EM Cases Course 2017
Toxicology Module

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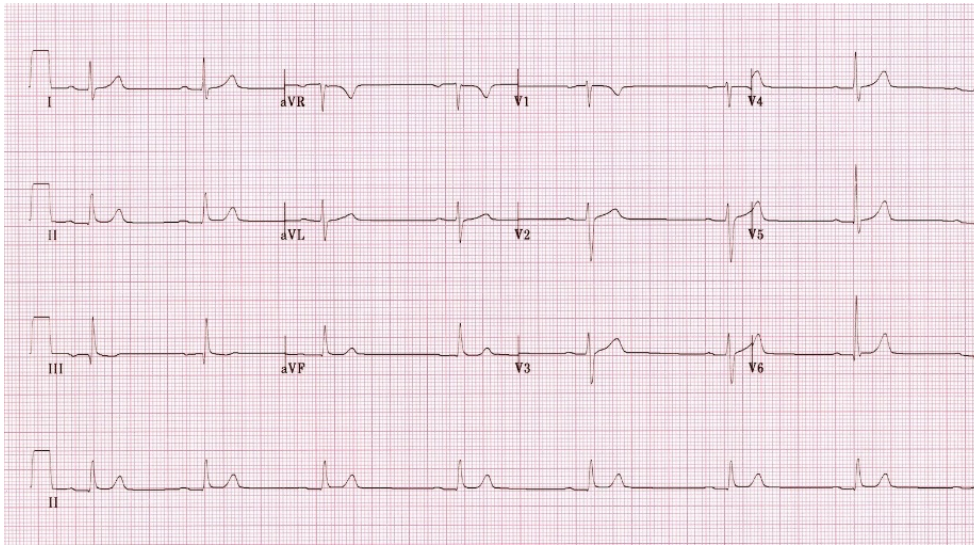
Podcasts to listen to/blog posts to read prior to the course

Link to: Alcohol Withdrawal & Delirium Tremens
Link to: Crit Cases 1- Massive TCA Overdose
Link to: Drugs of Abuse – Opioids & Stimulants
Link to: Slow and Low Poisoning

Toxicology can seem overwhelming due to the seemingly endless number of different presentations and combinations of ingestions that may present to us in the ED. Nevertheless, it is a field that the emergency physician must be comfortable with, particularly with the early management of dangerous ingestions. In this module we will be discussing toxicology cases of either common or especially critical ingestions.

Case 1: Low and Slow

A 60-year old man with a history of hypertension comes into the resuscitation bay seizing. The ED nurse obtains quick IV access and diazepam is administered. The seizure stops. The first set of vitals show: HR 30bpm, BP 70/40. His ECG is shown below.



Q1: What is your differential diagnosis?

Q2: How will you narrow your differential?

Q3: How might you differentiate between a calcium-channel blocker overdose and a beta-blocker overdose?

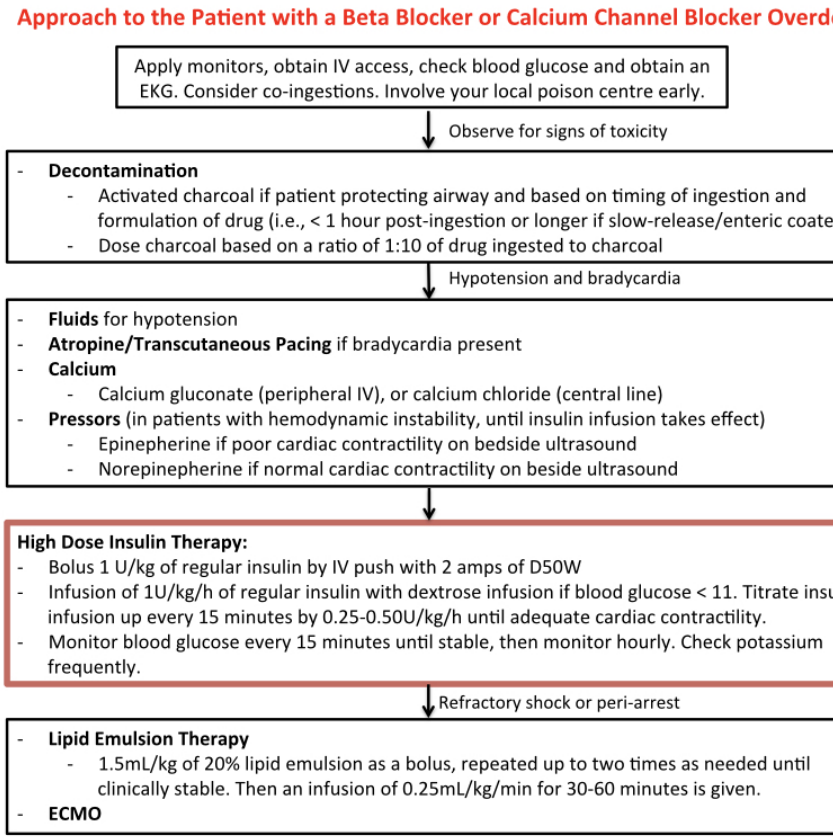
Q4: How is your management of a tox-induced seizure different than an epileptic seizure?

