Child Gastrointestinal

Nursing 201: Nursing Care of Special Populations

- Colic
  - Paroxysmal abdominal pain or cramping
  - Usually <3 months
- Signs and Symptoms
  - Loud crying, pulls legs up, red faced, fist clenched
  - When given a bottle: sucks for a few minutes then stops as the wave of intestinal pain occurs
- Etiology:
  - Unclear
  - Possible:
    - Overfeeding
    - Swallow too much air
    - Formula too high in carbs
    - Emotional tension between parent and child
    - Milk allergy
  - More common in bottle fed infant
  - Is frightening- can last for hours
  - 3 hours a day, at least 3 times a week
- Management:
  - Mylicon prn
  - Alternative treatments
    - Car rides, abdominal massage, music, heart beat bears, dietary restrictions for mom if BF (dairy products), "colic carry"
  - Parental support
    - Usually disappears around 3 months
    - Encourage to verbalize feelings

- Gastroesophageal Reflux (GERD)
  - Passive transfer of gastric contents into the esophagus
  - Normal occurrence
  - Frequency and persistence makes it abnormal
  - 1: 300-1000 infants have a significant problem
- Patho:
  - Neuromuscular disturbance
  - Gastroesophageal sphincter and lower portion of the esophagus are relaxed and allow easy regurgitation of gastric contents into the esophagus
  - Usually starts within 1 week of birth
  - Higher risk with CP or neuro involvement
  - Occurs most often after feeding or when infant is laid down after a feeding
- Signs and symptoms:
  - Passive regurgitation or emesis
    - Effortless, non-projective
  - Poor weight gain (not enough calories retained)
  - Irritability
  - Gagging
  - Choking after feed
  - Apnea

        - Recurrent aspiration PNA
- Diagnostics
    - H&P: feeding habits
    - Barium Swallow (observe for reflux)
    - Upper GI series- r/o anatomic obstruction
    - Esophageal pH monitoring
        - Probe through nose to distal esophagus
        - Connect to pH monitor
        - 24 hour measuring (frequency, amount of time acid is present, effects of feeding/positioning/sleep)
    - Endoscopy
- Management
    - Depends on severity
    - Thickened feedings
        - 1 tsp- 1 tbsp rice cereal in feed
    - Hold upright
    - Frequent burping
    - No supine position
        - Left side laying (may need to use wedge)
- Pharmacological Management
    - Antacids
    - H2 Blockers (Tagamet, Zantac, Pepcid)
        - gastric acid production
    - Propulsid
        - gastric emptying
    - Reglan
        - Increases motility
- Treatment
    - Usually self-limiting
        - Improves by 12-18 months
    - Severe, untreated GERD can cause esophageal strictures, recurrent respiratory distress, aspiration PNA, FTT
    - Nissen Fundoplication
        - Loosely wrap the gastric fundus around the lower esophagus
    - If Neuro impaired, may require tube feed

- <u>Pyloric Stenosis</u>
- Patho
    - Pyloric sphincter: opening between the lower portion of the stomach and the beginning portion of the duodenum
    - Circular muscle of the pylorus becomes thickened or hypertrophic leading to constriction of the pylorus and the stomach cannot empty
        - Thickened to about twice normal size
    - Most common in first born, Caucasian, full term, bottle fed, males
- Signs and Symptoms
    - First few to 10 weeks of life
    - Projective vomiting immediately after feed
    - Emesis is sour smelling- no bile
        - Has not reached duodenum
    - Appears hungry after feed
    - Severe: dehydration, metabolic acidosis, FTT, lethargy

- Diagnostics:
  - H&P
  - US
  - Barium Swallow
  - May palpate hypertrophied pylorus
  - Visible peristalsis
- Treatment
  - Surgical
    - Pyloromyotomy (Fredet- Ramstedt procedure)
      - Muscle of the pylorus is split, allowing for larger lumen
    - Good success rate

