medical

Term Gestation Breathing or Crying Good Muscle Tone

Yes → Provide Warmth, Dry Infant Wipe Mouth, then Nose As Needed
Pulse Oximetry
Skin-To-Skin Contact With Mother If Situation Appropriate

No → Warm, Dry and Stimulate Infant Clear Mouth, then Nose As Needed

Heart Rate <100 Agonal Breathing **OR** Apnea

No → Labored Breathing / Persistent Cyanosis
No → Skin-To-Skin Contact With Mother If Situation Appropriate

Yes → BVM Assisted Ventilations with 10-15L X 30 seconds, 60bpm
Pulse Oximetry
Continuous Cardiac Monitor

Yes (Labored Breathing) → BVM Assisted Ventilations with 10-15L X 30 seconds, 60bpm

Heart Rate <100

Yes → Neonatal Resuscitation Protocol p109

No → Supplemental O2 via Blow-By Maintain SpO2 ≥93%
Pulse Oximetry
Skin-To-Skin Contact With Mother If Situation Appropriate

Yes → BVM Assisted Ventilations with 10-15L X 30 seconds, 60bpm
Pulse Oximetry
Continuous Cardiac Monitor

Heart Rate <60

Yes → Neonatal Resuscitation Protocol p109

No → **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Most Newborns requiring resuscitation will respond to supplemental O2, BVMs, airway clearing maneuvers. If not, go to Neonatal Resuscitation Protocol
- Consider birth trauma during evaluation of non-vigorous Newborn; pneumothorax, hypovolemia, hypoglycemia
- Term gestation, strong cry / adequate respirations with good tone will generally need no resuscitation
- Expected Pulse Ox Readings: Birth – 1min = 60-65%, 1-2min = 65-70%, 3-4min = 70-75%, 4-5min = 75-80%, 5-10min = 80-85%, >10min = >90%
- APGAR scores at 1min and 5 min. Appearance, Pulse, Grimace, Activity, Respirations. Each score gets 0, 1 or 2 points (Total 10). If either in the moderately depressed range, continue to record and document every 5 minutes.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Overdose and Poisoning, General - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGEM
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Head Injury
- Hazmat Exposure
- Electrolyte Imbalance
- DM, CVA, Seizure
- Sepsis

Medical Protocols - Adult

General Approach – Adult, Medical

Hazmat Scene

Yes: Call For Additional Resources, Stage Until Safe

No: Pulse

Absent: Cardiac Arrest Protocol p38

Present: Assess Respirations, Ventilations and Oxygenation

Inadequate: Airway Management Protocol p32

Adequate: Blood Sugar

<70: Diabetic Emergencies Protocol p52

≥70: 12 Lead ECG Procedure p146

Arrhythmia / STEMI: Go To Appropriate Arrhythmia Protocol

A: IV Access Protocol p54

Assess Mental Status

Altered / Somnolent, Not Protecting Airway: Opiate Overdose Protocol p66

Awake, Protecting Airway

Unchanged

Potential Causes

- Pesticide or Nerve Gas Exposure, SLUDGEM Symptoms: Organophosphate OD Protocol p60
- Bradycardia, AV Block, History of Beta Blocker Ingestion: Beta Blocker OD Protocol p61
- Bradycardia, AV Block, History of Ca Channel Block Ingestion: Calcium Channel Blocker OD Protocol p62
- Ventricular Dysrhythmia, Seizure, History of TCA Ingestion: Tricyclic Antidepressant OD Protocol p68
- Altered Mental Status, Seizure, Smoke Exposure: Cyanide **OR** Carbon Monoxide Poisoning Protocol p64/63

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Skin, Blood Glucose

- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Bring pill bottles, contents, emesis to the ED for evaluation and assessment
- Be careful of off-gassing in cases of inhalation of volatile agents
- Many intentional overdoses involve multiple substances, some of which can have cardiac toxicity; **a 12-Lead ECG should be obtained on all overdose patients** unless the situation dictates otherwise. Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**
- **SLUDGEM – S**alivation, **L**acrimation, **U**rination, **D**efecation, **G**I Upset, **E**mesis, **M**iosis
- **DUMBELLS -D**iarrhea, **U**rination, **M**iosis/**M**uscle Weakness, **B**ronchorrhea, **E**mesis, **L**acrimation, **L**ethargy, **S**alivation/**S**weating

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Cholinergic / Organophosphate Overdose - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGEM
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Head Injury
- Hazmat Exposure
- Electrolyte Imbalance
- DM, CVA, Seizure
- Sepsis

Medical Protocols - Adult

Overdose and Poisoning, General - Adult

Scene Safe

No → Stage, Call for Law Enforcement and/or Additional Resources

Yes

Consider Hazmat, General – Adult p91

Begin Triage and Decontamination, As Appropriate

Evidence of Exposure / Toxidrome

Yes

No

Organophosphate / Pesticide Exposure / Cholinergic Crisis Patient Management

Consider provider safety, number of patients and early notification of receiving facility

Toxicity to the crew may occur from inhalation or topical exposure to the offending agent

DuoDote AND/OR Mark-I Kit may be used for civilians IF cache released from the State of Wisconsin

Estimate Symptom Severity

Asymptomatic

A — Consider IV Access Protocol p54

Minor Symptoms
Respiratory Distress + SLUDGEM

A — IV Access Protocol p54

P — Atropine 2mg IV/IO/IM Repeat Q5 min until symptoms resolve

* — DuoDote x 1 dose IM EMS Provider Use *only* May repeat x1 if symptoms return at 10 minutes

Major Symptoms
Altered Mental Status, Seizure, Respiratory Distress/Failure

A — IV Access Protocol p54

P — Atropine 6mg IV/IO/IM Repeat Q5 min until symptoms resolve

* — DuoDote x3 doses IM EMS Provider *only*

Seizure

Yes → Seizure, Adult Medical Protocol p72

No → **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- *Each DuoDote Kit contains 600mg 2-PAM and 2.1mg of Atropine. The kits in the ambulance are intended for responder use only. If/When the emergency cache has been released by the State of Wisconsin, those kits may be used for the general public.
- **SLUDGEM** – **S**alivation, **L**acrimation, **U**rination (Incontinence), **D**efecation (Incontinence), **GI** Upset, **E**mesis, **M**iosis
- For patients with major symptoms, there is no max dosing for Atropine; continue administering until salivation/secretions improved
- Follow all Hazmat procedures, strictly adhere to personal protective equipment for exposure prevention and begin decontamination early
- Patients who have been exposed to organophosphates are highly likely to off-gas; be sure to use all responder PPE and to avoid exposure to clothing or exhalations of victims. Helicopter EMS is generally NOT appropriate for these patients.
- A **cholinergic crisis** is an over-stimulation at a neuromuscular junction due to an excess of acetylcholine (ACh), as of a result of the inactivity or inhibition of the AChE enzyme, which normally breaks down acetylcholine

Cholinergic / Organophosphate Overdose - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Beta Blocker Overdose - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGEM
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting
- QT <450

Differential

- Status Epilepticus
- Anticholinergic Syndrome
- Meningitis, Tetanus
- Hyperventilation
- Hypocalcemia, hypomagnesemia
- Oropharyngeal Infections
- Serotonin Syndrome
- Sepsis

Medical Protocols - Adult

Clinical Features of Beta Blocker Overdose

Cardiovascular – hypotension, bradycardia, AV block
Pulmonary – bronchospasm, wheezing
Metabolic – Hypoglycemia, Hyperkalemia
Neuro - Stupor

Common Beta Blockers:

Metoprolol (Lopressor, Toprol-XL)
Atenolol (Tenormin)
Labetalol
Propanolol (Inderal LA, InnoPran XL)
Carvedilol (Coreg)

Overdose and Poisoning, General - Adult

Airway Evaluation
- Compromised → Airway Management Protocol p32
- Adequate

A — IV Access Protocol p54

A — Normal Saline Bolus 250mL IV/IO

Administer Supplemental O2

12-Lead ECG Procedure (If Not Already Done) p146

If at any time patient loses pulses GO IMMEDIATELY to CARDIAC ARREST PROTOCOL p38

**In the setting of overdose, these patients need CPR, *not CCR*

Beta Blocker Ingested Identified
- Sotalol → Monitor for Prolonged QT / Torsades de Pointes
  - P — If Yes, Magnesium Sulfate 2g IV/IO over 1-2 minutes
- Propranolol → Monitor for QRS Widening
  - P — If Yes Sodium Bicarbonate, 1mEq/kg IV/IO over 5 minutes As Needed
- No **OR** "Other"

Blood Sugar
- <70 → A — Dextrose Dosing: D10W 125mL IV/IO **OR** D5W 250mL IV/IO **OR** D50 25mL IV/IO Titrate to Effect
- ≥70

Peaked T-waves OR Suspected HyperK
- Yes → P — Sodium Bicarbonate, 1mEq/kg IV/IO over 5 minutes
- Yes → P — Calcium Chloride, 1g IV/IO bolus
- No → HR <60 AND Symptomatic
  - Yes → P — Atropine, 0.5mg IV/IO May repeat x 2
  - P — **No change** Glucagon, 50mcg/kg (max 5mg) IV/IO
  - P — **No change** External Cardiac Pacing Procedure p176
  - No

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- **Many beta blocker ingestions do not cause symptoms; exceptions are the elderly, poor cardiac/respiratory reserve, and coingestions with other cardiac medications**
- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Many intentional overdoses involve multiple substances, some of which can have cardiac toxicity; **a 12-Lead should be obtained on all overdose patients**
- Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**

Beta Blocker Overdose - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Calcium Channel Blocker Overdose - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGE
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Status Epilepticus
- Anticholinergic Syndrome
- Meningitis, Tetanus
- Hyperventilation
- Hypocalcemia, hypomagnesemia
- Oropharyngeal Infections
- Serotonin Syndrome
- Sepsis

Clinical Features of Calcium Channel Blocker Overdose

Cardiovasccular – hypotension, bradycardia, shock
Pulmonary – pulmonary edema, rales, crackles
Metabolic – Hyperglycemia (can be a marker of severity)
Neuro – Seizures, myoclonus, dizziness, syncope
GI – Nausea and vomiting

Common Calcium Channel Blockers:

Amlodipine (Norvasc)
Diltiazem (Cardizem, Tiazac)
Nicardipine
Nifedipine (Procardia)
Verapamil (Calan, Verelan)

Overdose and Poisoning, General - Adult

Airway Evaluation
- Compromised → Go To Airway Management Protocol p32
- Adequate

A — IV Access Protocol p54

A — Normal Saline Bolus 250mL IV/IO

Administer Supplemental O2

12-Lead ECG Procedure (If Not Already Done) p146

If at any time patient loses pulses GO IMMEDIATELY to CARDIAC ARREST PROTOCOL p38

In the setting of overdose, these patients need **CPR, not CCR

Blood Sugar
- <70 → A — Dextrose Dosing: D10W 125mL IV/IO **OR** D5W 250mL IV/IO **OR** D50 25mL IV/IO
- ≥70

HR <60 AND Symptomatic
- Yes → P — Atropine, 0.5mg IV/IO May repeat x 2
- Yes → P — Calcium Chloride, 1g IV/IO bolus
- No → P — Calcium Chloride, 1g IV/IO bolus

Notify Receiving Facility, Contact Medical Control As Necessary

Stable **OR** Improving
- Yes → **Notify Receiving Facility, Contact Medical Control As Necessary**
- No → P — Glucagon, 50mcg/kg (max 5mg) IV/IO
- No → P — **No change** Epinephrine, 2-10mcg/min 1:10,000 (max 10mcg/min) IV/IO
- Unstable → P — **No change** Consider External Cardiac Pacing Procedure p176

Medical Protocols - Adult

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Sustained release preparations may have delayed onset of toxic symptoms (up to 12 hours)
- **Overdoses with Calcium Channel Blockers have a high mortality!! Electrical conduction abnormalities, vasodilation, myocardial depression are severe**
- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Many intentional overdoses involve multiple substances, some of which can have cardiac toxicity; **a 12-Lead should be obtained on all overdose patients**
- Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**

Calcium Channel Blocker Overdose - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Carbon Monoxide Poisoning - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Known or suspected CO Exposure
- Source and Duration of Exposure
- Dysrhythmias
- Headache, Nausea/Vomiting
- Chest Pain, Arrhythmias
- Respiratory Distress
- Seizures
- Mental Status Change
- Vomiting

Differential

- Acute Myocardial Infarction
- Hypoglycemia
- Diabetic Ketoacidosis
- Subarachnoid Hemorrhage
- Acute Stroke
- Influenza
- Other toxic inhalation
- Tension Headache

Medical Protocols - Adult

Overdose and Poisoning, General - Adult

Provider Safety

No → Stage, Call for Law Enforcement and/or Additional Resources; Consider SCBA if Toxic Inhalation Suspected

Yes

Remove patient from Suspicious Environment, Administer 100% O2

Assess Blood Sugar Level

<70 → Diabetic Emergencies Protocol p52

≥70

CarboxHgb (SpCO) Available

No → Clincal Suspicion of CO Toxicity

No → Go To Appropriate Medical Treatment Protocol

Yes

Consider Need for ALS Level Service EARLY

Consider Safety of ALL Responders including Law Enforcement

Yes

Asses and Docment SpCO

<5% → Treatment for CO Not Indicated → Go To Appropriate Medical Treatment Protocol

≥5% → Measure SpO2 on Room Air

SpCO <15% **AND/OR** SpO2 ≥93% → Symptoms of Hypoxia **OR** CO Toxicity

No → Treatment for CO Not Indicated; Consider Screening Home/Work Environment for elevated CO; Go To Appropriate Medical Treatment Protocol

Yes

SpCO ≥15% **AND/OR** SpO2<93%

Administer 100% O2 via NRB

12-Lead ECG Procedure p146

Arrhythmia / STEMI → Go To Appropriate Cardiac Arrhythmia or STEMI Protocol p44

Sinus Rhythm

Cincinnati Stroke Screen Procedure p180

Positive → Suspected Stroke Protocol p73

Negative → **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Fetal hemoglobin has a stronger affinity for CO than adult, and will preferentially take the CO from the Mother, giving her a FALSE LOW SpCO level
- Hospital evaluation should be strongly encouraged for any pregnant or suspected to be pregnant females
- The absence or low levels of SpCO is not a reliable predictor of firefighter/victim exposures to other toxic byproducts of combustion. Consider the Cyanide Poisoning Protocol
- Multiple patients presenting with vague, influenza-like symptoms simultaneously should raise your suspicion of CO exposure. Ask about home heating methods, generator use, exposure to combustible fuels

Carbon Monoxide Poisoning - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Cyanide Poisoning - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Known or suspected CO Exposure
- Source and Duration of Exposure
- Dysrhythmias
- Headache, Nausea/Vomiting
- Chest Pain, Arrhythmias
- Respiratory Distress
- Seizures
- Mental Status Change
- Vomiting

Differential

- Acute Myocardial Infarction
- Hypoglycemia
- Diabetic Ketoacidosis
- Subarachnoid Hemorrhage
- Acute Stroke
- Influenza
- Other toxic inhalation
- Tension Headache

Medical Protocols - Adult

Overdose and Poisoning, General - Adult

Provider Safety

No → Stage, Call for Law Enforcement and/or Additional Resources; Consider SCBA if Toxic Inhalation Suspected

Yes

Remove patient from Suspicious Environment, Administer 100% O2

Assess Blood Sugar Level

<70 → Diabetic Emergencies Protocol p52

>70

Protecting Airway

No → Airway Management Protocol p32

Yes

Continuous Cardiac Monitor

A — IV Access Protocol p54

A — Normal Saline Bolus 250mL IV/IO

12-Lead ECG Procedure (If Not Already Done) p146

Arrhythmia/ STEMI → Go To Appropriate Cardiac Treatment Protocol

High Suspicion of Cyanide

No → Go To Appropriate Medical Treatment Protocol

Yes

P — Cyanokit, 70mg/kg IV/IO (max 5g) Infuse over 15 minutes if available

Notify Receiving Facility, Contact Medical Control As Necessary

Consider Need for ALS Level Service EARLY

Consider Safety of ALL Responders including Law Enforcement

If Cyanokit is appropriate, contact and make arrangements with receiving ED or equipped ALS unit ASAP

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Consider Cyanide when exposed to any products of combustion, mining incidents or industrial organic chemistry exposure.
- Fetal hemoglobin has a stronger affinity for CO than adult, and will preferentially take the CO from the Mother, giving her a **FALSE LOW** SpCO level
- Hospital evaluation should be strongly encouraged for any pregnant or suspected to be pregnant females
- The absence or low levels of SpCO is not a reliable predictor of firefighter/victim exposures to other toxic byproducts of combustion
- Multiple patients presenting with vague, influenza-like symptoms simultaneously should raise your suspicion of CO exposure. Ask about home heating methods

Cyanide Poisoning - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Antipsychotic Overdose / Acute Dystonic Reaction - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGEM
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Status Epilepticus
- Anticholinergic Syndrome
- Meningitis, Tetanus
- Hyperventilation
- Hypocalcemia, hypomagnesemia
- Oropharyngeal Infections
- Serotonin Syndrome
- Sepsis

Medical Protocols - Adult

Medical Protocols - Adult

Common Causes of Dystonic Reactions

Antipsychotics – i.e. Haldol, Prolixin, Thorazine
Antiemetics – i.e. prochlorperazine, metaclopramide
Antidepressants – i.e. buspirone, sumitriptan
Antibiotics – i.e. erythromycin
Anticonvulsants – i.e. carbamazepine, vigabatrin
H2 receptor blockers – i.e. ranitadine, cimetidine
Recreational Drugs – i.e. cocaine

Overdose and Poisoning, General - Adult

Airway Evaluation

Compromised → Airway Management Protocol p32

Adequate

A — IV Access Protocol p54

Administer Supplemental O2

12-Lead ECG Procedure (If Not Already Done) p146

Arrythmia/ STEMI → Go To Appropriate Cardiac Treatment Protocol

P — Diphenhydramine 25mg IV/IO
May repeat x 1 after 10 minutes

Improving

No → P — Lorazepam 1-2mg IV/IO
OR
Midazolam 5mg IV/IO if <60 y/o
Midazolam 2.5mg IV/IO if >60y/o

Yes

Notify Receiving Facility, Contact Medical Control As Necessary

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Acute dystonic reactions are extrapyramidal side effects of antipsychotic and certain other medications. 90% occur within 5 days of starting a new med
- **Dystonia refers to sustained muscle contractions, frequently causing twisting, repetitive movements or postures, and may affect any part of the body**
- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Many intentional overdoses involve multiple substances, some of which can have cardiac toxicity; **a 12-Lead should be obtained on all overdose patients**
- Contact Poison Control for all non-opiate overdoses: 1-**800-222-1222**

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Opiate Overdose - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGE
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Post-ictal After Seizure
- Hypothyroidism
- EtOH / BZD overdose
- Intracranial Hemorrhage
- Hypoglycemia
- Head Injury
- Encephalitis
- Liver Failure
- CO2 Retention (Hypercarbia)
- Polysubstance Overdose

Medical Protocols - Adult

General Approach – Adult, Medical

In opiate overdoses, poor respiratory effort is what kills patients; emphasis should be on ventilation support first, and Naloxone administration second

Intranasal Naloxone is **ONLY** effective if there is a pulse; circulatory support is key

IN Naloxone has a slower onset, but seems to have a lower incidence of agitation and aggression after administration

While there is no maximum for Naloxone, if the patient does not respond after 2 doses the emphasis should be on airway and ventilation support while looking for other causes of altered mental status

Airway Evaluation

Compromised → Airway Management Protocol p32

Adequate

	Naloxone 0.5-1mg IN each naris may repeat x 1 **OR**
A	IV Access Protocol p54
A	Naloxone 0.5-2.0mg IV/IO/IM, May repeat x1
	Administer Supplemental O2 to maintain SpO2 ≥93%
	12-Lead ECG Procedure (If Not Already Done) p146

Arrhythmia/ STEMI → Go To Appropriate Cardiac Care Protocol

Blood Sugar

<70 → A: Dextrose Dosing: D10W 125mL IV/IO **OR** D5W 250mL IV/IO **OR** D50 25mL IV/IO

>70

Monitor RR, SpO2 and Mental Status

Improved

No → Consider Altered Mental Status Protocol p50 → M: Contact Medical Control

Yes → **Notify Receiving Facility, Contact Medical Control As Necessary**

Single Agent Opiate Medications

Oxycodone
Hydrocodone
Morphine
Heroin
Dilaudid
Fentanyl
Codeine

Combination Opiate Medications

Vicodin – Hydrocodone + Tylenol
Norco – Hydrocodone + Tylenol
Percocet – Oxycodone + Tylenol
Darvocet – Darvon + Tylenol
Vicoprofen – Hydrocodone + Ibuprofen
T3 – Tylenol + Codeine

Long-Acting Opiate Medications

Oxycontin
MS Contin
Methadone

Medical Protocols - Adult

If at any time patient loses pulses
GO IMMEDIATELY to CARDIAC ARREST PROTOCOL p38

In the setting of overdose, these patients need **CPR, not CCR

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Opiates may be taken orally, intravenously and inhalational (smoked/snorted). All routes are capable of causing respiratory arrest in overdose
- All opiates have effects that last longer than Naloxone. Extended Release and Long-Acting formulations will likely need repeat Naloxone dosing in overdose
- Naloxone has been connected to flash pulmonary edema after administration for opiate overdose; for this reason, all opiate OD patients must be transported
- Intranasal Naloxone should be distributed between both nares to optimize absorption
- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Many intentional overdoses involve multiple substances, some of which can have cardiac toxicity; **a 12-Lead should be obtained on all overdose patients**
- Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**

Opiate Overdose - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Cocaine and Sympathomimetic Overdose - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGE
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Status Epilepticus
- Anticholinergic Syndrome
- Meningitis, Tetanus
- Hyperventilation
- Hypocalcemia, hypomagnesemia
- Oropharyngeal Infections
- Serotonin Syndrome
- Sepsis
- Subarachnoid Hemorrhage
- Pheochromocytoma

Medical Protocols - Adult

Overdose and Poisoning, General - Adult

Sympathomimetics are drugs that mimic the effects of the sympathetic nervous system

Clinical Features of Cocaine or Sympathomimetic Overdose

Hypertension, Tachycardia, Agitation, Seizure, Dilated Pupils

Common Sympathomimetics:

Ephedrine
Phenylephrine
Pseudophedrine
Methamphetamine
Terbutaline

Airway Evaluation

Compromised → Airway Management Protocol p32

Adequate

A — IV Access Protocol p54

A — Normal Saline Bolus 250mL IV/IO

Administer Supplemental O2

12-Lead ECG Procedure (If Not Already Done) p146

Arrhythmia/ STEMI → Go To Appropriate Cardiac Care Protocol

If at any time patient loses pulses GO IMMEDIATELY to CARDIAC ARREST PROTOCOL

In the setting of overdose, these patients need **CPR, not CCR

Blood Sugar

<70 → A — Dextrose Dosing: D10W 125mL IV/IO **OR** D5W 250mL IV/IO **OR** D50 25mL IV/IO

≥70

Agitation

Yes → P — Lorazepam 1-2mg IV/IO/IM **OR** Midazolam 2-4mg IV/IO/IM/IN (max 4mg)

Consider Behavioral / Excited Delirium Protocol p51

No

Seizure

Yes → Seizure Protocol p72

No

Chest Pain in the setting of Cocaine use should be treated with IV Fluids and Benzodiazepines.

***Beta Blockers are CONTRAINDICATED in cocaine use**, as it can result in unopposed alpha activity*

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- Patients on MAOIs for depression may have symptoms of a Sympathomimetic Overdose after eating certain foods such as **aged cheese, beer, mushrooms**
- Patients with Cocaine or Sympathomimetic Overdose are at high risk of Arrhythmias, Myocardial Infarction and Stroke
- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Many intentional overdoses involve multiple substances, some of which can have cardiac toxicity; **a 12-Lead should be obtained on all overdose patients**
- Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**

Cocaine and Sympathomimetic Overdose - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Tricyclic Overdose - Adult

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGEM
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Head Injury
- Hazmat Exposure
- Electrolyte Imbalance
- DM, CVA, Seizure
- Sepsis

Medical Protocols - Adult

Common Tricyclic Antidepressants:

Amitriptyline
Clomipramine
Doxepin
Imipramine
Nortryptyline
Protriptyline

Overdose and Poisoning, General - Adult

Any Co-ingestants — Yes → Collect Pill Bottles, Pill Fragments and Prescriptions as possible and bring to the ED

12-Lead ECG Procedure (If Not Already Done) p146

Wide QRS — ≥0.12sec →
- A: IV Access Protocol (If Not Already Done) p54
- P: Sodium Bicarbonate, 1mEq/kg IV/IO over 5 minutes

<0.12sec

Hypotension — SBP <100 →
- A: IV Access Protocol (If Not Already Done) p54
- A: Normal Saline Bolus 250mL IV/IO

Hypotension — Yes ← BP Improved **AND** QRS Narrowing

BP Improved **AND** QRS Narrowing — No →
- P: Sodium Bicarbonate, 1mEq/kg IV/IO over 5 minutes
- If Airway Managed, Hyperventilate to goal EtCO2 30-35mmHg

SBP ≥100

Improved — Yes → / Improving ←

Improved — No → Shock (Non-Trauma) Protocol p75

Seizure — Yes →
- A: IV Access Protocol (If Not Already Done) p54
- P: Lorazepam 1-2mg IV/IO/IM **OR** Midazolam 2-4mg IV/IO/IM/IN (One Time)

Seizure — No →

Arrhythmia — Yes → Go To Appropriate Arrhythmia Protocol

Arrhythmia — No → **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Neuro, Abdominal Exam, Cardiovascular

- If arrhythmias occur in TCA Overdose, the first step is to give more Sodium Bicarbonate. Then move on to the Appropriate Arrhythmia Protocol
- Administer IV Sodium Bicarbonate 1mEq/kg over 5 minutes, and repeat every 5 minutes until BP improves and QRS complex begins to narrow.
- **Avoid beta-blockers and amiodarone as they may worsen hypotension and conduction abnormalities**
- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Many intentional overdoses involve multiple substances, some of which can have cardiac toxicity; **a 12-Lead should be obtained on all overdose patients**
- Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

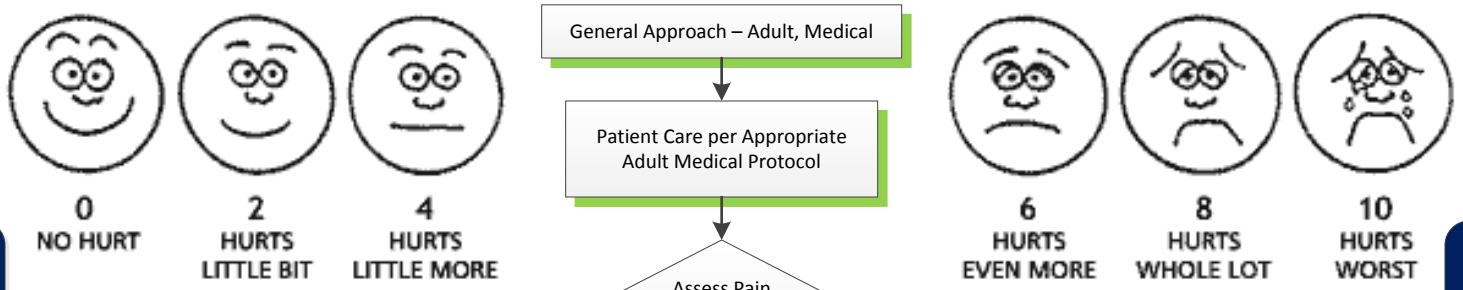
Pain Management – Adult

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- History of chronic pain

Differential

- Head injury
- Spine Injury
- Compartment Syndrome
- Fracture, Sprain, Strain
- Pneumo/hemo-thorax
- Pericardial effusion
- Aortic Dissection
- Internal organ injury



Medical Protocols – Adult

General Approach – Adult, Medical

Patient Care per Appropriate Adult Medical Protocol

Assess Pain
0-10 Pain Scale OR FACES Scale

None – Mild Pain (0-4)

A Consider IV Access Protocol p54

Reassess and Document VS, including Pain Scale

Moderate Pain (5-8)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P Consider IN Fentanyl 1mcg/kg (max 50mcg per naris)

A IV Access Protocol p54

Document response to meds, VS (HR, BP, SpO2, EtCO2)

SpO2 ≥93%, EtCO2 <45, **SBP >90**

Reassess Pain

Unchanged OR Worsening

Improved

Continue with Adult Medical Specific Protocol

Severe Pain (9-10)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P Consider IN Fentanyl 1mcg/kg (max 50mcg per naris)

A IV Access Protocol p54

Document response to meds, VS (HR, BP, SpO2, EtCO2)

SpO2 ≥93%, EtCO2 <45, **SBP >90**

P Fentanyl 1mcg/kg IV/IO/IM (max 100mcg) May repeat x 1

P Consider Ondansetron 4mg IV/IO/ODT/IM

M **Consider Morphine 0.1mg/kg IV/IO (max 4mg)**

Medical Protocols - Adult

Pearls

REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, Abdominal Exam, Musculoskeletal Exam, Area of Pain

- Provider Discretion to be used for patients suffering from chronic pain related issues. However, please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- Pain severity (0-10) is a vital sign to be recorded pre- and post-medication delivery and at disposition
- As with all medical interventions, assess and document change in patient condition pre- and post-treatment
- Opiate naive patients and the elderly can have a dramatic response to analgesic medications; start low and titrate up as appropriate
- Allow for position of maximum comfort as situation allows

Pain Management – Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Refusal Protocol - Adult

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxidrome
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Medical Protocols - Adult

General Approach – Adult, Medical

- ❑ ≥18 Years of Age **OR**
- ❑ Court Emancipated Minor **OR**
- ❑ Legally Married Person of Any Age **OR**
- ❑ Unwed Pregnant Female <18 **IF and ONLY IF** EMS Call Related to Pregnancy

No → Parent/Legal Guardian of Patient Can Be Contacted

Yes → Pediatric Refusal Protocol p124

No

Yes

- ❑ Altered Mental Status **OR**
- ❑ Impaired Decision Making Ability **OR**
- ❑ Hallucinations or Thought Disorder **OR**
- ❑ Incapacitated* **OR**
- ❑ Suicidal or Homicidal Ideation

Yes → Transport Required Under Implied Consent **OR** Police Protective Custody

No

- ❑ Clinically Intoxicated** **OR**
- ❑ EtOH Use AND *Prudent EMS Provider* Believes Treatment IS Needed

Yes →

- ❑ Consult PD To Determine Appropriate Disposition
- ❑ Transport by Ambulance or Alternative (Wisconsin State Statute 51.45)
- ❑ Police Officer Name and Badge Number REQUIRED in Documentation

No

- ❑ Bronchospasm Resolved after ONE Nebulizer Treatment **OR**
- ❑ Insulin *Only* Induced Hypoglycemia Resolved After ONE Treatment

Yes → Refusal After EMS Treatment Protocol p71

No

- ❑ Document assessment including mental status, physical exam, vitals, blood glucose and SpO2
- ❑ Assure that the patient/parent/guardian understands the possible consequences of refusal
- ❑ Complete documentation of refusal and obtain signatures
- ❑ Contact On-Line Medical Control for refusals that arise after EMS treatment has been initiated

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- *Incapacitated definition: A person who, because of alcohol consumption or withdrawal, is unconscious or whose judgment is impaired such that they are incapable of making rational decisions as evidenced by extreme physical debilitation, physical harm or threats of harm to themselves, others or property. Evidence of incapacitation: inability to stand on ones own, staggering, falling, wobbling, vomit/urination/defecation on clothing, inability to understand and respond to questions, DTs, unconsciousness, walking or sleeping where subject to danger, hostile toward others.
- **Intoxicated definition: A person whose mental or physical functioning is substantially impaired as a result of the use of alcohol.
- If there is ANY question, do not hesitate to involve Law Enforcement to ensure the best decisions are being made on behalf of the patient.

Refusal Protocol - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Refusal After EMS Treatment - Adult

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxidrome
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Refusal Protocol – Adult, Medical

Reason for EMS Activation

Bronchospasm, Resolved after Nebulizer

- ❑ Asymptomatic After One Treatment
- ❑ Presentation is Consistent with Mild Asthma/COPD Exacerbation
- ❑ No pain, no sputum, afebrile, no hemoptysis
- ❑ Not hypoxic after Treatment (SpO2 ≥93%)
- ❑ Complete Resolution of Symptoms
- ❑ Vital Signs WNL after Treatment

ALL 'Yes'

Insulin-only Induced Hypoglycemia

- ❑ Asymptomatic After Treatment
- ❑ Patient is on insulin ONLY (does not take ANY oral diabetes medications)
- ❑ Presentation consistent with simple hypoglycemia
- ❑ Vital Signs WNL after Treatment
- ❑ No indication of intentional overdose

ALL 'Yes'

ANY 'No'

ANY 'No'

Transport Required
OR
Police Protective Custody
Contact On-Line Medical Control as necessary

Consider Additional Patient Safety Measures

- ❑ A Family Member or Caregiver is available to stay with the patient to assist/activate EMS if symptoms return
- ❑ Assure that the patient/parent/guardian understands the possible consequences of refusal
- ❑ Request the patient to follow up with their physician as soon as possible and/or to contact 9-1-1 if symptoms return

ALL 'Yes'

- ❑ Document assessment including mental status, physical exam, vitals, blood glucose and SpO2
- ❑ Assure that the patient/parent/guardian understands the possible consequences of refusal
- ❑ Complete documentation of refusal and obtain signatures

ANY 'No'

Transport Required
OR
Police Protective Custody
Contact On-Line Medical Control as necessary

Medical Protocols - Adult

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- *Incapacitated definition: A person who, because of alcohol consumption or withdrawal, is unconscious or whose judgment is impaired such that they are incapable of making rational decisions as evidenced by extreme physical debilitation, physical harm or threats of harm to themselves, others or property. Evidence of incapacitation: inability to stand on ones own, staggering, falling, wobbling, vomit/urination/defecation on clothing, inability to understand and respond to questions, DTs, unconsciousness, walking or sleeping where subject to danger, hostile toward others.
- Simple Hypoglycemia for these protocols is defined as: hypoglycemia caused by insulin ONLY and not suspected to be due to occult infection or trauma
- **Intoxicated definition: A person whose mental or physical functioning is substantially impaired as a result of the use of alcohol.
- If there is ANY question, do not hesitate to involve Law Enforcement to ensure the best decisions are being made on behalf of the patient.

Refusal After EMS Treatment - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Seizure - Adult

Pertinent Positives and Negatives

- Age, VS, GCS, SpO2, Blood Sugar
- SAMPLE History
- OPQRST History
- Seizure History, Med Compliance
- Bowel or Bladder Incontinence
- Tongue Biting
- Pregnancy History
- Evidence of Trauma
- Number of Seizures and Duration

Differential

- Hypoxia
- Hypoglycemia
- Electrolyte Imbalance
- Eclampsia
- Stroke
- Hyperthermia
- Drugs, EtOH Abuse
- Drugs, EtOH Withdrawal
- Occult Head Injury
- Tumor
- Liver / Kidney Failure
- Infection / Sepsis

Medical Protocols - Adult

General Approach – Adult, Medical

Consider ALS *Early*
Prolonged Seizures Are BAD for Neurologic Outcomes!

Environmental Cause or Toxic Exposure — Yes → Notify Comm Center and Hazmat Team Ensure Responder and Public Safety → Hazmat, General Protocol p91

No

Actively Seizing on EMS Arrival — No / Yes

Blood Glucose — ≤70 → Diabetic Emergencies Protocol p52 ← ≤70 — Blood Glucose

>70 / >70

Loosen Constrictive Clothing Protect Patient from Injury

A IV Access Protocol p54

Consider Airway Management Protocol p32

P Midazolam 5mg IM/IN if <60 y/o
Midazolam 2.5mg IM/IN if ≥60 y/o

Monitor and Reassess

Consider Long Board Selective Spinal Immobilization Protocol p98

Loosen Constrictive Clothing Protect Patient from Injury

A IV Access Protocol p54

Normal Mental Status — No → Consider Altered Mental Status Protocol p50 ← No — Still Seizing

Yes → Seizure Returns — Yes → Yes

No

Notify Receiving Facility, Contact Medical Control As Necessary

Contact Medical Control

Status Epilepticus — No / Yes

P Lorazepam 1-2mg IV/IO
OR
Midazolam 5mg IV/IO if <60 y/o
Midazolam 2.5mg IV/IO if >60y/o

Medical Protocols - Adult

Pearls

REQUIRED EXAM: Blood Sugar, SpO2, GCS, Neuro Exam

- Midazolam is effective in terminating seizures. Do not delay IM/IN administration to obtain IV access in an actively seizing patient
- Do not hesitate to treat recurrent, prolonged (>1 minute) seizure activity
- Status epilepticus is ≥2 successive seizures without recovery or consciousness in between. This is a TRUE EMERGENCY requiring Airway Management and rapid transport
- Assess for possibility of occult trauma, substance abuse
- Active seizure in known or suspected pregnancy >20 weeks, give Magnesium 4gm IV/IO over 2-3 minutes

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Suspected Stroke - Adult

Pertinent Positive/Negative:
- SAMPLE History
- OPQRST History
- History of CVA, TIA
- Previous Cardiac, Vascular Surgery
- Anticoagulant Use
- Weakness / Paralysis
- Aphasia / Dysarthria
- Headache
- Vertigo
- Seizure

Differential
- TIA
- Seizure
- Hypoglycemia
- Tumor
- Occult Trauma
- Stroke
  - -Thrombolic (~85%)
  - -Hemorrhagic (~15%)

Medical Protocols - Adult

General Approach – Adult, Medical

Cincinnati Stroke Screen Procedure p180

0/3 positives → Consider Altered Mental Status Protocol p50

≥1/3 items positive

FAST-ED Stroke Screen p181 ↔ Alert Receiving Hospital "Potential LVO (Large Vessel Occlusion)"

Keep Scene Time < 10 min.

Blood Glucose → <70 or >250 → Diabetic Emergencies Protocol p52

12 Lead ECG Procedure p146 → Abnormal → Go To Appropriate Cardiac Dysrhythmia or STEMI Protocol p44

SpO2 → <93% → Airway Mangement Protocol p32

≥93%

A IV Access Protocol p54 ↔ Elevate Head of Stretcher 15-30 degrees

Establish Definite Time of Symptom Onset → ≤12 hours → Call Early "Stroke Alert" to Stroke Facility

>12 hours

Initiate Transport to Hospital

Monitor and Reassess BP → SBP ≤100 → Consider Hypotension / Shock (Non-Trauma) Protocol p75

Monitor and Reassess BP → SBP ≥220 **AND/OR** DBP ≥120 → M **Consider BP Management**

SBP >100 AND <220

Monitor and Reassess Symptoms ↔ Thrombolytic Screening Protocol p76

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Neuro Exam, Cincinnati Stroke Scale

- Thrombolytic Screening Protocol should be completed for any suspected stroke patient
- Think **FAST** – **F**acial Asymmetry, **A**rm Strength, **S**peech and **T**ime since last seen normal
- Be very diligent observing for airway compromise in suspected acute stroke (swallowing, vomiting, aspirating)
- Hypoglycemia, Infection and Hypoxia can present with Neurologic deficit, *especially in the elderly*.
- IV Access is important, but establishment of a line should not significantly delay initiation of transport. Time lost is brain lost!

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Sepsis Screening - Adult

Step One — Systemic Inflammatory Response Syndrome (SIRS) criterial met

- Temperature >38°C (100.4°F)
- Temperature <36°C (96.8°F)
- Chills/Rigors
- Pulse >90
- Respiratory Rate >20
- Acute Mental Status Changes from Baseline
- Glucose >120 without history of Diabetes

<2 Criteria Met →
- Monitor and reassess patient as indicated
- Notify Receiving Hospital for any changes in patient condition

Continue Treatment per Appropriate Medical Protocol

≥2 Criteria Met

Step Two — Is the patient's history / complaint suggestive of an infection?

- Pneumonia
- UTI
- Abdominal Infection
- Blood Stream Catheter Infection
- Bone or Joint Infection
- Skin or Soft Tissue Infection
- Central Nervous System Infection (i.e. Meningitis)
- Endocarditis
- ENT / Maxillofacial Infection
- Foreign Body / Implantable Device Infection

No →
- Monitor and reassess patient as indicated
- Notify Receiving Hospital for ay changes in patient condition

Continue Treatment per Appropriate Medical Protocol

Yes

Step Three — **Begin IVF Bolus, 500mL NS** and Consider Shock / Non-Trauma Protocol
Is any of the following organ dysfunction present and **NOT** considered chronic and **NOT** caused by another condition?
Consider ALS intercept - IVF resuscitation and pressors with early antibiotics are key to patient survival

- Systolic BP ≤90mmHg **OR** MAP ≤65mmHg
- SBP down 40mmHG from baseline
- New or increased O_2 requirement to keep SpO_2 ≥90%
- ST segment depression on 12-Lead ECG
- Mental Status Changes

No →
- Monitor and reassess patient as indicated
- Notify Receiving Hospital for ay changes in patient condition

Continue Treatment per Appropriate Medical Protocol

Yes

Step Four — Notify Receiving Hospital of "Medical Red, SEPSIS ALERT" as part of radio report

Medical Protocols - Adult

Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Neuro Exam, Cincinnati Stroke Scale

- **SIRS**: The body's inflammatory response to an insult that results in the activation of the immune response
- **Sepsis**: SIRS + documented or highly suspected infection
- **Severe Sepsis**: Sepsis + sepsis induced organ dysfunction
- **Septic Shock**: Sepsis-induced hypotension persisting despite adequate fluid resuscitation resulting in tissue hypoperfusion
- **Surviving Sepsis Campaign (SSC)**: An international initiative to reduce mortality in patients with sepsis. Mortality with severe sepsis is 30-50%, and increases to 60% when shock is present. There are 750,000 new cases and 210,000 US fatalities are attributed to sepsis annually.
- The importance of early identification of sepsis and prompt appropriate treatment cannot be understated; EMS **is** the critical first link!
- Fluid resuscitation, pressors and EARLY antibiotics are the things that save lives in sepsis.

Sepsis Screening - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Hypotension / Shock (Non-Trauma) - Adult

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Medical Protocols - Adult

General Approach – Adult, Medical

Blood Glucose

<70 or >250 → Diabetic Emergencies Protocol p52

12 Lead ECG Procedure p146

Abnormal → Go To Appropriate Cardiac Dyshrhythmia or STEMI Protocol p44

BOTH Normal

A IV Access Protocol p54

↔ Consider Airway Management Protocol p32

↔ Consider Sepsis Screening Protocol p74

History, Exam, Circumstances Suggest Etiology of SBP <100?

Trauma → Go To Hemorrhage (Trauma) Protocol p93

Medical

- Hypovolemic (Dehydration, GI Bleed)
- Distributive (Sepsis, Anaphalaxis)
- Cardiogenic (STEMI, CHF)
- Obstructive (PE, Tamponade)

Hypovolemic / Distributive

A Normal Saline Bolus 500mL
Repeat every 5 min., max 4 doses

SBP <100 → A Normal Saline Bolus 500mL Repeat every 5 min., max 4 doses

Repeat and Document BP

Improved?

Yes → Notify Receiving Facility, Contact Medical Control As Necessary

No

P **Norepinephrine infusion IF Available**
Start 8-12mcg/min IV/IO
Titrate to SBP >100

P Epinephrine infusion
Start 2-10mcg/min IV/IO (1:10,000)
OR
Dopamine infusion 5-20mcg/kg/min IV/IO
Titrate to SBP >100
OR

Cardiogenic / Obstructive

A Normal Saline Bolus 250mL
One Time

Repeat and Document BP

Improved?

Yes → Notify Receiving Facility, Contact Medical Control As Necessary

No

P **Norepinephrine infusion IF Available**
Start 8-12mcg/min IV/IO
Titrate to SBP >100

P Dopamine infusion 5-20mcg/kg/min IV/IO
Titrate to SBP >100
OR

Medical Protocols - Adult

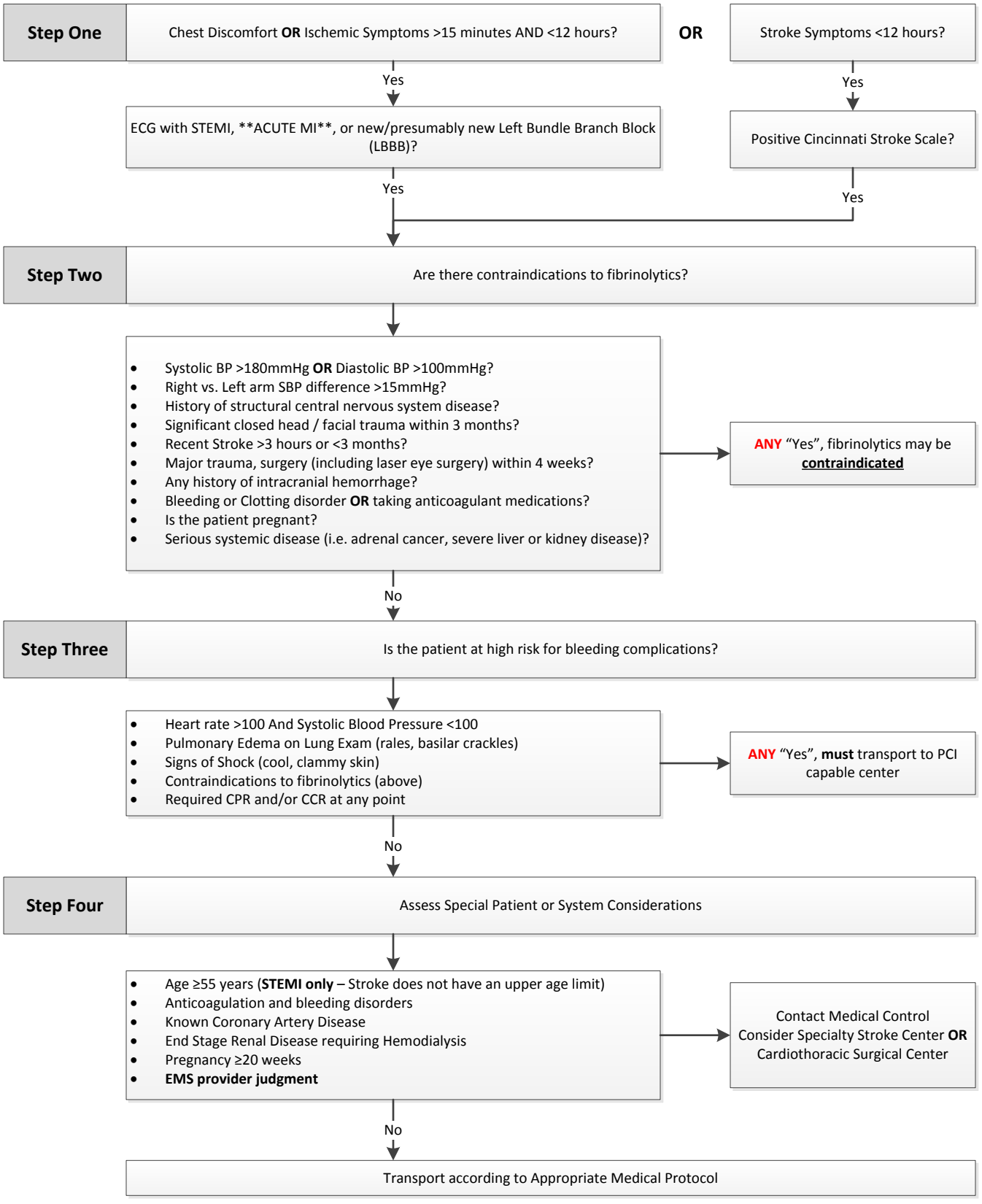
Pearls

REQUIRED EXAM: VS, GCS, RR, Lung sounds, JVD

- Shock may present with normal VS and progress insidiously.
- Tachycardia may be the *first and only* sign of shock.
- If evidence or suspicion of trauma, move to Hemorrhage Protocol early
- Acute Adrenal Insufficiency – State where the body cannot produce enough steroids. Primary adrenal disease vs. recent discontinuation of steroids (i.e. Prednisone) after long term use.
- ** If Adrenal Insufficiency suspected, contact Medical Control and review case. Medical Control may authorize Methylprednisone 125 mg IV/IO.
- Document respiratory rate, SpO2 and breath sounds with IV Fluids, and consider Pulmonary Edema Protocol as appropriate.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Thrombolytic Screening - Adult



Medical Protocols - Adult

Medical Protocols - Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

General Approach – Adult, Trauma

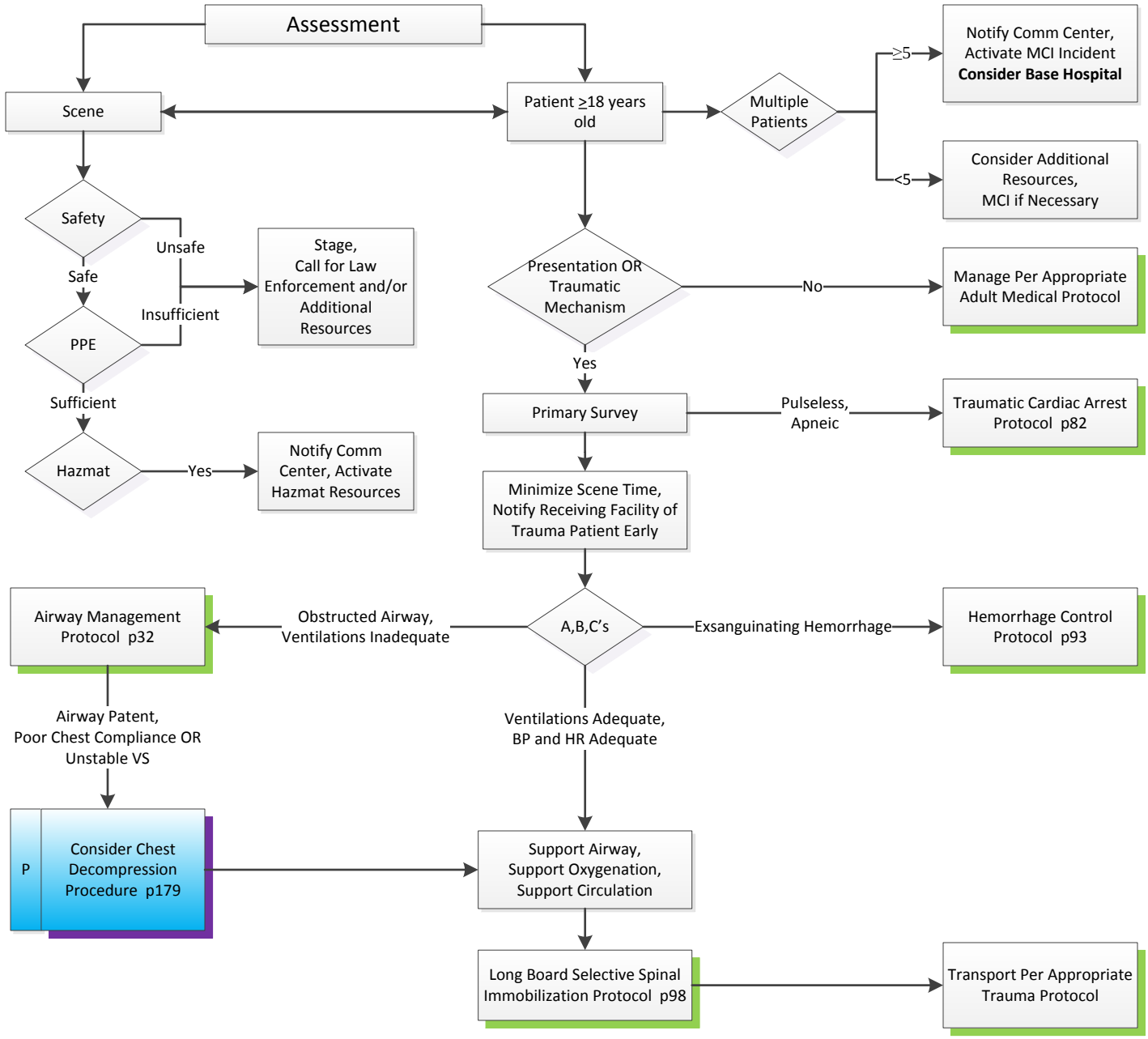
Pertinent Positives and Negatives

- Age, VS, GCS
- Time of Injury, Mechanism of Injury
- DCAP-BTLS
- SAMPLE History
- OPQRST History
- Pain / Swelling
- Mental Status
- Hypotension / Shock

Differential

- Stroke
- STEMI
- Overdose
- Elder Abuse
- Domestic Violence
- Non-Accidental Trauma

Trauma Protocols - Adult



Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Vital Signs, GCS, Loss of Consciousness, Location of Pain (then targeted per Appropriate Trauma Protocol)

- Assess for major trauma criteria immediately upon patient contact
  - -RR <10 or >29; SBP <90; Pulse <50 or >140; GCS <13; SpO2<93%
  - -Transport to Trauma Center, minimize scene time to goal of <10 minutes
- Disability – assess for neuro deficits including paralysis, weakness, abnormal sensation
- Suspect Tension Pneumothorax when:
  - -Mechanism consistent with Chest Trauma; Resp Distress; Decreased Breath Sounds; JVD; Low BP; Tachycardia; Tracheal Deviation
  - -Signs and Symptoms of Tension Pneumothorax may be present *with or without* positive pressure ventilations
  - -Needle Decompression should be performed with a 3" 14ga needle at the 2nd intercostal space, *midclavicular line*
  - -If repeat decompression necessary, continue to move laterally along the superior aspect of the 3rd rib

General Approach – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Destination Determination – Adult, Trauma

Any Airway Compromise not able to be managed by EMS should be taken to the CLOSEST FACILITY for stabilization immediately

Trauma Protocols - Adult

Step One — Measure Vital Signs and Level of Consciousness

Glasgow Coma Scale	≤13
Systolic blood pressure (mmHg)	<90 mmHG
Respiratory rate	<10 or >29 bpm OR need for ventilation support

Yes → Transport to Level 1 **OR** Level 2 Trauma Center; Notify via Radio as early as possible

No

Step Two — Assess Anatomy of Injury

- Penetrating Injury to head, neck, torso, extremities proximal to knee
- Chest wall instability or deformity
- ≥2 proximal long bone fractures
- Crushed, degloved, or mangled extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture
- Open or depressed skull fracture
- Paralysis

Yes → Transport to Level 1 **OR** Level 2 Trauma Center; Notify via Radio as early as possible

No

Step Three — Assess Mechanism of injury and evidence of High Energy Impact

- Falls > 20 ft
- High Risk Auto Crash
- Auto vs. Pedestrian/Bicyclist thrown, run over or significant (>20 mph) impact
- Motorcycle crash >20 mph

Yes → Transport to closest *appropriate* Leveled Trauma Center

No

Step Four — Assess Special Patient or System Considerations

- Age ≥55 years
- Anticoagulation and bleeding disorders
- Burns
  - without other trauma, transport to *burn facility*
  - with traumatic mechanism, transport to *trauma center*
- End Stage Renal Disease requiring Hemodialysis
- Pregnancy ≥20 weeks
- **EMS provider judgment**

Yes → Consider Trauma Center or Specialty Resource Center; Contact Medical Control as needed

No

Transport according to Appropriate Trauma Protocol

Trauma Protocols - Adult

Destination Determination – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Bites and Envenomations – Adult, Trauma

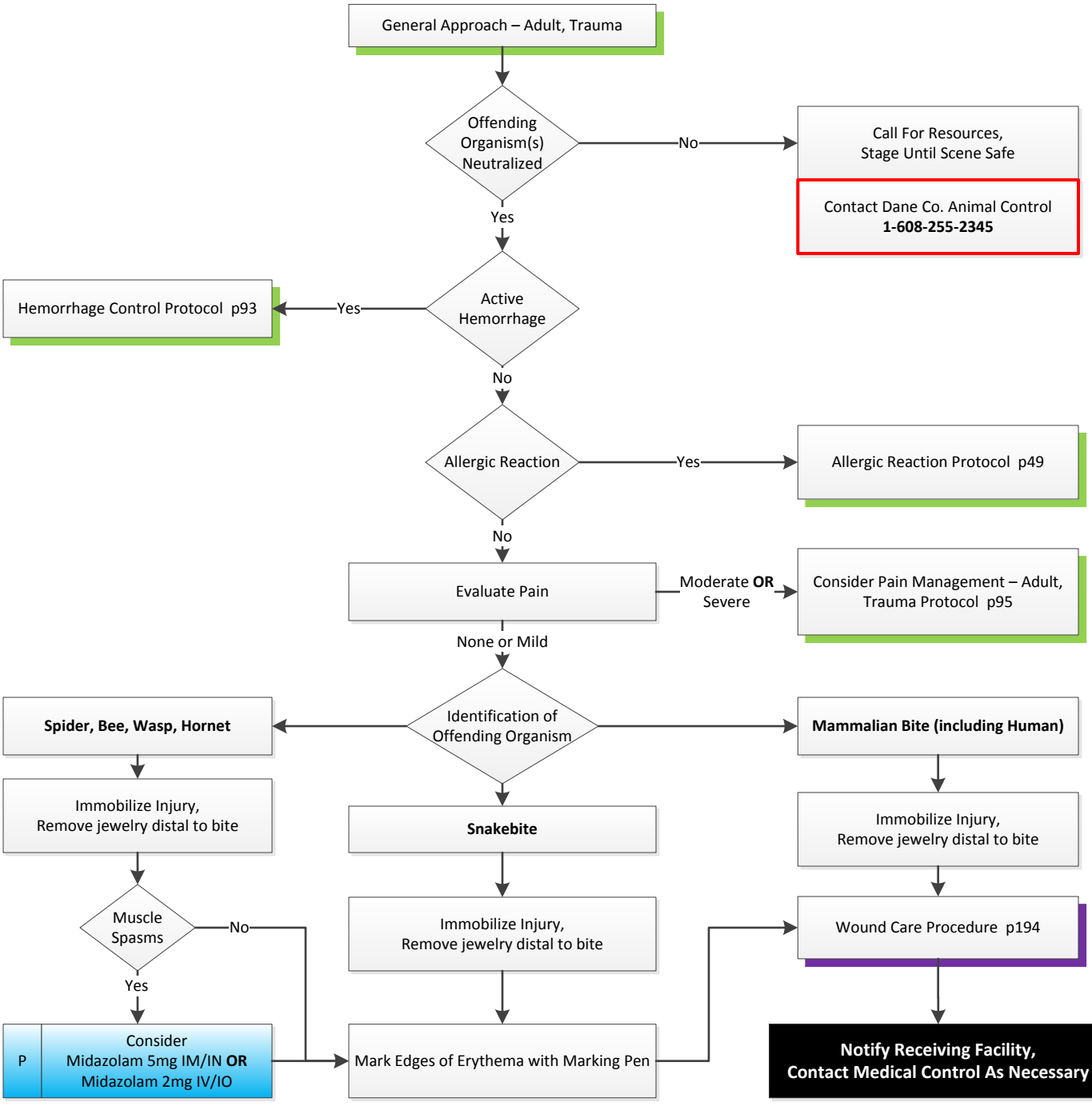
Pertinent Positives and Negatives

- Age, VS, Pulses distal to wound
- SAMPLE History
- OPQRST History
- Description or photo of offending creature
- Tetanus status
- Immunization History of Creature (if known)
- Domestic vs. Wild Animal
- Allergic Reaction
- Hypotension, Shock, Fever

Differential

- Penetrating Trauma
- Dry Bite (Snake)
- Abscess/Cellulitis
- Non-Accidental Trauma
- Projectile Injury

Trauma Protocols - Adult



Trauma Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Evidence of Intoxication, Affected Extremity Neurovascular Exam

- Cat bites may not initially appear serious, but can progress rapidly to severe infection
- Human bites have higher rates of infection than animal bites and necessitate evaluation in the Emergency Department for antibiotics
- Bites on the hands and lacerations over knuckles should be assumed to be "Fight Bites" until proven otherwise, and need evaluation
- Brown recluse spider bites are usually painless at the time of bite. Pain and tissue necrosis develops over hours to days
- Immunocompromised patients have higher risk of infection – Think: Diabetes, Chemotherapy, Organ Transplant

Bites and Envenomations – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Blast Injury – Adult, Trauma

Pertinent Positives and Negatives
- Events Leading Up To Injury
- SAMPLE History
- OPQRST History
- Other Injury
- Loss of Consciousness
- Airway Compromise
- Blood from Ears, Nose
- Hoarseness or Wheezing
- Nature of Device

Differential
- Thermal Injury
- Electrical Injury
- Chemical Burn
- Aspiration
- Radiation Injury
- Blast Lung
- Blunt Trauma

Trauma Protocols - Adult

General Approach – Adult, Trauma

Thermal / Chemical / Electrical Burn — Yes → Appropriate Burn Injury Protocol p81

No

Radiation Burn or Exposure — Yes → Radiation Injury Protocol p96

No

Crush Injury — Yes → Prolonged Crush Injury Protocol p85

No

Consider Airway Management Protocol p32

Continuous Cardiac Monitor

A — Consider IV Access Protocol p54

Maintain SpO2 ≥93%

Blast Lung Injury — Yes → Consider Airway Management Protocol p32

No

Pain — ≥5/10 **OR** Severe → Consider Pain Management, Trauma Protocol p95

Pain — <5/10 → **Notify Receiving Facility, Contact Medical Control As Necessary**

Blast Injury Patient Management

Consider provider safety, number of patients and early notification of receiving facility

Blood from the ears or poor hearing indicates ruptured tympanic membranes, and likely a significant blast wave

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro, Ear Exam, Nose Exam

- **Primary Blast Injury** – Injuries from Overpressure Wave; **Secondary Blast Injury** – Flying Debris that Hits People; **Tertiary Blast Injury** – Flying People that Hit Objects; **Quaternary Blast Injury** – Exacerbation of Chronic Illness due to debris, dust, etc.
- Blast Lung Injury – characterized by respiratory difficulty and hypoxia. More likely in enclosed spaces or close proximity to explosion; may require early intubation but positive pressure ventilation may worsen injury, air transport may worsen their condition
- Intentional Explosion – Responders may be targets! Have a high index of suspicion, be on the lookout for secondary devices, watch out for your partners in Fire and Law Enforcement and *keep your head on a swivel*

Blast Injury – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Burns – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS
- SAMPLE History
- OPQRST History
- Mechanism of Burn (heat, gas, chemical)
- Time of Injury
- Singed Facial Hair
- Wheezing, Hoarseness
- Subjective Throat Swelling
- Loss of Consciousness

Differential

- Blast Injury
- Radiation Injury
- Electrical Injury
- Cyanokit Need?
- Cellulitis
- Dermatitis
- Drug Reaction (Stevens-Johnson Syndrome)

Consider Need for Airway Management EARLY

General Approach – Adult, Trauma

Indications of possible Cyanide Poisoning

Exposure to fumes from burning Nitrile (polyurethane, vinyl) Seizures, coma, cardiac arrest, headache, vertigo and/or cherry red skin color from increased venous O2 concentration

Estimate TBSA Burned / Severity

Trauma Protocols - Adult

Minor Burn	Serious Burn	Critical Burn
<5% TBSA, 1st – 2nd Degree Burn No inhalation Injury, Normal BP, SpO2	5-15% TBSA, 2nd – 3rd Degree Burn Suspected Inhalation Injury, Hypotension, Altered Mental Status	>15% TBSA, 2nd – 3rd Degree Burn Burn with Trauma Burn with Airway Compromise

Remove Rings, Bracelets and Constricting Items

Remove or Cool Heat Source (if not already done)

Apply Dry Clean Sheet or Non-Adherent Dressing; **Consider Plastic Cling Wrap Application**

Consider Airway Management Protocol p32

A Consider IV Access Protocol p54

Consider Pain Management – Adult, Trauma Protocol p95

Consider Pain Management – Adult, Trauma Protocol p95

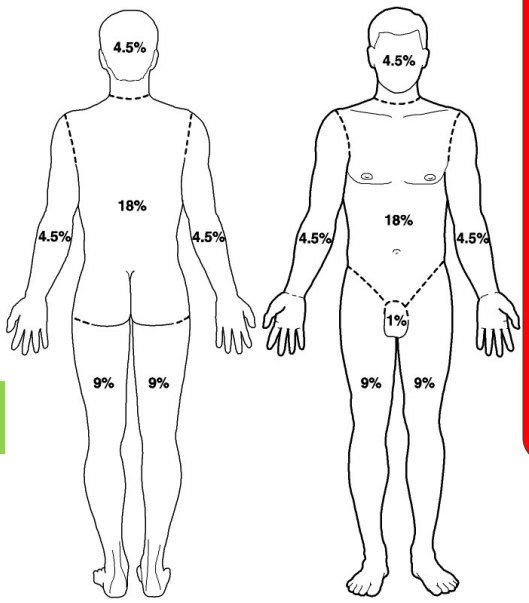
Remove Rings, Bracelets and Constricting Items

Remove or Cool Heat Source (if not already done)

Apply Dry Clean Sheet or Non-Adherent Dressing **Consider Plastic Cling Wrap Application**

A IV Access Protocol p54

A LR Preferred over NS, If available 500mL IV/IO Given over 1 hour



Burn to Hands, Feet, Face or Perineum

No → Transport to Facility of Choice

Yes → Transport to Designated Burn Center

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Lung Sounds, HEENT, Posterior Pharynx

- Burns to face and eyes, remove contact lenses prior to irrigation
- Chemical burns require removal of contaminated clothing. Brush away dry powder before beginning irrigation. Flush with copious warm water on scene and continue irrigation en route.
- Early intubation is strongly recommended if suspicion of inhalation injury. Signs and symptoms include carbonaceous sputum, facial burns or edema, hoarseness, singed nasal hairs, agitation, hypoxia or cyanosis

Burns – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Traumatic Cardiac Arrest – Adult, Trauma

Pertinent Positives and Negatives
- Age, if known
- Mechanism of Injury
- Events leading up to arrest

Differential
- Hypovolemic Shock
  - -External Hemorrhage
  - -Internal Hemorrhage
  - -Unstable Pelvic Fracture
- Tension Pneumothorax
- Medical Condition Causing Trauma (i.e. Cardiac Arrest)

Trauma Protocols - Adult

General Approach – Adult, Trauma

Injuries Incompatible With Life? (Incineration, Decapitation, Hemicorpectomy)

Yes → Criteria for Death/Withholding Resuscitation Policy p13

No

Rigor Mortis, Dependent Lividity or Decomposition of Body Tissue?

