Virginia EMS Symposium 2011

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Introduction

- Why use case studies?
- How do I use them?
- How do I build them?
- How do I evaluate performance of the student?
- How do I evaluate performance of the case?

Case Study

You are required to teach your 24 EMT students the following information at a fundamental depth and foundational breadth for respiratory emergencies:

Anatomy, physiology, pathophysiology, assessment, and management of epiglottitis, spontaneous pneumothorax, pulmonary edema, asthma, COPD, environmental/ industrial exposure, and toxic gas.

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Learning Verbs:

Identify, List, Discuss, Explain

Alternate:

How do I train new EMTs to differentiate between each one of these causes, so they can treat the patient accurately?

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Learning Verbs:

Compare and Contrast, Analyze, Evaluate

Compare

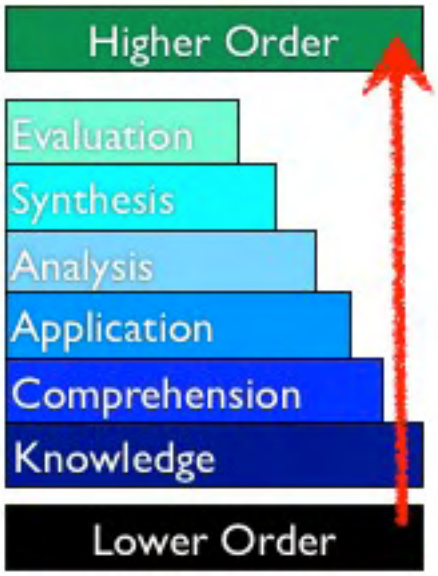
- Identify
- List
- Discuss
- Explain
- Compare and Contrast
- Analyze
- Evaluate

1) Which is the ultimate goal?

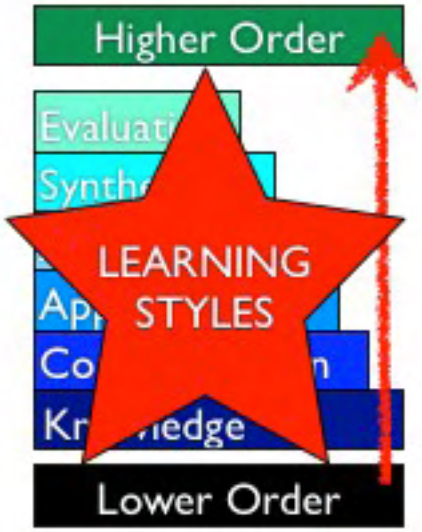
2) Which set is more important? Why, or why not?

Bloom's Taxonomy

- Each level is important
- Each level based upon the prior
- Historically taught in same order



Collision



Classic Teaching

- Read the Book
- Listen to Lecture

You are required to teach your 24 EMT students the following information at a fundamental depth and foundational breadth for respiratory emergencies:

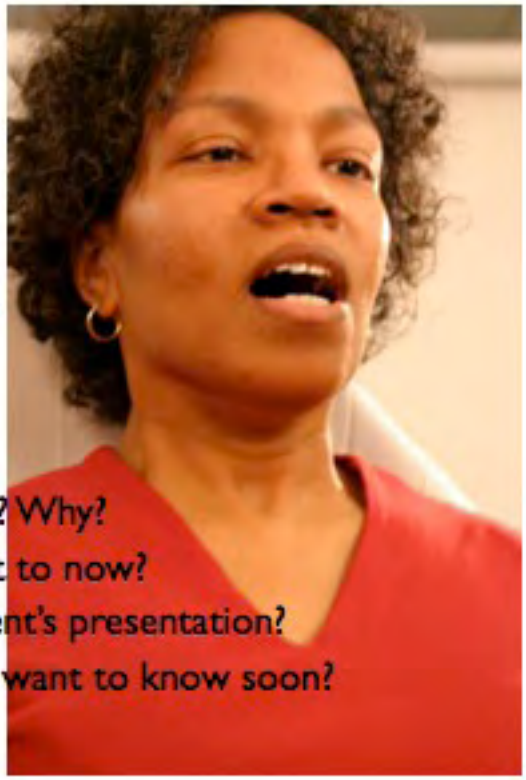
Anatomy, physiology, pathophysiology, assessment, and management of epiglottitis, spontaneous pneumothorax, **pulmonary edema, asthma, COPD,** environmental/ industrial exposure, and toxic gas.