- <u>Intussusception</u>
- Telescoping of one portion of the intestines into another
- Ileocecal valve is most common
- Results in bowel obstruction
- 2 walls of intestines press on each other causing: inflammation, edema, decreased blood flow
- R/F: ischemia, perforation, peritonitis, shock
- Incidence
  - Most common 3- 12 months
  - 50% occur in kids <1 yo
  - Males
  - Hx of cystic fibrosis
- Etiology
  - Unknown cause
  - 90% no pathologic reason
  - Few have specific intestinal lesions
- Signs and Symptoms:
  - Healthy, thriving child then sudden episode of acute, colicky, abdominal pain (screaming)
  - Pain
    - Draws knees to chest
    - Intervals of comfort and discomfort
    - Pain caused by peristaltic wave (approx Q 15 min)
  - Vomiting
  - Sausage shape mass felt in RUQ
  - Jelly like stool (mixture of stool, blood, mucous)
  - Abdomen tender and distended
- Diagnostics:
  - Subjective findings
  - Abdominal X-ray= r/o bowel perf
  - CT
  - Barium enema
- Management
  - Hydrostatic reduction (barium enema)
    - Utilizes sonographer to follow fluid
    - Force exerted by flowing barium pushes bowel into it’s original position
    - 80-90% success rate
  - Surgical
    - Manual reduction
    - Resect any non-viable intestine

        - NGT to LIWS post-op
    - Reoccurrence most common within 24 hours
    - Passage of normal stool means that intussusception has reduced

- Meckel Diverticulum
- Remnant of fecal omphalomesenteric duct that connects yolk sac with primitive mid-gut during fetal life
- Normally obliterated by 7-8 weeks gestation when placenta replaces yolk sac as source of nutrition
    - If no obliteration- omphalomesenteric fistula
        - Fibrous band connecting the small intestine to the umbilicus
- Arises from border of small intestine
- Usually near ileocecal valve
- Most common congenital malformation of GI tract
- May be a lead point for intussusception
- Higher incidence in males
- Signs and symptoms:
    - Abdominal pain
        - Similar to appendicitis
        - Vague, recurrent
    - Bloody stools
        - Often presenting sign
        - Painless
        - Bright red or dark red with mucous
    - Anemia/ Shock
        - Rare
    - Bleeding may be mild or profuse
- Diagnostics:
    - H&P
    - Radionucleotide Scintigraphy (Meckel Scan)
        - Nuclear study
        - 90% diagnostic
        - Detects presence of gastric mucosa
    - Labs
        - anemia
- Treatment
    - Surgical removal
    - If untreated
        - Hemorrhage
        - Bowel Obstruction
- Nursing Considerations
    - Onset is rapid
    - VS monitoring
    - R/F hemorrhage
    - Good prognosis with early tx
    - Untreated = mortality 15-20%

- Hirschsprung Disease
- Congenital anomaly that occurs 5-12th week gestation
- Absence of ganglionic innervation to the muscle of a section of bowel
    - Inadequate motility

        - Mechanical obstruction
        - Most often occurs in sigmoid colon
- What happens?
    - Absence of nerve cells
    - No peristaltic waves
    - Fecal material does not pass
    - Accumulation of feces
    - Bowel distention proximal to the defect
    - Bowel becomes distended
        - Possible ischemia, entercolitis
- Incidence
    - 1:5000 births
    - Males 4x more common
    - Familial pattern (abnormal gene on Chromosome 10)
    - Often associated with other anomalies (Downs)
    - May be acute or chronic
    - #1 cause of death is entercolitis
- Signs and Symptoms:
    - Constipation
        - No more than 1 BM per week
    - Fecal impaction
    - Passage of ribbon like, foul smelling stool
    - Abdominal distention
    - Palpable fecal mass
    - Poor appetite
    - FTT
- Diagnostics
    - Digital rectal exam
        - Rectum empty of stool
        - Internal sphincter is tight
    - Barium Enema
        - See a transition zone between megacolon and aganglionic distal segment
        - May not be able to expel after BE
    - Rectal biopsy
        - Absence of ganglion cells
    - Anorectal manometry
        - Test the strength of innervation of the internal rectal sphincter
        - Insert a balloon catheter into the rectum and measure the pressure exerted against it
- Treatment
    - Surgical
        - Dissection and removal of the affected section with anastomosis
    - Prior to surgery, need enemas to produce BM
    - Assess nutritional status (TPN, vitamins)

- <u>Hernias</u>
- Umbilical:
    - Failure of umbilical ring to close
    - African Americans, Females, LBW, Premature
    - Most noticeable over first year of life, not at birth
    - Gets larger with increase intraabdominal pressure (straining, crying)

        - Usually spontaneously resolves by 3-4 years
        - If not, surgical
- Inguinal
    - Weakness in lower abdominal muscle wall
    - Typically apparent at 2-3 months
    - "lump" in groin
        - Left, right, or bilateral
    - Pain?- Possible bowel incarceration
        - Surgical emergency
    - Surgical treatment required for resolution
    - Typical post-op care

