Role Playing to Rehearse Medical Emergencies

A typical day at the office…

A 23 year old male scheduled for upper right quad operative with local. His medical history is unremarkable. You administer 2 cartridges of local to get the patient numb. The patient complains of feeling light headed and warm. His eyes roll back in his head and he becomes unresponsive.

- What happened and what do you do?

Seating a crown …

You’re seating a crown and in spite of your best efforts the crown slips and is aspirated by the patient. The patient immediately clutches at their throat and looks at you with bugged out eyes. No sound is coming from the patient.

- What happened and what do you do?
- Imagine the same patient but they are not in severe distress, they are able to whisper that something is caught in their throat, and as of yet they can exchange enough air to keep from panicking. What do you do?
- Imagine the original patient but despite your best efforts you are not able to dislodge the crown and they become unconscious, what do you do?
- Imagine a similar patient as the original scenario, but this patient is asthmatic. You successfully dislodge the crown, but the stress and upper airway irritation of the aspiration triggers an asthmatic attack. What do you do?

Antibiotic premed …

You order an antibiotic for a healthy 63 year old woman with recent left total knee replacement. She took the 2.0 grams of Amoxicillin you ordered one hour prior to her appointment. She comes to the appointment within the hour, complaining of itching and has a rash spreading across her chest.

- What happened and what do you do?
- Imagine the same patient, in addition to the rash she complains of wheezing and moderate trouble breathing. The patient is not in severe
distress (normal vital signs), but you recognize she is having trouble breathing as well as the rash. What do you do?

8 year-old that weighs 25kg comes in for a cleaning (true story) . . .

This patient has been in for cleanings in the past. At this visit, the patient’s mother mentions that after the previous visit the patient had redness and itching around his mouth, and a runny nose that went away after a day or so, but a call to the patient’s pediatrician had him taking Benadryl after the appointment.

Your hygienist puts on her gloves and starts the prophy. The patient immediately develops redness across his face and chest, difficulty breathing with wheezing, and becomes light headed and confused, then loses consciousness.

- What happened and what do you do?
- How do you dose medication for a child?

Diabetic mother of twin toddlers …

This patient arrives 10 minutes late for her appointment, rushed because the baby sitter she had arranged for her appointment fell through. It was an especially frantic morning with the kids crying and upset all morning. She says she didn’t get a chance to brush her teeth, much less eat breakfast. She plugs the kids into a video in your waiting room, and sits in the chair. You start to give local and she gets pale, sweaty and lightheaded.

- What happened and what do you do?
- How could you avoid this problem in the first place?
- Imagine the same patient but despite your best efforts she becomes unconscious before you can begin treatment. What do you do?

60 year-old overweight smoker …

This patient starts complaining of chest pain after you begin treatment. It feels like a squeezing band around his chest.

- What is happening and what do you do?
- After treating with standard medications and waiting the appropriate amount of time, the pain does not subside. The patient starts getting light headed and weak. What is happening and what do you do?
In front of you the same patient loses consciousness. You cannot palpate a pulse. What is happening and what do you do?

16 year old with routine extraction (true story)…

A petite (100 pounds), otherwise healthy, 16 year old has an erupted upper third molar that is bothersome to her. The tooth has a very short and conical root. You are confident you can remove the tooth with local and give the patient a positive experience. You administer 2 cartridges of local anesthetic to the patient. The patient immediately complains of dizziness and begins to have tremor like shaking of their hands. Within moments they lose consciousness and have a mild seizure.

What do you think has happened and what do you do?

90 year-old from the local care center …

You were nice enough to see this patient from a local nursing home. The nursing home called this morning saying she broke a tooth, and asked if you could see her to evaluate what’s needed. She arrives by herself via transport cab. She has a packet of papers none of which are her health history or medication list.

What do you do?
While you are making your decision about what to do, she’s still sitting in the waiting room. She makes a soft groaning noise and loses consciousness. What do you do?
Additional Scenarios

If you provide conscious sedation in your office (Level 2 Permit/Halcion and Nitrous), you should practice what to do with a patient that develops:

1) Obstructed airway.
2) Apnea.
3) Intra-op vomiting

Although not thought of as a dental emergency, you should have systems in place of how to handle a needle stick, or similar injury of one of your staff or yourself. Rehearsing this and having a system in place will save you time and headache, if this ever occurs.

Discussion Points

A typical day in the office:

This is a standard syncope/fainting to get you warmed up.