- You are dispatched to a "difficulty breathing" call.
- You arrive in front of a high school and are directed into the main office.

Questions:

- What information can you gather from this scene?
- What scene safety issues are there, if any?
- What equipment would you like to bring in with you?
- When you make contact with the patient, what would you want to assess first?

- 44 year old teacher, oriented, anxious
- 3-4 word sentences
- Moderate to severe respiratory distress
- Faint wheezing in upper lung fields, diminished in bases bilaterally
- Rapid radial pulse, Cool, pale and dry skin



Questions:

- What is your transport decision? Why?
- What interventions do you want to now?
- What might be causing this patient's presentation?
- What other information do you want to know soon?

Focused HPI

- Was at rest when episode began
- Rapidly worsening; nothing improves it
- Associated chest pressure
- No sputum production
- Recent flu symptoms

Physical exam

- Sitting straight up
- JVD evident
- Accessory muscle use
- +1 pedal edema
- Wheezing in all lung fields

Past Medical History

- Heavy smoker; heavyset
- Asthma, hypertension
- Ventolin MDI, Captopril, Ortho Tri-cyclen
- Ate breakfast 3 hours ago

Vital Signs

- BP 152/96
- Pulse 116 regular
- RR 20 with prolonged exp phase

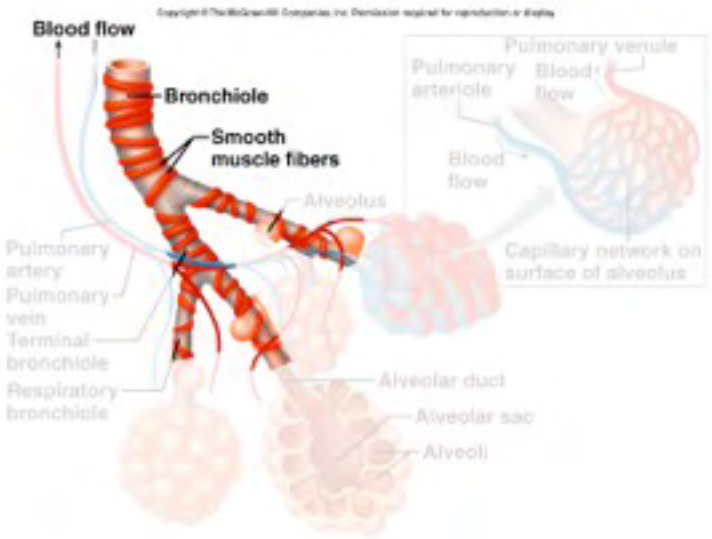
Possible Conditions

- Asthma
- COPD
- Pulmonary edema
- Pulmonary embolus
- Anaphylaxis
- Cardiac
- Spontaneous Pneumothorax
- Epiglottitis
- Pneumonia
- Toxic exposure

Questions:

- Name two likely causes of her condition.
- What is the pathophysiology of each cause?

Asthma: What's going on?



Asthma

- Bronchospasm
- Inflammation
  - Fluid shift
  - Mucous production
- Air Trapping

Debrief

Case Study Uses

- Large Group Activities
  - Promotes questions, responses from audience
  - Keeps entire group on track
  - Allow referencing to textbook
  - Show of hands for group consensus

Case Study Uses

- In class small group activities
  - Self directed learning
  - Groups each get a unique, but similar case
  - Report findings, conclusions, explanations to entire class
  - Debate: Assign two groups to one case

Case Study Uses

- Out of class self directed learning
  - Provides more time
  - Groups or independent
  - May ask more, and/or deeper questions

Case Study:

Come Out Swinging

The call pager goes off, and your partner reads the text message. Groaning, she says, "Another call to the police substation to check on a prisoner. Didn't Medic 43 go out there earlier? There better be a good reason to call us back."

You arrive at the substation. The station master buzzes the heavy steel door open. He motions back to the cell area. "He's in the back. I told the other medics that he needed to be taken to the hospital, but they said he was just drunk."

