Toxicological, Abdominal, Gynecological, Genitourinary & Renal Emergencies (Class 13)

Poisoning & Overdose

- Terminology
  - Addiction
    - Physical and/or psychological dependence on a drug
  - Delirium tremens
    - Alcohol withdrawal
  - Drug abuse
    - Self administration of drugs in a manner not accepted by society or medicine
  - Physical dependence
    - A condition wherein the body must have a continual presence of a drug in order to properly function

- Terminology (Cont.)
  - Poisoning
    - The introduction of a substance into the body which has a toxic effect on the tissues
  - Potentiation
    - The cumulative effect of two drugs is greater than the sum total of their individual effects (1+1=3)
  - Psychological dependence
    - An overpowering desire to re-experience a drug following its first use
  - Tolerance
    - Bodily acclimation to the presence of a drug
  - Withdrawal
    - The physical effects prompted by ceasing use of a drug

- Patient History
  - What substance?
  - When did you ingest/become exposed?
  - If an ingestion, how much did you ingest?
  - Over what time period?
  - Interventions?
  - How much do you weight?

Exposure Routes

- Ingestion
  - Signs & symptoms
• History of ingestion
• Nausea
• Vomiting
• Diarrhea
• Abdominal pain
• Chemical burns around the mouth
• Different breath odors
  - Arsenic produces a garlic odor
  - Cyanide produces an almond odor

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• Ingestion (Cont.)
  - Emergency medical care
    • Remove pills, tablets or fragments with gloves from patient's mouth, as needed, without injuring oneself.
    • Consult medical direction - activated charcoal.
    • Bring all containers, bottles, labels, etc. of poison agents to receiving facility.

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• Inhalation
  - Signs & symptoms
    • History of inhalation of toxic substance
    - CO, chlorine gas, etc.
    • Difficulty breathing
    • Chest pain
    • Cough
    • Hoarseness
    • Dizziness
    • Headache
    • Confusion
    • Seizures
    • Altered mental status

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• Carbon Monoxide (CO) poisoning
  - Most prevalent form of poisoning in industrialized countries
  • Suicide attempts
  • Accidental exposure (home furnace); tend to peak in winter months
  • Workplace/disaster exposure
    - Portable generators develop 150 times more CO than automobiles
    - Smoldering fires generate tremendous amounts of CO
      » Firefighters have significantly shorter lifespan due to heart disease caused by chronic CO exposure
  • Cigarette smoke
    - One cigarette can increase carboxyhemoglobin level by 3%
    - Half life of carboxyhemoglobin is > 4 hours, so chain smoking increases levels significantly
  - 5,000 to 6,000 annual deaths in US due to CO poisoning
  - 40,000 to 50,000 annual Emergency Department visits
• Carbon Monoxide (CO) poisoning (Cont.)
  - Pathology
    • Decreased oxygenation
      - CO bonds with hemoglobin more readily than oxygen
      - Body cannot utilize CO in aerobic metabolism
      - Patient literally suffocates at the cellular level due to no oxygen being available for metabolism
    • Fetal hemoglobin has far greater affinity for CO than does adult hemoglobin
      » All pregnant women exposed to CO, even if slight exposure, should be transported for evaluation
  - Vasodilation
    • Results in hypotension which decreases tissue perfusion
  • Causes tissue inflammation
  • Reduces cardiac function

• Carbon Monoxide (CO) poisoning (cont.)
  - Signs & Symptoms
    • Headache
    • Light-headedness
    • Dizziness
    • Confusion
    • Shortness of breath
    • Nausea
    • Cherry-red skin discoloration (late sign)

• Inhalation (Cont.)
  - Emergency medical care
    • Only trained rescuers should remove patient from poisonous environment.
    • Give oxygen, if not already done in the initial assessment.

