Objectives

• To review multiple reasons for cardiac arrests

• To review the best practices for treatment in these arrests
Scenario #1 Dispatch Information

- Dispatched Code 4 for a male patient in Victoria Park on a park bench unresponsive

- It is about 6 am and it is mid September
Scenario #1 Arrival

- On arrival you find an approximately 40 year old indigent male lying in the fetal position who is not rousable
Scenario #1 Primary Assessment

- Pt has very shallow snoring respirations at a rate of 14bpm
- Pt has no radial pulses, but has slow weak carotid pulse
- Pt is cool to touch
- You move the patient to your stretcher for a better assessment, insert an oral airway and start O2 by NRB
- What do you want to do next?
Scenario #1 What Next

Cardiac Monitor

Vitals

Secondary Exam

Incident History
Scenario #1 Differential

• What do you think could be involved here going on here?

Alcohol
Overdose
Head Trauma
Scenario #1 Diagnosis

• You start a line and begin to move the patient to the ambulance

• What do you think this patient's primary problem is?

Hypothermia
Scenario #1 Treatment Plan

• What is your treatment plan?

Administer Atropine
Initiate Pacing
Initiate Bolus
Scenario #1 Transport

• As you are moving the patient to the ambulance you notice a rhythm change

• What is this rhythm?

• What are you going to do next?
Scenario #1 Protocol Review

1. Confirm cardiac arrest by the absence of spontaneous respirations and palpable central pulses. A 45 second pulse check should be performed.

2. Initiate chest compressions and ventilations for approximately 2 minutes if unwitnessed.

3. Attach AED or defibrillator while performing CPR.
Scenario #1 Protocol Review

4. Initiate therapy according to the PCP or ACP Cardiac Arrest General Protocol. Continue until the first AED analysis or manual rhythm check has been performed and CPR has been re-initiated if necessary.

5. Transport should be initiated quickly. No further defibrillation efforts enroute. Update receiving facility enroute.

6. Establish IV access enroute (if certified). No IV drugs will be administered.
Scenario #1 Points of Interest

- Hypothermia does not have to be due to exposure alone

- In this case the patient was on an SSRI which could have impairepd his ability to thermoregulate increasing the degree of hypothermia

- Thermoregulatory mechanisms can also be impaired by brain damage, acid base imbalance, hemorrhage, hypoxia, drug overdose, intoxication, extremes of age, infections, major trauma, decreased mobility and ability to get out of the cold
Drugs that can affect thermoregulation include:

- alcohol
- antidepressants
- antipyretics
- sedatives
- and various pain medications
**Scenario #1 Points of Interest**

- The Osborn or J wave is a late sign in hypothermia and is not fully understood on why it appears.

- Severely hypothermic patients are prone to develop Ventricular Fibrillation.
"IT IS DEFINITELY HYPOTHERMIA!"

"OR MAYBE HEAT STROKE??"

Ready for the Next One
Scenario #1 Vital Signs

• Your vitals are:
  • RR – 14
  • P – 43
  • BP – 85/40

• Is there anything else you want?
  • Temp – 25°C
  • Glucose is 2.4 mmol
Scenario #1 Cardiac Monitor

• When you attached the cardiac monitor you have this rhythm

• What do you think it is?

• What is this?
Scenario #1 Incident History

• Police had a report of someone sleeping in the park

• On their arrival the officer could not wake the patient and called for EMS

• The officer indicates to that the patient is well know to them and has some sort of psychiatric history
Scenario #1 Secondary Exam

• There are no obvious signs of trauma

• The only thing you find is a pill bottle with about 20 pills in it and is marked as Zoloft
Scenario #1 Administer Atropine

- Contraindicated in Medical Directives

- Hypothermic patients may be unresponsive to cardiovascular drugs

- Decreased metabolism increases the risk of tissue toxicity when administering cardiovascular drugs
Scenario #1 Initiate Pacing

• Contraindicated In Medical Directives

• Cardiac pacing is usually not indicated as Bradycardia in hypothermia is thought to be protective and can maintain sufficient oxygen delivery
Scenario #1 Initiate Bolus

- Initiating an IV Bolus and patching is the most appropriate treatment

- If possible use warm fluids
Scenario #2 Dispatch Information

• Dispatched Code 4 for a female patient unresponsive at home
Scenario #2 Arrival

- On your arrival you find a 63 year old female on the floor of the living room who is not rousable.

