Medical Emergency Training Module for Clinical Faculty and Staff

Department of Anesthesia
University of Pittsburgh
School of Dental Medicine
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"STAT Page Protocol"

In the event of a medical emergency that requires the assistance of members of the Department of Anesthesiology

- **DO NOT leave the victim or patient**
- Do your best to manage the situation
- **DO NOT call 911 - DO NOT call the Anesthesia Department**

"STAT Page Protocol"

- Summon assistance to secure the oxygen tank with attached bag-valve-mask (BVM) device located in supply rooms throughout the school
- Have someone call **8-8621** and request a "**STAT" page for "Anesthesia**" To: the exact location of the emergency

  Example: Module 2, Third floor, Cubicle 3230

"STAT Page Protocol"

- Members of the Anesthesia Department will serve as first responders
- If the emergency involves a patient, the chart should be readily available
- Should the emergency take place before or after hours call **8-8621** for assistance
  - This is a dedicated line and never rings busy
  - If no one is present to answer it - call automatically transfers to the University Police

Emergency Oxygen Source

- Department or module responsibility:
  - Monthly check to ensure oxygen tank is present and contains at least 1/4 to 1/3 pressure of a full tank
  - Monthly check to ensure bag-valve-mask (BVM) device is attached properly to the oxygen tank and flowmeter
  - Notify anesthesia department if tank and/or BVM needs to be replaced
- Department Chairs or module leaders should appoint these responsibilities

Oxygen Check

- Full O2 tank registers ~2200 psi
- Pressure is proportional to amount in tank
- ½ tank will register ~1000 psi
- Notify anesthesia if tank is below 500-600 psi

Oxygen Check

- Turn wrench counter-clockwise to open
- Opposite to close
- Turn off tank after reading pressure
- Exhaust pressure in the system after checking pressure

DRUGS USED IN THE EVENT OF AN EMERGENCY

Aspirin 81mg (chewable tablet)

Emergency use:

- Acute Coronary Syndrome, Chest pains, Angina, Suspect MI, “Heart Attack”

Instructions for administration:

- Have patient chew (4) tablets and then swallow

Purpose:

- Reduces thrombus formation associated with an acute myocardial infarction

Diphenhydramine(Benadryl®)50mg/ml

Emergency use:

- Acute Allergic Reactions, Anaphylaxis

Instructions for administration:

- Inject 50mg (1ml) intramuscularly

Purpose:

- Blocks actions of histamine - i.e., skin rash, edema, hypotension, and bronchospasm

Glucose(paste) 30g

Emergency use:

- Hypoglycemia, Anti-diabetic drug induced hypoglycemia

Instructions for administration:

- Slowly squeeze the contents of tube into the buccal vestibule - If conscious have patient swallow

Purpose:

- Increases serum blood glucose

Epinephrine(EpiPen®)0.3mg auto-injector

Emergency use:

- Acute Allergic Reactions, Anaphylaxis, Life Threatening
- Asthmatic Episodes

Instructions for administration:

- Remove safety cover. Jab firmly (90º angle) into outer thigh.
- Pen is designed to work through clothing. Hold firmly against thigh for 10 seconds.

Purpose:

- Increases blood pressure, broncho-relaxation and decrease edema about the airway.

Asthma Inhaler (albuterol)

Emergency use:

- Acute Asthmatic Bronchospasm

Instructions for administration:

- Shake well. Hold can vertically. Inhale deeply
- with lips closed about inhaler. Repeat once.

Purpose:

- Relax smooth muscles in the lungs - improves
- breathing.

Morphine Sulphate 10mg/ml

Emergency use:

- Pain associated with an Acute Myocardial Infarction

Instructions for administration:

- Intramuscularly, Subcutaneously 8-10mg.

Note:

- Available in Anesthesia Department Crash Cart only.

Nitroglycerin (lingual spray)

Emergency use:

- Chest pains associated with Angina Pectoris

Instructions for administration:

- Do Not Shake. Spray (2) times directly on or under the tongue. Do not rinse or expectorate for 5 minutes. Administer in a sitting or reclined position.

Purpose:

- Decreases the work and oxygen consumption of the heart.

Midazolam (Versed® injection) 5mg/ml

Emergency use:

- Status Epilepticus, Prolonged seizures

Instructions for administration:

- Inject 5mg (1ml) intramuscularly

Purpose:

- Suppress electrical seizure foci. Stop prolonged muscle contraction, including the diaphragm.

Hydrocortisone (SoluCortef® injection) 100mg/ml

Emergency use:

- Acute Adrenal Insufficiency

Instructions for administration:

- Push rubber plunger to reconstitute vial. Inject the contents (100mg) of the vial intramuscularly.

Purpose:

- Augments epinephrine to increase blood pressure.

MANAGEMENT STRATEGIES

Medical Emergency Management Guidelines

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Acute Epinephrine Response

- Stop Treatment
- Allow patient to position themselves
- Stat Page
- Calm & Reassure
- Consider Oxygen, particularly if patient has underlying cardiovascular disease.