- Celiac Disease
- Intolerance of gluten (wheat, barley, rye, oats)
- Second leading cause of malnutrition in children
- Incidence
    - 1: 2500 people
    - Declining
        - Possibly r/t delay in introducing solid food
- Cause unknown
- Etiology
    - Gluten consists of glutenin and gliadin
        - Cannot digest gliadin factin
    - Results in accumulation of toxic substance that is damaging to mucosal cells
    - Villi atrophy
    - Reduces absorptive surface
        - Villi appear flattened
- Signs and Symptoms:
    - Noticed after several months after introduction of cereals
    - May not be evident until early childhood
    - Insidious, FTT, Diarrhea
    - Impaired fat absorption
        - Steatorrhea
            - Excessively large, pale, oily, frothy stools
        - Foul smelling stool
    - Impaired nutritional absorption
        - Malnutrition
        - Muscle wasting- especially legs/ buttocks
        - Anemia
        - Anorexia, bleeding disorders (Decreased Vit K absorption)
        - Abdominal distention
        - Behavioral changes
- Diagnostics:
    - Jejunal biopsy- definitive
    - Gluten free diet = dramatic improvement
    - Labs
        - d-xylose absorption test- shows intestines will not absorb nutrients
        - Fat free stool test collection
- Treatment
    - Dietary changes
        - Gluten free

        - Severe malnutrition
            - Supplemental vitamins, iron, increased calories
- Celiac Crisis
    - Happens in very young children
    - Acute episodes of profuse watery diarrhea and vomiting
    - Precipitated by: GI Infection, prolonged fluid and electrolyte depletion, emotional disturbance
- Prognosis
    - Chronic
    - R/F malignant lymphoma of small intestines or other GI malignancies
- Resource
    - American Celiac Society
    - Celiac Spruce Association of USA

- <u>Vomiting</u>
- Forceful ejection of gastric contents through the mouth
- Regurgitation is more passive and effortless
- Common in children
- May be life threatening if untreated
- Usually self-limiting
- Most often- gastroenteritis (viral or bacterial)
- Other causes:
    - Increased ICP
    - Toxic ingestions
    - Food intolerance- allergy
    - Mechanical obstructions
    - Metabolic disorders
    - Psychogenic problems
- Treatment
    - Feeding
        - NPO for short time (3-6 hours)
        - PO Challenge
            - Clear Liquids
                - Ice chips
                - Water/ Popsicles/ Pedialyte in small amounts
        - If tolerate, add dry crackers/ toast
        - Day 2: Soft diet
        - Day 3: Regular Diet
    - Anti-emetics prn (not commonly administered)
    - Prevent aspiration
    - Brush teeth or rinse mouth post vomiting
        - Decreases HCl acid on teeth

- <u>Diarrhea</u>
- Abnormal increase in stool liquidity, frequency, and weight
    - Not a disease
    - Indication of GI disturbance
- Leading cause of illness in children <5 years
- Fatal in 300 kids each year in U.S.
- Most commonly caused by infectious agents/parasites
- Always serious in infants

        - Note anterior fontanelle
- Most commonly spread via fecal-oral route
    - Contaminated food, water, person to person
- The younger the child- more susceptible and more severe
- Lower incidence in breast fed infants
- Rotavirus
    - Most common pathogen identified in U.S
- Other
    - Salmonella
    - Shigella
    - Parasites (Giardia)
    - Excessive sorbitol and fructose ingestion (apple juice, candy)
    - Antibiotics (alter normal flora)
- Signs and Symptoms:
    - Severity depends on frequency/ consistency
    - Consequences
        - Dehydration
        - Electrolyte disturbances
        - Malnutrition
        - Metabolic acidosis
    - Acute diarrhea- lasting 7-14 days (Infection)
    - Chronic- beyond 2-3 weeks (IBS)
    - If hospitalized- assume infection and use precautions until ruled out
- Diagnostics
    - H&P
    - Labs
        - Evaluate for dehydration
    - Stool specimen if diarrhea persists after a few days
- Management
    - Assess imbalances and rehydrate
    - Reintroduce diet early
        - Improve nutritional outcome
        - Decrease # stools, decreased weight loss
        - Decrease length of illness
    - Continue breast feeding
    - Typical K+ depletion
        - Do not replenish until confirmed they do not have ARF
    - No Abx treatment (unless positive cultures or parasites)
    - Antidiarrheal drugs are not indicated
    - Most cases treated at home
    - Oral Rehydration Guidelines
        - Replace 1:1 basis or 4-8 ounces with each loose stool
        - Infant: water/ breast milk/ lactose free formula
        - Older child: Oral Hydration Solutions (OHS) and Regular diet
- Not managed by encouraging intake of clear liquids
    - High carb and low electrolyte content
    - No soda- caffeine is mild diuretic
    - No broth- excessive Na
    - BRAT diet- not for acute diarrhea
        - Little nutrition, high carbs

