Chapter 19 Toxicology

Introduction
- Each day, we come into contact with things that are potentially poisonous.
- Acute poisoning affects 5 million people each year.
- Chronic _______________________ is much more common.
  - Caused by abuse of medications, _______________________ , alcohol, drugs

Definitions
- _______________________ : the study of toxic or poisonous substances
- Poison: Any substance whose chemical action can damage body structures or impair body functions.
- Substance Abuse: The knowing misuse of any substance to produce a desire effect.
- _______________________ : a toxic dose of a drug

Consider Poisoning In Patients With:
- Gastrointestinal S/S
- Altered LOC, Seizures, Unusual _______________________
- Disturbed Autonomic Nervous System
  - Pupil changes, salivation, diaphoresis
- _______________________ Depression
- Burns, Blisters of Lips or Mucous Membrane
- Vague or allusive _______________________

Identifying the Patient and the Poison
- If you suspect poisoning, ask the patient the following questions:
  - What _______________________ did you take?
  - _______________________ did you take it or (become exposed to it)?
  - How much did you ingest?
  - What _______________________ have been taken?
  - How much do you weigh?

Determining the Nature of the Poison
- Take suspicious materials, containers, and _______________________ to the hospital.
- Provides key information on:
  - Name and concentration of the drug
  - Specific ingredients
  - Number of pills originally in bottle
  - Name of manufacturer
    - _______________________ that was prescribed

Poison Control Centers
- Staff have information on most substances.
- Center has information on emergency treatments and antidotes.
If poison control is contacted, gain permission for treatment from ________________ control
1-800-764-7661
Can provide guidance but _________________ provide medical direction or
give orders to EMS

8 Routes of Poisonings
- ______________________ : By mouth
- Inhalation: Breathing in gases, toxins, or chemicals
- Injection: Mostly from deliberate drug overdose
- ______________________ : Corrosive substances that contact the skin
- All routes can be ______________________

9 How Poisons Get Into the Body

10 Ingested Poison (1 of 3)
- Poison enters the body by ______________________.
- Accounts for 80% of poisonings
  - Drugs
  - Liquids
  - Household cleaners
  - Contaminated ______________________.

11 Ingested Poisons (2 of 3)
- May be ______________________ or deliberate
- Signs and symptoms vary greatly with the:
  - Type of poison
  - ______________________ of the patient
  - ______________________ that has passed since ingestion

12 Management of Ingested Poisons (1 of 2)
- Goal is to rapidly ______________________ as much poison as possible from the
  GI tract.
  - Further care will be provided at the emergency department
- In the past, syrup of ipecac was used to induce vomiting.
  - Generally ______________________ used today

13 Management of Ingested Poisons (1 of 2)
- Assess ABCs.
- Prepare for ______________________.
- Activated ______________________ may be indicated.
  - Will bind with poison to decrease potency and expedite removal
  - Consult with medical direction

14 Activated Charcoal (1 of 2)
- Charcoal is not indicated for:
- Ingestion of an acid, alkali, or petroleum
- Patients with decreased level of consciousness
- Patients who are unable to swallow

Usual dosage (_________g/kg)
- ___________ to ___________ g for adults
- 12.5 to 25 g for pediatric patients.

15 **Activated Charcoal (2 of 2)**
- Obtain approval from medical control.
- ________________ bottle vigorously.
- Ask patient to drink with a straw.
  - You may have to ________________ the patient to drink
- Record the time you administered the activated charcoal.
- Be prepared for vomiting.

