EMS Presentations of Unusual Conditions ... Cases That You Can’t Afford to Miss!

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The objective to this lecture is simple – to provide you with information that you can use today that will impact your practice and approach to patients!
What I’ve learned in 34 years of EMS and 25 years of emergency medicine ...
... some of the most life-threatening conditions present in unusual ways and often what the book says is not always the way it is in real life!
How it’s easy to get fooled in emergency medicine / EMS

- Dispatch bias
- “Frequent flyer” bias
- “I’ve have this before” bias
- Partner or co-worker bias
- “They were waiting for me on the curb” bias
General rule of thumb: if you think you know the problem before you get a history or examine the patient you are highly likely to miss something bad!
Dispatch:

69 year old male patient
“kidney stone”
69 yo male patient with sudden severe left flank pain. Pt was watching TV and had sudden onset of pain. There is a hx of kidney stones “always on the left”.
History

- Sudden onset left back pain; no trauma
- Feels somewhat nauseated and sweaty since the pain started; no vomiting
- PMH: kidney stones, hypertension
- Meds: HCTZ
- Allergies: none
Exam

• Well developed male in moderate pain
• Skin diaphoretic
• VS: P 130; BP 107/70; RR 24
• Lungs - clear
• Abdomen – overweight slightly tender on left and left flank; some bruising noted on the left flank
Exam Clues

- Well developed male in moderate pain
- Skin diaphoretic
- VS: P 130; BP 107/70; RR 24
- Lungs - clear
- Abdomen – overweight slightly tender on left and left flank; some bruising noted on the left flank
Treatment Course

• Monitor: sinus tach / 12 lead unremarkable
• IV NSS placed
• Zofran 4mg given IV
• Pt stands to pivot to the stretcher and collapses forward
• Repeat VS: BP 70 systolic; HR 140
Ruptured Abdominal Aortic Aneurysm
AAA

• Affect 2% of the population (so not common but catastrophic if missed)
• Common in patients with hypertension
• Common in patients > 50 yo (males> females)
• May be detectable on exam as a pulsatile mass however may be difficult to detect in obese patients
Note the posterior position in the chest and abdomen.
AAA

• Think of the aorta as both an abdominal AND a back organ based on its anatomic position
• Presentation is usually sudden, not worse with movement
• Pain may be low back, flanks, abdomen, or pelvis depending on the location of the AAA and the location of the leak/rupture
• Pain may radiate to the testicle or thigh
Common Diagnostic Mimics

- “chronic back pain”
- “kidney stone”
- “sciatica”
- “acute scrotal pathology”
- May have numbness of the legs due to compression of the femoral or sciatic nerve mimicking a neurologic presentation
- Syncope
70% of all ruptured AAA patients are hemodynamically stable when first encountered
Only 38% of AAA have the textbook classic “pulsatile mass.”

There is no evidence that palpation of the abdomen (or mass) can precipitate rupture.
Only 30% of ruptured AAA have the classic findings of pulsatile mass and hypotension
65% of ruptured AAA die before ever reaching the hospital
Grey-Turner Sign
Takeaway Pearl Of Wisdom

• High index of suspicion – **ALWAYS** think AAA for any elderly patients with back, flank, or abdominal pain

• Decode the vital signs: P130; diaphoretic; BP 107 (in patient with hypertension) = shock!

• IV access with blood pressure support
Dispatch:

29 year old female patient “syncope”
39 yo female patient. Pt is a teacher at a local elementary school. She reports that she was teaching and “it’s been a hard day”. She became hot and flushed and collapsed. She is now in the nurses office and feels a little better.
History

- As stated
- She has “passed out 1-2 times in the past”; nauseated, no vomiting. Denies pregnancy. LMP - now
- PMHX: none
- Meds: none
- Allergies: PCN
Exam

• Well developed female appears anxious
• Skin diaphoretic
• VS: P 126; BP 100/70; RR 20
• Lungs - clear
• Abdomen – slight upper abdominal tenderness. Complains of mild shoulder pain “probably from collapsing” – no deformity
Exam Clues

• Well developed female appears anxious
• Skin diaphoretic
• VS: P 126; BP 100/70; RR 20
• Lungs - clear
• Abdomen – slight upper abdominal tenderness. Complains of mild shoulder pain “probably from collapsing” – no deformity; full ROM
Treatment Course

• EKG – sinus tach; 12 lead unremarkable
• IV NSS placed
• Zofran 4mg IV given
• Enroute to hospital abdominal and shoulder pain are worsening
• On arrival at local hospital HR 134; BP 86 systolic
• Your service is called back for an emergency transfer of this patient to another facility
Ruptured Ectopic Pregnancy
Ectopic / Ruptured Ectopic Pregnancy

