

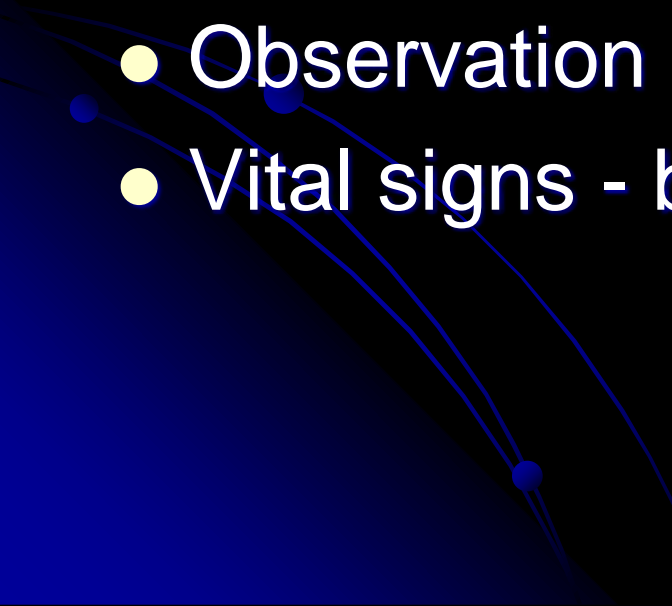
Dental Office Emergencies

Be prepared

Be alert

Anticipate

Successful Prevention

- Updated medical & health history
 - Operator & patient rapport
 - Minimal stress level
 - Observation
 - Vital signs - baseline
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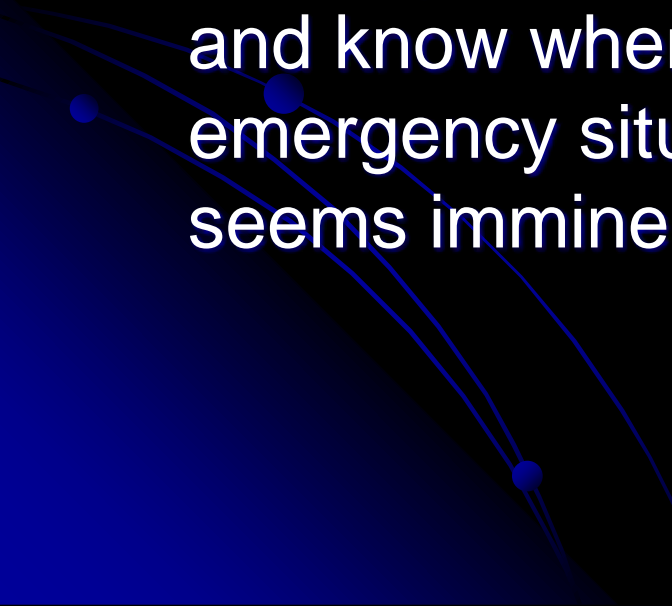
Patient Assessment

- Four step treatment approach
 - R - recognition of disease
 - A - assessment of the risk
 - M - management for safety
 - E - emergency care


Dentist's Role

- often the first to recognize a potential medical emergency
- Observe and monitor throughout care patient's changes in expression, skin tone, muscle tonus, respiration, verbal expressions



- Course in First Aid desirable
 - Course in CPR required
 - Classify responses and know when emergency situation seems imminent
 - Prompt, appropriate reactions to signs of distress
 - Ability to provide care until help is secured
 - Provide complete description of distress signs
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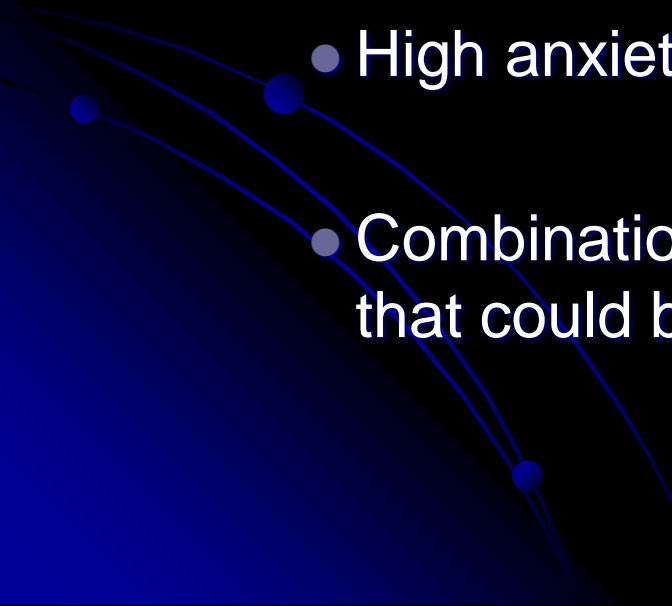
Being Prepared to React

- Emergency phone numbers
 - Rehearsal of emergency scenario
 - Procedures for alerting other staff members
 - Write out specific protocols for action in the event of medical emergency
 - Specific assignments made to ensure all designated procedures completed
- 

Generic Functions of Emergency Response Tasks

- Evaluate vital signs
- Diagnose nature of emergency
- Decide on appropriate treatment
- Instruct others what to do
- Phone for help
- Prepare for treatment administration
- Administer treatment
- Monitor vital signs
- Reassure patient
- Record events that occur
- Ensure privacy/and or manage other patients

Medical Emergencies

- Predisposition to emergency
 - Patient with HBP, Cardiac insufficiency, asthma, angina, diabetes
 - High anxiety levels
 - Combination of both may trigger physical response that could be classified as emergency
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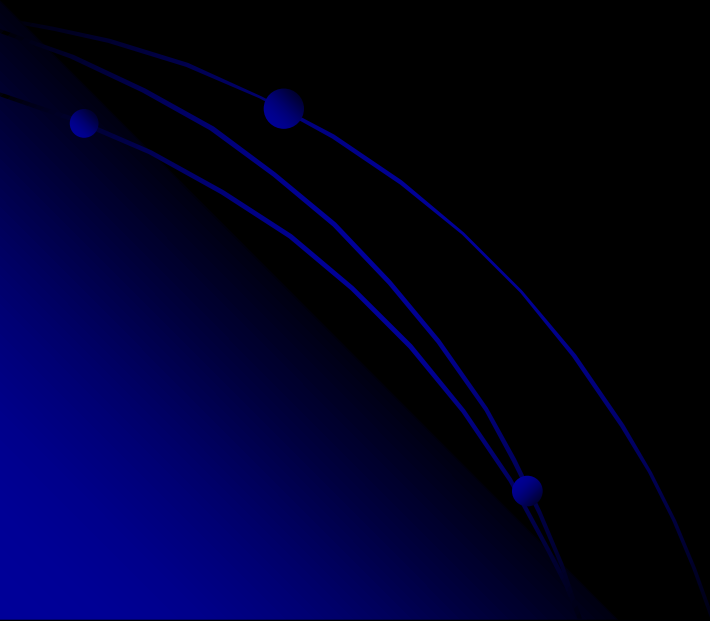
Medical Emergency Prevention

- Practitioner must be able to
 - Recognize patient anxiety
 - Modify dental therapy
 - Prevent an emergency

Emergency Situation

Most responses to emergencies can be managed using


- basic life support (without use of drugs) until advanced life support can arrive.