- Dehydration
- Total output > total intake
- Isotonic Dehydration
    - Water and Na+ lost in proportion to each other
    - Primary form in children
    - S&S: hypovolemic shock
    - Plasma Na+ WNL
- Hypotonic (hyponatremia)
    - Disproportionately high loss of electrolytes relative to fluid loss
    - Electrolyte deficit > water deficit
    - Decreased Na and Cl
    - S&S hypovolemia more pronounced
        - Shock is severe
        - CNS S&S due to brain swelling
        - Dehydration
- Hypertonic (Hypernatremia)
    - Water loss > electrolyte loss
    - Most dangerous
    - Na+ increased
    - Neuro Disturbances Severe (brain shrinks)
        - Seizures, lethargy, hyperreflexia, hyperirritability
- Degrees
    - Described loss in percentage
    - Calculate weight loss (this equals water loss)
    - Earlier detectable sign is tachycardia
        - Dry skin/mucous membranes
        - Sunken fontanels
        - Coolness/ mottling of extremities
        - Decreased turgor
        - Delayed cap refill
        - Decreased urine output
- Compensatory mechanisms try to keep fluid volume
    - Interstitial fluid shift to vascular compartments to maintain blood volume
    - Vasoconstriction to maintain pumping pressure
    - Unable to compensate?
        - Decreased BP
            - LATE SIGN in infants and children!
        - Metabolic acidosis
- Management
    - PO Fluids for oral rehydration
    - IV Therapy
        - NS or RL
        - Bolus 20 ml/kg
            - When do you stop bolusing?
        - Maintenance therapy

- Constipation
- Alteration in frequency, consistency or ease of passing stool
- 3 or more days without passing stool
- Painful BM's- blood streaked
- Obstipation- extremely long intervals between defecation

- Etiology
  - Structural disorders
    - Intestines
    - Spinal cord lesions
  - Systemic disorders
    - Hypothyroid
    - Chronic lead poisoning
  - Medications
    - Antacids, diuretics, opioids, iron supplements, anti-epileptics, antihistamines
- Infancy
  - Often dietary related
  - Almost never in breast fed infants
- Childhood
  - Environmental changes
  - Hurts- hold it in
    - Increased stool accumulation
    - Continual cycle
- School Age
  - Stress and toileting pattern changes
  - Decreased privacy, busy schedules
- Diet
  - Increase fiber and fluids
  - Breads- grains
  - Vegs- raw and cooked
  - Fruits
    - Especially skinned
  - Other
    - Nuts, seeds
- Stool softeners prn

- <u>Encopuresis</u>
  - The passing of stools into the underwear, far past the time of normal toilet training.
  - Primary- never successfully toilet trained
  - Secondary- developed the condition after being successfully toilet trained
- Stool retention → intestinal walls stretch (nerve sensation diminishes) → loss of ability to contract and squeeze the stools → chronic constipation → stools become hard and difficult to pass → painful BM → sphincter weakens → liquid stools seep around impaction → BM may pass and child not aware r/t decrease sensation
  - Diagnosis:
    - Repeated passage of feces into inappropriate places at least once/ month x 3 months
    - Voluntary or intentional
    - 4 years or older
  - Causes:
    - Unsuccessful toilet training, fear, stress
  - Therapeutic Management:
    - Behavior modification/ Reward system, psychological counseling
  - Treatment:
    - Initial Phase: enemas/ laxatives to empty GI tract and shrink to normal size
    - Maintenance Phase: laxatives, enemas, MOM, Mineral Oil

        - Schedule: Regular toilet schedule, reduce stool retention, behavior modification/ rewards
        - Diet: Increase fluids/fiber

- Night Bottle Syndrome
  (milk bottle syndrome)
- Child takes a bottle of milk or juice to bed or frequent nighttime breast feeding for prolonged times
- 18 months- 3 years
- Liquid pools in mouth, bathing the teeth in sugar
- Dental caries result
- Length of time of exposure is crucial factor
- Prevention
    - Eliminate night time bottle (bottle in bed)
        - May substitute water for milk or juice
        - Must break habit
        - Juice in cup, not bottle
    - Dental hygiene
        - Brushing of teeth or cleaning with cloth

