

Case Vignette of the Month

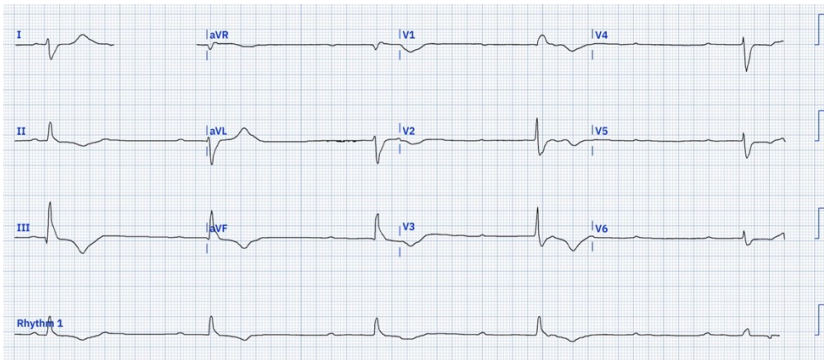
Case Study: You have been paged to an Echo level response, PNB patient. Per CAD notes, the patient's wife found him to be diaphoretic and short of breath just before going unconscious. He is 65 years old, has a history of HTN and high cholesterol but is otherwise healthy. Dispatch began coaching his wife through chest compressions almost immediately upon arrest. You find a 65 year old male supine on the floor, bluish in appearance, apneic and without a pulse. A Police Officer already on scene has taken over manual compressions while your team immediately assumes their roles in the High Performance CPR model. Within 3 minutes of arrival on scene, you have established IO access in the patient's left humeral head, your partner is set up to intubate using the video laryngoscope and SALAD technique, and the EMR has just applied the defib pads. The patient is bagging easily with an OPA and BVM, and the Police Officer continues to have excellent rate and depth on chest compressions. The LUCAS device has been brought to the patient's side and the team is organizing for a smooth transition from manual to mechanical chest compressions. You note that the rhythm on the monitor is asystole, and the patient remains pulseless and apneic.

Discussion:

- What should your next treatment be for this patient?
- What can EMS do to increase the likelihood of successful resuscitation after Sudden Cardiac Arrest?
- What are some indicators that increase the likelihood of successful resuscitation?
- Should you consider eCPR (aka ECMO) for this patient?

December Viz Quiz

You are responding to a skilled nursing facility for a 20-Delta-1 Heat/Cold Exposure, Not Alert for an 88 year old male. The staff tell you that the patient has a history of Dementia, HTN, DM and Dyslipidemia. The patient was in his room during medication rounds approximately 2 hours ago, but apparently was able to elope from the facility and was found outside. He is unresponsive, and the covering staff are not familiar with his baseline mental status or additional medical history. The



patient has a FSBS of 112, BP of 120/60, HR in the 30's, RR 16 and SpO2 of 91%. Your partner notes that the patient is very cold to the touch when applying the stickers to obtain a 12-lead EKG, then hands you this 12-lead. You believe that underlying cause of this patient's presentation is:

- A. Sepsis
- B. Hypothermia
- C. Mobitz II
- D. Complete Heart Block

Photo Credit: Twitter @LITFLblog, #MedTwitter, #FOAMed, #MedEd

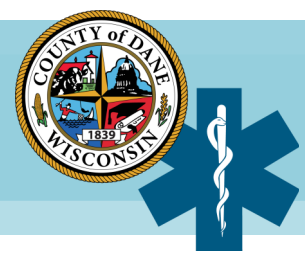
Submit your answers at <https://www.surveymonkey.com/r/9WS3Z29> for the chance to win a prize!