Yes → Criteria for Death/Withholding Resuscitation Policy p13

Criteria for Death/Withholding Resuscitation Policy p13 → **Contact Law Enforcement and/or Medical Examiner**

No

Apply Continuous Cardiac Monitor

Blunt Trauma

Yes → Asystole **OR** PEA <40bpm

Yes → Pregnant >22 weeks

No → Do Not Attempt Resuscitation

No

No

Begin Resuscitation
Continue CPR Throughout Transport to **Closest Leveled Trauma Center**
(Preference to Level 1 Center, if possible)

Yes

Full Spinal Immobilization with C-collar and Long Spine Board MANDATORY

A IV Access Protocol p54

A NS Bolus 500mL IV/IO

Return of Pulse

No → P Consider Chest Decompression Procedure p179

Yes

Go To Appropriate Trauma Protocol → **Notify Receiving Facility, Contact Medical Control As Necessary**

M **Notify Receiving Facility, Contact Medical Control**

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Pupillary Light Reflex, Palpation of Pulses, Heart and Lung Auscultation

- Injuries incompatible with life include; decapitation, incineration, massively deforming head or chest injury, dependent lividity, rigor mortis
- As with all trauma patients, DO NOT delay transport
- Consider using medical cardiac arrest protocols if uncertainty exists regarding etiology of arrest
- Use of a long spine board will make chest compressions more effective; however, if spinal immobilization interferes with CPR use reasonable effort to limit patient and spine movement
- Be aware that these may be crime scenes: do your best to avoid disturbing forensic evidence
- If provider safety becomes a concern, transport of deceased patients to the hospital *is acceptable*
- Pregnancy EDC can be estimated by palpating the gravid uterus; above the level of the umbilicus is generally ≥22 weeks

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Chemical / Electrical Burn – Adult, Trauma

Pertinent Positives and Negatives

- Type of exposure (heat, gas, chemical)
- Central and Peripheral Pulses
- Nausea, Vomiting, Diarrhea
- Chemical Name (if known)
- Time of Exposure (duration)
- Mechanism of secondary injury (blunt vs. penetrating)
- Voltage of Electrical Current (if known)

Differential

- Thermal Injury
- Chemical Burn
- Electrical Injury
- Blast Injury
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Adult

Consider need for Airway Management EARLY

General Approach – Adult, Trauma

Hazmat / Downed Power Lines Scene

Yes

Consider Responder and Citizen Safety, Follow Downed Power Lines Safety

Hazmat, General Protocol p91

No

Chemical / Electrical Burn Patient Management

Consider provider safety, number of patients and early notification of receiving facility

Estimate TBSA Burned / Severity

Minor Burn

<5% TBSA, 1st – 2nd Degree Burn
No inhalation Injury
Normal BP, SpO2

Serious Burn

5-15% TBSA, 2nd – 3rd Degree Burn
Suspected Inhalation Injury
Hypotension, Altered Mental Status
Preferred Transfer to Burn Center

Critical Burn

>15% TBSA, 2nd – 3rd Degree Burn
Burn with Trauma
Burn with Airway Compromise
Preferred Transfer to Burn Center

Continuous Cardiac Monitor for ALL Electrical Burns

Consider Cardiac Dysrhythmia Protocol, As Appropriate

Eye Involvement

Yes

Irrigate Involved Eye(s) with 2L NS or Sterile Water x 15 minutes
Repeat as needed

No

Consider Burn, Trauma Protocol p81

Flush Contact Area with Normal Saline x 15 minutes
Repeat as needed

Consider Pain Management, Trauma Protocol p95

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Provider Safety is paramount! Ensure Chemical Source is not a hazard to responders and Electrical Sources are not contacting patient prior to assessment. Don't allow yourself or your crew to become victims.
- Safety First! Assure a Chemical source of burn is NOT a hazard to responders. Assure an Electrical source of burn is OFF or no longer contacting pt.
- High Voltage Electrical Burns (>600 volts) require spinal immobilization, continuous cardiac monitor and immediate IVF regardless of external appearance of injury
- Chemical burns require removal of contaminated clothing, brush away dry powder before irrigation. Flush with copious warm water on scene and continue irrigation en route. Be sure to brush excess away and remove contaminated clothing BEFORE beginning irrigation
- Superficial appearance of Electrical Burns does NOT indicate severity of underlying tissue damage
- Attempt to locate contact points in Electrical Burns, generally contact point with source and where patient is grounded. Do not refer to them as entry or exit wounds. Surface appearance may belie the damage below
- Electrical Burns cause ventricular and atrial irritability and dysrhythmias; anticipate cardiac problems and treat accordingly

Chemical / Electrical Burn – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Chest Injury – Adult, Trauma

Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Respiratory Effort, Adequacy
- Abnormal Breath Sounds (unilateral vs. bilateral)
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- Aortic Root Disruption
- Bronchial Tree Injury
- Tracheal Disruption
- Great Vessel Laceration
- Cardiac Contusion
- Cardiac Laceration

Trauma Protocols - Adult

Trauma Protocols - Adult

General Approach – Adult, Trauma

Long Board Selective Spinal Immobilization Protocol p98

A IV Access Protocol p54

Consider Pain Management, Trauma Protocol p95

Mechanism

Blunt

Penetrating

Assess Breath Sounds, SpO2

Clear and Equal Bilaterally

Decreased Unilateral Breath Sounds

Assist Ventilations as Needed

Support Ventilations, Monitor VS, watch for JVD, tracheal deviation

Continuous Cardiac Monitor

Stabilize Foreign Body if applicable, Assess Breath Sounds, SpO2

Open **OR** Sucking Chest Wound

Decreased Unilateral Breath Sounds

Clear and Equal Bilaterally

Apply Occlusive Dressing and Assist Ventilations

Support Ventilations, Monitor VS, watch for JVD, tracheal deviation

Assist Ventilations as Needed

Signs of Tension Pneumothorax

No

Yes

P Chest Decompression Procedure p179

Continuous Cardiac Monitor

Consider Airway Management Protocol p32

Notify Receiving Facility, Contact Medical Control As Necessary

Consider Airway Management Protocol p32

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Consider tension pneumothorax in any patient with penetrating chest trauma, OR blunt chest trauma with decreased unilateral breath sounds, hypotension, tachycardia, hypoxia, tracheal deviation (late) or JVD (late)**
- Aortic root injuries, bronchial disruption and tracheal disruptions are common with major deceleration injuries (i.e. MVC)
- Cardiac contusions are common with blunt chest trauma, and may present with ectopy, PVCs or even STEMI appearance on cardiac monitor
- Pericardial Tamponade is a surgical emergency and needs rapid transport. Look for muffled heart tones, hypotension, tachycardia

Chest Injury – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Prolonged Crush Injury – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- Crushed under heavy load ≥30 min
- Building collapse, trench collapse, industrial accident, heavy equipment pinning

Differential

- Compartment Syndrome
- Entrapment without Crush
- Fracture, Sprain, Strain

Trauma Protocols - Adult

General Approach – Adult, Trauma

A IV Access Protocol p54

A NS Bolus, 500mL

Long Board Selective Spinal Immobilization Protocol p98

Management of Crush Injury Patient

Crush Injury should be suspected in prolonged pinnings >1 hour, AND proximal to the knee or elbow.

This protocol is **NOT** intended for hands or feet trapped in machinery or farm equipment

Continuous Cardiac Monitor

12-Lead ECG Procedure p146 (when possible)

Hemodynamically Unstable

Yes

P Sodium Bicarbonate 50mEq IV/IO **AND*** Calcium Chloride 1g IV/IO over 3 min

Go To Appropriate Cardiac Arrest Protocol

No

Abnormal ECG

Yes

Peaked T-waves, QRS ≥0.12 sec QT ≥0.46 sec

Immediately Prior to Extrication

P Sodium Bicarbonate 50mEq IV/IO **AND*** Calcium Chloride 1g IV/IO over 3 min

Albuterol 2.5mg/3mL Neb

No

Immediately Prior to Extrication

P Sodium Bicarbonate 50mEq IV/IO

Consider Trauma Pain Management Protocol p95

Hypotension / Shock (Trauma) Protocol p100

Monitor and Reassess for Fluid Overload

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Vital Signs, GCS, Lung Sounds, Neuro Exam, Musculoskeletal Exam

- Structural Collapse, Crush Scenes are often full of hazards, provider safety is the most important consideration
- Patients may become hypothermic, even in warm environments
  -Hypothermia can lead to coagulopathy, which will increase bleeding times and have worse outcomes for the patient
- Crush injuries can result in hyperkalemia from shift of Potassium out of injured cells. Cardiac monitoring is required and 12-lead ECG preferred whenever possible (as dicated by the situation)
- Monitor extremities for signs of compartment syndrome after crush injury; ***P***ain, ***P***allor, ***P***aresthesias, ***P***aralysis, ***P***ulselessness and ***P***oikilothermia (inability to regulate core body temperature)
- *Utilize different IV lines or flush between bicarb and calcium to prevent precipitation in the line

Prolonged Crush Injury – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Near-Drowning / Submersion Injury – Adult, Trauma

Pertinent Positives and Negatives

- Submersion in water regardless of depth
- SAMPLE History
- OPQRST History
- Temperature of water
- Mental Status Changes
- Degree of Water Contamination
- Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor

Differential

- Spinal Trauma
- Pre-Existing Medical Condition
- Hypothermia
- Aspiration
- The Bends
- Pressure Injury
  - Barotrauma
  - Decompression Sickness
- Post-Immersion Syndrome

Trauma Protocols - Adult

General Approach – Adult, Trauma

Long Board Selective Spinal Immobilization Protocol p98

Mental Status

Awake and Alert

Remove Wet Clothing
Dry and Warm Patient

Monitor and Reassess

Encourage Transport and Evaluation *even if asymptomatic*

Continuous Cardiac Monitor

A Consider IV Access Protocol p54

Awake but Altered

Consider Airway Management Protocol p32

Consider Altered Mental Status Protocol p50

Remove Wet Clothing
Dry and Warm Patient

Monitor and Reassess

Continuous Cardiac Monitor

A IV Access Protocol p54

Unresponsive

Pulse

Yes

No

Go To Appropriate Adult **MEDICAL** Cardiac Arrest Protocol

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Have a HIGH index of suspicion for possible spinal injuries. Any diving injury or submersion with unclear details should be fully immobilized
- Hypothermia is often associated with near-drowning and submersion injuries. **Consider the Hypothermia Protocol** as appropriate
- *All* patients with Near-Drowning / Submersion Injury should be transported for evaluation due to delayed presentation of respiratory failure
- With diving injuries (decompression / barotrauma) consider availability of a hyperbaric chamber; contact Medical Control early.
- Near-drowning patients who are awake and cooperative but with respiratory distress may benefit from CPAP / Positive Pressure Ventilation

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Environmental, Hyperthermia – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to hot environment
- Hot, dry or sweaty skin
- Seizures
- Nausea
- Hypotension, Shock, Fever

Differential

- Alcohol Withdrawal (DTs)
- Hyperthyroidism (Thyroid Storm)
- Dehydration
- Cocaine or Sympathomimetic OD
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (Serotonin Syndrome, Malignant Hyperthermia)

Trauma Protocols - Adult

General Approach – Adult, Trauma

If Evidence of Sympathomimetic OD

Consider Overdose, Sympathomimetic Protocol

Remove Patient from Hot Environment (if applicable)

Estimate Severity of Symptoms

Heat Cramps

Painful Spasms of Extremities and/or Abdominal Muscles
Normal Mental Status
Normal Vital Signs

Oral Fluids
Sponge with Cool Water and Fan

Heat Exhaustion

Dizziness, Lightheadedness, Headache, Irritability, Nausea
Normal or Mildly Depressed Mental Status
Mild Tachycardia (<150)
Normal or Mildly Elevated Temp

Keep Patient Supine
Apply 100% Oxygen
Sponge with Cool Water and Fan

Heat Stroke

Marked Alteration in Level of Consciousness
May Be Sweating OR Hot, Dry, Red Skin
Extremely High Temp, >104°F

Semi-Reclining Position with Head Elevated
Apply 100% Oxygen
Rapid Cooling with Cold Packs, Sponge with Cool Water and Fan

A IV Access Protocol p54

Tolerating Oral Fluids

Yes

Reassess and Document Mental Status, VS and ability to take PO

Abnormal

A IV Access Protocol p54

Consider Hypotension Shock /Trauma p100

P Consider Ondansetron 4mg IV/IO/ODT

Normal

Requires Transport

No

Execute and Document Patient Refusal Protocol p71

Yes

Consider Hypotension / Shock (Trauma) p100

P Ondansetron 4mg IV/IO

P If Shivering, Consider Midazolam 2mg IV/IO

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Extremes of Age are more prone to heat emergencies due to inability to easily self-extricate from hot environments
- Patients on Tricyclic Antidepressants, Anticholinergics, Diuretics (i.e. Lasix) are more susceptible to heat emergencies due to medication effects
- Cocaine, amphetamines and salicylates all may elevate body temperature or interfere with the ability to auto-regulate
- Sweating generally disappears as body temperature rises above 104°F
- If Heat Cramps resolved without IV Access or Medications, patients may refuse transport, **IF** tolerating oral fluids and VS normal

Environmental, Hyperthermia – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Environmental, Hypothermia – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to cold environment
- Cold or clammy skin
- Confusion
- Arrhythmias, J-waves on ECG
- Hypotension, Shock

Differential

- Alcohol Intoxication
- Hypothyroidism (Myxedema Coma)
- Dehydration
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (beta blocker overdose, opiate overdose)

Trauma Protocols - Adult

General Approach – Adult, Trauma

Remove Patient from Cold Environment (if applicable)
Remove Wet Clothing
Dry and Warm the Patient

Localized Cold Injury Only (Frostbite)

Yes

- General Wound Care
  Do NOT Rub Skin To Warm
  PREVENT Refreezing p194
- A IV Access Protocol p54
- A NS Warmed Fluids 500mL IV/IO over 30 min
- Consider Pain Management – Adult, Trauma Protocol p95

No

Blood Glucose Procedure p169

<70 → Diabetic Emergencies Protocol p52

>70

Estimate Severity of Symptoms

Mild Hypothermia
90-95°F (32-35°C)

Sympathetic Nervous System Excitation – Shivering, Hypertension, Tachycardia, Tachypnea
Awake But May Be Confused

Moderate Hypothermia
82-90°F (28-32°C)

Shivering more violent, ataxia and incoordination apparent.
Stumbling pace and Moderate Confusion
Appears pale as surface vessels constrict to retain heat.

Severe Hypothermia
<82°F (<28°C)

Heart rate, blood pressure and respiratory rate decrease.
Disoriented, confused and combative
Paradoxically may discard clothing

External Rewarming Measures

12-Lead ECG Procedure p146

- A IV Access Protocol p54
- A NS Warmed Fluids 500mL IV/IO over 30 minutes

External Rewarming Measures

12-Lead ECG Procedure p146

- A IV Access Protocol p54
- A NS Warmed Fluids 500mL IV/IO over 30 minutes

- Consider Airway Management Protocol p32
- Consider Altered Mental Status Protocol p50

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Hypoglycemia is found in many hypothermic patients, because hypothermia may be a result of hypoglycemia
- Severe hypothermia may cause myocardial irritability and rough handling can theoretically cause V-fib. Please handle carefully.
  -Do not withhold intubation or CPR for this concern, but only the most experienced provider available should *gently* attempt intubation
- Below 86°F (30°C), antiarrhythmics may not be effective. If given, they should be given at reduced intervals. Do NOT attempt to pace below 86°F. If antiarrhythmics necessary for severely hypothermic patient, Contact Medical Control
- Extremes of age, malnutrition, EtOH and drug abuse and outdoor hobbies / employment all predispose to hypothermia

Environmental, Hypothermia – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Extremity Injury – Adult, Trauma

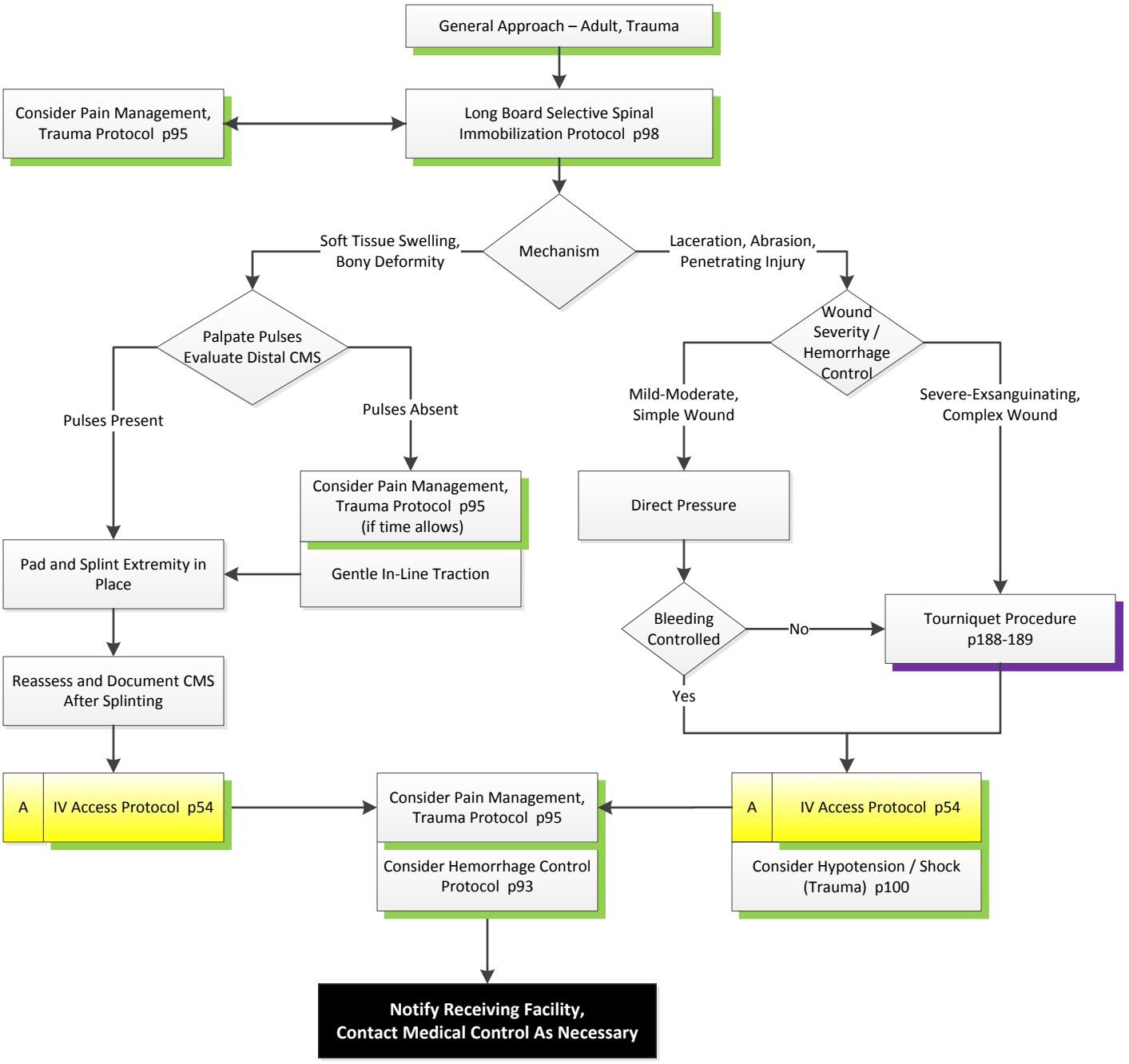
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Adult



Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Immobilization of bony injuries should include the joint above and below. Joint injuries require immobilization of bone above and below
- Palpate and document Circulation, Movement and Sensation both before and after splint application
- Tourniquets should remain in place once hemorrhage control is adequate. The tourniquet is tight enough when the bleeding stops!
- If active hemorrhage and bony/soft tissue deformity, priority should be put on hemorrhage control *first*, then splinting – remember A,B,C's
- If amputated extremities available, seal in a plastic bag and place in cool water and bring to the hospital with the patient

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

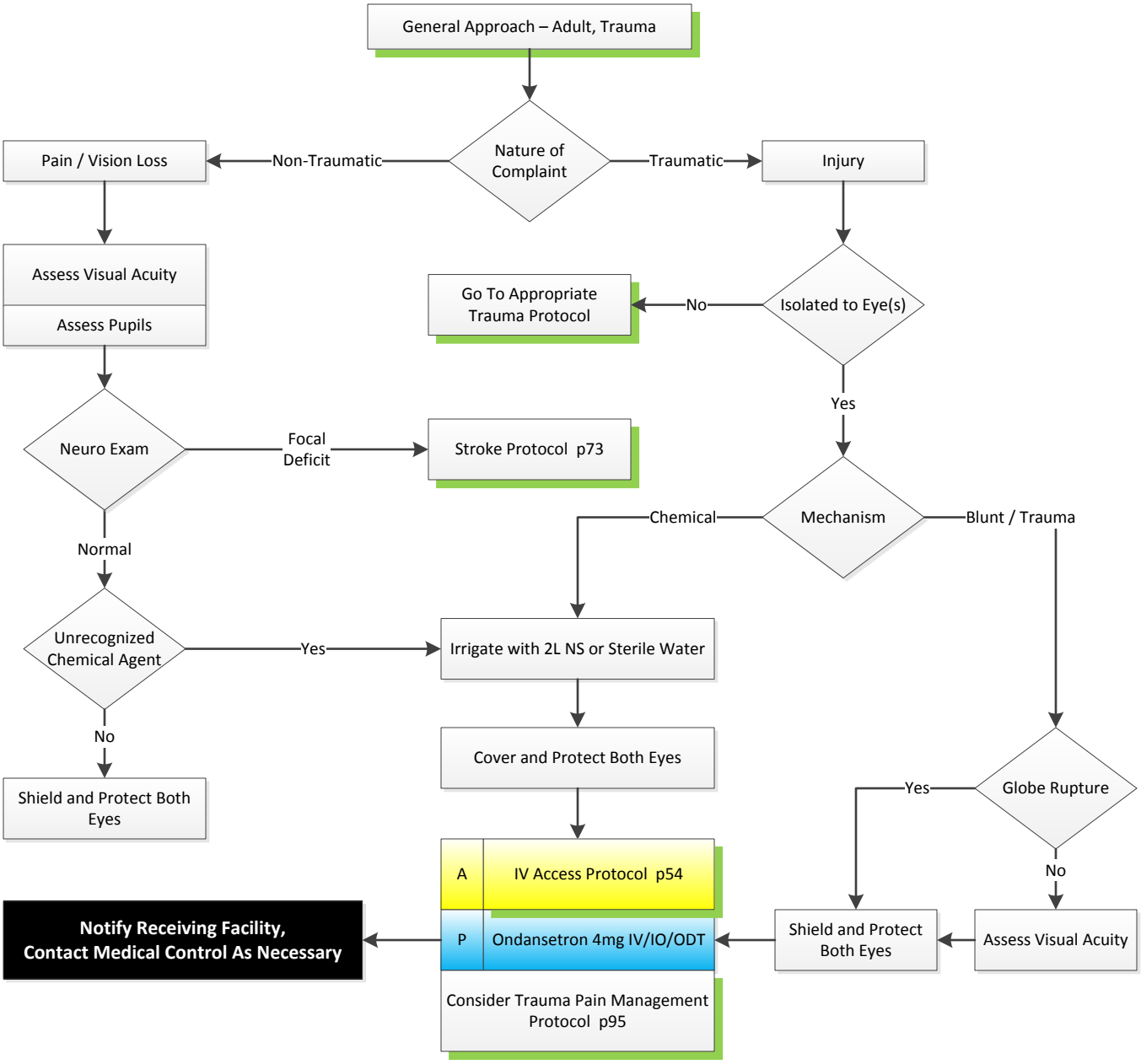
Eye Pain – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, Visual Acuity
- SAMPLE History
- OPQRST History
- Time of Injury
- Involved Chemical MSDS
- Contact/Corrective Lens Use
- "Shooting" or "Streaking" Lights
- Rust Ring
- "Lowering Shade" in Vision

Differential

- Globe Rupture
- Acute Closed Angle Glaucoma
- Stroke
- Retinal Artery Occlusion
- Chemical Burn
- Retinal Venous Thrombus



Trauma Protocols - Adult

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Visual Acuity, Neuro Exam, Extraocular Movements

- Stabilize any penetrating objects. DO NOT remove any embedded / impaled objects
- If Long Spine Board not indicated, transport with head of stretcher elevated to 60 degrees to help reduce intraocular pressure
- Remove contact lenses when possible
- Always cover both eyes to prevent further injury
- Orbital fractures increase concern for globe or optic nerve injury; follow visual acuity and extraocular movements for changes
- Normal visual acuity can be present, even with severe injury

Eye Pain – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Hazmat, General – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to toxic environment
- MSDS Sheet Info
- Mode of Release
- Number of Victims

Differential

- Alcohol Intoxication
- Hyperthyroidism
- Drug Abuse, Intoxication
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (beta blocker overdose, opiate overdose)

Trauma Protocols - Adult

Scene Assessment

Toxic Exposure Or Overdose

OD → Contact Poison Control Center **1-800-222-1222** → Overdose and Poisoning Protocol p59

Toxic Exposure

Hazmat Exposure

Consider Burns – Adult, Trauma Protocol p81

Do NOT Use Water To Flush:
Elemental metals (sodium, potassium, lithium)
Phenols

If available, dilute these burns with (in order of effectiveness)
- Polyethylene Glycol
- Glycerol
- Vegetable Oil

Inhalational Injury

Yes → Albuterol 2.5mg/3mL Neb **AND** Ipratropium Bromide 0.5mg/2.5mL Neb

Chlorine Gas **OR** Chloramine Gas

Yes → P: 2.5mL Bicarb in 5mL NS, Neb
Inhaled Sodium Bicarb to neutralize the HCl formed in the lungs

No

No

Notify Receiving Facility, Contact Medical Control As Necessary

Additional Helpful Numbers
Chemtrec: 1-800-424-9300
Chemtell: 1-888-255-3924
Infotract: 1-800-535-5053
3E: 1-800-451-8346

Step 1 – Site Control
- Respond to suspected Hazmat release from uphill and upwind
- Utilize binoculars for scene size-up
- Wear all appropriate PPE
- Control the scene by preventing entry into the area

Step 2 – Identification of Products
- As soon as safely possible, ID product(s) involved
- If moderately or extremely hazardous, notify HIT
- Utilize ERG for ID of placards, containers or product(s)

Step 3 – Hazard and Risk Assessment
- Utilize the ERG to make risk assessment

Step 4 – Personal Protective Equipment
- Use the ERG to determine PPE requirement
- Structural Firefighting Protective Clothing (SFPC) is not recommended for many Hazardous Materials

Step 5 – Information and Resource Coordination
- Communicate with additional units as appropriate
- Update HIT Leader on their arrival

Step 6 – Control Measures
- Confine and Contain product release as appropriate
- Consider additional resources as needed

Step 7 – Decontamination
- Consider appropriate decon after Hazmat incident
- Confer with HIT Leader as necessary

Step 8 – Termination Activities
- Before leaving the scene document all actions and equipment used
- Document possible parties names, addresses and phone numbers
- Turn the scene over to responsible party

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- The most important factor in Hazmat response is provider safety – you can't help anyone else if you're a victim as well
- In any Hazmat situation, consider that the exposure may not be accidental; consider intentional releases, secondary devices and terrorism
- Always park upwind and uphill of any potential exposures, and be conscious of any symptoms you may begin to develop
- Communication is key; contact the appropriate Hazmat authority early and notify the Hazmat leader as well as the Comm Center of findings
- In a large-scale event, have the Comm Center activate Dane County Mass Casualty Plan and notify the Base Hospital to get prepared
- Inhaled bicarb is controversial but seems to help. Aslan S, Kandis H, Akgun M, Cakir Z, Inandi T, Görgüner M. The effect of nebulized NaHCO3 treatment on "RADS" due to chlorine gas inhalation. *Inhal Toxicol*. 2006 Oct. 18(11):895-900.

Hazmat, General – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Head Injury – Adult, Trauma

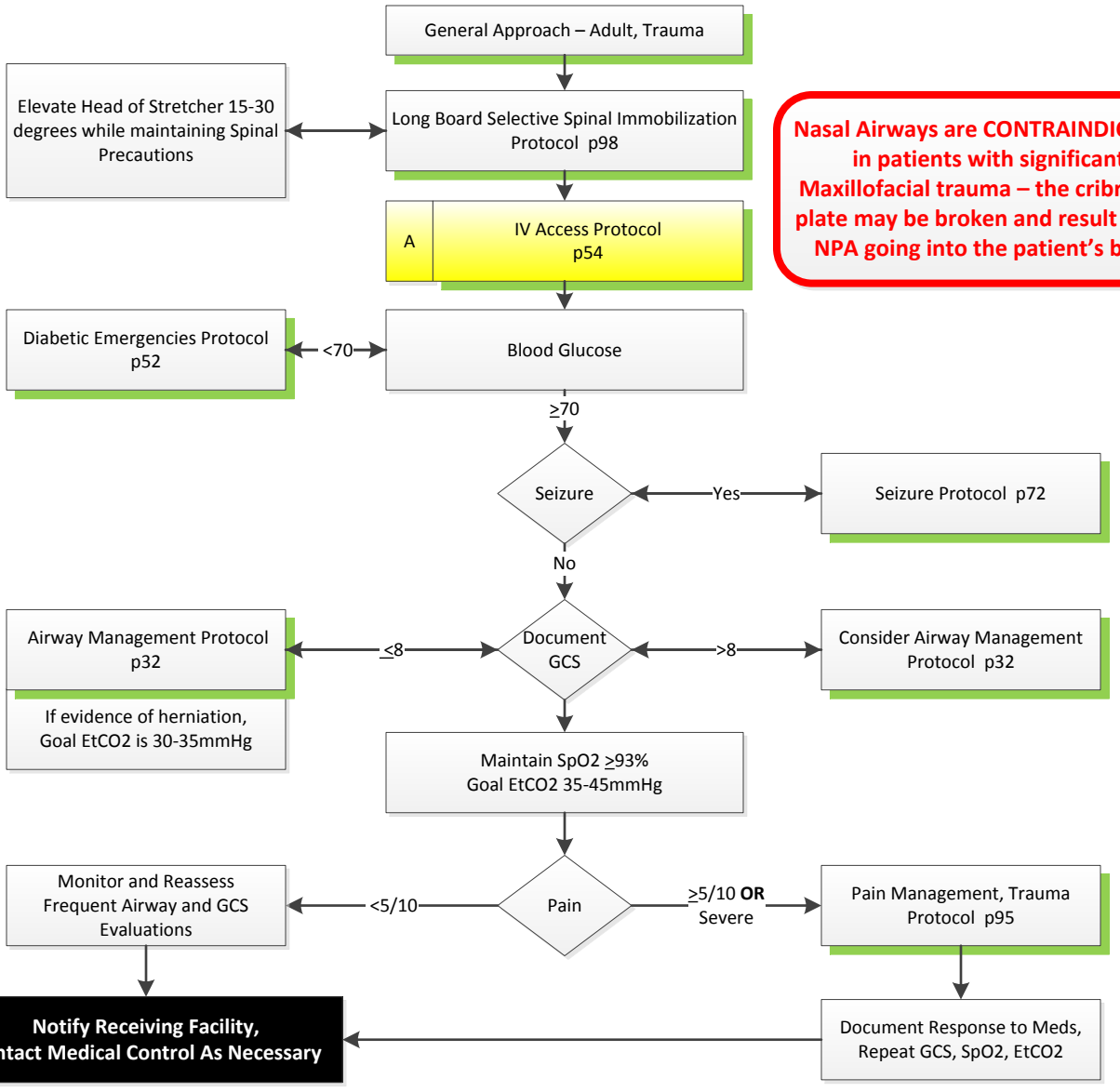
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Loss Of Consciousness
- Vomiting, Altered Mental Status
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Skull fracture
- Epidural hematoma
- Concussion, Contusion, Laceration, Hematoma
- Non-Accidental Trauma
- Spinal Cord Injury
- Subdural Hematoma
- Subarachnoid Hemorrhage

Trauma Protocols - Adult



Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- If GCS ≤13 consider Air transport or Rapid Transport
- **Airway interventions can be detrimental to patients with head injury by raising intracranial pressure, worsening hypoxia (and secondary brain injury) and increasing risk of aspiration. Whenever possible these patients should be managed in the least invasive manner to safely maintain O2 saturation >90% (ie. NRB, BVM with 100% O2)**
- Acute herniation should be suspected when the following signs are present: acute unilateral dilated and non-reactive pupil, abrupt deterioration in mental status, abrupt onset of motor posturing, abrupt increase in blood pressure, abrupt decrease in heart rate.
- Only in suspected acute herniation – increase ventilatory rate (rate 20/minute) and target EtCO2 30-35mmHg
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushings response)
- Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively
- Most important vital sign to monitor and document is level of consciousness (GCS)
- Concussions are periods of confusion or loss of consciousness (LOC) associated with trauma which may have resolved by the time EMS arrives. Any confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be transported to an Emergency Department. Any questions or clarifications, contact Medical Control.

Head Injury – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Hemorrhage Control – Adult, Trauma

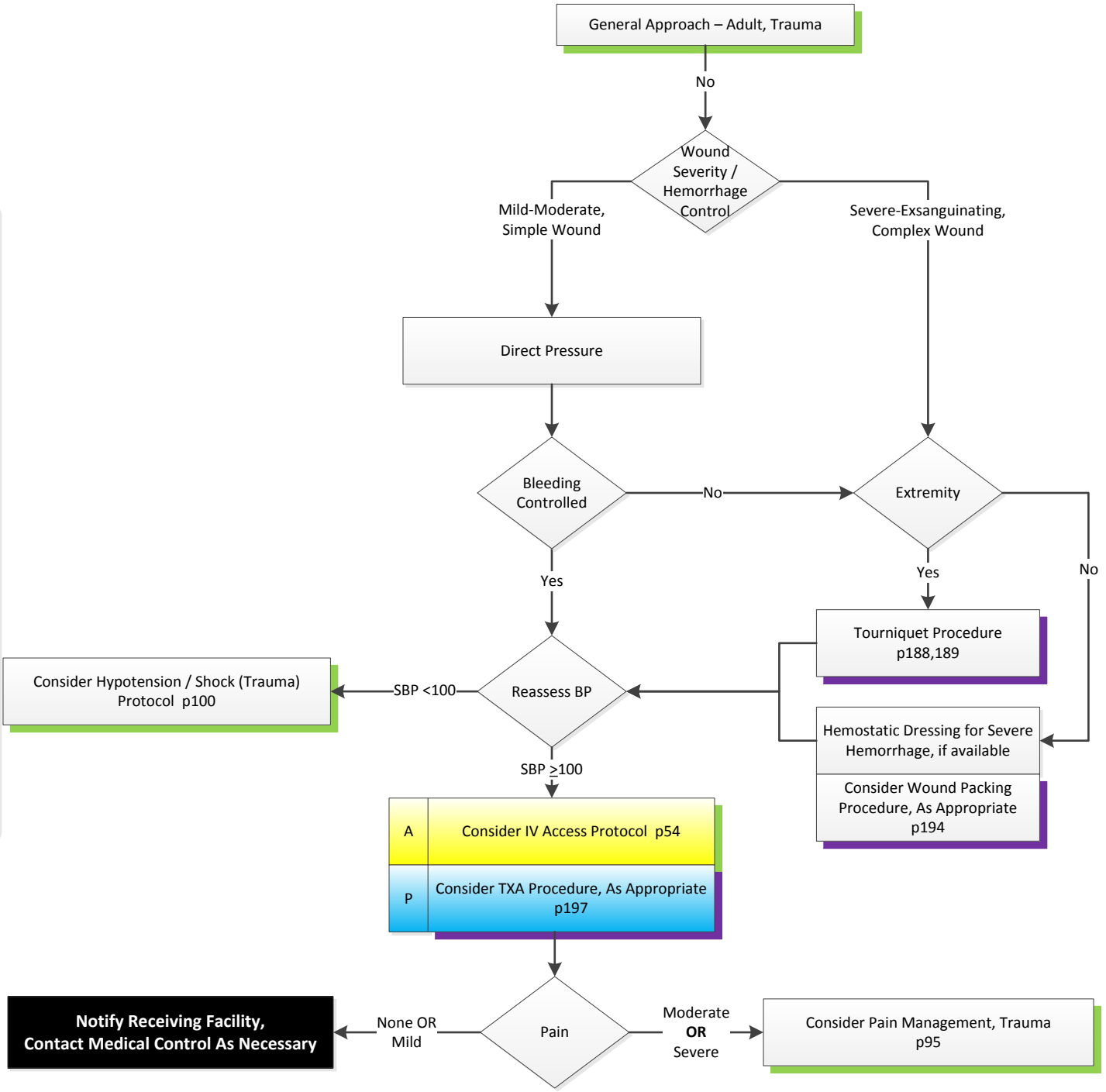
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury
- Time of Injury
- Deformity
- Diminished pulse / capillary refill

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Adult



Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Hypotension in trauma needs blood products early**, so minimize scene time. Goal for scene time in major trauma cases should be <10 min
- Multiple casualty incident or obvious life threatening hemorrhage, consider Tourniquet Procedure and/or Hemostatic Dressing FIRST
- Hemostatic Dressings are appropriate for hemorrhage that can't be controlled with a tourniquet, such as abdominal and pelvic wounds
- Signs/Symptoms of Shock include: altered mental status, pallor, hypotension (SBP <100), cap refill >3 sec, faint/absent peripheral pulses

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Lightning Strike – Adult, Trauma

Pertinent Positives and Negatives

- Type of Strike (Direct, Splash, Contact)
- Central and Peripheral Pulses
- Nausea, Vomiting, Diarrhea
- Amnesia, Confusion, Neuro Deficits
- Duration of Unresponsiveness (if applicable)
- Time of Strike
- Wounds to Hands, Feet or Areas of Contact

Differential

- Thermal Injury
- Electrical Injury
- Blast Injury
- Acute Myocardial Infarction
- Spine Fracture
- Rhabdomyolysis
- Cardiac Dysrhythmia
- Hypoglycemia

Trauma Protocols - Adult

General Approach – Adult, Trauma

Scene Safe

No → Stage, Call for Law Enforcement and/or Additional Resources

Yes

Normal Mental Status

Yes → Go to Appropriate Medical Protocol

No

Estimate Symptom Severity

Cardiorespiratory Arrest

A IV Access Protocol p54

Cardiac Arrest – Adult Protocol p38

Full Spinal Immobilization Procedure p185

Altered Level of Consciousness

A IV Access Protocol p54

Blood Glucose, SpO2, 12-Lead ECG, Full Spinal Immobilization Procedures

Cardiac Arrhythmia – Adult Protocol, As Appropriate

Inadequate Respirations

A IV Access Protocol p54

Airway Management – Adult Protocol p32

Full Spinal Immobilization Procedure p185

Seizure

Yes → Seizure, Adult Medical Protocol p72

No → **Notify Receiving Facility, Contact Medical Control As Necessary**

Trauma Protocols - Adult

Lightning Strike Patient Management

Typically, victims of lightning strikes who do not suffer cardiac or respiratory arrest survive; **typical triage protocols do not apply under these circumstances**, and resuscitation should be provided to those who are PNB **first**.

ECG evidence of direct myocardial damage from lightning strike includes ST segment elevation, T-wave inversion and prolongation of the QT interval.

Most injuries occur outdoors, but contact with plumbing, phone lines, etc. that are struck *can injure people indoors*.

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- National lightning safety guidelines state that risk continues for 30 minutes after the last lightning is seen or thunder heard
- Lightning not striking twice is a **myth**; if there is continued risk to EMS providers, remove the patient to a safe place before treatment
- *Full spinal immobilization should be performed* in any patient with altered level of consciousness, as spinal injuries are common from the concussive force of the strike and/or involuntary muscle spasms
- There are reports of patients surviving prolonged periods of arrest after lightning strike. Treatment for cardiopulmonary arrest is per ACLS protocols, but *decision to terminate resuscitation should be made in coordination with Medical Control*.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

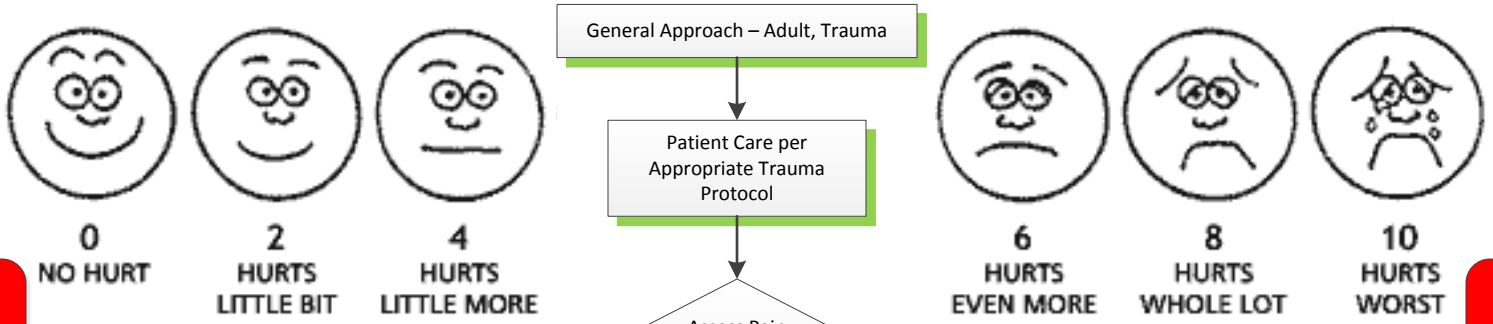
Pain Management – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- History of chronic pain

Differential

- Head injury
- Spine Injury
- Compartment Syndrome
- Fracture, Sprain, Strain
- Pneumo/hemo-thorax
- Pericardial effusion
- Aortic Dissection
- Internal organ injury



Trauma Protocols - Adult

General Approach – Adult, Trauma

Patient Care per Appropriate Trauma Protocol

Assess Pain
0-10 Pain Scale OR FACES Scale

Mild Pain
(0-4)

- A — IV Access Protocol p54

Moderate Pain
(5-8)

- A — IV Access Protocol p54
- A — Consider Nitrous Oxide Procedure, if available p196
- Place patient on cardiac monitor, continuous SpO2 and EtCO2
- Document VS (HR, BP, SpO2, EtCO2)
- SpO2 >93%, EtCO2 <45, **SBP ≥90**
- P — Fentanyl 1mcg/kg IV/IO/IM/IN (max single dose 100mcg) May repeat x 1
  OR
  IF SBP >120, Morphine 0.1mg/kg IV/IO (max single dose 4mg) May repeat x 2
- P — Consider Ondansetron 4mg IV/IO/ODT

Severe Pain
(9-10)

- A — IV Access Protocol p54
- A — Consider Nitrous Oxide Procedure, if available p196
- Place patient on cardiac monitor, continuous SpO2 and EtCO2
- Document VS (HR, BP, SpO2, EtCO2)
- SpO2 >93%, EtCO2 <45, **SBP ≥90**
- P — Fentanyl 1mcg/kg IV/IO/IM/IN (max single dose 100mcg) May repeat x 1
  OR
  IF SBP >120, Morphine 0.1mg/kg IV/IO (max single dose 4mg) May repeat x 2
- P — Consider Ondansetron 4mg IV/IO/ODT
- SBP >90
- P — **IF severe pain after ≥1 dose opiates** Consider Ketamine 0.2mg/kg IV/IO (max dose 20mg)

Reassess and Document VS, including Pain Scale

Return to Trauma Specific Protocol

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, abdominal exam, Musculoskeletal Exam

- Provider Discretion to be used for patients suffering from chronic pain related issues. Please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- If preference is to go directly to Ketamine, contact Medical Control for permission
- Ketamine major side effects: increased oral secretions, laryngospasm, emergence reaction
- Ketamine contraindications: suspected head or ocular globe injury (theoretical increase in intracranial and intraocular pressure)
- Nitrous Oxide contraindications: Eye Injury, Head injury, Suspected pneumothorax, pregnancy <28 weeks, altered mental status

Pain Management – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Radiation Injury – Adult, Trauma

Pertinent Positives and Negatives

- Type of exposure (heat, gas, chemical)
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Nausea, Vomiting, Diarrhea
- Time of Exposure (duration)
- Distance from Radiation Source
- Shielding from Radiation Source

Differential

- Thermal Injury
- Chemical Burn
- Electrical Injury
- Blast Injury
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Adult

General Approach – Adult, Trauma

Indication of Radiation Burn / Exposure

No → Consider Burn, Trauma Protocol p81

Yes

Radiation Incident Patient Management

Consider provider safety, number of patients and early notification of receiving facility
Responders should wear N95 mask, eye protection and gown to limit exposure to radiation

Consider Need for Airway Management EARLY

Don Protective Gear

Estimate TBSA Burned / Severity

Minor Burn

<5% TBSA, 1st – 2nd Degree Burn
No inhalation Injury
Normal BP, SpO2

Serious Burn

5-15% TBSA, 2nd – 3rd Degree Burn
Suspected Inhalation Injury
Hypotension, Altered Mental Status
Preferred Transfer to Burn Center

Critical Burn

>15% TBSA, 2nd – 3rd Degree Burn
Burn with Trauma
Burn with Airway Compromise
Preferred Transfer to Burn Center

Eye Involvement

Yes → Irrigate Involved Eye(s) with Normal Saline x 15 minutes
Repeat as needed

No

Flush Contact Area with Normal Saline x 15 minutes
Repeat as needed

Consider Burn, Trauma Protocol p81

Consider Pain Management, Trauma Protocol p95

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Radiation exposures can be a frightening experience. Do not ignore the ABC's; a dead but fully decon'd patient is not a good outcome
- Three methods for protecting yourself from radiation sources: limit time of exposure, distance from source, shield from radiation source
- Dirty bombs generally include previously used radioactive material combined with conventional explosives to distribute the material
- These events may require activation of the National Radiation Injury Treatment Network (RITN). Transport to the area RITN certified hospital

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Electronic Control Device (a.k.a. TASER) – Adult, Trauma

Pertinent Positives and Negatives
- Age, VS, SpO2, EtCO2, RR
- SAMPLE History
- OPQRST History
- Situational Crisis
- Pyschiatric Illness / Medication History
- Medic Alert Bracelet, DM History
- Anxiety, Agitation or Confusion
- Suicidal / Homicidal Thoughts or History
- Evidence of Substance Use / Overdose

Differential
- Illicit Drug Intoxication
- Drug/EtOH Withdrawal
- Primary Psychosis
- Hypoglycemia
- Hypoxia
- Head Injury
- Occult Trauma
- Cerebral Hypoperfusion
- Toxic Ingestion

Trauma Protocols - Adult

General Approach – Adult, Trauma

Scene Safe

No → Stage, Call for Law Enforcement **AND/OR** Additional Resources

Yes

The Thomas A. Swift Electric Rifle (TASER)

The TASER fires two small dart-like electrodes, which stay connected to the main unit by conductive wire as they are propelled by small compressed nitrogen charges

Evidence of Exposure / Toxidrome

Yes → Begin Triage and Decontamination, As Appropriate

Location of Electrodes

ANY Electrodes Present In The Eye, Face, Neck, Groin, Spinal Column or Axilla

DO NOT REMOVE ELECTRODES
Stabilize in Place and Transport

Examine Site for Bleeding, Expanding Hematoma or Distal Neuro Deficit

Superficial Soft Tissues **EXCLUDING** Eye, Face, Neck, Groin, Spinal Column or Axilla

Place one hand flat on the patient around the probe and stabilize the skin surrounding the puncture site. Place your other hand/pliers firmly around the base of the probe

In one fluid motion pull the probe *straight out* from the puncture site
Repeat procedure with second probe

Examine Site for Bleeding, Expanding Hematoma or Distal Neuro Deficit

Removed by Law Enforcement prior to EMS Evaluation

Examine Site for Bleeding, Expanding Hematoma or Distal Neuro Deficit

Consider Behavioral Emergencies – Adult, Medical Protocol p51

Refer to Police Custody Policy, As Appropriate p27

Notify Receiving Facility, Contact Medical Control As Necessary

Arrhythmia on Monitor

No

Yes → Go To Appropriate Cardiac Dysrhythmia, Adult Medical Protocol

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Safety first – for Providers, Police and Patients. Never restrain any patients in the prone (face down) position.
- Document the site of electrode penetration as well as whether the barb was completely intact or broken on removal
- Patients who require repeated deployments of the Electronic Control Device are at a significantly higher risk of cardiac dysrhythmias as well as in-custody death. Have a high index of suspicion and a low threshold to treat per the Behavioral Emergencies Protocol
- Patients who are actively restrained by Law Enforcement require an officer be present in the ambulance patient compartment during transport. It is a patient safety issue as well as a medicolegal liability for the EMS Provider.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Long Board Selective Spinal Immobilization – Adult, Trauma

General Approach – Adult, Trauma

Selective Spinal Immobilization

The *large majority of patients* with traumatic injury *SHOULD* still be immobilized with a rigid C-collar until radiographically evaluated.

Maintain Manual C-Spine Stabilization Until Evaluation and/or Immobilization Complete

Selective Spinal Immobilization

This initiative aims to match the patients with a high likelihood of injury to the correct use of the rigid Long Spine Board.

Assess Mechanism of Injury (MOI)

Trauma Protocols - Adult

Blunt Trauma (With OR Without Penetrating Trauma)

- ❑ Altered level of consciousness **OR**
- ❑ (GCS < 15) **OR**
- ❑ Clinical Intoxication* **OR**
- ❑ Midline Neck Pain **OR**
- ❑ Midline Tenderness to Palpation of C-Spine **OR**
- ❑ Paraspinal Muscle Tenderness to Palpation **OR**
- ❑ Neurologic Deficits **OR**
- ❑ Abnormal Sensation **OR**
- ❑ ANY Anatomic Deformity **OR**
- ❑ Distracting Injury** **OR**
- ❑ Inability to Communicate **OR**
- ❑ Significant Mechanism of Injury **OR**

ANY 'Yes'

Isolated Penetrating

- ❑ Neurologic Deficits **OR**
- ❑ Abnormal Sensation **OR**
- ❑ Altered Level of Consciousness **OR**
- ❑ (GCS <15) **OR**
- ❑ Clinical Intoxication*

ANY 'Yes'

Apply Rigid Cervical Collar as per Standard

- ❑ Midline Thoracic or Lumbar Pain **OR**
- ❑ Tenderness to Palpation of Spine **OR**
- ❑ Neurologic Deficits **OR**
- ❑ Abnormal Sensation **OR**
- ❑ Anatomic Deformity of Spine **OR**
- ❑ Inability to Communicate **OR**
- ❑ Distracting Injury**

ALL 'No'

Spinal Immobilization not indicated

ALL 'No'

Spinal Immobilization not indicated

ALL 'No'

ANY 'Yes'

Immobilization with Rigid Cervical Collar **AND** Long Spine Board Indicated

Evaluate and Treat per Appropriate Adult Trauma Protocol

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Motor Function both upper and lower extremities, Sensation of upper and lower extremities, subjective abnormal sensation, Tenderness to palpation of bony prominences OR paraspinal muscles

- ***Clinical Intoxication** – A transient condition resulting in disturbances in level of consciousness, cognition, perception, affect or behavior, or other psychophysiological functions and responses. Common examples include; ataxia, emotional instability, flight of ideas, tangential thought or motor incoordination.
- ****Distracting Injury** – Examples include, but are not limited to; long bone fracture, dislocations, large lacerations, deforming injuries, burns **OR** *any condition preventing patient cooperation with history*.
- **ALL** shallow water near drownings, diving injuries and high-voltage electrical injuries (lightning, ≥1000V AC or ≥1500V DC) **MUST** be fully immobilized
- If immobilization *indicated but refused*; advise the patient of risk of death, permanent disability or long term impairment. Clearly document the refusal and the conversation (re: risk); Apply a cervical collar, if allowed and transport in neutral alignment.
- Long spine boards have risks and benefits for patients. Spinal immobilization should always be applied when any doubt exists about the possibility of spinal trauma.
- It is always safer and better patient care to assume that a Cervical Spine injury has occurred and provide protection, and should be the standard of care in trauma patient management
- Long spine boards can be very useful for extricating patients, transferring locations, and providing a firm surface for chest compressions.
- Very thoughtful consideration should go into any decision to NOT use the rigid cervical collar OR long spine board.

Long Board Selective Spinal Immobilization – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Sexual Assault / Intimate Partner Violence – Adult, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- Mechanism of Injury
- Events leading up to 9-1-1 Activation
- Relationship to and Location of Offender
- Strangling or Neck Injury
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Hypovolemic Shock
  - -External Hemorrhage
  - -Internal Hemorrhage
  - -Unstable Pelvic Fracture
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Adult

General Approach – Adult, Trauma

Long Board Selective Spinal Immobilization Protocol p98

Consider Pain Management, Trauma Protocol p95

A IV Access Protocol p54

Dane County Rape Crisis Center
Rape Crisis Center: 608-251-5126
Crisis Line: 608-251-7273
Domestic Abuse Intervention Services
DAIS Help Line: 608-251-4445

Major Trauma Criteria

Steps 1 and 2 Destination Determination Protocol

Transport To Level 1 Trauma Center

No

Mechanism of Injury

Head Injury → Head Injury, Trauma Protocol p92

Chest Injury → Chest Injury, Trauma Protocol p84

Extremity Injury → Extremity Injury, Trauma Protocol p89

Eye Injury → Eye Injury, Trauma Protocol p90

Sexual Assault

Provide Emotional Support, Do Not Judge The Victim

Contact Law Enforcement for Scene and Provider Safety, if Not Already Present

Preserve Forensic Evidence, Wear Gloves, Use Burn Sheet To Collect Clothing

Work With Law Enforcement to Maintain Chain of Custody

Encourage Patient to Seek Evaluation While Respecting Autonomy

When Possible, Help Guide the Patient in Collection of Belongings and Preservation of Evidence

Consider Pain Management, Trauma Protocol p95

Transport to ED with SANE Nurse Capability

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Major Trauma Criteria – Step 1 and Step 2 in Destination Determination Protocol. GCS ≤13, SBP <90mmHg, Respiratory Rate <10 or >29 or need for ventilatory support
- Intimate Partner Violence is very difficult to disclose, and *many victims call 9-1-1 with vague complaints*; Have a HIGH index of suspicion
- Never judge a victim of intimate partner violence or sexual assault on the way they dress, act or present themselves
- Do not be afraid to involve Law Enforcement for assistance as needed, and have a low threshold to transport to a SANE Capable Emergency Department where Social Work, SANE Nurses, and Advocates can provide support and resources for these patients

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Hypotension / Shock (Trauma) – Adult

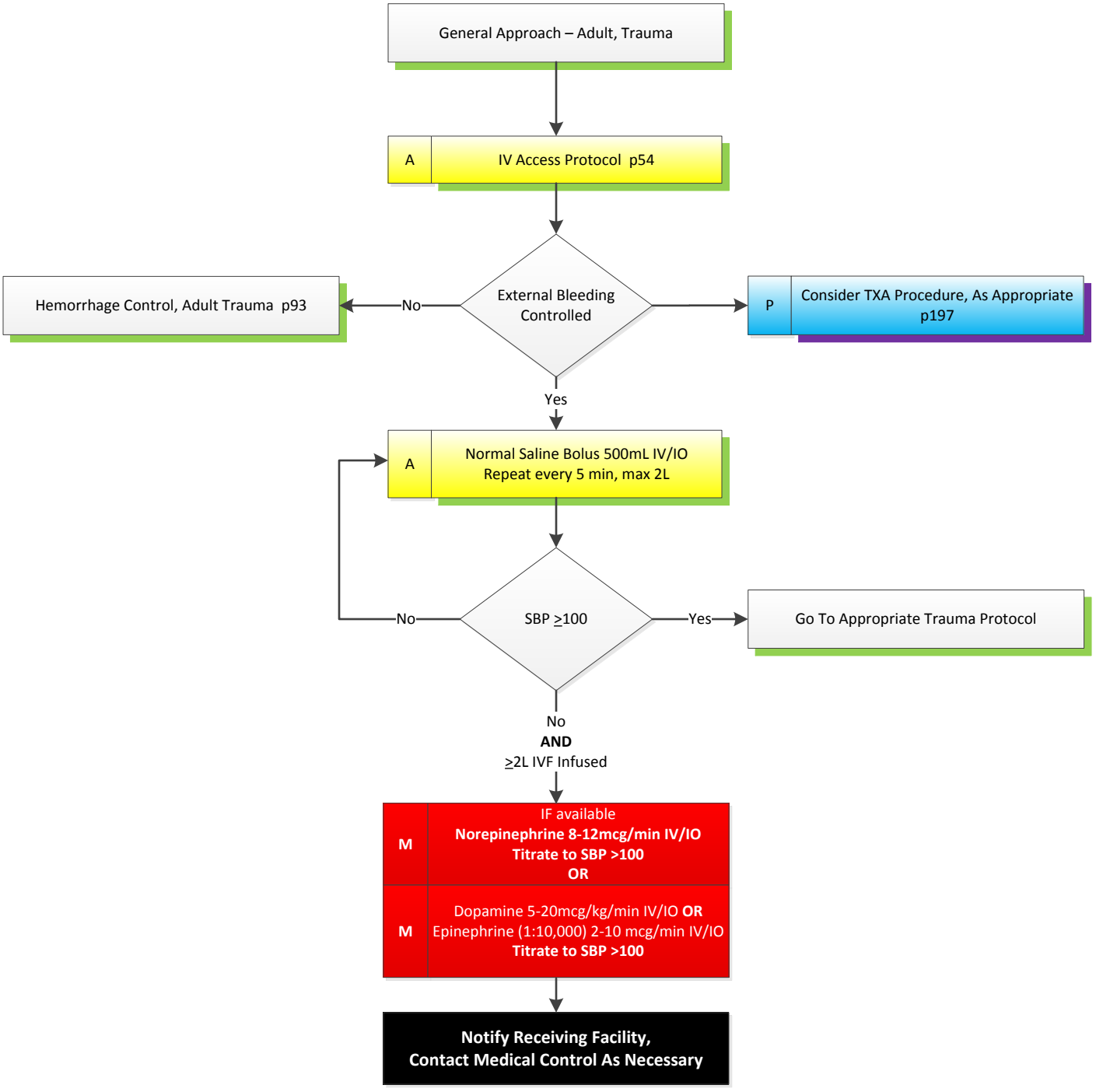
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury
- Time of Injury
- Deformity
- Diminished pulse / capillary refill

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Adult



Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Hypotension in trauma needs blood products early**, so minimize scene time. Goal for scene time in major trauma cases should be <10 min
- Multiple casualty incident or obvious life threatening hemorrhage, consider Tourniquet Procedure and/or Hemostatic Dressing FIRST
- Hemostatic Dressings are appropriate for hemorrhage that can't be controlled with a tourniquet, such as abdominal and pelvic wounds
- Signs/Symptoms of Shock include: altered mental status, pallor, hypotension (SBP <100), cap refill >3 sec, faint/absent peripheral pulses

Hypotension / Shock (Trauma) – Adult

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

WMD / Nerve Agent Exposure – Adult, Trauma

Pertinent Positives and Negatives

- Type of exposure (heat, gas, chemical)
- Central and Peripheral Pulses
- Nausea, Vomiting, Diarrhea
- Chemical Name (if known)
- Exposure to Chemical, Biologic, Nuclear or Radiologic Hazard
- Time of Exposure (duration)
- Pesticide Exposure

Differential

- Thermal Injury
- Chemical Burn
- Blast Injury
- Nerve Agent Exposure
- Respiratory Irritant (Chlorine Gas, Ammonia, etc.)
- Vesicant (blistering agent) exposure
- Organophosphate Exposure

Trauma Protocols - Adult

General Approach – Adult, Trauma

Scene Safe

No → Stage, Call for Law Enforcement and/or Additional Resources

Yes

Evidence of Exposure / Toxidrome

Yes → Begin Triage and Decontamination, As Appropriate

WMD / Nerve Agent Exposure Patient Management

Consider provider safety, number of patients and early notification of receiving facility

Toxicity to the crew may occur from inhalation or topical exposure to the offending agent

DuoDote AND/OR Mark-I Kit may be used for civilians IF cache released from the State of Wisconsin

Estimate Symptom Severity

Asymptomatic

A | Consider IV Access Protocol p54

Minor Symptoms
Respiratory Distress + SLUDGE

A | IV Access Protocol p54

P | Atropine 2mg IV/IO/IM Repeat Q5 min until symptoms resolve

* | DuoDote x 1 dose IM EMS Provider Use *only* May repeat x1 if symptoms return at 10 minutes

Major Symptoms
Altered Mental Status, Seizure, Respiratory Distress/Failure

A | IV Access Protocol p54

P | Atropine 6mg IV/IO/IM Repeat Q5 min until symptoms resolve

* | DuoDote x 3 doses IM EMS Provider Use *only*

Seizure

Yes → Seizure, Adult Medical Protocol p72

No → **Notify Receiving Facility, Contact Medical Control As Necessary**

Trauma Protocols - Adult

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- *Each DuoDote Kit contains 600mg 2-PAM and 2.1mg of Atropine. The kits in the ambulance are intended for responder use only. If/When the emergency cache has been released by the State of Wisconsin, those kits may be used for the general public.
- **SLUDGEM** – **S**alivation, **L**acrimation, **U**rination (Incontinence), **D**efecation (Incontinence), **G**I Upset, **E**mesis, **M**iosis
- For patients with major symptoms, there is no max dosing for Atropine; continue administering until salivation/secretions improved
- Follow all Hazmat procedures, strictly adhere to personal protective equipment for exposure prevention and begin decontamination early
- Patients who have been exposed to organophosphates are highly likely to off-gas; be sure to use all responder PPE and to avoid exposure to clothing or exhalations of victims. Helicopter EMS is generally NOT appropriate for these patients.

WMD / Nerve Agent Exposure – Adult, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Public Safety Personnel Rehab – Special Operations

General Approach – Adult, Medical

- ❑ Log Member into Rehab Sector
- ❑ Assist in removal of all PPE

Baseline Assessment

Criteria for Entering Rehab

- ❑ Use of a 2nd 30-minute OR 45-minute self-contained breathing apparatus (SCBA) cylinder **OR**
- ❑ A single 60-minute SCBA cylinder **OR**
- ❑ 40 minutes of intense work without SCBA

Infection Control

Members with direct involvement with patient care or exposure to bodily fluids must be decontaminated fully prior to entry into the Rehab Sector and accessing rehab supplies.

Special Operations

- ❑ Chest Pain **OR**
- ❑ Shortness of Breath not Improving with O2 **OR**
- ❑ Irregular HR and/or HR >160 **OR**
- ❑ STEMI **OR**
- ❑ Syncope, Disorientation OR Confusion **OR**
- ❑ Member Requesting Transport For Any Reason

ANY 'Yes' → Go To Appropriate Adult Medical Protocol → **Notify Incident Command, Begin ePCR and Initiate Transport to Hospital** → **Notify Receiving Facility, Contact Medical Control As Necessary**

ALL 'No'

- ❑ Temp >100.5°F **OR**
- ❑ Systolic BP ≥160 **OR**
- ❑ Diastolic BP ≥100 **OR**
- ❑ Pulse ≥100 **OR**
- ❑ RR <12 or >20 **OR**
- ❑ SpO2 ≤93% **OR**

ANY 'Yes' →

- ❑ **Consider Transport to Medical Facility**
- ❑ Hydrate orally
- ❑ Begin temperature controls based on member temperature and environment
- ❑ Rest for *at least* 10 minutes
- ❑ Reassess Vital Signs at 10 minutes

ALL 'No'

- ❑ Hydrate orally
- ❑ Begin temperature controls based on member temperature and environment
- ❑ Rest for *at least* 10 minutes
- ❑ Reassess Vital Signs at 10 minutes

Abnormal VS (as Previous)

ANY 'Yes' →

- ❑ **Consider Transport to Medical Facility**
- ❑ Continue temperature controls
- ❑ Orally hydrate, consider IV Fluids
- ❑ Rest for 10 minutes
- ❑ Reassess Vital Signs every 5 minutes

Abnormal VS (as Previous)

ALL 'No' → Release Member From Rehab Division

ANY 'Yes' → Evaluate and Treat per Appropriate Adult Medical Protocol → **Notify Receiving Facility, Contact Medical Control As Necessary**

Special Operations

Pearls

REQUIRED EXAM: Mental Status, Skin Condition, Temperature, Heart Rate, Respiratory Rate, Blood Pressure, SpO2, SpCO

- This Protocol was named "Public Safety Rehab", and should be applied to any situation during which Firefighters, Law Enforcement Officers, Emergency Medical Services or ANY Emergency Response Personnel are exerting themselves for > 40 minutes.
  - This INCLUDES training operations, special events and non-emergency operations lasting longer than 40 minutes.
- *Per NFPA 1584 Requirements*, the Rehab Site should be set up in a location that provides shelter for the members, is far enough away from the active scene that the turnout gear, SCBA and protective equipment may be safety doffed, and provide protection from the environmental conditions.
  - Ideally, members should be shielded from view of the active scene, to reduce anxiety and to prevent members from trying to exit rehab inappropriately.
- The purpose of this Protocol is to protect the physical and mental condition of members operating at the scene of an emergency or a training exercise and to prevent decompensation of the individual. By keeping the individuals safe, it improves the safety and integrity of the team as well as the operation.
- At a minimum, turnout coat and nomex hood should be removed and turnout pants pushed down to the knees while seated in Rehab.