• Injection
  - Signs & symptoms wildly varied depending on substance
    • Weakness
    • Dizziness
    • Chills
    • Fever
    • Nausea
    • Vomiting

• Injection (Cont.)
  - Emergency medical care
• Airway and oxygen.
• Be alert for vomiting.
• Bring all containers, bottles, labels, etc. of poison agents to receiving facility.
  - Probably not a good idea to transport contaminated sharps with the patient.

• Absorption
  - Signs & symptoms
  • History of exposure
  • Liquid or powder on patient's skin
  • Burns
  • Itching
  • Irritation
  • Redness

• Absorption (Cont.)
  - Emergency medical care
  • Skin - remove material (including clothing) while protecting oneself from contamination.
    - Liquid - irrigate with clean water for at least 20 minutes (and continue en route to facility if possible).
    - Powder - brush powder off patient, then irrigate with clean water for at least 20 minutes (and continue en route to facility if possible).
  » Caution: some materials produce an endothermic reaction or become caustic in the presence of water.
• Eye - irrigate with clean water away from affected eye for at least 20 minutes and continue en route to facility if possible.

Classes of Drugs

• Alcohol
  - General
  • Ethyl alcohol in all of its manifestations
  • Alcohol is the "great potentiator"
    - Narcotics
    - Depressants
  • The signs and symptoms of other problems mimic alcohol intoxication
    - DKA
    - Head injury
    - Epilepsy (postictal phase)

• Alcohol (Cont.)
  - Examples
  • Beer
  • Wine
• “Hard” liquor
  - Uses
    • No true medical use

• Alcohol (Cont.)
  - Effects
    • Low dose
      - Odor of alcohol
      - Slurred speech
      - Flushed appearance
      - Decreased coordination
      - Decreased reaction time
    • High dose
      - Nausea and vomiting
      - Depressed gag reflex
      - Respiratory depression
      - Slightly dilate pupils
      - Vertigo

• Alcohol (Cont.)
  - Delirium Tremens (alcohol withdrawal)
    • Maniacal behavior
    • Confusion
    • Hallucinations
    • Muscular tremors

• Narcotics
  - General
    • Opium and derivatives of opium
    • Synthetic substitutes
    • Major adverse effect is respiratory depression
    • Easily reversed by a drug called Narcan

• Narcotics (Cont.)
  - Examples
    • Heroin
    • Morphine
    • Demerol
    • Codeine
    • Dilaudid
    • Talwin
    • Darvocet
    • Oxycodone (OxyContin)
    • Hydrocodone (Vicodin)
• Narcotics (Cont.)
  - Uses
    • Analgesia
    • Suppress coughing
    • Anesthesia
    • "Chemical tourniquet"

• Narcotics (Cont.)
  - Effects
    • Low dose
      - Drowsiness
      - Apathy
      - Lethargy
      - Constipation
      - Pinpoint pupils
        » Demerol is the one exception
      - Blurred vision
    • High dose
      - Prolonged sleep
      - Nausea and vomiting
      - Respiratory depression

• Narcotics (Cont.)
  - Withdrawal
    • Early signs
      - Watery eyes & runny nose
      - Increased perspiration
    • Later signs
      - Insomnia
      - Tremors
      - Yawning & sneezing
      - Nausea and vomiting, cramps, diarrhea
      - Tachycardia
      - Hypertension

• Depressants
  - General
    • Sedatives & tranquilizers
    • Drugs which inhibit the sympathetic nervous system
    • Drugs which give psychic relief from anxiety
• Depressants (Cont.)
  - Examples
    • Nembutal (Pentobarbital)
    • Seconal (Secobarbital)
    • Valium
    • Librium
    • Phenergan
    • Quaalude
    • Thorazine
    • Haldol
    • Ketamine

• Depressants (Cont.)
  - Uses
    • Control of anxiety and/or insomnia
    • Control of nausea and vomiting
    • Psychiatric use

