Spit Happens
What is Reflux?

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What is the most difficult substance to swallow?

WATER

How much saliva do you make in a day?

1.5 liters

How often do you swallow in an hour?
70 times
200 when eating or drinking
10 times during sleep
Swallowing allows for digestion of food and liquids

Swallowing

Voluntary phase

- Bolus of food is created
- Bolus pushed towards back of mouth

Involuntary phase

- Soft palate and nasopharynx close
- Vocal cords close
- Larynx elevates and epiglottis covers airway
- Upper esophageal sphincter opens, pharynx closes, food enters upper esophagus

Swallowing Phase III

- Transit of food thru esophagus
- Liquids empty by gravity
- Need these coordinated to swallow
- Difficulties arise when uncoordinated
GERD

- Advances in therapy have gone beyond antacids and surgery (fundoplication)
- Acute dysphagia might be the first symptom of GERD in older children, adolescents and adults

Asthma: When to Treat for GERD

| Persistent asthma and GER symptoms | Vigorous acid suppressive therapy for 3 months, monitoring outcome variables Consider esophageal pH monitoring or |
| Persistent asthma and no GER symptoms | empiric treatment trial in children with • recurrent pneumonia • nocturnal asthma > 1X weekly • corticosteroid dependence If all studies positive → 3 month trial of antireflux medical therapy, monitoring outcome variables |

Rudolph et al, J Pediatr Gastroenterol Nutr 2001;32:S1

Goals of Pharmacotherapy

1. Control symptoms
2. Promote healing
3. Prevent complications
4. Improve health and quality of life
5. Avoid adverse effects of treatment
Esophagogastroduodenoscopy (EGD)

**Advantages**
- Enables visualization and biopsy of esophageal epithelium
- Determines presence of esophagitis, other complications
- Discriminates between reflux and non-reflux esophagitis

**Limitations**
- Need for sedation or anesthesia
- Endoscopic grading systems not yet validated for pediatrics
- Poor correlation between endoscopic appearance and histopathology
- Generally not useful for extra-esophageal GERD

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**Empiric Therapy**
- Diagnostic Workup

Presenting symptoms of GERD

- Recurrent vomiting in infant
- Poor weight gain in infant
- Recurrent vomiting in older children
- Heartburn in children and adolescents
- Dysphagia or food refusal
- APNEA or ALTE
- Asthma unresponsive to pulmonary txment
• Recurrent pneumonia
• Upper airway symptoms
• Excessive coughing
• Feeding problems
• Wheezing or stridor unrelated to a resp. illness

Conservative Therapy for GER

For Infants
- Normalize feeding volume and frequency
- Consider thickened formula
- Consider non-prone positioning during sleep
- Consider trial of hypoallergenic formula

For Older Children
- Avoid large meals
- Do not lie down immediately after eating
- Lose weight, if obese
- Avoid caffeine, chocolate, and spicy foods that provoke symptoms
- Eliminate exposure to tobacco smoke

SUMMARY

- GER IS COMMON IN HEALTHY INFANTS AND USUALLY RESOLVES BY 18MOS OF AGE
- PEDIATRIC GER CAN PRESENT WITH VARIABLE SYMPTOMS
- APPROACH TO DIAGNOSIS AND TREATMENT DEPENDS ON PRESENTING SIGNS AND SYMPTOMS
- CURRENTLY AVAILABLE TESTS OFTEN DO NOT CONCLUSIVELY DEMONSTRATE A RELATIONSHIP BETWEEN GER AND SPECIFIC SYMPTOMS
- GOOD HISTORY AND CLINICAL JUDGEMENT ARE IMPORTANT FOR OPTIMAL EVALUATION AND MANAGEMENT
Constipation Infancy to Adolescents

Carole S Rudman MS CPNP
How does the normal bowel function?

- The food you eat is broken down mechanically and biochemically as it passes through the GI system.
- Nutrients needed by the body are absorbed at various points along the intestines while the left over waste products are propelled down and out.