Emotional Problems

- Mental condition can affect physical condition: Hyperventilation, lightheadedness, giddiness, anxiety, confusion, dizziness, overbreathing, feelings of suffocation, heart pounds, tingling or numbness in extremities
- Patient position should be upright; loosen tight collar, reassure patient, breath into bag

Intro: Syncope

- Vasodepressor syncope, fainting occurs during stressful situations
 - Usually benign, unless left untreated.
 - Caused by transitory and sudden loss of consciousness after cerebral ischemia
 - Place in supine position, restore blood flow
- 

Intro: Syncope

- Predisposing factors:
 - fright,
 - pain
 - emotional stress
 - anxiety
 - hunger
 - sudden postural changes
 - exhaustion

Signs & Symptoms: Syncope


- Early:

- Loss of color, pallor
- Perspiration
- Nausea
- Increased heart rate
- Feeling of warmth

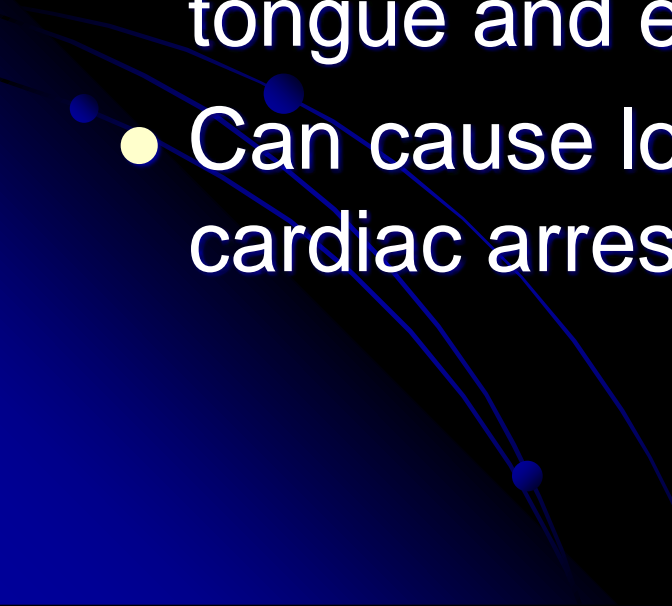
- Late:

- Yawning
- Dilated pupils
- Cold extremities
- Hypotension
- Dizziness
- Loss of consciousness

Treatment: Syncope

- Position patient-supine, head lower than feet if possible
 - Maintain open airway
 - Administer oxygen
 - Administer ammonia inhalant
 - Monitor vital signs
- 


Intro: Airway Obstruction

- Unlikely to occur while being treated
 - Upper airway obstruction usually reversible
 - Most common is unconsciousness - tongue and epiglottis occluding airway
 - Can cause loss of consciousness and cardiac arrest
- 

Intro: Airway Obstruction

- Diagnose partial versus complete is critical and must be done rapidly to prevent complications of anoxia
 - Partial: person is making coughing or other noises
 - Complete: no noises are made although patient is attempting to cough or talk, showing signal for choking

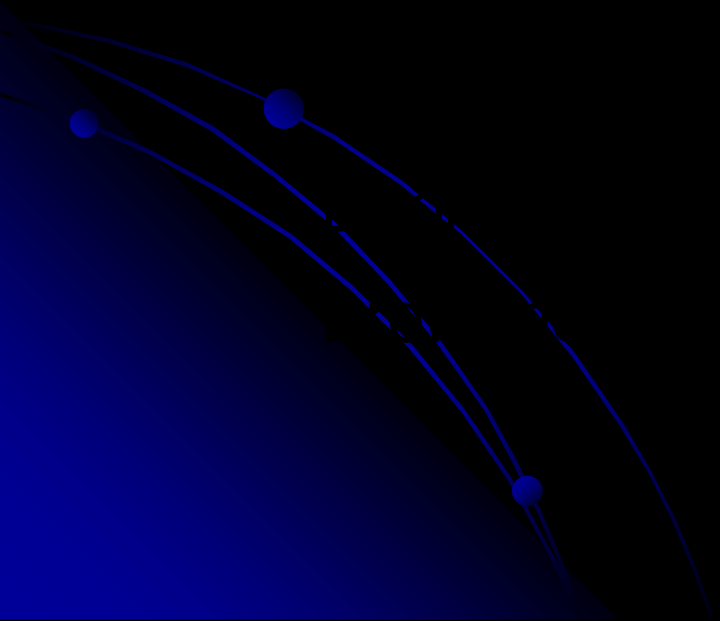
Signs & Symptoms: Airway Obstruction

- Choking
 - Gagging
 - Violent inspiratory efforts
 - Flushed face
 - Extreme anxiety
 - Cyanosis
 - Cardiovascular collapse
- 

Treatment: Airway Obstruction

- Position head
- Remove foreign object
 - sweeping motion of fingers
 - Magil or straight forceps
 - Suction
- Perform abdominal thrusts/Heimlich maneuver
- Repeat as needed, cricothyrotomy

Signs & Symptoms: Local Anesthesia Reactions



Intro: Anesthesia Reactions

- Reaction can be varied in extent and severity
- Most are result of either local anesthetic agent itself or the vasoconstrictor within formulation
- Toxicity can occur especially from rapid intravascular injection
- Reaction can occur 30-60 seconds to 1 hour after injection

Intro: Anesthesia Reactions

- Local anesthetic dosing should be calculated on:
 - patient's physical condition
 - body weight



Signs & Symptoms: Vasoconstrictor Toxicity

- Anxiety
- Tachypnea
- Tachycardia/
palpitations
- Chest pain
- Restlessness
- Dysrhythmias
- Headache
- Cardiac arrest

Treatment: Local Anesthesia Toxicity

- Initially, begin basic cardiac life support
- Assess and support airway, breathing, circulation
- Supportive treatment may be indicated
- Airway opened, oxygen given
- Severe reactions, patient transported to hospital emergency room as soon as possible