• Depressants (Cont.)
  - Effects
    • Resemble alcohol intoxication
    • High dose
      - Pupils
        » Normal
        » Dilated
        » Constricted
      - Coma
      - Weak, rapid pulse
      - Cold, clammy skin
      - Shallow respirations
      - Hypotension

• Depressants (Cont.)
  - Withdrawal
    • Anxiety
    • Agitation
    • Nausea and vomiting
    • Tachycardia
    • Sweating
    • Muscle spasms

• Cannabis products
  - General
    • Drugs manufactured from substances found in the hemp plant
    • Drugs chemically related to substances found in the hemp plant
• One of the most frequently abused drugs in American culture
  - Examples
    • Marijuana
    • Hashish
    • THC (Tetrahydrocannabinol)

• Cannabis products (Cont.)
  - Uses
    • Marinol
      - THC available by prescription
      - Controls glaucoma
      - Controls side-effects of chemotherapy
      - Increases appetite in AIDS patients
  - Effects
    • Low dose
      - Euphoria (an exaggerated feeling of happiness, confidence, or well-being)
      - Drowsiness
      - Increased appetite
      - Pinpoint pupils
    • High dose
      - Disorientation
      - Paranoia

• Cannabis products (Cont.)
  - Withdrawal
    • Insomnia
    • Hyperactivity
    • Decreased appetite

• Stimulants
  - General
    • Drugs producing increased SNS effects
    • Drugs producing mood elevation
    • According to the 2003 National Survey on Drug Use and Health, over 12 million people in the United States (5.2%) reported illicit use of methamphetamine at least once in their lifetime and 607,000 (0.3%) reported current use
  - Examples
    • Coffee
    • Tobacco
    • Cocaine, including crack cocaine
    • Amphetamines
      - Dexedrine
      - Methamphetamine
- Ecstasy (also has hallucinogenic effects)

• Stimulants (Cont.)
  - Uses
    - Appetite control
    - Sleepiness control
    - Topical local anesthetic for the upper respiratory tract
  - Effects
    - Low dose
      - "Rush" then "crash"
      - Exhilaration
      - Hyperactivity
      - Anxiety
      - Apprehension

• Stimulants (Cont.)
  - Effects
    - High dose
      - Dizziness
      - Tremor
      - Pupil dilation
      - Flushed skin
      - Elevated temperature
      - Convulsions
      - Cardiovascular collapse
      - Dental changes

• Stimulants (Cont.)
  - Withdrawal
    - Apathy
    - Depression
    - Fatigue

• Hallucinogens
  - General
    - Drugs producing altered perception
    - Fell from popularity, now making a comeback
  - Examples
• LSD (Lysergic Acid Diethylamide)
• Mescaline (Peyote cactus)
• Psilocybin (Psychedelic mushrooms)
• Phencyclidine (PCP)
• Ecstasy (stimulant with hallucinogenic effects)

Hallucinogens (Cont.)
- Uses
  • CIA interrogation
  • Psychiatric treatment (no longer used for this purpose)
  • Medical uses
    - None

Hallucinogens (Cont.)
- Effects
  • Low dose
    - Hallucinations
    - Restlessness
    - Incommunication
    - Dilated, reactive pupils
    - Drug produces increased SNS response which dilates pupils; drug itself does not affect pupils
    - Repetitive motor movements

Hallucinogens (Cont.)
- Effects
  • High dose
    - Coma
    - Disorientation
    - Misperception
  - Withdrawal
    • Usually not physiologically addictive
    • May be psychologically addictive

Common Drugs of Abuse
- Methylenedioxymethamphetamine (Ecstasy or MDMA)
  • Routes
    - Oral or smoked
  • Synonyms
• Ecstasy, ADAM, candy canes, disco biscuit, doves, E, eckie, essence, hug drug, love drug, M&M, rolls, white doves, X, XTC
  • Onset of action
    - 10 minutes
  • Duration of effect
    - Overall effects typically last 2-3 hours