November Viz Quiz Follow-Up

Answer: C. Monkeypox. Monkeypox is similar to smallpox, which was eradicated through vaccination. It is thought that prior smallpox vaccination has some protection against contracting monkeypox, however vaccination was stopped in 1972 after it was eradicated. Monkeypox is transmitted primarily through skin to skin contact. As of October 18, there have been 27,558 confirmed cases in the US. While the rash develops as small, painful vesicles primarily on the genitals and anus, it can also be seen on the hands. Early on, the patient may have mild flu-like symptoms. Symptoms begin 1-3 weeks after exposure, and the rash usually erupts within 1-3 days of the constitutional symptoms. Contact precautions are essential for prevention. So far, there have NOT been any documented cases from direct transmission to health care workers. So wear those gloves before shaking hands!

NOTE: Chicken pox and shingles are both grouped vesicles on a red base, unlike the clumps of clear-to-red smaller vesicles seen in monkeypox, and rarely distribute on the palms of the hands. Syphilis DOES distribute on the palms and soles, and is also painful, but is a macular rash and is NOT raised. And don't default to eczema when you see an unexplained rash. Eczema isn't contagious, but all of the other rashes are!





Case Study

Out of Hospital Cardiac Arrest

- The number of sudden cardiac deaths (SCDs) in the US in 2019 was approximately 370,000
- Incidence of sudden cardiac arrest (SCA) increases dramatically with age and with known underlying cardiac disease; In addition, men are 2-3 times more likely to experience SCA than women
- Among 161,808 post-menopausal women who participated in the Women’s Health Initiative and were followed for an average of 10.8 years:
 - The incidence of SCD was 2.4 per 10,000 women/year
 - Nearly 1/2 of women who experienced SCD did not have prior clinically recognized coronary artery disease (CAD)
- Factors that increase the risk of Sudden Cardiac Arrest include Cigarette, family history of SCA (alone or with MI), chronic inflammatory states, excess alcohol intake, excess caffeine

Outcome According to Presenting Rhythm

- Asystole: only 10% of patients with out-of-hospital arrest and initial asystole survive to hospital admission; less than 5% survive to hospital discharge with good neuro function.
- Pulseless Electrical Activity: poor outcomes due to absence of cardiac output and organ perfusion. In one study, 23% presenting with PEA were resuscitated and only 11% survived to hospital discharge.
- Ventricular Tachyarrhythmia: 25-40% presenting with SCA by Ventricular Fibrillation (VF) survive to hospital discharge

eCPR and ECMO

- Extracorporeal Cardiopulmonary Resuscitation (eCPR or “ECMO”) has been one of the first significant advances in survival from out-of-hospital cardiac arrest.
- eCPR is a time critical intervention, much like early defibrillation for VF. Start thinking about ECMO early for your patients and prioritize transport to an eCPR capable facility.
- Survival when asystole is the presenting rhythm is poor, even with ideal circumstances and early ECMO. For this reason, the UW is currently considering asystole on presenting rhythm to be a contraindication for eCPR in the ED.

https://www.uptodate.com/contents/prognosis-and-outcomes-following-sudden-cardiac-arrest-in-adults?source=history_widget

<https://www.uptodate.com/contents/overview-of-sudden-cardiac-arrest-and-sudden-cardiac-death?source=autocomplete&index=0~4&search=out%20of%20hospital>