Intro: Drug Related Emergencies

- Therapeutic agents can precipitate physiologic crisis
- Present as allergic or toxic reactions
- Drug abuse most commonly found are alcohol or cocaine related
- Act on central nervous system
- Be aware of signs of drug abuse and drug interactions
- Explicit directions for patients drug use

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Signs & Symptoms: Drug Related Emergencies

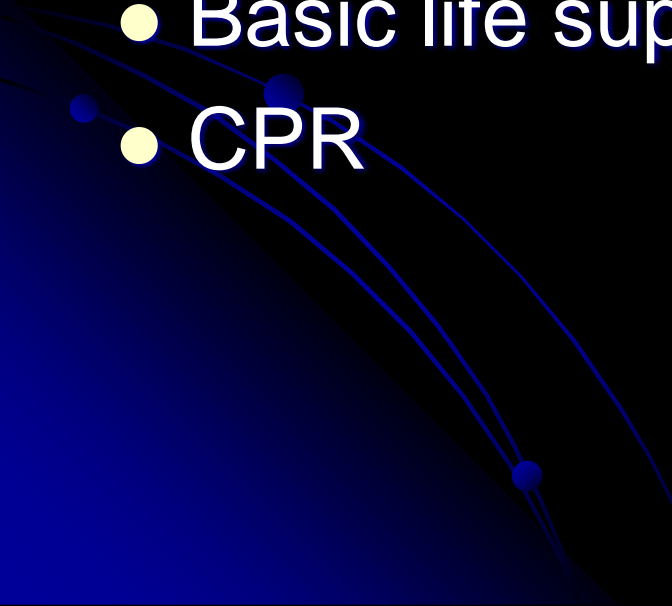
- Depression: Premorbid State
 - coma
 - pupils fixed and dilated
 - flaccid paralysis
 - cardiac arrest
 - respiratory arrest
 - cyanosis
 - lethargy, stupor

Signs & Symptoms: Drug Related Emergencies

- Actions on CNS
Stimulation:
Headache,
Nausea, Vomiting,
Vertigo, Twitching
small muscles,
Hallucinations,
Increased
RR, Elevated body
temp, Agitated,
Restless, Excitation
- Advanced
Stimulation:
Seizures. Decreased
response to
stimuli, Incontinence,
Tachycardia, Hyperten
sion, Weak rapid
pulse, Rapid irregular
breathing

Treatment:

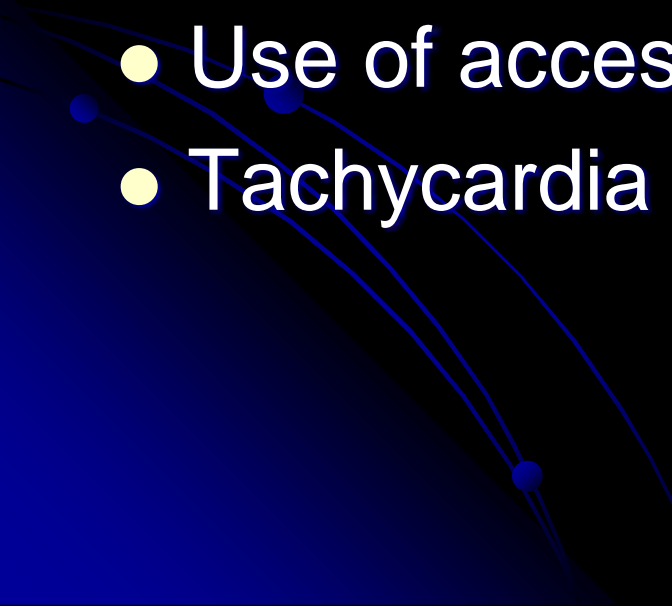
Drug Related Emergencies

- Hypotension with evidence of shock in non responsive individuals is indication for parenteral fluid therapy.
 - Activate emergency procedures protocol.
 - Basic life support
 - CPR
- 

Intro: Asthma

- Group of illnesses producing a reversible hyperreactivity of large and small airways
- Individuals may react to many stimuli
- Incidence is rising in general population
- Triggering factors include pollen, stress, cold, upper respiratory tract infections, exercise, animal fur, nonsteroidal antiinflammatory medications

Signs & Symptoms: Asthma

- Wheezing
 - Shortness of breath
 - Cough
 - Sputum production
 - Use of accessory muscles for breathing
 - Tachycardia
- 

Treatment: Asthma

- Objective is to improve ventilation by reducing or eliminating bronchospasm
- Patient removed from irritants
- Inhalants used: Albuterol-
Ventolin, Proventil or Terbutaline
- Monitor vital signs
- Possible oxygen supplement
- Assess need for emergency medical treatment

Intro, Signs & Symptoms, Treatment: Nose Bleed

- Profuse or uncontrolled bleeding: Apply compression over bleeding area. Digital pressure on pressure point of supplying vessel.
- Nosebleed:
 - Request patient to pinch nostrils between thumb and index finger for 5 minutes
 - Apply cold compress to back of neck or over nose
 - Upright position

Intro: Intraoral Lacerations

- Rare but possible
- High speed handpieces, overzealous subgingival scaling
- **Signs & Symptoms: Intraoral Lacerations**
- Bleeding-Pulsation, bright red-arterial;
Oozing, dark, red-venous
- Pain at trauma site or over area of swelling
- Swelling, slowly or rapidly, ecchymosis

Treatment: Intraoral Lacerations

- Discontinue treatment
- Remove foreign bodies from mouth
- Pressure applied to site with sterile gauze
- Wound flushed and irrigated with saline
- Follow emergency office protocol to inform dentist of situation
- May be cared for in office or referred to oral surgeon

Intro: Ocular Injuries

- Rare but these type of injuries do occur
- Need same prompt attention even though not life threatening
- Most ocular injuries affect trauma to cornea or the globe itself
- Want to minimize loss of visual acuity
- Refer patient ophthalmologist for definitive treatment

Signs & Symptoms: Ocular Injuries

- Chemical Burns:
serious, alkali burns
are true emergencies
- Mild to severe pain
- Blurred vision
- Excessive tearing
- **Treatment:**
Immediate copious
irrigation with tap
water Alkali
and /or acid burns
require 15-20 minutes
of irrigation before
transportation to
ophthalmologist for
immediate consult
and evaluation

Treatment: Ocular Injuries

- Foreign object in eye: Caution patient not to rub eye
 - Blink repeatedly to stimulate tear flow.
 - Locate object by lifting and rolling back eyelids.
 - Remove with tissue if possible or use eye wash station.
 - Always have patient wear protective eyewear.

