Welcome to the NICU Consortium

Agenda

October 26, 2016

9:00 am  Welcome, Announcements
9:15 am  'Hot Topics in NICU''
Dr. Anna Zimmermann
Rocky Mountain Hospital for Children
10:15 am  Break
10:30 am  "GI Concerns After Discharge from the NICU''
Dr. Theodore Stathos
Rocky Mountain Pediatric Gastroenterology
11:30 am  Adjourn
11:35 am  NICU Consortium Steering Committee – To 12:30 pm

Please join us if you would like.

JFK Partners and HCP, a program for Children and Youth with Special Health Care Needs

• Accessing Children's Benefits through Health First, Colorado's Medicaid State Plan
  Mon., Nov 14, 2016 - 9:00-10:30 a.m.
  JFK Partners website – deadline Nov. 8, 2016

NICU Outreach and Transition Partnership Update

Small Work Groups
1. Outreach to families, family advocates. Family engagement
2. Family empowerment, family advocacy
3. Mental health support for families and providers
4. Education and capacity building for the NICU and community
5. Building coordinated systems of care for families
6. Sustainability through data, community collaboration, grants, fundraising

If you are interested in working with any of these groups or attending the next meeting but were unable to attend in September, contact Barbara at specialcare@sk-sc.org.

Next Full Meeting: February 2017 – date to be announced

Hot Topics in Neonatal Nutrition

• Anna Zimmermann, MD, MPH
• Neonatologist, Pediatric Medical Group, RMHC

Topics Covered

• Nutritional Concerns after Discharge
• Marijuana Protocols

Discharge nutrition
Formula 101

- Standard Term Formulas
  - Enfamil Premium Newborn, Enfamil Premium Infant, Similac Advance
  - General Cow’s milk based, used for standard feeding
  - Historically 20kcal/oz. Similac now 19kcal/oz
  - WIC Contract is with Enfamil

Formula 101

- Soy Formulas
  - Prosobee, Similac Isomil soy
  - Used for milk allergy, galactosemia or lactose intolerance
  - If infants have milk allergy, will typically also be allergic to soy

Formula 101

- Semi-elemental formulas
  - Alimentum, Pregestimil, Nutramigen
  - For allergy to intact protein and/or generalized malabsorption
  - Pregestimil has higher % of MCT oil

- Elemental formula
  - Neocate, Elecare, PurAmino, Alfamino
  - Completely elemental, hypoallergenic formula

Formula 101

- Renal Formula
  - PM 60/40
  - Mineral levels approximate the mineral content of human milk
  - Calcium:Phosphorus ratio and content designed to manage serum calcium disorders - both hypercalcemia and hypocalcemia due to hyperphosphatemia
  - Low in Iron

Formula 101

- Human Milk Fortifier
  - Similac and Enfamil products
  - Liquid and powder formulations
  - Used in the NICU to fortify Maternal and Donor Breast Milk
  - Gives added calories - 22kcal/oz and 24kcal/oz
  - Gives additional protein, calcium, phosphorus necessary for growth and bone mineralization in preterm infants

Nutrient needs

- Calories
  - 100-130 kcal/kg/day

- Protein
  - 2.2 - 4 g/kg/day

- Fluid
  - 130-200 ml/kg/day

- Giving 24kcal/oz formula at 160ml/kg/day provides 120kcal/kg/day
Discharge nutrition

- Infants in the NICU receive fortified BM + HMF feedings
- We typically transition infants to premature discharge formula when they are bottling 50% of their feedings
- Providing 5 feedings/day of breast milk and 3 feedings/day of preterm discharge formula
  - Increases protein, calcium, phosphorus vs. “sprinkling” formula in every breast milk feeding for fortification
  - Allows mother to breast feed
- Infants on WIC will go home on Enfamil products.

