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 emergency kits and oxygen tanks 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
University of Pittsburgh
School of Dental Medicine
Department of Anesthesia
Contents

- Medications
- Medication cards
- Management Guidelines
- Nasal cannula
- Oxygen mask
- Blood pressure cuff
- Stethoscope
- IV fluids and lines
Contents

- Bag-valve mask (Ambu® Bag)
- Oral airways
- Nasal airways
- Syringes
- Needles
- Tourniquets
- Tape
- Catheters
Medication Cards

- Designed by the department, credit must be given to Dr. Walt Laverick for design and Christine Bettinger for production
- Every medication in the box will have a corresponding card
- Cards will describe:
  - Emergency use
  - Instructions for administration and Purpose
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 (90° 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.
Medical Emergency Management Guidelines

Department of Anesthesiology

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

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

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

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
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.

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

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

Chest Pains
✓ consider:
  • Angina, MI
  • Acute Epinephrine Response
  • Anxiety

Respiratory Problems
✓ consider:
  • Hyperventilation
  • Asthma
  • Allergic Reactions

Urticaria, Hives, Edema
✓ consider:
  • Allergy
  • Anxiety
  • Anaphylaxis
Emergency Kits

- One box in each module or department, as well as Dean’s Office → 16 boxes
- Department of Anesthesiology will maintain medications in boxes
  - Either periodically due to expiration dates, or
  - If box is opened for use
Emergency Kits

- Department or module responsibility:
  - Monthly check to assure box is present
  - And lock is secured
  - Also, to make notification to anesthesia if box was opened for any reason
  - And, oxygen tank is present and contains at least 1/4 to 1/3 pressure of a full tank
Emergency Kits

- We are asking that Chairs or module leaders appoint these responsibilities
- The check list will hang on the box
- Or this may be incorporated into axiUm
- Simply date and initial that the check was done for the month
Emergency Kits

- All medications will be stored in a sealed sandwich bag with the medication card
- Management Guideline cards will be kept in the box and bound with a ring
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 counterclockwise to open
- Opposite to close
- Turn off tank after reading pressure
- Exhaust pressure in the system after checking pressure
Emergency Kits

- Kits are not to be opened to access BP cuffs or stethoscopes unless there is a medical emergency
  - Dispensaries or students should have these
- Kits will be secured with a snap-off lock
- All cards will be placed on the department’s intranet page
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
- 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 COMPOZURE!
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 heart beat
  - 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:
  - 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 hyperirritability 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) subcutaneously
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) SQ or IM
  - Solu-cortef 100 mg IM