Public Safety Personnel Rehab – Special Operations

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Quick Reference Page – Peds (<12 years)

Vital Signs In Children

Age	Heart Rate (Beats Per Minute)		Age	Respiratory Rate (Breaths Per Minute)	Age	Minimum Systolic Blood Pressure
	Awake Rate	Sleeping Rate				
Newborn – 3mos	85-205	80-160	Infant	30-60	Term Neonates (0-28days)	>60
3mos – 2years	100-190	75-160	Toddler	24-40	Infants (1-12mos)	>70
2years – 10years	60-140	60-90	Preschooler	22-34	Children 1-10years	>70 + (age in years x 2)
>10years	60-100	50-90	School-Aged Child	18-30	Chilcren >10years	>90
			Adolescent	12-16		

Modified Glasgow Coma Scale for Infants and Children

	Child	Infant	Score
Eye Opening	Spontaneous To Speech To Pain None	Spontaneous To Speech To Pain None	4 3 2 1
Best Verbal Response	Oriented, Appropriate Confused Inappropriate Words Incomprehensible Sounds None	Coos and Babbles Irritable, Cries Cries in Response to Pain Moans in Response to Pain None	5 4 3 2 1
Best Motor Response	Obeys Commands Localizes Painful Stimulus Withdraws in Response to Pain Flexion in Response to Pain Extension in Response to Pain None	Moves Spontaneously and Purposely Withdraws in Reponse to Touch Withdraws in Response to Pain Abnormal Flexion Posture to Pain Abnormal Extension Posture to Pain None	6 5 4 3 2 1

Wisconsin EMSC Recommended Weight Conversion

(2.2lbs = 1kg -OR- 1lb = 0.45kg)

Lbs.	Kgs.	Lbs.	Kgs.	Lbs.	Kgs.
5 lbs	**2 kgs**	**20 lbs**	**9 kgs**	**35 lbs**	**16 kgs**
6	3	21	10	36	16
7	3	22	10	37	17
8	4	23	10	38	17
9	4	24	11	39	18
10 lbs	**5 kgs**	**25 lbs**	**11 kgs**	**40 lbs**	**18 kgs**
11	5	26	12	41	19
12	5	27	12	42	19
13	6	28	13	43	20
14	6	29	13	44	20
15 lbs	**7 kgs**	**30 lbs**	**14 kgs**	**45 lbs**	**20 kgs**
16	7	31	14	46	21
17	8	32	15	47	21
18	8	33	15	48	22
19	9	34	15	49	22
www.chawisconsin.org				**50 lbs**	**23 kgs**

Medical Protocols - Pediatric

Equipment	GRAY 3-5kg	PINK Small Infant 6-7kg	RED Infant 6-9kg	PURPLE Toddler 10-11kg	YELLOW Small Child 12-14kg	WHITE Child 15-18kg	BLUE Child 19-23kg	ORANGE Large Child 24-29kg	GREEN Adult 30-36kg
Resuscitation Bag		Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Adult
Oxygen Mask (NRB)		Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric/ Adult
Oral Airway (mm)		50	50	60	60	60	70	80	80
Laryngoscope Blade (Size)		1 Straight	1 Straight	1 Straight	2 Straight	2 Straight	2 Straight OR Curved	2 Straight OR Curved	3 Straight OR Curved
King Airway	Size 0 (Clear)	Size 1 (White)	Size 1 (White)	Size 1 (White)	Size 2 (Green)	Size 2 (Green)	Size 2.5 (Orange)	Size 3 (Yellow)	Size 3 (Yellow)
LMA	NA	#1	#1	#1.5	#2	#2.5	#3	#3.5	#4
Suction Catheter (French)		8	8	10	10	10	10	10	10-12
BP Cuff	Neonatal #5/ Infant	Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Small Adult
IV Catheter (ga)		22-24	22-24	20-24	18-22	18-22	18-20	18-20	16-20
IO (ga)		18/15	18/15	15	15	15	15	15	15
NG Tube (French)		5-8	5-8	8-10	10	10	12-14	14-18	16-18

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Destination Determination – Peds

Medical Protocols - Pediatric

Step One — Measure Vital Signs and Level of Consciousness

Any Airway Compromise not able to be managed by EMS should be taken to the CLOSEST FACILITY for stabilization immediately

Glasgow Coma Scale	≤13
Systolic blood pressure (mmHg)	<70 + (age in years x 2)mmHG
Respiratory rate	<10 or Inadequate Effort **OR** need for ventilation support

Yes → Transport to Pediatric ICU Capable Facility; Notify via Radio as early as possible

No

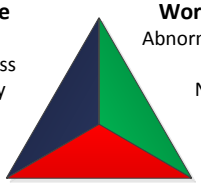
Step Two — Assess Severity of Illness

- Prolonged Seizure **OR** Status Epilepticus
- Cardiac Arrest **OR** Respiratory Arrest
- Severe Respiratory Distress (Cyanosis **OR** SpO2 ≤90%)
- Massive Gastrointestinal Bleeding
- Life Threatening Dysrhythmias
- Compromised Airway not relieved by EMS
- Signs or Symptoms of Sepsis or Shock

Yes → Transport to Pediatric ICU Capable Facility; Notify via Radio as early as possible

Appearance
Tone
Interactiveness
Consolability
Look/Gaze
Speech/Cry

Work of Breathing
Abnormal Breath Sounds
Retractions
Nasal Flaring



Circulation to the Skin
Pallor
Mottling
Cyanosis

No

Step Three — Assess for Potential Time-Sensitive Problems

- Altered Mental Status **NOT** Explained by Simple Hypoglycemia
- Significant Allergic Reaction
- Impending Cardiac **OR** Respiratory Collapse
- Multiple Medications Administered During Transport (*Including* Albuterol)

Yes → Transport to closest appropriate Pediatric ICU Capable Facility

No

Step Four — Assess Special Patient or System Considerations

- Age ≤1 year
- Anticoagulation **AND/OR** history of bleeding disorder(s)
- Significant Toxic Ingestion / Poisoning / Overdose History (Proven **OR** Suspected) with deteriorating vital signs **OR** not responding to therapy
- Burns
  - without other trauma, transport to B*urn Facility*
  - with traumatic mechanism, transport to T*rauma Center*
- End Stage Renal Disease requiring Hemodialysis
- Medically complex patients requesting transport to non-PICU Facility
- **EMS provider judgment**

Yes → **Contact Medical Control**; Consider Pediatric ICU Capable Facility **OR** Specialty Resource Center

No → Transport according to Appropriate Medical Protocol

Medical Protocols - Pediatric

Destination Determination – Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

General Approach – Peds, Medical

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Keep scene time to a minimum and notify receiving facility early of critical patient

All Patients should remain Nothing By Mouth (NPO) Unless Specified by Treatment Protocol

Medical Protocols - Pediatric

Assessment

Scene

Safety

Unsafe

Safe

Insufficient

PPE

Stage, Call for Law Enforcement and/or Additional Resources

Sufficient

Hazmat

Yes

Notify Comm Center, Activate Hazmat Resources

Patient

Presentation **OR** Traumatic Mechanism

Yes

Age <18

Yes

Go To Appropriate Peds Trauma Protocol

No

Go To Appropriate **ADULT** Trauma Protocol

No

Pulse

Pulseless, Apneic

Fits Broselow Tape

Yes

Peds Cardiac Arrest Protocol p110

No

ADULT Cardiac Arrest Protocol p38

Present

Age >12 **OR** Signs of Puberty

Yes

Go To Appropriate **ADULT** Medical Protocol

No

A,B,C's

Obstructed Airway, Ventilations Inadequate

Peds Airway Management Protocol p106

Exsanguinating Hemorrhage

Peds Hemorrhage Control Protocol p142

Ventilations Adequate, BP and RR Adequate

Support Airway, Support Oxygenation, Support Circulation

M Contact Medical Control

Doesn't Fit Protocol, Exhausted Protocol

Evaluate and Treat Per Appropriate Peds Medical Protocol

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- Continuous Cardiac Monitor should be applied early for *any* non-traumatic pain complaint between the ear lobes and the umbilicus (belly button). Consider 12-Lead if concerning findings on Cardiac Monitor.
- Include Blood Glucose reading for *any* patient with **weakness, altered mental status, seizure, loss of consciousness or known history of diabetes**
- Measure *and document* SpO2, EtCO2 for ANY patient with complaint of weakness, altered mental status, respiratory distress, respiratory failure or EMS managed airway
- If hypotensive (Systolic BP<Reference Page Value) and/or clinical evidence of dehydration, consider Peds IV Access Protocol and Shock (Non-Trauma) Peds Medical Protocol
- Any patient contact which does not result in an EMS transport must have an appropriately executed and completed refusal form.
- Never hesitate to consult Medical Control for assistance with patient refusals that can't meet all required fields, clarification of protocols or for patients that make you uncomfortable.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Airway Management - Peds

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of CHF, COPD, Asthma
- Lung Sounds before *AND after* intervention
- Allergen Exposure
- Toxic / Environmental Exposure

Differential

- Head Injury
- Electrolyte Abnormality
- COPD Exacerbation
- CHF Exacerbation
- DM, CVA, Seizure, Tox
- Sepsis
- Asthma Exacerbation
- Drug Ingestion / Overdose

Medical Protocols - Pediatric

General Approach – Peds, Medical

Assess A,B,C's (RR, Effort, Adequacy)

Adequate → Supplemental Oxygen As Appropriate (Nasal Cannula, Facemask) → Evaluate and Treat Per Appropriate Peds, Medical Protocol

Inadequate → Basic Airway Maneuvers (Open Airway, Suction, NPA vs. OPA)

Anticipate and Prepare for the Difficult Airway
LEMON Rule

- **L**ook Externally
- **E**valuate with 3:3:2 Rule
- **M**allampati Classification
- **O**bstruction
- **N**eck Mobility (or lack thereof)

Basic Airway Maneuvers (Open Airway, Suction, NPA vs. OPA) ↔ Consider Need for ALS Level Service EARLY

Assess Mental Status

- Altered **AND/OR** Apneic → Bag-Valve Mask
- Awake **OR** Protecting Airway → Consider CPAP Procedure IF mask fits patient, Awake, Following Commands **and** SBP ≥100 p163

Bag-Valve Mask → Failed → Consider Blindly Inserted Airway Device (BIAD); Max 1 Attempt P154-158

Consider CPAP Procedure IF mask fits patient, Awake, Following Commands **and** SBP ≥100 p163 → Decomp-ensated → Consider Blindly Inserted Airway Device (BIAD); Max 1 Attempt P154-158

M **Consider Midazolam 0.1mg/kg IV (max 2.0mg) If needed for CPAP compliance**

Assess Air Movement and Chest Rise

- Poor Chest Rise **OR** Poor Air Exchange → Consider Blindly Inserted Airway Device (BIAD); Max 1 Attempt P154-158
- Good Chest Rise **AND** Good Air Exchange → Document Response to Procedure Continuous EtCO2, SpO2 Monitoring → **Transport to PICU Capable Facility Contact Medical Control As Necessary**

Assess Air Movement and Chest Rise

- Poor Chest Rise **OR** Poor Air Exchange → Consider Airway Obstruction Procedure p149 → Peds Failed Airway Protocol p107
- Good Chest Rise **AND** Good Air Exchange → Document Response to Procedure Continuous EtCO2, SpO2 Monitoring → **Transport to PICU Capable Facility Contact Medical Control As Necessary**

Assess Air Movement and Chest Rise

- Poor Chest Rise **OR** Poor Air Exchange → Consider Blindly Inserted Airway Device (BIAD); Max 1 Attempt P154-158
- Good Chest Rise **AND** Good Air Exchange → Document Response to Procedure Continuous EtCO2, SpO2 Monitoring → **Transport to PICU Capable Facility Contact Medical Control As Necessary**

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- Digital capnography is the standard of care and is to be used with all methods of advanced airway management and endotracheal intubation
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO2 >93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital
- *Always* assume that patient reports of dyspnea and shortness of breath are physiologic, **NOT** psychogenic! Treatment for dyspnea is O2, not a paper bag!
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allow
- Once secured, every effort should be made to keep the advanced airway in the airway; commercially available tube holders and C-collars are good adjuncts
- For this protocol, an Attempt is defined as passing the tip of the laryngoscope blade or Advanced Airway past the teeth

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Failed Airway - Peds

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of CHF, COPD, Asthma
- Lung Sounds before *AND after* intervention
- Allergen Exposure
- Toxic / Environmental Exposure

Differential

- Head Injury
- Electrolyte Abnormality
- COPD Exacerbation
- CHF Exacerbation
- DM, CVA, Seizure, Tox
- Sepsis
- Asthma Exacerbation
- Drug Ingestion / Overdose

Medical Protocols - Pediatric

Airway Management Protocol – Peds, Medical

Each BIAD Placement Attempt should include change in approach and/or equipment
NO MORE THAN TWO (2) ATTEMPTS TOTAL

One (1) unsuccessful attempts at BIAD Placement
OR
Anatomy Inconsistent with Continued Attempts
AND
Unable to Ventilate or Oxygenate adequately during or after one (1) unsuccessful BIAD Placement Attempt

Call for additional resources as available
Expedite Transport to **CLOSEST** Emergency Dept. Do NOT spend time on scene

Bag-Valve Mask
Airway Adjuncts
Adjust Positioning

SpO2 ≥93% → Go To Appropriate Medical Protocol

Unsuccessful

Significant Facial Trauma / Swelling / Airway Distortion

Yes →

M	**Notify Medical Control (As Practical)**
P	Needle Jet Insufflation Procedure p168 (>5 but ≤12 years old)
P	Cricothyrotomy (Open) Surgical Procedure p167 (>12 years old)

No →

Blindly Inserted Airway Device (BIAD) Procedure p154-158

BIAD Successful

No →

M	**Notify Medical Control (As Practical)**
P	Needle Jet Insufflation Procedure p168 (>5 but ≤12 years old)
P	Cricothyrotomy (Open) Surgical Procedure p167 (>12 years old)

Yes →

Continue Ventilations and Support Airway
Maintain SpO2 >93%,
Goal EtCO2 35-45mmHg

P	Continue Ventilations and Support Airway Maintain SpO2 ≥93% Goal EtCO2 is 35-45mmHg
M	**Notify Medical Control (If Not Already Done)**

P	Continue Ventilations and Support Airway Maintain SpO2 ≥93% Goal EtCO2 is 35-45mmHg
M	**Notify Medical Control (If Not Already Done)**

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Lung Sounds, RR, Skin, Neuro

- A patient with a "failed airway" is near death or dying, not stable or improving. Inability to place a BIAD airway or low SpO2 alone are not indications for surgical airway.
- Continuous digital capnography is the standard of care and is to be used with **ALL** methods of advanced airway management and endotracheal intubation. If a service does not have digital capnography capabilities and an Invasive Airway Device is placed, an intercept with a capable service **MUST** be completed
- If Airway Management is adequately maintained with a Bag-Valve Mask and waveform SpO2 ≥93%, it is acceptable to defer advanced airway placement in favor of basic maneuvers and rapid transport to the hospital
- Gastric decompression with Oral Gastric Tube should be considered on all patients with advanced airways, if time and situation allow
- Once secured, every effort should be made to keep the advanced airway in the airway; commercially available tube holders and C-collars are good adjuncts
- For this protocol, *an Attempt is defined as* passing the tip of the laryngoscope blade or advanced airway past the teeth

Failed Airway - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Wheezing / Asthma - Peds

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2
- SAMPLE history
- OPQRST history
- Asthma, COPD, CHF history
- Home meds used prior to call (Nebs, Steroids, Theophylline)
- Wheezing, Rhonchi
- Accessory Muscle Use
- Decreased Ability to Speak
- History of CPAP/Intubation/ICU Admission from previous flares
- Smoke Exposure, Inhaled Toxins

Differential

- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- STEMI, CHF
- Inhaled Toxins (CO, CN, etc.)
- Anaphylaxis
- Asthma/COPD

Medical Protocols - Pediatric

General Approach – Peds, Medical

Airway Patent, Respirations Adequate, SpO2 ≥93%

No → Peds Airway Management Protocol p106

Yes

Allergic Reaction/Anaphylaxis

Yes → Peds Allergic Reaction Protocol p117

No

Cardiac Monitor

A: Consider Peds IV Access Protocol p121

Lung Exam

Wheezing / Lower Airway

- Albuterol 2.5mg/3mL Neb
  Ipratropium 0.5mg Neb *
- P: Consider Methylprednisolone 2mg/kg IV/IO (max 125mg)

12 Lead ECG Procedure p146

Stridor / Upper Airway

- Albuterol 2.5mg/3mL Neb *

Improving

No

- P: Nebulized Epinephrine 1mg Neb (1:1000) in 2 mL NS
  OR
  Racemic Epinephrine 2.25% 3mL/5mL Normal Saline Neb

Yes

Improving

Yes → Notify Receiving Facility, Contact Medical Control As Necessary

No → Consider Peds Airway Management Protocol p106

- Albuterol 2.5mg/3mL Neb
  Ipratropium 0.5mg Neb *
- Consider Epi 0.01mg/kg IM (1:1000) (max 0.3mg)
- P: Consider Mag Sulfate 50mg/kg IV/IO (max 2gm) Infuse over 10 minutes

Improving

No

Yes → Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, 12 Lead, GCS, RR, Lung Sounds, Accessory muscle use, nasal flaring

- Do not delay inhaled meds to get an extended history. Assessments and interviews may be carried out simultaneously with breathing treatments
- Supplemental O2 should be administered for all cases of hypoxia, tachypnea, and subjective air hunger
- Magnesium Sulfate is contraindicated if there is a history of renal failure
- Keep patient in position of comfort if partial obstruction
- EpiPen Jr. is 0.15mg and is indicated for patients <60lbs. The adult EpiPen is 0.30mg and is indicated for patients ≥60lbs
- Severe Asthma attacks may have such severe obstruction that they do NOT wheeze. Cases of "Silent Chest" need aggressive management with inhaled and IV medications. This is an ominous sign of impending respiratory failure.
- * **Albuterol** max 3 doses total, **Ipratropium** max 2 doses total. If pt. requires repeat dosing of either medication, contact Med Control **AND/OR** Activate ALS

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Neonatal Resuscitation - Peds

Pertinent Positives and Negatives

- Time of Delivery, Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
  - -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Pediatric

Newly Born – Adult, Medical

Warm, Dry and Stimulate Infant
Clear Mouth, then Nose As Needed

Heart Rate

HR ≤60:
- Pulse Oximetry, **Check Glucose**, Continuous Cardiac Monitor
- Chest Compressions at 120/minute
- BVM Assisted Ventilations with 10-15L O_2 At 60 breaths/min X 30 seconds
- M: **Contact Medical Control AND Activate ALS**

HR >100:
- Supplemental O2 via Blow-By Maintain SpO2 ≥94%
- Pulse Oximetry Continuous Cardiac Monitor
- Skin-To-Skin Contact With Mother If Situation Appropriate

→ **Notify Receiving Facility, Contact Medical Control As Necessary**

HR>60 BUT ≤100:
- BVM Assisted Ventilations with Room Air At 60 breaths/min X 30 seconds
- Pulse Oximetry, Check Glucose Continuous Cardiac Monitor

Heart Rate

>60:
- BVM Assisted Ventilations with 10-15L At 60 breaths/min X 30 seconds

Heart Rate

>60 BUT ≤100 → BVM Assisted Ventilations with 10-15L At 60 breaths/min X 30 seconds

≤60:
- Chest Compressions at 120/minute, BVM at 3:1 Compressions:Breaths
- A: IV Access Protocol p121
- P: Epi (1:10,000) 0.1-0.3mL/kg IV/IO (max 1mg) every 5 minutes

Heart Rate

≤60 → Chest Compressions at 120/minute, BVM at 3:1 Compressions:Breaths

>100 → **Notify Receiving Facility, Contact Medical Control As Necessary**

Heart Rate

≤100:
- Hypovolemia
  - Yes:
    - M: **Contact Medical Control, Expedite Transport**
    - A: Normal Saline Bolus, 10mL/kg (max 500mL)
  - No:
    - EtCO2 >45mmHG
      - Yes:
        - M: **Contact Medical Control, Expedite Transport**
        - P: Sodium Bicarb 2mEq/kg IV/IO (max 50mEq)
      - No → M: **Contact Medical Control, Expedite Transport**

>100 → **Notify Receiving Facility, Contact Medical Control As Necessary**

PM Quick Reference

Naloxone, 0.1mg/kg IV/IO/IM
Dextrose D10W, 5mL/kg IV/IO
Dopamine 2-20mcg/kg/min IV/IO
Epinephrine (1:10,000) 0.1-0.3mL/kg IV/IO
Sodium Bicarb, 1mEq/kg IV/IO
Normal Saline, 10mL/kg IV/IO

Medical Protocols - Pediatric

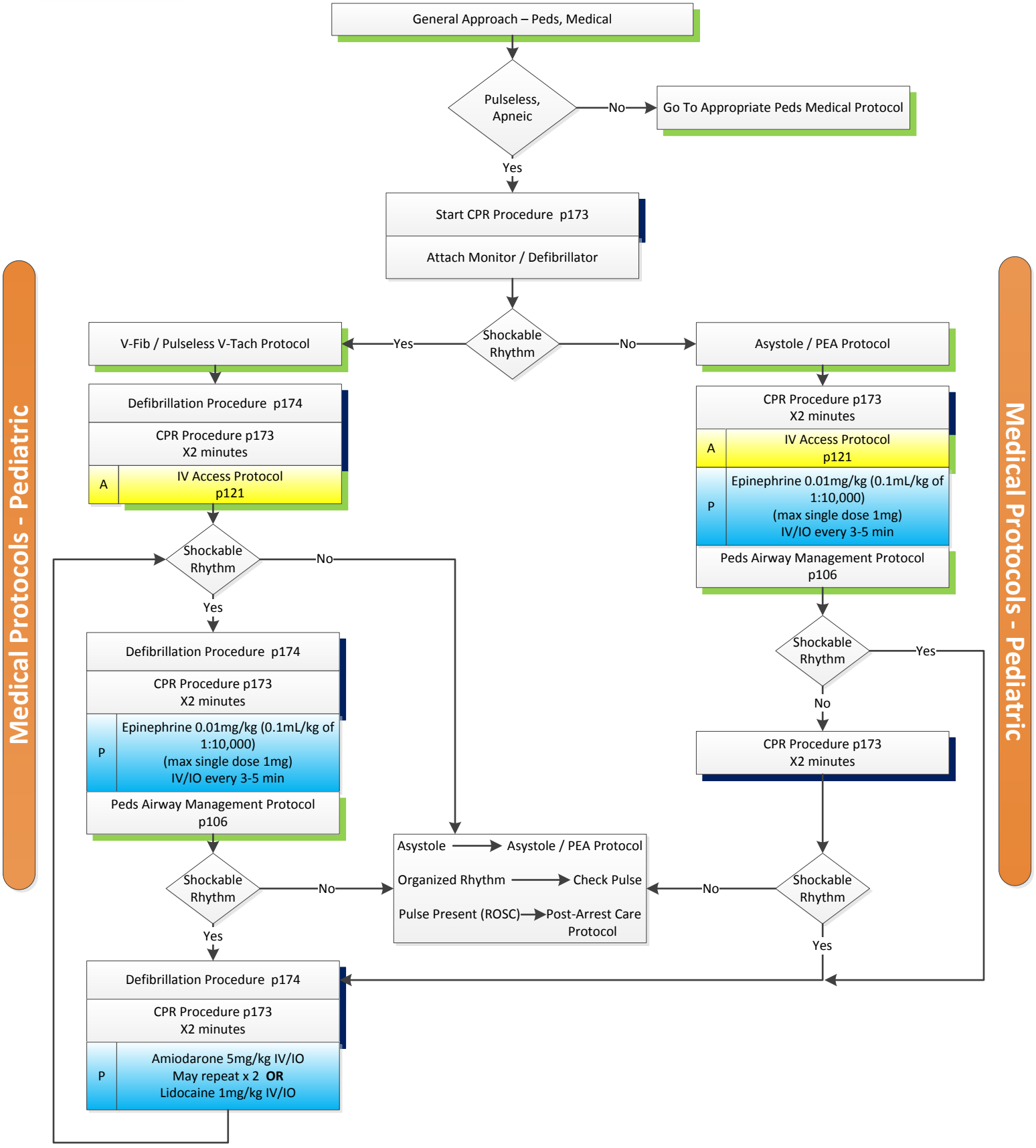
Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardivascular, Pulmonary

- If no IV Access in 3 attempts or 90sec (whichever comes first), move to IO
- Call early for ALS Intercept on neonates who are critically ill, and involve Medical Control so arrangements can be made at the receiving facility
- Transport rapidly to an OB Receiving Facility
- Consider hypoglycemia as etiology of neonatal arrest/peri-arrest situation. If not able to evaluate blood sugar, treat presumptively x 1
- The increased concentration of fetal hemoglobin (HbF) and its increased affinity for oxygen is a factor to consider in establishing target SpO2 values in the neonate. HbF will shift the oxygen dissociation curve to the left due to its high affinity for oxygen, which may result in high oxygen saturation (eg, 85 percent) at PaO2 levels below 40 mmHg

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Cardiac Arrest, General - Peds



Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Cardiac Arrest, General - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
  -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Pediatric

CPR Quality

- Push hard (>1/3 of anterior-posterior diameter of chest) and fast (at least 100/min) and allow for complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilations
- Rotate compressors every 2 minutes
- If no advanced airway, 15:2 compressions:ventilations ratio.
- If advanced airway, give 10 breaths per minute with continuous chest compression**

Shock Energy for Defibrillation

- First Shock 2 J/kg
- Second Shock 4 J/kg
- Subsequent Shocks >4 J/kg
  Maximum 10 J/kg or adult dose

Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen Ion (acidosis)
- **H**ypoglycemia
- **H**ypo- / **H**yperkalemia
- **H**ypothermia
- **T**ension Pneumothorax
- **T**amponade, Cardiac
- **T**oxins
- **T**hrombosis, Pulmonary
- **T**hrombosis, Coronary

Resuscitation Medications

Amiodarone IV/IO Dose

- 5mg/kg bolus in VF/pulseless V-Tach over 10 minutes, max 300mg
- May repeat up to 2 times if refractory VF/Pulseless VT

Atropine IM/IV/IO Dose

- 0.02 mg/kg IM/IV/IO, minimum dose 0.1mg; max 1mg

Calcium IV/IO

- 100mg/kg, max 1gm

Dextrose IV/IO

- 0.5 – 1mg/kg (5-10mL/kg of D10W or 2-4mL/kg of D25W)
- Use D10W if patient is <10kg or has peripheral IV only

Epinephrine IV/IO Dose:

- 0.01mg/kg (0.1mL/kg of 1:10,000 concentration), max 1mg.
- Repeat every 3-5 minutes.

Lidocaine IV/IO Dose

- 1mg/kg

Sodium Bicarbonate IV/IO Dose

- 1mEq/kg, max 50mEq

Advanced Airway

- If no advanced airway is in place, ventilate with 1 breath every 3-5 seconds (12-20 breaths per minute)*
- When bag-mask ventilation is unsuccessful... the LMA is acceptable when used by experienced providers to provide a patent airway and support ventilation.
- Waveform capnography to confirm and monitor airway placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths per minute)**

Return of Spontaneous Circulation (ROSC)

- Pulse and Blood Pressure check and documentation
- Spontaneous arterial pressure waves in the intra-arterial monitoring

Medical Protocols - Pediatric

Pearls

RECOMMENDED EXAM: Mental Status

- In order to successfully resuscitate a Pediatric patient, a cause of arrest must be identified and corrected
- Airway is the most important intervention. This should be addressed immediately. Survival is often dependent on successful airway management
- Airway management with BVM is often sufficient in the Pediatric patient.
- If evidence of tension pneumothorax - unilateral decreased or absent breath sounds, tracheal deviation, JVD, tachycardia, hypotension – consider needle thoracostomy. Chest decompression may be attempted at the 2nd intercostal space, mid clavicular line
- For Neonatal Resuscitation, refer to Neonatal Resuscitation, p. 109
- *https://eccguidelines.heart.org/wp-content/themes/eccstaging/dompdf-master/pdffiles/part-11-pediatric-basic-life-support-and-cardiopulmonary-resuscitation-quality.pdf
- * *https://eccguidelines.heart.org/wp-content/uploads/2015/10/PALS-Cardiac-Arrest-Algorithm.png

Cardiac Arrest, General - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Asystole / Pulseless Electrical Activity (PEA) Arrest - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
  -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Pediatric

General Approach – Peds, Medical

Start CPR

Initiate Transport Immediately

Give Oxygen

Attach Monitor / Defibrillator

Existing Advanced Airway

Yes → Ventilate at 8-10 breaths per minute with continuous compressions

No → 15:2 Ratio Compressions : Ventilations

IF AT ANY TIME
Return Of Spontaneous Circulation (ROSC)
Go To Peds Post Resuscitation Protocol p114

Expedite Transport to PICU Capable Facility

Shockable

Yes → Go To V-Fib / Pulseless V-Tach Arrest, Peds Protocol p105

No

Asystole, PEA

CPR Procedure x 2 Minutes (No Rhythm / No Pulse Check) p173

Consider Peds Airway Management Protocol p106

Blood Glucose, Treat for <70

A: Peds IV Access Protocol p121

P: Epinephrine 0.01mg/kg (0.1mL/kg of 1:10,000) IV/IO

Pulse

Yes → Peds Post Resuscitation Protocol p114

Transport to PICU Capable Facility
Contact Medical Control As Necessary

No

Treat Reversible Causes (Run the H's and T's)

CPR x 2 Minutes (No Rhythm / Pulse Check)

P: Epinephrine 0.01mg/kg (0.1mL/kg of 1:10,000) IV/IO every 3-5 min

Shockable

No

Yes → Go To V-Fib / Pulseless V-Tach Arrest, Peds Protocol p113

Medical Protocols - Pediatric

Pearls

RECOMMENDED EXAM: Mental Status

- In order to successfully resuscitate a Pediatric patient, a cause of arrest must be identified and corrected
- Airway is the most important intervention. This should be addressed immediately. Survival is often dependent on successful airway management
- Airway management with BVM is often sufficient in the Pediatric patient.
- If evidence of tension pneumothorax - unilateral decreased or absent breath sounds, tracheal deviation, JVD, tachycardia, hypotension – consider needle thoracostomy. Chest decompression may be attempted at the 2nd intercostal space, mid clavicular line

Asystole / Pulseless Electrical Activity (PEA) Arrest - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

V-Fib / Pulseless V-Tach Arrest - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
  -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Pediatric

General Approach – Peds, Medical

Start CPR Procedure, p173

Initiate Transport Immediately

Give Oxygen

Attach Monitor / Defibrillator

Existing Advanced Airway

No → 15:2 Ratio Compressions : Ventilations

Yes → Ventilate at 8-10 breaths per minute with continuous compressions

IF AT ANY TIME
Return Of Spontaneous Circulation (ROSC)
Go To Peds Post Resuscitation Protocol
Expedite Transport to PICU Capable Facility

Shockable

No → Asystole / PEA Arrest, Peds Protocol p112

Yes

Ventricular Fibrillation, Pulseless Ventricular Tachycardia

Defibrillate at 2J/kg

CPR x 2 Minutes
(No Rhythm / No Pulse Check)

Consider Peds Airway Management Protocol p106

Blood Glucose, Treat for <70

A: Peds IV Access Protocol p121

Shockable

No → Pulse

No → Asystole / PEA Arrest, Peds Protocol p112

Yes

Treat Reversible Causes
(Run the H's and T's)

CPR x 2 Minutes
(No Rhythm / Pulse Check)

P: Amiodarone 5mg/kg IV/IO (max single dose 300mg) May Repeat x 2

Defibrillate at ≥4J/kg

Yes

Defibrillate at 4J/kg

P: Epinephrine 0.01mg/kg (0.1mL/kg of 1:10,000) (max single dose 1mg) IV/IO every 3-5 min

CPR x 2 Minutes
(No Rhythm / Pulse Check)

Shockable

Yes

No

Yes → Peds Post Resuscitation Care p114

Transport to PICU Capable Facility
Contact Medical Control As Necessary

Medical Protocols - Pediatric

Pearls

RECOMMENDED EXAM: Mental Status

- In order to successfully resuscitate a Pediatric patient, a cause of arrest must be identified and corrected
- Airway is the most important intervention. This should be addressed immediately. Survival is often dependent on successful airway management
- Airway management with BVM is often sufficient in the Pediatric patient. Do not prolong transport or scene time.
- If evidence of tension pneumothorax - unilateral decreased or absent breath sounds, tracheal deviation, JVD, tachycardia, hypotension – consider needle thoracostomy. Chest decompression may be attempted at the 2nd intercostal space, mid clavicular line

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Post Resuscitation Care - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Arrest
- Estimated Time of Arrest
- Past Medical History (if known)
- Medications
- Concern for Foreign Body Aspiration
- Body Temperature
- History of Congenital Heart Defect

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Trauma
- Respiratory Failure
  -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Pediatric

Cardiac Arrest – Pediatric, Medical

Consider Peds Airway Management Protocol p106

Titrate FiO2 to maintain SpO2 ≥93%
Goal EtCO2 35-45mmHg
Do Not Hyperventilate

Airway Device Placed

P: Fentanyl 1mcg/kg IV/IO (max 75mcg) **AND** Midazolam 0.2mg/kg IV/IO (max 4mg) May Repeat x 2

P: Consider Ondansetron 0.1mg/kg (max 4mg) IV/IO

Persistent Signs of Shock

Yes

Cardiac History

No

A: Peds IV Access Protocol p121

A: Normal Saline Bolus 20mL/KG IV/IO May Repeat every 5 min. for hypotension x 2 (max 60mL/kg)

Repeat and Document BP

Improved

Yes

No

M: **Epinephrine 0.1-0.5mcg/kg/min IV/IO OR Dopamine 5-20mcg/kg/min IV/IO Titrate to Age Defined Minimum BP**

Yes

A: Peds IV Access Protocol p121

A: Normal Saline Bolus 10mL/KG IV/IO May Repeat every 5 min. for hypotension x 2 (max 30mL/kg)

Repeat and Document BP

Improved

Yes

No

M: **Dopamine 5-20mcg/kg/min IV/IO Titrate to Age Defined Minimum BP**

Notify Receiving Facility, Contact Medical Control As Necessary

No

Possible Reversible Causes of Arrest

Hypovolemia
Hypoxia
Hydrogen Ion (acidosis)
Hypoglycemia
Hypo-/**H**yperkalemia
Hypothermia
Tension Pneumothorax
Tamponade (cardiac)
Toxins
Thrombosis (pulmonary)
Thrombosis (cardiac)
Trauma

Notify Receiving PICU Capable Facility, Contact Medical Control As Necessary

Medical Protocols - Pediatric

Pearls

RECOMMENDED EXAM: Mental Status

- Monitor and treat for agitation and seizures
- Monitor and treat hypoglycemia
- If evidence of tension pneumothorax - unilateral decreased or absent breath sounds, tracheal deviation, JVD, tachycardia, hypotension – consider needle thoracostomy. Chest decompression may be attempted at the 2nd intercostal space, mid clavicular line
- Hyperventilation is a significant cause of hypotension / recurrent cardiac arrest in post resuscitation phase; **avoid at all costs**

Post Arrest Care - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Bradycardia With A Pulse - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Rhythm Change
- Estimated Time of Events
- Past Medical History (if known)

Differential

Hypoxemia, Hypovolemia, Hypotension, Acidosis
Toxins, Tension Pneumo, Pericardial Tamponade
Hypoglycemia, Sepsis
Increased Intracranial Pressure (trauma, shunt, NAT)

Medical Protocols - Peds

General Approach – Pediatric, Medical

Identify and Treat Underlying Cause

Patent Airway, Adequate Ventilations, SpO2 ≥93%

No → Peds Airway Management Protocol p106

A Peds IV Access Protocol p121

12-Lead ECG Procedure If Situation Allows p146

Cardiopulmonary Compromise

No → Support A,B,C's
Give O2
Monitor Closely for Change

Yes

Start Pediatric CPR
(C-A-B) if Heart Rate ≤60
At least 100 compressions per minute
15:2 Compressions:Breaths w/o airway
8-10 Breaths/min with advanced airway

Bradycardia Persists

No → Support A,B,C's
Give O2
Monitor Closely for Change

Yes, Severe →

P Epinephrine 0.01mg/kg IV/IO
1:10,000 (max 1mg)
Repeat every 3-5 minutes
While setting up to pace

M **Consider External Cardiac Pacing Procedure p176**

P Consider Sedation Before Initiation of Pacing

P Midazolam 0.2mg/kg IM/IN (max 10mg)
OR
Lorazepam 0.05mg/kg IV/IO (max 2mg)
OR
Midazolam 0.05mg/kg IV/IO (max 2mg)

Yes

P Epinephrine 0.01mg/kg IV/IO (max 1mg) Repeat every 3-5 minutes
OR

P IF Bradycardia due to Vagal Tone
Atropine, 0.02mg/kg IV/IO
(min dose 0.1mg, max 0.5mg)
may repeat ONCE

Peds Cardiac Arrest Protocol p110
IF loss of pulses at any time

Transport to PICU Capable Facility
Contact Medical Control As Necessary

Medical Protocols - Peds

Pearls

RECOMMENDED EXAM: Mental Status

- Maintain patent airway throughout evaluation and treatment; assist breathing as necessary
- Cardiopulmonary Compromise – Hypotension, Acutely Altered Mental Status, Signs of Shock
- Don't delay treatment to get 12-lead ECG if patient is unstable
- Pediatric patients **ALWAYS** get CPR; *CCR is not appropriate for the pediatric patient*

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Tachycardia With A Pulse - Peds

Pertinent Positives and Negatives

- Age (if known), Estimated Weight or Broselow
- Events Surrounding Rhythm Change
- Estimated Time of Events
- Past Medical History (if known)

Differential

- Hypoxemia, Hypovolemia, Hypotension, Acidosis
- Toxins, Tension Pneumo, Pericardial Tamponade
- Hypoglycemia, Sepsis
- Respiratory Distress
  -Foreign Body, Infectious, Epiglottitis

Medical Protocols - Pediatric

General Approach – Pediatric, Medical

Identify and Treat Underlying Cause

Run the H's and T's (in Differential Above)

Consider Peds Airway Management Protocol p106

Give Supplemental O2 via NRB

Cardiac Monitor

A Consider Peds IV Access Protocol p121

Evaluate QRS

Narrow (≤0.09 sec)

Wide (>0.09 sec)

12-lead ECG Procedure p146

Possible Ventricular Tachycardia

Infants <220 Children <180

Yes

No

Probable Sinus Tachycardia

Probable SVT

Search For and Treat Cause of Tachycardia (sepsis, dehydration, DKA, hypovolemia)

P Consider Vagal Maneuvers

Go To Appropriate Peds Medical Protocol

P Adenosine 0.1mg/kg IV/IO, (max 6mg) rapid push May repeat once at Adenosine 0.2mg/kg IV/IO, (max 12mg) rapid push

Ineffective, Unavailable **OR** Unstable

P Synchronized Cardioversion at 0.5-1 J/kg (May repeat ONCE at 2J/kg)

Consider Pain Management – Peds, Medical Protocol p123

Hemodynamic Instability

Yes

No

Rhythm regular and QRS monomorphic

No

Yes

P Adenosine 0.1mg/kg IV/IO, rapid (max 6mg) May repeat once at Adenosine 0.2mg/kg IV/IO, rapid (max 12mg)

No Change

M **Consider Amiodarone 5mg/kg IV/IO (max 300mg) over 20-60 minutes**

Improved

Effective

Transport to PICU Capable Facility Contact Medical Control As Necessary

Medical Protocols - Pediatric

Pearls

RECOMMENDED EXAM: Mental Status

- Once Hemodynamically stable a 12-Lead ECG should be obtained
- Maintain patent airway throughout evaluation and treatment; assist breathing as necessary
- Probable Sinus tachycardia – P-waves present before every QRS, constant P-R interval. Infants usually <220/min, Children usually <180/min
- Probable SVT – history vague, nonspecific with abrupt rate change, P-waves absent / abnormal, HR *not* variable. Infants usually >220/min, Children >180/min
- Hemodynamic Instability – Hypotension, Acutely Altered Mental Status, Signs of Shock
- Don't delay treatment to get 12-lead ECG if patient is unstable
- H's & T's – Hypovolemia, Hypoxia, Hydrogen Ion (acidosis), Hypoglycemia, Hypo-/Hyperkalemia, Tension Pneumothorax, Tamponade (cardiac), Toxins, Thrombosis (pulmonary), Thrombosis (coronary), Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Allergic Reaction - Peds

Pertinent Positives and Negatives
- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Onset and Location of Symptoms
- Lung Sounds before *AND after* intervention
- Allergen Exposure
- Toxic / Environmental Exposure
- Subjective throat "tightness" OR "closing"

Differential
- Urticaria (Rash Only)
- Anaphylaxis (Systemic Effect)
- Shock (Vascular Effect)
- Angioedema
- Aspiration / Airway Obstruction
- Vasovagal Event
- Asthma / COPD
- CHF

Medical Protocols - Pediatric

General Approach – Peds, Medical

Severity of Allergic Reaction

Mild

Flushing, Hives, Itching, Erythema
Normal BP, No Respiratory Involvement

- A: Consider Peds IV Access Protocol p121
- P: Consider Diphenhydramine 1mg/kg IV/IM/IO (max 50mg)
- M: **Consider Famotidine 0.5mg/kg IV/IO (max 20mg)**

Moderate

Flushing, Hives, Erythema PLUS Dyspnea, Wheezing
Chest Tightness

- Consider Epi 1:1,000 0.01mg/kg IM (max 0.3mg)
  <28kg, EpiPen Jr. (0.15mg)
  ≥28 kg, Adult EpiPen
- Albuterol 2.5mg/3mL Neb May repeat Q10min, Max 3
- A: Peds IV Access Protocol p121
- P: Diphenhydramine 1mg/kg IV/IM/IO (max 50mg)
- P: Famotidine 0.5mg/kg IV/IO (max 20mg)

Severe

Derm symptoms may not be present, depending on perfusion
Wheezing, Dyspnea, Hypoxia, Nausea/Vomiting PLUS Hypotension

- Epi 1:1,000 0.01mg/kg IM (max 0.3mg)
  <28kg, EpiPen Jr. (0.15mg)
  ≥28kg, Adult EpiPen
- Albuterol 2.5mg/3mL Neb May repeat Q10min, Max 3
- A: Peds IV Access Protocol p121 (If Not Already Done)
- A: Normal Saline, 20mL/kg IV/IO (max 500mL)
- P: Diphenhydramine 1mg/kg IV/IM/IO (max 50mg)
- P: Famotidine 0.5mg/kg IV/IM/IO (max 20mg)
- P: Methylprednisolone, 2mg/kg IV/IO (max 125mg)

Imminent Cardiac Arrest

Altered Mental Status, Hypotension, Pallor, Diaphoresis, Weak Pulses

- Consider Epi 1:1,000 0.01mg/kg IM (max 0.3mg)
  <28kg, EpiPen Jr. (0.15mg)
  ≥28kg, Adult EpiPen
- A: Peds IV Access Protocol p121 Normal Saline, 20mL/kg IV/IO
- M: **Contact Medical Control (As Practical)**
- P: Epi 1:10,000 0.005mg/kg IV/IO (Max 0.1mg)

Improving?
- Yes → Diphenhydramine 1mg/kg IV/IM/IO (max 50mg)
- Worsening / Refractory → Consider Peds Airway Management Protocol p106

Response to Medications?
- Stable / Improving → **Notify Receiving Facility, Contact Medical Control As Necessary**
- Worsening / Refractory → Consider Peds Airway Management Protocol p106

- M: **Epi Infusion 0.1-1mcg/kg/min IV/IO**

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardivascular, Pulmonary

- Epinephrine Infusion: Mix 2mg (1:1,000) in 250mL NS. If worsening or refractory anaphylaxis, contact Med Control first. Start at 2mcg/min, titrate up.
- Famotidine **dilution no longer reuired**. Infuse over 2 minutes.
- In general, the shorter the time from allergen contact to start of symptoms, the more severe the reaction
- Consider the Airway Management Protocol early in patients with Severe Allergic Reaction or subjective throat closing
- Imminent Cardiac Arrest should be considered in patients with severe bradycardia, unresponsiveness, no palpable radial or brachial pulse
- If parents have administered diphenhydramine (Benadryl) prior to EMS arrival, confirm medication given as well as dose

Allergic Reaction - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Altered Mental Status - Peds

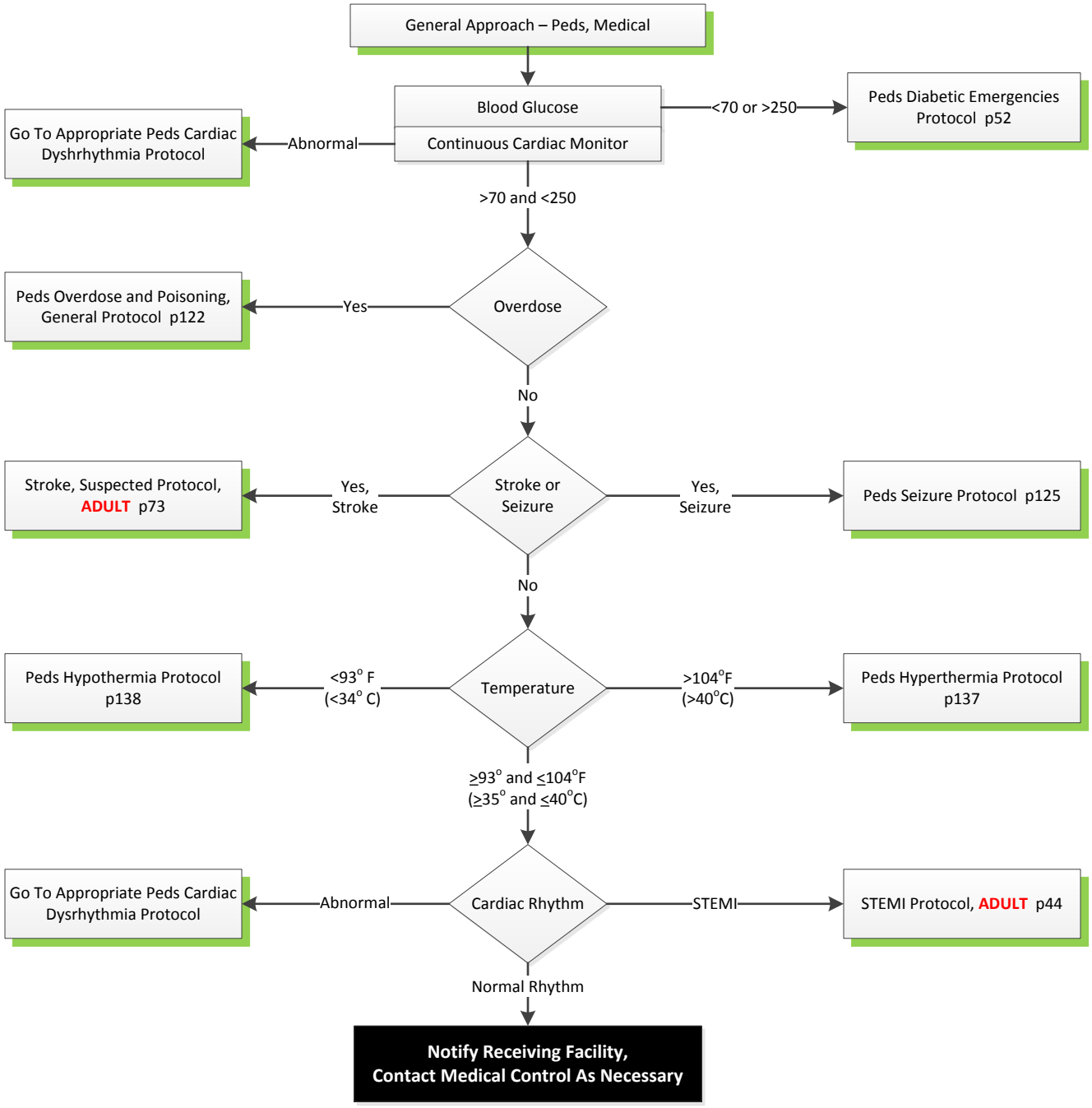
Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of DM, medic alert bracelet
- Drug paraphernalia or report of illicit drug use
- Evidence of environmental toxin / ingested toxin

Differential

- Head Injury
- Electrolyte Abnormality
- Psychiatric Disorder
- DM, CVA, Seizure, Tox
- Sepsis

Medical Protocols - Pediatric



Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Head, Neck, Blood Glucose

- Pay special attention to head and neck exam for bruising or signs of injury
- Altered Mental Status may be the presenting sign of environmental hazards / toxins. Protect yourself and other providers / community if concern. Involve Hazmat early
- Safer to assume hypoglycemia if doubt exists. Recheck blood sugar after dextrose/glutose administration and reassess
- **Do not let EtOH fool you!!** Intoxicated patients frequently develop hypoglycemia, Alcoholic Ketoacidosis (AKA) and often hide traumatic injuries!

Altered Mental Status - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Brief Resolved Unexplained Event (BRUE – Formerly "ALTE") - Peds

Pertinent Positives and Negatives

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- Events Leading up to 9-1-1
- Pregnancy History
- Complications During Pregnancy/Delivery
- Mother's GBS Status at Delivery
- Color, Tone and Appearance During Event

Differential

- Hypoglycemia
- Hyponatremia
- Seizure
- Congenital Heart Defect
- Non-Accidental Trauma
- Inborn Error of Metabolism
- Periodic Apnea
- Reflux

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Skin, Cardivascular, Pulmonary

- An Brief Resolved Unexplained Episode (BRUE) occurs in children **≤1 year of age** and may be referred to as an **"Apparent Life Threatening Episode (ALTE)"** or **"Near-miss SIDS";** it is an episode that is frightening to the observer/caregiver and involves some combination of the following: Apnea, Color Change, Marked Change In Muscle Tone, and Choking or Gagging
- The incidence of BRUE was found to be 7.5% in one studied out-of-hospital infant population
  - The overwhelming majority of BRUE patients (83%) **appeared to be in no apparent distress by EMS assessment**
  - Nearly half of the patients assessed by EMS to be in no apparent distress **(48%) were later found to have significant illness** upon ED evaluation
- This is why the history of a BRUE must always result in transport to an emergency department regardless of the infant's appearance at the time of EMS assessment
- **If the parent or guardian is refusing EMS transport, OLMC must be contacted prior to executing a refusal. Be supportive of parents as they may feel embarrassed for calling when the child now appears well.**
- ***Always* have a high index of suspicion for Non-Accidental Trauma (NAT). It affects all ethnicities, socioeconomic statuses and family types.**

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Diabetic Emergencies - Peds

Pertinent Positives/Negatives:

- Age, VS, Blood Glucose Reading
- SAMPLE History
- OPQRST History
- Last Meal, History of Skipped Meal
- Diaphoresis
- Siezures
- Abnormal Respiratory Rate
- History of DKA

Differential

- Toxic Ingestion
- Head Injury
- Sepsis
- Stroke/TIA
- Seizure
- EtOH Abuse/Withdrawal
- Drug Abuse/Withdrawal

Medical Protocols - Pediatric

General Approach – Peds, Medical

Blood Glucose

<70

- Mental Status
  - Awake Protecting Airway → Glutose 15g PO One time
  - Altered **AND/OR** Compromised Gag → Glucagon IM 0.5mg if <25kgs, 1mg if ≥25kgs **One Time**
- A IV Access Protocol p121
- A Dextrose Dosing: D10 3mL/kg IV/IO (max 125mL)
- Repeat Blood Glucose within 10 minutes
  - <70 → A IV Access Protocol p121; A Dextrose Dosing: D10 3mL/kg IV/IO (max 125mL)
  - ≥70 → Mental Status
    - Altered from Baseline **OR** Unknown → Peds Altered Mental Status Protocol p118
    - Baseline → Full Assessment Evaluate for Secondary Complaint
      - Issue Discovered → Go To Appropriate Peds Medical Protocol
      - None → Recommend Transport
        - Accepts → **Notify Receiving Facility, Contact Medical Control As Necessary**
        - Parent/Guardian Declines → M **Contact Medical Control**

≥70 and <250 → Go To Appropriate Peds Medical Protocol

≥250

- Age-Defined Hypotension
  - No
    - Clinically Dehydrated
      - Yes → A Consider Peds IV Access Protocol p121
      - No → Go To Appropriate Peds Medical Protocol
  - Yes → A Consider Peds IV Access Protocol p121
    - A Consider Normal Saline Bolus, 20mL/kg (max 500mL)
    - M **Contact Medical Control for any Mental Status Changes or Additional NS**

To Make D10 from D50 (IF D10 not available)

Draw 4mL of D50 into a 20mL syringe, then draw 16mL of NS (This will give enough D10 to treat up to roughly 7kg (15lb) child under this protocol)

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, SpO2, Blood Glucose, Skin, Respiratory Rate and Effort, Neuro Exam

- Do NOT administer oral glucose to patients that can't swallow or adequately protect their airway
- Do NOT give Bicarb to patients with hyperglycemia suspected to be in DKA – This has been proven to result in WORSE outcomes for the patients
- Prolonged hypoglycemia may not respond to Glucagon; be prepared to start an IV and administer IV Dextrose
- Infants and patients with congenital liver diseases may not respond to Glucagon due to poor liver glycogen stores
- Patients on oral diabetes medications are at a very high risk of recurrent hypoglycemia and should be transported. Contact Medical Control for advice/ patient counseling if patient is refusing. See Refusal after Hypoglycemia Treatment Protocol for additional information as necessary.
- Always consider intentional insulin overdose, and ask patients / family / friends / witnesses about suicidal ideation, comments or gestures

Diabetic Emergencies - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

IV Access - Peds

Medical Protocols - Pediatric

Medical Protocols - Pediatric

Pearls

- In the setting of **CARDIAC ARREST ONLY**, any preexisting dialysis shunt or central line may be used by paramedics
- For patients who are hemodynamically unstable or in extremis, Medical Control MUST be contacted prior to accessing any preexisting catheters
- Upper Extremity sites are preferred over Lower Extremity sites. Lower Extremity IVs are discouraged in patients with peripheral vascular disease or diabetes
- In patients with dialysis catheters, avoid IV attempts, blood draws, injections or blood pressures in the upper extremity *on the affected side*
- Saline Locks are acceptable in cases where access may be necessary but the patient is not volume depleted; having an IV does not mandate IV Fluid infusion
- The *preferred order* of IV Access is: Peripheral IV, Intraosseous IV, IN/IM access **UNLESS** medical acuity or situation dictate otherwise.

IV Access - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Overdose and Poisoning, General - Peds

Pertinent Positives/Negatives:

- Age, VS, SpO2, EtCO2, RR
- SAMPLE history
- OPQRST history
- History of Ingestion or Suspected Ingestion
- Dysrhythmias
- SLUDGEM
- DUMBELLS
- Time of Ingestion
- Type, Number and Dose of Pills Taken (if known)
- Seizures
- Mental Status Change
- Vomiting

Differential

- Head Injury
- Hazmat Exposure
- Electrolyte Imbalance
- DM, CVA, Seizure
- Sepsis

Medical Protocols - Pediatric

General Approach – Peds, Medical

Hazmat Scene

Yes → Call For Additional Resources, Stage Until Safe

No

Remember D.E.B.
Do Everyone's Blood Sugar!!

Assess Respirations, Ventilations and Oxygenation

Adequate → 12 Lead ECG Procedure p146

A: Peds IV Access Protocol p121

Inadequate → Pulse

Absent → Peds Cardiac Arrest Protocol p110

Present → Peds Airway Management Protocol p106

Blood Glucose

<70 → Peds Diabetic Emergencies Protocol p120

≥70

Assess Mental Status

Altered OR Not Protecting Airway

Awake, Protecting Airway

Continuous Cardiac Monitor

Regular

Arrhythmia → Go To Appropriate Peds Arrhythmia Protocol

Naloxone 0.1mg/kg IN (max 1mg per nare) **OR**

A: Peds IV Access Protocol p121

A: Naloxone 0.1mg/kg IV/IO/IM (max 2mg)

Improved → Consider Opiate Overdose Protocol, **ADULT** p66

Unchanged

Potential Causes

Pesticide or Nerve Gas Exposure
SLUDGEM Symptoms
→ Organophosphate OD Protocol, **ADULT** p60

Bradycardia, AV Block
History of **Beta Blocker** Ingestion
P: Consider Glucagon 0.1mg/kg IV/IO (max 5mg)

Bradycardia, AV Block
History of **Ca+ Channel** Blocker Ingestion
P: Consider Calcium Chloride 20mg/kg IV/IO (max 1gm)

Ventricular Dysrhythmia, Seizure
History of **TCA Ingestion**
P: Consider Sodium Bicarb 1mEq/kg IV/IO (max 50mEq)

Altered Mental Status, Seizure
Smoke Exposure
→ Cyanide **OR** Carbon Monoxide Poisoning Protocol, **ADULT** p63/64

M: **Notify Receiving Facility, Contact Medical Control As Necessary**

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Mental Status, Skin, Blood Glucose

- Patients are unreliable historians in overdose situations, particularly in suicide attempts. Trust what they tell you, but verify (pill bottles, circumstances, etc.)
- Bring pill bottles, contents, emesis to the ED for evaluation and assessment
- Be careful of off-gassing in cases of inhalation of volatile agents
- Many intentional overdoses involve multiple substances, some with cardiac toxicity; a 12-Lead ECG should be obtained on all overdoses situation permitting
- Contact Poison Control for all non-opiate overdoses: **1-800-222-1222**
- **SLUDGEM** – **S**alivation, **L**acrimation, **U**rination, **D**efecation, **GI** Upset, **E**mesis, **M**iosis
- **DUMBBELLS** – **D**iarrhea, **U**rination, **M**iosis/Muscle Weakness, **B**ronchorrhea, **B**radycardia, **E**mesis, **L**acrimation, **L**ethargy, **S**alivation/Sweating

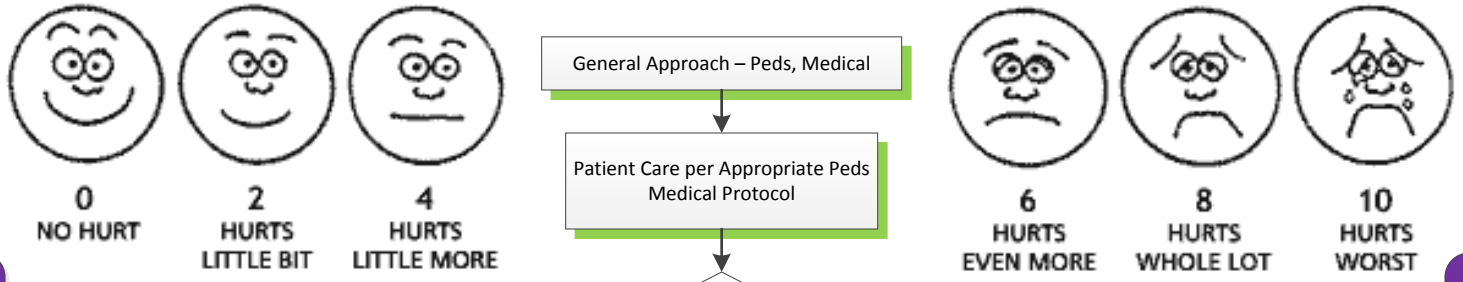
Overdose and Poisoning, General - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Pain Management – Peds

Pertinent Positives and Negatives
- Age, VS, GCS
- SAMPLE History
- OPQRST History
- History of chronic pain

Differential
- Head injury
- Spine Injury
- Compartment Syndrome
- Fracture, Sprain, Strain
- Pneumo/hemo-thorax
- Pericardial effusion
- Aortic Dissection
- Internal organ injury



Medical Protocols – Pediatric

General Approach – Peds, Medical

Patient Care per Appropriate Peds Medical Protocol

Assess Pain
0-10 Pain Scale OR FACES Scale

None – Mild Pain
(0-4)

A Consider Peds IV Access Protocol p121

Moderate Pain
(5-8)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P Consider IN Fentanyl 1.5mcg/kg (max 50mcg per nare)

A Consider Peds IV Access Protocol p121

Document response to meds, VS (HR, BP, SpO2, EtCO2)

Reassess Pain

Unchanged OR Worsening

Improved

Severe Pain
(9-10)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P Consider IN Fentanyl 1.5mcg/kg (max 50mcg per nare)

A Consider Peds IV Access Protocol p121

Document response to meds, VS (HR, BP, SpO2, EtCO2)

SpO2 ≥93%,
EtCO2 <45,
SBP >90

P Fentanyl 1mcg/kg IV/IO/IM (max 75mcg) May repeat x 1

P Consider Ondansetron 0.1mg/kg IV/IO (max 4mg)

M **Consider Morphine 0.1mg/kg IV/IO (max 4mg)**

Reassess and Document VS, including Pain Scale

Continue to Peds Medical Specific Protocol

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, Abdominal Exam, Musculoskeletal Exam, Area of Pain

- Provider Discretion to be used for patients suffering from chronic pain related issues. Please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- Pain severity (0-10) is a vital sign to be recorded pre- and post-medication delivery and at disposition
- As with all medical interventions, assess and document change in patient condition pre- and post-treatment
- Opiate naive patients can have a much more dramatic response to medications than expected; start low and titrate up as appropriate
- Allow for position of maximum comfort as situation allows

Pain Management – Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Refusal Protocol - Peds

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Overdose
- Toxidrome
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

General Approach – Peds, Medical

Parent or Legal Guardian is Present

No → Transport Required Under Implied Consent **OR** Police Protective Custody

Yes

Parent/Guardian Condition:

- ❑ Altered mental status
- ❑ Impaired decision making ability
- ❑ Hallucinations or thought disorder
- ❑ Incapacitated or intoxicated
- ❑ Expresses Suicidal or Homicidal Ideation

Yes → Transport Required Under Implied Consent **OR** Police Protective Custody Contact On-Line Medical Control as necessary

No

- ❑ Vital Sign or Physical Exam abnormalities
- ❑ Reasonable concern that the parent/guardian decision poses a threat to the minor
- ❑ Advanced Life Support measures initiated and parent/ guardian refusing

Yes → Transport Required Under Implied Consent **OR** Police Protective Custody Contact On-Line Medical Control as necessary

No

❑ <1 Year Old

Yes → Contact On-Line Medical Control

No

- ❑ Document assessment including mental status, physical exam, vitals, blood glucose and SpO2
- ❑ Assure that the patient/parent/guardian understands the possible consequences of refusal
- ❑ Complete documentation of refusal and obtain signatures

Medical Protocols - Peds

Pearls

REQUIRED EXAM: VS, GCS, Nature of Complaint

- *Incapacitated definition: A person who, because of alcohol consumption or withdrawal, is unconscious or whose judgment is impaired such that they are incapable of making rational decisions as evidenced by extreme physical debilitation, physical harm or threats of harm to themselves, others or property. Evidence of incapacitation: inability to stand on ones own, staggering, falling, wobbling, vomit/urination/defecation on clothing, inability to understand and respond to questions, DTs, unconsciousness, walking or sleeping where subject to danger, hostile toward others.
- **Intoxicated definition: A person whose mental or physical functioning is substantially impaired as a result of the use of alcohol.
- If there is ANY question, do not hesitate to involve Law Enforcement to ensure the best decisions are being made on behalf of the patient.

Refusal Protocol - Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Seizure - Peds

Pertinent Positives and Negatives
- Age, VS, GCS, SpO2, Blood Sugar
- SAMPLE History
- OPQRST History
- Seizure History, Med Compliance
- Bowel or Bladder Incontinence
- Tongue Biting
- Recent Fever History
- Evidence of Head Trauma
- Number of Seizures and Duration

Differential
- Hypoxia
- Hypoglycemia
- Electrolyte Imbalance
- Eclampsia
- Drugs, EtOH Abuse
- Drugs, EtOH Withdrawal
- Occult Head Injury
- Non-Accidental Trauma
- Syncope

Consider ALS *Early*
Prolonged Seizures Are BAD for Neurologic Outcomes!

Subtle Indications of Peds Seizure:
Persistent Gaze Deviation, Jaw Clenching, Rhythmic Mouth Movements, Focal Stiffening or Rhythmic Twitching of Extremity

Medical Protocols - Pediatric

General Approach – Peds, Medical

Environmental Cause or Toxic Exposure
- Yes → Notify Comm Center and Hazmat Team Ensure Responder and Public Safety → Go To Hazmat, General Protocol p91
- No ↓

Actively Seizing on EMS Arrival
- Yes → P: Midazolam 0.2mg/kg **IM/IN** (max 5mg) → Blood Glucose
- No → Blood Glucose

Blood Glucose
- <70 → Peds Diabetic Emergencies Protocol p120 **OR**
  - M: **If Peds Ketogenic Diet, Goal Blood Sugar ≥50**
- ≥70 → Loosen Constrictive Clothing Protect Patient from Injury
  - A: Consider Peds IV Access Protocol p121
  - Monitor and Reassess

Blood Glucose
- <70 → Peds Diabetic Emergencies Protocol p120 **OR**
- ≥70 → Consider Peds Airway Intervention Protocol p106
  - Loosen Constrictive Clothing Protect Patient from Injury
  - A: Peds IV Access Protocol p121

Monitor and Reassess
- Support Breathing → Consider Peds Spinal Immobilization Protocol p145

Loosen Constrictive Clothing Protect Patient from Injury
- Support Breathing → Consider Peds Spinal Immobilization Protocol p145

Consider Peds Spinal Immobilization Protocol p145 → Consider Peds Altered Mental Status Protocol p118

Consider Peds Altered Mental Status Protocol p118 → Seizure Returns

Seizure Returns
- No → **Notify Receiving Facility, Contact Medical Control As Necessary**
- Yes → P: Lorazepam 0.1 mg/kg IV/IO (max 2mg) **OR** Midazolam 0.1mg/kg IV/IO (max 10mg)
  - P: **IF** IV Failed, Midazolam 0.2mg/kg **IM/IN** (max 5mg)

Status Epilepticus
- No → **Notify Receiving Facility, Contact Medical Control As Necessary**
- Yes → M: **Contact Medical Control**

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: Blood Sugar, SpO2, GCS, Neuro Exam

- Midazolam is effective in terminating seizures. Do not delay IM/IN administration to obtain IV access in an actively seizing patient. IN Midazolam is preferred to rectal Diazepam.
- Do not hesitate to treat recurrent, prolonged (>1 minute) seizure activity. Have a low threshold to give IN Midazolam rather than spend time on IV Access.
- Status epilepticus is a seizure lasting greater than 5 minutes OR ≥2 successive seizures without recovery of consciousness in between. This is a TRUE EMERGENCY requiring Airway Management and rapid transport to the most appropriate Pediatric ICU Capable facility
- Assess for possibility of occult trauma, substance abuse
- Active seizure in known or suspected pregnancy >20 weeks, give Magnesium 4gm IV/IO over 2-3 minutes

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Hypotension / Shock (Non-Trauma) - Peds

Pertinent Positives and Negatives

- Age, VS, BP, RR, SpO2
- SAMPLE history
- OPQRST history
- Source of blood loss, if any (GI, vaginal, AAA, ectopic)
- Source of fluid loss, if any (vomiting, diarrhea, fever)
- Pregnancy history
- Mental Status
- Pale, Cool Skin
- Delayed Cap Refill
- Coffee Ground Emesis
- Tarry Stools
- Allergen Exposure

Differential

- Cardiac Dysrhythmia
- Hypoglycemia
- Ectopic Pregnancy
- AAA
- Sepsis
- Occult Trauma
- Adrenal Insufficiency

Medical Protocols - Pediatric

General Approach – Peds, Medical

Blood Glucose

<70 or >250 → Peds Diabetic Emergencies Protocol p120

12 Lead ECG Procedure

Arrhythmia/STEMI → Go To Appropriate Peds Cardiac Dyshrhythmia Protocol

A IV Access Protocol p121 ↔ Consider Peds Airway Management Protocol p106

History, Exam, Circumstances Suggest Etiology of Shock?

Trauma → Peds Hemorrhage Control, Trauma Protocol p142

Medical

- Hypovolemic (Dehydration, Hemorrhage)
- Distributive (Sepsis, Anaphalaxis)
- Cardiogenic (CHF, Congenital Heart Defect)
- Obstructive (PE, Tamponade)

A Normal Saline Bolus 20mL/KG IV/IO
Repeat every 5 min. x 2 (max 60mL/kg)

SBP <70 + (2xage)

Repeat and Document BP

A Normal Saline Bolus 10mL/kg IV/IO
Repeat at 5 min. if necessary (max 30mL/kg)

SBP <70 + (2xage)

Repeat and Document BP

Improved → Yes

No

M **Epinephrine 0.1-0.5mcg/kg/min IV/IO**
OR
Dopamine 5-20mcg/kg/min IV/IO
Titrate to Age Defined Minimum BP

Improved → Yes

No

M **Dopamine 5-20mcg/kg/min IV/IO**
Titrate to Age Defined Minimum BP

Notify Receiving Facility, Contact Medical Control As Necessary

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, RR, Lung sounds, JVD

- Shock may present with initially normal VS and progress insidiously; follow frequent blood pressures, particularly if the patient "looks sicker than Vital Signs"
- Tachycardia may be the first and only sign of shock in the pediatric population; remember – Peds patients compensate to a point, then crash quickly
- If evidence or suspicion of trauma (accidental OR non-accidental), move to Hypotension/Shock (Trauma) Protocol early
- Acute Adrenal Insufficiency – State where the body cannot produce enough steroids. Primary adrenal disease vs. recent discontinuation of steroids (Prednisone) after long term use.