- Implantation of the fertilized egg anywhere outside of the uterus
Ectopic / Ruptured Ectopic Pregnancy

- Leading cause of maternal mortality in the first trimester of pregnancy
- Often presents very early in pregnancy sometimes prior to the patient even knowing that she is pregnant
- May occur in up to 25:1000 pregnancies
- Can occur at any age but frequency increases with age
Ectopic pregnancy

Ectopic (extra uterine / tubal) pregnancy
Ruptured Ectopic Pregnancy

• Syncope is a common presentation
• Think “ectopic” in any patient of child bearing years with syncope (with or without abdominal pain)
• Abdominal pain and vaginal bleeding are common (often mistaken for menses)
• Signs of compensated shock are often present
Kehr’s Sign

Free blood in the abdominal cavity pools under the diaphragm and irritates the phrenic nerve causing shoulder pain.
Common Diagnostic Mimics

- “simple faint”
- “anxiety/hysteria”
- “hyperventilation”
- “heavy period”
Only 50% of all ectopic pregnancies have the classic triad of bleeding, abdominal pain, and missed period.
2/10,000 ruptured ectopics will result in maternal death but overall ectopics account for 13% of all pregnancy related deaths in the US (30-40 women per year)
Takeaway Pearl Of Wisdom

• High index of suspicion – **ALWAYS** think ectopic for any female patient (of child bearing years) with syncope especially with vaginal bleeding and abdominal pain (even if they think its normal menses and/or “deny” chance of pregnancy)

• Decode the vital signs: P126; diaphoretic; BP 100 = compensated shock!

• IV access
Dispatch:

79 year old female patient
“lift assist”
79 yo female slipped to the floor at home. No injuries. “Just feels weak this morning” Elderly husband states “I wouldn’t have called if I could have picked her up myself”
History

• Well appearing female, no pain or distress propped against a chair in the living room
• Denies injury
• States “I just felt tired this morning and my legs wouldn’t hold me up”
• PMHx: Atrial fib, HTN, high cholesterol
• Meds: Cardizem, Coumadin, Lisinopril and Zocor
• NKA
Exam

• Alert and oriented
• No pain, no apparent injuries from the fall
• VS: HR 78; BP 146/86; RR 16
• EKG atrial fib 70-80. No 12 lead
• Lungs: clear
• Pt stating “just help me up I am fine”
Patient insists to be helped to the couch which EMS crew does. EMS has patient sign a refusal for transport and EMS clears the scene.

45 minutes later … 2nd dispatch to the same address …
History Clues

• Well appearing female, no pain or distress propped against a chair in the living room
• Denies injury
• States “I just felt tired this morning and my legs wouldn’t hold me up”
• PMHx: Atrial fib, HTN, high cholesterol
• Meds: Cardizem, Coumadin, Lisinopril and Zocor
• NKA
CT Scan – Acute Stroke
What Faked EMS Out?

- Dispatch bias “lift assist”
- The patient “I just want moved to the couch”
- The husband “I would have never called but …”
Lift Assists – Use Extreme Caution

- 2013 LA County study: 1087 “lift assist calls” 50% of the time EMS was called back to the scene within 30 days and a transport resulted.

- London Ambulance Service – 47% of elderly fall victims not transported called for help again within 2 weeks of the initial call.
Lift Assists – Use Extreme Caution

All refusals and lift assist calls require **complete vital signs** and **exams** to assure that what you are being told by the patient is true and accurate.
Review of the trip sheet revealed that on the first call there is no assessment of neurological status except “alert and oriented” – narrative focused on the fall no potential medical causes.
Second call ...

- Vital signs are unchanged
- Glucose normal
- Alert and oriented
- Stroke assessment:
  - Face normal
  - No arm drift
  - Speech clear
  - **Left leg weakness noted on exam**
“Weakness” and “my legs won’t hold me” were this patient’s description of her right sided stroke and left leg neurological weakness.
Takeaway Pearl Of Wisdom

• High index of suspicion for acute medical causes of the initial fall and survey closely for clues to a cause

• Old people minimize!

• Carefully survey all meds – be aware that any patient on blood thinners poses a higher risk of serious illness

• Make patients “show you” they are ok

• Use medical command to help defer your risk
Dispatch:

16 year old female patient
“sick”
16 yo female found at the local Holiday Inn Express complains of being “sick”. Her uncle reports that she has been sick all night. Her uncle states they are travelling back home to Indiana.
History

• There has been nausea and occasional abdominal pain. There is some vaginal bleeding that “might be her period”. There is no fever. No trauma. No other details of the history are pertinent.