- The patient's daughter is present and indicates to you that she just collapsed.

- You see that she has bilateral below knee amputations.
Scenario #2 Primary Assessment

- The patient is protecting her own airway and has respirations of approximately 12 per minute

- Pt has no radial pulses, but has slow weak carotid pulse

- Pt is cool to touch

- You move the patient to your stretcher for a better assessment and start O2 by NRB

- What do you want to do next?
Scenario #2 What Next

Cardiac Monitor

Vitals

Secondary Exam

Incident History
Scenario #2 Diagnosis

• So what do you think is going on here?

Hyperkalemic

Due to Renal Failure
Scenario #2 Treatment Plan

• What is your treatment plan?

Treat with Sodium Bicarb

Patch

Obtain IV Access
Scenario #2 Sodium Bicarb

• As you administer the Sodium Bicarb and you notice a rhythm change as your patient stops breathing

• What is this rhythm?

• What are you going to do next?
Scenario #2 Resuscitation

- You run a complete cardiac arrest protocol with no change in the rhythm

- You transport the patient and the patient is pronounced at the hospital after a long resuscitation effort
**Scenario #2 Points of Interest**

- Hyperkalemia can occur rapidly in patients with renal failure.
- Any patient in cardiac arrest who has a history of renal failure should be suspected of having severe hyperkalemia.
- Initial ECG changes show a tall or tented T wave.
- As Potassium levels rise, conduction slows which results in a prolonged P–R interval, depressed ST segments and may include loss of P waves.
- The QRS will widen and conduction is further delayed as the levels become severe.
Scenario #2 Points of Interest

- Central Venous AccessDevices are able to be utilized by ACPs in times when no IV access is available and the patient is in cardiac arrest or a pre arrest state.

- The tip of the CVAD rests in the superior vena cava.
Scenario #2 Points of Interest

- Sodium Bicarbonate is given in renal failure with hyperkalemia for two reasons

1. To try and help compensate for the acidosis created by the renal failure

2. To try and shift the Potassium out of the blood stream and into the cells
Scenario #2 Points of Interest

- Sodium Bicarbonate has an immediate onset and has a duration that is PH dependant

- Sodium Bicarbonate is supplied in 50mEq in 50 ml

- The dosage is usually 1.0 mEq/kg, repeated in 10 min at 0.5 mEq/kg
Ready for the Next One
Scenario #2 Vital Signs

- Your vitals are:
  - RR – 14
  - P – 63
  - BP – 73/41

- Is there anything else you want?
  - Glucose is 4.4 mmol
Scenario #2 Cardiac Monitor

- When you attached the cardiac monitor you have this rhythm

- What do you think it is?
Scenario #2 Incident History

• The daughter explains that the patient just collapsed out of her wheel chair

• The patient has been feeling unwell for a few days and missed her “blood appointment”

• The patient is also suffers from IDDM
Scenario #2 Secondary Exam

- There are no obvious signs of trauma

- On physical exam the only thing you notice is a 4 x 4 gauze over the right clavicle, which the patient's daughter states is for the hospital to use because they can't get IVs
Scenario #2 Patch

Please Patch to Dr. Dukelow

Go Back
Scenario #2 Obtain IV Access

• You are unable to obtain a IV

• What now?

• The patient is not eligible for IO

• What about the thing under the gauze????

**IT IS C.V.A.D.**

**TIME**
Scenario #2 CVAD Access Review

What are the Indications?
• Immediate IV access required

What are the Conditions?
• Patient $\geq$ 40 kg AND
• Patient is in cardiac arrest or pre–arrest state
Scenario #2 CVAD Access Review

When IV access is required, proceed with the following steps:

1. Identify the type of CVAD

2. Have available an empty 10 cc syringe and also draw up a second 10 cc syringe with sterile NS,
3. Ensure lumen to be accessed is clamped.

4. Remove prn adapter from lumen exposing luer lock end

5. Connect the empty syringe to the lumen, unclamp the lumen
6. Using sterile technique, aspirate 3–5 cc of blood from the lumen you wish to use (to remove instilled heparin), keeping a closed system.