Call for help in your office, for this emergency and all others do this first. Remember emergencies are not closed book exams. Recruit help and recruit ideas to solve the problem at hand.

The main steps of treatment are:

- Position the patient lying down.
- Maintain the airway.
- Administer Oxygen.
- Allow patient to wake back up.
- TLC and eliminate source of anxiety that caused the syncope in the first place.
- Consider an ammonia stimulant to hasten recovery.

In this scenario I imagine all goes well and the patient recovers normally. If you want to continue with this scenario, and the patients is not recovering, it’s time to get vital signs and start investigating other causes of loss of consciousness. In this scenario the patient is healthy and lying down. So it could be hypoglycemia or local anesthetic overdose. The patient is not moving from lying to standing so orthostatic hypotension is excluded. The age and health make catastrophic stroke extremely unlikely.
Seating a crown:

Whatever you can do to prevent this in the first place is easier than treating this emergency. Use gauze as a barrier when seating a crown. Have an assistant there to act like a goalie to catch the crown for you. Prior to seating the crown, rehearse with your patient if the crown slips off, you want the patient to sit up and spit it out. With a little preparation, this can often be avoided.

This first patient has obviously aspirated the crown and has a completely obstructed airway. The Heimlich maneuver is needed.
- The technique for the Heimlich is to press hard into the abdomen with a quick up movement, like you are trying to lift the person up.
- The Red Cross suggest the Heimlich only.
- The Mayo Clinic Website has you doing a 5 and 5 technique. Alternating 5 back blows and 5 abdominal thrusts till the object gets dislodged.

The second patient has a partial obstruction, but not so severe that they need our help yet. Encourage them to cough to clear the obstruction. Knowing my luck, the patient would cough it up high enough to get it out of the airway and then swallow it.

The third patient is now unconscious. The Red Cross suggests:
- Two rescue breaths
- 30 chest compressions of CPR
- Check the airway to see if the aspirated object is now visible in the back of the throat. The idea is the loss of muscle tone due to the patient becoming unconscious may allow the object to move up and you may now see it in the back of the throat.
- Both Red Cross and Mayo Clinic caution against blind sweeps of the throat as you may push the object deeper when you do this.
- For Obese or Pregnant patients, place your hands higher than normal at the base of the breastbone, just above where the lowest ribs join the sternum.

The asthma attack is treated per the asthma outline.
- Position the patient sitting up.
- Administer Albuterol, 2 puffs.
- Shake inhaler first and prime it before handing it to the patient, if this is the first time it’s been used.
- Slow inhalation over 5 to 6 seconds. Hold in lungs for 10 seconds. Rapid improvement should be seen in 15 to 20 seconds.
- EMS should be called if no improvement or for severe asthmatic attacks.
- If you have administered Albuterol and EMS has been called, administer oxygen and wait for EMS to arrive.
- If the patient deteriorates before EMS arrives you need to give Epinephrine 0.3 to 0.5mg IM. This can be repeated every 30 to 60 minutes according to Malamed. I’m sure EMS would be there and gone by the time a repeat dose is necessary.

**Antibiotic premed:**

In general, allergies are a local immune mediated reaction, with Mast cells getting activated and releasing histamine into the surrounding tissues. This histamine release is why we see heat, swelling, itching, redness and pain at the site of the reaction.

There are also interleukins released that can amp up the B cell activation locally, and propagate the reaction to more distant sites. If this happens, in addition to the local skin reaction, changes occur far away from the site of exposure.

You can see runny eyes and nose, abdominal pain from GI smooth muscle spasm, respiratory reactions like laryngeal edema or bronchospasm, and finally cardiac collapse due to the increase in vascular permeability leading to hypotension, decreased cardiac output, and an increase in heart rate to compensate. How intense each site is affected is a consequence of how robust the person’s immune response is, the more activated the immune response, the more severe the reaction.

The first patient has a mild allergy with skin reaction only. There are no signs of cardiac or respiratory involvement (no tachycardia, hypotension, dyspnea, wheezing). It’s happening quickly enough (within 60 minutes) that 50mg IM Benadryl should be given, and followed up with oral Benadryl for 2 to 3 days.

The patient will be pretty sleepy from the Benadryl and will need assistance getting home. Malamed isn’t clear if it’s OK to send this patient home or if they should be evaluated by medical personal. You are just going to have to work this out on your own. You can call your local ER and ask for help in puzzling through this, to make the best decision for the individual patient.