<table>
<thead>
<tr>
<th>Weight gain goals</th>
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<tbody>
<tr>
<td>Age</td>
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<tr>
<td>Preterm (&lt;2kg)</td>
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<tr>
<td>Preterm (&gt;2kg) - term corrected</td>
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<tr>
<td>0-4 months corrected</td>
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<td>4-8 months corrected</td>
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<td>8-12 months corrected</td>
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How long on Preterm Discharge Formula

- Smaller babies born at earlier gestations need Preterm Discharge Formula longer (2 months - 1 year)
- Recommend minimum 2-4 months for most preterm infants born <32 weeks.
- Would like to see weight at 25%ile and Head Circumference over 10%ile.

<table>
<thead>
<tr>
<th>Vitamin supplementation</th>
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<tbody>
<tr>
<td>All term infants on breast milk need 400 IU Vitamin D until 1 year of age.</td>
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<tr>
<td>All infants on plain or fortified BM need Iron supplementation until 1 year corrected age (2mg/kg/day)</td>
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<tr>
<td>Formula fed infants do not need supplemental Iron</td>
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<tr>
<td>Premature infants on fortified Breast Milk feedings</td>
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</tbody>
</table>
  - Continue Multivitamin supplementation as long as infant remains on breast milk feedings |

Managing Poor Growth

- #1 - Investigate
  - How are parents mixing the formula
  - What is mom’s milk supply like?
  - How many total ounces/day is the infant receiving
  - Other symptoms? Rash? Emesis? Excessive crying?
Managing poor growth

- If infant is receiving at least 120kcal/kg/day
  - Consider increasing volume to provide 130kcal/kg/day
  - Consider increasing calories above 22-24kcal/oz.
    • Can use formula or canola oil
- If infant is receiving >130 kcal/kg/day
  - Think malabsorption, milk protein allergy or other intolerance

Post-discharge HMF

- Just approved by WIC
- May get some help from insurance for private pay patients
- Providers from hospitals across Colorado joined forces to create guidelines to standardize use and recommendations to use powder HMF post discharge to fortify breast milk.

Post-discharge HMF

- Indications:
  - MOC as adequate Breast Milk supply and one or more of the following:
    • Birthweight <1500g
    • <28 weeks at birth
    • Alk Phos >600, Serum Phos <6, BUN <10
    • Radiological evidence of bone demineralization and/or fractures
    • <10% on Fenton Growth curve for CGA at time of discharge

Post-discharge HMF

- Recipes:
  - 22kcal/oz Human Milk: 1 packet HMF + 50mL breast milk (or 2 packets + 100mL)
  - 24kcal/oz Human Milk: 1 packet HMF + 25mL breast milk (or 2 packets + 50mL)

- Daily Limits -- do not exceed 20 packets per day of HMF

Post-discharge HMF

- Recommended Labs to be monitored by Pediatrician
  - Calcium, Phos, Alk Phos levels at 3-4 weeks post discharge and then monthly while infant remains on HMF
  - If Ca or Phos levels are elevated (Ca>11.5mg/dL and Phos >8.5mg/dL), suggest decreasing number of packets of HMF per day)

Post-discharge HMF

- Guidelines for when to Stop HMF:
  - Depends on the nutrition status of the infant
    • 12 weeks Post-discharge with normal biochemical labs
    • Weight >3.6kg with good growth and normal labs
    • Or per RD discretion with agreement with Primary MD
Questions?

Marijuana and Breastfeeding

Marijuana

- Typically inhaled, but can be ingested (Edibles at showers???)
- Made legal in Colorado about 2 years ago
- Most common illicit drug used by pregnant women in US
  - 4.6% report use during 1st trimester
  - 1.4% report use during 3rd trimester
  - Higher rate in CO since legalization
- Overall prevalence of ever using THC among WIC mothers: 30%
- Overall prevalence of current THC use among WIC mothers: 6%. Higher in women <30.