• Common Drugs of Abuse (Cont.)
  - Phencyclidine (PCP)
    • Routes
      - Smoked (most common), intravenous injection, snorted, added as eye drops, oral ingestion, and transdermal absorption
    • Synonyms
      - Amp, angel dust, animal tranquilizer, dips, dust, elephant, embalming fluid, formaldehyde, fry, hog, ozone, peace pill, rocket fuel, super kools, TicTac, tranq, water, wet
    • Onset of action
      - 30 to 45 minutes after oral ingestion
      - 1 to 10 minutes after snorting or injecting
    • Duration of effect
      - 4 to 6 hours

• Common Drugs of Abuse (Cont.)
  - Lysergic acid diethylamide (LSD)
    • Routes
      - Primarily oral administration, but can be inhaled, injected, and transdermally absorbed
    • Synonyms
      - Acid, animal, barrels, beast, blotter, ‘cid, dots, kool aid, microdots, panes, sandoz, tabs, trips, white lightning, window panes
    • Onset of action
      - 10 minutes following intravenous administration, 20-30 minutes following oral ingestion
    • Duration of effect
      - Effects peak at 2-4 hours and gradually diminishing over 6-8 hours
      - Flashbacks may occur suddenly, often without warning, and may occur within a few days or more than a year after use.

• Common Drugs of Abuse (Cont.)
  - Methamphetamine (Crystal Meth)
    • Routes
      - Users often begin with smoking, intranasal or oral use and progress to intravenous use
    • Synonyms
- Chalk, chrissy, crank, crystal, glass, go, hydro, ice, meth, rock candy, speed, whiz
- Onset of action
  - 5 to 10 minutes following intravenous use and smoking
  - 20 to 30 minutes following oral use
- Duration of effect
  - Overall effects typically last 4-8 hours; residual effects can last up to 12 hours

- Common Drugs of Abuse (Cont.)
  - Cocaine and crack
    - Routes
      - Users often begin with intranasal use or smoking, may progress to intravenous use
    - Synonyms
      - Coke, snow, flake, blow, cane, dust, shake, toot, nose candy, white lady, crack, rock, free-base
    - Onset of action
      - 15 to 30 seconds following intravenous use and smoking
      - 30 seconds to one minute following snorting
    - Duration of effect
      - 1 to 2 hours

**Treatment**

- Establish responsiveness
- Airway
  - Positioning
  - Modified jaw thrust
  - Chin lift
  - Adjuncts as needed
    - Nasal airway
    - Oral airway
    - PTL
- Breathing
  - High flow oxygen
    - Non-rebreathing mask @ 15 LPM
    - Bag-valve-mask assembled and ready
  - Ventilate, assist and supplement breathing as necessary
- Circulation
  - Check and maintain appropriate pulse
  - IV normal saline TKO (may use INT)
- Positioning
- Coma position if breathing
  - Prevent aspiration
- Supine if managing airway
  - Identify drug
    - Good history
    - Transport bottles, pills, etc.
    - Transport pill fragments from vomitus
- NPO (non per os)
- Frequent vital signs
- Psychological intervention
  - Encourage communication
  - Be non-judgmental
  - Tell patient that he/she is experiencing the effects of the drug, not an altered reality
- Emergency transport, if necessary

Medications
- Activated charcoal
  - Medication name
    - Generic - Activated charcoal
    - Trade
      » SuperChar
      » InstaChar
      » Actidose
      » LiquiChar
      » Others
- Medications
  - Activated charcoal (Cont.)
    - Indications - poisoning by mouth
    - Contraindications
      - Altered mental status
      - Ingestion of acids or alkalis
      - Unable to swallow
    - Medication form
      - Pre-mixed in water, frequently available in plastic bottle containing 12.5 grams activated charcoal
      - Powder - should be avoided in field
- Medications
  - Activated charcoal (Cont.)
    - Dosage
      - Adults and children: 1 gram activated charcoal/kg of body weight.
- Usual adult dose: 25 - 50 grams
- Usual infant/child dose: 12.5 - 25 grams