Extracorporeal Cardiopulmonary Resuscitation (ECPR or “ECMO”) - Adult

<p>Inclusion Criteria for ECPR:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Age 13 -70 years; weight ≥40kg <input type="checkbox"/> Arrest is EITHER <ul style="list-style-type: none"> • Witnessed OR • Initial Shockable Rhythm OR • Intermittent ROSC <input type="checkbox"/> ECPR can be initiated within ~60 minutes of estimated initial arrest <input type="checkbox"/> Suspect reversible cause of arrest – STEMI, massive PE, cardiac toxin overdose, primary arrhythmia, accidental hypothermia, etc. <input type="checkbox"/> ECPR and full ICU care are consistent with patient wishes (if known by family at bedside) 	<p>Exclusions to ECPR:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Estimated BMI >40 due to morbid obesity <ul style="list-style-type: none"> • (i.e. >300lbs at 6’ tall; >250lbs at 5’6” tall; cannot fit into LUCAS device) <input type="checkbox"/> Cannot safely anticoagulate <ul style="list-style-type: none"> • (i.e. Trauma, Aortic Dissection, ICH, Uncontrolled Hemorrhage) <input type="checkbox"/> Cannot perform ADLs at baseline, including (if known or reported by family) <ul style="list-style-type: none"> • Resident of Nursing Home, SNF, LTAC • Not oriented to self and place and/or not conversational <input type="checkbox"/> Advanced comorbidities (if known or reported by family) <ul style="list-style-type: none"> • Oxygen-dependent lung disease • Previously evaluated and deemed not a candidate for LVAD • ESRD requiring dialysis • ESLD, including jaundice, ascites, varices and/or transplant list • Metastatic cancer and/or receiving chemo or radiation <input type="checkbox"/> DNR/DNI (if known or reported by family) <input type="checkbox"/> Attending physician perception of futility, including <ul style="list-style-type: none"> • EtCO2 <10mmHg for >20minutes
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Activating An “ECMO Alert”

- Contact the ECMO Capable Hospital Early by radio. “We are on scene with a potential ECPR Candidate”
- Over the radio, give a reliable phone number for the Medical Control Physician to call you back (may require communication of HIPAA protected patient information)
- Medical Control will call you directly to review the case and make a decision regarding patient candidacy for ECPR

Flowchart:

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graph TD
    Start[Cardiac Arrest – Adult, Medical] --> ECPR_Candidate{ECPR Candidate}
    ECPR_Candidate -- No --> GoTo[Go To Appropriate Arrest Protocol]
    ECPR_Candidate -- Yes --> Consider[Consider Application of Mechanical CPR Device]
    Consider --> Consult[Consult with ECMO Capable Hospital Early “ECMO Alert”]
    Consult --> Medical_Control{Medical Control Recommends ECPR}
    Medical_Control -- No --> Continue[Continue HPCPR Procedure p156]
    Continue --> Return[Return To Appropriate Arrest Protocol]
    Medical_Control -- Yes --> Notify[Initiate Transport to ECMO Center Continue HPCPR Procedure p156]
    Notify --> Notify_Rec[Notify Receiving Facility, Contact Medical Control As Necessary]
                    
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Pearls

REQUIRED EXAM: VS, GCS, RR, Lung Sounds, Cardiac Exam, IV/D

- Goal is estimated time of arrest to on ECMO Circuit <60 minutes
- It is important to balance High Performance CPR on scene with ECPR potential; Strongly consider candidate patient if not responding to quality CPR
- Ideally, decision to move patient should be made and transport from scene should happen in <16 minutes
- Contact ECPR-capable receiving hospital with “ECMO Alert” early; consider contact after 2” shock for refractory V-fib, nearest after ROSC, EMS Discretion, etc.
- ECPR is a highly time-critical intervention; it is important to consider the patient circumstances and whether pt. could be a candidate. Consultation with ECMO center early is a priority
- There are many variables that go into the decision to start a patient in ECPR circuit; not every candidate patient will be able to be cannulated on arrival to the ED

Inclusion Criteria for ECPR:

- Age 13 -70 years; weight ≥40kg
- Arrest is EITHER:
 - Witnessed OR
 - Initial Shockable Rhythm OR
 - Intermittent ROSC
- ECPR can be initiated within ~60 minutes of estimated initial arrest
- Suspect reversible cause of arrest – STEMI, massive PE, cardiac toxin overdose, primary arrhythmia, accidental hypothermia, etc.
- ECPR and full ICU care are consistent with patient wishes (if known by family at bedside)

Image Credit: Dane County Interactive Protocol Book, Page 39

<https://em.countyofdane.com/documents/pdf/ems/2021-2022-Protocol-Update/Interactive-Protocol-Book--Protected.pdf>

Protocol Quiz

Test your knowledge on the Dane County Protocols by completing [this quiz](#).

Happy Holidays and Happy New Year to all!