** If Adrenal Insufficiency suspected, contact Medical Control and review case. Medical Control may authorize Methylprednisone 2mg/kg IV/IO

- Hypotension is a LATE finding in pediatric patients, and is an ominous sign that they are losing their ability to compensate

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Sickle Cell Crisis – Peds

Pertinent Positives and Negatives
- Age, VS, GCS
- SAMPLE History
- OPQRST History
- History of chronic pain
- History of Sickle Cell Anemia
- Signs of Infection
- Hypoxia
- Dehydration
- Painful Joint(s)

Differential
- Dehydration
- Sepsis
- Pneumonia
- Fracture, Sprain, Strain
- Vaso-Occlusive Crisis
- Acute Chest Syndrome
- Splenic Sequestration
- Acute Stroke

Medical Protocols – Pediatric

General Approach – Peds, Medical

Supplemental O2 at 2LPM NC
Titrate Up As Appropriate

Warm Blanket if available

Assess Pain
0-10 Pain Scale OR FACES Scale

None – Mild Pain
(0-4)

A: Consider Peds IV Access Protocol p121

A: If IV placed, consider Normal Saline 20mL/kg IV/IO (max 500mL)

Reassess Pain

Worsening

Stable

Moderate Pain
(5-8)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P: Consider Fentanyl 1.5mcg/kg IN (max 50mcg per nare)

A: Consider Peds IV Access Protocol p121

A: If IV placed, consider Normal Saline 20mL/kg IV/IO (max 500mL)

Document response to meds, VS (HR, BP, SpO2, EtCO2)

Reassess Pain

Unchanged OR Worsening

Improved

Severe Pain
(9-10)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P: Consider Fentanyl 1.5mcg/kg IN (max 50mcg per nare)

A: Peds IV Access Protocol p121

A: Normal Saline 20mL/kg IV/IO (max 500mL)

Document response to meds, VS (HR, BP, SpO2, EtCO2)

SpO2 ≥93%,
EtCO2 <45,
SBP >90

P: Fentanyl 1mcg/kg IV/IO/IM (max 75mcg) May repeat x 1

P: Consider Ondansetron 0.1mg/kg IV/IO (max 4mg)

M: **Consider Morphine 0.1mg/kg IV/IO (max 5mg)**

Reassess and Document VS, including Pain Scale

Continue to Peds Medical Specific Protocol

Medical Protocols - Pediatric

Pearls

REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, Abdominal Exam, Musculoskeletal Exam, Area of Pain

- Provider Discretion to be used for patients suffering from chronic pain related issues. Please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- Pain severity (0-10) is a vital sign to be recorded pre- and post-medication delivery and at disposition
- Sickle Cell Anemia is a chronic hemolytic anemia occurring almost exclusively in African Americans; pain crises result from the occlusion of blood vessels by masses of misshapen blood cells during times of crisis
- Sickle Pain Crises occur typically in the joints and back. Liver, Pulmonary and CNS involvement can present with RUQ pain, hypoxia or stroke
- Patients with sickle cell disease have a high incidence of life-threatening conditions at a very young age

Sickle Cell Crisis – Peds

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Quick Reference Page – Peds (<18 years)

Trauma Protocols - Pediatric

Vital Signs In Children

Age	Heart Rate (Beats Per Minute)		Age	Respiratory Rate (Breaths Per Minute)	Age	Minimum Systolic Blood Pressure
	Awake Rate	Sleeping Rate				
Newborn – 3mos	85-205	80-160	Infant	30-60	Term Neonates (0-28days)	>60
3mos – 2years	100-190	75-160	Toddler	24-40	Infants (1-12mos)	>70
2years – 10years	60-140	60-90	Preschooler	22-34	Children 1-10years	>70 + (age in years x 2)
>10years	60-100	50-90	School-Aged Child	18-30	Chilcren >10years	>90
			Adolescent	12-16		

Modified Glasgow Coma Scale for Infants and Children

	Child	Infant	Score
Eye Opening	Spontaneous To Speech To Pain None	Spontaneous To Speech To Pain None	4 3 2 1
Best Verbal Response	Oriented, Appropriate Confused Inappropriate Words Incomprehensible Sounds None	Coos and Babbles Irritable, Cries Cries in Response to Pain Moans in Response to Pain None	5 4 3 2 1
Best Motor Response	Obeys Commands Localizes Painful Stimulus Withdraws in Response to Pain Flexion in Response to Pain Extension in Response to Pain None	Moves Spontaneously and Purposely Withdraws in Reponse to Touch Withdraws in Response to Pain Abnormal Flexion Posture to Pain Abnormal Extension Posture to Pain None	6 5 4 3 2 1

Wisconsin EMSC Recommended Weight Conversion

(1 kg = 2.2 lbs -OR- 1 lb = 0.45 kgs)

Lbs.	Kgs.	Lbs.	Kgs.	Lbs.	Kgs.
5 lbs	**2 kgs**	**20 lbs**	**9 kgs**	**35 lbs**	**16 kgs**
6	3	21	10	36	16
7	3	22	10	37	17
8	4	23	10	38	17
9	4	24	11	39	18
10 lbs	**5 kgs**	**25 lbs**	**11 kgs**	**40 lbs**	**18 kgs**
11	5	26	12	41	19
12	5	27	12	42	19
13	6	28	13	43	20
14	6	29	13	44	20
15 lbs	**7 kgs**	**30 lbs**	**14 kgs**	**45 lbs**	**20 kgs**
16	7	31	14	46	21
17	8	32	15	47	21
18	8	33	15	48	22
19	9	34	15	49	22
www.chawisconsin.org				**50 lbs**	**23 kgs**

Trauma Protocols - Pediatric

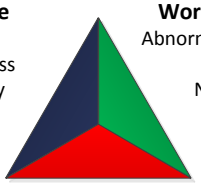
Equipment	GRAY 3-5kg	PINK Small Infant 6-7kg	RED Infant 6-9kg	PURPLE Toddler 10-11kg	YELLOW Small Child 12-14kg	WHITE Child 15-18kg	BLUE Child 19-23kg	ORANGE Large Child 24-29kg	GREEN Adult 30-36kg
Resuscitation Bag		Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Adult
Oxygen Mask (NRB)		Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric/ Adult
Oral Airway (mm)		50	50	60	60	60	70	80	80
Laryngoscope Blade (Size)		1 Straight	1 Straight	1 Straight	2 Straight	2 Straight	2 Straight OR Curved	2 Straight OR Curved	3 Straight OR Curved
King Airway	Size 0 (Clear)	Size 1 (White)	Size 1 (White)	Size 1 (White)	Size 2 (Green)	Size 2 (Green)	Size 2.5 (Orange)	Size 3 (Yellow)	Size 3 (Yellow)
LMA	NA	#1	#1	#1.5	#2.0	#2.5	#3	#3.5	#4
Suction Catheter (French)		8	8	10	10	10	10	10	10-12
BP Cuff	Neonatal #5/ Infant	Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Small Adult
IV Catheter (ga)		22-24	22-24	20-24	18-22	18-22	18-20	18-20	16-20
IO (ga)		18/15	18/15	15	15	15	15	15	15
NG Tube (French)		5-8	5-8	8-10	10	10	12-14	14-18	16-18

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Destination Determination – Peds, Trauma

Trauma Protocols - Pediatric

Step One — Measure Vital Signs and Level of Consciousness



Glasgow Coma Scale	≤13
Systolic blood pressure (mmHg)	<70 + (age in years x 2)mmHG
Respiratory rate	<10bpm or >upper normal (p.121) **OR** need for ventilation support

ANY 'Yes'

Circulation to the Skin
Pallor
Mottling
Cyanosis

ALL 'No'

Step Two — Assess Anatomy of Injury

- Penetrating Injury to head, neck, torso, extremities proximal to knee
- Chest wall instability or deformity
- ≥2 proximal long bone fractures
- Crushed, degloved, or mangled extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture
- Open or depressed skull fracture
- Paralysis

ANY 'Yes'

Transport to Level 1 *Pediatric* Trauma Center; Notify via Radio as early as possible

Any Airway Compromise not able to be managed by EMS should be taken to the CLOSEST FACILITY for stabilization immediately

ALL 'No'

Step Three — Assess Mechanism of injury and evidence of High Energy Impact

- Falls > 10 ft or twice the height of the child
- High Risk Auto Crash
- Auto vs. Pedestrian/Bicyclist thrown, run over or significant (>20 mph) impact
- Motorcycle crash >20 mph

ANY 'Yes' → Transport to closest appropriate PICU-Capable, Leveled Trauma Center

ALL 'No'

Step Four — Assess Special Patient or System Considerations

- Age ≤1 year
- Anticoagulation **AND/OR** history of bleeding disorder(s)
- Burns
  - without other trauma, transport to B*urn Facility*
  - with traumatic mechanism, transport to *trauma center*
- End Stage Renal Disease requiring Hemodialysis
- Pregnancy ≥20 weeks
- **EMS provider judgment**

ANY 'Yes' → **Contact Medical Control**; Consider Pediatric Trauma Center or Specialty Resource Center

ALL 'No'

Transport according to Appropriate Trauma Protocol

Trauma Protocols - Pediatric

Destination Determination – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

General Approach – Peds, Trauma

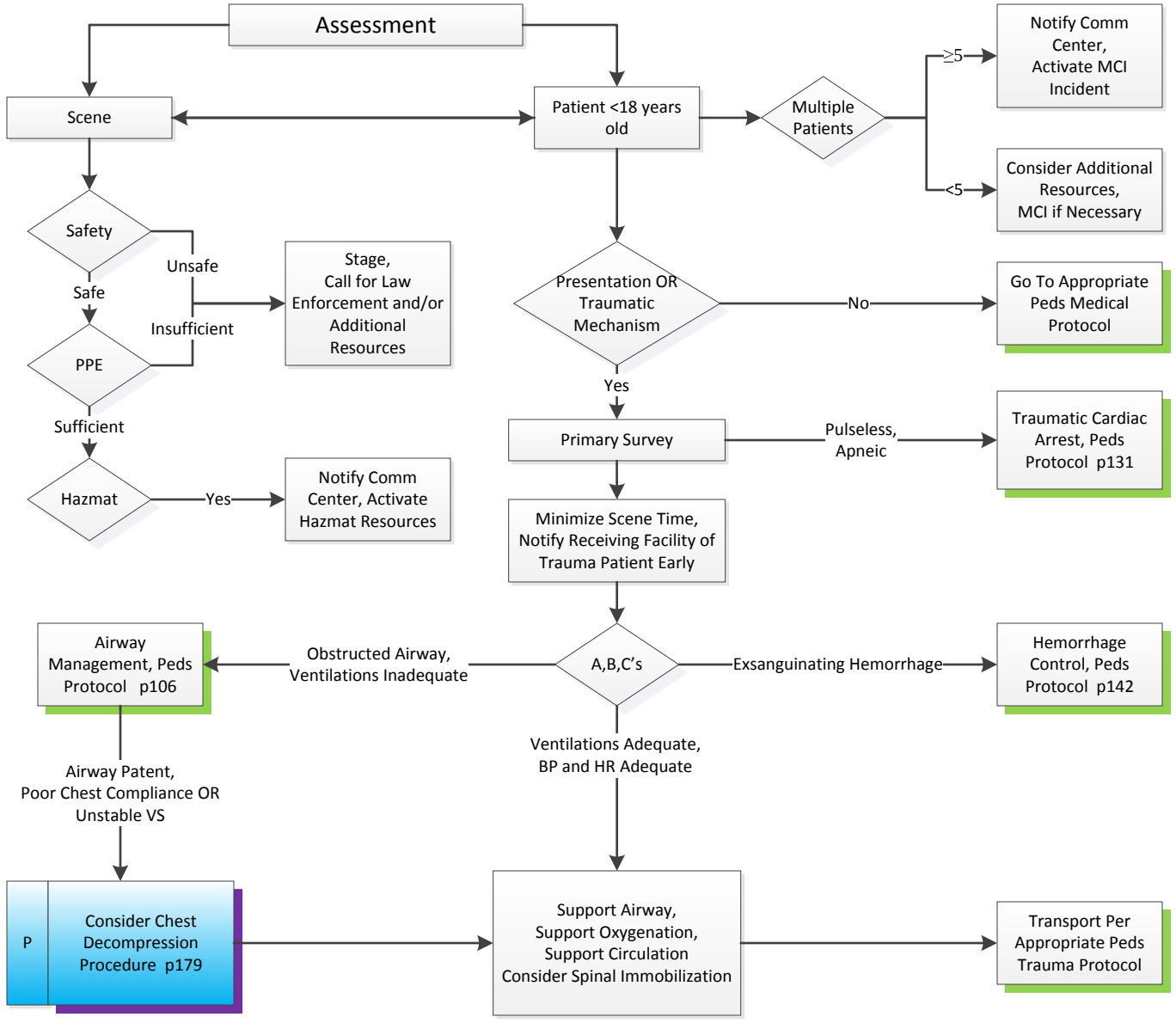
Pertinent Positives and Negatives

- Age, VS, GCS
- Time of Injury, Mechanism of Injury
- DCAP-BTLS
- SAMPLE History
- OPQRST History
- Pain / Swelling
- Mental Status
- Hypotension / Shock

Differential

- Stroke
- STEMI
- Overdose
- Elder Abuse
- Domestic Violence
- Non-Accidental Trauma

Trauma Protocols - Pediatric



Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Vital Signs, GCS, Loss of Consciousness, Location of Pain (then targeted per Appropriate Trauma Protocol)

- Assess for major trauma criteria immediately upon patient contact
  - -RR <10 or >upper normal **(p.121)**; SBP <70 + (age in years x 2)mmHG; Pulse <50 or >upper normal **(p.121)**; GCS <13; SpO2<93%
  - -Transport to Trauma Center, minimize scene time to goal of <10 minutes
- Disability – assess for neuro deficits including paralysis, weakness, abnormal sensation
- Suspect Tension Pneumothorax when:
  - -Mechanism consistent with Chest Trauma; Resp Distress; Decreased Breath Sounds; JVD; Low BP; Tachycardia; Tracheal Deviation
  - -Signs and Symptoms of Tension Pneumothorax may be present *with or without* positive pressure ventilations
  - -Needle Decompression should be performed with an 18-20ga needle at the 2nd intercostal space, *midclavicular line*
  - -If repeat decompression necessary, continue to move laterally along the superior aspect of the 3rd rib

General Approach – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Traumatic Cardiac Arrest – Peds, Trauma

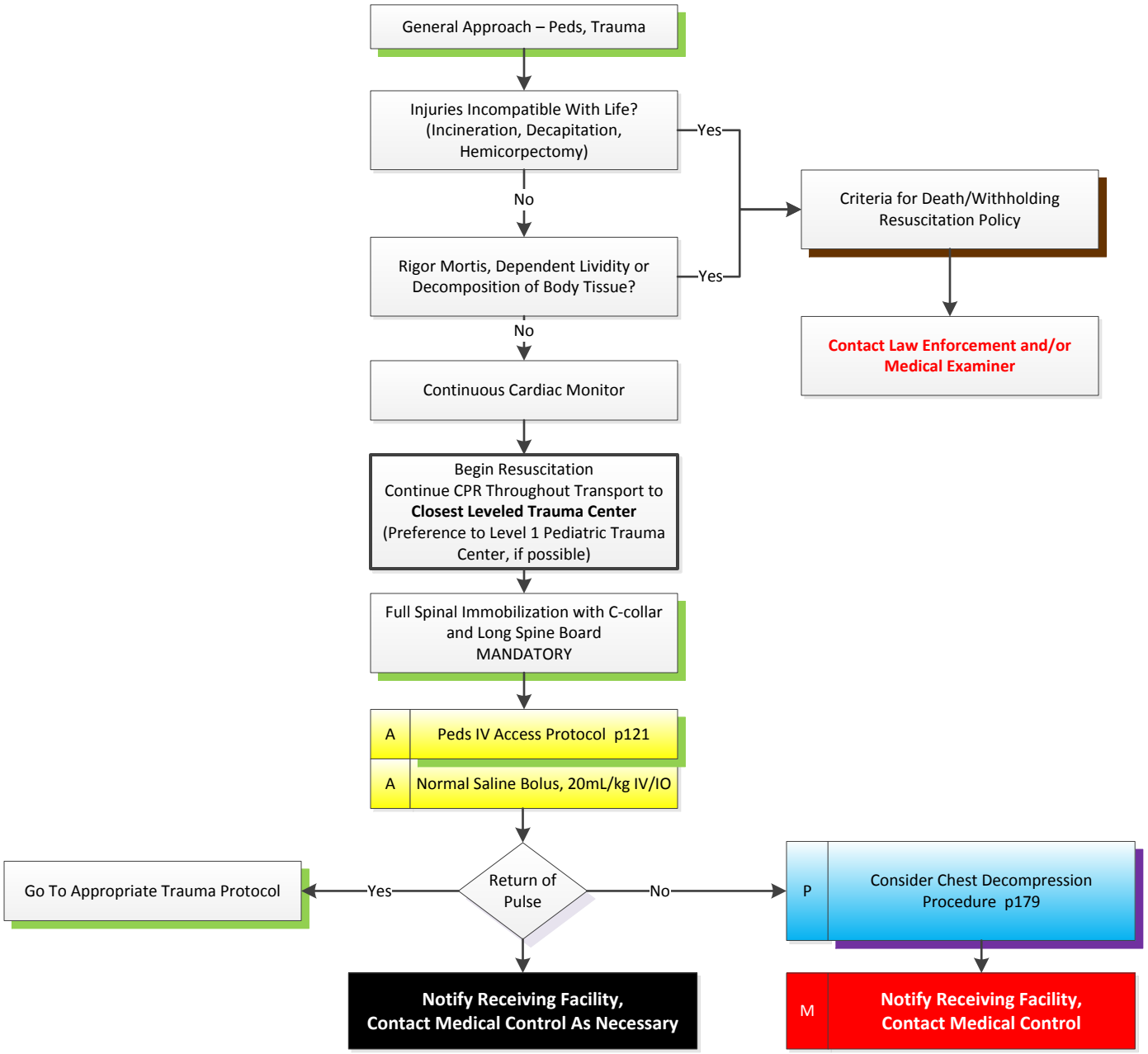
Pertinent Positives and Negatives

- Age, if known
- Mechanism of Injury
- Events leading up to arrest

Differential

- Hypovolemic Shock
  - -External Hemorrhage
  - -Internal Hemorrhage
  - -Unstable Pelvic Fracture
- Tension Pneumothorax
- Medical Condition Causing Trauma (i.e. Cardiac Arrest)

Trauma Protocols - Pediatric



Pearls

REQUIRED EXAM: Pupillary Light Reflex, Palpation of Pulses, Heart and Lung Auscultation

- This protocol is compliant with the Joint Position Statement of the ACS, ACEP, NAEMSP and AAP and can be referenced here: http://www.annemergmed.com/article/S0196-0644(14)00074-2/fulltext#sec6
- Injuries incompatible with life include; decapitation, incineration, massively deforming head or chest injury, dependent lividity, rigor mortis
- As with all trauma patients, DO NOT delay transport
- Consider using medical cardiac arrest protocols if uncertainty exists regarding etiology of arrest
- Use of a long spine board will make chest compressions more effective; however, if spinal immobilization interferes with CPR use reasonable effort to limit patient and spine movement
- Be aware that these may be crime scenes: do your best to avoid disturbing forensic evidence
- If provider safety becomes a concern, transport of deceased patients to the hospital *is acceptable*

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Bites and Envenomations – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Pulses distal to wound
- SAMPLE History
- OPQRST History
- Description or photo of offending creature
- Tetanus status
- Immunization History of Creature (if known)
- Domestic vs. Wild Animal
- Allergic Reaction
- Hypotension, Shock, Fever

Differential

- Penetrating Trauma
- Dry Bite (Snake)
- Abscess/Cellulitis
- Non-Accidental Trauma

Trauma Protocols - Pediatric

Trauma Protocols - Pediatric

General Approach – Peds, Trauma

Offending Organism(s) Neutralized

- No → Call For Resources, Stage Until Scene Safe
  - Contact Dane Co. Animal Control **1-608-255-2345**
- Yes

Active Hemorrhage

- Yes → Hemorrhage Control, Peds Protocol p142
- No

Allergic Reaction

- Yes → Allergic Reaction, Peds Protocol p117
- No

Evaluate Pain

- >5/10 **OR** Severe → Consider Pain Management, Peds Trauma Protocol p143
- None or Mild

Identification of Offending Organism

Spider, Bee, Wasp, Hornet

Immobilize Injury, Remove jewelry distal to bite

Muscle Spasms

- No → Mark Edges of Erythema with Marking Pen
- A: Peds IV Access Protocol p121
- P: Midazolam 0.02mg/kg IV/IO (max 10mg) **OR** Midazolam 0.1mg/kg IM/IN (max 5mg)

Snakebite

Immobilize Injury, Remove jewelry distal to bite

Mark Edges of Erythema with Marking Pen

Mammalian Bite (including Human)

Immobilize Injury, Remove jewelry distal to bite

Wound Care Procedure p194

Notify Receiving Facility, Contact Medical Control As Necessary

Pearls

REQUIRED EXAM: VS, GCS, Evidence of Intoxication, Affected Extremity Neurovascular Exam

- Cat bites may not initially appear serious, but can progress rapidly to severe infection
- Human bites have higher rates of infection than animal bites and need to be evaluated in the Emergency Department for antibiotics
- Bites on the hands and lacerations over knuckles should be assumed to be “Fight Bites” until proven otherwise, and need evaluation
- Brown recluse spider bites are usually painless at the time of bite. Pain and tissue necrosis develops over hours to days
- Immunocompromised patients have higher risk of infection – Think: Diabetes, Chemotherapy, Organ Transplant

Bites and Envenomations – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Burns – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS
- SAMPLE History
- OPQRST History
- Mechanism of Burn (heat, gas, chemical)
- Time of Injury
- Singed Facial Hair
- Wheezing, Hoarseness
- Subjective Throat Swelling
- Loss of Consciousness

Differential

- Blast Injury
- Radiation Injury
- Electrical Injury
- Cyanokit Need?
- Cellulitis
- Dermatitis
- Drug Reaction (Stevens-Johnson Syndrome)

Consider Need for Airway Management EARLY

General Approach – Peds, Trauma

Indications of possible Cyanide Poisoning

Exposure to fumes from burning Nitrile (polyurethane, vinyl)
Seizures, coma, cardiac arrest, headache, vertigo and/or cherry red skin color from increased venous O2 concentration

Estimate TBSA Burned / Severity

Trauma Protocols - Pediatric

vMinor Burn

<5% TBSA, 1st – 2nd Degree Burn
No inhalation Injury
Normal BP, SpO2

Remove Rings, Bracelets and Constricting Items

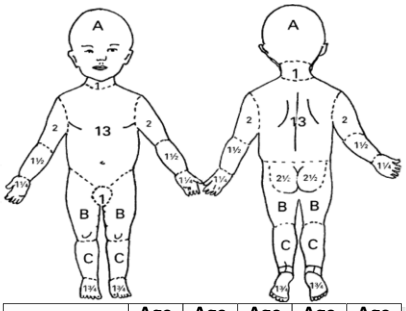
Remove or Cool Heat Source (if not already done)

Apply Dry Clean Sheet or Non-Adherent Dressing
Consider Plastic Cling Wrap Application

A | Consider Peds IV Access Protocol p121

Serious Burn

5-15% TBSA, 2nd – 3rd Degree Burn
Suspected Inhalation Injury,
Hypotension, Altered Mental Status



Area	Age 0	Age 1	Age 5	Age 10	Age 15
A=½ of Head	9 ½	8 ½	6 ½	5 ½	4 ½
B=½ of Thigh	2 ¾	3 ¼	4	4 ¼	4 ½
C=½ of Leg	2 ½	2 ½	2 ¾	3	3 ¼

Consider Pain Management – Peds, Trauma Protocol p143

Critical Burn

>15% TBSA, 2nd – 3rd Degree Burn
Burn with Trauma,
Burn with Airway Compromise

Consider Peds Airway Management Protocol p106

Remove Rings, Bracelets and Constricting Items

Remove or Cool Heat Source (if not already done)

Apply Dry Clean Sheet or Non-Adherent Dressing
Consider Plastic Cling Wrap Application

A | Peds IV Access Protocol p121

A | LR Preferred over NS, If available
If **<5 y/o**, 125mL IV/IO
If **≥5 and <14 y/o**, 250mL IV/IO
If **≥14 y/o**, 500mL IV/IO
Fluids given over 1 hour

Trauma Protocols - Pediatric

Burn to Hands, Feet, Face or Perineum

No → Transport to Facility of Choice

Yes → Transport to Designated Burn Center

Pearls

REQUIRED EXAM: VS, GCS, Lung Sounds, HEENT, Posterior Pharynx

- Safety First! Assure a Chemical source of burn is NOT a hazard to responders. Assure an Electrical source of burn is OFF or no longer contacting pt. Never overlook the possibility that a burn injury may be the result of child abuse / non-accidental trauma.
- High Voltage Electrical Burns (>600 volts) require spinal immobilization, continuous cardiac monitor and immediate IVF regardless of external appearance of injury
- Chemical burns require removal of contaminated clothing, brush away dry powder before irrigation. Flush with copious warm water on scene and continue irrigation en route
- Burns to face and eyes, remove contact lenses prior to irrigation
- Early advanced airway is strongly recommended if suspicion of inhalation injury. Signs and symptoms include carbonaceous sputum, facial burns or edema, hoarseness, singed nasal hairs, agitation, hypoxia or cyanosis

Burns – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Chest Injury – Peds, Trauma

Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Respiratory Effort, Adequacy
- Abnormal Breath Sounds (unilateral vs. bilateral)
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- Aortic Root Disruption
- Bronchial Tree Injury
- Tracheal Disruption
- Great Vessel Laceration
- Cardiac Contusion
- Cardiac Laceration

Trauma Protocols - Pediatric

General Approach – Peds, Trauma

Peds Spinal Immobilization Protocol p145

A Peds IV Access Protocol p121

Consider Pain Management, Peds Trauma Protocol p143

Mechanism

Blunt

Assess Breath Sounds, SpO2

Clear and Equal Bilaterally

Assist Ventilations as Needed

Decreased Unilateral Breath Sounds

Support Ventilations, Monitor VS, watch for JVD, tracheal deviation

Penetrating

Stabilize Foreign Object Assess Breath Sounds, SpO2

Open **OR** Sucking Chest Wound

Apply Occlusive Dressing and Assist Ventilations

Decreased Unilateral Breath Sounds

Support Ventilations, Monitor VS, watch for JVD, tracheal deviation

Clear and Equal Bilaterally

Assist Ventilations as Needed

Signs of Tension Pneumothorax

No

Yes

P Chest Decompression Procedure p179

Continuous Cardiac Monitor

Consider Peds Airway Management Protocol p106

Notify Receiving Facility, Contact Medical Control As Necessary

Consider Peds Airway Management Protocol p106

Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Consider tension pneumothorax in any patient with penetrating chest trauma, OR blunt chest trauma with decreased unilateral breath sounds, hypotension, tachycardia, hypoxia, tracheal deviation (late) or JVD (late)**
- Aortic root injuries, bronchial disruption and tracheal disruptions are common with major deceleration injuries (i.e. MVC)
- Cardiac contusions are common with blunt chest trauma, and may present with ectopy, PVCs or even STEMI appearance on cardiac monitor
- Pericardial Tamponade is a surgical emergency and needs rapid transport. Look for muffled heart tones, hypotension, tachycardia

Chest Injury – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Prolonged Crush Injury – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- Crushed under heavy load ≥30 min
- Building collapse, trench collapse, industrial accident, heavy equipment pinning

Differential

- Compartment Syndrome
- Entrapment without Crush
- Fracture, Sprain, Strain
- Pelvic Fracture
- Hypothermia

Trauma Protocols - Pediatric

General Approach – Adult, Trauma

A Peds IV Access Protocol p121

A NS Bolus, 20mL/kg IV/IO (max 500mL)

Peds Spinal Immobilization Protocol p145

Management of Crush Injury Patient
Crush Injury should be suspected in prolonged pinnings >1 hour, AND proximal to the knee or elbow.

This protocol is **NOT** intended for hands or feet trapped in machinery or farm equipment

Continuous Cardiac Monitor

12-Lead ECG Procedure p146 (when possible)

Hemodynamically Unstable

Yes

P Sodium Bicarbonate 1mEq/kg IV/IO **AND*** Calcium Chloride 20mg/kg IV/IO over 3 min, max 1g

Go To Appropriate Peds Cardiac Arrest Protocol

No

Abnormal ECG

Yes

Peaked T-waves,
QRS ≥0.12 sec
QT ≥0.46 sec

Immediately Prior to Extrication

P Sodium Bicarbonate 1mEq/kg IV/IO **AND*** Calcium Chloride 20mg/kg IV/IO over 3 min, max 1g

Albuterol 2.5mg/3mL Neb

No

Immediately Prior to Extrication

P Sodium Bicarbonate 1mEq/kg IV/IO

Consider Pain Management, Peds Protocol p143

Monitor and Reassess for Fluid Overload

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Vital Signs, GCS, Lung Sounds, Neuro Exam, Musculoskeletal Exam

- Structural Collapse, Crush Scenes are often full of hazards, provider safety is the most important consideration
- Patients may become hypothermic, even in warm environments
  -Hypothermia can lead to coagulopathy, which will increase bleeding times and have worse outcomes for the patient
- Crush injuries can result in hyperkalemia from shift of Potassium out of injured cells. Cardiac monitoring is required and 12-lead ECG preferred whenever possible (as dicated by the situation)
- Monitor extremities for signs of compartment syndrome after crush injury; ***P***ain, ***P***allor, ***P***aresthesias, ***P***aralysis, ***P***ulselessness and ***P***oikilothermia (inability to regulate core body temperature)
- * Sodium Bicarb Infusion: 1mEq/kg added to 1L NS, administered 20mL/kg IV just prior to extrication
- **Utilize different IV lines or flush between bicarb and calcium to prevent precipitation in the line

Prolonged Crush Injury – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Near-Drowning / Submersion Injury – Peds, Trauma

Pertinent Positives and Negatives

- Submersion in water regardless of depth
- SAMPLE History
- OPQRST History
- Temperature of water
- Mental Status Changes
- Degree of Water Contamination
- Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor

Differential

- Spinal Trauma
- Pre-Existing Medical Condition
- Hypothermia
- Aspiration
- The Bends
- Pressure Injury
  - Barotrauma
  - Decompression Sickness
- Post-Immersion Syndrome

Trauma Protocols - Pediatric

General Approach – Peds, Trauma

Peds Spinal Immobilization Protocol p145

Mental Status

Awake and Alert

Remove Wet Clothing
Dry and Warm Patient

Monitor and Reassess

Encourage Transport and Evaluation *even if asymptomatic*

Continuous Cardiac Monitor

A — Consider Peds IV Access Protocol p121

Awake but Altered

Consider Peds Airway Management Protocol p106

Consider Peds Altered Mental Status Protocol p118

Remove Wet Clothing
Dry and Warm Patient

Monitor and Reassess

Continuous Cardiac Monitor

A — Peds IV Access Protocol p121

Unresponsive

Pulse

Yes → Consider Peds Airway Management Protocol p106

No → Go To Appropriate Peds **MEDICAL** Cardiac Arrest Protocol

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Have a HIGH index of suspicion for possible spinal injuries. *Any* diving injury or submersion with unclear details should be fully immobilized
- Hypothermia is often associated with near-drowning and submersion injuries. Consider the Hypothermia Protocol as appropriate
- *All* patients with Near-Drowning / Submersion Injury should be transported for evaluation due to delayed presentation of respiratory failure
- With diving injuries (decompression / barotrauma) consider availability of a hyperbaric chamber; contact Medical Control early.
- Near-drowning patients who are awake and cooperative but with respiratory distress may benefit from CPAP / Positive Pressure Ventilation

Near-Drowning / Submersion Injury – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Environmental, Hyperthermia – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to hot environment
- Hot, dry or sweaty skin
- Seizures
- Nausea
- Hypotension, Shock, Fever

Differential

- Alcohol Withdrawal (DTs)
- Hyperthyroidism (Thyroid Storm)
- Dehydration
- Cocaine or Sympathomimetic OD
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (Serotonin Syndrome, Malignant Hyperthermia)

If Evidence of Sympathomimetic OD

Consider Overdose, Sympathomimetic Protocol

Trauma Protocols - Pediatric

General Approach – Peds, Trauma

Remove Patient from Hot Environment (if applicable)

Estimate Severity of Symptoms

Heat Cramps

Painful Spasms of Extremities and/or Abdominal Muscles
Normal Mental Status
Normal Vital Signs

Oral Fluids
Sponge with Cool Water and Fan

Heat Exhaustion

Dizziness, Lightheadedness, Headache, Irritability, Nausea
Normal or Mildly Depressed Mental Status
Mild Tachycardia (age defined)
Normal or Mildly Elevated Temp

Keep Patient Supine
Apply 100% Oxygen
Sponge with Cool Water and Fan

Heat Stroke

Marked Alteration in Level of Consciousness
May Be Sweating **OR** Hot, Dry, Red Skin
Extremely High Temp, >105°F

Semi-Reclining Position with Head Elevated
Apply 100% Oxygen
Rapid Cooling with Cold Packs, Sponge with Cool Water and Fan

A — Peds IV Access Protocol p121

A — Normal Saline 20mL/kg IV/IO (max 500mL)
P — Ondansetron 0.1mg/kg IV/IO (max 4mg)
P — If shivering, consider Midazolam 0.04mg/kg IV/IO (max 2mg)

Tolerating Oral Fluids
- Yes → Reassess and Document Mental Status, VS and ability to take PO
  - Abnormal → A — Peds IV Access Protocol p121
  - Normal → Requires Transport
- No → A — Peds IV Access Protocol p121

A — Normal Saline 20mL/kg IV/IO (max 500L)
P — Consider Ondansetron 0.1mg/kg IV/IO/ ODT (max 4mg)

Requires Transport
- No → Execute and Document Patient Refusal Protocol p124
- Yes → **Notify Receiving Facility, Contact Medical Control As Necessary**

Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Extremes of Age are more prone to heat emergencies due to inability to easily self-extricate from hot environments
- Patients on Tricyclic Antidepressants, Anticholinergics, Diuretics (i.e. Lasix) are more susceptible to heat emergencies due to medication effects
- Cocaine, amphetamines and salicylates all may elevate body temperature or interfere with the ability to auto-regulate
- Sweating generally disappears as body temperature rises above 104°F
- If Heat Cramps resolved without IV Access or Medications, patients may refuse transport, **IF** tolerating oral fluids **and** VS normal

Environmental, Hyperthermia – Pediatric, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Environmental, Hypothermia – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to cold environment
- Cold or clammy skin
- Confusion
- Arrhythmias, J-waves on ECG
- Hypotension, Shock

Differential

- Alcohol Intoxication
- Hypothyroidism (Myxedema Coma)
- Dehydration
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (beta blocker overdose, opiate overdose)

Trauma Protocols - Pediatric

General Approach – Peds, Trauma

Remove Patient from Cold Environment (if applicable)
Remove Wet Clothing
Dry and Warm the Patient

Localized Cold Injury (Frostbite)

Yes → Wound Care Procedure
Do NOT Rub Skin To Warm
PREVENT Refreezing p194

A Peds IV Access Protocol p121

A NS Warmed Fluids 20mL/kg IV/IO over 30 minutes Max 500mL

Consider Pain Management – Peds, Trauma Protocol p143

No

Blood Glucose Procedure p169

<70 → Go To Peds Diabetic Emergencies Protocol p120

>70

Estimate Severity of Symptoms

Mild Hypothermia
<93°F (<34°C)

Sympathetic Nervous System Excitation – Shivering, Hypertension, Tachycardia, Tachypnea
Awake But May Be Confused

Moderate Hypothermia
86-93°F (30-34°C)

Shivering more violent, ataxia and incoordination apparent.
Stumbling pace and Moderate Confusion
Appears pale as surface vessels constrict to retain heat.

Severe Hypothermia
<86°F (<30°C)

Heart rate, blood pressure and respiratory rate decrease.
Disoriented, confused and combative
Paradoxically may discard clothing

External Rewarming Measures

12-Lead ECG Procedure p146

A Peds IV Access Protocol p121

A NS Warmed Fluids 20mL/kg IV/IO over 30 minutes (max 500mL)

External Rewarming Measures

12-Lead ECG Procedure p146

A Peds IV Access Protocol p121

A NS Warmed Fluids 20mL/kg IV/IO over 30 minutes (max 500mL)

Consider Peds Airway Management Protocol p106

Consider Peds Altered Mental Status Protocol p118

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Hypoglycemia is found in many hypothermic patients, because hypothermia may be a result of hypoglycemia
- Severe hypothermia may cause myocardial irritability and rough handling can theoretically cause V-fib. Please handle carefully.
  -Do not withhold advanced airway or CPR for this concern, but only the most experienced provider available should *gently* attempt advanced airway
- Below 86°F (30°C), antiarrhythmics may not be effective. If given, they should be given at reduced intervals. Do NOT attempt to pace below 86°F. If antiarrhythmics necessary for severely hypothermic patient, Contact Medical Control
- Extremes of age, malnutrition, EtOH and drug abuse and outdoor hobbies / employment all predispose to hypothermia

Environmental, Hypothermia – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Extremity Injury – Peds, Trauma

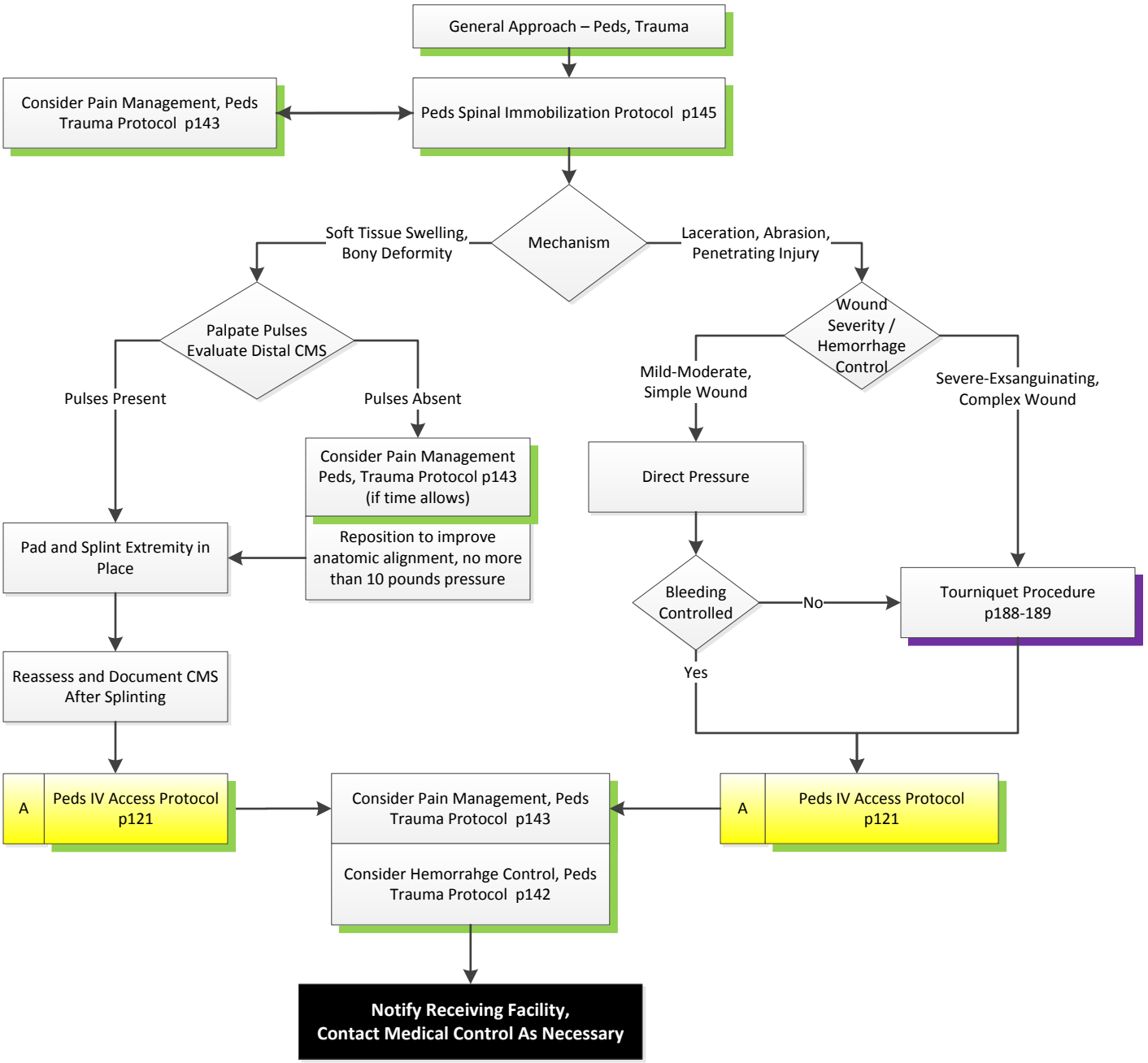
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Pediatric



Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Immobilization of bony injuries should include the joint above and below. Joint injuries require immobilization of bone above and below
- Palpate and document Circulation, Movement and Sensation both before and after splint application
- Tourniquets should remain in place once hemorrhage control is adequate. The tourniquet is tight enough when the bleeding stops!
- If active hemorrhage and bony/soft tissue deformity, priority should be put on hemorrhage control *first*, then splinting – remember A,B,C's
- If amputated extremities available, seal in a plastic bag and place in cool water and bring to the hospital with the patient

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

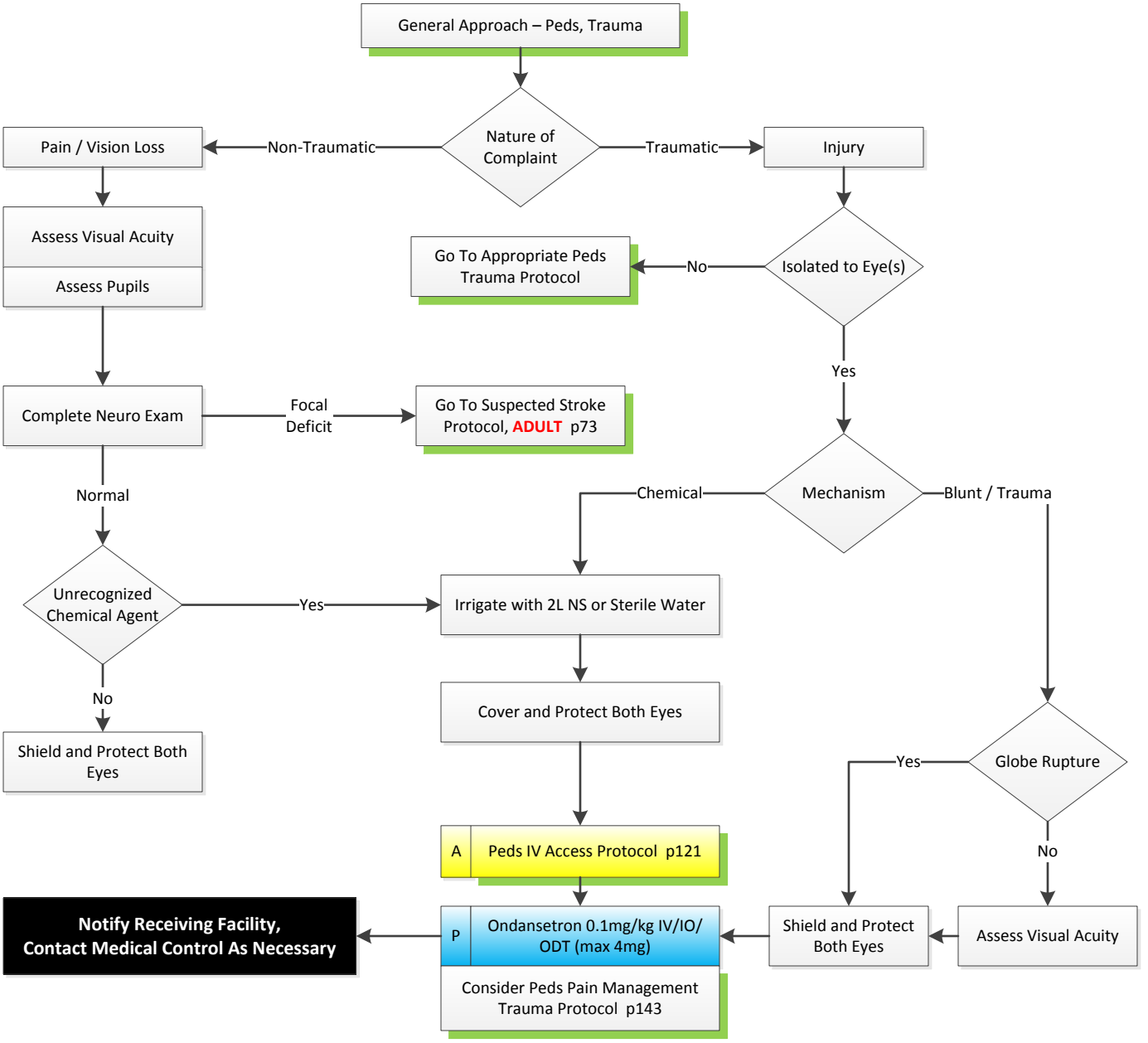
Eye Pain – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Visual Acuity
- SAMPLE History
- OPQRST History
- Time of Injury
- Involved Chemical MSDS
- Contact / Corrective Lens Use
- "Shooting" or "Streaking" Lights
- Rust Ring
- "Lowering Shade" in Vision

Differential

- Globe Rupture
- Acute Closed Angle Glaucoma
- Stroke
- Retinal Artery Occlusion
- Chemical Burn
- Retinal Venous Thrombus



Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: VS, GCS, Visual Acuity, Neuro Exam, Extraocular Movements

- Stabilize any penetrating objects. DO NOT remove any embedded / impaled objects
- If Long Spine Board not indicated, transport with head of stretcher elevated to 60 degrees to help reduce intraocular pressure
- Remove contact lenses when possible
- Always cover both eyes to prevent further injury
- Orbital fractures increase concern for globe or optic nerve injury; follow visual acuity and extraocular movements for changes
- Normal visual acuity can be present, even with severe injury

Eye Pain – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Head Injury – Peds, Trauma

Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Loss Of Consciousness
- Vomiting, Altered Mental Status
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Skull fracture
- Epidural hematoma
- Concussion, Contusion, Laceration, Hematoma
- Non-Accidental Trauma
- Spinal Cord Injury
- Subdural Hematoma
- Subarachnoid Hemorrhage

Trauma Protocols - Pediatric

General Approach – Peds, Trauma

Elevate Head of Stretcher 15-30 degrees while maintaining Spinal Precautions ↔ Peds Spinal Immobilization Protocol p145

A Peds IV Access Protocol p121

Peds Diabetic Emergencies Protocol p120 ← <70 — Blood Glucose

≥70

P Consider Midazolam 0.2mg/kg IM/IN (max 5mg) ← Agitation — Altered Mentation — Seizure → Peds Seizure Protocol p125

Altered Mentation — ≤8 → Peds Airway Management Protocol p106

Altered Mentation — >8 → Consider Peds Airway Management Protocol p106

If evidence of herniation, Goal EtCO2 is 30-35mmHg

M **Increase Respiratory Rate <1 year of age, 35bpm ≥1 year of age, 25bpm**

Maintain SpO2 >93% Goal EtCO2 35-45mmHg

Pain — ≥6/10 → Pain Management, Peds Trauma Protocol p143

Pain — <6/10 → Monitor and Reassess Frequent Airway and GCS Evaluations

Pain Management, Peds Trauma Protocol p143 → Document Response to Meds, Repeat GCS, SpO2, EtCO2

Monitor and Reassess Frequent Airway and GCS Evaluations → **Notify Receiving Facility, Contact Medical Control As Necessary**

Nasal Airways are CONTRAINDICATED in patients with significant Maxillofacial trauma – the cribriform plate may be broken and result in an NPA going into the patient's brain

Unless Patient Condition Dictates Otheriwse, Severe Head Injury Cases Should Be Transported to The Peds Trauma Center

Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- If GCS ≤13 consider Air transport or Rapid Transport to Leveled Trauma Facility
- **Airway interventions can be detrimental to patients with head injury by raising intracranial pressure, worsening hypoxia (causing secondary brain injury) and increasing risk of aspiration. Whenever possible these patients should be managed in the least invasive manner to safely maintain O2 saturation >90% (ie. NRB, BVM with 100% O2, etc.)**
- Acute herniation should be suspected when the following signs are present: acute unilateral dilated and non-reactive pupil, abrupt deterioration in mental status, abrupt onset of motor posturing, abrupt increase in blood pressure, abrupt decrease in heart rate.
- **Only** in suspected acute herniation – increase ventilatory rate with target EtCO2 30-35mmHg
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushings response)
- Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively
- Most important vital sign to monitor and document is level of consciousness (GCS)
- Concussions are periods of confusion or loss of consciousness (LOC) associated with trauma which may have resolved by the time EMS arrives. Any confusion or mental status abnormality should be transported to an Emergency Department. **Any questions or clarifications, contact Medical Control.**

Head Injury – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Hemorrhage Control – Peds, Trauma

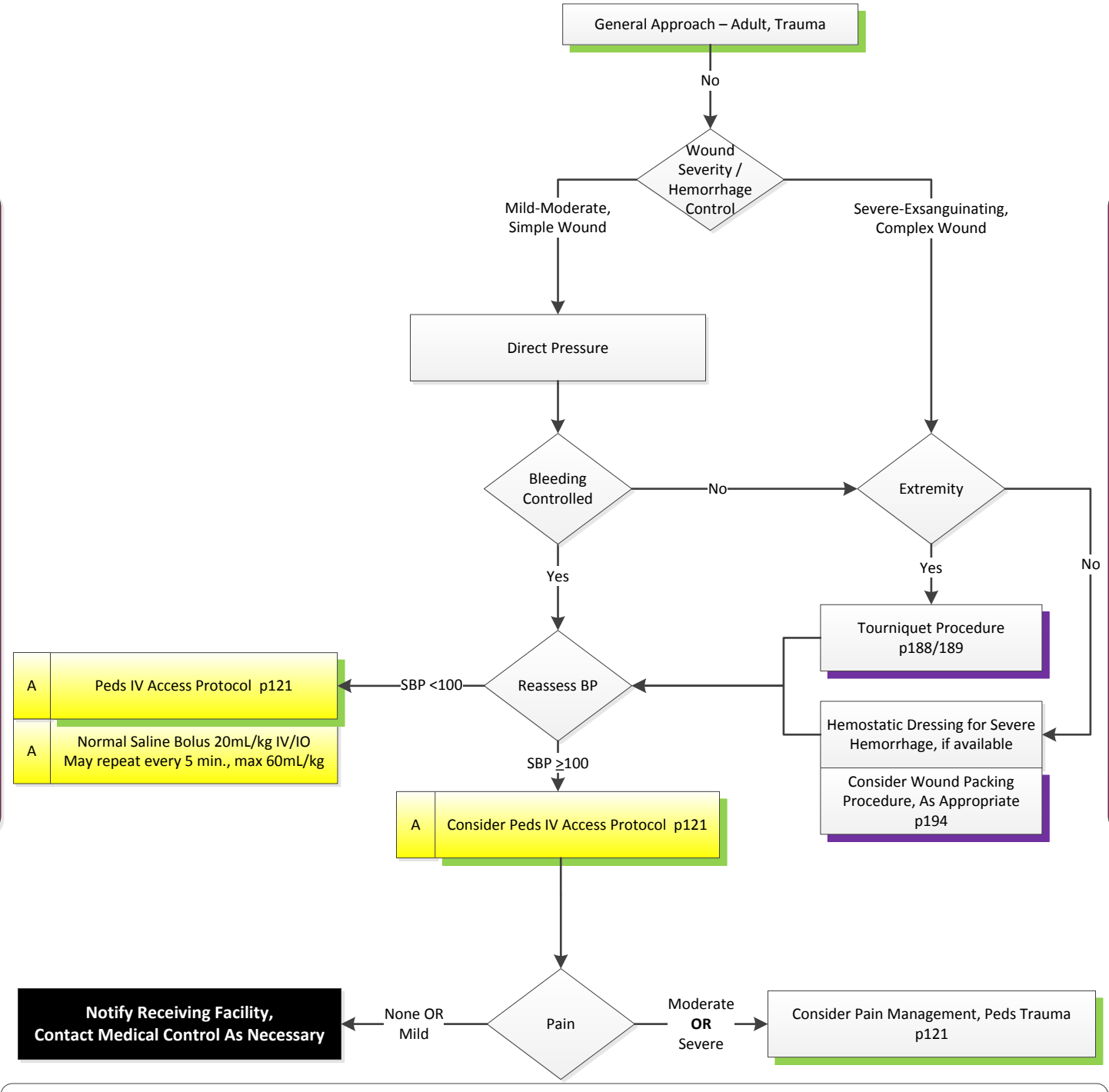
Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury
- Time of Injury
- Deformity
- Diminished pulse / capillary refill

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Trauma Protocols - Pediatric



Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Hypotension in trauma needs blood products early**, so minimize scene time. Goal for scene time in major trauma cases should be <10 min
- Multiple casualty incident or obvious life threatening hemorrhage, consider Tourniquet Procedure and/or Hemostatic Dressing FIRST
- Hemostatic Dressings are appropriate for hemorrhage that can't be controlled with a tourniquet, such as abdominal and pelvic wounds
- Signs/Symptoms of Shock include: altered mental status, pallor, cap refill >3 sec, faint/absent peripheral pulses, hypotension (age defined)

Hemorrhage Control – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

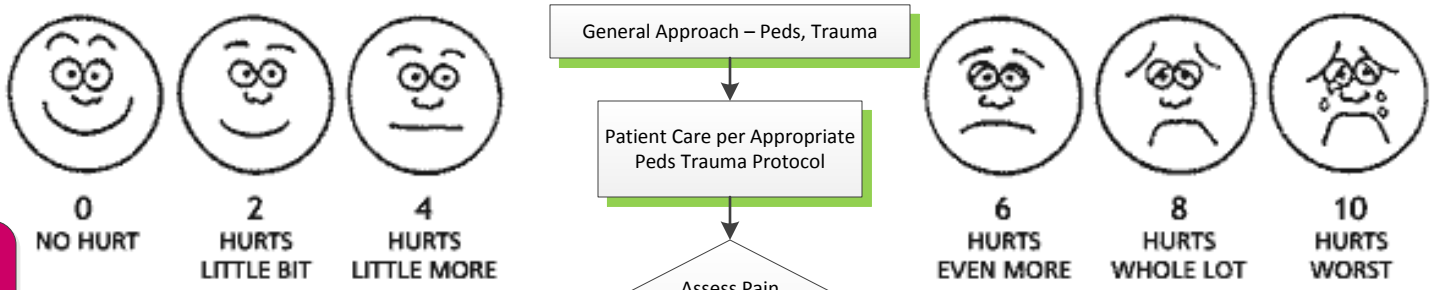
Pain Management – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- History of chronic pain

Differential

- Head injury
- Spine Injury
- Compartment Syndrome
- Fracture, Sprain, Strain
- Pneumo/hemo-thorax
- Pericardial effusion
- Aortic Dissection
- Internal organ injury



Trauma Protocols – Pediatric

General Approach – Peds, Trauma

Patient Care per Appropriate Peds Trauma Protocol

Assess Pain
0-10 Pain Scale OR FACES Scale

None – Mild Pain
(0-4)

A Consider Peds IV Access Protocol p121

Moderate Pain
(5-8)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P Consider IN Fentanyl 1.5mcg/kg (max 100mcg)

A Consider Peds IV Access Protocol p121

Document pain level after meds, VS (HR, BP, SpO2, EtCO2)

Severe Pain
(9-10)

Place patient on cardiac monitor, continuous SpO2 and EtCO2

P Consider IN Fentanyl 1.5mcg/kg (max 100mcg)

A Consider Peds IV Access Protocol p121

Document pain level after meds, VS (HR, BP, SpO2, EtCO2)

SpO2 >93%,
EtCO2 <45,
SBP >90

Reassess Pain

Unchanged **OR** Worsening

P Fentanyl 1mcg/kg IV/IO/IM (max single dose 75mcg) After 5 min, may repeat x 1

P Consider Ondansetron 0.1mg/kg IV/IO (max 4mg)

M **Consider Morphine 0.1mg/kg IV/IO (max 5mg)**

Improved

Reassess and Document VS, including Pain Scale

Return to Peds Trauma Specific Protocol

Trauma Protocols - Pediatric

Pearls

REQUIRED EXAM: Vital Signs, GCS, Neuro Exam, Lung Sounds, abdominal exam, Musculoskeletal Exam

- Provider Discretion to be used for patients suffering from chronic pain related issues. Please note that history of chronic pain does not preclude the patient from treatment of acute pain related etiologies.
- As with all medical interventions, assess and document change in patient condition pre- and post-treatment
- Opiate naive patients can have a much more dramatic response to medications than expected; start low and titrate up as appropriate
- If not fully immobilized, allow patient to choose position of maximum comfort as situation allows
- Intranasal medication doses should be divided between nares, unless contraindications present

Pain Management – Peds, Trauma

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Sexual Assault / Intimate Partner Violence – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- Mechanism of Injury
- Events leading up to 9-1-1 Activation
- Relationship to and Location of Offender
- Strangling or Neck Injury
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Hypovolemic Shock
  - -External Hemorrhage
  - -Internal Hemorrhage
  - -Unstable Pelvic Fracture
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

ALL Healthcare Providers are MANDATORY reporters of suspected abuse, including EMS

If something doesn't feel right, report it

Trauma Protocols - Pediatric

General Approach – Peds, Trauma

Peds Spinal Immobilization Protocol p145

Consider Pain Management, Peds Trauma Protocol p143

A Peds IV Access Protocol p121

Dane County Rape Crisis Center
Rape Crisis Center: 608-251-5126
Crisis Line: 608-251-7273
Domestic Abuse Intervention Services
DAIS Help Line: 608-251-4445

Major Trauma Criteria

Steps 1 and 2 Destination Determination Protocol

Transport To Level 1 Trauma Center

No

Mechanism of Injury

Head Injury → Head Injury, Peds Trauma Protocol p141

Chest Injury → Go To Chest Injury, Peds Trauma Protocol p134

Extremity Injury → Go To Extremity Injury, Peds Trauma Protocol p139

Eye Injury → Go To Eye Injury, Peds Trauma Protocol p140

Sexual Assault

Provide Emotional Support, Do Not Judge The Victim

Contact Law Enforcement for Scene and Provider Safety, if Not Already Present

Preserve Forensic Evidence, Wear Gloves, Use Burn Sheet To Collect Clothing

Work With Law Enforcement to Maintain Chain of Custody

Encourage Patient to Seek Evaluation While Respecting Autonomy

Discourage Patient from Voiding, Vomiting or Bathing to Preserve Evidence

Consider Pain Management, Peds Trauma Protocol p143

Transport to ED with SANE Nurse OR Child Abuse Evaluation Capability

Notify Receiving Facility, Contact Medical Control As Necessary

Trauma Protocols - Pediatric

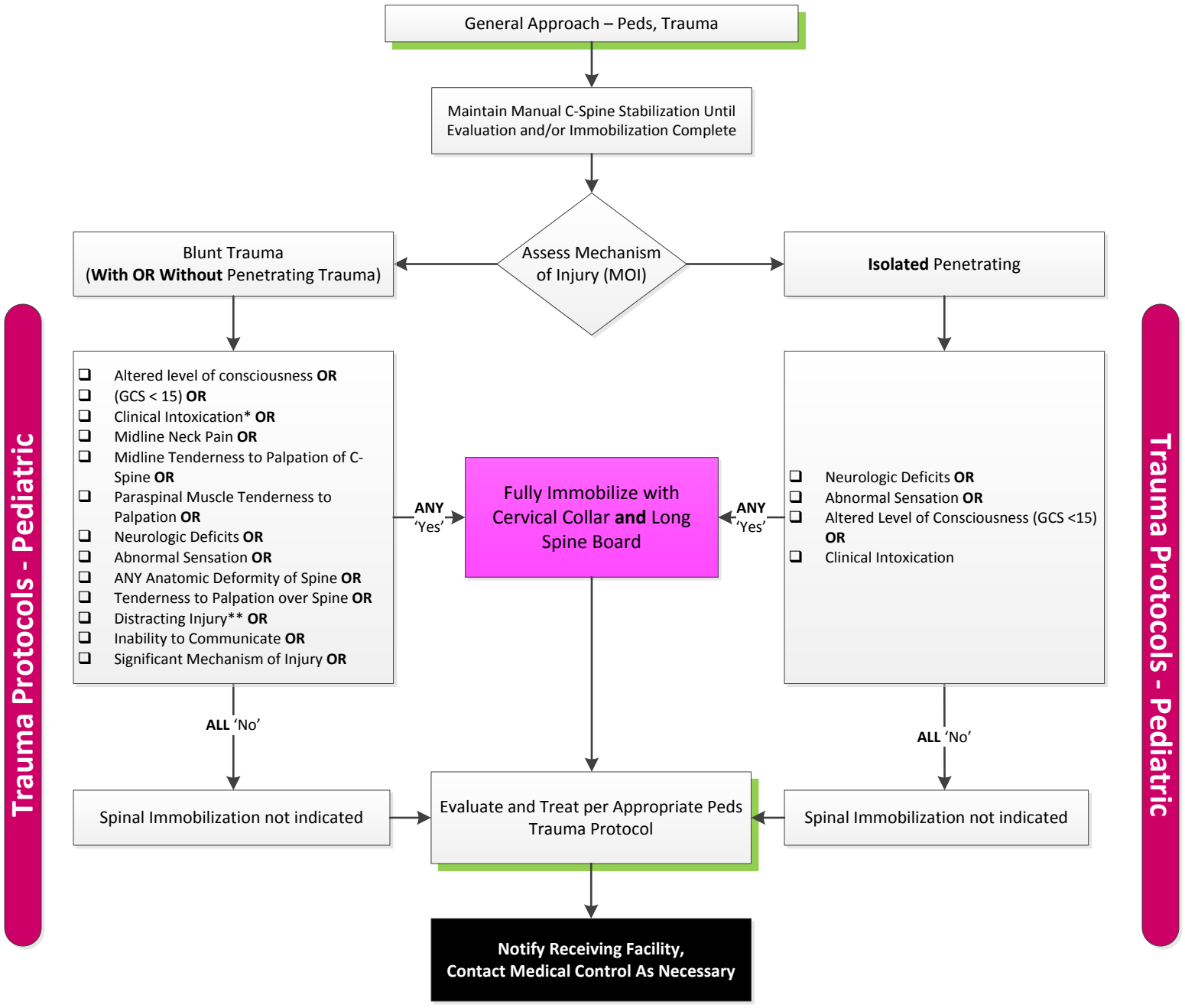
Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Major Trauma Criteria – Step 1 and Step 2 in Destination Determination Protocol.
- Intimate Partner Violence is very difficult to disclose, and *many victims call 9-1-1 with vague complaints*; Have a HIGH index of suspicion
- Never judge a victim of intimate partner violence or sexual assault on the way they dress, act or present themselves
- Do not be afraid to involve Law Enforcement for assistance as needed, and have a low threshold to transport to a SANE Capable Emergency Department where Social Work, SANE Nurses, and Advocates can provide support and resources for these patients
- Child Abuse Evaluation centers are also specialized units with specialized forensic capabilities, Child-Life Specialists and Social Work.

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Spinal Immobilization – Peds, Trauma



Pearls

REQUIRED EXAM: Motor Function both upper and lower extremities, Sensation of upper and lower extremities, subjective abnormal sensation, Tenderness to palpation of bony prominences OR paraspinal muscles

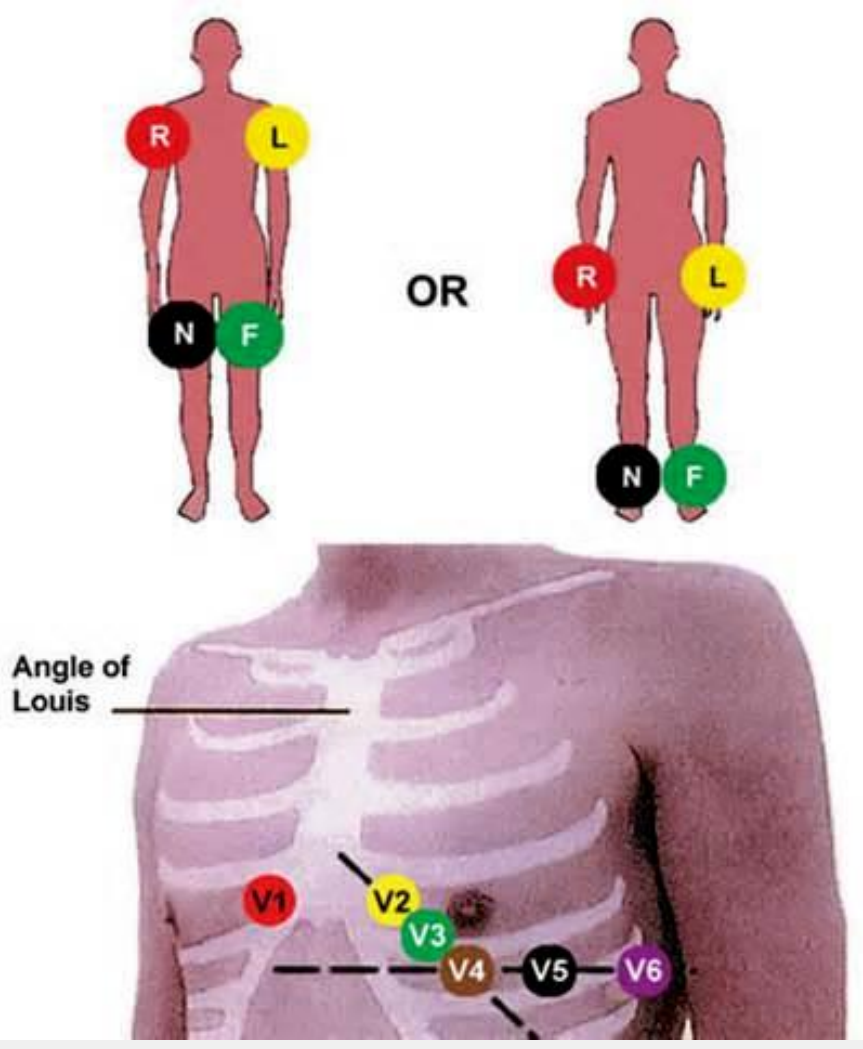
- ***Clinical Intoxication** – A transient condition resulting in disturbances in level of consciousness, cognition, perception, affect or behavior, or other psychophysiological functions and responses. Common examples include; ataxia, emotional instability, flight of ideas, tangential thought or motor incoordination.
- **Distracting Injury – Examples include, but are not limited to: long bone fracture, dislocations, large lacerations, deforming injuries, burns OR any condition preventing patient cooperation with history.
- It is always safer and better patient care to assume that a Spinal Cord injury has occurred and provide protection, and should be the standard of care in trauma patient management
- Rigid cervical collars have risks and benefits for patients. Spinal immobilization should always be applied when ***any*** doubt exists about the possibility of spinal trauma.
- EXTREMELY thoughtful consideration and careful physical exam should be part of any decision to apply or not apply the spinal immobilization, and *must be well documented*.