Marijuana

- In Marijuana smoke there are more than 400 compounds present with THC
- THC is the agonist of cannabinoid receptors in the nervous system
- These receptors are found in high quantities in the parts of the brain that influence thought, concentration, memory, pleasure, perception of time and pain and also cognitive concentration

THC: Tetra-hydro-cannabinol

- Releases Dopamine giving euphoric high
- Subtle effects on two opioid receptors giving pain management
- Anxiolytic and calming effects can lead to ambivalence
- Decreases nausea and induces appetite
- Enhances our own natural endocannabinoid system
- Improves selective memory

THC: Benefits

- Beneficial for treating MS
  - Treats spasticity and muscle contractions
  - Alleviates tremors
- Treats Alzheimer’s disease
- Reduces seizures associated with epilepsy
- Treatment for anorexia
- Treatment for HIV/AIDS patients
- Treats symptoms / side effects of chemotherapy
THC: Concerns

- Induced phychosis, delusions, hallucinations
- Impairment of problem-solving, memory and balance
- Drug abuse & dependence
- Neurotoxic to hippocampal cells with potential decreased size of the hippocampus
- Compromises immune system
- Tachycardia, red eyes, dry eyes, dry mouth
- Concerns relating to fetal development during pregnancy
- Concerns with childhood growth and development

Marijuana

- Ingested THC can take up to an hour to peak, with effects lasting several hours
- Half life of THC for an adult is 1 to 2.5 days
- Metabolized through the kidneys
- Urine testing can be positive for 4-6 weeks post inhalation or ingestion
- In infants, urine may test positive for 2-3 weeks after ingestion of breast milk containing THC

“Spice” – synthetic THC

- Can be more dangerous
  - THC analogues in spice are hundreds of times stronger than original product
- Can have side effects including seizures
- Spice can cause seizures and extremely high blood pressure
  - Both are a risk factor for placental abruption and hemorrhage which can cause poor maternal/infant outcomes

Marijuana and Moms

- THC crosses placental barrier
  - Estimated that 33% of the THC in mother’s blood crosses the placental barrier
- THC is secreted in Breast milk
  - THC is fat soluble. Has an affinity for breast milk
  - Levels in BM have been reported in quantities up to 8 times the amount in mother’s blood stream
  - Babies exposed to THC in breast milk - THC can be excreted in the infant’s urine for several weeks
- No studies teasing out prenatal exposure vs postnatal exposure vs both

THC Use during pregnancy: Infant and child effects

- Evidence of short and long term cognitive, behavioral and emotional effects of children exposed prenatally to marijuana
  - Abnormal EEG, abnormal sleep patterns in infants
  - Deficits in academic achievement
  - Deficits in problem-solving skills
  - Deficits in gross motor and coordination
  - Deficits in memory
  - Increased ADHD, impulsivity, anxiety and depression
  - Reports of higher likelihood of becoming users of tobacco and marijuana

Generation R Study

- Study involved ~7500 pregnant mothers
- Cannabis was most commonly consumed illicit drug
- Maternal cannabis use during pregnancy was associated with growth restriction and lower birth weights
- THC use resulted in more pronounced growth restriction than maternal tobacco use
THC and Intelligence

- Study of 648 children — exposure during pregnancy and follow up at 6 years
  - Heavy marijuana use (1+ joint / day) during first trimester was associated with lower verbal reasoning scores
  - Heavy use during second trimester associated with short-term memory and lower quantitative scores
  - Prenatal marijuana exposure has a significant effect on school-age intellectual development

THC and neurocognitive

- Study of 580 mother/child pairs over 14 years
  - Children of heavier marijuana users were more likely to report delinquent behavior at age 14
  - Children exposed to marijuana had more attention problems at age 10 and age 14
  - Difficult to tease out isolated effect of marijuana vs. socio-economic and other environmental factors