7. Clamp the lumen and connect the 10 cc saline syringe, then unclamp the lumen.

8. Inject approx. 2 cc of NS, then withdraw 1–2 cc and visualize blood return to ensure the line is patent. Then flush remaining NS – if resistance is met, assume the lumen is obstructed and repeat procedure on the second lumen (if a 2nd lumen exists).
9. Once lumen patency has been confirmed, re-clamp lumen and remove syringe.

10. Attach IV bag and flushed tubing to lumen, unclamp lumen and run IV at appropriate rate. Ensuring there are no air bubbles in the syringe, IV tubing or CVAD is imperative.

11. Ensure IV tubing is well secured to CVAD lumen.
Scenario #3 Dispatch Information

- Dispatched Code 4 to the jail cells at LPD HQ for a male patient having an seizure
**Scenario #3 Arrival**

- On your arrival you find a 35 year old male on the floor of the cell in active seizure

- There is a police officer present, who is providing no care at this time
Scenario #3 Primary Assessment

- The patient is having a full body seizure
- The patient’s teeth are clenched and he is breathing at a rapid rate
- You administer O2 by NRB
- What do you want to do next?
Scenario #3 What Next

Cardiac Monitor

Blood Glucose

Incident History
Scenario #3 Initial Treatment

What do you want to do now?

**IV Access**

**Vital Signs**
Scenario #3 Treatment

- How are you going to treat this patients cardiac rhythm?

Synchronized Cardioversion

- You attempt to patch for the order and are unable to obtain a patch while in the cells

- Can you do this without an order?
  
  YES
Scenario #3 Treatment

• The cardioversion is unsuccessful after three attempts, and you decide package for transport

• What else would be beneficial to this patient and why?

Sodium Bicarbonate
Scenario #3 Treatment

- As you are leaving the cells you get your patch and get the order for Sodium Bicarbonate

- You attempt another synchronized cardioversion after administration with success

- The rhythm converts to the following with stable vitals
Scenario #3 Points of Interest

- Early signs of TCA overdose include dry mouth, confusion, blurred vision, inability to concentrate and hallucinations

- Late signs of TCA overdose include depressed respirations, delirium, hyper or hypotension, hyper or hypothermia, seizure and coma

- Sodium Bicarbonate is used in these cases to treat the fast sodium channel blockage and increase the number of open sodium channels
Thanks For Coming
Scenario #3 Blood Glucose

- Glucose is 5.5 mmol
- As you are completing the blood glucose determination the patient stops his seizure
- You are now able to insert an oral airway and do so
Scenario #3 Cardiac Monitor

- When you attached the cardiac monitor you have this rhythm

- What do you think it is?
Scenario #3 Incident History

- The officer tells you that the patient was walking around town confused and when he was approached he hit the officer and he was brought here.

- After being in the cells for a couple of hours the patient started to have a seizure and they called EMS.

- The only thing that the officer found on the patient was an empty bottle of Elavil.
Scenario #3 IV Access

• You are unable to obtain an IV

• What options do you have now?

Adult Intraosseous Time
Scenario #3 Vital Signs

You vitals are as follows:

- RR – 20
- P – 192
- BP – 70/40
Scenario #3 Adult IO Review

Indications

• Any critically ill adult patient who is in a pre-arrest state (unconscious with rapidly deteriorating vital signs) AND in whom IV access is unobtainable

Conditions

• Patient must be \( \geq 12 \) years of age

Contraindications

• Placement of an IO in a bone with a suspected fracture or in a limb distal to a fractured bone
Scenario #3 Adult IO Review

Procedure

1. If presented with an unconscious patient with rapidly deteriorating vital signs, and peripheral veins can be seen or palpated, attempt at least one peripheral IV. If IV access fails following two attempts or after 90 seconds, proceed to an intraosseous line.

   Note: An EJ is defined as a Peripheral IV

2. Landmark the site appropriate to the specific device being used (i.e. proximal tibia)
3. Place IV solutions in a pressure bag inflated to a maximum of 300 mmHg or “push” the fluid bolus with a large bore syringe for more-rapid infusion. Infuse fluid volumes as per the Intravenous Access & Fluid Administration Protocol.

4. Intraosseous access will be limited to a maximum of two (2) attempts only.

5. Monitor the site near the point of skin penetration to ensure fluid is not infiltrating the tissues.

6. Update the receiving facility enroute.