Spinal Immobilization – Peds, Trauma

ECG, 12-Lead – Procedure

Procedure:

- ❑ 1. Prepare ECG monitor and connect patient cable to electrodes
- ❑ 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- ❑ 3. Apply chest leads and extremity leads using the following landmarks: (Distal to shoulder and distal to hip joint for most accurate ECG)
  - RA: Right Arm
  - LA: Left Arm
  - RL: Right Leg
  - LL: Left Leg
  - V1: 4th intercostal space at right sternal border
  - V2: 4th intercostal space at left sternal border
  - V3: Directly between V2 and V4
  - V4: 5th intercostal space at midclavicular line
  - V5: Level with V4 at left anterior axillary line
  - V6: Level with V5 at left midaxillary line
- ❑ 4. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- ❑ 5. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- ❑ 6. Provide 12 Lead to hospital staff, transmit when appropriate
- ❑ 7. Document the procedure, time, and results on/with the PCR



Procedures

	EMT
A	A-EMT
P	Paramedic

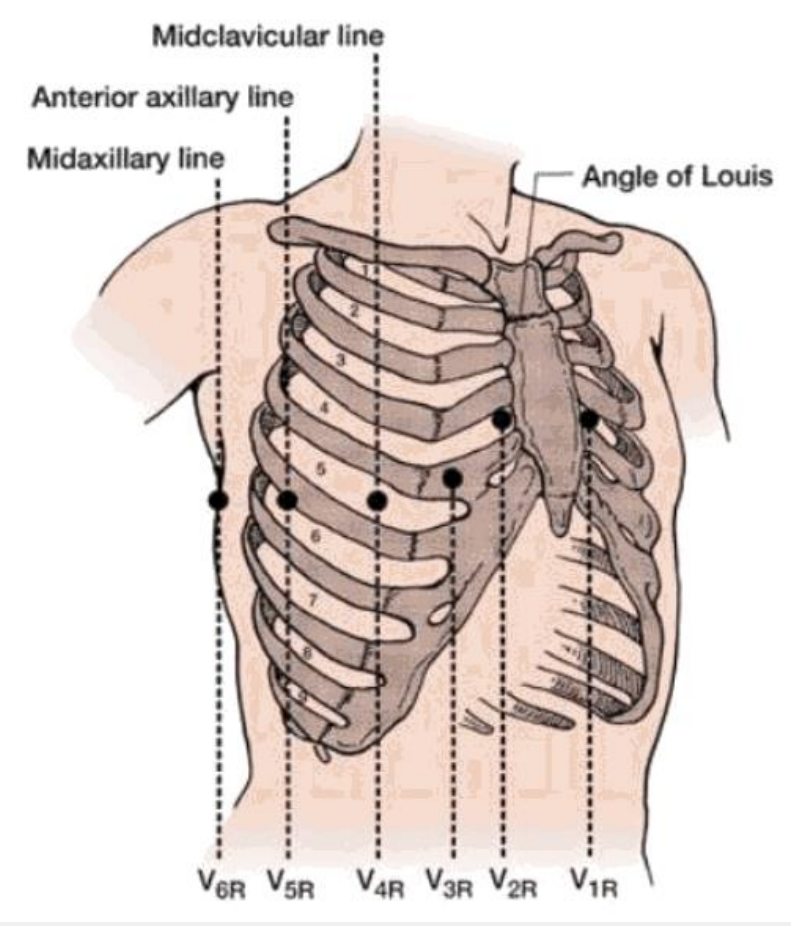
ECG, Right Sided – Procedure

To detect right ventricular STEMI associated with occlusion of the Right Coronary Artery, obtain a Right Sided ECG.
Indications of a Right Ventricle Wall infarct may include:

- ❑ ST elevation in the inferior leads, II, III and aVF
  - ▪ ST elevation that is greatest in lead III is especially significant
- ❑ ST elevation in V1 (the only precordial lead that faces the RV on standard 12-lead ECG)
- ❑ Right Bundle Branch Block, 2nd and 3rd Degree AV Blocks, ST elevation in V2 50% greater than the ST depression in aVF

Procedure:

- ❑ 1. Prepare ECG monitor and connect patient cable to electrodes
- ❑ 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- ❑ 3. Apply chest leads and extremity leads using the following landmarks: (Distal to shoulder and distal to hip joint for most accurate ECG)
  - ▪ V1R: 4th intercostal space, left sternal border
  - ▪ V2R: 4th intercostal space, right sternal border
  - ▪ V3R: halfway between V2R and V4R, on a diagonal line
  - ▪ V4R: 5th intercostal space, right midclavicular line, same horizontal line as V5R and V6R
  - ▪ V5R: right anterior axillary line, same horizontal line as V4R and V6R
  - ▪ V6R: right mid-axillary line, same horizontal line as V4R and V5R
- ❑ 4. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- ❑ 5. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- ❑ 6. Provide Right Sided ECG to hospital staff, transmit when appropriate
- ❑ 7. Document the procedure, time, and results in the electronic Patient Care Report (ePCR)



Procedures

Procedures

	EMT
A	A-EMT
P	Paramedic

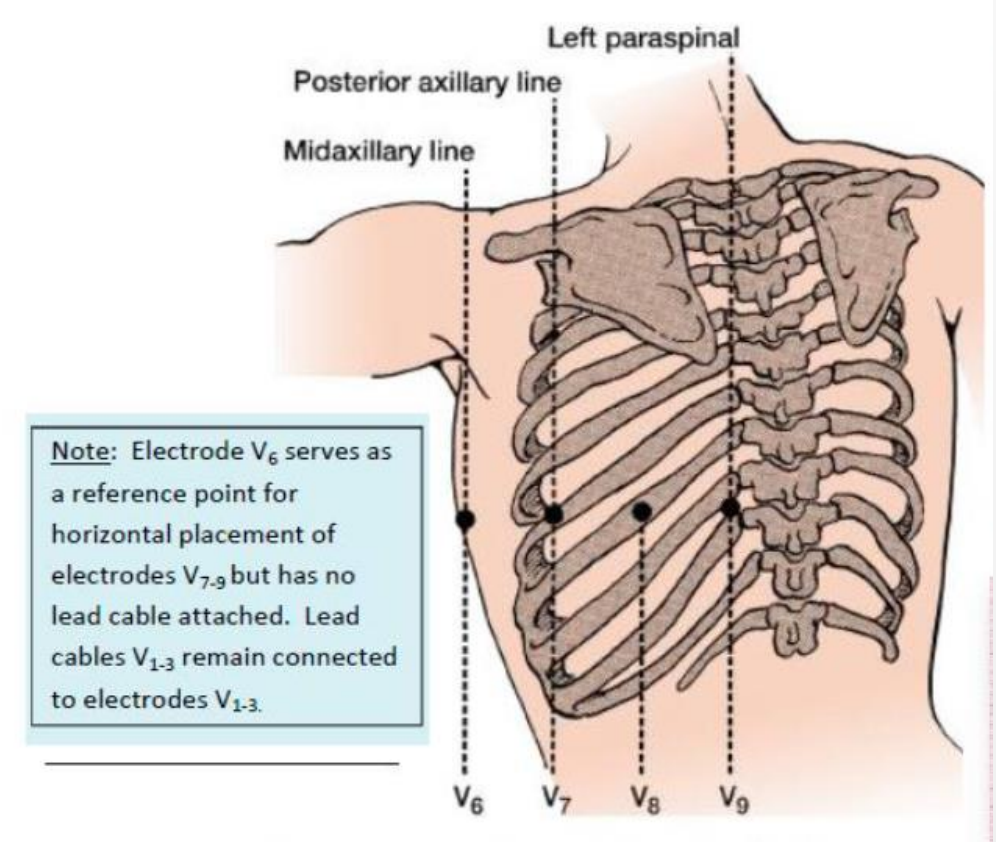
ECG, Posterior – Procedure

To detect posterior STEMI associated with occlusion of the circumflex artery or dominant right coronary artery, obain a posterior ECG. Indications of a posterior wall infarction may include:

- ❑ Changes in V1-V3 on the standard 12-lead ECG predominantly, which include
  - Horizontal ST depression
  - A tall, upright T-wave
  - A tall, wide R-wave
  - R/S wave ratio greater than one
- ❑ Inferior or lateral wall MI (especially if accompanied by ST depression or prominent R waves in leads V1-V3)

Procedure:

- ❑ 1. Prepare ECG monitor and connect patient cable to electrodes
- ❑ 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- ❑ 3. Place three additional ECG electrodes. TIP: start at V9 (the last electrode) and work forward
  - V9: Left spinal border, same horizontal line as V4-6
  - V8: midscapular line, same horizontal line as V7 and V9
  - V7: posterior axillary line, same horizontal line as V4-6
- ❑ 4. Place ECG lead cables as follows (using standard 12-Lead)
  - Lead cable V6 connects to electrode V9
  - Lead cable V5 connects to electrode V8
  - Lead cable V4 connects to electrode V7
  - Lead cables V1-V3 are connected the same way as when obtaining a standard 12-lead ECG
- ❑ 5. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- ❑ 6. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- ❑ 7. Provide Posterior Sided ECG to hospital staff, transmit when appropriate
- ❑ 8. Document the procedure, time, and results in the electronic Patient Care Report (ePCR)



Procedures

Airway Obstruction – Procedure

	EMT
A	A-EMT
P	Paramedic

Procedure:

Foreign Body Airway Obstruction – 1 Year Old Or Less, *Conscious*

- ❑ If coughing, wheezing and exchanging air, do not interfere with the victims efforts to expel the foreign body.
- ❑ If unable to cry or speak, weak or absent cough or no air exchange
  - 1. Support the victim in the head down position with your non-dominant hand and forearm.
  - 2. Perform 5 back slaps with the heel of your dominant hand between the should blades
  - 3. Perform 5 chest thrusts with two fingers in the center of the chest
  - 4. Repeat the steps above until the object is expelled or the victim becomes unresponsive

Foreign Body Airway Obstruction – Greater Than 1 Year Old, *Conscious*

- ❑ If coughing, wheezing and exchanging air, do not interfere with the patient's efforts to expel the foreign body.
- ❑ If unable to speak, weak or absent cough OR no air exchange, perform abdominal thrusts (Heimlich Maneuver).

Foreign Body Airway Obstruction – All Ages, *Unconscious*

- ❑ 1. If patient was responsive and then became unresponsive
  - lower the victim to the ground and begin CPR, starting with compressions (do not check for a pulse)
  - Every time you open the airway to give breaths, open the mouth wide and look for the object
  - If you see an object that can easily be removed, remove it with your finger
  - If you do not see an object, continue CPR
- ❑ 2. If a foreign body is visualized but cannot be removed with finger, attempt to remove it under direct visualization using the Laryngoscope blade and Magill forceps
  - Assemble Laryngoscope and check bulb on blade
  - Hold Laryngoscope in left hand,
  - Place patient in sniffing position
  - Using tongue-jaw lift or cross-finger technique to open mouth
  - Insert laryngoscope blade into right corner of mouth and move to midline, sweeping tongue out of way
  - Elevate mandible to visualize obstruction without using teeth or gums as a fulcrum
  - Grasp Magill forceps in right hand and remove obstruction under direct visualization
- ❑ 3. Provide suction as needed
- ❑ 4. Resume appropriate CPR and airway management

ACTIVATE ALS IF NOT ALREADY CONTACTED AND TRANSPORT RAPIDLY TO THE CLOSEST FACILITY!

P	Paramedic

Paramedic:
Move to FAILED AIRWAY MANAGEMENT PROTOCOL

- ❑ If the obstruction is not visualized or cannot be retrieved, attempt endotracheal intubation with appropriate size ET tube or 0.5 smaller if ≥12 years old
- ❑ If ETT cannot pass and patient is ≥12 years old perform cricothyrotomy with pertrach.
- ❑ If patient is ≥1year old but <12 years old perform needle jet insufflation

TRANSPORT RAPIDLY TO THE CLOSEST FACILITY!

Rapid Sequence Airway (RSA) – Procedure

P | Double Paramedic

Indications:

- ❑ Age >18 unless specific permission given prior to procedure by medical control
- ❑ Need for invasive airway management in the setting of an intact gag reflex or inadequate sedation to perform non-pharmacologically assisted airway management
  - Apnea
  - Decreased LOC with respiratory failure (ie. Hypoxia O2 sat <90% not improved by 100% Oxygen, and/or respiratory rate <8)
  - Poor ventilatory effort (with hypoxia not improved by 100% Oxygen)
  - Unable to maintain patent airway by other means
  - Burns with suspected significant inhalation injury

Contraindications:

- ❑ Sensitivity to Succinylcholine or other RSA drugs
- ❑ Inability to ventilate via BVM
- ❑ Suspected hyperkalemia
- ❑ Myopathy or neuromuscular disease
- ❑ History of malignant hyperthermia
- ❑ Major burn (>48 hours after injury)
- ❑ Crush Injury
- ❑ End Stage Renal Disease
- ❑ Recent Spinal Cord Injury (72 hours – 6 months)

SIMULTANEOUSLY CONTACT MEDICAL CONTROL

TWO PARAMEDICS REQUIRED FOR THIS PROCEDURE

Procedures

Procedures

Procedure:

- ❑ **PREPARATION (T-8 minutes)**
  - Monitoring (continuous ECG, SPO2, Blood Pressure)
  - 2 patent IV's
  - Functioning Laryngoscope and BVM with highflow O2
  - Endotracheal tube(s), stylet, syringe(s)
  - LTA(s) and appropriate syringe(s)
  - Alternative/Rescue Airway (LMA and surgical airway kit) immediately available
  - All medications drawn up and labeled (including post-procedure sedation)
  - Suction - turned on and functioning
  - End Tidal CO2 device on and operational (colometric immediately available as backup only)
  - Assess for difficult airway – LEMON
- ❑ **PREOXYGENATE**
  - 100% O2 x5 minutes (NRB) or 8 vital capacity breaths with 100% O2 (BVM/NRB)
  - Continue apneic oxygenation via high-flow Nasal Cannula throughout procedure (if available)
- ❑ **PRETREATMENT (T-3 minutes)**
  - Lidocaine 1.5mg/kg IV/IO (max 150mg)
  - Begin cricoid pressure/Sellick's maneuver
- ❑ **PARALYSIS and INDUCTION (T=0)**
  - Etomidate 0.3mg/kg (max 20mg)
  - Succinylcholine 2mg/kg (max 200mg)
- ❑ **PLACEMENT with PROOF (T + 30 seconds)**
  - Place LTA/ETT
  - Confirm with
    - ❑ EtCO2 waveform
    - ❑ Auscultation
    - ❑ Physical findings
  - Secure Device, note position
- ❑ **POST-PLACEMENT MANAGEMENT (T + 1 minute)**
  - Sedation: Refer to Sedation Protocol, as needed.
  - If additional needed and transport time >10 minutes: Rocuronium 1mg/kg IV/IO

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Pulse Oximetry – Procedure

Procedure:

- ❑ 1. Apply probe to patient finger or toe, as recommended by the device manufacturer.
- ❑ 2. Allow machine to register oxygen saturation level
- ❑ 3. Record time and initial saturation percent on room air if possible on/with the PCR
- ❑ 4. Verify pulse rate on machine or with actual manual pulse check of the patient
- ❑ 5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary
- ❑ 6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia
- ❑ 7. In general, normal saturation is 97-99%. Below 93% suspect a respiratory compromise
- ❑ 8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device
- ❑ 9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain
- ❑ 10. Factors which may reduce the reliability of the pulse oximetry reading include:
  - Poor peripheral circulation (blood volume, hypotension, hypothermia)
  - Excessive pulse oximeter sensor motion
  - Fingernail polish (may be removed with acetone pad)
  - Carbon monoxide bound to hemoglobin
  - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
  - Jaundice
  - Placement of Blood Pressure cuff on same extremity as pulse ox probe

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Procedures

Intubation – Procedure

P Paramedic

When Considering Intubating Any Patient, Prepare Materials EARLY:

- ❑ Laryngoscope handle with appropriate size blade
- ❑ Proper Size Endotracheal Tube (ETT) *PLUS* Backup ETT 0.5-1.0mm smaller and BIAD
- ❑ Water-soluble lubrication gel, (lubricate distal end of tube at cuff)
- ❑ 10cc syringe (larger syringe if low pressure cuff)
- ❑ Stylet, (insert into ET tube and do no let stylet extend beyond tip of ET tube) – if not already incorporated into ETT
- ❑ Tape or ETT securing device
- ❑ Proper size oral pharyngeal airway
- ❑ BVM
- ❑ Oxygen Source
- ❑ Suction Device
- ❑ Stethoscope
- ❑ Continuous Digital Waveform Capnography
- ❑ Oxygen saturation monitor

Procedure:

- ❑ 1. Maintain cervical alignment and immobilization, as necessary
- ❑ 2. Attach proper blade to laryngoscope handle and check light
- ❑ 3. Check endotracheal tube cuff, lubricate distal end of the tube
- ❑ 4. Confirm patient attached to cardiac monitor and oxygen saturation monitor
- ❑ 5. Ready ETCO2 detection device
- ❑ 6. Specify personnel to:
  - Apply cricoid pressure
  - Maintain cervical alignment and immobilization during procedure
  - Watch cardiac and oxygen saturation monitors
- ❑ 7. Preoxygenate patient with 100% Oxygen (BVM or NRB) before intubation attempt to achieve O2 saturation ≥93% for 5 minutes or 8 vital capacity breaths. Have assistant apply cricoid pressure (Sellick's Maneuver) during entire procedure.
- ❑ 8. Remove all foreign objects, such as dentures, Oropharyngeal Airways (OPA), etc., and suction the patients airway if needed.
  - May leave an esophageal ETT if prior unsuccessful attempt to use as landmark for second attempt
- ❑ 9. Insert the blade into the right side of the patient's mouth sweeping the tongue to the left side
- ❑ 10. Visualize the vocal cords while avoiding any pressure on the teeth
- ❑ 11. Insert the endotracheal tube until the cuff passes the vocal cords.
  - Insert far enough so that balloon port tubing is even with the lips
  - Typical depth = tube size (ID) x3 (example would be tube depth of 24 for a 8.0mm tube)
- ❑ 12. Remove the laryngoscope blade
- ❑ 13. Inflate the endotracheal cuff with the syringe with 5-10cc of air (low pressure cuff may require larger volume) and remove the syringe from inflation valve
- ❑ 14. Ventilate with BVM and confirm tube placement:
  - Observe immediate (within 6 breaths) EtCO2 waveform and number with capnography
  - Watch for chest rise AND
  - Auscultate abdomen, listening for air movement in the stomach to ensure tube is not esophageal
  - Auscultate bilateral breath sounds to confirm tube placement
- ❑ 15. Observe oxygen saturation

Note: Regardless of apparent presence of lung sounds, tube misting, chest rise, AND/OR lack of gastric sounds:
if EtCO2 does NOT indicate proper tube location (alveolar waveform), ETT must be removed.

Procedures

Procedures

Intubation – Procedure

Procedure (continued):

- ❑ 16. If unilateral right sided breath sounds are heard, consider:
  - Right mainstem intubation
  - Deflate the cuff and withdraw tube 1-2cm
  - Reinflate cuff and repeat auscultation procedure as above for breath sounds
- ❑ 17. If bowel sounds heard with bagging or EtCO2 device does not indicate proper ETT placement, deflate cuff, remove tube and ventilate with BVM for two minutes
  - **IF AND ONLY IF** intubation attempted for medical reason AND unsuccessful on first attempt, may return to Step 7 of Procedure and repeat
- ❑ 18. If intubation attempt unsuccessful, refer to the next step in the Airway Management, Adult protocol.

IF successful intubation confirmed by Steps 13-15 above:

- ❑ 19. Secure tube using an endotracheal securing device
- ❑ 20. Document depth of tube
- ❑ 21. Reassess and document lung sounds, Vital Signs and patient clinical status
- ❑ 22. Insert Oropharyngeal Airway (OPA), or use commercially available bite block with ET Tube holder (if available)
- ❑ 23. Ensure Cervical Spine is immobilized to prevent accidental dislodgement of ETT during procedures or patient movement
- ❑ 24. Continue ventilations at a rate of 8-10 breaths per minute; adjust rate to maintain SpO2 ≥93% and EtCO2 35-45mmHg, and as appropriate for patient condition
- ❑ 25. Document EtCO2 waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Procedures

Video Assisted Laryngoscopy (VAL)

- ❑ Video Assisted Laryngoscopy (VAL) shall be performed in accordance with documented manufacturer recommendations.
- ❑ Follow Intubation procedure with the addition of VAL technology.
- ❑ It is *essential* that every operator of a VAL be competent in Direct Laryngoscopy (DL) in preparation for unsuccessful VAL operation or equipment malfunction.

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King LT-D and King LTS-D Laryngeal Tube Airway – Procedure

Prepare All Procedure Specific Materials:

- ❑ Correctly sized Laryngeal Tube Airway (LTA) – see chart below
- ❑ Bag Valve Mask
- ❑ Oxygen Reservoir
- ❑ Suction Device
- ❑ Bite Block AND/OR endotracheal tube holder (if available)
- ❑ Appropriately sized syringes for inflating cuff
- ❑ End Tidal CO2 and Oxygen Saturation Monitoring Devices

Airway Size	Connector Color	Patient Height	OD/ID (mm)	Cuff Volume (ml)	Gastric Tube (Fr.)
0	Transparent	<5kg	NA	10ml	10
1	White	5-12kg	NA	20ml	10
2	Green	12-25kg	NA	25-35	16
2.5	Orange	41-51 inches	NA	30-40	16
3	Yellow	4-5 feet	18/10mm	45-60	Up to 18
4	Red	5-6 feet	18/10	60-80	Up to 18
5	Purple	>6 feet	18/10	70-90	Up to 18

Procedure:

- ❑ 1. Pre-oxygenate patient with 100% Oxygen via Bag Valve Mask or spontaneous ventilation to achieve O2 saturation of ≥93% if possible
- ❑ 2. Check the integrity of the cuff inflation system and pilot balloon
- ❑ 3. Fully deflate the cuff with the syringe
- ❑ 4. Lubricate the posterior distal tip of the device with a water soluble lubricant
- ❑ 5. Place patient in neutral sniffing position (if no Cervical Spine/Spinal Injury suspected)
  - For patient with suspected Cervical Spine injury, perform two-person insertion technique
  - One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure
- ❑ 6. Pull mandible down to open mouth
- ❑ 7. Insert uninflated device into oral cavity with midline or a lateral technique
- ❑ 8. Advance the tip behind the base of the tongue while rotating tube back to midline so that the blue orientation line faces the chin of the patient.
- ❑ 9. Without exerting excessive force, advance tube until base of the colored connector is aligned with teeth or gums
- ❑ 10. Inflate the King with the appropriate volume:
  - If inflated King Airway insertion is difficult, perform jaw thrust, pulling the tongue forward. Alternately, a laryngoscope may be used to lift the jaw/mandible to facilitate insertion.
- ❑ 11. Attach the BVM to the King.
- ❑ 12. While bagging the patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure).
- ❑ 13. Adjust cuff inflation if necessary to obtain a seal of the airway at the peak ventilatory pressure employed.
- ❑ 14. Obtain End-tidal CO2 (waveform), auscultate breath sounds bilaterally, look for chest excursion, and check oxygen saturation
- ❑ 15. Secure in the midline to help maintain a good seal over the larynx.
- ❑ 16. Place bite block, oral airway or endotracheal tube holder (if available) between teeth to prevent biting tube
- ❑ 17. Place orogastric tube and attach to low continuous suction as directed in the applicable procedure to assist in gastric decompression
- ❑ 18. Ensure C-spine is still immobilized
- ❑ 19. If repeated attempts are made, oxygenate with 100% O2 for 2 minutes between attempts
- ❑ 20. **Follow manufacturers suggested guidelines at all times**
- ❑ 21. Document ETCO2 waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO2 does NOT indicate proper tube location (alveolar waveform), Advanced Airway must be removed.

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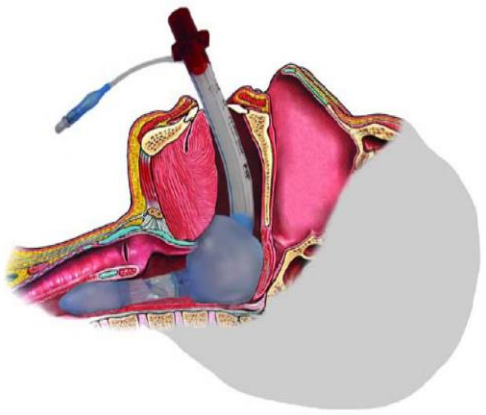
King LTD and King LTS-D Laryngeal Tube Airway – Procedure

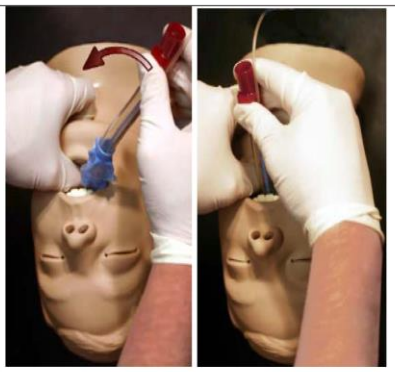


King LT Airway – The correctly placed King LT airway lies with the tip resting in the upper esophagus. The distal cuff inflates in the esophagus, isolating the laryngopharynx from the esophagus. The proximal cuff inflates at the base of the tongue. It isolates laryngopharynx from the oropharynx and the nasopharynx.

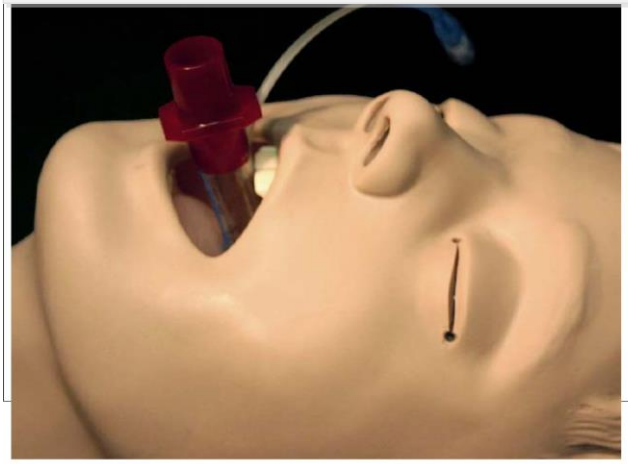
Proper placement of a King LT (Emergency Insertion Technique)

1. Place patient in neutral (sniffing position if no cervical spine injury suspected) and pull down on the mandible to open the mouth. Insert the King LT into the oral cavity from either a midline or lateral approach.

2. Advance the tip of the tube behind the base of the tongue (see figure 1).Then rotate the tube back to the midline so that the blue orientation line faces the chin of the patient (see figure2).



3. Without exerting force, advance tube until base of connector is aligned with the teeth or gums. Then inflate cuff with appropriate volume.



4. Attach BVM to King LT. While bagging the patient gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure). Adjust cuff inflation to maintain seal at the peal ventilatory pressure employed.

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Laryngeal Mask Airway (LMA) – Procedure

Prepare All Procedure Specific Materials:

- ❑ Correctly sized laryngeal mask airway (see chart below)
- ❑ Bag valve mask or automatic ventilator
- ❑ Oxygen reservoir
- ❑ Suction device
- ❑ Bite block and/or endotracheal tube holder (if available)
- ❑ 25 and/or 35mL syringes for expanding cuff
- ❑ End Tidal CO2 and Oxygen saturation monitoring devices

Laryngeal Mask Airway Sizes					
Mask Size	**Patient weight (kg)**	**Age (years)**	**Length (cm)**	**Cuff volume (mL)**	**Largest ETT***
1	<5kg	<0.5yrs	10cm	4	3.5mm
1.5	5-10		10	5-7	
2	10-20	.5-5	11.5	7-10	4.5
2.5	20-30	5-10	12.5	14	5
3	30-60	10-15	19	15-20	6
4	60-80	>15	19	25-30	6.5
5	>80	>15	19	30-40	7

*Appropriately sized endotracheal tube (internal diameter) that can be passed through LMA for blind intubation if intubating LMA is inserted

Procedure:

- ❑ 1. Pre-Oxygenate patient with 100% Oxygen via bag valve mask to achieve O2 saturation of >93% if possible
- ❑ 2. Remove the red tag from the balloon port
- ❑ 3. Check the integrity of the cuff and pilot balloon
- ❑ 4. Tightly deflate the cuff with the syringe – the deflated cuff should appear BOAT shaped
- ❑ 5. Lubricate the posterior surface
- ❑ 6. Place patient in neutral sniffing position (if no c-spine/spinal injury suspected)
  - For patients with suspected c-spine injury, perform two person insertion technique: One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure as below
- ❑ 7. Pull mandible down to open mouth
- ❑ 8. Insert uninflated LMA into oral cavity with cuff facing away from hard palate
- ❑ 9. Guide LMA around curvature of the posterior pharynx into the hypopharynx until resistance is felt. Resistance is due to the tip of the LMA stopping at the upper esophageal sphincter
- ❑ 10. If uninflated LMA insertion is difficult:
  - If the curvature of the posterior/hypopharynx is too acute, perform a jaw thrust, pulling the tongue forward. Alternately, a laryngoscope may be used to lift the jaw/mandible to facilitate insertion
  - A slight inflation of the cuff to ⅓ to ½ of typical inflation volume may also increase ease of insertion
  - Insert LMA with cuff facing hard palate, then rotate 180 degrees into the proper position after the angle around the posterior aspect of the tongue has been cleared.

Continued on next page-

Laryngeal Mask Airway (LMA) – Procedure

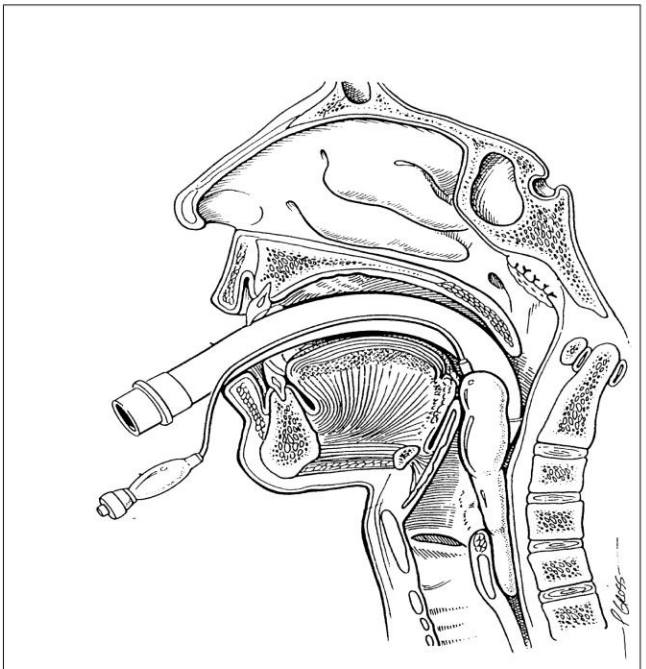
Procedure (continued):

- ❑ 11. Inflate cuff without holding the tube
- ❑ 12. Ensure that the black line running the length of the LMA shaft is in the midline of the upper lip and between the two central incisors (this will help maintain a seal)
- ❑ 13. Administer gentle positive pressure ventilation
- ❑ 14. Obtain End-Tidal CO_2 (waveform), listen for breath sounds bilaterally, look for chest excursion, and check oxygen saturation
- ❑ 15. Secure in the midline to help maintain a good seal over the Larynx
- ❑ 16. Place bite block, gauze or endotracheal tube holder (if available) between teeth to prevent biting tube
- ❑ 17. Ensure c-spine is still immobilized
- ❑ 18. If repeated attempts are made, oxygenate with 100% O2 for 2 minutes between attempts.

Intubation using Intubating Laryngeal Mask Airway (ILMA):

- ❑ 1. Select correct size ILMA
- ❑ 2. Insert endotracheal tube into oropharynx at 90 degree angle (from corner of mouth)
- ❑ 3. During insertion and passage through the ILMA rotate ET tube 90 degrees so that the tip of the ET tube will pass through the bars that traverse the distal opening of the ILMA
- ❑ 4. Confirm placement as per endotracheal intubation procedure.

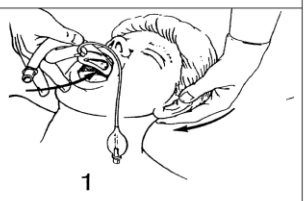
Laryngeal Airway Mask



Laryngeal Mask Airway – The correctly placed LMA lies with the tip resting against the upper esophageal sphincter, the sides against the pyriform fossa and the upper border against the tongue. The opening of the distal end of the LMA should be directly over the glottis (the anterior portion under the epiglottis)

LMA, continued

Proper placement for an LMA (Emergency Insertion Technique)

1. Place patient in neutral (sniffing position if no cervical spine injury suspected) and pull down on the mandible to open the mouth. Insert the LMA into the oral cavity and hold it against the hard palate. This also may be performed from the foot of the bed.	 1
2. Press the LMA tube firmly against the hard palate by placing a lubricated finger or thumb just inside the mouth under the tube **(1).** (see figure) Guide the LMA around the curvature of the posterior pharynx and into the hypopharynx until the characteristic resistance is felt as the tip touches the upper esophageal sphincter. (do not place finger into mouth as shown in this figure. Maintaining firm pressure push tube inwards **(2)** aiming in a cephalad direction so that it slides between the finger and palate until resistance is felt.	 2
3. Inflate the cuff. This will cause the LMA to advance out of the oropharynx by 1-2 cm. Apply gentle positive pressure ventilation and listen for breath sounds. If successful place bite block.	

Procedures

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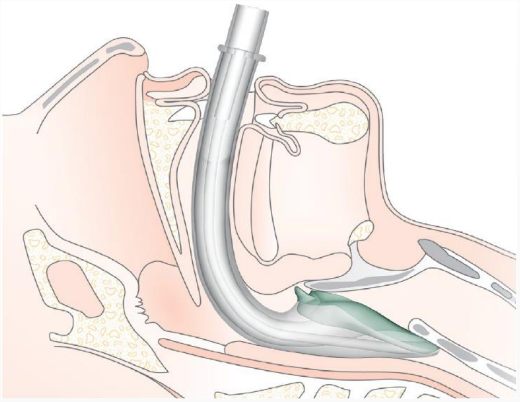
i-gel Airway – Procedure

Prepare All Procedure Specific Materials:

- ❑ Correctly sized i-gel Airway Device – see chart below
- ❑ Bag Valve Mask
- ❑ Oxygen Reservoir
- ❑ Suction Device
- ❑ Appropriate endotracheal tube holder (if available)
- ❑ End Tidal CO_2 and Oxygen Saturation Monitoring Devices



Patient Size	Size	Weight
Neonate	1	2-5kg
Infant	1.5	5-12kg
Small paediatric	2	10-25kg
Large paediatric	2.5	25-35kg
Small adult	3	30-60kg
Medium adult	4	50-90kg
Large adult	5	90+kg

Procedure:

- ❑ 1. Pre-oxygenate patient with 100% Oxygen via Bag Valve Mask or spontaneous ventilation to achieve O_2 saturation of ≥93% if possible
- ❑ 2. Lubricate the posterior distal tip of the device with a thin layer of water soluble lubricant
- ❑ 3. Place patient in neutral sniffing position (if no Cervical Spine/Spinal Injury suspected)
  - For patient with suspected Cervical Spine injury, perform two-person insertion technique
  - One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure
- ❑ 4. Pull mandible down to open mouth
- ❑ 5. Insert device into oral cavity with midline or a lateral technique
- ❑ 6. Advance the tip behind the base of the tongue with the i-gel cuff outlet facing toward the chin of the patient
  - NOTE: If necessary, the upper airway should be suctioned prior to attempted insertion
- ❑ 7. Without exerting excessive force, advance tube downwards and backwards along the hard palate with a continuous but gentle push until definitive resistance is felt.
  - WARNING: Do not apply excessive force on the device during insertion.
- 8. The incisors should be resting on the device integrated bite block.
- ❑ 9. Attach the BVM to the i-gel.
- ❑ 10. If resistance is felt while bagging the patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure).
- ❑ 11. Obtain End-Tidal CO_2 (waveform), auscultate breath sounds bilaterally, look for chest excursion, and check oxygen saturation
- ❑ 12. Secure in the midline to help maintain a good seal over the larynx.
- ❑ 13. Place orogastric tube in side port and advance to appropriate position. Attach to low continuous suction as directed in the applicable procedure to assist in gastric decompression
- ❑ 14. Ensure C-spine is still immobilized
- ❑ 15. If repeated attempts are made, oxygenate with 100% O2 for 2 minutes between attempts
- ❑ 16. **Follow manufacturers suggested guidelines at all times**
- ❑ 17. Document ETCO2 waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO2 does NOT indicate proper tube location (alveolar waveform), Advanced Airway must be removed.

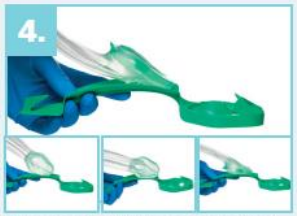
i-gel Airway – Procedure

Adult sizes

Open the i-gel package, and on a flat surface take out the protective cradle containing the device.

Remove the i-gel and transfer it to the palm of the same hand that is holding the protective cradle, supporting the device between the thumb and index finger.

Place a small bolus of a water-based lubricant, such as K-Y Jelly®, onto the middle of the smooth surface of the protective cradle in preparation for lubrication.



Grasp the i-gel with the opposite (free) hand along the integral bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant.

Inspect the device carefully, confirm there are no foreign bodies or a BOLUS of lubricant obstructing the distal opening. Place the i-gel back into the protective cradle in preparation for insertion.

Go to step **6.** for insertion technique

Paediatric sizes

Open the i-gel package, and on a flat surface take out the cage pack containing the device.

Open the cage pack and transfer the i-gel into the lid of the cage.

Place a small bolus of a waterbased lubricant, such as K-Y Jelly®, onto the middle of the smooth surface of the cage pack ready for use.

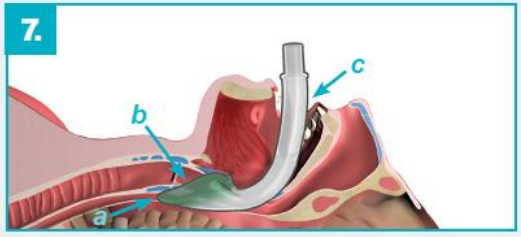
Grasp the i-gel along the integral bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant.

Inspect the device carefully, confirm there are no foreign bodies or a BOLUS of lubricant obstructing the distal opening. Place the i-gel back into the cage pack in preparation for insertion.

Go to step **6.** for insertion technique

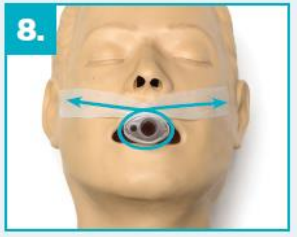
Insertion technique

Remove the i-gel from the protective cradle or cage pack. Grasp the lubricated i-gel firmly along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the chin of the patient. The patient should be in the 'sniffing the morning air' position with head extended and neck flexed. The chin should be gently pressed down before proceeding. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.



Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.

The tip of the airway should be located into the upper oesophageal opening (a) and the cuff should be located against the laryngeal framework (b). The incisors should be resting on the integral bite block (c).



The i-gel should be taped down from 'maxilla to maxilla'.

http://www.intersurgical.com/info/igel

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Suctioning (Basic) – Procedure

Procedure:

- ❑ 1. Ensure suction device is in proper working order with suction tip in place.
- ❑ 2. Set mechanical suction device to appropriate setting (Adult: 120-150mmHg **OR** Pediatric: 80-100mmHg).
- ❑ 3. Measure suction tip from corner of mouth to ear lobe and marks maximum insertion depth; **OR** ensure tip of catheter is always in sight during use.
- ❑ 4. Preoxygenate the patient.
- ❑ 5. Explain the procedure to the patient, if they are coherent.
- ❑ 6. Examine the oropharynx and remove any potential foreign bodies or material that may occlude the airway if dislodged by the suction device.
- ❑ 7. If applicable, remove ventilation devices (i.e. BVM, OPA) from the mouth and upper airway.
- ❑ 8. Insert into mouth without finger hole covered
- ❑ 9. Once inserted, cover the finger hole with a gloved finger to remove any secretions, blood, or other substances. The alert patient may assist with this procedure. Continue to cover the finger hole while removing.
- ❑ 9. Max suction time:
  - Adult - 15 seconds
  - Pediatric - 10 seconds
  - Infant - 5 seconds
- ❑ 10. Reattach ventilation device (i.e. BVM) and resume ventilations or patient assistance, as applicable.
- ❑ 11. Record the time and result of the suctioning procedure in the electronic Patient Care Report (ePCR).

Procedures

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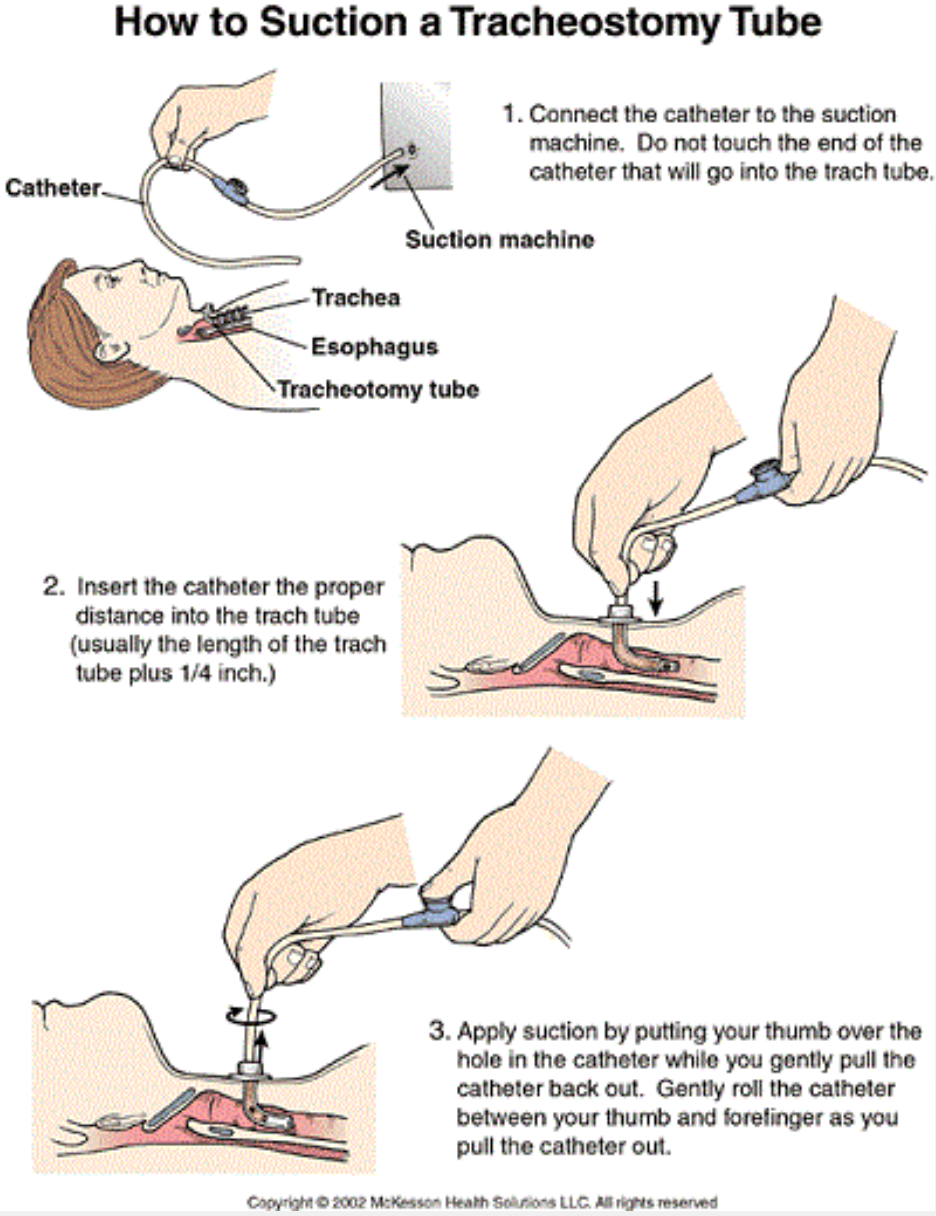
Suctioning (ET Tube and Stoma) – Procedure

P Paramedic

Procedure:

- ❑ 1. Ensure suction device is in proper working order with suction tip in place.
- ❑ 2. Preoxygenate the patient.
- ❑ 3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
- ❑ 4. For all devices, use the suprasternal notch as the end of the airway. Measure the depth desired for the catheter (judgement must be used regarding the depth of suctioning with Endotracheal, Cricothyrotomy and Tracheostomy tubes).
- ❑ 5. If applicable, remove ventilation devices (i.e. BVM, OPA) from the airway.
- ❑ 6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
- ❑ 7. Once the desired depth (measured in #4 above) has been reached, use a gloved finger to occlude the thumb port and remove the suction catheter slowly.
- ❑ 8. A small volume (<10mL) of normal saline may be used to lavage secretions as needed, with supplemental oxygen and/or ventilations x 5 tidal volumes between lavages.
- ❑ 9. Reattach ventilation device (i.e. BVM) and ventilate or assist the patient as needed.
- ❑ 10. Record the time and result of the suctioning procedure in the electronic Patient Care Report (ePCR).



Procedures

	EMT
A	A-EMT
P	Paramedic

Tracheostomy Care – Procedure

Purpose:

- ❑ To maintain a patent airway and adequate oxygenation of the patient with a temporary or permanent tracheostomy.

Clinical Indications:

- ❑ Patient with temporary or permanent tracheostomies obstructed by secretions.
- ❑ Patient unable to replace own tracheostomy tube.

Procedure:

Permanent Tracheostomy (upper airway structures surgically removed and trachea surgically attached to skin stoma)

- ❑ Suction through opening in neck (upper airway is surgically absent and aspiration not possible)
- ❑ If secretions are very thick, instill 2.5-5mL NS to liquefy secretions
- ❑ Ventilate as necessary through stoma
- ❑ Consider intubation
- ❑ Insert ET tube through stoma until cuff is past opening
- ❑ Inflate cuff with 6-8mL of air
- ❑ Auscultate bilaterally over axilla and stomach to confirm placement
- ❑ Connect end-tidal CO2 monitoring as standard
- ❑ Secure ET tube
- ❑ ET tube may only be shortened to where the balloon inflation line separates from the tube

Temporary Tracheostomy (a metal or plastic tube is placed through the anterior neck and is held in place with ties around the neck)

- ❑ Suction through inner trach tube
- ❑ If secretions are very thick, instill 2.5-5mL NS to liquefy secretions
- ❑ If outer tube has been displaced or is blocked, remove and replace it with patient's spare tube or an ET tube
- ❑ Ventilate as necessary by attaching bag-valve directly to tube (an adapter from an ET tube may be needed to make the connection
- ❑ If ventilating through stoma with uncuffed tube, block the upper airway
- ❑ Consider intubation

IF ABLE To Intubate Through Stoma

- ❑ Remove tracheostomy tube
- ❑ Insert ET tube through stoma until cuff is past skin opening
- ❑ Inflate cuff with 6-8mL of air
- ❑ IF uncuffed ET tube was used, upper airway must be blocked when ventilating
- ❑ Auscultate bilaterally over the axilla and stomach to confirm placement
- ❑ Connect end-tidal CO2 monitoring as standard
- ❑ Secure ET tube
- ❑ ET tube may only be shortened to where the balloon inflation line separates from the tube

IF NOT ABLE To Intubate Through Stoma

- ❑ Intubate through upper airway
- ❑ Pass cuff of tube BELOW stoma opening in anterior neck (partner or assistant to visually verify externally)
- ❑ Inflate cuff with 6-8mL of air
- ❑ Ventilate, blocking opening in anterior neck
- ❑ Auscultate bilateally over axilla and stomach to confirm placement
- ❑ Connect end-tidal CO2 monitoring as standard
- ❑ Secure ET tube
- ❑ No shortening of ET tube permitted

Notes:

- ❑ Suctioning removes air as well as secretions. Be sure to over-ventilate for 20-30 seconds after suctioning
- ❑ "Fresh" Tracheostomies (<3 months) are very fragile and have a high potential for creating a false tract if manipulated without trach tube in place – this should be avoided unless all other airway options have been exhausted and the patient is in extremis

Continuous Positive Airway Pressure (CPAP) – Procedure

Prepare All Procedure Specific Materials:

- ❑ Medical Director approved Continuous Positive Airway Pressure (CPAP) Device as per manufacturer written procedure.

Procedure:

- ❑ 1. Attach cardiac monitor, End-tidal CO2 (EtCO2) and continuous pulse oximetry (SpO2).
- ❑ 2. Assemble device according to manufacturer procedure. Attach supplemental Oxygen per manufacturer procedure.
- ❑ 3. Verbally instruct patient and coach breathing with the device.
  - Patient must be able to follow commands and interact with EMS Provider to use this tool effectively.
- ❑ 4. Instruct patient to slowly breathe in through the nose and exhale through the mouth.
  - Inhalation to exhalation ratio should be roughly 4:1.
- ❑ 5. Set positive end-expiratory pressure (PEEP) to 5cmH_2O.
- ❑ 6. Secure mask in place with head strap.
- ❑ 7. Reassess patient and titrate PEEP to desired effect, per protocol.
- ❑ 8. Record and monitor vital signs, EtCO2, and SpO2 frequently.
  - Changes in patient condition, patient complaint or clinical picture should all result in repeat of full VS and documentation.
- ❑ 9. In the event of worsening respiratory status after initiation of CPAP:
  - Evaluate patient compliance and offer reassurance, verbal coaching if appropriate.
  - Remove CPAP mask and stop treatment if patient unable to tolerate CPAP **OR** if clinically deteriorating.
  - Institute BLS and ALS care per appropriate protocol.
  - Document adverse reactions, and reasons why CPAP was discontinued in electronic Patient Care Report (ePCR).

Consider CPAP protocol if 2 or more are present:

- ❑ Tachypnea, nasal flaring, subcostal/intercostal retractions, tracheal tugging
- ❑ Suspected bronchospasm on clinical exam
- ❑ Rales suggesting pulmonary edema and patient with history of congestive heart failure (CHF) or renal insufficiency
- ❑ Respiratory rate >25 per minute
- ❑ Oxygen saturation <93% on high flow Oxygen

Contraindications

- ❑ Respiratory Arrest
- ❑ Agonal Respirations
- ❑ Unconsciousness or obtundation
- ❑ Shock associated with cardiac insufficiency
- ❑ Trauma
- ❑ Persistent nausea and vomiting
- ❑ Facial anomalies
- ❑ Inability to cooperate with the procedure
- ❑ Current tracheostomy

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Bougie – Procedure

P Paramedic

Procedure:

- ❑ 1. Prepare, position, and oxygenate the patient with 100% Oxygen
- ❑ 2. Select proper ET tube without stylette, test cuff and prepare suction
- ❑ 3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal ½ of the endotracheal tube introducer (Bougie)
  - Note: failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT
- ❑ 4. Using laryngoscopic techniques, visualize the vocal cords if possible using the Sellick's/BURP as needed.
- ❑ 5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or about the arytenoids if the cords cannot be visualized.
- ❑ 6. Once inserted, gently advance the Bougie until you meet resistance (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated).
- ❑ 7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie
- ❑ 8. Gently advance the Bougie and loaded ET tube until you have resistance again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie
- ❑ 9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth
- ❑ 10. IF you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails, to facilitate passing the ETT you may attempt a direct laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie and if so desired advance the ETT)
- ❑ 11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie
- ❑ 12. Confirm tracheal placement with capnography according to the intubation protocol. Inflate the cuff, auscultate for equal breath sounds, and reposition accordingly
- ❑ 13. When final position is determined secure the ET tube, continuously monitor, and record
- ❑ 14. If there is any question regarding placement of ETT (Esophageal vs. Tracheal) remove immediately and ventilate with BVM

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Procedures

	EMT
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P	Paramedic

Capnography – Procedure

Nasal End-tidal CO2 (EtCO2)

Procedure:

- ❑ 1. Attach capnography tubing to device
- ❑ 2. Attach tubing to patient (may supplement with NRB mask if needed)
- ❑ 3. Record readings initially and throughout treatment as with other vital signs
- ❑ 4. Document the procedure and results on/with the electronic Patient Care Report (ePCR)

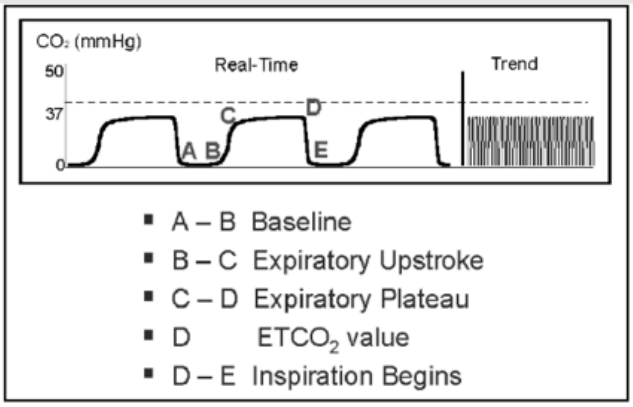
Advanced Airway End-tidal CO2 (EtCO2)

Procedure:

- ❑ 1. Attach capnography sensor to Advanced Airway.
- ❑ 2. Note CO2 level and waveform.
- ❑ 3. Record readings on scene, en route to the hospital and upon patient delivery to receiving facility.
- ❑ 4. Any loss of EtCO2 detection of waveform indicates an airway problem – recheck tube placement and remove if appropriate
- ❑ 5. End-tidal CO2 goal is 40mmHg
  - Above 45mmHg, increase ventilation rate
  - Below 35mmHg, slow down ventilation rate
- ❑ 6. Document the procedure and results on/with the Patient Care Report (PCR)

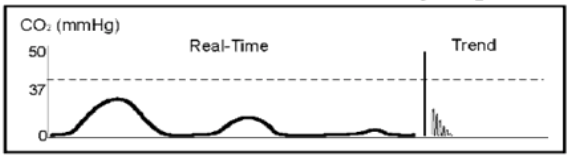
Procedures

Procedures



- A – B Baseline
- B – C Expiratory Upstroke
- C – D Expiratory Plateau
- D $ETCO_2$ value
- D – E Inspiration Begins

Endotracheal Tube in Esophagus



Possible Causes:

- Missed intubation
- A normal capnogram is the best evidence that the ET tube is correctly positioned
- With ET tube in the esophagus, little or no CO_2 is present

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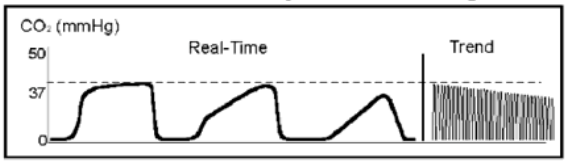
Obstruction in Airway or Breathing Circuit



Possible Causes:

- Partially kinked or occluded artificial airway
- Presence of foreign body in the airway
- Obstruction in expiratory limb of breathing circuit
- Bronchospasm

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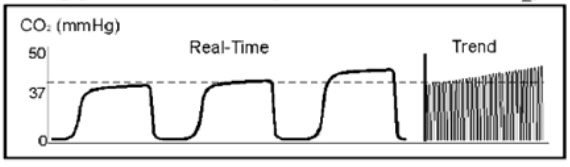
Hypoventilation (Increase in $ETCO_2$)



Possible Causes:

- Decrease in respiratory rate
- Decrease in tidal volume
- Increase in metabolic rate
- Rapid rise in body temperature (hyperthermia)

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Cricothyrotomy – Procedure

P Paramedic

Contact Medical Control Prior to Initiating Procedure, IF Time and Situation Permit

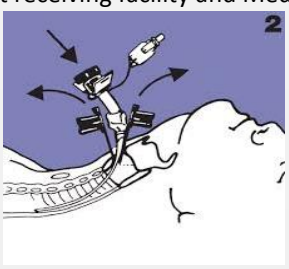
- *When all airway interventions have failed and the patient needs a secure airway immediately, consider performing cricothyrotomy.* ***<u>The percutaneous approach is preferred to the open.</u>***
- *If the patient is not able to be ventilated via BVM, ETT or BIAD and the Paramedic feels a surgical airway is necessary, Medical Control should be contacted first. If time and situation do not allow it, this Procedure may be completed prior to authorization by Medical Control.*

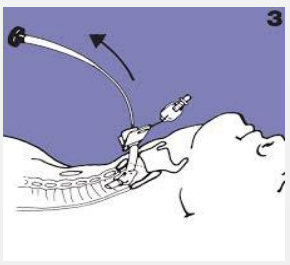
Prepare All Procedure Specific Materials:

- ❑ 14 gauge or larger IV catheter
- ❑ Needle
- ❑ 10 mL syringe
- ❑ Adapter from a 3.0mm ETT
- ❑ Saline
- ❑ Alcohol pad
- ❑ 4x4 gauze pad
- ❑ Tape
- ❑ Suction

Procedure:

- ❑ 1. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
- ❑ 2. Cleanse anterior neck
- ❑ 3. Fill a 10mL syringe with 5mL of 0.9% Normal Saline
- ❑ 4. Remove dilator from the package and sheath and advance into the tracheostomy tube
- ❑ 5. Insert the splitting needle perpendicular to the skin and cricothyroid membrane while gently holding negative pressure and aspirating with the syringe. Upon entering the trachea there will be a loss of resistance and free flow of air with bubbles flowing easily into the syringe.
- ❑ 6. Drop the angle of the needle $\geq$ 45 degrees and aim the tip of the needle toward carina (toward the feet) and complete insertion of needle, while continuing to aspirate to ensure the needle remains in the trachea.
- ❑ 7. While stabilizing the needle in place, disconnect the needle form the syringe and advance guidewire (attached to the dilator into the hub of the splitting needle until resistance is met.
- ❑ 8. Squeeze wings of needle together. The needle should split in half and allow the guidewire/dilator to be advanced.
- ❑ 9. When the dilator meets resistance at the skin, remove the needle by pulling in opposite directions, while securing the guidewire in the trachea and the dilator at the skin.
- ❑ 10. Place thumb on dilator knob while first and second fingers are curved under flange of trachea tube. With gentle, continuous pressure, advance the dilator and tracheostomy tube into position until flange is secure against the skin.
- ❑ 11. Remove dilator and inflate cuff until device is secure in the airway (max 5mL).
- ❑ 12. Attach EtCO2 and BVM.
- ❑ 13. Secure tube in place using the provided twill tape behind the neck of the patient.
- ❑ 14. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted
- ❑ 15. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
- ❑ 16. Consider Sedation Protocol as appropriate.
- ❑ 17. If not previously done, immediately contact receiving facility and Medical Control





Procedures

Cricothyrotomy (Open) Surgical – Procedure

P Paramedic

Clinical Indication:

- ❑ Failed airway management when standard airway procedures cannot be performed or have failed in an adult patient that requires airway management.
- ❑ Upper airway obstruction (eg. facial or neck trauma occluding airway patency, foreign body unable to be removed, angioedema) and inability to adequately oxygenate and ventilate using less invasive methods.
- ❑ If Possible Contact Medical Control Before Proceeding. If not possible, notify receiving hospital as soon as possible.

Prepare All Procedure Specific Materials:

- ❑ Scalpel
- ❑ Antiseptic swab
- ❑ 6.0 mm endotracheal tube
- ❑ 10cmL syringe
- ❑ Tracheal hook (if available)
- ❑ Bougie device
- ❑ Continuous Digital Waveform Capnography

Contraindications:

- ❑ Ability to oxygenate and ventilate using less invasive methods.
- ❑ Pediatric Patients
- ❑ Suspected fractured larynx and/or cricoid cartilage
- ❑ Suspected tracheal transection
- ❑ Inability to find anatomical landmarks

Procedure:

- ❑ 1. Have suction and supplies available and ready.
- ❑ 2. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
- ❑ 3. Prep the area with an antiseptic swab.
- ❑ 4. Using the non-dominant hand, spread the overlying skin taut with the thumb and fingers, and slightly depress the skin over the cricothyroid membrane with the index finger to mark the site of cricothyrotomy. Do not release the non-dominant hand from the neck until the procedure is complete. Once the anatomy is found and defined, avoid movement of the anatomy to promote proper cricothyrotomy airway placement.
- ❑ 5. Using a sterile scalpel, make a vertical incision in the mid-line of the neck extending from just above the lower edge of the thyroid cartilage to the middle of the cricoid cartilage. Make the depth of this incision sufficient to extend through the skin and fatty tissue underneath.
- ❑ 6. Using the same scalpel, make a short horizontal incision in the middle of the cricothyroid membrane into the trachea.
  - If a tracheal hook *is* available: prior to removing scalpel from incision, use a tracheal hook to pull anterior and inferior on the thyroid cartilage (lower edge of horizontal incision). Exercise caution when manipulating the tracheal hook into the incision – the tip of most tracheal hooks is particularly sharp-edged.
  - If tracheal hook *is not* available: a bougie device should be used as introducer into the tracheal opening prior to passing the ET tube.
- ❑ 7. Pass a 6.0mm Endotracheal Tube through the horizontal incision in the cricothyroid membrane, angling the tube inferior and posterior along the tracheal anatomy.
- ❑ 8. Inflate the endotracheal cuff with 5-10mL of air and verify airway placement with EtCO2 (continuous digital capnography monitoring) and physical exam (chest rise, breath sounds).
- ❑ 9. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted
- ❑ 10. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
- ❑ 11. Consider Sedation Protocol as appropriate.
- ❑ 12. If not previously done, immediately contact receiving facility and Medical Control
- ❑ 13. Continually monitor for respiratory changes during transport, especially after any patient movement/transfers.
- ❑ 14. Monitor for complications (ie hemorrhage, expanding neck hematoma, dislodgement).
- ❑ 15. Document procedure.

Procedures

Needle Jet Insufflation – Procedure

P Paramedic

Clinical Indications:

Life threatening upper airway obstruction where all other BLS and ALS maneuvers and techniques have failed.

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. Locate the cricothyroid membrane and prep the area with antiseptic wipe
- ❑ 3. Extend the neck to bring the cricothyroid membrane anterior and as close to the skin as possible
- ❑ 4. Insert the #10 gauge angiocath through the membrane at 90° to the skin until loss of resistance
  - Use a 3mL syringe and apply negative pressure to confirm free aspiration of air and needle presence in the trachea
  - Consider using a second angiocath through the same insertion site if first needle becomes occluded during procedure
- ❑ 5. Drop the angle of the needle to approximately 60° with the tip aimed toward the patient's feet
  - Continue negative pressure on the syringe to confirm continued placement in the trachea
- ❑ 6. Attach the 7.0 Endotracheal Tube BVM adapter to the end of the syringe
- ❑ 7. Ventilate at a ratio of 1:5 inhalation:exhalation
- ❑ 8. If the airway resistance continues to increase, disconnect the BVM to allow for exhalation
  - Consider addition of second angiocath for use as an exhalation port
- ❑ 9. If subcutaneous emphysema develops, stop insufflation and remove angiocath
  - Repeat steps 2-7 as above
- ❑ 10. Notify the receiving facility of Failed Airway Protocol use and need for Needle Jet Insufflation.
- ❑ 11. Document the procedure and patient response to care in the electronic Patient Care Report (ePCR).

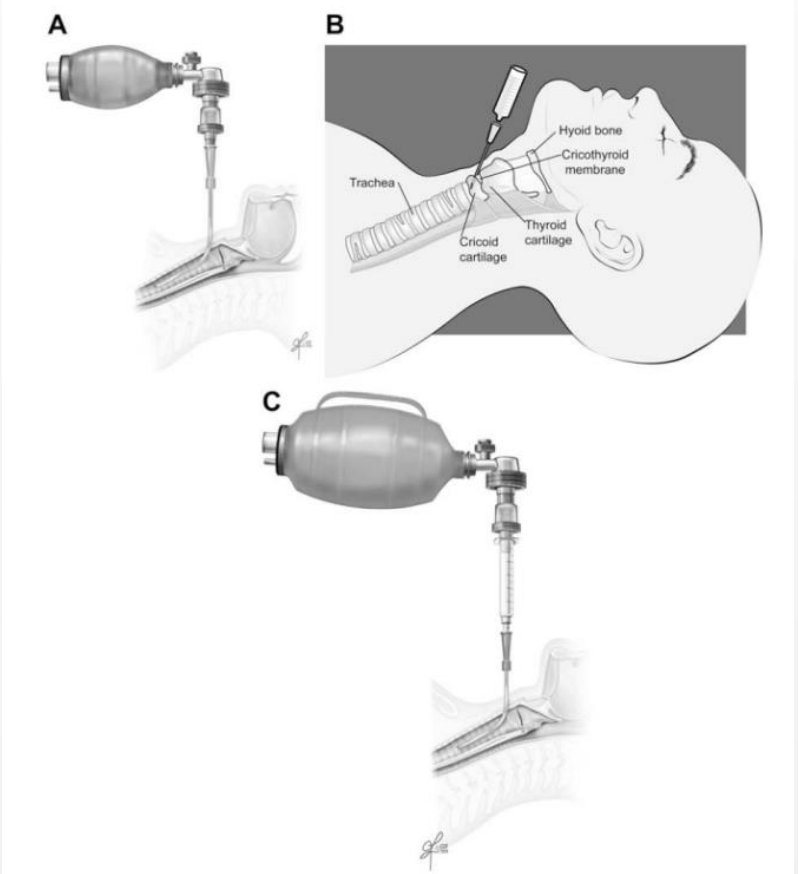


Fig. 6. Ventilation using a standard ventilation bag (*A*) using a 3.5-mm pediatric endotracheal tube (ET) adapter; (*B*) using a 7.0-mm adult ET adapter connected to a plungerless 3 mm syringe without a bag-valve–mask attached; and (*C*) using a 7.0-mm adult ET adapter connected to a plungerless 3-mm syringe with a bag-valve–mask attached. (*Courtesy of* S.E. Mace, MD, and J. Loerch, Clinic Cleveland Center for Medical Art and Photography, Cleveland, OH; with permission.)

Procedures

	EMT
A	A-EMT
P	Paramedic

Blood Glucose Analysis – Procedure

Prepare All Procedure Specific Materials:

- ❑ Glucometer
- ❑ Test Strip
- ❑ Lancet
- ❑ 2x2 gauze pad
- ❑ Alcohol prep pad
- ❑ Bandage

Procedure:

- ❑ 1. Select appropriate site.
- ❑ 2. Blood samples for performing glucose analysis may be obtained simultaneously with intravenous access when possible.
- ❑ 3. Cleanse site appropriately with alcohol prep.
- ❑ 4. Puncture skin with lancet.
- ❑ 5. Dispose of sharps in proper container.
- ❑ 6. Wipe first drop of blood with 2x2 gauze.
- ❑ 7. Place correct amount of blood on reagent strip or site on glucometer per the manufacturers instructions.
- ❑ 8. Apply direct pressure and cover site with bandage as needed.
- ❑ 9. If result does not fit patient clinical picture:
  - Consider presumptive management per Diabetic Emergencies Protocol while reassessing.
  - Consider equipment error, may redraw sample and repeat analysis.
- ❑ 10. Record the time and result of the blood glucose analysis in the electronic Patient Care Report (ePCR).

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Procedures

Carbon Monoxide Measurement – Procedure

Procedure:

- ❑ 1. Apply probe to patient's digit(s) as recommended by the manufacturer. If near strobe lights, cover the finger to avoid interference and/or move away from the lights if possible. Where the manufacturer provides a light shield it should be used.
- ❑ 2. Allow machine to register percent circulating carboxyhemoglobin values
- ❑ 3. Verify pulse rate on machine with palpated pulse of the patient
- ❑ 4. Record levels in electronic Patient Care Report (ePCR) or on the scene rehabilitation form
  - If CO ≤5%, assess for other possible illness or injury
  - If CO >5% to ≤15% and symptomatic from Carbon Monoxide – treat per Carbon Monoxide Exposure Protocol
  - If CO >15% - treat per Carbon Monoxide Exposure Protocol

***Signs and symptoms of Carbon Monoxide (CO) poisoning* – altered mental status, dizziness, headache, nausea/vomiting, chest pain, respiratory distress, neurological impairments, vision problems, reddened eyes, tachycardia, tachypnea, arrhythmias, seizures and/or coma.**

- ❑ 5. Monitor critical patients continuously with continuous pulse oximetry (SpO2) and SpCO until arrival at the hospital.
- ❑ 6. Document percent of carboxyhemoglobin values every time vital signs are recorded during therapy for exposed patients.
- ❑ 7. Use the SpO2 feature of the device as an added tool for patient evaluation. Treat the patient, not the data provided by the device. Utilize the relevant protocol for guidance.
- ❑ 8. The SpO2 reading should never be used to withhold oxygen from a patient with respiratory distress or complaining of shortness of breath.
- ❑ 9. Factors which may reduce the reliability of the reading include:
  - Poor peripheral circulation (hypovolemia, hypotension, hypothermia).
  - Excessive external lighting, particularly strobe/flashing lights
  - Excessive sensor motion.
  - Fingernail polish (should be removed with acetone pad).
  - Irregular heart rhythms (atrial fibrillation, SVT, etc.).
  - Jaundice.
  - Placement of BP cuff on same extremity as SpO2 probe.