Lorr Summary Findings: Effects on exposed offspring of maternal Marijuana use

<table>
<thead>
<tr>
<th>Substantial Evidence</th>
<th>Moderate Evidence</th>
<th>Limited Evidence</th>
<th>Insufficient Evidence</th>
<th>Mixed Evidence</th>
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<tbody>
<tr>
<td>Decreased fetal and infant growth</td>
<td>Still birth</td>
<td>Pica</td>
<td>Premature delivery</td>
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<tr>
<td>Decreased IQ scores in young children</td>
<td>SES (evidence of no association)</td>
<td>Breastfeeding and SES</td>
<td>Low birth weight and SGA</td>
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<tr>
<td>Decreased cognitive function</td>
<td>Depression symptoms</td>
<td>Initiation of future THC use</td>
<td>Newborn behavior issues</td>
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<tr>
<td>Decreased academic ability</td>
<td>Delinquent behavior</td>
<td>Poor breastfeeding and poor latch</td>
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<tr>
<td>Attention problems</td>
<td>Isolated simple VSD</td>
<td>Infants motor development</td>
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<td></td>
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<td>Birth defects including NTD, gastroesophageal</td>
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<td>Frequency of use during adolescence</td>
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Marijuana use during Breastfeeding

- Nationally, 4% of women report using marijuana with infants <3 months old while breastfeeding
  - Limited studies on infants exposed thru breastfeeding - most studies confounded by prenatal exposure
  - Garry, et al reported in 2009 that infants exposed to THC through breastfeeding may show signs of:
    - Decreased motor development at 1 year of age
    - Reduced muscular tone
    - Poor sucking reflex
  - Harkany reported in 2014 that exposure to cannabis while brain developing disrupts synapses (nerve connections) critical for higher order executive and cognitive function (study done in rats)

Marijuana: AAP Recommendations

- Avoid marijuana when pregnant or nursing
  - American Academy of Pediatrics states if you can not avoid marijuana, you should not breastfeed or use breast milk

CO Public Health Statements

- There is no known safe amount of marijuana use during pregnancy
  - THC can pass from mother to the unborn child through the placenta
  - The unborn child is exposed to THC used by the mother, typically in a higher more concentrated dose
  - Maternal use of marijuana during pregnancy is associated with negative effects on exposed offspring, including decreased academic ability, cognitive function and attention. These effects may not appear until adolescence.
  - Marijuana use during pregnancy may be associated with an increased risk of heart defects (isolated simple VSD) in exposed offspring.
CO Public Health Statements

- Marijuana use during pregnancy may be associated with an increased risk of stillbirth.
- There is conflicting research for whether or not marijuana use during pregnancy is associated with increased marijuana use in exposed offspring.
- Marijuana use during pregnancy may be associated with increased depression symptoms and delinquent behaviors in exposed offspring.
- There are negative effects of marijuana use during pregnancy regardless of when it is used during pregnancy.
- THC can be passed from the mother’s breast milk, potentially affecting the baby.

Who gets screened?

- The infant’s cord, urine and/or meconium drug screen may be obtained for the following:
  - Positive screen on mother during pregnancy
  - History of maternal drug use during pregnancy
  - ? What about first trimester use that stops with adequate counseling?
  - No prenatal care, Late prenatal care
  - Placental abruption without clear cause

Implications

- Hospitals and Providers should have policies and education in place to discuss marijuana with pregnant and breastfeeding women
- Children exposed to THC may benefit from early intervention aimed at reducing future problems
- Screening for maternal use and neonatal exposure may have long term consequences for families
- Hospitals and Providers should have policies and education in place to discuss marijuana

Marijuana: Legal Implication

- Current Colorado law defines a baby testing positive at birth for a Schedule I substance (includes THC) as an instance of child neglect.
- This requires a report to social services.
- In Colorado, reports to social services are handled at a county level. Procedures and policies may be different from county to county.
- We find, in well baby and NICU, many mothers do not know that they will be reported to social services for a positive toxicology test.
- Inform patients/mothers while they are pregnant: “Some hospitals test babies after birth for drugs. If your baby tests positive for THC at birth, Colorado law states that child protective services must be notified.”