Q5: What is your general approach to managing the slow and low overdose when the exact agent ingested is unknown?

Q: How would you decontaminate this patient? Would you give charcoal? Whole bowel irrigation?

Q: Would you administer High-dose insulin therapy? How? Glucagon? Pacing? Pressors? What if nothing was helping?

Q: How would your management differ if the ingestion was of a long-acting calcium-channel blocker?



Case 2: Alcohol Withdrawal and Delirium Tremens

A 52 year-old man known to the ED for chronic alcohol use presents to the ED asking for help detoxing. He usually drinks 750ml of vodka daily. His last drink was yesterday. Physical exam reveals a heart rate of 140bpm, BP 170/85. He is diaphoretic and tremulous.

Q: What more information would you like on history?

Q: What is the timing of alcohol withdrawal and delirium tremens relative to ingestion?

Q: How can you tell the difference between a true alcohol withdrawal tremor and a malingerer?

https://youtu.be/JgJsRHHMJ0o

Q: How do you assess severity of alcohol withdrawal?

"SHOT"

*Sweating	0 - No sweating visible 1 - Palms moderately moist 2 - Beads of sweat visible on forehead
Hallucinations: "Are you feeling, seeing, or hearing anything that is disturbing to you? Are you seeing or hearing things you know are not there?"	0 - No hallucinations 1 - Tactile hallucinations only 2 - Visual and/or auditory hallucinations
Orientation: "What is the date, month, and year? Where are you? Who am I?"	0 - Oriented 1 - Disoriented for date by 1 month or m 2 - Disoriented to place or person
Tremor: Arms extended. Reach for object. Optional: walk across hall	0 - No tremor 1 - Minimally visible tremor 2 - Mild 3 - Moderate 4 - Severe

Q: Is a blood alcohol level helpful in the management of alcohol withdrawal patients?

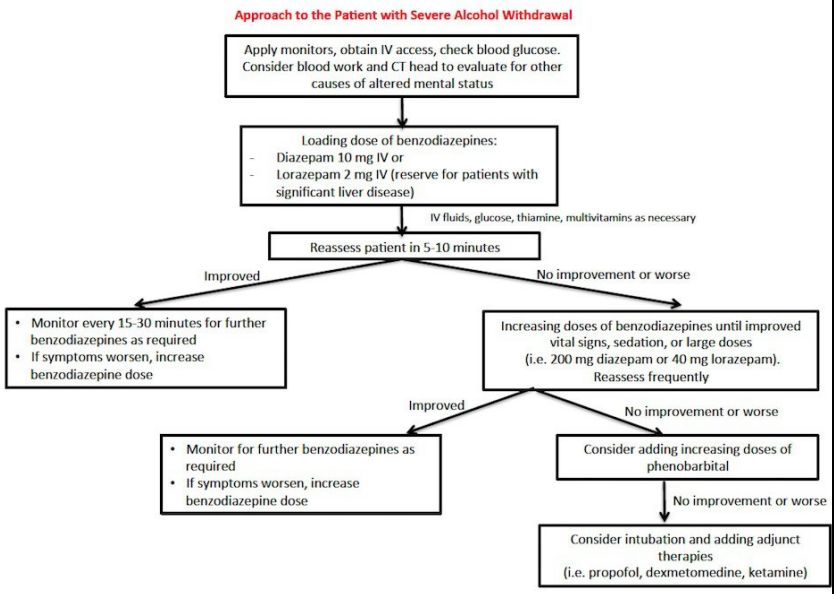
Q: What's the first line agent you will use for the ED management of alcohol withdrawal? What if the patient in in overt liver failure? 2nd line? What if the patient has delirium tremens – how will that change your management?