CO poisoning can look a lot like influenza, particularly in the winter months. Have a high index of suspicion when seeing multiple patients from the same environment with flu-like illnesses and consider Carbon Monoxide.

Synchronized Cardioversion – Procedure

P | Paramedic

Procedure:

- ❑ 1. Ensure the patient is attached properly to a cardiac monitor/defibrillator capable of synchronized cardioversion.
- ❑ 2. Have all equipment prepared for unsynchronized cardioversion/defibrillation, if the patient fails synchronized cardioversion and/or the clinical condition worsens.
- ❑ 3. Firmly apply defib pads to patients chest – assure it is clean, dry, with minimal chest hair.
- ❑ 4. Consider the use of Sedation Protocol, as appropriate.
- ❑ 5. Set energy selection to the appropriate setting, per Protocol.
- ❑ 6. Set monitor/defibrillator to synchronized cardioversion mode, per manufacturer's instructions.
- ❑ 7. Make certain all personnel are clear of the patient.
- ❑ 8. PRESS and HOLD the "Shock" button to deploy the charge and cardiovert. Stay clear of the patient until you are certain the energy has been delivered.
  - NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there may be a delay between activating the cardioversion and the actual delivery of energy.
- ❑ 9. Note patient response – immediately refer to Appropriate Cardiac Dysrhythmia Protocol.
  - Document patient response to intervention, VS and clinical condition as situation permits.
- ❑ 10. Repeat per protocol until maximum setting or until efforts successful.
- ❑ 11. Note procedure, response, and times in electronic Patient Care Report (ePCR).

AHA Initial Recommended Doses	
Narrow Regular	50-100 J
Narrow Irregular	120-200 J
Wide Regular	100 J

Escalate the second and subsequent shock dose as needed
Follow manufacturer recommendations if available

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Procedures

	EMT
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P	Paramedic

Cardio-Cerebral Resuscitation – Procedure

Procedure:

- ❑ 1. Check for responsiveness and feel for a carotid pulse.
- ❑ 2. If compressions are ongoing on EMS arrival, evaluate rate and depth while attaching the AED **OR** Cardiac Monitor
  - If compressions adequate, begin AED analysis **OR** charge the monitor for rhythm analysis and shock immediately
  - If no compressions **OR** felt to be inadequate, initiate high quality chest compressions for two minutes
- ❑ 3. Open the airway with a head-tilt, chin-lift
- ❑ 4. Apply an airway adjunct (OPA or NPA) with NRB mask and O2 at 15Lpm
- ❑ 5. At first rhythm analysis: (Immediately after AED application if bystander compressions adequate, **OR** after 2 minutes)
  - If shock advised by AED **OR** interpreted as V-fib **OR** pulseless V-tach, deploy charge and notify dispatch of first defibrillation time, Continue to #6
  - If no shock advised by AED **OR** interpreted to be non-shockable, discard shock and continue chest compressions, go to CPR Procedure
- ❑ 6. At every 2 minutes (200 chest compressions), perform a rhythm and pulse check
  Begin charging the monitor to prepare for defibrillation approximately 20 seconds before the 2 minute mark
  - If adequate personnel present, rotate compressors every 1-2 minutes
  - Electrical therapy and medications per Cardiac Arrest Protocol and specific rhythm protocols
- ❑ 7. Minimize interruptions in chest compressions
- ❑ 8. At 6 minutes (3 cycles of chest compressions), perform a rhythm and pulse check
- ❑ 9. If patient continues to be pulseless and apneic, begin positive pressure ventilations
  - BVM with airway adjunct (OPA or NPA) **OR**
  - Advanced Airway (BIAD or ETT) if situation and clinical presentation appropriate
    - ❑ If situation dictates or unable to successfully place advanced airway, it is always acceptable to fall back to BVM with an airway adjunct (NPA or OPA)
- ❑ 10. Contact Medical Control for any additional orders or questions.

Notes:

This Procedure is NOT appropriate for patients <18 years of age, overdoses, hangings, drownings, traumatic arrests OR arrests suspected to be noncardiac in etiology.

The Kellum and Barney article in 2008 evaluated CCR performed on witnessed arrests with initial shockable rhythm

Dr. Ewy's article in Circulation evaluated witnessed arrest due to V-fib in adults.
http://circ.ahajournals.org/content/111/16/2134.full

The protocols listed all have CCR for shockable rhythms only
http://www.azdhs.gov/asshare/documents/EMSresponder.pdf

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P	Paramedic

Cardiopulmonary Resuscitation – Procedure

Procedure:

- ❑ 1. Check for responsiveness and feel for a pulse
  - Carotid pulse for adults and older children, brachial or femoral pulse for infant
- ❑ 2. If compressions are ongoing on EMS arrival, evaluate rate and depth while attaching the Cardiac Monitor **OR** AED
  - If compressions adequate, charge the monitor for rhythm analysis and shock evaluation immediately if appropriate **OR** begin AED analysis
  - If no compressions **OR** felt to be inadequate, initiate high quality chest compressions at >100 compressions per minute for two minutes.
- ❑ 3. Open the patient's airway
  - Head-tilt, chin-lift technique if no head or neck trauma suspected
  - Jaw-thrust if head or neck trauma suspected or unknown
- ❑ 4. For arrests without advanced airway, perform compressions:breaths as age appropriate
  - Once advanced airway established, transition to >100 compressions per minute *uninterrupted* with 8-10 breaths per minute.
- ❑ 5. At first rhythm analysis:
  - If shock advised by AED or interpreted as V-fib / Pulseless V-tach, defibrillate and notify dispatch of first defibrillation time.
  - If no shock advised by AED or interpreted to be non-shockable, discard shock and continue.
- ❑ 6. At 2 minutes if no response to resuscitation, consider advanced airway placement (BIAD or ETT) if situation and clinical presentation appropriate.
  - If good chest rise and air exchange achieved, it is acceptable to continue BVM with an airway adjunct (NPA or OPA)
- ❑ 7. Begin charging the monitor to prepare for defibrillation approximately 20 seconds before the 2 minute mark
- ❑ 8. At every 2 minute mark (200 chest compressions)
  - Rotate compressors (as allowed by personnel on scene)
  - Perform a rhythm and pulse check.
    - ❑ If V-fib / Pulseless V-tach, deliver shock as per Appropriate Cardiac Arrest Protocol
      - Medications delivered *after* shock as per Appropriate Cardiac Arrest Protocol
    - ❑ If no shockable rhythm, safely dump pending charge to prevent negligent discharge and/or responder injury.
      - Medications delivered *after decision* as per Appropriate Cardiac Arrest Protocol
- ❑ 9. Resume compressions at 100 per minute, ventilations at 8-10 breaths per minute (as age appropriate if no advanced airway).
  - Minimize interruptions in chest compressions as much as possible.
- ❑ 10. Repeat steps 7-9 until change in patient condition or decision made to terminate resuscitation after 20 minutes (4 rounds of ACLS medications)
- ❑ 11. Contact Medical Control as needed for orders or with any questions.

Age	Location	Depth	Rate
Neonate	Lower 1/3 of the sternum, between nipples, 2 thumbs technique	(1/3 of the anterior-posterior chest dimension)	90 compressions and 30 breaths per minute 1 or 2 Rescuers - 3:1
Infant (<1 year excluding newborns)	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1.5 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 Rescuer - 30:2 2 Rescuers - 15:2
Child (1 year to puberty)	Over sternum, between nipples (inter-mammary line), heel of one hand	2 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 Rescuer 30:2 2 Rescuers 15:2
Adult (puberty through adulthood)	Over sternum, just above the xyphoid process, hands with interlocked fingers	At least 2 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 or 2 Rescuers - 30:2

	EMT
A	A-EMT
P	Paramedic

Defibrillation – Procedure

Manual

Procedure:

- ❑ 1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the Monitor is being prepared for use
- ❑ 2. Remove any medication patches on the chest and wipe off any residue
- ❑ 3. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions (front/back or shifted slightly to not rest on the implanted device). Refer to pictures for pediatric placement.
- ❑ 4. If necessary, connect defibrillator leads, per manufacturer recommendations
- ❑ 5. Charge the defibrillator per protocol. Continue chest compressions while the defibrillator is charging
- ❑ 6. Pause chest compressions and determine if shockable after reviewing rhythm for max of 5 seconds.
- ❑ 7. Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.
- ❑ 8. Defibrillate if appropriate by depressing the "shock" button.
- ❑ 9. If non-shockable discard the shock, per manufacturer recommendations
- ❑ 10. Continue to follow protocol
- ❑ 11. Record the time and result of the analysis in the patient care report (PCR).

Automated

Procedure:

- ❑ 1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use
- ❑ 2. Remove any medication patches on the chest and wipe off any residue
- ❑ 3. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions (front/back or shifted slightly to not rest on the implanted device).
- ❑ 4. If necessary, connect defibrillator leads, per manufacturer recommendations
- ❑ 5. Activate AED for analysis of rhythm
- ❑ 6. Stop chest compressions and clear the patient for rhythm analysis. Keep interruption in chest compressions as brief as possible
- ❑ 7. Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.
- ❑ 8. Defibrillate if appropriate by depressing the "shock" button. Biphasic defibrillators will determine the correct joules accordingly
- ❑ 9. Continue to follow protocol
- ❑ 10. Record the time and result of the analysis in the electronic Patient Care Report (ePCR).

Procedures

Double Sequential Defibrillation – Procedure

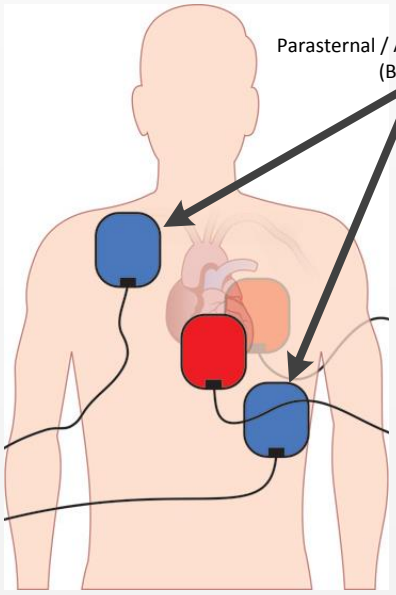
P Paramedic

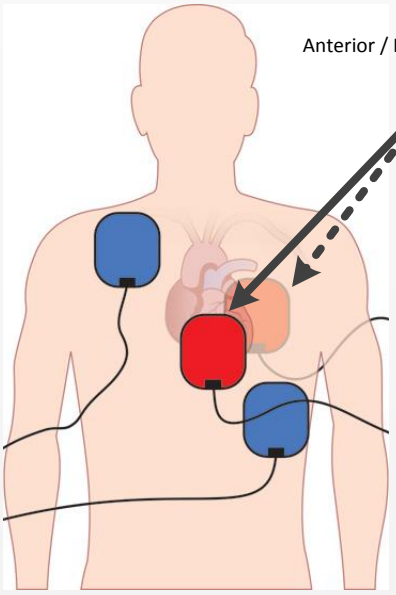
Clinical Indications:

- ❑ Patients with refractory or recurrent ventricular fibrillation (V-fib) or pulseless ventricular tachycardia (V-tach) or shockable rhythm per AED analysis that has not responded to ≥3 standard defibrillation attempts.

Procedure:

- ❑ 1. Ensure all necessary cardiac arrest interventions have been applied up to this point.
  - Uninterrupted and effective CPR.
  - Defibrillation at maximum output for at least three rounds of shocks (including first responder AED shocks, if applicable).
  - Administration of Amiodarone 300mg.
  - Consideration of other possible causes of cardiac arrest.
- ❑ 2. Upon decision to attempt Double Sequential Defibrillation, the first set of pads should be removed from the patient
- ❑ 3. Apply the manual defibrillator in the parasternal / axillary positions as shown in the figure below (blue pads)
  - The first rhythm check after moving the pads should be completed as a single shock, as previous
- ❑ 4. Apply an AED in the anterior / posterior positions as shown in the figure below (red pads)
  - Assure that the two sets of pads do not contact one another
- ❑ 3. Select maximum energy setting for both devices. Charge devices in advance of the anticipated break in CPR and ensure chest compressions continue while both devices are being charged.
- ❑ 4. At next rhythm analysis, if patient remains in ventricular fibrillation (V-fib) or pulseless ventricular tachycardia (V-tach) OR shock advised by AED:
  - Clear patient.
  - Deliver **double sequential defibrillation** by having two operators depressing both "Shock" buttons simultaneously.
- ❑ 5. Once criteria are met for dual sequential defibrillation, *all subsequent shocks delivered shall be using this method*.





NOTE:

- ❑ There is the potential to cause damage to equipment when performing this procedure. Therefore, it is recommended that attempts be made to perform Double Sequential Defibrillation using an AED in combination with a monitor to reduce risk.
- ❑ The case reports of equipment failure have not indicated the mechanism of damage; the steps above are an attempt to improve patient outcome while mitigating risk, but have not been proven to change outcomes.
- ❑ Because of the potential for adverse equipment results, **it is important that your Service Director and Medical Director approve this procedure BEFORE attempting.**
- ❑ **Devices used for Double Sequential Defibrillation should be removed from service until a user evaluation and function check can be completed to ensure safety of subsequent patients. Any faulty test should result in the defibrillator being removed from service until a full evaluation can be completed.**

External Cardiac Pacing – Procedure

P Paramedic

Procedure:

- ❑ 1. Attach standard cardiac monitor.
- ❑ 2. Apply defibrillation/pacing pads per manufacturer recommendations.
  - One pad to left mid chest next to sternum, one pad to left mid posterior back next to spine.
- ❑ 3. Place monitor into pacing mode, as specified by manufacturer.
- ❑ 4. Adjust heart rate to 70bpm for an adult, 100bpm for pediatric patients.
- ❑ 5. Note pacer spikes on EKG screen.
- ❑ 6. Slowly increase output until capture of electrical rhythm is noted on the monitor.
- ❑ 7. If unable to capture while at maximum current output, stop pacing immediately.
- ❑ 8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
- ❑ 9. Mechanical capture occurs when paced electrical spikes on the monitor correspond with palpable pulse.
- ❑ 10. Consider Sedation Protocol as appropriate.
- ❑ 11. Document the dysrhythmia and the response to external pacing with ECG strips in the electronic Patient Care Report (ePCR).

Procedures

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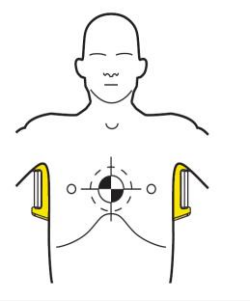
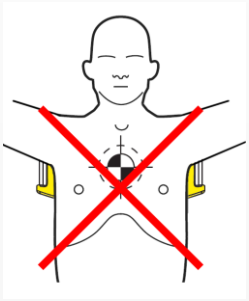
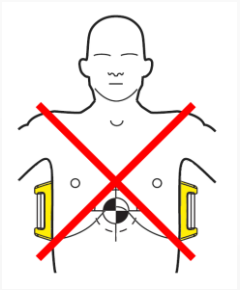
Mechanical CPR Device - Procedure

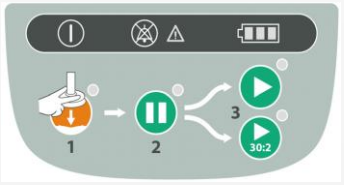
Clinical Indications:
- May be used in patients 12 years of age or greater requiring chest compressions related to cardiac arrest.

Contraindications:
- Patients <12 years
- Patients suffering traumatic cardiac arrest or patients with obvious signs of traumatic injury
- Patients who do not fit within the device:
  Too large and with whom you cannot press the pressure pad down 2 inches
  Too small and with whom you cannot pull the pressure pad down to touch the sternum

Procedure:
- ❑ All therapies related to the management of cardiopulmonary arrest should be continues as currently defined.
- ❑ Initiate resuscitative measures following protocol – **DO NOT DELAY MANUAL CPR FOR THE DEVICE. CONTINUE MANUAL CPR UNTIL THE DEVICE CAN BE PLACED**
- ❑ Detailed instructions for LUCAS device follow:
- ❑ 1. While resuscitative measures are initiated, the LUCAS device should be removed from its carrying device and placed on the patient in the following manner
- ❑ 2. The Backplate should be centered on the nipple line and the top of the backplate should be located just below the patients armpits

- ❑ 3. In cases which the patient is already on the stretcher, place the backplate underneath the thorax. This can be accomplished by log-rolling the patient or raising the torso (placement should occur during a scheduled discontinuation of compressions [ie. After five cycles of 30:2 or two minutes of uninterrupted compressions])
- ❑ 4. Position the compressor
- ❑ 5. Turn the LUCAS Device on (the device will perform a 3 second self test)



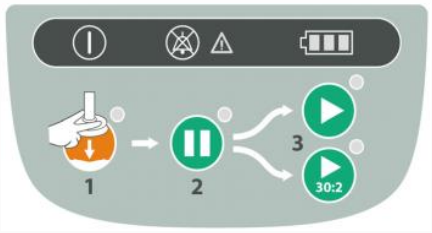
- ❑ 6. Remove the LUCAS device from its carrying case usign the handles provided on each side
- ❑ 7. With the index finger of each hand, pull the trigger to ensure the device is set to engage the backplate. Once this is complete you may removed your index finger from the trigger loop
- ❑ 8. Approach the patient from the side opposite the person performing manual chest compressions
- ❑ 9. Attach the claw hook to the backplate on the sie of the patient opposite that where compressions are being provided.
- ❑ 10. Place the LUCAS device across the patient, between the staff members' arms who is performing manual CPR
- ❑ 11. At this point the staff member performing manual CPOR stops and assists attaching the claw hook to the backplate on their side
- ❑ 12. Pull up once to make sure that the parts are securely attached

Procedures

Mechanical CPR Device - Procedure

Procedure Continued:

- ❑ 13. Adjust the height of the compression arm
- ❑ 14. Use the two fingers (V pattern) to make sure that the lower edge of the Suction Cup is immediately above the end of the sternum. If necessary, move the device by pulling the support legs to adjust the position
- ❑ 15. Press the Adjust Mode Button on the control pad labeled #1 (this will allow you to easily adjust the height of the compression arm)



- ❑ 16. To adjust the start position of the compression arm, manually push down the SUCTION CUP with two fingers onto the chest (without compressing the patient's chest)
- ❑ 17. Once the position of the compression arm is satisfactory, push the green PAUSE button labeled #2 (This will lock the arm in this positon), then remove your fingers from the SUCTION CUP
- ❑ 18. If the position is incorrect, press the ADJUST MODE BUTTON and repeat the steps
- ❑ 19. Start Compressions
- ❑ 20. If the patient in not intubated and you will be providing compression to ventilation ratio of 30:2 push ACTIVE (30:2) button to start
- ❑ 21. If the patient is intubated and you will be providing continuous compressions push ACTIVE (continuous) button
- ❑ 22. Patient Adjuncts
- ❑ 23. Place the neck roll behind the patient's head and attach the straps to the LUCAS device (this will prevent the LUCAS from migrating toward the patient's feet
- ❑ 24. Place the patients arms in the straps provided

-Defibrillation can and should be performed with the LUCAS device in place and in operation
-One may apply the defibrillation electrodes either before or after the LUCAS device has been put in position
-The pads and wires should not be underneath the suction cup
-If the electrodes are already in an incorrect position when the LUCAS is placed, you must apply new electrodes
-If the rhythm strip cannot be assessed during compressions, one may stop the compressions for analysis by pushing the PAUSE BUTTON (The duration of interruption of compressions should be kept as short as possible and should not be > 10 seconds. There is no need to interrupt chest compressions other than to analyze the rhythm).
-Once the rhythm is determined to require defibrillation, the appropriate ACTIVE BUTTON should be pushed to resume compressions while the defibrillator is charging and then the defibrillator should be discharged.

Procedures

Chest Decompression – Procedure

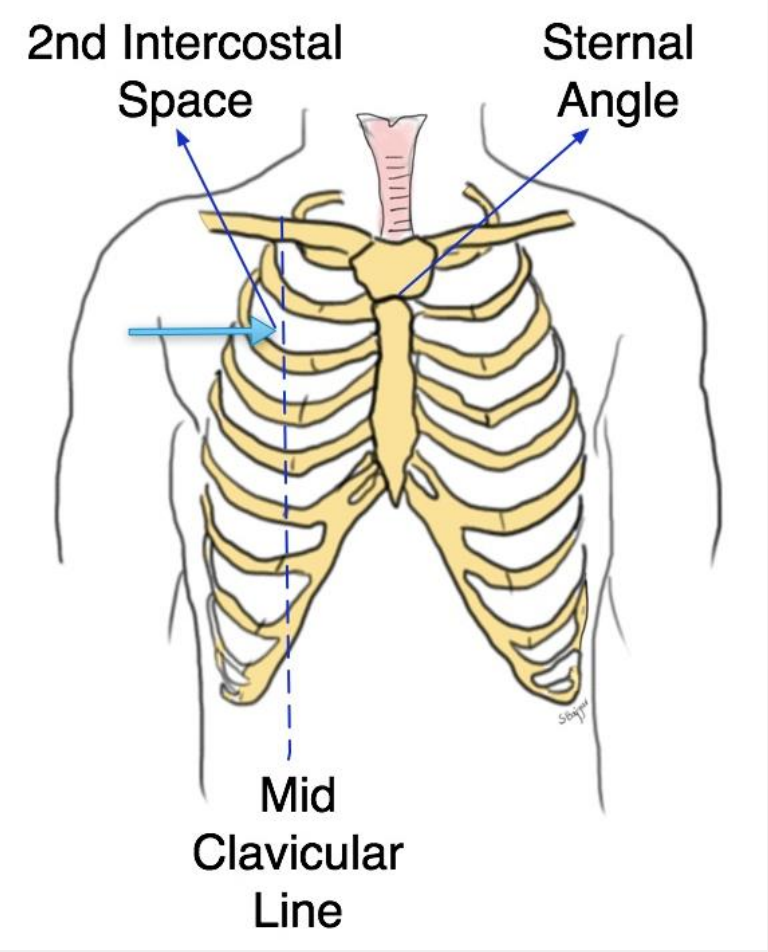
P Paramedic

Prepare All Procedure Specific Materials:

- ❑ 14 gauge 2–2.5 inch over the needle catheter
- ❑ Tape
- ❑ Sterile Gauze Pads
- ❑ Antiseptic swabs
- ❑ Occlusive dressing

Procedure:

- ❑ 1. Locate landmarks for needle decompression – Identify the 2nd intercostal space in the mid-clavicular line on the same side as the pneumothorax
- ❑ 2. Prepare the site with an antiseptic swab
- ❑ 3. Firmly introduce catheter immediately above superior edge of rib at selected site
  - Remember: the neurovascular bundle (nerve, artery and vein) run under the inferior edge of the ribs)
- ❑ 4. Insert the needle perpendicular to the skin with downward pressure until there is a loss of resistance and a return of air.
- ❑ 5. Advance the needle another 1/8", to ensure the catheter is inside the thoracic cavity.
  - Hold the catheter in place with one hand while removing the needle and disposing of sharps in container.
- ❑ 6. Secure the catheter taking care not to allow it to kink
  - If time and situation allow, use an occlusive dressing to cover the catheter and tape on 3 sides to create a one-way valve.
- ❑ 7. Reassess lung sounds, pulses, tracheal deviation and patient clinical condition
- ❑ 8. Dress area with occlusive dressing then cover with sterile gauze pad
- ❑ 9. Reassess breath sounds and respiratory status
- ❑ 10. Document Procedure, patient response, VS and change in clinical condition in the electronic Patient Care Report



Procedures

	EMT
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P	Paramedic

Cincinnati Stroke Screen – Procedure

Procedure:

- ❑ 1. Assess and treat suspected stroke patients as per protocol
- ❑ 2. The Cincinnati Stroke Screen should be completed for all suspected stroke patients
- ❑ 3. Establish the "time last normal" for the patient. This will be the presumed time of onset.
- ❑ 4. Perform the screen through physical exam:
  - Look for facial droop by asking the patient to smile
  - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes, and turn their palms upward. Assess for unilateral drift of an arm.
  - Have the person say, "you can't teach an old dog new tricks", or some other simple, familiar saying. Assess for the person to slur the words, get some words wrong, or inability to speak.
- ❑ 5. If one of these exam components is "yes", then the stroke screen is positive
- ❑ 6. Evaluate Blood Glucose level
- ❑ 7. If the "time last normal" is ≤12 hours, blood glucose is between 60 and 400, and at least one of the physical exam elements is positive, follow the Suspected Stroke Protocol,
  - Alert the receiving hospital with Stroke Alert as early as possible.
- ❑ 8. All sections of the Cincinnati screen must be completed.
- ❑ 9. The complete screening should be documented in the electronic Patient Care Report (ePCR).

Cincinnati Prehospital Stroke Scale[4]

Facial Droop (have patient smile)

Normal: Both sides of face move equally

Abnormal: One side of face does not move as well

Arm Drift (have patient hold arms out for 10 seconds)

Normal: Both arms move equally or not at all

Abnormal: One arm drifts compared to the other, or does not move at all

Speech (have patient speak a simple sentence)

Normal: Patient uses correct words with no slurring

Abnormal: Slurred or inappropriate words, or mute

Procedures

	EMT
A	A-EMT
P	Paramedic

FAST-ED Stroke Screen – Procedure

Procedure:

- ❑ 1. Assess and treat suspected stroke patients as per protocol **(p. 73)**
- ❑ 2. The FAST-ED Stroke Screen may be considered for all stroke patients with suspected Large Vessel Occlusion (LVO)
  - Patients who are likely to have a LVO may benefit from transport to a Comprehensive Stroke Center
- ❑ 3. Establish the "time last normal" for the patient. This will be the presumed time of onset.
- ❑ 4. Perform the screen through physical exam:
  - Look for facial palsy by asking the patient to smile
  - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes, and turn their palms upward. Assess for unilateral weakness or drift of an arm.
  - Have the person say, "you can't teach an old dog new tricks", or some other simple, familiar saying. Assess for the person to slur the words, get some words wrong, or inability to speak.
  - Ask the patient to look in all four cardinal directions (up, down, left, right). Assess for the ability of the pupil to cross midline
  - Assess the patient's ability to interpret stimulus from both sides of the body.
- ❑ 5. Add up the patient score from the table (below). A score of 4 or greater has a 60-85% prediction of a large vessel occlusion
- ❑ 6. Evaluate Blood Glucose level
- ❑ 7. If the "time last normal" is ≤12 hours, blood glucose is between 60 and 400, and the patient has a score of 4 or greater, consider the clinical presentation of the patient
  - Patients with unstable VS or emergent airway needs should go to the closest appropriate facility
  - Patients who are clinically stable and suspected LVO, consider transport directly to a Comprehensive Stroke Center.
  - Alert the receiving hospital with Stroke Alert and FAST-ED score as early as possible.
- ❑ 8. The complete screening should be documented in the electronic Patient Care Report (ePCR).

Field Assessment Stroke Triage for Emergency Destination (FAST-ED)	
Assessment Item	**Score**
Facial Palsy – Weakness on one side of the face with smile	
▪ Absent or minor paralysis	0
▪ Partial or Complete paralysis	1
Arm Weakness	
▪ No drift	0
▪ Drift or some effort against gravity	1
▪ No effort against gravity OR No movement	2
Eye Deviation	
▪ Absent	0
▪ Partial	1
▪ Forced Deviation	2
Denial / Neglect	
▪ Absent	0
▪ Extinction to bilateral simultaneous stimulation in only one sensory modality	1
▪ Does not recognize own had or only orients to one side of the body	2
LVO is likely if FAST-ED score is ≥ 4	

Procedures

	EMT
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P	Paramedic

Intranasal – Procedure

Procedure:

- ❑ 1. Determine appropriate dose of medication per Protocol
- ❑ 2. Draw medication into syringe and dispose of the sharps, do not administer more than 1ml per nostril.
- ❑ 3. Attach intranasal device to syringe
- ❑ 4. With one hand, control the patient's head
- ❑ 5. Gently introduce device into nare, stop when resistance is met.
- ❑ 6. Aim slightly upwards and toward the ear on the same side
- ❑ 7. ***Briskly*** compress the syringe to administer one half of the medication, repeat the procedure with the remaining medication on the other nare.
  - ▪ It is important for the medication to be atomized or it will not be absorbed.
- ❑ 8. Document the results in the electronic Patient Care Report (ePCR).

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Procedures

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P	Paramedic

Orogastric Tube Insertion – Procedure

Prepare All Procedure Specific Materials:

- ❑ Tube
- ❑ Lubricating Gel
- ❑ Securing device/Tape
- ❑ Suction
- ❑ Syringe for injecting Air

Procedure:

- ❑ 1. Measure the length of the tube from the tip of nose to earlobe to ziphoid process, mark maximum insertion depth.
- ❑ 2. Lubricate the tube with water based lubricant prior to insertion.
- ❑ 3. Insert lubricated tube through the gastric port of the BIAD or lift tongue/jaw anteriorly while passing tip lateral to endotracheal tube.
- ❑ 4. Continue to advance the tube gently until the appropriate distance is reached.
- ❑ 5. Confirm placement by injecting 20cc of air and auscultate for the whoosh or bubbling of the air over the stomach. If any doubt about placement, remove and repeat the insertion.
- ❑ 6. Secure the tube.
- ❑ 7. Decompress the stomach by connecting the tube to low continuous suction (50-150mmHg).
- ❑ 8. Document the procedure, time, and result (success) on/with the electronic Patient Care Report (ePCR).

Procedures

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P	Paramedic

Restraints – Procedure

Any patient who may harm himself, herself or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique

Procedure:

- ❑ 1. The least restrictive means of managing the patient should always be employed first.
- ❑ 2. Ensure that there are sufficient personnel available to restrain the patient safely.
- ❑ 3. **Restrain the patient in a lateral or supine position. No devices such as backboards, splints or other devices will be on top of the patient.**
- ❑ 4. **The patient will never be restrained in the prone position.**
- ❑ 5. The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as continuous cardiac, pulse oximetry and capnography monitoring as indicated.
- ❑ 6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This MUST be documented in the electronic Patient Care Report (ePCR).
- ❑ 7. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider chemical restraint per protocol.
- ❑ 8. IF a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel cannot remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle
- ❑ 9. Consider Behavioral Emergencies Protocol.
- ❑ 10. **Restraining a patient in the prone position is never authorized.**

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Procedures

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P	Paramedic

Spinal Immobilization – Procedure

Clinical Indications:

- ❑ Need for spinal immobilization, as per appropriate Trauma Protocol
- ❑ Utilization of the Long Spine Board should occur in consideration with the risks and benefits to the individual patient and the current circumstances

Patients who should be immobilized with a Long Spine Board include:

- ❑ Blunt trauma with distracting injury
- ❑ Altered mental status
- ❑ Intoxication
- ❑ Neurologic complaint, including numbness and/or subjective weakness (even without finding on exam)
- ❑ Blunt trauma with spinal pain, tenderness to palpation of spine or paraspinal muscles, and spinal deformity
- ❑ Inability to communicate with the EMS Personnel

Prepare All Procedure Specific Materials:

- ❑ Backboard
- ❑ Straps
- ❑ C-collar appropriate for patient size
- ❑ Tape and/or Head Rolls

Procedure:

- ❑ 1. Explain the procedure to the patient.
- ❑ 2. Apply an appropriately sized c-collar while maintaining in-line stabilization of the c-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applies the collar. This may be performed by any credentialed responder if indicated by protocol.
- ❑ 3. Once the collar is secure, the second rescuer should continue to maintain inline neutral position to ensure stabilization.
  - The collar is helpful but will not do the job by itself.
- ❑ 4. If the patient is supine or prone, consider the log roll technique. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on the backboard by the safest method available that maximizes maintenance of in-line spinal stability
- ❑ 5. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
- ❑ 6. NOTE: some patients , due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and c-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital.
- ❑ 7. Document the time of the procedure in the electronic Patient Care Report (ePCR).

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P	Paramedic

Spinal Immobilization of Athletes with Helmets – Procedure

EMS Providers must use extreme caution when evaluating and treating an injured player, especially when the extent of the injury remains unknown. Suspect any unconscious football player to have an accompanying spinal injury until proven otherwise. If the player isn't breathing or the possibility of respiratory arrest exists, its essential that certified athletic trainers and EMS providers work quickly and effectively to remove the face mask and administer care. In most situations, the helmet should not be removed in the field. Proper management of head and neck injuries includes leaving the helmet and shoulder pads in place whenever possible, removing only the face mask from the helmet and developing a plan to manage head-and-neck injured players using well-trained sports medicine and EMS providers.

Guidelines and Recommendations:

The following guidelines and recommendations were developed by the Inter-Association Task Force for the appropriate Care of the Spine-Injured Athlete:

❑ 1. General Guidelines for Care *Prior to Arrival of EMS*
- The Emergency Medical Services system should be activated
- Any athlete suspected of having a spinal injury should not be moved and should be managed as though a spinal injury exists.
- The athlete's airway, breathing and circulation, neurological status and level of consciousness should be assessed
- The athlete should NOT be moved unless absolutely essential to maintain airway, breathing and circulation
- If the athlete must be moved to maintain airway, breathing and circulation, the athlete should be placed in a supine position while maintaining spinal immobilization.
- When moving a suspected spine injured athlete, the head and trunk should be moved as a unit. One accepted technique is to manually splint the head to the trunk.

❑ 2. Face Mask Removal
- The face mask should be removed prior to transportation, regardless of current respiratory status (see figure 1)
- Those involved in the pre-hospital care of injured players must have the tools for face mask removal readily available.

Indications for Helmet Removal:

❑ 1. The athletic helmet and chin straps should *only* be removed *if*:
- The helmet and chin strap do not hold the head securely, such that immobilization of the helmet does not also immobilize the head
- The design of the helmet and chin strap is such that even after removal of the face mask the airway cannot be controlled, or ventilation be provided.
- The face mask cannot be removed after a reasonable period of time
- The helmet prevents immobilization from transporting in an appropriate position.

Helmet Removal:

❑ 1. If it becomes absolutely necessary, spinal immobilization must be maintained while removed the helmet
- Helmet removal should be frequently practiced under proper supervision by an EMS supervisor or Training Division staff
- Due to the varying types of helmets encountered, the helmet should be removed with close oversight by the team athletic trainers and/or sports medicine staff
- In most circumstances, it may be helpful to remove cheek padding and/or deflate air padding prior to helmet removal.

Spinal Alignment:

❑ 1. Appropriate spinal alignment *must* be maintained during care and transport using backboard, straps, tape, head blocks or other necessary equipment.
- Be aware that the helmet and shoulder pads elevate an athlete's trunk when in the supine position
- Should either be removed, or if only one is present, appropriate spinal alignment must be maintained.
- The front of the shoulder pads can be opened to allow access for CPR and defibrillation

Procedures

	EMT
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Splinting – Procedure

Clinical Indications:

- ❑ Immobilization of an extremity for transport due to suspected fracture, sprain or other traumatic injury
- ❑ Immobilization of an extremity for transport to secure medically necessary devices such as IV catheter

Procedure:

- ❑ 1. Assess and document pulses, sensation and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
  - If extended scene time, prolonged extrication and pulseless extremity, contact Medical Control for recommendations
- ❑ 2. Remove all clothing from the extremity.
- ❑ 3. Select a site to secure the splint both proximal and distal to the area of suspected injury or the area where the medical device will be placed.
- ❑ 4. Do not secure the splint directly over the injury.
- ❑ 5. Place the splint and secure with Velcro, straps, or bandage material (ie. Kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
- ❑ 6. Document pulses, sensation and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, reposition the splint and reassess. If no improvement, remove splint.
- ❑ 7. IF a femur fracture is suspected and there is no evidence of pelvic fracture or instability, place a traction splint.
- ❑ 8. Consider pain management per Pain Management Protocol.
- ❑ 9. Document the time, type of splint, and the pre and post assessment of pulse, sensation and motor function in the electronic Patient Care Report (ePCR).

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Procedures

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Tourniquet (CAT – Combat Application Tourniquet) – Procedure

Principles:

- ❑ Apply Tourniquet as proximal as possible to wound, minimum of 2" above hemorrhage site. Do not cross joints or bony prominences with the Tourniquet
- ❑ Secure Tourniquet in place and expedite transport.
- ❑ Document time and location of tourniquet deployment in electronic Patient Care Report (ePCR) and on device.
- ❑ Notify receiving center of tourniquet use, location of device and time placed.
- ❑ IF hemorrhage not controlled, a second tourniquet can be deployed, proximal to the first without overlap.

Procedure:

1. Route the self adhering band around the extremity and pass the free-running end of the band through the inside slit of the friction adapter buckle

2. Pass the band through the outside slit of the buckle, utilizing the friction adaptor buckle, which will lock the band in place.

3. Pull the self-adhering band tight and securely fasten the band back on itself.

4. Twist the rod until bright red bleeding has stopped.

5. Lock the rod in place with the Windlass Clip™

6. Hemorrhage is now controlled. Secure the rod with the strap: Grasp the Windlass Strap™, pull it tight and adhere it to the opposite hook on the Windlass Clip™

Procedures

	EMT
A	A-EMT
P	Paramedic

SOF Tactical Tourniquet - Wide - Procedure

Principles:

- ❑ Apply Tourniquet as proximal as possible to wound, minimum of 2" above hemorrhage site. Do not cross joints or bony prominences with the Tourniquet
- ❑ Secure Tourniquet in place and expedite transport.
- ❑ Document time and location of tourniquet deployment in electronic Patient Care Report (ePCR) and on device.
- ❑ Notify receiving center of tourniquet use, location of device and time placed.
- ❑ IF hemorrhage not controlled, a second tourniquet can be deployed, proximal to the first without overlap.

Procedure:

1. Release the quick disconnect buckle, then route the constricting band around the injured limb.

2. Reconnect the quick disconnect buckle

3. Remove slack by pulling on the loose end of the constricting band. Removing as much slack as possible will increased efficacy of windlass.

4. Turn windlass until bleeding stops completely. Wound may continue to seep but there should be no active blood flow.

5. Stow windlass in tri-ring once bleeding is controlled.

6. If possible, mark the time of tourniquet application so the next provider is aware.

Procedures

Accessing Peripherally Inserted Central Catheter (PICC) – Procedure

P Paramedic

Clinical Indications:

- ❑ Inability to obtain adequate alternative peripheral access
- ❑ Access of an existing catheter for medication or fluid administration
- ❑ Central venous access in a patient in cardiac arrest
- ❑ Only appropriate for critical patients

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. Clean the port of the catheter with alcohol wipe
- ❑ 3. Using sterile technique, withdraw 5-10mL of blood and place syringe in sharps box.
- ❑ 4. Using 5mL normal saline, access the port with sterile technique and gently attempt to flush the saline.
  - IF there is NO resistance with flush, no evidence of infiltration (i.e. No subcutaneous, collection of fluid), and no pain experienced by the patient, then proceed to step 5
  - IF there IS resistance with flush, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, *do not use the catheter*.
- ❑ 5. Begin administration of medications or IV fluids slowly. Observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
- ❑ 6. Document procedure, any complications, and fluids/medications administered in the electronic Patient Care Report (ePCR).

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Procedures

Extremity Venous Access – Procedure

A	A-EMT
P	Paramedic

Prepare All Procedure Specific Materials:

- ❑ Appropriate tubing or IV lock
- ❑ #14-#24 catheter over the needle, or butterfly needle
- ❑ Venous tourniquet
- ❑ Antiseptic swab
- ❑ Gauze pad or adhesive bandage
- ❑ Tape or commercially available securing device

Procedure:

- ❑ 1. Saline locks may be used as an alternative to IV tubing and fluid under the authorization of the Service Medical Director and at the discretion of the provider.
- ❑ 2. Intraosseous access can be used where threat to life exists as provided for in the Venous Access – Intraosseous Procedure.
- ❑ 3. Use the largest catheter bore necessary based upon the patient's condition and size of veins
- ❑ 4. Fluid and set up choice is preferably:
  - Normal Saline with macro drip (10 drops/mL) for medical/trauma conditions.
  - Normal Saline with a micro drip (60 drops/mL) for medication infusions or for patients at risk of fluid overload.
- ❑ 5. Assemble IV solution and tubing:
  - Open IV bag and check for clarity, expiration date, etc.
  - Verify correct solution
  - Open IV tubing and assemble according to manufacturer's guidelines
- ❑ 6. Insertion:
  - Explain to the patient that an IV is going to be started
  - Place the tourniquet around the patient's arm proximal to the IV site, if appropriate
  - Palpate veins for resilience
  - Clean the skin with the antiseptic swab in an increasing sized concentric circle and follow it with an alcohol swab
  - Stabilize the vein distally with the thumb/fingers
  - Enter the skin with the bevel of the needle facing upward
  - Enter the vein, obtain a flash, and advance the catheter into the vein while stabilizing the needle
  - Remove the needle while compressing the proximal tip of the catheter to minimize blood loss
  - Remove the tourniquet
  - Connect IV tubing to the catheter, or secure the IV lock to the catheter to minimize blood loss
  - Open the IV clamp to assure free flow (no infiltration, pain, etc) and set infusion rate
- ❑ 7. Secure the IV:
  - Secure the IV catheter and tubing
  - Recheck IV drip rate to make sure it is flowing at appropriate rate.
- ❑ 8. Trouble shoot the IV, (if the IV is not working well):
  - Make sure the tourniquet is off
  - Check the IV insertion site for swelling
  - Check the IV tubing clamp to make sure it is open
  - Check the drip chamber to make sure it is half full
  - Lower the IV bag below IV site and watch for blood to return into the tubing

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Procedures

IO Intraosseous Venous Access – Procedure

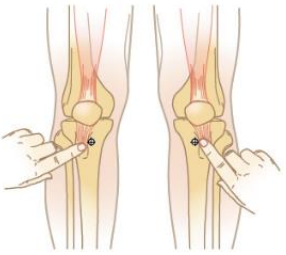
A	A-EMT
P	Paramedic

Procedure:

❑ 1. Select the appropriate insertion site and palpate the appropriate bony landmarks to identify the site of insertion.

- **The PROXIMAL HUMERUS is contraindicated in patients ≤18 years old, UNLESS authorized by Medical Control.**

Anterior Tibia	Anteromedial aspect of the proximal tibia (bony prominence below the kneecap). The insertion location will be 1-2cm (2 finger widths) below this.
Proximal Humerus (Hand Over Umbilicus Technique)	Keeping the elbow flat on the floor and close to the side of the body, rotate the palm over the umbilicus (belly button) and palpate the greater tubercle of the humerus. The insertion location will be 1-2cm (2 finger widths) above the surgical neck.
Proximal Humerus ("Thumb-to-Bum" Technique)	With the arm fully extended and tight to the body, rotate the hand medially (inward) until the palm is facing out. Palpate the greater tubercle of the humerus approximately 1-2cm (2 finger widths) above the surgical neck.



❑ 2. Cleanse the site with chlorhexidine, iodine or alcohol prep pad.

❑ 3. Device insertion

- Manual devices (Cook or Jamshidi):
  - ❑ Hold the intraosseous needle at a 90° degree angle to the bony surface, aimed away from the nearby joint and epiphyseal plate.
  - ❑ Provide pressure to push the needle tip through the skin until resistance from the bone is felt.
  - ❑ Twist the needle handle with a rotating grinding motion applying controlled downward force until a "pop" or loss of resistance is felt.
  - ❑ *Do not advance more than 1cm after the loss of resistance is felt*.
- Powered Intraosseous Device (EZ-IO):
  - ❑ Hold the intraosseous needle at a 90° degree angle to the bony surface, aimed away from the nearby joint and epiphyseal plate.
  - ❑ Provide pressure to push the needle tip through the skin until resistance form the bone is felt.
  - ❑ Power the driver until a "pop" or loss of resistance is felt.
  - ❑ *Do not advance more than 1cm after the loss or resistance is felt*.
- Automatic Intraosseous Device (NIO):
  - ❑ Rotate the cap 90° in either direction to unlock
  - ❑ Place dominant hand over cap, and press device against patient. While pressing down on the device with palm, pull trigger wings upwards with fingers
  - ❑ Gently pull the NIO up in a rotating motion while holding the needle stabilizer against the insertion site
  - ❑ Continue holding the needle stabilizer in place and pull up the stylet to remove.

❑ 4. Remove the stylet and place in an approved sharps container

❑ 5. Attach a 10mL syringe filled with 5mL of Normal Saline; aspirate bone marrow to verify placement, then inject 5mL of Normal Saline to clear the lumen of the needle.

❑ 6. Attach the IV line with fluids on a pressure bag.

❑ 7. **Paramedics may infuse 10-20mg of Lidocaine into the IO in adult patients who are awake and aware of pain.**

- **½-1mL of 2% Lidocaine at 100mg/5mL concentration**
- **Allow the Lidocaine to sit in the marrow for approximately 30 seconds prior to fluid infusion through the line.**

❑ 8. Stabilize and secure the needle with dressings and tape

❑ 9. Document the procedure, time, and procedure success (or failure) on the PCR

Complications:

- Incorrect identification of landmarks
- A bent needle (more common with longer needles)
- Clogging of the needle with marrow, clot or bone spicules.
  -Can be avoided by flushing the needle or continuous infusion
- Through and through penetration of both anterior and posterior cortices caused by excess force after the needle has penetrated the cortex.
- Subcutaneous or subperiosteal infiltration, caused by incomplete placement or dislodgement of needle.
- Fractures caused by excess force or fragile bones.
- Compartment syndrome

Contraindications:

- Fracture proximal to proposed intraosseous site
- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site
- Previous intraosseous insertion or joint replacement at the selected site

External Jugular Venous Access – Procedure

P Paramedic

Clinical Indications:

- ❑ Medical patients who are awake and alert, and require IV access but are peripherally exhausted
- ❑ External jugular cannulation can be attempted initially in life threatening events when no obvious peripheral site is noted.

Prepare All Procedure Specific Materials:

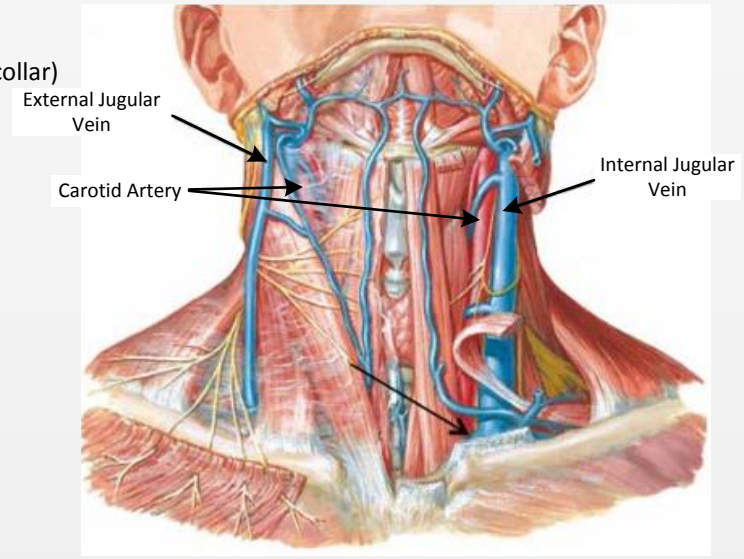
- ❑ Appropriate tubing or IV lock
- ❑ #14-#24 catheter over the needle or butterfly needle
- ❑ Antiseptic swab
- ❑ Gauze pad or adhesive bandage
- ❑ Tape or other securing device

Procedure:

- ❑ 1. Position yourself at the head of the patient.
- ❑ 2. Place the patient in a slight Trendelenburg (supine, head down) position if possible. This helps distend the vein and prevent air embolism.
- ❑ 3. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
- ❑ 4. Prep the site with antiseptic swab.
- ❑ 5. Align the catheter with the vein (insertion direction is away from the patient's head, toward the patient's same side shoulder).
- ❑ 6. Anchoring the vein lightly with one finger above the clavicle, puncture the vein at a superficial angle midway between the angle of the jaw and the clavicle and cannulate the vein.
- ❑ 7. Confirm placement with saline flush.
- ❑ 8. Attach the IV and secure the catheter (avoiding circumferential dressing or taping around the neck).
- ❑ 9. If unsuccessful, place occlusive dressing over site and do NOT go to other side of neck
- ❑ 10. Document the procedure appropriately.

Contraindications:

- ❑ Patient combative or uncooperative with positioning (i.e. unable to hold still while procedure is being performed)
- ❑ Anterior neck hematoma/burn/cellulitis
- ❑ Anatomic landmarks not visible
- ❑ Medical appliance in place covering anterior neck (i.e. c-collar)
- ❑ Monitor for complications
  - Expanding hematoma
  - Tracheal shift
  - Difficulty breathing



***PEARL: Superficial insertion angle is crucial as the carotid artery is in close proximity to the EJ.**

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Wound Care – Procedure

Clinical Indications:

Skin and soft tissue wounds with associated bleeding and pain.

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on compression bandage to control bleeding. Direct pressure is much more effective
- ❑ 3. Consider tourniquet use early for extremity bleeding not controlled with direct pressure.
- ❑ 4. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate
  - Consider Pain Management Protocol before beginning irrigation.
  - Irrigation and decontamination are key to stopping ongoing tissue injury, preventing infection and promoting wound healing.
  - Control bleeding and address life threats first.
  - Irrigate thermal burns, chemical burns or contaminated wounds with Normal Saline, Lactated Ringer's or sterile water.
  - For chemical splashes to the eye, emergent irrigation is critical to preventing further tissue damage. If possible, have patient remove contact lenses as early as possible. Go to Eye Pain Protocol, as appropriate.
- ❑ 5. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
- ❑ 6. Monitor wounds and/or dressing throughout transport for bleeding
- ❑ 7. Bolster existing bandages as necessary if saturation or
- ❑ 8. Consider second tourniquet use as indicated in protocol/procedure. Do not remove first tourniquet; apply the second higher on the limb.
- ❑ 9. If serious hemorrhage not controlled by other means:
  - Apply approved non-heat generating hemostatic agent per manufacturer's directions.
  - Supplement hemostatic agent impregnated gauze with direct pressure and standard hemorrhage control techniques
  - Apply additional hemostatic impregnated gauze and/or standard dressings as needed.
  - Hemostatic impregnated gauze is contraindicated in wounds involving the thoracic cavity or violating the peritoneum of the abdominal cavity.
- ❑ 10. Document the wound assessment and care in the electronic Patient Care Report (ePCR).

Procedures

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Wound Packing – Procedure

Clinical Indications:

Skin and soft tissue wounds with MAJOR bleeding not controlled by direct pressure or tourniquet deployment as above.

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. Apply direct pressure to the wound
- ❑ 3. Insert finger(s) into the wound and apply firm pressure to visualized bleeding vessel to control bleeding.
- ❑ 4. Create a small ball at the beginning of the roll gauze (preferentially hemostatic impregnated)
- ❑ 5. Press the gauze deep into the wound, occluding the bleeding vessel against bone or firm tissue.
- ❑ 6. While maintaining pressure on the leading edge of the gauze, begin to feed more gauze into the wound, packing it tightly in place while continuing pressure on the bleeding vessel.
- ❑ 7. Continue packing the wound until you have filled the wound space -OR- until you have a minimum 2-3" of gauze remaining
  - Leave an adequate "tail" on packing to facilitate later removal at the hospital
- ❑ 8. Maintain manual direct pressure on the wound for 3-5 minutes.
- ❑ 9. Reassess and wrap the wound with a pressure dressing to maintain pressure for support.
- ❑ 10. If bleeding persists, apply more gauze but DO NOT remove the wound packing.
- ❑ 11. Continue monitoring the wound and assess for continued direct pressure as needed throughout transport.
- ❑ 12. Document the wound assessment and patient care in the electronic Patient Care Report (ePCR).

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Ventricular Assist Device – Procedure

Frequently Asked Questions:

What is a Ventricular Assist Device (VAD)?
A ventricular assist device (VAD) is a mechanical pump that is used to support heart funciton and blood flow in people who have weakened hearts. Some common reasons for VAD implantation are MI, Heart Failure, myocarditis, cardiomyopathy and heart surgery.

How does a VAD work?
The device takes blood from a lower chamber of the heart and helps pump it to the body and vital organs, just as a healthy heart would.

What are the parts of a VAD?
The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver blood to your body; and a power source.

What is the power source?
The power source is either batteries or AC power. The power source is connected to a control unit that monitors the VAD functions. The batteries are carried in a case usually located in a holster in a vest around the patient's shoulders.

What does the control unit (or controller) do?
The control unit gives warnings or alarms if the power is low or if it senses that the device isn't functioning properly.

MOST patients have a tag located on the controller around their waist that lists the type of device, the institution that put it in and a number to call.

Patient Management:

- ❑ 1. Assess the patients airway and intervene per the Airway Management Protocol
- ❑ 2. Auscultate heart sounds to determine if the device is functioning and what type of device it is. If it is a continuous flow device, you should hear a "whirling sound".
- ❑ 3. Assess the device for any alarms.
- ❑ 4. Look on the controller located around the patient's waist or in the VAD PAK and see what device it is.
- ❑ 5. Intervene appropriately based on the type of alarm and patient guide.
  - You may follow the standard Cardiac Arrhythmia Protocols as per ACLS guidelines, EXCEPT:
  - NO Chest Compressions
  - NO Thrombolytics
  - Defibrillation is the standard process
- ❑ 6. Start one large bore IV
- ❑ 7. Assess Vital Signs – use Mean BP with Doppler, if available. The first sound you will hear is the Mean Arterial Pressure (MAP)
- ❑ 8. If no Doppler available, use the Mean on the Non-Invasive BP cuff
- ❑ 9. Transport to the closest VAD Center. Call the number listed on the device for advice.
- ❑ 10. Bring all of the patient's equipment and paperwork to the Emergency Department.
- ❑ 11. Allow the trained caregiver to ride in the patient compartment when possible. They may be able to serve as an expert on the device if the patient is unconscious or unable to answer for themselves.

Quick Tips for Ventricular Assist Devices (VADs)

- ❑ Let the patient and/or caregiver take the lead; they will be your on-scene experts.
- ❑ Remember not to perform chest compressions because they could dislodge the pump, making the patient bleed to death. Use the assistance of the VAD coordinator before starting compressions in the case of obvious arrest and pump failure.
- ❑ Defibrillate / cardiovert as normal. Do NOT place the pads over the device that is under the patient's skin.
- ❑ Keep in mind it may be difficult to obtain an accurate SpO2 because of little or no pulse.
- ❑ **BE CAREFUL WHEN REMOVING / CUTTING CLOTHING so you don't inadvertently dislodge or cut the drive line.**
- ❑ Take the patient's emergency travel bag when leaving the scene. It should have an extra controller, batteries and the VAD Coordinator's emergency contact number.

http://mylvad.com/sites/mylvadrp/files/EMS%20Field%20Guides/MCSO%20EMS%20GUIDE%202015%20.pdf

http://www.jems.com/articles/print/volume-37/issue-2/patient-care/patients-ventricular-assist-device-need.html

Procedures

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Nitrous Oxide – Procedure

Clinical Indications:

- ❑ Adult patients with acute, traumatic pain.
- ❑ Nitrous Oxide should ONLY be used by patients who have the capacity to understand and the ability to perform self-administration of inhaled medications.

Contraindications:

- ❑ Nitrous Oxide rapidly diffuses into air-filled spaces within the body and can significantly increase pressures exerted by gases. Therefore, it should NOT be used in cases where there are or are suspected to be abnormal collections of air within the body. Some common examples include but are not limited to:
  - Pneumothorax
  - Pulmonary Blebs (commonly seen in COPD)
  - Air Embolism
  - Small Bowel Obstruction
  - Pneumocephalus (air within the skull)
  - Eye Injury or Eye Surgery
  - Recent Middle Ear Surgery
- ❑ Nitrous is known to be teratogenic and is contraindicated before the end of 3rd trimester of pregnancy
- ❑ Altered mental status from head injury, alcohol or drugs
- ❑ Inability to follow commands and/or safely self-administer the medication

Preparation:

- ❑ Prepare all procedure specific materials:
- ❑ Set up Medical Director approved nitrous oxide system per manufacturer written procedure.
- ❑ Turn on exhaust fan in patient care area.
- ❑ Verify indications and contraindications prior to Nitrous Oxide administration

Procedure:

- ❑ 1. Instruct the patient to hold the face mask lightly on the face, covering the nose and mouth.
- ❑ 2. Instruct patient to breathe normally though the demand valve mask until pain at acceptable level or until patient no longer able to hold the mask to their face. Personnel must not hold mask to patient's face.
- ❑ 3. Turn off flow of nitrous oxide when patient completes self-administered dose.
- ❑ 4. Reassess patient's pain at 3-5 minutes with pain scale. If pain not controlled, consider other pain management options.
- ❑ 5. Document start and stop times for Nitrous Oxide use. Do not exceed time permitted by NIOSH occupational exposure standards.
  - In open, outside, well ventilated areas: no maximum time of administration
  - Ambulance with open windows and exhaust fans running: Max of 30 minutes per 8 hour period.
- ❑ 6. Document Nitrous Oxide canister pressure at the start of administration and at the end of administration.
- ❑ 7. Record vital signs during and after treatment (Nitrous Oxide may cause BP to drop in some cases).

Special notes:

- ❑ Nitrous oxide is in liquid state in its bottle. Ensure the bottle remains in the upright position when the bottle is open and especially during patient administration.
- ❑ Nitrous oxide can potentiate the effects of other CNS depressants such as narcotics, sedatives, hypnotics and alcohol.
- ❑ Patients on chronic opiates may be highly tolerant to the analgesic effects of nitrous.
- ❑ **Nitrous oxide is minimally metabolized in humans, and therefore retains its potency when exhaled into the room by the patient; a continuous-flow fresh-air ventilation system and/or N2O scavenger system must be used to prevent waste gas buildup in the passenger compartment.**

Procedures

Tranexamic Acid Administration – Procedure

P Paramedic

Clinical Indications:

- ❑ Trauma Patients who are ≥18 years old
- ❑ Clinical evidence of marked blood loss – internal or external – with sustained tachycardia ≥100bpm and hypotension with SBP ≤90mmHg
- ❑ First administration initiated <3 hours after injury, and transport to facility able to complete infusion upon receipt of patient

Procedure:

- ❑ 1. Loading Dose: 1gm IVP over 10 minutes
  - May mix in 150mL NS and administer at 960mL/hr on an infusion pump
- ❑ 2. Maintenance Dose (Interfacility): 1gm IVP over 8 hours

Contraindications:

- ❑ Past history of thromboembolic disease (i.e. DVT, MI, Ischemic Stroke or Pulmonary Embolism)
- ❑ Known history of thrombophilia (blood disorder that increases the risk of thrombus / clot formation)
- ❑ ≥3 hours after time of injury
- ❑ Shock from cause other than hemorrhage (i.e. tension pneumothorax, cardiac tamponade)
- ❑ Isolated Head Injury
- ❑ Known Subarachnoid Hemorrhage (SAH)
- ❑ Non-traumatic hemorrhage (i.e. GI bleed)
- ❑ Hemorrhagic shock stabilized by Hemorrhage Protocol or other means

Precautions:

- ❑ **Too rapid of administration may cause hypotension**
- ❑ Theoretical concern for thromboembolic disease (i.e. DVT, PE, MI, Ischemic Stroke)

Side Effects:

- ❑ Thromboembolism
- ❑ Seizure
- ❑ Cerebral Edema
- ❑ Headache
- ❑ Muscle Cramps

Key Points:

- ❑ Onset – possibly as early as 3-4 minutes with max effect within 4 hours (exact timing unknown)
- ❑ Duration – Delayed effects up to 48 hours secondary to anti-inflammatory action
- ❑ Does not promote clot formation, but prevents clot breakdown

References:

- ❑ The CRASH-2 Collaborators. Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant hemorrhage (CRASH-2): a randomized, placebo-controlled trial. *Lancet* 2010; **376:** 23–32.
- ❑ Roberts I, Shakur H, Ker K, Coats T, for the CRASH-2 Trial collaborators. Antifibrinolytic drugs for acute traumatic injury. *Cochrane Database Syst Rev* 2011; **1:** CD004896
- ❑ The CRASH-2 Collaborators. The importance of early treatment with tranexamic acid in bleeding trauma patients: an exploratory analysis of the CRASH-2 randomized controlled trial. *Lancet* 2011; Published **Online** March 24, 2011DOI:10.1016/S0140-6736(11)60278-X
- ❑ CRASH-2 study protocol, viewed at http://www.crash2.lshtm.ac.uk/prot_EngStudydesign.htm

Procedures

Overview

The purpose of this section is to serve as a drug information supplement and to provide a brief description of the out-of-hospital medications that are authorized by the State of Wisconsin for use in the Dane County EMS System. This document in no way represents the comprehensive pharmaceutical knowledge required for use of these medications by Emergency Medical Technicians providing field care. The comprehensive information about the use of these medications by practicing EMTs and paramedics, requires reference to other detailed sources.

Medications are listed alphabetically based on generic names.

Michael T. Lohmeier, MD, FACEP
Medical Director,
Dane County EMS

Overview

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Adenosine

Mechanism of Action
Slows conduction through the AV node, can interrupt reentry pathways through the AV node, and can restore normal sinus rhythm in patients with paroxysmal supraventricular tachycardia; decreases cardiac oxygen demand, decreasing hypoxia

Uses
PSVT, as a diagnostic aid to assess myocardial perfusion defects in CAD, Wolff-Parkinson-White syndrome
Unlabeled Uses: Wide-complex tachycardia diagnosis

Contraindications
Hypersensitivity, 2nd- or 3rd-degree AV block, sick sinus syndrome
Precautions
Pregnancy (C), breast-feeding, children, geriatric patients, asthma, atrial flutter, atrial fibrillation, ventricular tachycardia, bronchospastic lung disease, symptomatic bradycardia, bundle branch block, heart transplant, unstable angina, COPD, hypotension, hypovolemia, vascular heart disease, CV disease

Protocol Uses
Narrow Complex Tachycardia **(p. 45)**, Wide Complex Tachycardia **(p. 46)**, Tachycardia With A Pulse **(p. 116)**

Side Effects
CNS: Lightheadedness, dizziness, arm tingling, numbness, headache
CV: Chest Pain, pressure, atrial tachydysrhthmias, sweating, palpitations, hypotension, facial flushing, AV block, cardiac arrest, ventricular dysrhythmias, atrial fibrillation
GI: Nausea, metallic taste
Resp: Dyspnea, chest pressure, hyperventilation, bronchospasm (asthmatics)

Pharmacokinetics
Cleared from plasma in <30sec, half-life 10sec, converted to inosine/adenosine monophosphate

Interactions
Increase: risk for higher degree of heart block – Carbamazepine
Increase: risk for ventricular fibrillation – digoxin, verapamil
Increase: effects of adenosine – dypridamole
Decrease: activity of adenosine – theophylline or other methylxanthines (caffeine)

EMT Considerations
Assess cardiopulmonary status – BP, pulse, respiration, rhythm, ECG intervals (PR, QRS, QT); check for transient dysrhythmias (PVCs, PACs, sinus tachycardia, AV block)
Assess respiratory status – rate, rhythm, lung fields for crackles; watch for respiratory depression; bilateral crackles may occur in CHF patient; increased respiration, increased pulse, product should be discontinued
CNS effects – dizziness, confusion, psychosis, paresthesias, seizures; product should be discontinued

Treatment of Overdose
Defibrillation, vasopressor for hypotension, theophylline

Adenosine

Albuterol

Mechanism of Action
Beta$_2$-adrenergic agonist. Activates beta$_2$ receptors on airway smooth muscle, increasing the cyclic AMP concentration, increasing activation of protein kinase A and lowers intracellular ionic calcium concentrations, leading to muscle relaxation.