You can see the patient lying on the jail cot. Your partner wrinkles her nose. "Wow! That smell… is that him?" You have to agree, the odor is overwhelming. You notice that the patient's eyes are closed. From the odor and the stains on his pants, you determine that he is incontinent of urine, and maybe more.

You recognize that this is Blaine. Well known to the police and EMS, Blaine was arrested again for being drunk and disorderly in public. He frequents the city's parks to sleep and get drunk. Blaine became unruly with some passersby and tried to assault one of them. The police were called and, after a brief struggle, they subdued Blaine and took him to the station.

Blaine continued to be belligerent, banging against the police car cage with his body. Once he arrived at the station, he was more subdued. He was placed into the holding cell, where he proceeded to doze off. When the station master went by the cell a couple of hours later, Blaine was difficult to awaken. Following policy, the station master placed a call EMS. Medic 43 arrived and evaluated Blaine.

Question

Knowing that Medic 43 left the patient in the custody of the police after their evaluation, what would you assume about the patient's condition? What would you expect the crew to have performed during their evaluation?

You visually assess Blaine through the cell bars. He is curled up in a ball on the cell cot, near the commode. His face is turned toward you, but his eyes are closed. His breathing is quiet, rapid and shallow. You see evidence of fresh abrasions and small lacerations on his face and hands, covering the marks of previous injuries.

With another loud buzz, the door opens to let and your partner into the cell. A police officer also steps in behind you. You kneel down near the patient, but at an arm's length away. Reaching over, you grasp the top of his shoulder firmly. This normally will get Blaine to rouse to an awakened state; today he simply moans and stiffens. His arms twitch slightly.

You carefully open his stained jacket He has several layers of shirts on, all of them soiled. He has a few old, healed surgical scars on his chest as well as remnants of other less precise wounds. You do not observe intercostal muscle retraction or accessory muscle use. The smell of an unwashed body, coupled with stale beer and pungent urine, is nearly overwhelming.

You note that Blaine's wrists are swollen and edematous. You are unable to detect a radial pulse. A check of a carotid artery reveals a thready, rapid pulse. Other than the abrasions and small cuts, there are no signs of external severe bleeding.

Question

How does the patient presentation compare to your expectations? Based on this set of findings, would you consider Blaine to be "sick", "not sick", or "not yet sick"? Why?

You review the narrative on the PCR written by the previous crew.

"47-year-old male, well known to PD and EMS, presents alert, belligerent and resisting assistance. Strong odor of EtOH on breath. Refuses further physical examination and history by EMS, is verbally abusive when questioned. PD reports patient was detained after attempting assault. No fall or trauma associated with arrest." The time of the patient care report was about 6 hours ago.

Blaine continues to breathe rapidly. Your partner says, "I wish he would quit hyperventilating. Hey Blaine, quit faking. You'll still stay here tonight."

You reach down to recheck a radial pulse. As you do so, you notice an odd, sweet smell coming from his mouth.

You perform a secondary survey.

Vital signs: P=110, RR=28, BP=82/60.

His ECG is a Sinus tachycardia with prolonged QT interval.

His corneas are faintly yellow, and he has a disconjugate gaze.

A test of his blood glucose level shows a measurement of 200.

There is evidence of a green-tinged fluid spilled on his shirt and pants.

He has scattered wheezes that can be auscultated toward the base of both lung fields.

List possible causes for Blaine's condition, based upon your current findings. Of your list, which ones are the most likely to be the cause of his presentation? Why?

You point out some of your findings to your partner. She is a bit more interested now. "Should we treat the wheezes?" she asks?

You look at Blaine's extremities again. They are swollen, and you can see bright green stains under his fingernails, similar in color to what's on his shirt. You check the pulse oximeter. In response to your partner' previous statement, you reply, "No, I don't think so. I think we should……"

What were you planning to do next? What was the reading on the pulse oximeter?

En route to Community Hospital, you reassess Blaine's vital signs, breathing and circulatory status. His blood pressure is now 88/70, and his heart rate is 100.

The patient continues to be tachypneic. His extremities continue to spasm periodically. His level of consciousness has not changed.

After consultation with medical direction, you administer a medication intravenously. The ECG, after administration now shows this: (Sinus rhythm/ borderline sinus tachycardia, normal QT interval)

What medication did you give to the patient, and why did you administer it? What positive benefit does this medication have?