• Medications
  - Activated charcoal (Cont.)
    • Administration
      - Obtain order from medical direction
      - Container must be shaken thoroughly
      - Since medication looks like mud, patient may need to be persuaded to drink it
      - A covered container and a straw may improve patient compliance since the patient cannot see the medication this way
      - If patient takes a long time to drink the medication, the charcoal will settle and will need to be shaken or stirred again
      - Record activity and time

• Medications
  - Activated charcoal (Cont.)
    • Actions
      - Binds to certain poisons and prevents them from being absorbed into the body
      - Not all brands of activated charcoal are the same; some bind much more poison than others, so consult medical direction about the brand to use

• Medications
  - Activated charcoal (Cont.)
    • Side effects
      - Black stools
      - Some patients, particularly those who have ingested poisons that cause nausea, may vomit
      - If the patient vomits, the dose should be repeated once

• Medications
  - Syrup of Ipecac
    • Induces emesis
    • Indication - ingested poisoning
    • Contraindications
      - Caustic poison ingestion
      - Petroleum ingestion
        - Unless pesticide
      - Unconscious patient or decreased LOC
      - Anything depressing the gag reflex
      - Seizures
• Medications
  • Syrup of Ipecac (Cont.)
    • Dose
      - 6 months to 1 year
        » 10 ml Ipecac
        » 2 to 3 oz. tepid water
      - 1 to 5 years
        » 15 ml Ipecac
        » 4 to 6 oz. tepid water
      - 5 years to adult
        » 15 to 30 ml Ipecac
        » 8 oz. tepid water

Abdominal Emergencies

• Assessment
  - Restless or quiet?
  - Pain increased upon movement?
  - Nausea
  - Vomiting
    • Hematemesis (vomiting blood)
      - Bright Red
      - Coffee ground appearance
  - Diarrhea
    • Bright red blood
    • Melena
      - Black, tarry stool
      - Digested blood

• Assessment (Cont.)
  - Visualization
  - Distention
  - Posturing
    - Knee-chest position
    - Fetal position
    - Arms across abdomen

• Assessment (Cont.)
  - Palpation
    • Localize pain to single quadrant if possible
• Brief, gentle, midline palpation for pulsating mass
• Begin in quadrant diagonally away from the pain
• Observe for
  - Pain
    » Point tenderness
    » Rebound tenderness
  - Distention
    » Air
    » Blood
  - Masses
    » Pulsating
    » Non-pulsating
  - Guarding
  - Abdominal rigidity
    » Can patient relax abdominal muscles upon request

  Assessment (Cont.)
  - Auscultation
    • Probably not profitable use of time
    • Listen one minute in each quadrant for peristaltic noises

Problems/Conditions

• Peritonitis
  - Causes
    • Inflammation of peritoneum
      - Perforation of gut or stomach
      - Bile release

• Peritonitis
  - Signs and symptoms
    • Severe abdominal pain
      - Rebound tenderness
    • Abdominal distention
    • Abdominal rigidity
    • Fetal positioning
    • Nausea and vomiting
    • Tachycardia
    • Tachypnea
    • Fever
    •
 Appendicitis
  - Causes
    • Inflammation of appendix
  - Signs and symptoms
    • Abdominal pain or cramping
      - Lower right quadrant
    • Nausea and vomiting
    • Fever
    • Guarding
    • Diarrhea

 Cholecystitis
  - Causes
    • Usually caused by gallstones
  - Signs and symptoms
    • Right upper quadrant pain
      - Usually after large, fat laden meals
      - Can occur at night
    • Fever
    • Nausea and vomiting
      - Bile