- Malnutrition
- Kwashiorkor
    - Protein deficiency with an adequate supply of calories
    - 1-4 years when weaned from breast
        - Often once second child born
- S&S:
    - All body systems affected
    - Thin, wasted extremities
    - Prominent abdomen (ascites)
    - Scale, dry skin with depigmentation
    - Permanent blindness (Severe lack of Vit A)
    - Mineral deficiencies
    - Hair thin, dry, course, full, patchy alopecia
    - Diarrhea
    - Behavioral changes
    - Fatal r/t diarrhea, infection risk, circulatory failure
- Management
    - Dietary changes
    - Immediate tx of electrolyte imbalances and infections
- Nursing Considerations
    - Rest
    - Protect from infection
    - hygiene
- Marasmus
    - General malnutrition of calories and proteins
    - 6-18 months
    - FTT
    - Common in underdeveloped countries
    - S/Sx:
        - Wasting, atrophy of tissues (especially Subcutaneous far)
        - Child appears old

        - Skin flabby and wrinkled
    - Maintain thermoregulation
    - Avoid infections

- Nutritional Deficiencies
- True deficiencies are rare in US
- Vitamin A
    - Green and yellow veggies
    - Results in night blindness, difficult in dim lights
- Vitamin B
    - Meats, beans, nuts, grains
    - Results in paresthesia of hands, diarrhea, vomiting, heart failure
- Vitamin C
    - Citrus fruits, green and yellow veggies
    - Muscle pain
- Vitamin D
    - Fish, enriched food
    - Necessary for calcium absorption
    - Results in poor bone formation, bow legs, spinal deformities, tetany

- Parasites
- Can occur at any age
- Highest incidence in toddlers and preschool age
- Increased emphasis on hygiene
- Usually live in upper intestine
- Dx:
    - Stool specimens
    - String test
        - Nylon string attached to gelatin capsule
        - Swallow
        - Contents examined microscopically
- Treatment:
    - Quinacrine
        - 3-7 days
        - Crush pill due to bitter taste and place in syrup/jam
    - Furoxone
        - Choice but costly
    - Flagyl
        - Antimicrobial
- Nursing Considerations
    - Prevention
        - HYGIENE!
        - Prevent the spread
            - Change diaper as soon as soiled
        - Treat drinking water
    - Compliance

- Guardiasis (Protozoa)
    - Most common in U.S.
    - GI tract
    - Person to person

        - Water
        - Food
        - Animals
- Very resistant
    - Can form membranes that allow them to survive for months in the environment
- S/Sx
    - Diarrhea
    - Vomiting
    - Anorexia
    - FTT
    - Abdominal cramps
    - Constipation
    - Stools: malodorous, watery, pale, greasy
- Tx:
    - Spontaneously resolve in 4-6 weeks
    - Furoxone is drug of choice

- Pinworms (enterobiasis)
    - Caused by nematode
    - Most common helminthic infection in US
    - Thread like worms that live in cecum
        - Eggs are swallowed
        - Hatch in stomach
        - Live for 4-6 weeks and reach adult size
        - Female deposits eggs in perianal area at night
        - Causes itching- kid scratched- reinfect
        - Eggs are too small to see
- S/Sx
    - Intense perianal itching
    - Irritability
    - Restlessness
    - Poor sleep
    - Bedwetting
    - Distractibility
    - Short attention span
    - Perianal dermatitis secondary to itching
- Dx:
    - Use flashlight at night to examine the anal areas (worms will be visible)
    - Tape test- press sticky tape against the anal area
        - Will notice eggs on tape when removed in AM
- Tx:
    - Mebendazole or Vermox
        - Contraindicated in <2 years or pregnancy
        - Treat all in household
    - Antiitch creams
    - Wash all bedclothes, towels, etc. in hot water
    - Keep nails short
    - Wash hands!

- Roundworm
    - Prevalent in warm climates

        - 1-4 years
        - Live in intestines
        - Eggs excreted in feces
        - S/Sx:
            - Mild upper GI obstruction
            - Can enter circulation and reach the lungs

- Hookworm
    - Lives in warm soil
    - Discharges eggs on the soil and then pick up through skin contact
    - S/Sx:
        - Erythema and papular eruption in areas in which organisms migrate
        - Itching, burning
        - Mild to severe anemia, malnutrition

- Tapeworm
    - Results from ingestion of tapeworm larvae living in inadequately cooked beef or pork
    - Can migrate to brain or eyes
    - Tx:
        - Antihelminithics
        - Prevention
        - Proper handling of meats