You transfer Blaine to the hospital staff at Community. Blood samples are drawn for laboratory testing. Later on you review his chart. His lab values include:

Calcium: 6.1 mg/dL

Carbon dioxide: 25 mEq/L

Creatinine: 4 mg/dL

BUN: 70 mg/dL

Glucose: 180 mg/dL

Your prehospital treatment appears to have benefited the patient. His blood pressure improves, and his respiratory rate has slowed to a more normal rate. His level of consciousness remains unchanged. The emergency department physician orders additional medication therapies and admits Blaine to the intensive care unit.

Question

What do the lab values tell you? What did the physician order?

Debrief

Case Study Construction

- Start with the end in mind
  - Didactic, skills, integrative; learning v. testing
- Reference resources
  - Textbooks, Case books, Web references (MD consult, WebMD, EMedicine, Epocrates, others)
  - MD Director, education director, etc.

Case Template

- Make it fit your needs
- Helps provide consistency
- Becomes reproducible by others
- Include goals, objectives, resource list?

Small Group Case Study Sample

Scenario Sample

SEIZURE SCENARIO PATIENT #1	
Patient/ Instructor Information	(Read teletype for response information) Upon arrival you find your PT. lying on the beach. PT. in mid 30's. PT. is unresponsive. (Instructor – This PT. laying supine w/ gurgling respirations. At some point the PT. will start to seize. Be spontaneous!)
Case Presentation	You arrive on scene to find a 35 yo male lying on the wet sand. 56 degrees F air temperature. PT. is unresponsive, it is a cool day.
Patient Presentation	30ish male, wet sand, slow respirations
Initial Assessment	**A** – open / gurgling **B** – shallow @ 6/min. LS – clear **C** – skin, cool, pail, some peripheral cyanosis and moist; weak radial pulses @ 60/min.; CRT – 2sec. **D** – Unresponsive, moans to painful stimuli. Does not move extremities. **E** –Needle track marks on arms, anterior thighs, and lower abdomen. Bystanders state that they have seen PT at this beach many times.
Vital Signs	**B/P** – 88/64 **P** – 60 regular w/o ectopy **R** – 6 (S/VM@12-20/min) **SPO2** – 92% w/ventilations **EtCO2** – 35 **BG** – 88mg/dl **Pupils** – pin point, none reactive **ECG** – Sinus Brady @ 60/min. w/occ. Multi-focal PVC's
SAMPLE / OPQRST	**S** – Skin cool, pail, moist with some peripheral cyanosis. weak radial pulses @ 60/min. CRT >2sec. **A** – unk **M** – unk **P** – Medic Alert Bracelet states IDDM **L** – unk **E** – Found on the beach **O** – unk **P** – unk **Q** – unk **R** – unk **S** – unk **T** - unk
INSTRUCTOR	*PT starts to seize, clonic/tonic movement. PT is vomiting, w/bloody secretions*
Initial Treatment	Provide safety for PT w/seizing. Monitor airway and suction if necessary O2 – discuss best method

SEIZURE SCENARIO PATIENT #1	
	IV NS TKO Repeat VS, and reassess after seizure stops.
Changes after initial treatment	**A** – Teeth clinched w/vomit **B** – Resp. @ 28/min LS – difficult to assess **C** – Increase diaphoresis and pallor, weak radial pulses @ 110/min. CRT 3sec. BP – 100/P **D** – seizure W/clonic – tonic movement **E** – no change
Subsequent Treatment	BVM @ 12 – 20/min. Then to NRB 15L Transport code 3 to closest Support and reassess
Changes after treatment	Remains post-ictal
Critical Actions	Appropriate Airway management, positioning of patient; consider spinal precautions, differential of underlying causes
Talking Points	What is the working diagnosis? I.N. dose for the adult PT. Have medic draw up Narcan dose and show how administered. C-Spine?

Performance Assessment

- Individuals vs. group
- If group, clearly state who was responsible
- Check for key terms, rationale of answers
- The "right" answer may not be necessary

Sample Scoring

- Did they get the "right" answer(s)? **25 pts**
- Did they support their answers with an explanation? **20 pts**
- Were the explanations rational, logical? **25 pts.**
- Were there minimal grammatical/spelling mistakes? **20 pts**
- Did they cite their references? **10 pts**

Summary

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