Acute Adrenal Insufficiency

- Stop Treatment
- Semi-reclined Position
- Stat Page
- 100% Oxygen
- If patient loses consciousness:
- Maintain patent airway
- Hydrocortisone 100mg IM
- Prepare for Basic Life Support

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Acute Anxiety
(panic attacks)

- Stop Treatment
- Allow patient to position themselves
- Stat Page
- Calm & Reassure
- Consider other etiology: ie. acute epinephrine response, hypoglycemia.

Seizure

- Do not hold or restrain..but rather protect patient from physical contact with objects in the operatory
- Do not use “bite blocks” or force objects into patient’s mouth.
- Attempt to maintain a patent airway.
- Stat Page
- If episode extends greater than 1-2 minutes:
- 100% Oxygen
- Midazolam (Versed®) 5mg IM
- Prepare for Basic Life Support

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Hypoglycemia

- Stop Treatment
- Semi-reclined Position
- Administer Glucose Paste
- Stat Page
- If patient loses consciousness:
- Maintain patent airway
- 100% Oxygen
- Administer Glucose Paste
- Prepare for Basic Life Support

Asthma or Bronchospasm

- Stop Treatment
- Semi-Reclined or upright position
- Calm & reassure patient
- Asthma Inhaler
- Stat Page
- 100% Oxygen
- No relief?… EpiPen

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Allergy and Anaphylaxis

- Hives or Rash only…observe patient
- Hives or Rash occurring very rapidly… Stat Page
- Benadryl 50mg IM
- Any signs of Breathing Problems, Altered Consciousness, Fall in BP, or Edema about the Tongue/Airway…Stat Page
- Benadryl 50mg IM
- EpiPen
- 100% Oxygen
- Prepare for Basic Life Support

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Cerebrovascular Accident (Stroke)

- Stop Treatment
- Semi-reclined or upright position
- Stat Page
- Oxygen
- If Unconscious,place in semi-reclined position & maintain airway.
- Monitor vital signs& prepare for Basic Life Support.

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Hyperventilation Syndrome

- Stop Treatment
- Semi-reclined or upright position
- Calm & reassure patient
- Verbally attempt to persuade patient to take “slow & easy breaths”
- Stat Page
- Have patient breathe into paper bag. Allow patient to seal bag about mouth & nose.

Syncope/Fainting

- Physiologic Rest (semi-reclined) Position
- Loss of Consciousness for more than 1 minute? Consider more than simple fainting, then:
    - Maintain airway
    - Chin lift/head tilt
    - Jaw thrust
    - Oxygen
    - Stat Page

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Angina/Myocardial Infarction

Acute Coronary Syndrome

- Stop Treatment
- Semi-reclined Position
- 100% Oxygen
- Stat Page
- Nitroglycerin Spray
    - Contraindicated within 72 hours of sexual enhancing drug administration (viagra,etc)
- Aspirin
- Unstable ACS may lead to Cardiac Arrest - Prepare for Basic Life Support
- Summon AED

Loss of Consciousness

✓ consider:

- Syncope (fainting)
- Hypoglycemia
- Seizure
- CVA (stroke)
- Cardiac Arrest
- Anaphylaxis
- Acute Adrenal insufficiency

Altered Consciousness

✓ consider:

- CVA (stroke)
- Seizure
- Acute Anxiety
- Acute Epinephrine Response
- Local Anesthetic Toxicity

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Chest Pains

✓ consider:

- Angina, MI
- Acute Epinephrine Response
- Anxiety

Respiratory Problems

✓ consider:

- Hyperventilation
- Asthma
- Allergic Reactions

Urticaria, Hives, Edema

✓ consider:

- Allergy
- Anxiety
- Anaphylaxis

Most Common Medical Emergencies Seen at the School (In order of frequency)

- Syncope
- Hypoglycemia
- Seizure
- Asthma
- Chest pain
- Local anesthetic/epinephrine reaction
- Hyperventilation
- Mild allergic reaction

76% of medical emergencies in dentistry are related to stress and anxiety

Syncope

- A fainting or swooning;
- A sudden fall of blood pressure resulting in lack of oxygen to the brain and subsequent loss of consciousness.
- Three phases
  - Pre-syncope
  - Syncope
  - Recovery

Predisposing Factors

- Psychogenic
  - Fright
  - Anxiety
  - Emotional stress
  - Receiving unwelcome news
  - Pain
  - Sight of blood or instruments

Predisposing Factors

- Nonpsychogenic
  - Standing or sitting (pooling of blood)
  - Hunger
  - Exhaustion
  - Poor physical condition
  - Hot, humid, crowded environment

Pre-syncope

- Patient feels warm in face or neck
- Cold sweat
- Patient feels bad or “faint”
- Nausea
- Tachycardia

Syncope

- Bradycardia (slow pulse)
- Very low blood pressure
- Possible airway obstruction
- May have seizure activity

Recovery

- Pallor
- Nausea
- Weakness
- Sweating
- Patient may feel faint for hours

Management

- Stop procedure
- Position patient supine with legs slightly elevated
- Institute basic life support (A-B-C's)
- Give Oxygen
- May place cool damp cloth on forehead
- If recovery not complete in 15 minutes, look for another cause
- MAINTAIN YOUR COMPOSURE!