Signs & Symptoms: Broken and Lodged Instrument Tip

- Don't use incorrectly sharpened instruments which are extremely thin
- Don't force instruments out of contact area
- To loosen: relax the face of the instrument toward the tooth (close blade), Attempt to back blade out of area
- Instruct patient not to swallow, check floor of mouth and in gingival tissue, x-ray prn

Procedural Overview

- Respond in logical, rehearsed pattern of behavior
- For each possible situation clinician should be prepared to respond in predetermined fashion
- Move instruments or other potentially harmful equipment
- Reposition chair
- Go for help calmly
- Let patient sit quietly
- Locate Emergency first Aid Kit

Procedural Overview

- Preparing a syringe for an intramuscular injection (IM); intravenous injection (IV) or subcutaneous injection.
- Performing CPR
- Directing emergency squad to right location
- Prepare dental team to respond by role assignment according to skill level and abilities to react appropriately

- Prompt, appropriate reaction may

- avert an emergency

- save a life



Intro: Adrenal Crisis

- Adrenal gland consists of two distinct regions .
 - Adrenal cortex produces endogenous steroids.
 - Medulla produces and secretes epinephrine and norepinephrine.
 - Hypofunction of adrenal cortex results in decreased cortisol production. Cortisol necessary to help body react to stressful situations.

Intro: Adrenal Crisis

- Individuals with decreased cortisol production cannot respond to stress and risk cardiovascular collapse and possible death.
- Patients may be taking supplement.
(Addison's disease)
- May need to increase level of exogenous steroids before undergoing stressful procedures

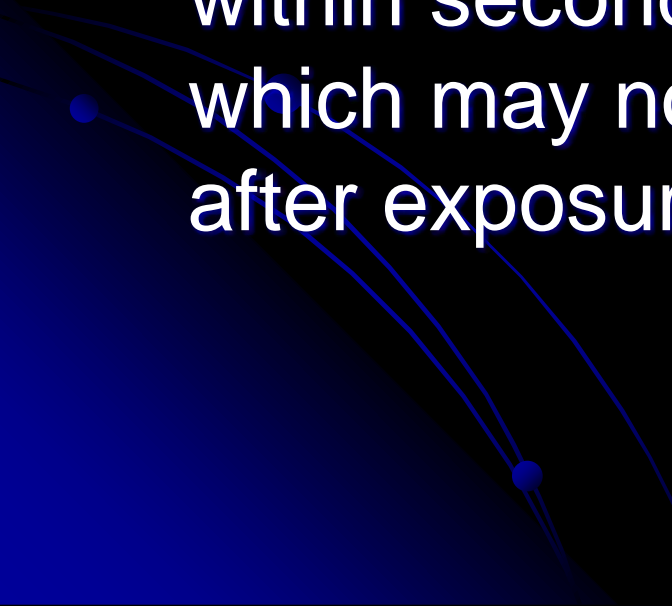
Signs & Symptoms: Adrenal Crisis

- Shocklike symptoms(cardiovascular collapse)
 - Hypotension
 - Bradycardia
 - Fever
 - Respiratory depression
- Hypercalcemia
- Lethargy

Treatment: Adrenal Crisis

- Terminate treatment
- Monitor and record vital signs
- Place patient in Trendelenburg's position
- Access and support airway, breathing, circulation- BLS
- Activate emergency protocol
- Provide supplemental oxygen
- Administer saline, hydrocortisone

Intro: Anaphylaxis/Allergy

- Allergy-hypersensitive state results from exposure to allergen.
 - Range in clinical manifestation from immediate-life threatening condition seen within seconds or delayed type reaction which may not manifest until hours or days after exposure.
- 

Intro: Anaphylaxis/Allergy

- Immediate or anaphylactic reaction that occur in the dental office pose greatest risk to patient and are of greatest concern to dental staff.
- Usually result from drug administration or reaction to an allergen in impression material or other materials used in oral cavity.

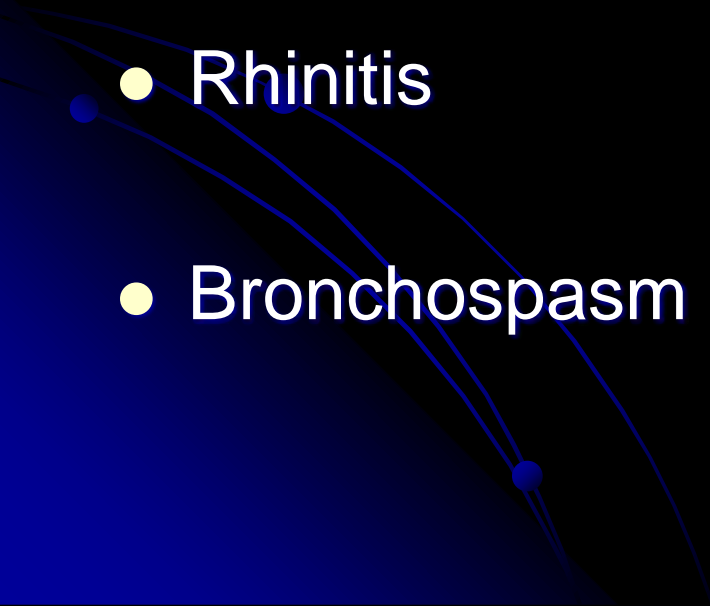
Intro: Anaphylaxis/Allergy

- Generalized most life threatening and dramatic allergic reaction.
- Death can occur in minutes if not treated appropriately.
- Reactions affect skin, smooth muscle, respiratory and cardiovascular system

Intro: Anaphylaxis/Allergy

- Anaphylactic shock occurs when consciousness is lost as a result of hypotension from an anaphylactic reaction.
- Symptoms begin with skin, followed by eyes, nose, and gastrointestinal system, then respiratory system, finally cardiovascular symptoms develop
- Prompt therapy can stop reaction

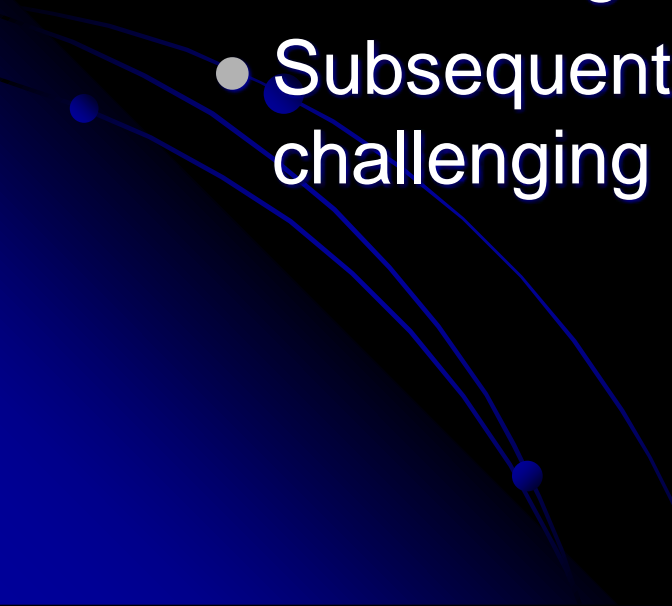
Signs & Symptoms: Anaphylaxis/Allergy

- Urticaria-itching, flushing, hives
 - Rash
 - Rhinitis
 - Bronchospasm
 - Laryngeal edema
 - Weak pulse-syncope
 - Loss of consciousness
 - Cardiac arrest
- 