The next patient has skin and airway reaction. Administer Albuterol per the asthma protocol like in the previous seating a crown scenario. Also give IM Benadryl as above. This patient should not be sent home, but should be sent to ER for evaluation, as the allergic reaction could return after the medications wear off.
8 year-old that weighs 25kg comes in for a cleaning:

This is anaphylaxis from a latex allergy and immediate epinephrine is needed. The clue was the prior but not recognized (or communicated) allergic reaction. Anaphylaxis doesn’t always happen on the first exposure. Repeated exposure to the allergen can make the body’s response more intense.

Children are dosed by weight. Per Epocrates.com, epinephrine for anaphylaxis for a child is dosed at 0.01 mg/kg to a max of 0.5 mg. The package insert for a Epi Pen Jr. says this size epi pen is for patients 15 to 30kg. This 25kg child would receive 0.25mg epi by Epocrates.com and 0.15mg by another source. I don’t think either is more right. If you have an epi pen, use it. If you are drawing up epi you can choose to use the higher dose.

Be ready to start giving positive pressure oxygen if respiratory collapse. Be ready to start CPR if cardiac collapse. As you can imagine, this patient, needs to be transported to the ER for post resuscitation care.

Diabetic Mother:

The patient became hypoglycemic.
- Position the patient comfortably.
- Give oral carbohydrate, such as apple juice or cake frosting.
- If you have it, get the glucometer and get a baseline blood sugar reading.
- Monitor the patient’s vitals and allow the hypoglycemic episode to end.
- Like a fainting patient, you can administer your TLC, Oxygen, and a cold towel.

Once unconscious:
- If you are able to give IV dextrose that is the best option.
- Otherwise, you will be giving supportive care to maintain the airway, administering oxygen, and being vigilant to worsening in the patient till EMS arrives.
- Theoretically there are other options such as IM Glucagon. However this takes 15 to 20 minutes to be affective, so I’m not a big fan. I think the better to summon EMS.
It could be avoided by asking either when she last had something to eat and/or checking a blood sugar, and depending on the blood sugar, giving the patient some juice before starting treatment.

60 year-old smoker:
The patient is suffering from angina that then progresses to a MI/heart attack and then cardiac arrest.
Angina:
- Stop the procedure.
- Position the patient comfortably, usually sitting up.
- Administer oxygen.
- Get vitals to monitor blood pressure and pulse.
- Nitroglycerin 0.4 mg pill or spray. Ask about erectile dysfunction drugs in last 48 hours.
- Systolic BP less than 110 or 30% below baseline you may need to lie flat before giving nitroglycerin.
- Repeat up to 3 times every 3 to 5 minutes.

MI/Heart attack

The classic treatment is MONA, which is Morphine, Oxygen, Nitroglycerin, and Aspirin. In this scenario we have already have oxygen on the patient and given the max of nitroglycerin. We don’t have morphine, but nitrous oxide can be used for pain management. The dose for aspirin is 325 mg chewed over 30 seconds and then swallowed. The patient is then transported by EMS to the hospital to go to the cardiac cath lab to open the clots and stent the occluded vessels.

Cardiac Arrest: This is classic BLS, which I’m sure you all know. AED and compressions.

16 year old with routine extraction:

This is local anesthetic overdose, presumably from an inadvertent IV injection given how fast it occurred. These usually resolve in 15 to 20 minutes as the anesthetic is bio transformed and leaves the blood stream.

- Terminate treatment
- Prevent injury by moving the tray table away and clearing the dental tray away.
- Maintain the airway.
- Allow the seizure to end
- Place the patient in the recovery position. Patient on their side, top leg in front, top hand under cheek, head tilted back and up.
- Call EMS if this is the first seizure, seizure lasts more than 2 minutes, or multiple seizures lasting 5 minutes.

90 year-old from a local care center:

The old adage that no good deed goes unpunished. My thought here is to remind us, you sometimes are better of doing nothing. It would be a mistake to bring this lady back into a chair with no idea about what her baseline medical state. Call and get a current medical history, problem list, and list of medications. Make sure she is competent to make health care decisions. If you can’t get these things, don’t treat her. It is OK to examine her, but let the care facility know you can’t treat her until you have the answers to the questions you have.

The second point is just to get you thinking that emergencies are probably more likely to happen in the waiting room or even the parking lot. Think about how you would respond to those situations. Is your emergency kit and oxygen portable enough to take out of the treatment area?