Q: When are patients safe to be discharged from the ED who present in alcohol withdrawal? Which patients in alcohol withdrawal, if any, are safe to discharge home with an outpatient prescription for benzodiazepines?

Q: How will you counsel the patient upon discharge?

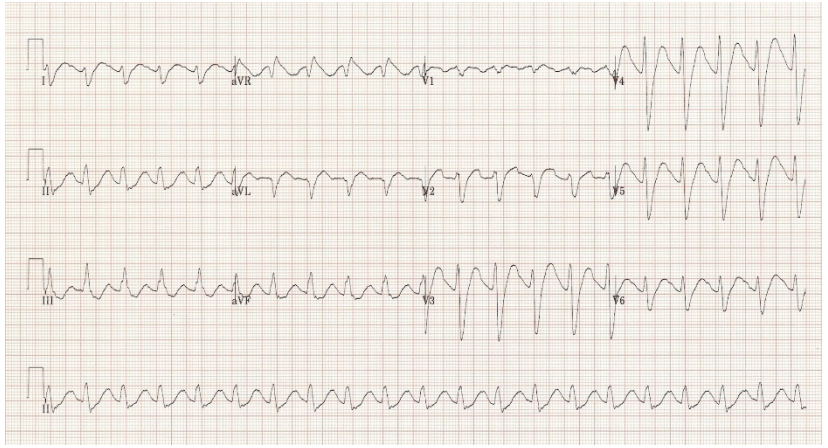
1. You need help for your serious alcohol problem
2. You can't do it on your own
3. There are effective treatments available to you
4. With treatment the way you feel, your mood, social relationships and work will be profoundly better

Provide several options to the patient, if available (i.e., AA, local treatment programs).



Case 3: Na channel blockade

A 51yo male comes in to your rural ED 5 hours after he ingested 60 tabs of amitryptilline (50mg). He is confused and combative on arrival. Vital signs are: BP 55/30, HR 135, RR 24, Temp 37.8. Cap blood sugar is normal. The ECG is shown here:



Q: What are the typical ECG findings in a massive TCA overdose?

Q: What other medications cause Na channel blocker effects?

Q: What is your initial management going to consist of? What doses of medications will you administer?

Q: Despite initial therapy the patient continues to be unstable. You decide to try lipid emulsion therapy. How would you give it? What are the indications for lipid emulsion therapy?

Q: Lipid emulsion therapy is not immediately available in your ED. What other medications are you going to try in your unstable patient?

Case 3 Continued

The patient is intubated due to an inability to maintain his airway.

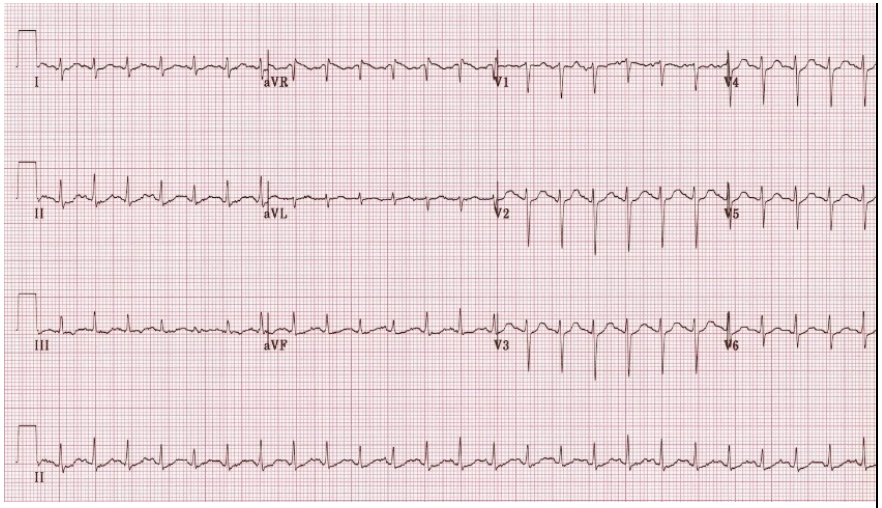
Q: What ventilation strategy will you use in this patient?