Treatment: Anaphylaxis/Allergy

- Acute Reaction:
 - Basic Life Support
 - Epinephrine, injection IM
 - Oxygen
 - Diphenhydramine, injection IM
 - Corticosteroid
 - CPR
 - Airway management - intubation, cricothyrotomy

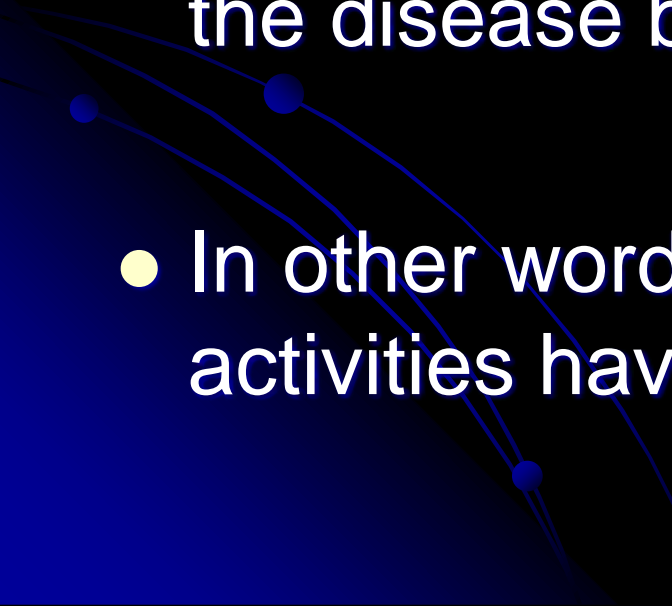
Signs & Symptoms: Anaphylactic Shock

- Anaphylactic reaction: immediate allergic response
 - For any allergic reaction to occur patient had to have previous exposure to antigen-called sensitizing dose
 - Subsequent exposure to antigen termed challenging dose
- 

Intro: Angina Pectoris

- Chest pain caused by temporary myocardial ischemia without damage to heart muscle.
- Due to narrowed coronary arteries' inability to supply myocardium with sufficient blood to meet heart's demand for oxygen during times of stress.
- Can be caused by atherosclerosis, coronary artery vasospasm, or combination of both.

Intro: Angina Pectoris

- Detailed medical history important to prevent these occurrences.
 - Try to quantify the extent and pattern of the disease before beginning treatment.
 - In other words, know what types of activities have caused symptoms in past.
- 


Signs & Symptoms: Angina Pectoris

- Chest pain brought on by myocardial stress - left center or center chest
- Chest fullness
- Burning
- Tightness
- Pain radiating to neck, left arm, jaw, back, shoulder and epigastrium

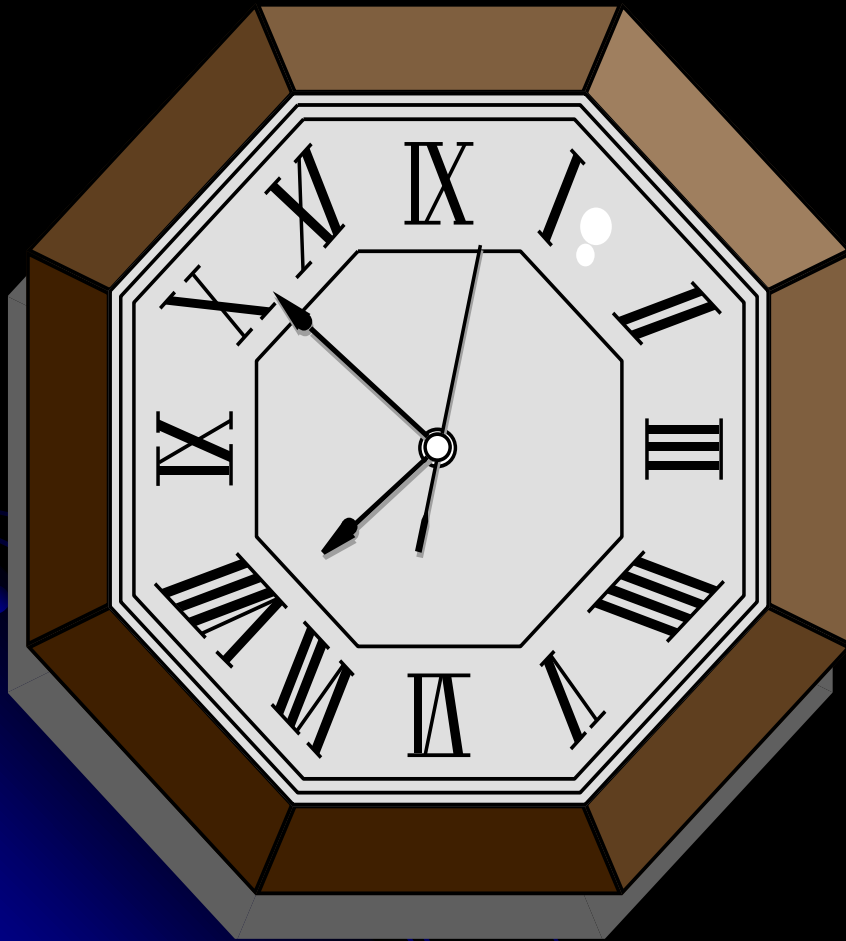
Signs & Symptoms: Angina Pectoris

- Weakness
- Dyspnea
- Nausea
- Diaphoresis
- Pain can last up to 20 minutes; prolonged discomfort should be evaluated at emergency medical facility

Treatment: Angina Pectoris

- Avoid situations needing increased oxygen demands
 - Stop procedure and allow patient to rest
 - Monitor vital signs repeatedly
 - Place patient in semireclined position
 - Provide supplemental oxygen
- 