 Pancreatitis
  - Causes
    • Gallstones
    • Alcoholism
  - Signs and symptoms
    • Steady midline epigastric pain that radiates to the back unrelieved by vomiting
    • Rales at lung bases (pancreatic enzymes inflame diaphragm causing lung inflammation at bases)
    • Vomiting
    • Weight loss
    • Low grade temperature
    • Tachycardia
    • Extreme fatigue
    • New onset diabetes (hyperglycemia)
    • Cramping (calcium loss causes muscle spasms)
• Hepatitis
  - Definition
  • Inflammation of the liver due to viral infection.
  - Viral
  • Types
    - Type A
      » Highly contagious
      » Transmitted by fecal-oral route
      » Ingestion of contaminated food, milk, water
      » Once had it, you are immune
    - Type B
      » Once thought to be transmitted only by direct blood contact
      » Now know to be transmitted also like Type A
      » No immunity
    - Type C
      » Once thought to be related to blood transfusions
      » Now know to be specific virus
    - Type D
      » Found only with patients also having Type B
    - Type E
      » Patient typically infected by trip to Asia, Central America, India, Africa

• Hepatitis (Cont.)
  - Non-viral (Chemical)
    • Causes
      - Tylenol
      - Carbon tetrachloride
      - Certain mushrooms
      - Certain anesthetic agents
    - Signs & Symptoms
      • Upper abdominal pain, usually in the RUQ (largest area of liver)
      • Fatigue
      • Joint pain
      • Headache
      • Nausea & vomiting
      • Jaundice
      • Dark colored urine

• Cirrhosis
  - Definition
• Liver tissue death, destruction and failure secondary to chronic inflammation of the liver
  - Causes
    • Alcoholism (most frequent cause)
    • Biliary tract disease
    • Hepatitis
  - Pathology
    • Liver cell death and destruction secondary to chronic inflammation
    • When cells repair themselves, they become scar tissue
    • Scar tissue is non-functional and changes the shape and structure of the liver
    • Vessels and ducts are squeezed causing secondary problems (esophageal varices)

  - Cirrhosis (Cont.)
    - Signs & Symptoms
      • Vague abdominal pain, more prominent in RUQ when sitting up or leaning forward
      • Indigestion
      • Nausea & Vomiting
      • Nose bleeds
      • Easy bruising
      • Dry skin
      • Low grade temperature
      • Upper GI bleeding (esophageal varices)

  - Upper GI bleeding
    - Causes
      • Gastric ulcers
      • Esophageal varices
    - Signs and symptoms
      • Hematemesis
        - Bright red
        - Coffee ground appearance
      • Epigastric pain

  - Lower GI bleeding
    - Causes
      • Cancers
      • Ulcerative Colitis/Crohn’s Disease
    - Signs and symptoms
      • Abdominal pain
      • Bloody stools
        - Bright red
        - Melena
• Abdominal aneurysm
  - Causes
    • Weakened aortic lining
  - Signs and symptoms
    • Abdominal pain
      - Radiates
        » Lower back
        » Between shoulder blades
    • Nausea and vomiting
    • Decreased pulses in lower extremities
    • Pulsating abdominal mass
    • Signs and symptoms of hypoperfusion

• Abdominal aneurysm (Cont.)
  - Types
    • Ruptured
    • Dissecting
  - Locations
    • Suprarenal
      - Above the renal arteries
    • Infrarenal
      - Below the renal arteries

• Emergency Medical Care
  - Airway
    • All as previously learned
  - Breathing
    • All as previously learned
  - Circulation
    • Check and maintain a central pulse
    • IV normal saline TKO
    • 20 cc/kg bolus if hypotensive
  - Positioning
    • Trendelenburg
    • Left lateral recumbent
    • Semi-fowlers

• Emergency Medical Care (Cont.)
- NPO
- Treat for hypoperfusion if present
  - High flow oxygen
  - Trendelenburg position/MAST trousers
  - IV with volume expander
    - Normal saline
    - Lactated Ringer's
  - Keep warm
- Emergency transport if unstable vitals