• The uncle requests that she “be checked out” and “if she seems ok they will continue their travels to Indiana”
History

• PMHx: “none”
• Meds: BCP
• Allergies: none
Exam

- Quiet young female sitting on the bed in the hotel room. Affirms nausea with head nodding
- VS: HR 88; BP 110/70; RR 14
- Patient is nervous about cooperating with her vital assessment
- Glucose is normal (2 attempts)
- Lungs clear; abdomen soft
Treatment Course

• Following assessment EMS crew suggests transport to local hospital
• Uncle prefers to refuse care and continue travelling – states “I will sign whatever I need, if she looks ok we are just heading home”
• EMS crew requests contact with patient’s parents and contacts medical command for refusal consult for this minor
16 yo female found at the local Holiday Inn Express complains of being “sick”. Her uncle reports that she has been sick all night. Her uncle states they are travelling back home to Indiana.
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• The uncle requests that she “be checked out” and “if she seems ok they will continue their travels to Indiana”
Exam Clues

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Human Trafficking primarily involves exploitation which comes in many forms, including: prostitution, slavery or involuntary servitude, and compelling victims to commit sex acts for the purpose of creating pornography.
There are approximately 20-30 million slaves in the world today.
The average “cost” of a slave worldwide today is $90

Worldwide this is a $32 billion industry ($15 billion in industrialized nations – this is not just a third world problem!)
According to the US State Dept., there are approximately 600,000-800,000 people trafficked across international borders every year (80% women and 50% are children)
Approximately 20,000 are trafficked into the U.S. every year.
The average age a teen enters the sex trade in the U.S. is 12-14yo – many are runaways
EMS has a unique opportunity to identify potential victims of human trafficking – mandatory reporting applies to possible human trafficking victims under the child abuse laws.
Identifying Victims of Trafficking

• Patient accompanied by another who appears controlling (answering for them, etc)
• Patient may appear guarded in conversation or afraid to speak
• Patient may appear submissive or fearful
• Unusual security measures in place at home (extra locks, cameras, etc)
• Conditions and sleeping quarters seem degraded or unsuitable
• Vague or unknown medical histories
• Patient has no ID or recall of their actual address or demographics
• Exam reveals bruises or varying ages or scars
• Abdominal, vaginal, rectal, or urinary complaints are common
EMS Interventions

• Listen to the hair on the back of your neck!
• If possible interview the patient separately – consider early move to the EMS unit
• Provide necessary EMS care
• If the patient is able to be separated, don’t be afraid to ask “are you safe?”, “do you need help?”
EMS Interventions

• If able, transport and report concerns to the ED – mandatory reporting is in effect
• If transport is refused, follow normal refusal protocols and consult medical command
• When SAFE, contact 911 and report concerns to law enforcement – do not confront!
Reporting

Local law enforcement

Childline reporting if a minor

Human Trafficking Hotline
1-888-373-7888
Case Resolution

EMS was unable to secure parents contact information for refusal and uncle was getting agitated. For safety reasons, EMS left the hotel room and contacted police. The uncle and the patient quickly left in an identified car however were never located by police.
Coming to the BLS Protocols in July 2017
Dispatch:

15 year old female patient
“hyperventilation”
15 yo female high school student in the school nurse’s office found with “hyperventilation.” Patient states that she has had “trouble breathing” for a few days. The nurse reports that she has been in the office a few times this year for anxiety.
History

- Feels “anxious” and “jittery” the last few days
- Denies substance use/abuse
Exam

- Well appearing but anxious appearing young girl in moderate respiratory distress
- Alert and oriented
- SAO2 99% on room air
- VS: HR 120; RR 38; BP 130/70
- Lungs – clear/= bilaterally
Treatment Course

• Oxygen applied
• Breathing “coached” for approximately 15 minutes with no change in condition
• Mother arrives and confirms all history and states “I’ve never seen it this bad”
• IV lock is placed
• Mother requests transport to local facility
After evaluation at the local facility the patient is transferred emergently to Children’s Hospital and admitted to the ICU.
History Clues

- Feels “anxious” and “jittery” the last few days
- Denies substance use/abuse
Exam Clues

• Well appearing but anxious appearing young girl in moderate respiratory distress
• Alert and oriented
• SAO2 99% on room air
• VS: HR 120; RR 38; BP 130/70
• Lungs – clear/= bilaterally
What causes a young, healthy patient to have tachypnea?
Sorting It All Out ...

• Anxiety? – maybe, this is what the bias would suggest
• Infection? – not ill, clear lungs (no wheezes or rales)
• Heart issue? – no history, no recent illness, no arrhythmia.
• Toxicology? Maybe, no history
• Trauma? – no history
• What else?
Increase in acid will force the elimination of excess CO2 thus causing hyperventilation.