Hypoglycemia

- Small amount of glucose in circulating blood
- Normal = 80-100 mg / dl
- Causes
  - Lack of food intake (did not eat)
  - Diabetic patient who took insulin or oral diabetes medications without eating
  - Metabolic diseases

Hypoglycemia

- Signs and Symptoms
  - Nausea and/or vomiting
  - Dizziness
  - Rapid heartbeat
  - Lethargy
  - Sweating
  - Seizures

Management

- Identify at-risk patients
- Verify meals and insulin or oral medication intake
- Measure blood glucose by finger stick
- Mid-morning appointments
- Do not interfere with meal and medication schedule
- In the event of an episode
  - Orange juice
  - Coke
  - Glucose paste

Seizures

- Sudden attack triggered when neurons in the brain create abnormal electrical discharges
- Characterized by:
  - Staring or absence
  - Muscle spasm
  - Mental confusion
  - Uncontrolled body movements
  - Loss of consciousness

Causes of Seizures

- Congenital abnormalities
- CNS damage
- Trauma
- Poisons
- Diseases (epilepsy)
- Tumors
- Poor nutrition

Types of Seizures

- Partial
  - Simple
  - Complex
- Generalized
  - Absence “petit mal”
  - Tonic-Clonic “grand mal”

Management

- Good History
  - Type of seizure?
  - What meds?
  - How well controlled?
  - What is your aura?

Management

- Remove any items from the mouth
  - NO tongue blades or fingers!
- Remain in dental chair
- Loosen tight clothing
- Protect patient from self-injury
- Maintain patient's airway
- Administer oxygen and wait it out
- If seizures persist > 5 minutes
  - Midazolam IV or IM

After the Seizure

- Patient may have respiratory depression
- Patient will be very fatigued, lethargic and sleepy
- Make sure the airway is secure
- Contact the patient's physician for follow-up care or send to a hospital emergency room

Asthma

- An inflammatory respiratory disease consisting of recurrent episodes of shortness of breath, coughing, and wheezing resulting in hyper-irritability of the tracheobronchial tree.

Asthma Prevention

- Good history
  - What drugs do you use?
  - What precipitates your attacks?
  - Have you ever been hospitalized for your asthma?
- Medical consult if severe
- Preoperative use of bronchodilating inhaler
- Avoid precipitating factors

Asthma

- Signs and Symptoms
  - Cough
  - Wheezing
  - Dyspnea
  - Increased anxiety
  - Difficulty catching breath
  - Patient uses accessory muscles of respiration

Management

- Discontinue procedure and administer inhaler
- 0.3-0.5 mg epinephrine (1:1000) intramuscularly

Angina/Chest Pain

- A severe constricting, substernal pain, usually precipitated by stress, exercise, emotion, or a heavy meal resulting from inadequate coronary circulation

Precipitating Factors

- Physical activity
- Hot, humid, or cold weather
- Large meals
- Emotional stress or anxiety
- Caffeine
- Fever
- Anemia
- High altitude
- Excessive use of vasoconstrictors in the local anesthetic

Angina/Chest Pain

- Stable
  - Alleviated by nitroglycerin
  - Does not occur at rest
  - Does not increase in pain quality / frequency
  - No new onset
- Unstable
  - Not alleviated by nitroglycerin
  - Occurs at rest
  - Increases in pain quality and frequency
  - New onset

Management

- Stop dental treatment
- Position patient comfortably
- Give oxygen
- Give nitroglycerin every 5 minutes, up to 3 doses
- If symptoms do not subside, consider a myocardial infarction

Local Anesthetic/Epinephrine Reaction

- Local anesthetic reactions
  - Ringing in the ears
  - Mental confusion
  - Lethargy
  - Tremor
  - Seizure
- Epinephrine reactions
  - Palpitations and awareness of heartbeat
  - Hypertension
  - Anxiety

Management

- Stop procedure
- Reassure and support patient
- Administer oxygen

Hyperventilation

- Anxiety-induced rapid, shallow breathing
- Chest tightness and feeling of suffocation
- Confusion
- Vertigo (dizziness)
- Paresthesia (numbness or tingling of extremities)
- Tachycardia / diaphoresis
- Carpo-pedal spasm

Hyperventilation

- Calm and reassure the patient
- If persistent, rebreathe into a paper bag over the nose and mouth

Allergy Signs and Symptoms

- Itching (pruritis)
- Hives (urticaria)
- Rash (erythema)
- Bronchospasm (wheezing and difficulty breathing)
- Hypotension (low blood pressure)

Management

- Skin reactions
- Benadryl 50 mg orally or IM
  - Refer to allergist

Management

- Respiratory reactions (bronchial constrictions)
  - Stop dental treatment
  - Position patient (UPRIGHT!)
  - Administer O2
  - Bronchial inhaler
  - Benadryl 50 mg IV or IM
  - 0.2-0.5 mg epinephrine (1:1000) IM
  - Solu-cortef 100 mg IM