Defining Constipation

- Very large bowel movements
- Small very hard and or dry BM's
- Very narrow and stringy stools
- Straining during BM
- Blood around the outside of stool
- Abdominal pain and or bloating between BM's

Cont.

- Crankiness and or listlessness relieved by having a BM
- Wetting especially if during both night and day
- Smears or leakage of stool in underwear or diaper = ENCOREPSIS
- Extreme reluctance to use toilet
The Evaluation

- History and exam are key
  - “a history of stool withholding behavior reduces the likelihood that there is an organic disorder.” NASPGHAN
  - KUB may be useful if case is questionable by history or exam
    - May allow visualization of stool in pelvic area beneath palpable abdomen
    - May elucidate clear impaction beyond finger length

What to watch out for...

- Red flags that organic disease may be present
  - Onset <12 months
  - Delayed passage of meconium
  - No stool withholding
  - No soiling
  - FTT
  - Tight anal sphincter (explosive stool with rectal exam)
  - Empty rectum
  - Abnormal neuro exam
  - Heme positive stool
  - No response to conventional treatment
Medications that can cause constipation

- Ritalin
- Tylenol with codeine
- Antispasmodics ie: levsin, donnatol, bentyl
- Antihistamines
- Antacids containing calcium/aluminum
- Products containing iron and iron supplements

Constipation: an important medical condition

- Constipation is the leading GI complaint
- Mentioned in 4.5 million physician visits/year
- Treatment options are dwindling

Laxatives Use and Precaution

- Bulk Agents:
  - Metamucil
  - Benefiber
  - Fibercon
Stool softeners

- Colace
- Miralax
- Lactulose/Kristalose

Lubricants

- Mineral Oil
- Kondremule

Hyperosmotic laxatives

- Glycerin Suppository
• Stimulants

Milk of Magnesia
Dulcolax
Ex Lax
Senekot
Castor Oil

Combination Medications

Haleys MO (magnesium and mineral oil)
Correctol (phenolphthalein and docusate)
Pericolace (casanthranol and docusate)

Stool Softening

Softening agents should be:
- Effective
- Palatable
- Free of side effects
- Safe for long term use
Keep traffic flowing

- Goal = soft-serve ice cream-like stools qd-BID

Dosages

- Miralax = 1gm/kg/day
- Milk of Magnesia = 1-4ml/kg/day
- Lactulose = 1-3gms/kg/day
- Mineral Oil = 2-6ml/kg/day
- Mag citrate = <6yrs 1-3mg/kg/day
  - 6-12 yrs = 3-5ounces/day
  - >12yrs = 5-10ounces/day

MIRALAX

- Indicated for occasional constipation
- Free flowing easily dissolved powder
- Mixes in anything
- Tasteless
- No electrolytes
Initial Evaluation

- Labs: TSH, T4, Electrolytes, Celiac Screen, Iron, TIBC

Fixing Constipation

- 1) Disempaction
- 2) maintenance therapy (minimum 6mos)
- 3) Behavioral modification

Acknowledgement

- Listen to your body
- Acknowledge that “nobody poops at school”
- Discuss ways to overcome public toilet fear
- Schedule toilet time before and after school
- Arrange to use nurses office
- Reward system if appropriate
Unpublished tricks to Miralax

- Every parent is afraid of the “addictive” potential
- NO Miralax holidays
- Give it whatever time of day the patient drinks the best
- Measure in teaspoons
- Mix it with favorite liquid

Normal stooling pattern

- Adults: 3/day to 3/week
- Infants 4/day
  - Breast fed large range multiple/day to 1/week
  - 2 yrs 2/day
  - 4 yrs average 1-2/day to qod

Constipation in Adolescents

- Food intolerance
  - Allergy
  - Something they can't absorb completely
- Unbalanced Diet
  - primarily high in processed grains(sugars)
  - processed foods
Typical adolescent diet
- Increased milk intake
- Low fiber
- Marginal fluid intake
- Vitamin and mineral deficiency
- Essential fat deficiency