Uses
Bronchospasm associated with asthma, exercise induced asthma, COPD
Unlabeled Uses: Hyperkalemia

Contraindications
Hypersensitivity to sympathomimetics, tachydysrhythmias, severe cardiac disease, heart block
Precautions
Pregnancy (C), breast-feeding, cardiac/renal disease, hyperthyroidism, diabetes mellitus, hypertension, prostatic hypertrophy, angle-closure glaucoma, seizures, exercise-induced bronchospasm (aerosol) in children <12 y/o, hypoglycemia

Protocol Uses
Guidelines For Use of Protocols **(p. 7)**, Paramedic Intercept Guidelines **(p. 21)**, Radio Report Format **(p. 27)**, COPD/Asthma/Stridor – Adult **(p. 36)**, Allergic Reaction – Adult **(p. 49)**, Prolonged Crush Injury – Adult, Trauma **(p. 85)**, Hazmat, General – Adult, Trauma **(p. 91);**
Destination Determination – Pediatric **(p. 104)**, Wheezing / Asthma – Pediatric **(p. 108)**, Allergic Reaction – Pediatric **(p. 117)**, Prolonged Crush Injury – Peds, Trauma **(p. 135)**

Side Effects
CNS: Tremors, anxiety, insomnia, headache, dizziness, stimulation, restlessness, hallucinations, flushing, irritability
CV: Palpitations, tachycardia, angina, hypo/hypertension, dysrhythmias
EENT: Dry nose, irritation of nose and throat
GI: Heartburn, nausea, vomiting
MS: Muscle cramps
Resp: Cough, wheezing, dyspnea, parodoxical bronchospasm, dry throat
Misc: Flushing, sweating, anorexia, bad taste/smell changes, hypokalemia, metabolic acidosis

Pharmacokinetics
Extensively metabolized in the liver and tissues, crosses placenta, breast mild, blood-brain barrier
INH – onset 5-15min, peak 1-1.5hr, duration 3-6hr, half-life 4hr

Interactions
Increase: QTc prolongation – other drugs that increase QT prolongation
Increase: ECG changes/hypokalemia – potassium wasting diuretics
Increase: action of albuterol – tricyclics, MAOIs, other adrenergics; do not use together
Decrease: effectiveness of albuterol – other β-blockers

EMT Considerations
Respiratory Function: vital capacity, forced expiratory volume, ABGs; lung sounds, hear rate and rhythm, BP, sputum (baseline and peak); whether patient has not received theophylline therapy before giving dose
Evaluate: therapeutic response: absence of dyspnea, wheezing after 1hr, improved airway exchange, improved ABG

Treatment of Overdose
Administer β_1-adrenergic blocker, IV Fluids

Albuterol

Amiodarone

Mechanism of Action
Prolongs duration of action potential and effective refractory period, noncompetitive a- and b-adrenergic inhibition; increases PR and QT intervals, decreases sinus rate, decreases peripheral vascular resistance

Uses
Hemodynamically unstable ventricular tachycardia, supraventricular tachycardia, ventricular fibrillation not controlled by 1st-line agents
Unlabeled Uses: Atrial fibrillation treatment/prophylaxis, atrial flutter, cardiac arrest, cardiac surgery, CPR, heart failure, PSVT, Wolff-Parkinson-White (WPW) syndrome, supraventricular tachycardia

Contraindications
Black Box Warning – 2nd- and 3rd-degree AV block, bradycardia, severe hepatic disease, cardiac arrhythmias, pulmonary fibrosis
Pregnancy (D), breastfeeding, neonates, infants, severe sinus node dysfunction, hypersensitivity to this product/iodine/a=benzyl alcohol, cardiogenic shock
Precautions
Children, goiter, Hashimoto's thyroiditis, electrolyte imbalance, CHF, respiratory disease, torsades de pointes

Protocol Uses
Cardiac Arrest – Adult **(p. 39)**, V-Fib/Pulseless V-Tac Arrest Adult **(p. 41)**, Narrow Complex Tachycardia With a Pulse **(p. 45)**, Wide Complex Tachycardia With a Pulse **(p. 46)**, Tricyclic Overdose – Adult **(p. 68);**
Cardiac Arrest, General – Peds **(p. 110-111)**, V-Fib/Pulseless V-Tach Arrest – Peds **(p. 113)**, Tachycardia with a Pulse – Peds **(p. 116)**, Double Sequential Defibrillation – Procedure **(p. 175)**

Side Effects
CNS: Headache, dizziness, involuntary movement, tremors, peripheral neuropathy, malaise, fatigue, ataxia, paresthesia, insomnia
CV: Hypotension, bradycardia, sinus arrest, CHF, dysrhythmias, SA node dysfunction, AV block, increased defibrillation energy
EENT: Blurred vision, halos, photophobia, corneal microdepositis, dry eyes
GI: Nausea, vomiting, diarrhea, abdominal pain, anorexia, constipation, hepatotoxicity
MS: weakness, pain in extremities
Resp: Pulmonary fibrosis/toxicity, pulmonary inflammation, ARDS; gasping syndrome if used with neonates
Misc: Flushing, abnormal taste or smell, edema, abnormal salivation, coagulation abnormalities

Pharmacokinetics
Metabolized by liver (CYP3A4, CYP2C8), excreted by kidneys, 99% protein binding

Interactions
Increase: QT prolongation – azoles, fluoroquinolones, macrolides
Increase: amiodarone concentration, possible serious dysrhythmias – protease inhibitors, reduce dose
Increase: anticoagulation effects - warfarin
Increase: bradycardia – b-blockers calcium channel blockers

EMT Considerations
Evaluate: therapeutic response: decreased in ventricular tachycardia, supraventricular tachycardia, fibrillation
CNS Symptoms: confusion, psychosis, numbness, depression, involuntary movements; product should be discontinued

Treatment of Overdose
O_2, artificial ventilation, ECG, administer dopamine for circulatory depression, administer diazepam for seizures

Amiodarone

Aspirin

Mechanism of Action
Blocks pain impulses in CNS, reduces inflammation by inhibition of prostaglandin synthesis; antipyretic action results from vasodilation of peripheral vessels; decreases platelet aggregation

Uses
Mild to moderate pain or fever including RA, osteoarthritis, thromboembolic disorders; TIAs, rheumatic fever, post-MI, prophylaxis of MI, ischemic stroke, angina, acute MI
Unlabeled Uses: Prevention of cataracts, Kawasaki disease, pericarditis, PCI

Contraindications
Pregnancy (D) 3rd trimester, breastfeeding, children <12 y/o, children with flu-like symptoms, hypersensitivity to salicylates, GI bleeding, bleeding disorders, intracranial bleeding, nasal polyps, urticaria
Precautions
Abrupt discontinuation, acid/base imbalance, alcoholism, ascites, asthma, bone marrow suppression in elderly, G6PD deficiency, gout, heart failure, anemia, renal/hepatic disease, gastritis, pregnancy (C) 1st trimester

Protocol Uses
CHF/Pulmonary Edema – Adult **(p. 37)**, Chest Pain / Suspected Acute Coronary Syndrome – Adult **(p. 43)**

Side Effects
CNS: Stimulation, drowsiness, dizziness, confusion, seizures, headache, flushing, hallucinations, coma
CV: Rapid pulse, pulmonary edema
EENT: Tinnitus, hearing loss
Endocrine: Hypoglycemia, hyponatremia, hypokalemia
GI: Nausea, vomiting, GI bleeding, diarrhea, heartburn, anorexia, hepatitis, GI ulcer
Heme: Thrombocytopenia, agranulocytosis, leukopenia, neutropenia, hemolytic anemia, increased bleeding time
Resp: Wheezing, hyperpnea, bronchospasm
Skin: Rash, urticaria, bruising
Syst: Reye's syndrome (children), anaphylaxis, laryngeal edema

Pharmacokinetics
Enteric metabolism by liver; inactive metabolites excreted by kidneys; crosses placenta; excreted in breast mild; half-life 15-20min

Interactions
Increase: gastric ulcer risk – corticosteroids, anti-inflammatories, NSAIDs, alcohol
Increase: bleeding – alcohol, plicamycin, thrombolytics, anticoagulants
Increase: hypotension - nitroglycerin
Decrease: effects of aspirin – antacids (high dose), urinary alkalizers, corticosteroids

EMT Considerations
Allergic reactions: rash, urticaria; if these occur, product may have to be discontinued; patients with asthma, nasal polyps allergies: severe allergic reaction may occur
Ototoxicity: tinnitus, ringing, roaring in ears; audiometric testing needed before, after long-term therapy

Treatment of Overdose
Lavage, activated charcoal, monitor electrolytes, VS

Aspirin

Atropine

Mechanism of Action
Blocks acetylcholine at parasympathetic neuroeffector sites; increases cardiac output, heart rate by blocking vagal stimulation in heart; dries secretions by blocking vagus nerve stimulation

Uses
Bradycardia <40-50bpm, bradydysrhythmia, reversal of anticholinesterase agents, insecticide poisoning, blocking cardiac vagal reflexes, decreasing secretions before surgery, antispasmodic with GU, biliary surgery, bronchodilator, AV heart block
Unlabeled Uses: Cardiac arrest, CPR, diarrhea, pulseless electrical activity, ventricular asystole, asthma

Contraindications
Hypersensitivity to belladonna alkaloids, closed-angle glaucoma, GI obstructions, myasthenia gravis, thyrotoxicosis, ulcerative colitis, prostatic hypertrophy, tachycardia, asthma, acute hemorrhage, severe hepatic disease, myocardial ischemia
Precautions
Pregnancy ©, breastfeeding, children <6 y/o, geriatric patients, renal disease, CHF, hyperthyroidism, COPD, hypertension, Down Syndrome, spastic paralysis, gastric ulcer

Protocol Uses
Bradycardia With a Pulse – Adult **(p. 47)**, Cholinergic / Organophosphate Overdose – Adult **(p. 60)**, Beta Blocker Overdose – Adult **(p. 61)**, WMD / Nerve Agent Exposure – Adult, Trauma **(p. 101);**
Cardiac Arrest, General – Peds **(p. 111)**, Bradycardia with a Pulse – Peds **(p. 115)**

Side Effects
CNS: Headache, dizziness, involuntary movement, confusion, psychosis, anxiety, coma, flushing, drowsiness, insomnia, delirium
CV: Hypo/hypertension, paradoxical bradycardia, angina, PVCs, tachycardia, ectopic ventricular beats, bradycardia
EENT: Blurred vision, photophobia, glaucoma, eye pain, pupil dilation, nasal congestion
GI: Dry mouth, nausea, vomiting, abdominal pain, anorexia, constipation, paralytic ileus, abdominal distention, altered taste
GU: Retention, hesitancy, impotence, dysuria
Skin: Rash, urticaria, contact dermatitis, dry skin, flushing
Misc: Suppression of lactation, decreased sweating, anaphylaxis

Pharmacokinetics
Half-life 2-3hr, terminal 12.5hr. Excreted by kidneys unchanged (70-90% in 24hr), metabolized in liver 40-50% crosses placenta

Interactions
Increase: mucosal lesions – potassium chloride tab
Increase: anticholinergic effects – tricyclics, amantadine, antiparkinson agents
Decrease: effect of atropine – antacids

EMT Considerations
Assess ECG for ectopic ventricular beats, PVCs, tachycardia. Assess for increased intraocular pressure; eye pain, nausea, vomiting, blurred vision, increased tearing

Treatment of Overdose
O_2, artificial ventilation, ECG; administer dopamine for circulatory depression; administer diazepam for seizures; assess need for antidysrhythmics

Atropine

Calcium

Mechanism of Action
Needed for maintenance of nervous, muscular, skeletal function; enzyme reactions; normal cardiac contractility; coagulation of blood; affects secretory activity of endocrine, exocrine glands

Uses
Prevention and treatment of hypocalcemia, hypermagnesemia, hypoparathyroidism, neonatal tetany, cardiac toxicity caused by hyperkalemia, lead colic, hyperphosphatemia, Vitamin D deficiency, osteoporosis prophylaxis, calcium antagonist toxicity
Unlabeled Uses: Electrolyte abnormalities in cardiac arrest, CPR

Contraindications
Hypercalcemia, digoxin toxicity, ventricular fibrillation, renal calculi
Precautions
Pregnancy (C), breastfeeding, children, respiratory/renal disease, cor pulmonale, patient in digoxin, respiratory failure, diarrhea

Protocol Uses
Cardiac Arrest – Adult **(p. 39)**, Overdose and Poisoning, General – Adult **(p. 59)**, Beta Blocker Overdose – Adult **(p. 61)**, Calcium Channel Blocker Overdose – Adult **(p. 62)**, Prolonged Crush Injury – Adult, Trauma **(p. 85);**
Cardiac Arerst, General – Peds **(p. 111)**, Overdose and Poisoning, General – Peds **(p. 122)**, Prolonged Crush Injury – Peds **(p. 135)**

Side Effects
CV: Shortened QT, heart block, hypotension, bradycardia, dysrhythmias, cardiac arrest
GI: Vomiting, nausea, constipation
Hypercalcemia: Drowsiness, lethargy, muscle weakness, headache, constipation, coma, anorexia, nausea, vomiting, polyuria,
Skin: Pain, burning at IV site, severe venous thrombosis, necrosis, extravasation

Pharmacokinetics
Crosses placenta, enters breast milk, excreted via urine and feces, half-life unknown, protein binding 40-50%

Interactions
Increase: dysrhythmias – digoxin glycosides
Increase: toxicity - verpamil
Decrease: effects of atenolol, verapamil

EMT Considerations
Assess: ECG for decreased QT and T-wave inversion; seizure precautions with padded side rails, decreased stimuli, place airway suction equipment
Evaluate: therapeutic response with decreased twitching, paresthesias, muscle spasms; absence of tremor, seizure or dysrhythmia

Treatment of Overdose
Discontinue product; supportive care

Calcium

Dextrose

Mechanism of Action
Needed for adequate utilization of amino acids; decreases protein, nitrogen loss; prevents ketosis

Uses
Increases intake of calories; increases fluids in patients unable to take adequate fluids, calories orally; acute hypoglycemia

Contraindications
Hyperglycemia, delirium tremens, hemorrhage (cranial/spinal), CHF, anuria, allergy to corn products

Precautions

Cardiac/renal/hepatic disease, diabetes mellitus, carbohydrate intolerance

Protocol Uses
Documentation of Vital Signs **(p. 16),** Radio Report Format **(p. 27),** Cardiac Arrest – Adult **(p. 39),** Altered Mental Status – Adult **(p. 50),** Diabetic Emergencies – Adult **(p. 52),** Beta Blocker Overdose – Adult **(p. 61),** Calcium Channel Blocker Overdose – Adult (p. **62),** Opiate Overdose – Adult **(p. 66),** Cocaine and Sympathomimetic Overdose – Adult **(p. 67);**
Neonatal Resuscitation – Peds **(p. 109),** Cardiac Arrest, General – Peds **(p. 110, 111),** Altered Mental Status – Peds **(p. 118),** Diabetic Emergencies – Peds **(p. 120)**

Side Effects
CNS: confusion, **loss of consciousness**, dizziness
CV: hypertension, **CHF, pulmonary edema, intracranial hemorrhage**
Endo: Hyperglycemia, rebound hypoglycemia, hyperosmolar syndrome, hyperglycemic non-ketotic syndrome, aluminum toxicity, hypokalemia, hypomagnesium
GI: Nausea
GU: Glycosuria, osmotic diuresis
Skin: Chills, flushing, warm feeling, rash, urticarial, extravasation necrosis
Resp: Pulmonary edema

Pharmacokinetics
Metabolized at the cellular level to carbon dioxide and water.
Oral – onset 10 minutes, peak 40 minutes; **IV –** onset immediate, peak 30 minutes

Interactions
Increase: fluid retention/electrolyte excretion—corticosteroids

EMT Considerations
Assess: Electrolytes (Potassium), blood glucose; Injection site for extravasation (redness along vein, edema at site, necrosis, pain/tenderness), site should be changed immediately
Evaluate: Therapeutic response

Treatment of Overdose
Insulin; discontinue product; supportive care

Dextrose

Diazepam

Mechanism of Action
Potentiates the actions of GABA, especially in the limbic system, reticular formation; enhances presympathetic inhibition, inhibits spinal polysynaptic afferent paths

Uses
Anxiety, EtOH withdrawal, seizure disorder, muscle relaxation

Contraindications
Pregnancy (D), hypersensitivity to benzodiazepines, closed -angle glaucoma, myasthenia gravis, EtOH intoxication, liver disease

Precautions

Breastfeeding, children <6 months, geriatric patients, COPD, CNS depression, labor, Parkinson's disease, psychosis

Protocol Uses
Seizure – Peds **(p. 125)**

Side Effects
CNS: Dizziness, drowsiness, confusion, headache, anxiety, tremors, fatigue, hallucinations, ataxia
CV: Orthostatic hypotension, tachycardia, hypotension
EENT: Blurred vision, tinnitus, mydriasis, nystagmus
GI: Constipation, dry mouth, nausea, vomiting, anorexia, diarrhea
Heme: Neutropenia
Resp: Respiratory depression

Pharmacokinetics
Metabolized by the liver via CYP2C19, CYP3A4; excreted by kidneys, crosses the placenta, excreted in breast mild; crosses the blood-brain barrier; half life 20-50 hours. **IM**: Onset 15-30min, duration 1-1½ hour; **IV**: Onset immediate, duration 15 min-1 hour

Interactions
Increase: Diazepam effect – amiodarone, diltiazem, disulfiram, ketoconazole, nicardipine, verapamil, valproic acid
Increase: toxicity – barbiturates, SSRIs, cimetidine, CNS depressants, valproic acid, CYP3A4 inhibitors
Increase: CNS depression – EtOH
Decrease: Diazepam metabolism – oral contraceptives, valproic acid, disulfiram, propranolol
Decrease: Diazepam effect – CYP3A4 inducers (rifampin, barbiturates, carbamazepein, phenytoin, fosphenytoin), smoking

EMT Considerations
Assess BP (lying, standing), pulse; respiratory rate,
Assess EtOH withdrawal symptoms, including hallucinations (visual, auditory), delirium, irritability, agitation, fine or coarse tremor
Assess IV site for thrombosis or phlebitis, which may occur rapidly
Evaluate therapeutic response – decreased anxiety, restlessness, muscle spasms

Treatment of Overdose
Discontinue product, supportive care, monitor VS

Diazepam

Diltiazem

Mechanism of Action
Inhibits calcium ion influx across cell membrane during cardiac depolarization; produces relaxation of coronary vascular smooth muscle, dilates coronary arteries, slows SA/AV node conduction times, dilates peripheral arteries

Uses
Angina pectoris due to coronary artery spasm, hypertension, atrial fibrillation, atrial flutter, paroxysmal supraventricular tachycardia

Contraindications
Sick sinus syndrome, AV heart block, hypotension <90mmHg systolic, acute MI, pulmonary congestion, cardiogenic shock

Precautions

Pregnancy (C), breastfeeding, children, geriatric patients, CHF, aortic stenosis, bradycardia, GERD, hepatic disease, hiatal hernia, ventricular dysfunction

Protocol Uses
Narrow Complex Tachycardia With a Pulse – Adult **(p. 45),** Wide Complex Tachycardia With a Pulse – Adult **(p. 46),** Calcium Channel Blocker Overdose – Adult **(p. 62)**

Side Effects
CNS: Headache, fatigue, drowsiness, dizziness, depression, weakness, insomnia, tremor, paresthesias
CV: dysrhythmia, edema, CHF, bradycardia, hypotension, palpitations, heart block
GI: Nausea, vomiting, diarrhea, gastric upset, constipation, increased LFTs
GU: Nocturia, polyuria, acute renal failure
Skin: Rash, flushing, photosensitivity, burning or itching at injection site
Resp: Rhinitis, dyspnea, pharyngitis

Pharmacokinetics
Metabolized by the liver, excreted in the urine (96% as metabolites)
IV – onset 30-60 min; peak 2-3 hours

Interactions
Increase: toxic effects – theophylline
Increase: effects of -blockers, digoxin, lithium, carbamazepine, cyclosporine, anesthetics, HMG-CoA reductase inhibitorys, benzodiazepines, lovastatin, methylprednisolone
Increase: effects of diltiazem – cimetidine

EMT Considerations
Assess for CHF – look for dyspnea, weight gain, edema, jugular venous distention, rales,
Assess dysrhythmias – BP, pulse, respiratory rate, ECG and PR intervals, QRS and QT intervals

Treatment of Overdose
Discontinue product, atropine for AV block, vasopressors for hypotension

Diltiazem

Diphenhydramine

Mechanism of Action
Acts on blood vessels, GI, respiratory system by competing with histamine for H_1-receptor site; decreases allergic response by blocking histamine

Uses
Allergy symptoms, rhinitis, motion sickness, antiparkinsonism, nighttime sedation, nonproductive cough

Contraindications
Hypersensitivity to H1-receptor antagonist, acute asthma attack, lower respiratory tract disease, neonates
Precautions
Pregnancy (B), breastfeeding, children <2 years old, increased intraocular pressure, cardiac/renal disease, hypertension, bronchial asthma, seizure disorder, stenosed peptic ulcers, hyperthyroidism, prostatic hypertrophy, bladder neck obstruction

Protocol Uses
Allergic Reaction – Adult **(p. 49),** Antipsychotic Overdose / Acute Dystonic Reaction – Adult **(p. 65);**
Allergic Reaction – Peds **(p. 117)**

Side Effects
CNS: Dizziness, drowsiness, poor coordination, fatigue, anxiety, euphoria, confusion, paresthesia, neuritis, seizures
CV: hypotension, palpitations
EENT: Blurred vision, dilated pupils, tinnitus, nasal stuffiness, dry nose, throat mouth
GI: Nausea, anorexia, diarrhea
GU: Retention, dysuria, frequency
Heme: thrombocytopenia, agranulocytosis, hemolytic anemia
Misc: **Anaphylaxis**
Resp: Increased thick secretions, wheezing, chest tightness

Pharmacokinetics
Metabolized in liver, excreted by kidneys, crosses placenta, excreted in breast milk, half life 2-7 hours. **IM** – onset ½ hour, peak 1-4 hours, duration 4-7 hours. **IV** – onset immediate, duration 4-7 hours

Interactions
Increase: CNS depression – barbiturates, opiates, hypnotics, tricyclics, EtOH
Increase: diphenhydramine effect – MAOIs

EMT Considerations
Assess for urinary retention, frequency, dysuria
Assess respiratory status – rate, rhythm, increase in bronchial secretions, wheezing, chest tightness

Treatment of Overdose
Discontinue product, administer diazepam for seizures, vasopressors for hypotension, phenytoin for refractory seizures

Diphenhydramine

Dopamine

Mechanism of Action
Causes increased cardiac output; acts on β_1 and α- receptors, causing vasoconstriction in blood vessels; low dose causes renal and mesenteric vasodilation; β_1 stimulation produces inotropic effects with increased cardiac output

Uses
Shock, increased perfusion, hypotension, cardiogenic/septic shock
Unlabeled Uses: Bradycardia, cardiac arrest, CPR, acute renal failure, cirrhosis, barbiturate intoxication

Contraindications
Hypersensitivity, ventricular fibrillation, tachydysrhthmias, pheochromocytoma, hypovolemia
Precautions:
Pregnancy (C), breastfeeding, geriatric patients, arterial embolism, peripheral vascular disease, sulfite hypersensitivity, acute MI

Black Box Warning: Extravasation

Protocol Uses
CHF / Pulmonary Edema – Adult **(p. 37),** Bradycardia With a Pulse – Adult **(p. 47),** Hypotension / Shock (Non-Trauma) – Adult **(p. 75),** Hypotension / Shock (Trauma) Adult **(p. 100);**
Neonatal Resuscitation – Peds **(p. 109),** Post Resuscitation Care – Peds **(p. 114),** Hypotension / Shock (Non-Trauma) – Peds **(p. 126)**

Side Effects
CNS: *Headache,* anxiety
CV: *Palpitations, tachycardia, hypertension, ectopic beasts, angina, wide QRS complex,* peripheral vasoconstriction, hypotension
GI: *Nausea, vomiting, diarrhea*
Rash: Necrosis, tissue sloughing with extravasation, **gangrene**
Resp: Dyspnea

Pharmacokinetics
IV: Onset 5 minutes, duration <10 min; metabolized in liver/kidney/plasma; excreted in urine (metabolites); half-life 2 min

Interactions
Do not use within 2 weeks of MAOIs; hypertensive crisis may result
Increase: bradycardia, hypotension—phenytoin
Increase: dysrhythmias—general anesthetics
Increase: severe hypertension—ergots
Increase: blood pressure—oxytocics
Increase: pressor effect—tricyclics, MAOIs
Decrease: dopamine action – β/α blockers

EMT Considerations
Assess: Hypovolemia, oxygenation/perfusion deficits (check BP, chest pain, dizziness, loss of consciousness), heart failure (dyspnea, neck venous distension, bibasilar crackles), ECG (monitor continuously, if BP increase consider decreasing dosing), parasthesias/coldness (peripheral blood flow may decrease), injection site
Preform/Provide: Storage of reconstituted solution for up to 24 hour if refrigerated, do not use discolored solution; protect from light
Evaluate: Therapeutic response (increase BP)

Treatment of Overdose
Discontinue IV, may give short-acting α-adrenergic blocker

Dopamine

DuoDote Kit

The DuoDote autoinjector provides a single intramuscular dose of the anti-nerve agent medications atropine and pralidoxime chloride in a self contained unit. The kits are only effective against the nerve agents **tabun** (GA), **sarin** (GB), **soman** (GD) and **VX**. It may also be used in cases of agricultural insecticide exposure, as organophosphates are a key component of the agent. Common examples of insecticides using organophosphates are **malathion**, **parathion**, **diazinon**, **fenthion**, **dichlorvos**, **ethion** and **trichlorfon**.

Mechanism of Action

Atropine counters the parasympathetic response from the muscarinic receptor overstimulation associated with organophosphate and nerve agent poisoning, and reverses the SLUDGEM symptoms.
Pralidoxime chloride ("2-PAM") binds to the organophosphate or nerve agent and changes the conformation of the molecule, which causes it to lose its binding to the acetylcholinesterase enzyme. The joined poison / antidote then releases from the site and regenerates the enzyme, allowing it to function again.

Uses

Organophosphate and nerve agent poisonings.

Contraindications

None in the emergency setting.
Precautions
Known hypersensitivity to the DuoDote or Mark I Kit and Pediatric patients under the age of 3 are *relatively* contraindicated.

Protocol Uses

Cholinergic / Organophosphate Overdose – Adult **(p. 60),** WMD / Nerve Agent Exposure – Adult, Trauma **(p. 101)**

Each kit contains: Atropine 2.1mg and Pralidoxime chloride 600mg
Minor initial symptoms – administer **ONE** DuoDote Kit via autoinjector (IM)
Severe symptoms appearing within 10 minutes of first dose – administer **ONE additional** DuoDote Kit via autoinjector (IM)
Severe symptoms present from the beginning – administer **THREE** DuoDote Kits via autoinjector (IM)

Side Effects

HEENT: Dry mouth
Skin: Flushing
CNS: Dilated pupils, Headache, Drowsiness
CV: Tachycardia

Interactions

Morphine, theophylline, aminophylline and **succinylcholine** should be avoided in patients with organophosphate poisoning. Barbiturates are potentiated by the anticholinesterase enzyme and should be used cautiously when treating seizures in the poisoned patient.

EMT Considerations

The use of a DuoDote Kit offers no prophylactic protection and should be administered only if symptoms are present.

There is a high potential for "off-gassing" from patients exposed to both organophosphates and nerve agents. In cases of "off-gassing", vapors are given off by chemically contaminated clothing or exhaled by poisoned individuals. EMS Providers should use all appropriate PPE including SCBA and be vigilant when monitoring for symptoms in themselves and other responders. These patients are generally NOT safe for transport by Helicopter EMS (HEMS).

Treatment of Overdose

Discontinue product; supportive care

DuoDote Kit

Epinephrine (Adrenaline)

Mechanism of Action
β_1- and β_2-agonist causing increased levels of cAMP, thereby producing bronchodilation, cardiac and CNS stimulation; high doses cause vasoconstriction via alpha-receptors; low doses can cause vasodilation vai β_2-vascular receptors

Uses
Acute asthma attacks, hemostasis, bronchospasm, anaphylaxis, allergic reactions, cardiac arrest, shock

Contraindications
Hypersensitivity to sympathomimetics, sulfites, closed-angle glaucoma, nonanaphylactic shock during general anesthesia

Precautions

Pregnancy (C), breastfeeding, cardiac disorders, hyperthyroidism, diabetes mellitus, prostatic hypertrophy, hypertension, organic brain syndrome, local anesthesia in certain areas, labor, cardiac dilation, coronary insufficiency, cerebral atherosclerosis, organic heart disease

Protocol Uses
Termination of Resuscitation **(p. 28),** COPD / Asthma / Stridor – Adult **(p. 36),** Cardiac Arrest – Adult **(p. 39),** Asystole / Pulseless Electrical Activity (PEA) Arrest – Adult **(p. 40),** V-Fib / Pulseless V-Tach Arrest – Adult **(p. 41),** Bradycardia With a Pulse – Adult **(p. 47),** Allergic Reaction – Adult **(p. 49),** Calcium Channel Blocker Overdose – Adult **(p. 62),** Hypotension / Shock (Non-Trauma) – Adult **(p. 75),** Hypotension / Shock (Trauma) – Adult **(p. 100);**
Wheezing / Asthma – Peds **(p. 108),** Neonatal Resuscitation – Peds **(p. 109),** Cardiac Arrest, General – Peds **(p. 110, 111),** Asystole / Pulseless Electric Activity (PEA) Arrest – Peds **(p. 112),** V-Fib / Pulseless V-Tach Arrest – Peds **(p. 113),** Post Resuscitation Care – Peds **(p. 114),** Bradycardia With a Pulse – Peds **(p. 115).** Allergic Reaction – Peds **(p. 117),** Hypotension / Shock (Non-Trauma) – Peds **(p. 126)**

Side Effects
CNS: Tremors, anxiety, insomnia, headache, dizziness, confusion, hallucinations, cerebral hemorrhage, weakness, drowsiness
CV: Palpitations, tachycardia, hypertension, dysrhythmias, increased T wave
GI: Anorexia, nausea, vomiting
MISC: Sweating, dry eyes
Resp: Dyspnea

Pharmacokinetics
Crosses placenta, metabolized in the liver. **IM** – onset variable, duration 1-4 hours; **Inhaled -** onset 1-5 minutes, duration 1-3 hours

Interactions
Do not use with MAOIs or tricyclics; hypertensive crisis may occur.
Toxicity: other sympathomimetics
Decrease: hypertensive effects – β-adrenergic blockers

EMT Considerations
Assess Asthma – auscultate lungs, pulse, BP, respiratory rate and effort, sputum
ECG completed when continuous albuterol administered
Sulfite sensitivity may be life-threatening
Allergic reactions, bronchospasms

Treatment of Overdose
Discontinue product, administer α -blocker and β -blocker

Epinephrine (Adrenaline)

Etomidate

Mechanism of Action
Ultrashort-acting nonbarbiturate hypnotic used for rapid induction of anesthesia with minimal cardiovascular effects; modulates $GABA_A$ receptors to induce general anesthesia. Does NOT have any analgesic properties

Uses
Conscious sedation, anesthesia for rapid-sequence intubation
Unlabeled uses: determine speech lateralization in patients prior to lobectomies to remove epileptogenic centers in the brain

Contraindications
Hypersensitivity
Precautions
Renal impairment, Elderly patients, Pregnancy category (C), unknown if excreted in breast milk

Protocol Uses
Rapid Sequence Airway – Adult **(p. 33),** Rapid Sequence Airway – Procedure **(p. 150)**

Side Effects
Suppresses corticosteroid synthesis in the adrenal cortex by inhibiting 11-beta-hydroxylase, an enzyme important in adrenal steroid production.
CV: Arrhythmias, bradycardia, HTN, hypotension
GI: Nausea, vomiting on emergence from anesthesia
MS: Pain at injection site
Resp: Hiccups, laryngospasm, hypoventilation

Pharmacokinetics
Protein binding 76%, metabolized by hepatic and plasma esterases, excreted by kidneys, half life 1.25 hours
IV – Onset in 30-60 seconds, peak within 1 minute, duration approximately 3-5 minutes

Interactions
No interactions listed on Lexi-Comp

EMT Considerations
Administer IV push over 30-60 seconds. Solution is highly irritating to small vessels
Assess vital signs, note muscle tone prior to and after injection, drug history, hepatic or renal failure
Assess for CNS changes – dizziness, somnolence, hallucinations, euphoria, LOC

Treatment of Overdose
Discontinue product; supportive care

Etomidate

Famotidine

Mechanism of Action
Competitively inhibits histamine at histamine H_2-receptor site, thus decreasing gastric secretion while pepsin remains at a stable level.

Uses
Short-term treatment of active duodenal ulcer, maintenance therapy for duodenal ulcer, Zollinger-Ellison syndrome, multiple endocrine adenomas, gastric ulcers; gastroesophageal reflux disease, heartburn
Unlabeled uses: GI disorders in those taking NSAIDs; urticaria; prevention of stress ulcers, aspiration pneumonitis, inactivation of oral pancreatic enzymes in pancreatic disorders

Contraindications
Hypersensitivity
Precautions
Pregnancy (B), breastfeeding, children <12 years old, geriatric patients, severe renal/hepatic disease

Protocol Uses
Allergic Reaction – Adult **(p. 49),** Allergic Reaction – Peds **(p. 117)**

Side Effects
CNS: Headache, dizziness, paresthesia, depression, anxiety, somnolence, insomnia, fever, **seizures in renal disease**
CV: **Dysrhythmias, QT prolongation in impaired renal function**
EENT: Taste change, tinnitus, orbital edema
Skin: Rash, **toxic epidermal necrolysis, Stevens-Johnson syndrome**
MS: Myalgias, arthralgias
Resp: **Pneumonia**

Pharmacokinetics
Plasma protein binding 15-20%, metabolized in liver 30% (active metabolites), 70% excreted by kidneys, half life 2½-3½ hours;
IV – onset immediate, peak 30-60 minutes, duration 8-15 hours

Interactions
Decrease: absorption – ketoconazole, itraconazole, cefpodoxime, cefditoren
Decrease: famotidine absorption – antacids
Decrease: effect of – atazanavir, delavirdine

EMT Considerations
Assess for signs of ulcers – epigastric pain, abdominal pain, frank or occult blood in emesis
Assess for signs of allergic reaction – redness, hives, itching

Treatment of Overdose
Discontinue product; supportive care

Famotidine

Fentanyl

Mechanism of Action
Inhibits ascending pain pathways in the CNS, increases pain threshold, alters pain perception by binding to opiate receptors

Uses
Controls moderate to severe pain; adjunct to general anesthetic, adjunct to regional anesthesia; conscious sedation

Contraindications
Hypersensitivity to opiates, myasthenia gravis

Precautions

Pregnancy (C), breastfeeding, geriatric patients, increased intracranial pressure, seizure disorders, severe respiratory disorders, cardiac dysrhythmias

Protocol Uses
Post Advanced Airway Sedation – Adult, Medical **(p. 34),** Opiate Overdose – Adult **(p. 66),** Pain Management – Adult **(p. 69),** Pain Management – Adult, Trauma **(p. 95);**
Post Resuscitation Care – Peds **(p. 114),** Pain Management – Peds **(p. 123),** Sickle Cell Crisis – Peds **(p. 127),** Pain Management – Peds, Trauma **(p. 143)**

Side Effects
CNS: Dizziness, euphoria, sedation
CV: **Bradycardia, arrest**, hypo/hypertension
EENT: Blurred vision, miosis
GI: Nausea, vomiting, constipation
Skin: Rash, diaphoresis
MS: Muscle rigidity
Resp: **Respiratory depression, arrest, laryngospasm**

Pharmacokinetics
Metabolized by liver, excreted by kidneys, crosses placenta, excreted in breast milk. Half-life IV: 2-4 hours
IM: onset 7-8 minutes, peak 30 minutes, duration 1-2 hours. **IV**: Onset 1 minute, peak 3-5 minutes, duration ½ - 1 hour

Interactions
Increase: fentanyl effect (fetal respiratory depression) – cyclosporine, ketoconazole, cimetidine, fluconazole, nefazodine, zafrilukast
Increase: hypotension – droperidol
Increase: CV depression – diazepam
Increase: fentanyl effect with other CNS depressants – EtOH, opioids, sedative/hypnotics, antipsychotics, skeletal muscle relaxants, protease inhibitors
Decrease: fentanyl effect – CYP3A4 inducers (carbamazepine, phenytoin, phenobarbital, rifampin)

EMT Considerations
Assess vital signs, note muscle rigidity, drug history, hepatic or renal failure
Assess for CNS changes – dizziness, drowsiness, hallucinations, euphoria, LOC, pupil reaction

Treatment of Overdose
Discontinue product, naloxone

Glucagon

Mechanism of Action
Increases in blood glucose, relaxation of smooth muscle of the GI tract, and a positive inotropic and chronotropic effect on the heart; increases in blood glucose are secondary to stimulation of glycogenolysis

Uses
Hypoglycemia, used to temporarily inhibit movement of GI tract as a diagnostic test

Contraindications
Hypersensitivity, pheochromocytoma, insulinoma (insulin-secreting tumor)

Protocol Uses
Cardiac Arrest – Adult **(p. 39).** Diabetic Emergencies – Adult **(p. 52),** Beta Blocker Overdose – Adult **(p. 61),** Calcium Channel Blocker Overdose – Adult **(p. 62);**
Diabetic Emergencies – Peds **(p. 120),** Overdose and Poisoning, General – Peds **(p. 122)**

Side Effects
CNS: Dizziness, headache,
CV: Hypotension
GI: Nausea, vomiting

Pharmacokinetics
IV: Onset immediate, peak 30 minutes, duration 1-1½ hours
IM: Onset 5-10 minutes, peak 13-20 minutes, duration 12-30 minutes

Interactions
Increase: Bleeding risk – anticoagulants

EMT Considerations
Assess for hypoglycemia – monitor blood glucose levels before and after use; use other products to control hypoglycemia if patient is conscious

Treatment of Overdose
Discontinue product, supportive care

Glucagon

Glucose

Mechanism of Action
Needed for adequate utilization of amino acids; decreases protein, nitrogen loss; prevents ketosis

Uses
Increases intake of calories; increases fluids in patients unable to take adequate fluids, calories orally; acute hypoglycemia

Contraindications
Inability to swallow effectively, impaired airway reflexes / inability to protect airway, hyperglycemia, delirium tremens, hemorrhage (cranial/spinal), CHF, anuria, allergy to corn products

Precautions

Cardiac/renal/hepatic disease, diabetes mellitus, carbohydrate intolerance

Protocol Uses
General Approach – Adult, Medical **(p. 31),** Airway Management – Adult **(p. 32),** Rapid Sequence Airway – Adult **(p. 33),** CHF / Pulmonary Edema – Adult **(p. 37),** Altered Mental Status – Adult **(p. 50),** Diabetic Emergencies – Adult **(p. 52),** Overdose and Poisoning, General – Adult **(p. 59),** Refusal Protocol – Adult **(p. 70),** Refusal After EMS Treatment – Adult **(p. 71),** Seizure – Adult **(p. 72),** Suspected Stroke – Adult **(p. 73),** Sepsis Screening – Adult **(p. 74),** Hypotension / Shock (Non-Trauma) – Adult **(p. 75),** Environmental, Hypothermia – Adult, Trauma **(p. 88),** Head Injury – Adult, Trauma **(p. 92),** Lightning Strike – Adult, Trauma **(p. 94);** General Approach – Peds, Medical **(p. 105),** Airway management – Peds **(p. 106),** Neonatal Resuscitation – Peds **(p. 109),** Asystole / Pulseless Electric Activity (PEA) Arrest – Peds **(p. 112),** V-Fib / Pulseless V-Tach Arrest – Peds **(p. 113),** Altered Mental Status – Peds **(p. 118),** Brief Resolved Unexplained Event (BRUE – formerly "ALTE") – Peds **(p. 119),** Diabetic Emergencies – Peds **(p. 120),** Overdose and Poisoning, General – Peds **(p. 122),** Refusal Protocol – Peds **(p. 124),** Seizure – Peds **(p. 125),** Hypotension / Shock (Nono-Trauma) – Peds **(p. 126),** Environmental, Hypothermia – Peds, Trauma **(p. 138),** Head Injury – Peds, Trauma **(p. 141),** Blood Glucose Analysis – Procedure **(p. 169),** Cincinnati Stroke Screen – Procedure **(p. 180),** FAST-ED Stroke Screen – Procedure **(p. 181)**

Side Effects
CNS: confusion, **loss of consciousness**, dizziness
CV: hypertension, **CHF, pulmonary edema, intracranial hemorrhage**
Endo: Hyperglycemia, rebound hypoglycemia, hyperosmolar syndrome, hyperglycemic non-ketotic syndrome, aluminum toxicity, hypokalemia, hypomagnesium
GI: Nausea
GU: Glycosuria, osmotic diuresis
Skin: Chills, flushing, warm feeling, rash, urticarial, extravasation necrosis
Resp: Pulmonary edema

Pharmacokinetics
Metabolized at the cellular level to carbon dioxide and water
Oral – onset 10 minutes, peak 40 minutes

Interactions
Increase: fluid retention/electrolyte excretion—corticosteroids

EMT Considerations
Assess: Mental status and appropriateness for oral medications, electrolytes (Potassium), blood glucose
Evaluate: Therapeutic response

Treatment of Overdose
Insulin, IVF, discontinue product, supportive care

Glucose (Oral)

Haloperidol

Mechanism of Action
Depresses cerebral cortex, hypothalamus, limbic system, which control activity and aggression; blocks neurotransmission produced by dopamine at synapse; exhibits, strong α-adrenergic, anticholinergic blocking action; mechanism for antipsychotic effects unclear

Uses
Psychotic disorders, control of tics, vocal utterances in Gilles de la Tourette's syndrome, short-term treatment of hyperatcive children showing excessive motor activity, prolonged parenteral therapy in chronic schizophrenia, organic mental syndrome with psychotic features, hiccups (short-term), emergency sedation of severely agitated or delirious patients, ADHD
Unlabeled uses: Intraoperative nausea, vomiting; autism; migraine

Contraindications
Hypersensitivity, coma, Parkinson's disease
Precautions
Pregnancy (C), breastfeeding, geriatric patients, seizure disorders, hypertension, pulmonary/cardiac/hepatic disease, QT prolongation, torsades de pointes, prostatic hypertrophy, hyperthyroidism, thyrotoxicosis, children, blood dyscrasias, brain damage, bone marrow depression, EtOH and barbiturate withdrawal states, angina, epilepsy, urinary retention, closed angle glaucoma, CNS depression **Black Box Warning**: Increased mortality in elderly patients with dementia-related psychosis

Protocol Uses
Behavioral / Excited Delirium – Adult **(p. 51)**

Side Effects
CNS: EPS – pseudoparkinsonism, akathisia, dystonia, tardive dyskinesia, drowsiness, headache, **seizures, neuroleptic malignant syndrome**, confusion
CV: Orthostatic hypotension, hypertension, **cardiac arrest**, ECG changes, **tachycardia, QT prolongation, sudden death, torsades de pointes**
EENT: Blurred vision, glaucoma, dry eyes
GI: Dry mouth, nausea, vomiting, anorexia, constipation, diarrhea, jaundice, weight gain, **ileus, hepatitis**
GU: Urinary retention, dysuria, urinary frequency, enuresis, impotence, amenorrhea, gynecomastia
Skin: Rash, photosensitivity, dermatitis
Resp: **laryngospasm**, dyspnea, respiratory depression

Pharmacokinetics
Metabolized by liver, excreted in urine, bile; crosses placenta; enters breast mild; protein binding 92%; terminal half-life 12-36 hours (metabolites) **IM**: Onset 15-30 minutes, peak 15-20 minutes, half life 21 hours

Interactions
Increase: serotonin syndrome, neuroleptic malignant syndrome – SSRIs, SNRIs
Increase: QT prolongation – class 1A, III antidysrhythmics, tricyclics, amoxapine, maprotiline, phenothiazines, pimozide, risperidone, sertindole, ziprasidone, β-blockers, chloroquine, clozapine, dasatinib, dolasetron, droperidol, dronedarone, flecainide, methadone, erythromycin, ondansetron, tacrolimus
Increase: oversedation – other CNS depressants, EtOH, barbiturate anesthetics
Increase: toxicity – epinephrine, lithium
Decrease: effects – lithium, levodopa

EMT Considerations
Assess patient response to medications, scene safety, evaluate for dystonic reaction

Treatment of Overdose
Discontinue product, supportive care, ECG monitoring, diphenhydramine for dystonia

Hydroxocobalamin

Mechanism of Action
Precursor to cyanocobalamin (vitamin B12). Cyanocobalamin acts as a coenzyme for various metabolic functions including fat and carbohydrate metabolism and protein synthesis. In the presence of cyanide, each hydroxocobalamin molecule can bind one cyanide ion and form cyanocobalamin, which is then excreted in the urine.

Uses
Cyanide antidote, vitamin B12 deficiency, pernicious anemia, vitamin B12 malabsorption syndrome, increased requirements with pregnancy, thyrotoxicosis, hemolytic anemia, hemorrhage, renal/hepatic disease, nutritional supplementation

Contraindications
Hypersensitivity, optic nerve atrophy

Precautions

Pregnancy (A), breastfeeding, children

Protocol Uses
Cyanide Poisoning – Adult **(p. 64)**

Side Effects
CNS: Flushing, optic nerve atrophy
CV: **CHF**, peripheral vascular thrombosis**, pulmonary edema**
GI: Diarrhea
Skin: Itching, rash, pain at injection site
Endo: Hypokalemia
Systemic: **Anaphylactic shock**

Pharmacokinetics
Stored in liver/kidneys/stomach; 50%-90% excreted in urine; crosses placenta; excreted in breast milk

Interactions
Increase: absorption—prednisone
Decrease: absorption—aminoglycosides, anticonvulsants, colchicine, chloramphenicol, aminosalicylic acid, potassium preparations, cimetidine

EMT Considerations
Assess: For vitamin B12 deficiency (red/beefy tongue, psychosis, pallor, neuropathy); For pulmonary edema, worsening of CHF in cardiac patients
Perform/provide: Protection from light, heat
Evaluate: Therapeutic response:, dyspnea on exertion, palpitations, paresthesias, psychosis, visual disturbances

Treatment of Overdose
Discontinue product, IVF, supportive care

Hydroxocobalamin

Ipratropium

Mechanism of Action
Inhibits interaction of acetylcholine at receptor sites on the bronchial smooth muscle, thereby resulting in decreased cGMP and bronchodilation

Uses
COPD, Asthma

Contraindications
Hypersensitivity to this product, atropine, bromide, soybean or peanut products

Precautions

Breastfeeding, children <12 yr, angioedema, heart failure, surgery, acute bronchospasm, bladder obstruction, closed-angle glaucoma, prostatic hypertrophy, urinary retention, pregnancy (B)

Protocol Uses
COPD / Asthma / Sridor – Adult **(p. 36),** Hazmat, General – Adult, Trauma **(p. 91);**
Wheezing / Asthma – Peds **(p. 108)**

Side Effects
CNS: *Anxiety, dizziness, headache*, nervousness
CV: Palpitations
EENT: Dry mouth, blurred vision, nasal congestion
GI: *Nausea, vomiting, cramps*
Skin: Rash
RESP: *Cough, worsening of symptoms*, **bronchospasms**

Pharmacokinetics
15% of dose reaches lower airways. Protein binding <9%, half-life elimination 2 hours
INH – onset 15 minutes, peak 1-2 hours, duration 2-5 hours

Interactions
Increase: toxicity—other bronchodilators (INH)
Increase: anticholinergic action—phenothiazines, antihistamines, disopyramide

EMT Considerations
Assess: Palpitations; respiratory status (rate, rhythm, auscultate breath sounds prior to and after administration
Perform/provide: Storage at room temp
Evaluate: Therapeutic response: ability to breathe adequately

Treatment of Overdose
Discontinue product; supportive care

Ipratropium

Ketamine

Mechanism of Action
Produces a cataleptic-like state in which the patient is dissociated from the surrounding environment by direct action on the cortex and limbic system. Noncompetitive NMDA receptor antagonist that blocks glutamate in the brain. Low doses produce analgesia and modulate central sensitization, hyperalgesia and opioid tolerance. Reduces polysynaptic spinal reflexes.

Uses
Induction and maintenance of general anesthesia
Unlabeled uses: Complex regional pain syndrome, analgesia, sedation

Contraindications
Hypersensitivity, conditions in which increased blood pressure would be hazardous. Additional contraindications per American College of Emergency Physicians (ACEP) – Infants <3 months of age, known or suspected schizophrenia (even if currently stable or controlled with medications)

Precautions
Increased intracranial pressure, increased ocular pressure, thyroid disorders, cardiovascular disease, respiratory depression, airway complications, CNS depression, emergence reaction
Ketamine crosses the placenta and can be detected in fetal tissue; it is not known if ketamine is excreted in breast milk

Protocol Uses
Rapid Sequence Airway – Adult **(p. 33),** Post Advanced Airway Sedation - Adult, Medical **(p. 34),** Behavioral / Excited Delirium – Adult **(p. 51),** Pain Management – Adult, Trauma **(p. 95)**

Side Effects
CNS: Prolonged emergence, confusion, **hallucinations**, irrational behavior, **increased CSF pressure**, hypertonia (may resemble seizures), drug dependence
CV: Bradycardia, arrhythmia, hypotension, HTN, tachycardia
Derm: Erythema (transient), morbilliform rash (transient), rash at injection site
Endo: Central diabetes insipidus
GI: Anorexia, nausea, **sialorrhea** (drooling), vomiting
EENT: Diplopia, **increased intraocular pressure**, nystagmus
Resp: **Airway obstruction**, apnea, respiratory depression, laryngospasm

Pharmacokinetics
Metabolized in liver via hydroxylation and N-demehtylation, excreted primarily in the urine
IV – onset 30 seconds, peak 5-10 minutes; IM – onset 3-4 minutes, peak 12-25 minutes. Half life 2.5 hours

Interactions
Increase: CNS depression – **alcohol**, buprenorphine, **cannabis**, **magnesium sulfate**, minocycline, mirtazapine, zolpidem, **hydrocodone**, **antihistamines**, thalidomide
Increase: active metabolites – quazepam, stiripentol,memantine
Ketamine may increase the toxic effects of – memantine, mifepristone, thiopental, **SSRI antidepressants**

EMT Considerations
Assess heart rate, blood pressure, respiratory rate, SpO2
Assess for emergence reaction
Assess cardiac function continuously in patients with increased blood pressure or cardiac decompensation

Treatment of Overdose
Discontinue product; respiratory support for laryngospasm and respiratory depression, airway suctioning for increased salivation and secretions, supportive care for psychomotor agitation and hallucinations

Lidocaine

Mechanism of Action
Increases electrical stimulation threshold of ventricle, His-Purkinje system, which stabilizes cardiac membrane, decreases automaticity

Uses
Ventricular tachycardia, ventricular dysrhythmias during cardiac surgery, digoxin toxicity, cardiac catheterization
Unlabeled uses: Attenuation of intracranial pressure increases during intubation/endotracheal tube suctioning

Contraindications
Hypersensitivity to amides, severe heart block, supraventricular dysrhythmias, Adams-Stokes syndrome, Wolff-Parkinson-White syndrome
Precautions: Pregnancy (B), breastfeeding, children, geriatric patients, renal/hepatic disease, CHF, respiratory depression, malignant hyperthermia, myasthenia gravis, weight <50 kg

Protocol Uses
Rapid Sequence Airway – Adult **(p. 33);**
Cardiac Arrest, General – Peds **(p. 110, 111),** Rapid Sequence Airway (RSA) – Procedure **(p. 150),**
IO Intraosseous Venous Access – Procedure **(p. 192)**

Side Effects
CNS: *Headache, dizziness*, involuntary movement, confusion, tremor, drowsiness, euphoria, **seizures**, shivering
CV: *Hypotension, bradycardia*, **heart block, CV collapse, arrest**
EENT: Tinnitus, blurred vision
GI: Nausea, vomiting, anorexia
Hematology: **Methemoglobinemia**
Skin: Rash, urticaria, edema, swelling, petechiae, pruritus
Misc: Febrile response, phlebitis at injection site
Resp: Dyspnea, **respiratory depression**

Pharmacokinetics
Half-life 8 min, 1-2 hr (terminal); metabolized in liver; excreted in urine; crosses placenta
IV: Onset 2 minutes, duration 20 min

Interactions
Increase: cardiac depression, toxicity—amiodarone, phenytoin, procainamide, propranolol
Increase: hypotensive effects—MAOIs, antihypertensives
Increase: neuromuscular blockade—neuromuscular blockers, tubocurarine
Increase: lidocaine effects—cimetidine, beta blockers, protease inhibitors, ritonavir
Decrease: lidocaine effects—barbiturates, ciprofloxacin, voriconazole
Decrease: effect of—cyclosporine
Decrease: effect—coltsfoot

EMT Considerations
Assess: ECG continuously to determine increased PR or QRS segments; if these develop, discontinue or reduce rate; watch for increased ventricular ectopic beats, may have to re-bolus; Blood pressure; Malignant hyperthermia (tachypnea, tachycardia, changes in BP, increased temp); Respiratory status (rate, rhythm, lung fields for crackles, watch for respiratory depression); CNS effects (dizziness, confusion, psychosis, paresthesias, convulsions-- product should be discontinued)
Evaluate: Therapeutic response: decreased dysrhythmias

Treatment of Overdose
Discontinue product, O_2, artificial ventilation, ECG; administer Dopamine for circulatory depression, diazepam for seizures

Lidocaine

Lorazepam

Mechanism of Action
Potentiates the actions of GABA, especially in the limbic system and the reticular formation

Uses
Anxiety, irritability with psychiatric or organic disorders, preoperatively; insomnia; adjunct for endoscopic procedures, status epilepticus
Unlabeled uses: Antiemetic prior to chemotherapy, rectal use, alcohol withdrawal, seizure prophylaxis, agitation, insomnia, sedation maintenance

Contraindications
Pregnancy (D), breastfeeding, hypersensitivity to benzodiazepines, benzyl alcohol; closed-angle glaucoma, psychosis, history of drug abuse, COPD, sleep apnea
Precautions: Children <12 yr, geriatric patients, debilitated, renal/hepatic disease, addiction, suicidal ideation, abrupt discontinuation

Protocol Uses
Narrow Complex Tachycardia With a Pulse – Adult **(p. 45),** Bradycardia With a Pulse – Adult **(p. 47),** Behavioral / Excited Delirium – Adult **(p. 51),** OB General – Adult **(p. 55),** Antipsychotic Overdose / Acute Dystonic Reaction – Adult **(p. 65),** Cocaine and Sympathomimetic Overdose – Adult **(p. 67),** Tricyclic Overdose – Adult **(p. 68),** Seizure – Adult **(p. 72);**
Bradycardia With a Pulse – Peds **(p. 115),** Seizure – Peds **(p. 125)**

Side Effects
CNS: *Dizziness, drowsiness*, confusion, headache, anxiety, tremors, stimulation, fatigue, depression, insomnia, hallucinations, weakness, unsteadiness
CV: *Orthostatic hypotension*, **ECG changes, tachycardia**, hypotension; **apnea, cardiac arrest (IV, rapid)**
EENT: *Blurred vision*, tinnitus, mydriasis
GI: Constipation, dry mouth, nausea, vomiting, anorexia, diarrhea
Skin: Rash, dermatitis, itching
Misc: Acidosis

Pharmacokinetics
Metabolized by liver; excreted by kidneys; crosses placenta, excreted in breast milk; half-life 14 hr
IM: Onset 15-30 min, peak 1-1.5 hours; duration 6-8 hours
IV: Onset 5-15 min, peak unknown, duration 6-8 hours

Interactions
Increase: Lorazepam effects—CNS depressants, alcohol, disulfiram, oral contraceptives
Decrease: Lorazepam effects—valproic acid

EMT Considerations
Assess: Anxiety (decrease in anxiety; mental status); Physical dependency (withdrawal symptoms: headache, nausea, vomiting, muscle pain, weakness, tremors, seizures)
Perform/provide: Assistance with ambulation during beginning therapy, since drowsiness, dizziness occurs; Refrigerate parenteral form
Evaluate: Therapeutic response: decreased anxiety, restlessness

Treatment of Overdose
GI lavage, VS, supportive care, flumazenil

Lorazepam

Magnesium

Mechanism of Action
When taken orally, promotes bowel evacuation by causing osmotic retention of fluid which distends the colon with increased peristaltic activity. Parenteral infusion decreases acetylcholine in motor nerve terminals and acts on myocardium by slowing rate of SA node impulse formation and prolonging conduction time. Magnesium is necessary for the movement of calcium, sodium and potassium into and out of the cells as well as stabilizing excitable membranes.

Uses
Anticonvulsant for preeclampsia/eclampsia
Unlabeled uses: persistent pulmonary hypertension of the newborn (PPHN), cardiac arrest, CPR, digitoxin/digoxin toxicity, premature labor, seizure prophylaxis, status asthmaticus, torsades de pointes, ventricular fibrillation/tachycardia

Contraindications
Hypersensitivity, abdominal pain, nausea/vomiting, obstruction, acute surgical abdomen, rectal bleeding, heart block, myocardial damage
Precautions: Pregnancy (A), renal/cardiac disease

Protocol Uses
Asthma / COPD – Adult **(p. 36),** Cardiac Arrest – Adult **(p. 39),** Wide Complex Tachycardia With A Pulse – Adult **(p. 46),** OB General – Adult **(p. 55),** Beta Blocker Overdose – Adult **(p. 61),** Seizure – Adult **(p. 72);**
Wheezing / Asthma – Peds **(p. 108),** Seizure – Peds **(p. 125)**

Side Effects
CNS: Muscle weakness, flushing, sweating, confusion, sedation, depressed reflexes, **flaccid paralysis**, hypothermia
CV: Hypotension, heart block, **circulatory collapse**, vasodilation
GI: *Nausea, vomiting, anorexia, cramps*, diarrhea
Hematology: Prolonged bleeding time
Metabolic: Electrolyte, fluid imbalances
Resp: Respiratory depression/paralysis

Pharmacokinetics
Protein binding 30% to albumin, excreted in the urine as magnesium
IM – onset 1 hour, duration 3-4 hours; **IV –** onset immediate, duration 30 min

Interactions
Increase: effect of neuromuscular blockers
Increase: hypotension—antihypertensives
Decrease: absorption of tetracyclines, fluoroquinolones, nitrofurantoin
Decrease: effect of digoxin

EMT Considerations
Assess: Eclampsia (seizure precautions, BP, ECG)
Evaluate: Therapeutic response (absence of seizures, stabilization of dysrhythmia, improvement in respiratory status)

Treatment of Overdose
Discontinue product; support respirations with positive pressure ventilation, supportive care

Magnesium

Mark 1 Kit

Mark I NAAK ("Nerve Agent Antidote Kit") is a dual-chamber autoinjector with two anti-nerve agent drugs. The kits are only effective against the nerve agents **tabun** (GA), **sarin** (GB), **soman** (GD) and **VX**. It may also be used in cases of agricultural insecticide exposure, as organophosphates are a key component of the agent. Common examples of insecticides using organophosphates are **malathion**, **parathion**, **diazinon**, **fenthion**, **dichlorvos**, **ethion** and **trichlorfon**.

Mechanism of Action

Atropine counters the parasympathetic response from the muscarinic receptor overstimulation associated with organophosphate and nerve agent poisoning, and reverses the SLUDGEM symptoms.
Pralidoxime chloride ("2-PAM") binds to the organophosphate or nerve agent and changes the conformation of the molecule, which causes it to lose its binding to the acetylcholinesterase enzyme. The joined poison / antidote then releases from the site and regenerates the enzyme, allowing it to function again.

Uses

Organophosphate and nerve agent poisonings.

Contraindications

None in the emergency setting.

Precautions

Known hypersensitivity to the Mark I or DuoDote Kit and Pediatric patients under the age of 3 are *relatively* contraindicated.

Protocol Uses

Cholinergic / Organophosphate Overdose – Adult **(p. 60)**

Each kit contains: Atropine 2mg and Pralidoxime chloride 600mg
Minor initial symptoms – administer **ONE** Mark I Kit via autoinjector (IM)
Severe symptoms appearing within 10 minutes of first dose – administer **ONE additional** Mark I Kit via autoinjector (IM)
Severe symptoms present from the beginning – administer **THREE** Mark I Kits via autoinjector (IM)
Tube one (atropine) is always administered before tube two (2-PAM)

Side Effects

HEENT: Dry mouth
Skin: Flushing
CNS: Dilated pupils, Headache, Drowsiness
CV: Tachycardia

Interactions

Morphine, theophylline, aminophylline and **succinylcholine** should be avoided in patients with organophosphate poisoning. Barbiturates are potentiated by the anticholinesterase enzyme and should be used cautiously when treating seizures in the poisoned patient.

EMT Considerations

The use of a Mark I Kit offers no prophylactic protection and should be administered only if symptoms are present.

There is a high potential for "off-gassing" from patients exposed to both organophosphates and nerve agents. In cases of "off-gassing", vapors are given off by chemically contaminated clothing or exhaled by poisoned individuals. EMS Providers should use all appropriate PPE including SCBA and be vigilant when monitoring for symptoms in themselves and other responders. These patients are generally NOT safe for transport by Helicopter EMS (HEMS).

Treatment of Overdose

Discontinue product; supportive care

Mark I Kit

Methylprednisolone

Mechanism of Action
In a tissue-specific manner, corticosteroids regulate gene expression subsequent to binding specific intracellular receptors and translocation into the nucleus. Corticosteroids exert a wide array of physiologic effects including modulation of musculoskeletal, endocrine and neurologic physiology are influenced by corticosteroids. Decreases inflammation by suppression of migration of polymorphonuclear leukocytes, reversal of increased capillary permeability, and lysosomal stabilization

Uses
Anaphylaxis, Asthma, COPD. Used primarily as an anti-inflammatory or immunosuppressant agent in the treatment of a variety of diseases.
Unlabeled uses: bronchiolitis, cadaveric organ recovery, COPD exacerbation

Contraindications
Hypersensitivity, neonates
Precautions
Pregnancy (C), breastfeeding, diabetes mellitus, glaucoma, osteoporosis, seizure disorders, ulcerative colitis, CHF, myasthenia gravis, renal disease, esophagitis, peptic ulcer, viral infection, TB, trauma.

Protocol Uses
COPD / Asthma / Stridor – Adult **(p. 36),** Allergic Reaction – Adult **(p. 49);**
Wheezing / Asthma – Peds **(p. 108),** Allergic Reaction – Peds **(p. 117)**

Side Effects
CNS: Sedations, fatigue, restlessness, headache, sleeplessness, dystonia, dizziness, suicidal ideation, seizures, neuroleptic malignant syndrome, tardive dyskinesia (>3 months at high doses)
CV: hypotension, SVT
GI: Dry mouth, constipation, nausea, vomiting, diarrhea, anorexia
GU: Decrease libido, amenorrhea, galactorrhea
Hematology: Neutropenia, leukopenia, agranulocytosis
Skin: urticaria , rash

Pharmacokinetics
Metabolized by the liver, excreted in urine
Half-life 2.5-6 hours
IV: onset 1-2 minutes, duration 1-2 hours

Interactions
Avoid use with MAOIs
Increase: sedation- alcohol, other CNS depressants
Increase: risk of EPS- haloperidol, phenothiazines
Decrease: action of metoclopramide, anticholinergics, opiates

EMT Considerations
Assess: respiratory status (rate, rhythm, auscultate breath sounds prior to administration)
Evaluate: therapeutic response, ability to breathe adequately

Treatment of Overdose
Discontinue product; supportive care

Methylprednisolone

Midazolam

Mechanism of Action
Binds to BZD receptors on the postsynaptic receptors on the postsynaptic GABA neuron at several sites within the CNS, including the limbic system, reticular formation. Enhancement of GABA on neuronal excitability results in hyperpolarization (less excitable state) and stabilization. BZD receptors and effects appear to be linked to $GABA_A$ receptors, BZDs do not bind $GABA_B$ receptors.

Uses
Seizure, anxiolysis, pre-sedation for intubation, anesthesia
Unlabeled uses: Status epilepticus

Contraindications
Pregnancy (D), hypersensitivity to benzodiazepines, acute closed-angle glaucoma
Precautions
Breastfeeding, children, geriatric patients, COPD, CHF, chronic renal failure, chills, debilitated, hepatic disease, shock, coma, alcohol intoxication, status asthmaticus

Protocol Uses
Airway Management – Adult **(p. 32),** Post Advanced Airway Sedation – Adult, Medical **(p. 34),** CHF / Pulmonary Edema – Adult **(p. 37),** Narrow Complex Tachycardia With A Pulse – Adult **(p. 45),** Bradycardia With A Pulse – Adult **(p. 47),** OB General – Adult **(p. 55),** Antipsychotic Overdose / Acute Dystonic Reaction – Adult **(p. 65),** Cocaine and Sympathomimetic Overdose – Adult **(p. 67),** Tricyclic Overdose – Adult **(p. 68),** Seizure – Adult **(p. 72),** Bites and Envenomations – Adult, Trauma **(p. 79),** Environmental, Hyperthermia – Adult, Trauma **(p. 87);**
Airway Management – Peds **(p. 106),** Post Resuscitation Care – Peds **(p. 114),** Bradycardia with a Pulse – Peds **(p. 115),** Seizure – Peds **(p. 125),** Bites and Envenomations – Peds, Trauma **(p. 132),** Environmental, Hyperthermia – Peds, Trauma **(p. 137),** Head Injury – Peds, Trauma **(p. 141)**

Side Effects
CNS: retrograde amnesia, euphoria, confusion, headache, anxiety, insomnia slurred speech, paresthesia, tremors, weakness, chills, agitation, paradoxical reactions
CV: hypotension, PVCs, tachycardia, bigeminy, nodal rhythm, cardiac arrest
EENT: blurred vision, nystagmus, diplopia, loss of balance
GI: nausea, vomiting, increased salivation, hiccups
Skin: urticaria, pain/swelling/pruritus at injection site, rash
Resp: coughing, apnea, bronchospasm, laryngospasms, dyspnea, respiratory depression

Pharmacokinetics
Protein binding 97%, half-life 1.8-6.4 hr, metabolized in liver; metabolites excreted in urine; crosses placenta and the blood brain barrier
IV – onset 3-5 minutes, duration <2 hours (6 hours in liver failure); **IM –** onset 15 minutes, duration 6 hours; **IN –** onset 4-8 minutes, duration 41 minutes

Interactions
Increase: hypotension- antihypertensives, opiates, alcohol, nitrates
Increase: extended half-life—CYP3A4 inhibitors (cimetidine, erythromycin, ranitidine)
Increase: respiratory depression—other CNS depressants, alcohol, barbiturates, opiate analgesics, verapamil, ritonavir, indinavir
Decrease: midazolam metabolism—CYP3A4 inducers (azole antifungals, theophylline)

EMT Considerations
Assess: BP, pulse, respirations during IV; Injection site for redness, pain and swelling; Degree of amnesia in geriatric patients; may be increased; Anterograde amnesia; Vital signs during recovery period in obese patients, since half-life may be extended
Preform/Provide: Assistance with ambulation until drowsy period ends; Storage at room temp, protect from light; Immediate availability of resuscitation equipment, O2 to support airway, do NOT give by rapid bolus
Evaluate: Therapeutic response

Treatment of Overdose
Discontinue product, supportive care, flumazenil (may induce seizures if used in patients with chronic benzodiazepine use), O_2

Midazolam

Morphine

Mechanism of Action
Binds to opioid receptors in the CNS causing inhibition of ascending pain pathways, altering the perception of and response to pain; produces generalized CNS depression

Uses
Moderate to severe pain

Contraindications
Hypersensitivity, addition (opioid), hemorrhage, bronchial asthma, increase intracranial pressure, paralytic ileus, hypovolemia, shock

Protocol Uses
Pain Management – Adult **(p. 69),** Pain Management – Adult, Trauma **(p. 95);**
Pain Management – Peds **(p. 123),** Sickle Cell Crisis – Peds **(p. 127),** Pain Management – Peds, Trauma **(p. 143)**

Side Effects
CNS: Drowsiness, dizziness, confusion, headache, sedation, euphoria, insomnia, seizures
CV: Palpitations, bradycardia, change in BP, shock, cardiac arrest, chest pain, hypo/hypertension, edema, tachycardia
EENT: Tinnitus, blurred vision, miosis, diplopia
GI: Nausea, vomiting, anorexia, constipation, cramps, biliary tract pressure
GU: Urinary retention
Heme: Thrombocytopenia
Skin: Rash, urticarial, bruising, flushing, diaphoresis, pruritus
Resp: Respiratory depression, respiratory arrest, apnea

Pharmacokinetics
Metabolized by liver, crosses placenta, excreted in urine/breast milk
IV – onset 5-10 minutes, duration patient dependent. Half-life 1.5-2 hours

Interactions
Unpredictable reaction, avoid use - MAOIs
Increase: effects with other CNS depressants- alcohol, opiates, sedative/hypnotics, antipsychotics, skeletal muscle relaxants
Decrease: morphine action- rifampin

EMT Considerations
Assess: Pain: location, type, character; give dose before pain becomes severe; BP, pulse, respirations (character, depth, rate); CNS changes: dizziness, drowsiness, hallucinations, euphoria, LOC, pupil reaction; Allergic reactions: rash, urticarial
Preform/Provide: Storage in light-resistant container at room temp; Assistance with ambulation; Safety measures
Evaluate: Therapeutic response; decrease in pain intensity

Treatment of Overdose
Discontinue product, supportive care, naloxone (Narcan): 0.2-0.8 mg IV, O_2, IV fluids, vasopressors

Naloxone

Mechanism of Action
Pure opioid antagonist that competes and displaces opioids at opioid receptor sites

Uses
Opiate overdose, respiratory depression induced by opioids, pentazocine, propoxyphene
Unlabeled uses: opiate-induced pruritis

Contraindications
Hypersensitivity
Precautions
Pregnancy (C), breastfeeding, children, neonates, CV disease, opioid dependency, seizure disorder, drug dependency

Protocol Uses
Documentation of Vital Signs **(p. 16),** Cardiac Arrest – Adult **(p. 39),** Opiate Overdose – Adult **(p. 66);**
Neonatal Resuscitation – Peds **(p. 109),** Overdose and Poisoning, General – Peds **(p. 122)**

Side Effects
CNS: Drowsiness, nervousness, seizures, tremor
CV: Rapid pulse, increase systolic BP (high doses), ventricular tachycardia/fibrillation, hypo/hypertension, cardiac arrest, sinus tachycardia
GI: Nausea, vomiting, hepatotoxicity
Resp: Tachypnea, pulmonary edema

Pharmacokinetics
Metabolized by liver, crosses placenta; excreted in urine/breast milk
IV – onset 1 minute, duration 45 min. Half-life 30-81 minutes

Interactions
Increase: seizures - tramadol
Decrease: effect of opioid analgesics

EMT Considerations
Assess: *Withdrawal*: cramping, hypertension, anxiety, vomiting; signs of withdrawal in drug-dependent individuals may occurs <2 hours after administration;
Vital Signs q3-5 minutes;
Cardiac Status: tachycardia, hypertension, monitor ECG ;
Respiratory Function: respiratory depression, character, rate, rhythm, if respiration <10/min, administer naloxone; probably due to opioid overdose; monitor LOC;
Pain: duration, intensity, location before and after administration
Preform/Provide: Dark storage at room temp
Evaluate: Therapeutic Response: reversal of respiratory depression; change in level of consciousness

Treatment of Overdose
Discontinue product; supportive care

Naloxone

Nitroglycerin

Mechanism of Action
Produces a vasodilator effect on the peripheral veins and arteries with more prominent effects on the veins. Primarily reduces cardiac oxygen demand by decreasing preload (left ventricular end-diastolic pressure). May modestly reduce afterload. Dilates coronary arteries and improves collateral flow

Uses
Unstable angina, Hypertension, Flash Pulmonary Edema
Unlabeled use: esophageal spasms, uterine relaxation, short-term management of pulmonary hypertension

Contraindications
Known hypersensitivity, increased intracranial pressure, cerebral hemorrhage
Precautions
Used with caution in postural hypotension, pregnancy, breastfeeding, children, renal disease, hepatic injury, **inferior STEMI**

Protocol Uses
CHF / Pulmonary Edema – Adult **(p. 37),** Chest Pain / Suspected Acute Coronary Syndrome – Adult **(p. 43),** ST Elevation Myocardial Infarction – Adult **(p. 44)**

Side Effects
CNS: Headache, flushing, dizziness
CV: Hypotension, tachycardia, collapse, syncope, palpitations
GI: Nausea, vomiting
Skin: Pallor, sweating, rash

Pharmacokinetics
Metabolized by liver, excreted in urine
Half-life 1-4 min.
Sublingual – onset 1-3 minutes, duration 30 minutes. **IV –** onset 1-2 minutes, duration 3-5 minutes

Interactions
Severe hypotension, CV collapse: alcohol
Increase: effects of beta-blockers, diuretics, antihypertensives, calcium channel blockers
Increase: erectile dysfunction meds (fatal hypotension - sildenafil, tadalafil, vardenafil; do not use together)
Increase: nitrate level - aspirin
Decrease: heparin - IV nitroglycerin

EMT Considerations
Assess: Orthostatic BP, pulse; Pain: duration time started, activity being preformed, character; Tolerance: if taking over long period of time; Headache, lightheadedness, decreased BP
Perform/Provide: Storage protected from light, moisture; store in cool environment
Evaluate: Therapeutic response: decrease in anginal pain

Treatment of Overdose
Discontinue product, IV fluids, supportive care

Nitroglycerin

Nitrous Oxide

Mechanism of Action
The mechanism of action of nitrous oxide is not completely understood. It is trifold and includes analgesia, anxiolysis and anesthesia.
Its analgesic mechanism of action is described as opioid in nature and may involve a number of spinal neuromodulators.
The anxiolytic effect is similar to that of benzodiazepines and may involve gamma aminobutyric (GABA) receptors
The anesthetic mechanism may involve GABA and possibly N-methyl-D-aspartate receptors as well.