16 **Inhaled Poisons (1 of 2)**
- Wide range of effects
  - Some inhaled agents cause progressive lung damage.
- Move to ________________ air immediately.
- All patients require immediate transport.
  - ________________ is greatest danger
  - Some poisons may require decontamination

17 **Inhaled Poisons (2 of 2)**
- Carbon Monoxide Poisoning
  - Colorless, tasteless, and ________________ gas
  - Produced by incomplete combustion
  - Binds to hemoglobin ____________ times more readily than oxygen
  - S/S: N/V, headache, “roaring” in ears, seizures, coma, and cherry red skin
- Suspect respiratory ________________
- Pulse ox may register ____________ saturation

18 **Injected Poisons (1 of 2)**
- Usually result of drug overdose
- Signs and symptoms may include:
  - Weakness
  - ________________
  - Fever/chills
  - Unresponsiveness
  - ________________

19 **Injected Poisons (2 of 2)**
- Impossible to remove or ________________ poison once injected
  - Usually absorbed quickly into the body
  - Can cause intense ________________ tissue destruction
• Monitor the airway, provide high-flow oxygen, be alert for nausea and vomiting, and transport promptly.

20 Care for Injected Poisonings
• Try to slow absorption
  • Venous _______________________ bands
  • Cold Packs
  • Splinting
• Remove _______________________ if swelling starts
• Monitor airway and respirations
• ABCs and prompt transport

21 Absorbed Poisons (1 of 2)
• Many substances will damage the skin, mucous membranes, or eyes.
  • Substance should be _______________________ from patient as rapidly as possible.
  • If substance is in the eyes, they should be irrigated.
  • Do not irrigate with water if substance is _______________________ .

22 Absorbed Poisons (2 of 2)
• Signs and symptoms include:
  • A history of _______________________ 
  • Liquid or powder on a patient’s skin
  • Burns
  • Itching
  • _______________________ 
  • Typical odors of the substance

23 Treatment of Absorbed Poisonings (1 of 3)
• Avoid _______________________ yourself or others.
• While protecting yourself, remove substance from patient as rapidly as possible.
• Remove all contaminated clothing.
• Flush and _______________________ the skin.
• Avoid using “_______________________ ” agents

24 Treatment of Absorbed Poisonings (2 of 3)
• Try to obtain Material Safety Data Sheet (MSDS) of substance
• If in eyes _______________________ continuously
  • 5 to 10 minutes for acid substances
  • 15 to 20 minutes for alkalis
• If dry material, _______________________ off as much as possible then flush with copious amounts of water

25 Treatment of Absorbed Poisonings (3 of 3)
• If chemical is water reactive:
  • Brush the chemical off.
• Remove contaminated __________________________.
• Apply a __________________________ dressing to the burn area.
• In all cases involving flushing the skin, assure adequate __________________________ supply

26 General Care of Poisonings (1 of 2)
• Ensure scene safety
  • __________________________ activity involving illegal drugs
  • Hazardous conditions
  • Suicide attempts
• Treat the patient, not the poison.
• Rule out __________________________.
• Hi-Con oxygen.
• Bring in __________________________ of poison if possible.

27 General Care of Poisonings (2 of 2)
• Save __________________________ for analysis.
• Contact Poison Control and Medical Control
• If amount taken cannot be determined, assume __________________________ missing content was taken

28 Emergency Medical Care
• __________________________ decontamination is important.
• Care focuses on __________________________: assessing and maintaining ABCs.
• You may be permitted to give activated charcoal for ingested poisons.
  • Contact medical control or follow protocols

29 Substance Abuse Terms
• Drug: substance for preventing or treating of diseases or enhancement of the welfare of humans or animals.
• __________________________: An overwhelming desire or compulsion to continue using the drug.
• Dependency: physical and psychological state in which the drug is required to prevent withdrawal
• __________________________: Increasing resistance to a drug

30 Alcohol (1 of 3)
• Most commonly abused __________________________ in the US
• Kills more than 200,000 people a year
• Alcohol is a powerful CNS depressant.
• Acts as a __________________________ and hypnotic
• A person that appears intoxicated may have a __________________________ problem.

31 Alcohol (2 of 3)
• Intoxicated patients should be transported and seen by a __________________________.
• If patient shows signs of serious CNS depression, provide respiratory support.
• Patients may also experience hypoglycemia, trauma, internal bleeding, respiratory depression, and shock.
• A patient with alcohol withdrawal may experience delirium \textbf{delirium tremens} (DTs).