Treatment: Angina Pectoris

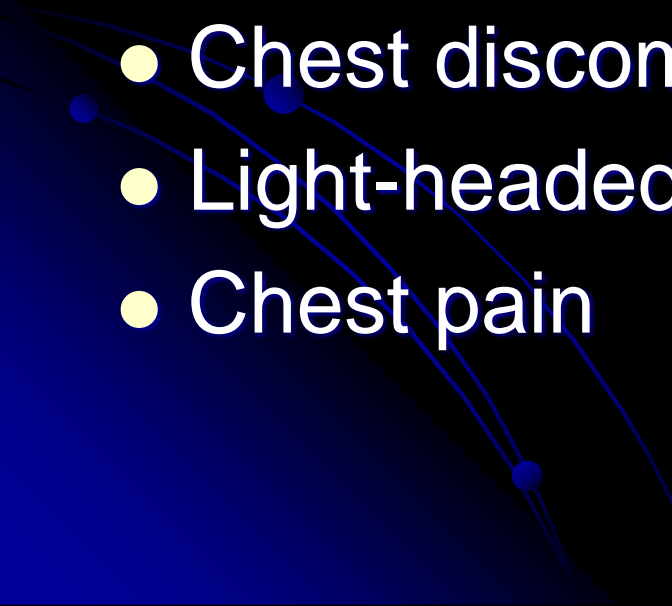


- Administer sublingual nitroglycerin(0.4mg) every five minutes for three doses
- If not relieved, patient may be having myocardial infarction and transport to emergency medical facility

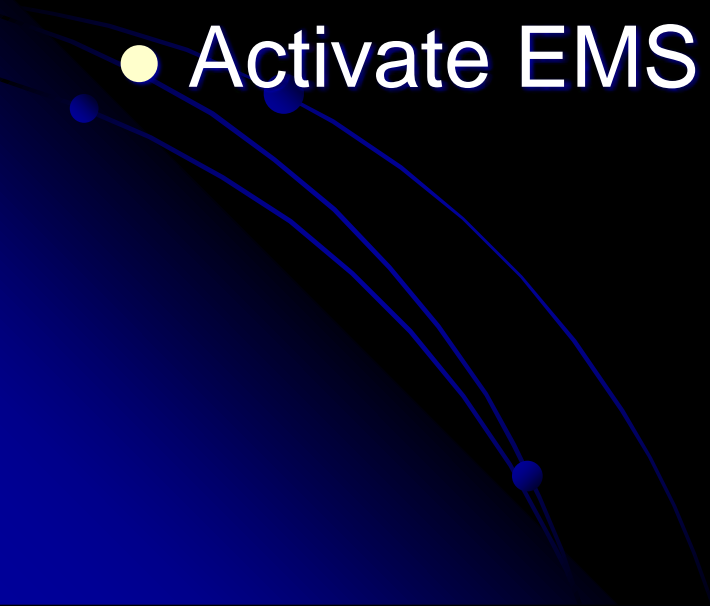
Intro: Cardiac Dysrhythmias

- Commonly known as heart palpitations
- Often result of anxiety over dental procedures
- Can be result of epinephrine given in local anesthetic or of underlying cardiac condition
- Use simple reassurance to patient
- More severe may need more intervention

Signs & Symptoms: Cardiac Dysrhythmias

- Racing heart (tachycardia)
 - Irregular heart beat
 - Apprehension
 - Chest discomfort
 - Light-headedness
 - Chest pain
- 

Treatment: Cardiac Dysrhythmias

- Monitor vital signs
 - Place patient in reclined position
 - Administer supplemental oxygen
 - Activate EMS
- 

Intro: Cerebrovascular Accident/Stroke

- Process that interferes with blood flow to the brain
- Prolonged ischemic event causes infarction of part of brain. Can result in neurologic deficit.
- Three major causes of stroke: arterial thrombosis, embolism, hemorrhage of the vasculature

Signs & Symptoms: Cerebrovascular Accident/Stroke


- Headache
- Confusion
- Vertigo
- Nausea/vomiting
- Alteration in consciousness, vision & speech
- Extremity weakness
- Facial weakness
- Hypertension
- Change in mental status

Treatment:

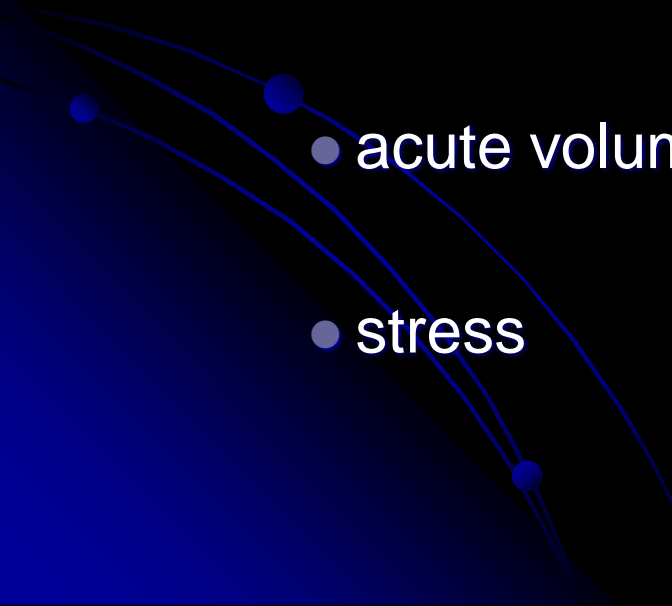
Cerebrovascular Accident/Stroke

- Assess and monitor vital signs
- Initiate basic cardiac life support as needed
- Administer oxygen if patient goes unconscious or has trouble breathing
- Place patient in supine position with head slightly elevated
- Activate EMS

Intro: Congestive Heart Failure

- Failure of cardiac ventricles to pump blood efficiently to the body and lungs.
 - Result is pulmonary edema and peripheral edema, overfilling venous system.
 - Pulmonary edema can be result of lung disease or left ventricular failure.
- 

Intro: Congestive Heart Failure

- Causes of acute onset:
 - new arrhythmias
 - new myocardial infarction
 - acute volume overload
 - stress
- 

Signs & Symptoms: Congestive Heart Failure

- Shortness of breath
- Exertional dyspnea
- Fatigue
- Orthopnea(2-3 pillows to sleep)
- Cough
- Rales (crackle) at lung base
- Edema-right side failure
- Plural effusion (fluid in the lungs)
- Pink frothy sputum
- Jugular venous distention