CO₂ + H₂O ⇌ H₂CO₃ ⇌ H⁺ + HCO₃⁻

Lungs

Kidneys
New Onset Diabetes

Blood glucose in the ED - 942
New Onset Diabetes

• Incidence is on the rise in all age groups

• Usually presents in children in a manner that is less than exciting (weakness, fatigue, odd neurologic symptoms such as numbness, nausea, vague abdominal pain)

• Often precipitated by a recent illness such as a cold or other stressor
Diabetic Ketoacidosis

- Extreme hyperglycemia and the development of acids (ketones) in the blood
- Blood pH falls (acidosis)
- Polyuria and polydipsia ensue – polyuria causes dehydration
- As acids build, CO2 needs to be expelled and hyperventilation results early on
DIABETIC KETOACIDOSIS

Onset Over 4-10 Hours

- Lack of Insulin
- History
- GI Upset
- Febrile Illness

- Breath Smells Like...
  - Juicy Fruit Gum
  - Kussmaul Respirations
  - Thirsty, Dehydration

- Tachycardia
- Hypotension
- Acidosis

- High Blood Sugar (>240 mg/dl)
- Hyperkalemia
- Polyuria

Needs...

Hydration
Insulin
Electrolyte Replacement

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Takeaway Pearl Of Wisdom

• High index of suspicion - when the dyspnea doesn’t make sense (lungs are clear, SAO2 is normal, no obvious cause) do a simple test – fingerstick glucose!

• Remember that any condition that can cause acidosis will cause a compensatory hyperventilation
Causes of Metabolic Acidosis

- Methanol, Metformin
- Uraemia
- Diabetic Ketoacidosis
- Starvation Ketoacidosis
- Alcoholic Ketoacidosis
- Phenformin, Paraldehyde
- Iron, Isoniazid, Inhalants → Cyanide, Carbon Monoxide
- Lactic Acidosis (inc. Shock)
- Ethylene Glycol
- Salicylates
- Lactic Acidosis
- Lactic Acidosis + Ketoacidosis
- Ketoacidosis
Dispatch:

21 year old male patient
“severe headache and vomiting”
21 year old otherwise healthy male patient complains of severe headache and vomiting. He reports having “the flu” for the last few days with vomiting.
History

• Severe generalized headache worsening over the last few days.
• Vomiting. No light sensitivity, no neck pain. There is no hx of trauma. Other family members have had a similar “flu”
• PMHx: none
• Meds/Allergies: none
Exam

- Uncomfortable appearing in moderate distress; vomiting
- Skin is warm and flushed (but the house is warm – its winter)
- VS: HR 110; BP 128/60; RR 24; SAO2 100%
- Lungs - clear
- During your exam the patient’s mother requests that you also check his younger brother with similar symptoms
Exam Clues

• Uncomfortable appearing in moderate distress; vomiting
• Skin is warm and flushed (but the house is warm – it’s winter)
• VS: HR 110; BP 128/60; RR 24; SAO2 100%
• Lungs - clear
• During your exam the patient’s mother requests that you also check his younger brother with similar symptoms
Carbon Monoxide
The Silent Killer
This can kill you as a rescuer!!
CO has an affinity for binding hemoglobin 240x that of oxygen – hemoglobin with CO thus circulates and the organs are starved for oxygen.
Common CO Poisoning Symptoms

• Headache
• Red flushed skin – “cherry red skin” is rarely seen
• GI symptoms (often mistaken for the flu)
• Acidosis (as organs are starved for oxygen) = hyperventilation results
Heating sources are common causes thus accidental poisoning is more common in the winter.
Approximately 15,000 CO exposures yearly in the US –

77% are residential
12% workplace

Approx 450 deaths/year
Treatment

• REMOVE THE VICTIM FROM THE TOXIC ENVIRONMENT ... SAVE YOURSELF!

• High flow oxygen

• Transport – consider transport to facility capable of performing hyperbaric oxygen therapy if:
  – Altered mental status or loss of consciousness
  – Neonates and pregnant patients
Takeaway Pearl Of Wisdom

• **SAVE YOURSELF!** Any scene (especially indoors) in which there are multiple victims **THINK ABOUT SCENE SAFETY!**
Takeaway Pearl Of Wisdom

• High index of suspicion for CO poisoning especially in the winter or in industrial indoor areas
• Consider CO with winter headaches and flu-like symptoms especially if multiple family members are ill
"The more that you read, the more things you will know. The more that you learn, the more places you'll go."

- Dr. Seuss
Share Your WISDOM

Experience
Questions ?
"Mr. Wong, may I be excused?
My brain is full."