32 \textbf{Alcohol (3 of 3)}
• Patients with DTs may experience:
  • \textbf{Agitation} and restlessness
  • Fever
  • Confusion and/or disorientation
  • Delusions and/or hallucinations

33 \textbf{Care for ETOH Patients}
• Use caution, protect yourself
• Check closely for other illnesses or \underline{complete history and head to toe as needed}
  • Alcohol combines with other medications.
  • Suspect other medications or substances
• Treat patient with same care as others.
• Protect \underline{from vomiting}.

34 \textbf{Opioids (Narcotics) (1 of 2)}
• Drugs containing \underline{opiates} from the poppy seed
• Most of these, such as codeine, Morphine, Darvon, and Percocet, have medicinal purposes.
• The exception is \textbf{heroin}, which is illegal.
• Opioids are CNS \underline{depressants} causing severe respiratory distress and constricted (pinpoint pupils).

35 \textbf{Opioids (Narcotics) (2 of 2)}
• Care includes supporting airway and \underline{respiratory support}.
• You may try to wake patients by talking loudly or \underline{gently}.
• Always give supplemental oxygen and prepare for vomiting.
• Request for \underline{Narcan} back up for administration of a narcotic antagonist (Narcan).

36 \textbf{Sedative-Hypnotic Drugs (Barbiturates) (1 of 2)}
• These drugs are CNS \underline{depressants} and alter level of consciousness.
• Patients may have severe respiratory depression and even coma.
• The main concern is respiratory ______________________ and airway clearance, ventilatory support, and transport.

37  Sedative-Hypnotic Drugs (Barbiturates) (1 of 2)
• ______________________ may be life threatening
• Treatment is to support airway and breathing
  • The antidote (_______________________ ) may be administered in the hospital.

38  Abused Inhalants (1 of 3)
• Common household products inhaled by teenagers for a “high”
• Called “_______________________ ”
• Effects range from mild drowsiness to coma
• May often cause _______________________

39  Abused Inhalants (2 of 3)
• These agents are inhaled instead of ingested or injected:
  • ______________________ , toluene, xylene, hexane
    • Found in glues, cleaning compounds, paint thinners, and lacquers
  • ______________________ and halogenated hydrocarbons are also abused.

40  Abused Inhalants (2 of 3)
• Halogenated hydrocarbon solvents can make the heart hypersensitive to the patient’s own adrenaline.
• Even the action of ______________________ may cause a fatal ventricular arrhythmia and cardiac arrest.
• Give oxygen and use a ______________________ to move patient.
• Prompt transport is essential.

41  Sympathomimetics
• CNS stimulants that mimic the effects of the ______________________ (flight or flight) nervous system
• Cause hypertension, tachycardia, and dilated pupils.
  • ______________________ and methamphetamine are commonly taken by mouth.
  • ______________________ can be taken in may different ways.
    • Can lead to seizures and cardiac disorders
• Be aware of personal safety.

42  Street Names for Sympathomimetics

43  Marijuana
• Smoked by 20 million people daily in the US
• Produces ______________________ , relaxation, and drowsiness
• Impairs short-term memory and ability to work
• Transport to hospital is rarely needed.
• Marijuana can be used as ______________________ for other drugs
  • It can be covered with PCP, crack, or other drugs.

44  Hallucinogens (1 of 2)
• Alter an individual’s sense of ______________________
• _______________________ and PCP are potent hallucinogens.
• Sometimes, people experience a “bad trip.”
• Patient typically are hypertensive, tachycardic, anxious, and
  ______________________

45 Hallucinogens (2 of 2)
• Use extreme caution
• Use a ______________________, professional manner and provide emotional
  support.
• Only restrain if danger of injury exists.
• ______________________ the patient carefully during transport.