Therapy
- Balance the diet
  - Increase whole foods: nuts, seeds, dried fruit, whole grain
  - Eat at regular intervals
  - Supplement with a probiotic: esp. acidophilus
  - Aloe
  - Vitamin and minerals: Ca, mg
  - Essential fats

Optimal nutrient sources for constipation
- Vitamin C
- Kiwi
- Green/red pepper
- Broccoli
- Brussel sprouts
- Papaya
- Citrus
- Magnesium
- Legumes
- Tofu
- Soybean nuts
- Buckwheat
- Oats
- Molasses
- Chocolate
- Halibut
- Shrimp
- Brown rice
Stop using/abusing laxatives

Improve bowel flora: poor bowel flora causes the digestive system to move sluggishly. Bifidobacteria help regulate peristalsis, it ferments fiber which produces short chained fatty acids to fuel the colonic tissue.

 Therapies

- Mg 400-500mg/day
- Vit C (helps soften stool)
- Exercise/movement
- Biofeedback (learn to relax pelvic floor muscles)
- Avoid caffeine, EtOH, soft drinks they dehydrate

MAKE WHOLE GRAINS THE RULE AND PROCESSED GRAINS THE EXCEPTION
Diarrhea IBS

- Ford et al. BMJ, 2008 reviewed treatments:
  - Hycosamine: 22 trials,
  - Tegaserod: 8 trials,
  - Alosetron: 6 trials,
  - Tricyclics: 8 trials,
  - Peppermint oil: 8 trials.
- Overall more effective than placebo, Peppermint with the smallest treatments to effectiveness.

- Peppermint: commonly used as gut remedy.
  - Prolongs orocecal transit time, inhibits smooth muscle contraction through Ca-channels. Rapidly absorbed in proximal gut so needs to be enteric coated to avoid upper GI side effects.
  - Goerg kj, Alim Pharm Ther 2003, Gigoleit Phytomedicine 2005
  - Also used to reduce colonic spasm with GI procedures.
- Chamomile: antispasmodic, possible anti-inflammatory
  - German study: 2006, chamomile and pectin reduced severity and duration of diarrhea.
  - Savino et al Phystherp 2005, combined with fennel helped colic vs placebo

Some Carminatives: Anise, Basil, Caraway, Catmint, Cinnamon, Dill, Fennel, Ginger, Lemon balm, Peppermint, Sage, Thyme

Spices which can be added to foods or used as supplements

IBS

- Complex disease
- Multiple factors
- Heterogeneous
- Frustrating for all
- Recognizing reality of pain and mind-body component. Better than “all in your head”
- Patient-practitioner interactions critical.
  - Kaptchuk et al BMJ, 2008
- More recent data with ~ 50% using CAM
Anxiety

• Major component and I almost always treat
  – Hops: excellent herb. Also effective as a bitter for upper GI issues. Pills or tinctures, commonly add to tea
  – L-Theanine: anxiolytic from green tea.

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Iberogast

• Proprietary blend of Chamomile, peppermint, caraway, candytuft, licorice lemon balm and +/- milk thistle, angelica and celandine depending on which prep
Probiotics

- From chart by G Mullin
- 18 RDBC Trials in IBS
  - 10 with benefits, from overall improvement to reduction in flatulence
  - 3 others with improvement but no better than placebo (note 40-50% improvement in both arms of study!)
  - Most common organisms: Lactobacillus, Bifidobacterium, and Saccharomyces

Botanicals/Supplements

- Usually look at constipation vs diarrhea IBS
- If both try and focus on primary concern or secondary symptoms IE bloating, nausea etc.
- Commonly Bloating is a major complaint, therefore carminatives are popular herbs.
- Carminatives may have secondary effects such as anti-emetic, anti-inflammatory, URI treatments, anxio-lytic.

Triphala and Licorice

- Common Ayurvedic treatment for constipation, may also help with diarrhea
  - 3 fruits (Terminalia chebula, T. blerica, Phyllanthus emblica)
  - Comes as powder or pill. I commonly add to senna/chamomile tea.
- Licorice: 5-HT receptor antagonist
  - May be useful as previously discussed.
THE END