Uses
Nitrous is commonly used in dental surgery and as part of a procedural sedation during short, painful procedures in the Emergency Department. It acts as an analgesic and mild sedative when dispensed at the standard 2:1 ratio of N2O to O2. It is often used with other anesthetics.

Unlabeled use:
Nitrous is sometimes used in auto racing. It is safe and stable at room temperature, but at ~600^{o}C it decomposes into a gas with 33% oxygen per unit volume. Atmospheric air has only ~21% oxygen and thus can burn less fuel in a given volume.
Nitrous is commonly used as a short-term euphoric high which features audio and visual strobing effects. This use is generally illegal.

Contraindications
Respiratory compromise, or inability to reliably follow commands.
Nitrous rapidly diffuses into air-filled cavities, and patients in whom expansion of these air-filled cavities could compromise patient safety. This includes patients with pneumothorax, pulmonary blebs, air embolism, bowel obstruction, and those undergoing surgery of the eye or middle ear.
Nitrous is known to be teratogenic and is contraindicated in pregnancy.
Precautions
Patients on chronic opiates may be highly tolerant to the analgesic effects of nitrous. When animals are given morphine chronically, they develop tolerance to its pain-killing effects, and this also renders the animals tolerant to the analgesic effects of N2O.

Because nitrous oxide is minimally metabolized in humans (with a rate of 0.004%), it retains its potency when exhaled into the room by the patient, and can pose an intoxicating and prolonged exposure hazard to the staff if the room is poorly ventilated. Where nitrous oxide is administered, a continuous-flow fresh-air ventilation system or N2O scavenger system must be used to prevent a waste-gas buildup.

Protocol Uses
Pain Management – Adult, Trauma **(p. 95),** Nitrous Oxide – Procedure **(p. 196)**

Inhalational gas that MUST be self-administered by the patient.

Side Effects
CNS: Headache (especially if pt. not given inhaled O2 for 5 min after administration), Blurred Vision, Lethargy
CV: Orthostatic Hypotension, Dizziness, Faintness, or Lightheadedness
GI: Nausea, Vomiting
Heme: Methemoglobinemia
Misc: Exposure to nitrous oxide may cause vitamin B_{12} deficiency. It inactivates the cobalamin form of vitamin B_{12} by oxidation. Symptoms of vitamin B_{12} deficiency, including sensory neuropathy, myelopathy, and encephalopathy, may occur within days or weeks of exposure to nitrous oxide anesthesia in people with subclinical vitamin B_{12} deficiency.

Pharmacokinetics
Onset of action: Inhalation: 2-5 minutes
Absorption: Rapid via lungs; blood/gas partition coefficient is 0.47
Metabolism: Body: <0.004%
Excretion: Primarily exhaled gases; skin (minimal amounts)
Half-life: Approximately 5 minutes; depends on patient ventilatory volume, rate and quality. In general, the clinical effects of nitrous cease when inhalation stops, with minimal residual effect.

Interactions
Increase:effects of CNS depressants (EtOH, benzodiazepines, opiates, cannabis)

EMT Considerations
Assess: xx
Perform/Provide: xx
Evaluate: xx

Treatment of Overdose
Discontinue product; IV Fluids; 100% inhaled O2 (preferably via NRB); antiemetics; supportive care

Nitroglycerin

Norepinephrine

Mechanism of Action
β_1 and α agonist causing increased contractility, increased heart rate, and vasoconstriction. Thus, increasing systemic blood pressure and coronary blood flow. Has greater alpha (vasoconstriction) than beta effects (contractility and heart rate).

Uses
Hypotension, shock

Contraindications
Extravasation, hypersensitivity to sympathomimetics or sulfites

Protocol Uses
Hypotension / Shock (Non-Trauma) – Adult **(p. 75),** Hypotension / Shock (Trauma) – Adult **(p. 100)**

Side Effects
CNS: anxiety, headache, tremor
CV: hypertension, arrhythmia
GI : Nausea, vomiting, gut ischemia
Misc: Skin necrosis with extravasation

Pharmacokinetics
Onset of action: 1-2 minutes
Excretion: Kidney
Crosses placenta, Category C

Interactions
Concurrent use with the following may increase blood pressure further: linezolid, dihydroergotamine, TCAs

EMT Considerations
Assess: Vital Signs: BP and pulse
Evaluate: Change in blood pressure

Treatment of Overdose
Discontinue product, administer α-blocker and/or β-blocker

Norepinephrine

Ondansetron

Mechanism of Action
Selective 5-HT3-receptor antagonist, blocking serotonin both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone

Uses
Chemotherapy associated nausea and vomiting, radiotherapy associated nausea and vomiting, postoperative nausea and/or vomiting
Unlabeled use: Hyperemesis gravidarum (severe or refractory), breakthrough nausea and/or vomiting associated with chemotherapy

Contraindications
Hypersensitivity, congenital OR acquired prolonged QT, history of Torsades de Pointes
Precautions
Pregnancy (B), breastfeeding, children, geriatric patients

Protocol Uses
Post Advanced Airway Sedation – Adult, Medical **(p. 34),** Chest Pain / Suspected Acute Coronary Syndrome – Adult **(p. 43),** ST Elevation Myocardial Infarction – Adult **(p. 44),** Abdominal Pain / GI Bleeding – Adult **(p. 48),** Pain Management – Adult **(p. 69),** Environmental, Hyperthermia – Adult, Trauma **(p. 87),** Eye Pain – Adult, Trauma **(p. 90),** Pain Management – Adult, Trauma **(p. 95);** Post Resuscitation Care – Peds **(p. 114),** Pain Management – Peds **(p. 123),** Sickle Cell Crisis – Peds **(p. 127),** Environmental, Hyperthermia – Peds, Trauma **(p. 137),** Eye Pain – Peds, Trauma **(p. 140),** Pain Management – Peds, Trauma **(p. 143)**

Side Effects
CNS: Headache, dizziness, drowsiness, fatigue, EPS
GI: Diarrhea, constipation, abdominal pain, dry mouth
Misc: Rash, bronchospasm (rare), musculoskeletal pain, wound problems, shivering, fever, hypoxia, urinary retention

Pharmacokinetics
Metabolized in the liver, excreted primarily in urine
Half-life 3.5-4.7 hr

Interactions
Decrease: ondansetron effect- rifampin, carbamazepine, phenytoin

EMT Considerations
Assess: Hypersensitivity reaction: rash, bronchospasm (rare); EPS: shuffling gait, tremors, grimacing, period rigidity
Perform/Provide: Storage at room temp
Evaluate: Therapeutic response: absence of nausea/vomiting

Treatment of Overdose
Evaluate QT for prolongation; monitor for dysrhythmias; discontinue product; supportive care

Ondansetron

Rocuronium

Mechanism of Action
Blocks acetylcholine from binding to receptors on motor endplate inhibiting depolarization. Inhibits transmission of nerve impulses by binding with cholinergic receptor sites, antagonizing action of acetylcholine

Uses
Facilitation of endotracheal intubation; skeletal muscle relaxation during mechanical ventilation
Unlabeled use: preinduction to blunt defasciculation

Contraindications
Hypersensitivity
Precautions
Pregnancy (C), breastfeeding, children, geriatric patients, electrolyte imbalances, dehydration, respiratory/neuromuscular/cardiac/renal/hepatic disease

Protocol Uses
Rapid Sequence Airway – Adult **(p. 33),** Rapid Sequence Airway (RSA) – Procedure **(p. 150)**

Side Effects
CV: Bradycardia, tachycardia, change in BP, edema
GI: Nausea, vomiting
Skin: Rash, flushing, pruritus, urticarial
MSK: Myopathy
Resp: Prolonged apnea, bronchospasm, cyanosis, respiratory depression, dyspnea, pulmonary vascular resistance

Pharmacokinetics
Metabolized in liver
Half-Life 30 min, duration 60-70 min

Interactions
Theophylline increases risk of dysrhythmias
Increase: neuromuscular blockade caused by amphotericin B, verapamil, aminoglycosides, clindamycin, enflurane, isoflurane, lincomcin, lithium, opiates, local anesthetics, polymyxin, anti-infectives, quinidine, thiazides

EMT Considerations
Assess: Vital Signs: BP, pulse, respirations, airway until fully recovered; Allergic reactions: rash, fever, respiratory distress, pruritus
Preform/Provide: Storage in light-resistant area, stable at room temp for 30 days
Evaluate: Therapeutic response

Treatment of Overdose
Discontinue product, Edrophonium or Neostigmine, Atropine, Monitor VS

Rocuronium

Sodium Bicarbonate

Mechanism of Action
Increase plasma bicarbonate which buffers hydrogen ion concentrations and reverses acidosis

Uses
Acidosis (metabolic), cardiac arrest, salicylate poisoning, tricyclic antidepressant overdose

Contraindications
Metabolic/respiratory alkalosis, hypochloremia, hypocalcemia

Precautions

Pregnancy (C), children, CHF, toxemia, renal disease, hypertension, hypokalemia, breastfeeding, hypernatremia, Cushing's syndrome, hyperaldosteronism

Protocol Uses
Cardiac Arrest – Adult **(p. 39),** Beta Blocker Overdose – Adult **(p. 61),** Tricyclic Overdose – Adult **(p. 68),** Prolonged Crush Injury – Adult, Trauma **(p. 85);**
Cardiac Arrest, General – Peds **(p. 111),** Prolonged Crush Injury – Peds, Trauma **(p. 135)**

Side Effects
CNS: Irritability, confusion, headache, stimulation, tremors, hyperreflexia, weakness, seizures of alkalosis
CV: Irregular pulse, cardiac arrest, water retention, edema, weight gain
GI: Flatulence, belching, distension
MSK: Muscular twitching, tetany, irritability

Pharmacokinetics
Excreted in urine
Onset 15 minutes. Duration 1-2 hours

Interactions
Increase: effects- amphetamines, mecamylamine, quinine, quinidine, pseudophedrine, flecainide, anorexiants, sympathomimetics
Increase: sodium and decrease potassium- corticosteroids
Decrease: effects- lithium, chlorpropamide, barbiturates, salicylates, benzodiazepines, ketoconazole, corticosteroids

EMT Considerations
Assess: Respiratory and pulse rate/rhythm; Fluid balance: edema, crackles, shortness of breath; Alkalosis: irritability, confusion, twitching, hyperreflexia, slow respirations, cyanosis, irregular pulse; Milk-Alkali Syndrome: confusion, headache, nausea, vomiting, anorexia, urinary stones, hypercalcemia

Treatment of Overdose
Discontinue product; ventilatory support to exhale excess CO2; supportive care

Sodium Bicarbonate

Succinylcholine

Mechanism of Action
Acts similar to acetylcholine, producing depolarization of the motor endplate at the myoneural junction which causes sustained flaccid skeletal muscle paralysis.

Uses
Facilitation of endotracheal intubation

Contraindications
Hypersensitivity, malignant hyperthermia, trauma (crush injuries)

Precautions

Pregnancy (C), breastfeeding, geriatric or debilitated patients, cardiac disease, severe burns, fractures (fasciculations may increase damage), electrolyte imbalances (**hyperkalemia**), dehydration, **neuromuscular disease**, respiratory/cardiac/renal/hepatic disease, collagen disease, glaucoma, eye surgery

Protocol Uses
Rapid Sequence Airway – Adult **(p. 33),** Rapid Sequence Airway (RSA) – Procedure **(p. 150)**

Side Effects
CV: Bradycardia, tachycardia, hypo/hypertension, sinus arrest, dysrhythmias, edema
EENT: Increased secretions, Increased intraocular pressure
Heme: Myoglobinemia
Skin: Rash, flushing, pruritus, urticaria
MSK: Weakness, muscle pain, fasciculations, prolonged relaxation, myalgia, rhabdomyolysis
Resp: Prolonged apnea, bronchospasm, cyanosis, respiratory depression, wheezing, dyspnea
Systemic: **anaphylaxis, angioedema, malignant hyperthermia**

Pharmacokinetics
Hydrolyzed in blood, excreted in urine
IV - onset 1 min, peak 2-3 min, duration 6-10 min

Interactions
Dysrhythmias: theophylline
Increase: neuromuscular blockade- aminoglycosides, beta-blockers, cardiac glycosides, clindamycin, lincomycin, procainamide, quinidine, local anesthetics, polymyxin antibiotics, lithium, opiates, thiazides, enflurane, isoflurane, magnesium salts, oxytocin

EMT Considerations
Assess: Electrolyte imbalances (potassium, magnesium); may lead to increase action of product; Vital Signs: BP, pulse, respirations, airway; Recovery: decreased paralysis; Allergic Reactions: rash, fever, respiratory distress, pruritus
Perform/Provide: Storage in refrigerator powder at room temp
Evaluate: Therapeutic response: paralysis of jaw, eyelid, head, neck rest of body

Treatment of Overdose
Discontinue product, supportive care, Neostigmine, Atropine

Succinylcholine

Tranexamic Acid (TXA)

Mechanism of Action
Displaces plasminogen from fibrin, inhibiting fibrinolysis (clot breakdown). Has inhibitory effects on plasmin, preventing further fibrinolysis.

Uses
Trauma associated hemorrhage, menorrhagia, tooth extraction in hemophiliac patients

Contraindications
IV: Hypersensitivity to tranexamic acid, active intravascular clotting, subarachnoid hemorrhage
PO: hypersensitivity to tranexamic acid, active thromboembolic disease, concurrent use with hormonal contraception

Protocol Uses
Tranexamic Acid Administration – Procedure **(p. 197)**

IV indicated for trauma associated hemorrhage
PO indicated for menorrhagia, tooth extraction in hemophiliac patients

Side Effects
CNS: Headache (PO), Dizziness (IV)
CV: **Hypotension** (IV)
GI: Abdominal pain (PO), Diarrhea, nausea, vomiting (IV)
Heme: thromboembolic complications (i.e. DVT), anemia (PO)
Misc: Backache (PO), blurred vision (IV and PO)

Pharmacokinetics
Onset of Action: IV: 5 minutes, PO: 2.5 hours
Excretion: Renal
Half-life: IV: 2 hours, PO: 11 hours
Crosses placenta, Category B

Interactions
May enhance tranexamic acid: Estrogen derivatives, progestins

EMT Considerations
Assess: Hypersensitivity
Evaluate: Serial Blood Pressure, Mental Status, HR

Treatment of Overdose
Discontinue product, supportive care

Tranexamic Acid (TXA)

Vasopressin

Mechanism of Action
Increases water permeability at the renal tubule resulting in decreased urine volume and increased intravascular volume. Direct vasoconstrictor without inotropic or chronotropic effects. Increases systemic vascular resistance and mean arterial blood pressure, decreases heart rate and cardiac output.

Uses
Cardiac arrest, vasodilatory shock, diabetes insipidus
Unlabeled uses: cadaveric organ recovery, gastroesophageal variceal hemorrhage

Contraindications
Hypersensitivity, chronic nephritis
Precautions
Pregnancy (C), breastfeeding, CAD, asthma, vascular/renal disease, migraines, seizures

Protocol Uses
Removed from ACLS algorithm

Side Effects
CNS: Drowsiness, headache, lethargy, flushing, vertigo
CV: Increased BP, dysrhythmias, cardiac arrest, shock, chest pain, MI
EENT: Nasal irritation, congestion, rhinitis
GU: Nausea, heartburn, cramps, vomiting, flatus
Misc: Tremor, sweating, vertigo, urticarial, bronchial constriction

Pharmacokinetics
Metabolized by the liver and kidneys, excreted in the urine
IV – onset <15 minutes, duration 20 minutes

Interactions
Increase: antidiurectic effects- tricyclics, carbamazepine, chloropromide, fludrocortisone, clofibrate, urea
Decrease: antidiuretic effect- lithium, demeclocycline

EMT Considerations
Assess: Vital Signs: BP and pulse
Evaluate: Therapeutic response: return of spontaneous circulation, change in BP

Treatment of Overdose
Discontinue product; supportive care

Vasopressin

Approved Abbreviations

A&O x 3	Alert and Oriented to Person, Place and Time
A&O x 4	Alert and Oriented to Person, Place, Time and Events
A-Fib	Atrial Fibrillation
AAA	Abdominal Aortic Aneurysm
ABC's	Airway, Breathing and Circulation
ABD	Abdomen
ACLS	Advanced Cardiac Life Support
AKA	Above The Knee Amputation
ALS	Advanced Life Support
AMA	Against Medical Advice
AMS	Altered Mental Status
AMT	Amount
APPROX	Approximately
ASA	Aspirin
ASSOC	Associated
BG	Blood Glucose
BILAT	BIlateral
BKA	Below The Knee Amputation
BLS	Basic Life Support
BM	Bowel Movement
BP	Blood Pressure
BS	Breath Sounds
BVM	Bag-Valve Mask Ventilations
C-SECTION	Caesarean Section
C-SPINE	Cervical Spine

C/O	Complains Of
CA	Cancer
CABG	Coronary Artery Bypass Graft
CAD	Coronary Artery Disease
CATH	Coronary Catheter
CC	Chief Complaint
CCR	Cardiocerebral Resuscitation
CHF	Congestive Heart Failure
CMS	Circulation, Motor, Sensation
CNS	Central Nervous System
COPD	Chronic Obstructive Pulmonary Disease
CP	Chest Pain
CPAP	Continuous Positive Airway Pressure
CPR	Cardiopulmonary Resuscitation
CSF	Cerebrospinal Fluid
CT	Computed Tomography (CAT Scan)
CVA	Cerebrovascular Accident (Stroke)
D5W	5% Dextrose in Water
DKA	Diabetic Ketoacidosis
DNR	Do Not Resuscitate
DOA	Dead on Arrival
DOB	Date of Birth
DOE	Dyspnea on Exertion
DT	Delirium Tremens
DVT	Deep Vein Thrombosis

Approved Abbreviations

Dx	Diagnosis
ECG	Electrocardiogram
ED	Emergency Department
EEG	Electroencephelogram
EMT-B	EMT Basic
EMT- A	Advanced EMT
EMT-P	Paramedic
ET	Endotracheal
EtOH	Ethanol (alcohol)
ETT	Endotracheal Tube
ERG	Emergency Response Guide
EXT	External (extension)
°F	Farenheit
FB	Foreign Body
FLEX	Flexion
Fx	Fracture
g	gram(s)
GERD	Gastroesophageal Reflux Disease
GI	Gastrointestinal
GSW	Gunshot Wound
gtts	“Guttae” (Latin for drops)
GU	Genitourinary
GYN	Gynecology (gynecological)
H/A	Headache
HEENT	Head, Eyes, Ears, Nose, Throat

HR	Heart Rate
HTN	Hypertension
Hx	History
ICP	Intracranial Pressure
ICU	Intensive Care Unit
IDDM	Insulin-Dependent Diabetes Mellitus
IM	Intramuscular
IN	Intranasal
IO	Intraosseous
IV	Intravenous
JVD	Jugular Vein Distention
kg	kilogram
KVO	Keep Vein Open
L-SPINE	Lumbar Spine
L/S-SPINE	Lumbarsacral Spine
L&D	Labor and Delivery
LAT	Lateral
lb	pound
LLQ	Left Lower Quadrant
LMP	Last Menstrual Period
LOC	Level of Consciousness / Loss of Consciousness
LR	Lactated Ringers
LUQ	Left Upper Quadrant
MAST	Military Anti-Shock Trousers
mcg	microgram(s)

Approved Abbreviations

MD	Medical Doctor
MED	Medicine
mg	miligram(s)
MI	Myocardial Infarction (heart attack)
min	minimum/minute
MRI	Magnetic Resonance Imaging
MS	Mental Status
MVA	Motor Vehicle Accident
MVC	Motor Vehicle Crash
N/V	Nausea/Vomiting
N/V/D	Nausea/Vomiting/Diarrhea
NAD	No Apparent Distress
NG	Nasogastric Tube
NC	Nasal Cannula
NEB	Nebulizer
NIDDM	Non Insulin-Dependent Diabetes Mellitus
NKDA	No Known Drug Allergies
NRB	Non-Rebreather
NS	Normal Saline
NSR	Normal Sinus Rhythm
O2	Oxygen
OB/GYN	Obstectrics/Gynecology
PA	Physician Assistant
PALP	Palpation
PAC	Premature Atrial Contraction
PE	Pulmonary Embolus
Peds	Pediatric
PERRL	Pupils Equal, Round, Reactive to Light
PMHx	Past Medical History
PO	Per Os (By Mouth)
PRN	Pro Re Nata (As Needed)
PT	Patient
PVC	Premature Ventricular Contraction
RLQ	Right Lower Quadrant
RN	Registered Nurse
RUQ	Right Upper Quadrant
Rx	Medicine
S/P	Status Post
SOB	Shortness of Breath
SQ	Subcutaneous
ST	Sinus Tachycardia
SVT	Supraventricular Tachycardia
Sx	Symptom
SZ	Seizure
T-SPINE	Thoracic Spine
TB	Tuberculosis
Temp	Temperature
TIA	Transient Ischemic Attack
TKO	To Keep Open
Tx	Treatment

Approved Abbreviations

TXA	Tranexamic Acid
UOA	Upon Our Arrival
URI	Upper Respiratory Infection
UTI	Urinary Tract Infection
VF	Ventricular Fibrillation
VS	Vital Signs
VT	Ventricular Tachycardia
WAP	Wandering Atrial Pacemaker
WNL	Within Normal Limits
+	Positive
-	Negative
?	Questionable
~	Approximately
>	Greater Than
<	Less Than
=	Equal

YO (YOA)	Years Old (Years of Age)
ACS-COT	American College of Surgeons Committee on Trauma
ACEP	American College of Emergency Physicians
SAEM	Society of Academic Emergency Medicine
NAEMSP	National Association of EMS Physicians
NREMT	National Registry of EMTs
AAP	American Academy of Pediatrics
AHA	American Heart Association
ILCOR	International Liaison Committee on Resuscitation

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Airway Emergency Reference – Adult, Medical

Medication Quick Reference

		Paralysis and Induction				Post Placement Management			
Medication Name		**Etomidate**	**Ketamine**	**Succinylcholine**	**Rocuronium**	**Morphine**	**Fentanyl**	**Midazolam**	**Ketamine**
Dose		0.3 mg/kg	2 mg/kg	2 mg/kg	1 mg/kg	0.1 mg/kg	1 mcg/kg	0.05 mg/kg	0.2 mg/kg
Concentration		2 mg/mL	100 mg/mL	20 mg/mL	10 mg/mL	10 mg/mL	50 mcg/mL	5 mg/mL	100 mg/mL
lbs	**kg**								
66	**30**	9mg / 4.5mL	60mg / 0.6mL	60mg / 3mL	30mg / 3mL	3mg / 0.3mL	30mcg / 0.6mL	1.5mg / 0.3mL	6mg / 0.06mL
88	**40**	12mg / 6mL	80mg / 0.8mL	80mg / 4mL	40mg / 4mL	**4mg / 0.4mL**	40mcg / 0.8mL	2mg / 0.4mL	8mg / 0.08mL
110	**50**	15mg / 7.5mL	100mg / 1mL	100mg / 5mL	50mg / 5mL	4mg / 0.4mL	50mcg / 1mL	2.5mg / 0.5mL	10mg / 0.1mL
132	**60**	18mg / 9mL	120mg / 1.2mL	120mg / 6mL	60mg / 6mL	4mg / 0.4mL	60mcg / 1.2mL	3mg / 0.6mL	12mg / 0.12mL
154	**70**	**20mg / 10mL**	140mg / 1.4mL	140mg / 7mL	70mg / 7mL	4mg / 0.4mL	70mcg / 1.4mL	3.5mg / 0.7mL	14mg / 0.14mL
176	**80**	20mg / 10mL	160mg / 1.6mL	160mg / 8mL	80mg / 8mL	4mg / 0.4mL	80mcg / 1.6mL	**4mg / 0.8mL**	16mg / 0.16mL
198	**90**	20mg / 10mL	180mg / 1.8mL	180mg / 9mL	90mg / 9mL	4mg / 0.4mL	90mcg / 1.8mL	4mg / 0.8mL	18mg / 0.18mL
220	**100**	20mg / 10mL	**200mg / 2mL**	**200mg / 10mL**	**100mg / 10mL**	4mg / 0.4mL	**100mcg / 2mL**	4mg / 0.8mL	**20mg / 0.2mL**
242	**110**	20mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	4mg / 0.4mL	100mcg / 2mL	4mg / 0.8mL	20mg / 0.2mL
264	**120**	20mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	4mg / 0.4mL	100mcg / 2mL	4mg / 0.8mL	20mg / 0.2mL
286	**130**	20mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	4mg / 0.4mL	100mcg / 2mL	4mg / 0.8mL	20mg / 0.2mL
308	**140**	20mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	4mg / 0.4mL	100mcg / 2mL	4mg / 0.8mL	20mg / 0.2mL
330	**150**	20mg / 10mL	200mg / 2mL	200mg / 10mL	100mg / 10mL	4mg / 0.4mL	100mcg / 2mL	4mg / 0.8mL	20mg / 0.2mL
Max Dose		**20mg / 10mL**	**200mg / 2mL**	**200mg / 10mL**	**100mg / 10mL**	**4mg / 0.4mL**	**100mcg / 2mL**	**4mg / 0.8mL**	**20mg / 0.2mL**

Medication Quick Reference

Airway Emergency Reference – Adult, Medical

Pressor Drip Reference – Adult, Medical

Medication Quick Reference

Medication Quick Reference

DOPAMINE (400mg in 250mL D5W) 60 gtt tubing

	5 mcg/kg	7.5 mcg/kg	10 mcg/kg	12.5 mcg/kg	15 mcg/kg	17.5 mcg/kg	20 mcg/kg	
kg								lbs
10	2 gtt/min	3 gtt/min	4 gtt/min	5 gtt/min	6 gtt/min	7 gtt/min	8 gtt/min	22
20	4 gtt/min	6 gtt/min	8 gtt/min	9 gtt/min	11 gtt/min	13 gtt/min	15 gtt/min	44
30	6 gtt/min	8 gtt/min	11 gtt/min	14 gtt/min	17 gtt/min	20 gtt/min	23 gtt/min	66
40	8 gtt/min	11 gtt/min	15 gtt/min	19 gtt/min	23 gtt/min	26 gtt/min	30 gtt/min	88
50	9 gtt/min	14 gtt/min	18 gtt/min	23 gtt/min	28 gtt/min	33 gtt/min	38 gtt/min	110
60	11 gtt/min	17 gtt/min	22 gtt/min	28 gtt/min	34 gtt/min	39 gtt/min	45 gtt/min	132
70	13 gtt/min	20 gtt/min	26 gtt/min	33 gtt/min	39 gtt/min	46 gtt/min	53 gtt/min	154
80	15 gtt/min	23 gtt/min	30 gtt/min	38 gtt/min	45 gtt/min	53 gtt/min	60 gtt/min	176
90	18 gtt/min	25 gtt/min	34 gtt/min	42 gtt/min	51 gtt/min	59 gtt/min	68 gtt/min	198
100	19 gtt/min	28 gtt/min	37 gtt/min	47 gtt/min	56 gtt/min	66 gtt/min	75 gtt/min	220
110	21 gtt/min	31 gtt/min	41 gtt/min	52 gtt/min	62 gtt/min	72 gtt/min	83 gtt/min	242
120	23 gtt/min	34 gtt/min	45 gtt/min	56 gtt/min	68 gtt/min	79 gtt/min	90 gtt/min	264
130	24 gtt/min	37 gtt/min	49 gtt/min	61 gtt/min	73 gtt/min	85 gtt/min	98 gtt/min	286
140	26 gtt/min	39 gtt/min	53 gtt/min	66 gtt/min	79 gtt/min	92 gtt/min	105 gtt/min	308
150	28 gtt/min	42 gtt/min	56 gtt/min	70 gtt/min	84 gtt/min	98 gtt/min	113 gtt/min	330

The abbrevation gtt comes from the Latin "guttae", meaning "drops"

EPINEPHRINE (1mg of 1:1,000 in 250mL D5W) 60 gtt tubing

mcg/min	gtt/min	mcg/min	gtt/min	mcg/min	gtt/min
1 mcg/min	15 gtt/min	5 mcg/min	75 gtt/min	9 mcg/min	135 gtt/min
2 mcg/min	30 gtt/min	6 mcg/min	90 gtt/min	10 mcg/min	150 gtt/min
3 mcg/min	45 gtt/min	7 mcg/min	105 gtt/min		
4 mcg/min	60 gtt/min	8 mcg/min	120 gtt/min		

All gtt/min rates on this page are based off 60 gtt tubing.
If using 10 gtt tubing, divide the listed gtt/min rate by 6.

ALWAYS check drug concentrations BEFORE using any charts in this book

NOREPINEPHRINE (4mg in 250mL D5W) 60 gtt tubing

mcg/min	gtt/min	mcg/min	gtt/min	mcg/min	gtt/min
1 mcg/min	4 gtt/min	11 mcg/min	41 gtt/min	21 mcg/min	79 gtt/min
2 mcg/min	8 gtt/min	12 mcg/min	45 gtt/min	22 mcg/min	82 gtt/min
3 mcg/min	11 gtt/min	13 mcg/min	49 gtt/min	23 mcg/min	86 gtt/min
4 mcg/min	15 gtt/min	14 mcg/min	53 gtt/min	24 mcg/min	90 gtt/min
5 mcg/min	19 gtt/min	15 mcg/min	56 gtt/min	25 mcg/min	94 gtt/min
6 mcg/min	23 gtt/min	16 mcg/min	60 gtt/min	26 mcg/min	98 gtt/min
7 mcg/min	26 gtt/min	17 mcg/min	64 gtt/min	27 mcg/min	101 gtt/min
8 mcg/min	30 gtt/min	18 mcg/min	68 gtt/min	28 mcg/min	106 gtt/min
9 mcg/min	34 gtt/min	19 mcg/min	71 gtt/min	29 mcg/min	109 gtt/min
10 mcg/min	38 gtt/min	20 mcg/min	75 gtt/min	30 mcg/min	113 gtt/min

Pressor FAQs – Adult, Medical

Medication Quick Reference

PRESSOR	Receptor	Main Effect	Main Shock Use	Other
Epinephrine	α1, α2, β1, β2	Vasoconstriction Inotropy (increased squeeze) Dromotropy (increased conduction through AV node) Chronotropy (increased rate)	Anaphylaxis Asthma Cardiac Arrest	▪ Nonspecific α and β receptor activation ▪ Hard on myocardium ▪ Typically an add-on agent to norepinephrine in septic shock when an additional agent is required and occasionally an alternative first-line agent if norepinephrine is contraindicated. ▪ Increases heart rate. ▪ **May decrease mesenteric perfusion, may induce tachyarrhythmias and ischemia** ▪ Must be diluted; eg, a usual concentration is 1 mg of 1:1,000 in 250 mL D5W (4 micrograms/mL).
Norepinephrine	α1, β1	Vasoconstriction Inotropy	Septic Shock Undifferentiated Shock	▪ First line med for most kinds of shock ▪ Initial vasopressor of choice in septic, cardiogenic and hypovolemic shock. ▪ Wide range of doses used clinically. ▪ Must be diluted; a usual concentration is 4mg in 250mL of D5W or NS (16mcg/mL)
Phenylephrine	α1	Vasoconstriction	Hypotension ("push dose" pressors in the ED)	▪ May cause reflex bradycardia ▪ Pure alpha-adrenergic vasoconstrictor. ▪ Alternative vasopressor for patients with septic shock who: (1) develop tachyarrhythmias on norepinephrine, (2) have persistent shock despite use of two or more vasopressor/inotropic agents including vasopressin (salvage therapy), or (3) high cardiac output with persistent hypotension. ▪ **May decrease stroke volume and cardiac output in patients with cardiac dysfunction.** ▪ May be given as bolus dose of 50 to100 micrograms to support blood pressure during rapid sequence intubation.
Dobutamine	β1, β2	Inotropy Vasodilation	Cardiogenic Shock	▪ Minimal change in heart rate ▪ Hard on myocardium ▪ Initial agent of choice in cardiogenic shock with low cardiac output and maintained blood pressure. ▪ Add-on to norepinephrine for cardiac output augmentation in septic shock with myocardial dysfunction or ongoing hypoperfusion despite adequate intravascular volume and MAP. ▪ Increases cardiac contractility and rate; **may cause hypotension and tachyarrhythmias.**
Dopamine	α1, α2, β1, β2, DA	Vasoconstriction (high doses) Inotropy Dromotropy Chronotropy	Septic Shock (2nd line behind Norepinephrine)	▪ **More adverse effects** (eg, tachycardia, arrhythmias particularly at doses ≥20 mcg/kg/minute) **and failed therapy than norepinephrine.** ▪ May be useful in selected patients (eg, with compromised systolic function or bradycardia at low risk for tachyarrhythmias). ▪ Must be diluted; eg, a usual concentration is 400mg in 250mL D5W (1.6 mg/mL); use of a commercially available pre-diluted solution is preferred.
Vasopressin	V1	Vasoconstriction	Norepinephrine sparing effect at low doses	▪ Add-on to another vasopressor (eg, norepinephrine) to augment efficacy and decrease initial vasopressor requirement. Not recommended as a replacement for a first-line vasopressor. ▪ Pure vasoconstrictor; **may decrease stroke volume and cardiac output in myocardial dysfunction or precipitate ischemia in coronary artery disease.** ▪ Must be diluted; eg, a usual concentration is 25units in 250mL D5W or NS (0.1 units/mL).

Medication Quick Reference

Pressor FAQs – Adult, Medical

https://www.uptodate.com/contents/use-of-vasopressors-and-inotropes#H376789843

Medication Quick Reference – Adult, Medical

Medication Quick Reference

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max
Adenosine	Narrow Complex Tachycardia (p. 45)	6.0 mg	12.0 mg	May repeat 12.0mg x1
	Wide Complex Tachycardia (p. 46)	6.0 mg	12.0 mg	May repeat 12.0mg x1
Albuterol	COPD / Asthma / Stridor (p. 36)	2.5 mg	2.5 mg	3 doses
	Allergic Reaction (p. 49)	2.5 mg	2.5 mg	3 doses
	Prolonged Crush Injury (p. 85)	2.5 mg		
	Hazmat, General (p. 91)	2.5 mg		
Amiodarone	Cardiac Arrest, Adult (p. 39)	300 mg	150 mg	
	V-Fib / Pulseless V-Tach (p. 41)	300 mg	150 mg	
	Narrow Complex Tachycardia With A Pulse (p. 45)	**150 mg over 10 minutes**		
	Wide Complex Tachycardia With A Pulse (p. 46)	**150 mg over 10 minutes**		
Aspirin	CHF / Pulmonary Edema (p. 37)	324 mg		
	Chest Pain / Suspected ACS (p. 43)	324 mg		
	ST Elevation MI (STEMI) (p. 44)	324 mg		
Atropine	Bradycardia With A Pulse (p. 47)	0.5 mg	0.5 mg	3 doses
	Cholinergic / Organophosphate Overdose (p. 60)	Minor – 2.0 mg Major – 6.0 mg		
	Beta Blocker Overdose (p. 61)	0.5 mg	0.5 mg	3 doses
	Calcium Channel Blocker Overdose (p. 62)	0.5 mg	0.5 mg	3 doses
	WMD / Nerve Agent Exposure (p. 101)	Minor – 2.0 mg Major – 6.0 mg		
Calcium Chloride	Cardiac Arrest (p. 39)	1.0 g		1 dose
	Beta Blocker Overdose (p. 61)	1.0 g		1 dose
	Calcium Channel Blocker Overdose (p. 62)	1.0 g		1 dose
	Prolonged Crush Injury (p. 85)	1.0 g over 3 min		1 dose

Medication Quick Reference

Medication Quick Reference – Adult, Medical

Medication Quick Reference

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Dextrose	Diabetic Emergencies (p. 52)	D10W – 125mL D5W – 250mL D50 – 25mL		
Diltiazem	Narrow Complex Tachycardia With A Pulse (p. 45)	**0.25 mg/kg**	**0.35 mg/kg**	20 mg
	Wide Complex Tachycardia With A Pulse (p. 46)	**0.25 mg/kg**	**0.35 mg/kg**	20 mg
Diphenhydramine	Allergic Reaction (p. 49)	50 mg		
	Antipsychotic OD / Acute Dystonic Reaction (p. 65)	25 mg		2 doses
Dopamine (400mg in 250mL in D5W)	CHF / Pulmonary Edema (p. 37)	5-20 mcg/kg/min (See Pressor Drip Sheet)		
	Bradycardia With A Pulse (p. 47)	5-20 mcg/kg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Non-Trauma) (p. 75)	5-20 mcg/kg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Trauma) (p. 100)	5-20 mcg/kg/min (See Pressor Drip Sheet)		
Epinephrine (1:1,000)	Allergic Reaction (p. 49)	0.3 mg IM		3 doses
	COPD / Asthma / Stridor (p. 36)	0.3 mg IM	**0.15mg IF HR >150 or Age > or CAD**	
	COPD / Asthma / Stridor (p. 36)	1 mg Neb in 2mL NS	**0.15mg IF HR >150 or Age > or CAD**	
Epinephrine (1:10,000)	Cardiac Arrest (p. 39)	1 mg		
	V-Fib / Pulseless V-Tach (p. 41)	1 mg		
	Asystole / Pulseless Electrical Activity (PEA) (p. 40)	1 mg		
Epinephrine Infusion (1mg of 1:1,000 in 250mL D5W)	Allergic Reaction (p. 49)	0.1 mg over 5 minutes (0.1mL of 1:1000 into 10mL NS)	**0.1 mg over 5 minutes (0.1mL of 1:1000 into 10mL NS)**	**Epi Infusion 2-10 mcg/min**
	Bradycardia With A Pulse (p. 47)	2-10 mcg/min (See Pressor Drip Sheet)		
	Calcium Channel Blocker Overdose (p. 62)	2-10 mcg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Non-Trauma) (p. 75)	2-10 mcg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Trauma) (p. 100)	2-10 mcg/min (See Pressor Drip Sheet)		
Etomidate	Rapid Sequence Airway (p. 33)	0.3 mg/kg		20mg
Famotidine	Allergic Reaction (p. 49)	20 mg		

Medication Quick Reference

Medication Quick Reference – Adult, Medical

Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Fentanyl	Post Advanced Airway Sedation (p. 34)	1 mcg/kg		100mcg, max 3 doses
	Narrow Complex Tachycardia With A Pulse (cardioversion) (p. 45)	1 mcg/kg		100mcg
	Bradycardia With A Pulse (pacing) (p. 47)	1 mcg/kg		100mcg
	Pain Management (p. 69)	1 mcg/kg IV/IN		100mcg IV, max 2 doses (50 mcg per nare)
	Pain Management, Trauma (p. 95)	1 mcg/kg IV/IN		100mcg IV, max 2 doses (50 mcg per nare)
Glucagon	Cardiac Arrest (p. 39)	50 mcg/kg		5 mg
	Diabetic Emergencies	1.0 mg		
	Calcium Channel Blocker Overdose (p. 62)	50 mcg/kg		5 mg
	Beta Blocker Overdose (p. 61)	50 mcg/kg		5 mg
Glucose (Oral)	Diabetic Emergencies (p. 52)	15 g PO (1 tube)		2 tubes
Haloperidol	Behavioral / Excited Delirium (p. 51)	<60 kg – 5 mg IM >60 kg – 10 mg IM		
Hydroxycobalamin (Cyanokit)	Cyanide Poisoning (p. 64)	70 mg/kg		5 g
Ipratroprium Bromide	Asthma / COPD (p. 36)	0.5 mg / neb		2 doses
	Hazmat, General (p. 91)	0.5 mg / neb		5 mg
Ketamine	Rapid Sequence Airway (RSA) (p. 33)	**2 mg/kg**		**200 mg**
	Post Advanced Airway Sedation (p. 34)	2 mg/kg		200mg
	Behavioral / Excited Delirium (p. 51)	2-4 mg/kg IM		200mg
	Pain Management (p. 95)	0.2 mg/kg		20 mg
Lidocaine 2%	RSA (with Head Injury) (p. 33)	1.5 mg/kg		150 mg
	Intraosseous Venous Access Procedure (p. 192) (Awake and aware of pain)	10-20 mg ½ - 1 mL of 2% at 100mg/5mL concentration		

Medication Quick Reference

Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Lorazepam	Narrow Complex Tachycardia (cardioversion) (p. 45)	0.04 mg/kg IV/IO		2 mg
	Bradycardia With A Pulse (pacing) (p. 47)	0.04 mg/kg IV/IO		2 mg
	Behavioral / Excited Delirium (p. 51)	<60kg-1mg IM ≥60kg-1-2mg IM		
	OB General (seizures) (p. 55)	1-2mg		4 mg total
	Antipsychotic Overdose / Acute Dystonic Reaction (p. 65)	1-2mg		2 mg
	Cocaine and Sympathomimetic Overdose (p. 67)	1-2mg		2 mg
	Tricyclic Overdose (p. 68)	1-2mg		
	Seizure (p. 72)	1-2mg		
Magnesium Sulfate	COPD / Asthma / Stridor (p. 36)	2 g over 10 minutes		
	Cardiac Arrest (p. 39)	2 g over 1-2 minutes		
	Wide Complex Tachycardia With A Pulse (p. 46)	2 g over 1-2 minutes		
	OB General (p. 55)	4 g over 10 minutes		
	Beta Blocker Overdose (p. 61)	2 g over 1-2 minutes		
MARK I Kit	Cholinergic / Organophosphate Overdose (p. 60)	2 mg Atropine IM & 600 mg 2-PAM IM		
	WMD / Nerve Agent Exposure (p. 101)	2 mg Atropine IM & 600 mg 2-PAM IM		
Methylprednisone	Asthma / COPD (p. 36)	125 mg IV/IO		
	Allergic Reaction (p. 49)	125 mg IV/IO		
Midazolam	Airway Management (p. 32)	**1 mg IV/IN**		
	Post Advanced Airway Sedation (p. 34)	4 mg IV/IO		Max 3 doses
	CHF / Pulmonary Edema (p. 37)	**1 mg IV**		
	Narrow Complex Tachycardia With A Pulse (cardioversion) (p. 45)	2-4 mg IM/IN/IV/IO		Max 4 mg

Medication Quick Reference

Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Midazolam (cont)	Bradycardia With A Pulse (pacing) (p. 47)	2-4 mg		4 mg
	OB General (p. 55)	5 mg IM/IN/IV/IO		May repeat x 1
	Antipsychotic Overdose / Acute Dystonic Reaction (p. 65)	5 mg if <60 y/o 2.5 mg if ≥60 y/o		5 mg
	Cocaine and Sympathomimetic Overdose (p. 67)	2-4 mg		
	Tricyclic Overdose (p. 68)	2-4 mg		
	Seizure (p. 72)	5 mg if <60 y/o 2.5 mg if ≥60 y/o		
	Bites and Envenomations (p. 79)	5 mg IM/IN or 2 mg IV/IO		
	Environmental – Hyperthermia (p. 87)	2 mg		
Morphine Sulfate	Pain Management – Medical (p. 69)	**4 mg**		**4 mg**
	Pain Management – Trauma (p. 95)	0.1 mg/kg		4 mg / dose May repeat x 2
Naloxone	Opiate Overdose (p. 66)	0.5-2.0 mg		May repeat x 2
Nitroglycerin	CHF / Pulmonary Edema (p. 37)	0.4 mg SL if IV present **OR** 1", 1.5" or 2" Nitro Paste	**0.4 mg SL if no IV present**	3 doses
	Chest Pain / Suspected ACS (p. 43)	0.4 mg SL if IV present **OR** 1", 1.5" or 2" Nitro Paste	**0.4 mg SL if no IV present**	3 doses
	ST Elevation Myocardial Infarction (STEMI) (p. 44)	0.4 mg SL if IV present **OR** 1", 1.5" or 2" Nitro Paste	**0.4 mg SL if no IV present**	3 doses
Nitrous Oxide	Pain Management – Trauma (p. 95)			
	Nitrous Oxide – Procedure (p. 196)			
Norepinephrine	Hypotension / Shock (Non-Trauma) (p. 75)	8-12 mcg/min (See Pressor Drip Sheet)		
	Hypotension / Shock (Trauma) (p. 100)	8-12 mcg/min (See Pressor Drip Sheet)		
Ondansetron	Post Advanced Airway Sedation (p. 34)	4.0 mg		4.0 mg
	Chest Pain / Suspected ACS (p. 43)	4.0 mg		4.0 mg
	ST Elevation MI (nausea) (p. 44)	4.0 mg		4.0 mg

Medication Quick Reference

Medication Quick Reference – Adult, Medical

Medication Name	Indication (Protocol Use)	First Dose	Second Dose	Max Dose
Ondansetron (cont.)	Abdominal Pain / GI Bleeding (p. 48)	4.0 mg		4.0 mg
	Pain Management (p. 69)	4.0 mg		4.0 mg
	Environmental – Hyperthermia (p. 87)	4.0 mg		4.0 mg
	Eye Pain – Trauma (p. 90)	4.0 mg		4.0 mg
	Pain Management – Trauma (p. 95)	4.0 mg		4.0 mg
Rocuronium	Rapid Sequence Airway (RSA) (p. 33)	1.0 mg/kg		100 mg
	Rapid Sequence Airway – Procedure (p. 150)	1.0 mg/kg		100 mg
Sodium Bicarb	Cardiac Arrest (hyperkalemia) (p. 39)	50 mEq		
	Beta Blocker Overdose (p. 61)	1 mEq/kg over 5 minutes		100 mEq
	Tricyclic Overdose (p. 68)	1 mEq/kg over 5 minutes		100 mEq
	Prolonged Crush Injury (p. 85)	50 mEq		
	Hazmat General (p. 91)	2.5mL Bicarb in 5mL NS, neb		
Succinylcholine	Rapid Sequence Airway (RSA) (p. 33)	2 mg/kg		200 mg
	Rapid Sequence Airway – Procedure (p. 150)	2 mg/kg		200 mg
Tranexamic Acid (TXA)	Hemorrhage Control – Trauma (p. 95)	1 gm over 10 minutes	1gm over 8 hours	2 gm
	Tranexamic Acid – Procedure (p. 197)	1 gm over 10 minutes	1gm over 8 hours	2 gm
Mixing Directions: **Tranexamic Acid (TXA) 1gm into 50mL NS (60mL total volume). Infuse over 10 minutes. 10 gtts tubing = 60 gtts/min**				

Medication Quick Reference

Medication Quick Reference
Peds Cardiac Arrest (General) p. 111

Medication Name		1st Shock	Epinephrine (1:10,000)	2nd Shock	Amiodarone	Atropine	Calcium Gluconate	Sodium Bicarb	3rd Shock	Lidocaine
Dose		Biphasic	0.01 mg/kg	Biphasic	5 mg/kg	0.02 mg/kg	100 mg/kg	1 mEq/kg	Biphasic	1 mg/kg
Concentration		2 J/kg	0.1 mg/mL	4 J/kg	50 mg/mL	0.1 mg/mL	100 mg/mL	1 mEq/mL	4-10 J/kg	20 mg/mL
lbs	**kg**				**May repeat x 2 OR switch to Lidocaine**					**May repeat at 5-10 minutes, ½ dose**
2-4	**1**	**2 J**	**0.01mg / 0.1mL**	**4 J**	**5mg / 0.1mL**	**0.1mg / 1mL (minimum)**	**100mg / 1mL**	**1mEq / 1mL**	**4-10 J**	**1mg / 0.05mL**
5	**2**	**4 J**	**0.02mg / 0.2mL**	**8 J**	**10mg / 0.2mL**	**0.1mg / 1mL (minimum)**	**200mg / 2mL**	**2mEq / 2mL**	**8-20 J**	**2mg / 0.1mL**
6-7	**3**	6 J	0.03mg / 0.3mL	12 J	15mg / 0.3mL	0.1mg / 1mL (minimum)	300mg / 3mL	3mEq / 3mL	12-30 J	3mg / 0.15mL
8-9	**4**	8 J	0.04mg / 0.4mL	16 J	20mg / 0.4mL	0.1mg / 1mL (minimum)	400mg / 4mL	4mEq / 4mL	16-40 J	4mg / 0.2mL
10-12	**5**	10 J	0.05mg / 0.5mL	20 J	25mg / 0.5mL	0.1mg / 1mL	500mg / 5mL	5mEq / 5mL	20-50 J	5mg / 0.25mL
13-14	**6**	12 J	0.06mg / 0.6mL	24 J	30mg / 0.6mL	0.12mg / 1.2mL	600mg / 6mL	6mEq / 6mL	24-60 J	6mg / 0.3mL
15-16	**7**	**14 J**	**0.07mg / 0.7mL**	**28 J**	**35mg / 0.7mL**	**0.14mg / 1.4mL**	**700mg / 7mL**	**7mEq / 7mL**	**28-70 J**	**7mg / 0.35mL**
17-18	**8**	**16 J**	**0.08mg / 0.8mL**	**32 J**	**40mg / 0.8mL**	**0.16mg / 1.6mL**	**800mg / 8mL**	**8mEq / 8mL**	**32-80 J**	**8mg / 0.4mL**
19-20	**9**	**18 J**	**0.09mg / 0.9mL**	**36 J**	**45mg / 0.9mL**	**0.18mg / 1.8mL**	**900mg / 9mL**	**9mEq / 9mL**	**36-90 J**	**9mg / 0.45mL**
21-23	**10**	**20 J**	**0.1mg / 1mL**	**40 J**	**50mg / 1mL**	**0.2mg / 2mL**	**1gm / 10mL**	**10mEq / 10mL**	**40-100 J**	**10mg / 0.5mL**
26-27	**12**	24 J	0.12mg / 1.2mL	48 J	60mg / 61.2mL	0.24mg / 2.4mL	1gm / 10mL	12mEq / 12mL	48-120 J	12mg / 0.6mL
32-34	**15**	30 J	0.15mg / 1.5mL	60 J	75mg / 1.5mL	0.3mg / 3mL	1gm / 10mL	15mEq / 15mL	60-150 J	15mg / 0.75mL
43-45	**20**	40 J	0.2mg / 2mL	80 J	100mg / 2mL	0.4mg / 4mL	1gm / 10mL	20mEq / 20mL	80-200 J	20mg / 1mL
55-56	**25**	50 J	0.25mg / 2.5mL	100 J	125mg / 2.5mL	0.5mg / 5mL	1gm / 10mL	25mEq / 25mL	100-200 J	25mg / 1.25mL
110-111	**50**	100 J	0.5mg / 5mL	**200 J**	250mg / 5mL	**1mg / 10mL**	1gm / 10mL	**50mEq / 50mL**	**200 J**	50mg / 2.5mL
132-133	**60**	120 J	0.6mg / 6mL	200 J	**300mg / 6mL**	1mg / 10mL	1gm / 10mL	50mEq / 50mL	200 J	60mg / 3mL
165-166	**75**	150 J	0.75mg / 7.5mL	200 J	300mg / 6mL	1mg / 10mL	1gm / 10mL	50mEq / 50mL	200 J	75mg / 3.75mL
220-221	**100**	**200 J**	**1mg / 10mL**	200 J	300mg / 6mL	1mg / 10mL	1gm / 10mL	50mEq / 50mL	200 J	100mg / 5mL
Max Dose		**200 J**	**1mg / 10mL**	**200mg / 10mL**	**300mg / 6mL**	**1mg / 10mL**	**1gm / 10mL**	**50mEq**	**200 J**	**3 mg/kg**

Medication Quick Reference

Medication Quick Reference

Medication Quick Reference
Peds Perfusing Arrhythmias (p. 115-116)

Medication Quick Reference

Bradycardia With A Pulse (p. 115)

Medication Name		Epinephrine (1:10,000)	Atropine	Midazolam INTRANASAL	Lorazepam IV	Midazolam IV
Dose		0.01 mg/kg	0.02 mg/kg	0.2 mg/kg	0.05 mg/kg	0.05 mg/kg
Concentration		0.1 mg/mL	0.1 mg/mL	5 mg/mL	20 mg/mL	5 mg/mL
lbs	kg	Every 3-5 min while setting up to pace	If Brady due to vagal tone	Sedation for Pacing		
2-4	1	0.01mg / 0.1mL	0.1mg / 1mL (minimum)	0.2mg / 0.04mL	0.05mg / 0.003mL	0.05mg / 0.01mL
5	2	0.02mg / 0.2mL	0.1mg / 1mL (minimum)	0.4mg / 0.08mL	0.1mg / 0.005mL	0.1mg / 0.02mL
6-7	3	0.03mg / 0.3mL	0.1mg / 1mL (minimum)	0.6mg / 0.12mL	0.15mg / 0.008mL	0.15mg / 0.03mL
8-9	4	0.04mg / 0.4mL	0.1mg / 1mL (minimum)	0.8mg / 0.16mL	0.2mg / 0.01mL	0.2mg / 0.04mL
10-12	5	0.05mg / 0.5mL	0.1mg / 1mL	1mg / 0.2mL	0.25mg / 0.013mL	0.25mg / 0.05mL
13-14	6	0.06mg / 0.6mL	0.12 mg / 1.2mL	1.2mg / 0.24mL	0.3mg / 0.015mL	0.3mg / 0.06mL
15-16	7	0.07mg / 0.7mL	0.14mg / 1.4mL	1.4mg / 0.28mL	0.35mg / 0.018mL	0.35mL / 0.07mL
17-18	8	0.08mg / 0.8mL	0.16mg / 1.6mL	1.6mg / 0.32mL	0.4mg / 0.02mL	0.4mg / 0.08mL
19-20	9	0.09mg / 0.9mL	0.18mg / 1.8mL	1.8mg / .36mL	0.45mg / 0.023mL	0.45mg / 0.09mL
21-23	10	0.1mg / 1mL	0.2mg / 2mL	2mg / 0.4mL	0.5mg / 0.03mL	0.5mg / 0.1mL
26-27	12	0.12mg / 1.2mL	0.24mg / 2.4mL	2.4mg / 0.48mL	0.6mg / 0.03mL	0.6mg / 0.12mL
32-34	15	0.15mg / 1.5mL	0.3mg / 3mL	3mg / 0.6mL	0.75mg / 0.038mL	0.75mg / 0.15mL
43-45	20	0.2mg / 2mL	0.4mg / 4mL	4mg / 0.8mL	1mg / 0.05mL	1mg / 0.2mL
55-56	25	0.25mg / 2.5mL	**0.5mg / 5mL**	5mg / 1mL	1.25mg / 0.063mL	1.25mg / 0.25mL
110-111	50	0.5mg / 5mL	0.5mg / 5mL	**10mg / 2mL**	**2mg / 0.1mL**	**2mg / 0.4mL**
132-133	60	0.6mg / 6mL	0.5mg / 5mL	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL
165-166	75	0.75mg / 7.5mL	0.5mg / 5mL	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL
220-221	100	**1mg / 10mL**	0.5mg / 5mL	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL
Max Dose		1mg / 10mL	0.5mg / 5mL	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL

Tachycardia With A Pulse (p. 116)

Adenosine	Adenosine	Amiodarone
0.1 mg/kg	0.2 mg/kg	5 mg/kg
3 mg/mL	3mg / mL	50 mg/mL
First Dose	Second Dose	Infuse over 20-60 minutes
0.1mg / 0.03mL	0.2mg / 0.07mL	5mg / 0.1mL
0.2mg / 0.07mL	0.4mg / 0.13mL	10mg / 0.2mL
0.3mg / 0.1mL	0.6mg / 0.2mL	15mg / 0.3mL
0.4mg / 0.13mL	0.8mg / 0.27mL	20mg / 0.4mL
0.5mg / 0.17mL	1mg / 0.33mL	25mg / 0.5mL
0.6mg / 0.2mL	1.2mg / 0.4mL	30mg / 0.6mL
0.7mg / 0.23mL	1.4mg / 0.47mL	35mg / 0.7mL
0.8mg / 0.27mL	1.6mg / 0.53mL	40mg / 0.8mL
0.9mg / 0.3mL	1.8mg / 0.6mL	45mg / 0.9mL
1mg / 0.33mL	2mg / 0.67mL	50mg / 1mL
1.2mg / 0.4mL	2.4mg / 0.8mL	60mg / 1.2mL
1.5mg / 0.5mL	3mg / 1mL	75mg / 1.5mL
2mg / 0.67mL	4mg / 1.33mL	100mg / 2mL
2.5mg / 0.83mL	5mg / 1.67mL	125mg / 2.5mL
5mg / 1.67mL	10mg / 3.33mL	250mg / 5mL
6mg / 2mL	**12mg / 4mL**	**300mg / 6mL**
6mg / 2mL	12mg / 4mL	300mg / 6mL
6mg / 2mL	12mg / 4mL	300mg / 6mL
6mg / 2mL	12mg / 4mL	300mg / 6mL

Medication Quick Reference

Medication Quick Reference
Peds Allergic Reaction (p. 117)

Medication Name		Epinephrine IM (1:1,000)	Epinephrine IV (1:10,000)	Albuterol	Diphenhydramine	Famotidine	Epinephrine gtt	Methylprednisolone
Dose		0.01 mg/kg	0.005 mg/kg	2.5 mg / 3mL	1 mg/kg	0.5 mg/kg	0.1-1 mcg/kg/min	2 mg/kg
Concentration		1 mg/mL	0.1 mg/mL		50 mg/mL	10 mg/mL	1mg of 1:1,000 in 250mL D5W	62.5 mg/mL
lbs	kg							
2-4	1	0.01mg / 0.01mL	0.005mg / 0.05mL		1mg / 0.02mL	0.5mg / 0.05mL	1mcg/min / 15gtt/min	2mg / 0.03mL
5	2	0.02mg / 0.02mL	0.01mg / 0.1mL		2mg / 0.04mL	1mg / 0.1mL	2mcg/min / 30gtt/min	4mg / 0.06mL
6-7	3	0.03mg / 0.03mL	0.03mg / 0.3mL		3mg / 0.06mL	1.5mg / 0.15mL	3mcg/min / 45gtt/min	6mg / 0.09mL
8-9	4	0.04mg / 0.04mL	0.04mg / 0.4mL		4mg / 0.08mL	2mg / 0.2mL	4mcg/min / 60gtt/min	8mg / 0.13mL
10-12	5	0.05mg / 0.05mL	0.05mg / 0.5mL		5mg / 0.1mL	2.5mg / 0.25mL	5mcg/min / 75gtt/min	10mg / 0.16mL
13-14	6	0.06mg / 0.06mL	0.06mg / 0.6mL		6mg / 0.12mL	3mg / 0.3mL	6mcg/min / 90gtt/min	12mg / 0.19mL
15-16	7	0.07mg / 0.07mL	0.07mg / 0.7mL		7mg / 0.14mL	3.5mg / 0.35mL	7mcg/min / 105gtt/min	14mg / 0.22mL
17-18	8	0.08mg / 0.08mL	0.08mg / 0.8mL		8mg / 0.16mL	4mg / 0.4mL	8mcg/min / 120gtt/min	16mg / 0.26mL
19-20	9	0.09mg / 0.09mL	0.09mg / 0.9mL		9mg / 0.18mL	4.5mg / 0.45mL	9mcg/min / 135gtt/min	18mg / 0.29mL
21-23	10	0.1mg / 0.1mL	0.1mg / 1mL		10mg / 0.2mL	5mg / 0.5mL	10mcg/min / 150gtt/min	20mg / 0.32mL
26-27	12	0.12mg / 0.12mL	0.1mg / 1mL		12mg / 0.24mL	6mg / 0.6mL	10mcg/min / 150gtt/min	24mg / 0.38mL
32-34	15	0.15mg / 0.15mL	0.1mg / 1mL		15mg / 0.3mL	7.5mg / 0.75mL	10mcg/min / 150gtt/min	30mg / 0.48mL
43-45	20	0.2mg / 0.2mL	0.1mg / 1mL		20mg / 0.4mL	10mg / 1mL	10mcg/min / 150gtt/min	40mg / 0.64mL
55-56	25	0.25mg / 0.25mL	0.1mg / 1mL		25mg / 0.5mL	17.5mg / 1.75mL	10mcg/min / 150gtt/min	50mg / 0.8mL
110-111	50	0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	100mg / 1.6mL
132-133	60	0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	120mg / 1.92mL
165-166	75	0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	125mg / 2mL
220-221	100	0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	125mg / 2mL
Max Dose		0.3mg / 0.3mL	0.1mg / 1mL		50mg / 1mL	20mg / 2mL	10mcg/min / 150gtt/min	125mg / 2mL

Medication Quick Reference

Medication Quick Reference

Medication Quick Reference
Peds Seizure (p. 125)

Medication Name		Midazolam INTRANASAL	Lorazepam IV	Midazolam IV	Glucagon IM	D10
Dose		0.2 mg/kg	0.1 mg/kg	0.1 mg/kg		3 mL/kg
Concentration		5 mg/mL	20 mg/mL	5 mg/mL		
lbs	kg					
2-4	1	0.2mg / 0.04mL	0.1mg / 0.005mL	0.1mg / 0.02mL	0.5mg	3mL
5	2	0.4mg / 0.08mL	0.2mg / 0.01mL	0.2mg / 0.04mL	0.5mg	6mL
6-7	3	0.6mg / 0.12mL	0.3mg / 0.015mL	0.3mg / 0.06mL	0.5mg	9mL
8-9	4	0.8mg / 0.16mL	0.4mg / 0.02mL	0.4mg / 0.08mL	0.5mg	12mL
10-12	5	1mg / 0.2mL	0.5mg / 0.025mL	0.5mg / 0.1mL	0.5mg	15mL
13-14	6	1.2mg / 0.24mL	0.6mg / 0.03mL	0.6mg / 0.12mL	0.5mg	18mL
15-16	7	1.4mg / 0.28mL	0.7mg / 0.035mL	0.7mg / 0.14mL	0.5mg	21mL
17-18	8	1.6mg / 0.32mL	0.8mg / 0.04mL	0.8mg / 0.16mL	0.5mg	24mL
19-20	9	1.8mg / .36mL	0.9mg / 0.045mL	0.9mg / 0.18ml	0.5mg	27mL
21-23	10	2mg / 0.4mL	1mg / 0.05mL	1mg / 0.2mL	0.5mg	30mL
32-34	15	3mg / 0.6mL	1.5mg / 0..075mL	1.5mg / 0.3mL	0.5mg	45mL
32-34	15	3mg / 0.6mL	1.5mg / 0..075mL	1.5mg / 0.3mL	0.5mg	45mL
43-45	20	4mg / 0.8mL	2mg / 0.1mL	2mg / 0.4mL	0.5mg	60mL
55-56	25	5mg / 1mL	2mg / 0.1mL	2mg / 0.4mL	1mg	75mL
110-111	50	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL	1mg	125mL
132-133	60	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL	1mg	125mL
165-166	75	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL	1mg	125mL
220-221	100	10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL	1mg	125mL
Max Dose		10mg / 2mL	2mg / 0.1mL	2mg / 0.4mL	1mg	125mL

Disposable Diaper ROUGH Weight Estimate Chart		
Diaper Size	lbs	kg
P	<6	<2.7
N	<10	<4
1	8-14	3-6
2	12-18	5-8
3	16-28	7-13
4	22-37	9-17
5	27+	12+
6	35+	16+
7	41+	18+

Medication Quick Reference

Medication Quick Reference

Madison and Dane County Responder Resources

"In case you haven't felt it today… **You are appreciated.**
In case you wanted to quit today… **Don't. You are needed.**
In case you need to talk but feel noone will listen… **There are many who will**.
In case you haven't heard it today… **THANK YOU**"

Call 2-1-1 any time for information about almost anything related to health and human services.
You can also visit http://www.211wisconsin.org or http://www.referweb.net/uwdc/

Employee Assistance Program (EAP) City of Madison…… (608) 266-6561
tmartinez@cityofmadison.com
hkrueger@cityofmadison.com
samos@cityofmadison.com
2300 S. Park St
Suite 111
Madison, WI

Employee Assistance Program (EAP) Dane County…. (608) 280-2644
Karen Smith
http://www.journeymhc.org/
Journey Mental Health Center
49 Kessel Ct
Madison, WI

Dane County Human Services (http://www.danecountyhumanservices.org/default.aspx)…… **(608) 242-6200**

Mental Health Services
Mental Health Crisis Line (24 Hours)…… **(608) 280-2600**
Emergency and Crisis Child Care (24 hours per day)…… **(608) 244-5700**
Parental Stress Line (8am – 10pm daily)…… **(608) 241-2221**
Recovery Dane…… **(608) 237-1661**

National Alliance on Mental Illness (NAMI) Dane County……(608) 249-7188
contact@namidanecounty.org
National Alliance on Mental Illness
2059 Atwood Ave
Madison, WI

Transportation
Dane County Transportation Services……(**608) 242-6486**
http://danecountyhumanservices.org/Transportation/key_phone_numbers.aspx
Madison Metro Transit and Paratransit
https://cityofmadison.com/metro/ and https://www.cityofmadison.com/metro/paratransit/
BadgerCare / Medicaid……**(608) 907-1493**

Medical Emergency : Call 9-1-1