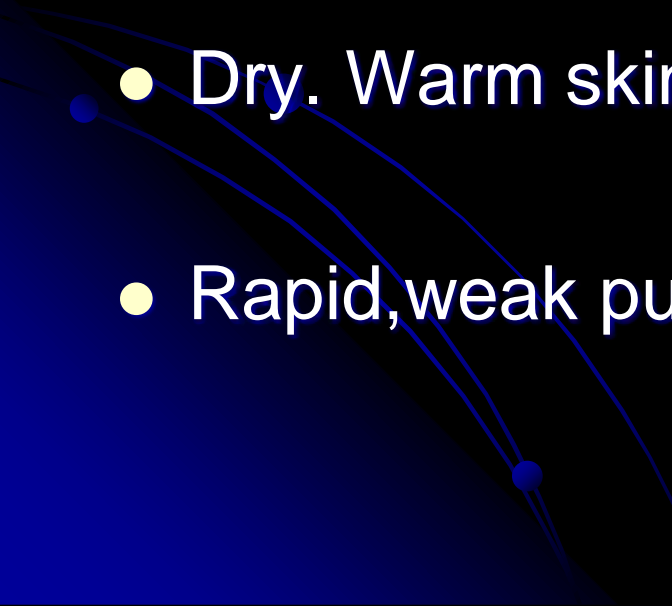
Treatment: Congestive Heart Failure

- Correct underlying cause
 - Stress- Infection - Environmental conditions(heat)
- Administer supplemental oxygen
- Activate emergency response
- Monitor vital signs
- Discontinue procedure
- Have patient rest in semireclined position

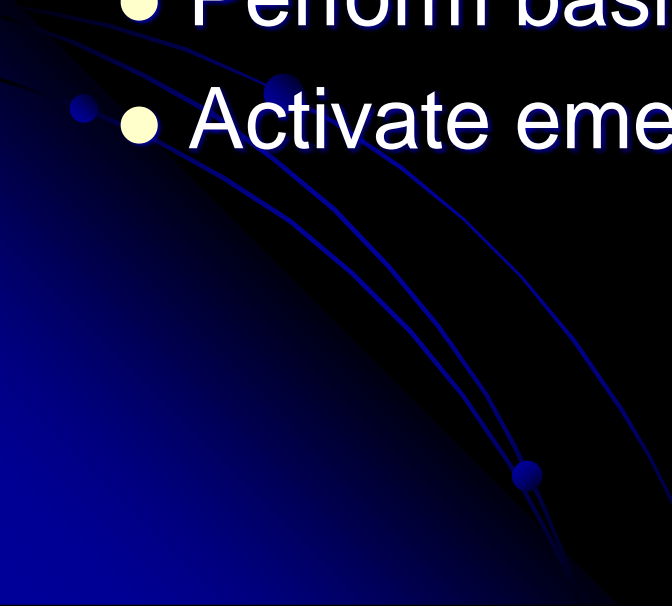
Intro: Hyperglycemia

- Increased blood sugar
- One of two life threatening complications of diabetes
- Slow to develop but if not treated can result in diabetic coma and death

Signs & Symptoms: Hyperglycemia

- Deep, labored respirations
 - Sweet fruity breath
 - Dry, Warm skin
 - Rapid, weak pulse
 - Thirst
 - Lassitude
 - Headache
- 

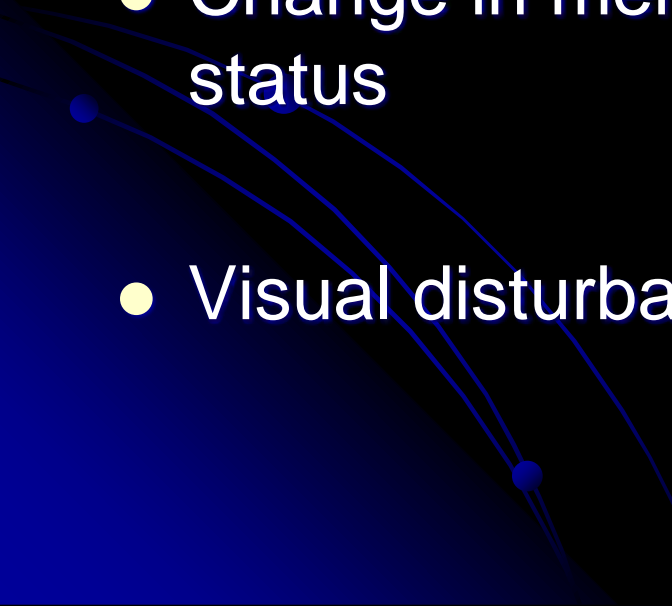
Treatment: Hyperglycemia

- Terminate procedure
 - Administer glucose
 - Oral- paste or drink(must be conscious)
 - IV
 - Perform basic life support
 - Activate emergency response protocol
- 

Intro: Hypertension

- Unlikely to be seen but may manifest as underlying cause of another crisis
- Absolutely essential to control increased blood pressure in response to any other situation
- Must decide if patient needs emergent or referral care—depends on history or any symptoms present

Signs & Symptoms: Hypertension

- Headache
 - Vomiting
 - Change in mental status
 - Visual disturbance
 - Seizure
 - Shock
 - Stroke
 - Blood Pressure Readings - WNL
- 

Treatment: Hypertension

- Discussed elsewhere to control blood pressure
- Must refer for care in hospital by physicians
- Focus on prevention- make sure medication taken, anesthetic w/out epinephrine



Intro: Hyperventilation

- Imbalance in ratio of blood oxygen and blood carbon dioxide levels
- Produced by either rapid or excessively deep respirations
- Common occurrence in dental office as it is result of anxiety or emotional stress
- Recognition and management of patient anxiety can prevent this problem

Signs & Symptoms and Treatment: Hyperventilation

- Signs & Symptoms:

- Dizziness
- Light-headedness
- Numb fingers
- Heart dysrhythmias
- Abdominal cramps
- Muscle cramps

- Treatment:

- Terminate dental treatment
- Reassure the patient
- Try to institute regular respirations
- Rebreath exhalations to reverse alkalosis (breath into hands/bag)

Intro: Hypoglycemia

- Condition of acutely decreased blood sugar
- Life threatening- more critical than hyperglycemia in emergency situation
- Must be treated rapidly
- Administration of glucose is indicated - will not significantly affect patient

Signs & Symptoms and Treatment: Hypoglycemia

● Signs & Symptoms:

- Hunger
- Nausea
- Cool, moist skin
- Shallow respirations
- Irritation
- Confusion
- Bizarre behavior

● Treatment:

- Terminate procedure
- Administer glucose
 - Oral-paste or drink
 - IV
- Perform basic life support
- Activate EMS

Intro: Myocardial Infarction

- Occurs when myocardial oxygen demand exceeds available oxygen supplied by blood for an extended period.
- Most myocardial infarctions result of atherosclerotic coronary artery disease
- Plaques develop and occlude coronal arteries, decrease blood flow to myocardium, cause irreversible damage