Take Home Points for Management of Massive TCA Overdose

1. Use a QRS > 100 msec, a target pH of 7.5-7.55 and serum sodium of 150-155 mmol/L to guide sodium bicarbonate ***bolus*** therapy in TCA overdose. After 4 amps of sodium bicarbonate, if these targets are not met, consider adjunctive therapies.
2. Intralipid (20% lipid emulsion) should be considered in hemodynamically unstable TCA overdose patients, those with refractory ventricular dysrhythmias following adequate sodium bicarbonate therapy or lidocaine, and those with refractory seizures.
3. Adjunctive therapies for massive TCA overdose include hypertonic saline, lidocaine, magnesium sulfate and ECMO where available.

Case 4: The hot and crazy patient

A 27yo male is brought into the ED after having a witnessed tonic-clonic seizure in the bathroom at a house-party. The seizure was estimated to last 10 minutes. On arrival GCS is 8, HR 155, BP 195/125 RR30, Temp 38.0. He is frothing at the mouth. Pulses are bounding. Skin is warm and sweaty. He is flailing about his stretcher. Pupils are dilated and reactive. His ECG is shown below.



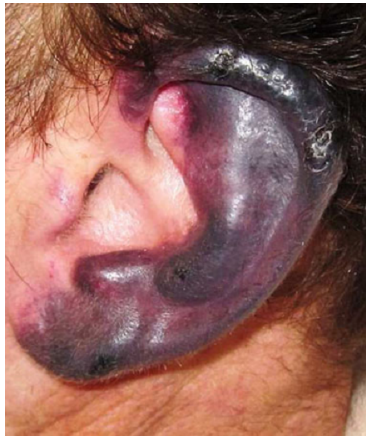
Q: What is the differential diagnosis of the 'hot and crazy' patient'?

Q: What investigations, if any, will be helpful here? Is a urine drug screen helpful?

Q: How would you manage this patient? Specifically how would you mange his BP?

Case 4 Continued

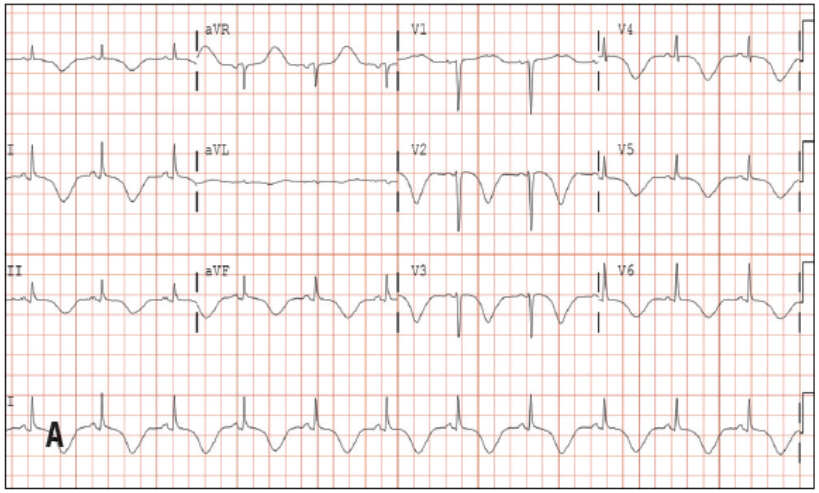
The patient's friend who was in the bathroom with him at the house-party comes into the ED complaining of severe chest pain. He is tachycardic and hypertensive. You notice that his ear is black and necrotic. His ECG shows flipped T-waves in the anterior leads.



Q: How will you manage this patient?

Q: What investigations would you order?

Q: He is given diazepam and his heart rate slows down. You repeat the ECG and notice a prolonged QT. How will you manage him now?



References

ECG examples obtained from http://lifeinthefastlane.com

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