46 Anticholinergics
• “Hot as a hare, blind as a bat, dry as a bone, red as a beet, and mad as a hatter”
• Block the _______________________ nerves
• ______________________, Benadryl, Jimson weed, certain anti-depressants
• Patient may go from “normal” to seizure to death within ________minutes.
• Treat ABCs and consider ALS backup.

47 Cholinergic Agents
• Commonly used as _______________________ agents for warfare
• Overstimulate body functions controlled by the parasympathetic nervous system
• Organophosphate _______________________ or wild mushrooms are also
  cholinergic agents.
• S/S produce DUMBELS/SLUDGE

48 S/S of Cholinergic Poisoning
• DUMBELS
• D ______________________
• U Urination
• M Miosis (tears)
• B Bronchorrhea
• E ______________________
• L Lacrimation (pupil  constriction)
• S Salivation

49 Care for Cholinergic Poisoning (1 of 2)
• Main concern is to avoid ______________________
• May require field decontamination
• Priority after decontamination is to decrease the secretions in the
  ______________________ and trachea.
• Provide airway support.
• May be treated as a HazMat incident
• Contact ______________________ backup
50  Care for Cholinergic Poisoning (2 of 2)
- Antidote kits may be available:
  - Mark I kit, DuoDote kit
- Indications include a known _______________________ to nerve agents or organophosphates with manifestation of signs and symptoms.
- The kit consists of an auto-injector of _______________________ and one of 2-PAM chloride.

51  Aspirin
- Signs and symptoms of OD
  - Nausea/vomiting
  - _______________________
  - Ringing in ears
  - Confusion
  - _______________________
- Patients should be transported quickly to the hospital.

52  Acetaminophen
- Overdosing is common.
  - Generally not ________________________ toxic
  - Symptoms may not appear until it is too late.
  - ________________________ failure may not be apparent for a full week.
- Gathering information at the scene is very important.

53  Other Alcohols
- Methyl alcohol and ethylene glycol are more toxic than ethyl alcohol.
- May be taken by chronic alcoholics who cannot obtain drinking alcohol
- More often taken by someone attempting ________________________
- Immediate ________________________ is essential.

54  Geriatric Needs
- Patient may become ________________________ about medications and experience an accidental overdose.
- Elderly patient may intentionally overdose in an attempt to commit suicide.
- Exposures may have increased effects due to ________________________ in various systems of the body.

55  Food Poisoning
- ________________________ bacterium causes severe GI symptoms within 72 hours.
- Staphylococcus is a common bacteria that grows in foods kept too long.
- ________________________ often results from improperly canned foods.

56  Salmonella
- Characterized by severe GI symptoms within 72 hours of ingestion, including nausea, vomiting, abdominal pain, and ________________________
Proper cooking kills ______________________, and proper cleanliness in the kitchen prevents the contamination of uncooked foods.

57  **Staphylococcus**
- The more common cause of food poisoning is the ingestion of powerful toxins produced by bacteria, often in ______________________.
- Quick to grow and produce toxins in food.
- Foods prepared with ______________________, when left unrefrigerated, are a common vehicle.
- Produces extreme GI symptoms

58  **Botulism**
- The most ______________________ form of toxin ingestion
- Can result from eating improperly canned food
- Symptoms are neurologic:
  - ______________________ of vision
  - Weakness
  - Difficulty in speaking and breathing

59  **Care for Food Poisoning**
- Try to obtain as much ______________________ as possible.
- Transport patient to hospital promptly.
- If more than one ______________________ experiences symptoms, suspect food poisoning.
- If possible, bring some of the suspected food to the hospital.

60  **Plant Poisoning**
- Many household plants are poisonous if ______________________.
- Several ______________________ cases of plant poisonings occur each year.

61  **Dieffenbachia**
- Irritation of the ______________________ and/or mucous membranes
- Maintain an open airway.
- Give oxygen.
- Transport the patient promptly to the hospital for ______________________ support.

62  **Management of Plant Poisonings**
- IfAssess the patient’s airway and vital signs:
- Notify poison control center.
- Take the ______________________ to the emergency department.
- Provide ______________________ transport.