Signs & Symptoms: Myocardial Infarction

- Chest pain
 - Crushing
 - Radiating to neck, jaw, arm, back
 - Substernal
- Hypertension or hypotension
- Indigestion
- Diaphoresis (sweating)
- Shortness of breath
- Tachycardia or bradycardia
- Dysrhythmias
- Loss of or alteration in consciousness

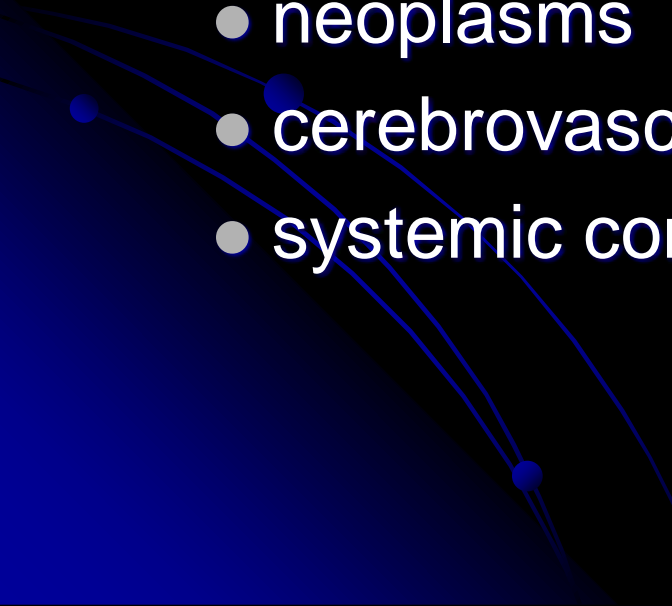
Treatment: Myocardial Infarction

- Discontinue dental treatment
- Place patient in semireclined position
- Administer supplemental oxygen
- Continually monitor and record vital signs
- Administer sublingual nitroglycerin 0.4mg every 5 minute for 3 doses
- If no improvement, activate EMS

Intro: Seizures

- Sudden and unexpected central paroxysmal neuronal depolarization of nerve cells that result in uncontrolled muscular movement.
- Two types:
 - Focal- limited
 - Generalized- loss of consciousness

Intro: Seizures

- Caused by:
 - head injuries
 - infections
 - neoplasms
 - cerebrovascular disease
 - systemic conditions idiopathic
- 

Signs & Symptoms: Seizures

- Feeling of aura-visual, auditory or olfactory sensory disturbance
- Minor personality changes
- Depression
- Anxiety
- Headache
- Loss of consciousness, muscle rigidity
- Tonic/Clonic movements

Treatment: Seizures

- Place patient in reclined or supine position
- Protect patient from injury during seizure
- Protect head from injury during seizure
- Administer supplemental oxygen prn
- Suction mouth secretions-turn head to side if vomiting occurs-clear airway
- Monitor vital signs
- Initiate further support if needed

Treatment: Seizures

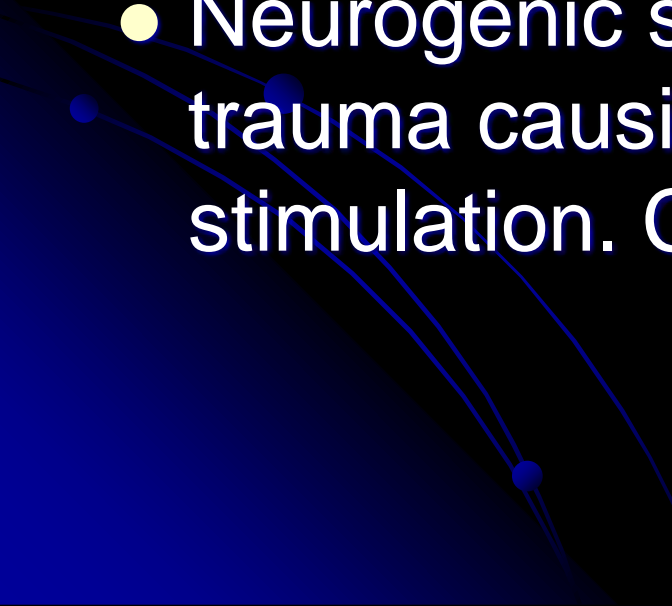
- Do not allow patients to drive themselves home. Arrange for transportation home by family member or other service.



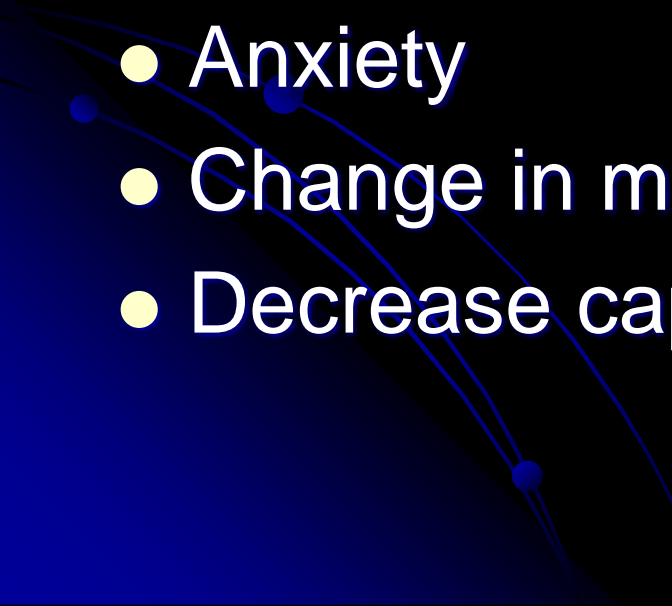
Intro: Shock

- Condition in which circulatory system inadequately perfuses body tissues resulting in cellular hypoxia
- Hypovolemic shock: due to sudden and acute loss of blood-secondary to trauma
- Septic shock: vasodilatory action of endotoxins produced by virulent systemic bacteremia

Intro: Shock

- Cardiogenic shock: failure of heart to pump a sufficient amount of blood to maintain perfusion pressure
 - Neurogenic shock: result of spinal cord trauma causing loss of sympathetic stimulation. Causes vasodilation.
- 

Signs & Symptoms: Shock

- Hypotension/postural hypotension
 - Tachycardia
 - Cool skin
 - Pale skin color
 - Anxiety
 - Change in mental status
 - Decrease capillary refill
- 

Treatment: Shock

- Goal to maintain perfusion pressure and maintain oxygenation to vital organs and tissues
- Monitor vital signs
- Place in Trendelenburg position
- Keep quiet and warm
- Activate EMS
- Provide supplemental oxygen
- Monitor skin signs and capillary perfusion