Patient Resources:

- [www.goodtoknowcolorado.com](http://www.goodtoknowcolorado.com)
- 1-800-children (free statewide resources for families)
- [www.smartchoicessafekids.org](http://www.smartchoicessafekids.org)
- [www.speaknowcolorado.org](http://www.speaknowcolorado.org)
- [www.colorado.gov/cdphe/marijuana-clinical-guidelines](http://www.colorado.gov/cdphe/marijuana-clinical-guidelines)

Factsheets

- Information for the public/patients about marijuana, health effects and legal issues
  - Middle school reading level
  - Working on Spanish versions
  - For health care agencies, blank space on back page to place your logo and contact information if wanted.
Factsheets

• Currently available online:
  – Pregnant/breastfeeding: Marijuana and Your Baby
  – Youth and Marijuana
  – Retail Marijuana: Tips for Parents
  – Retail Marijuana: Tips for Youth Serving Professionals
• In Development:
  – Methods of use
  – General use / laws
  – Facts about Marijuana use

More Information

• “Cannabis Webinar Series for Health Care Professionals”
• Joint presentations from University of Colorado School of pharmacy and College of Nursing
• Multiple Lectures, Including:
  – HASHing It Out: Overview of Medical Uses for Marijuana
  – Buyer Beware: Information about Marijuana for Patients and Special Populations
  – Marijuana POTpourri: The Many Delivery Forms of Medical Marijuana
  – Legal Status, implications and anticipated regulatory developments (coming Sept 21st)
• http://www.ucdenver.edu/academics/colleges/pharmacy/AcademicPrograms/ContinuingEducation/live_events/Cannabis_Webinar_Series/Pages/cannabis.aspx

questions?

Gastroesophageal Reflux

Gastroesophageal Reflux in Children
Theodore Stathos, M.D. and Kyle Kusek, M.D.
Rocky Mountain Pediatric Gastroenterology
October 26th, 2016

Gastroesophageal Reflux

• The most common gastrointestinal problem in children.
• The movement of stomach contents into the esophagus
• GER can produce a wide variety of symptoms.
  – benign regurgitation
  – ALTEs
  – A large percentage of which are outside of the esophagus

Break and Reminder
Please Consider Giving

Smoothing the Transition – NICU Home
Help us continue to provide Family Support Grants to parents of infants discharged from the NICU for newborn cribs, respite care, lactation consultation, support services, and infant supplies. Any amount will help.

#GIVINGTUESDAY – November 29, 2016
Colorado Gives Day – December 8, 2016

Donations: http://www.specialkids-specialcare.org/donate-now
GER vs GERD

- Gastroesophageal reflux disease (GERD) occurs when sequelae are produced by GER.

Physiology of GER

- The lower esophageal sphincter regulates passage of material to and from the stomach.
- Reflux occurs in normal children and adults.
  - 1-2 per hour prior to meals
  - 5 episodes per hour after meals
    - The average UGI takes 42 minutes to complete

The Antireflux Barrier

Good News

More esophagus does not mean more reflux

Causes of GERD associated Esophagitis

- Increased frequency of reflux.
- Poor esophageal clearance of refluxate.
- Increased noxiousness of refluxate.
- Decreased mucosal resistance.

Causes of Increased GER Frequency

- Lower esophageal sphincter hypotonia – Infants
  - LES tone doesn’t approach adult levels until 10-14 months of age
- Transient lower esophageal sphincter relaxation - Adults
  - TLESRs account for 65-75% of reflux episodes in adults with GERD
- Increased gastric pressures & delayed emptying
  - Delays in emptying are present in 20-25% of children < 3 years of age with GERD
  - can come from anything that causes gastric or duodenal inflammation
- Decreased gastric volume
  - Can be caused by common problems such as chronic cough, constipation
Decreased Esophageal Clearance of Refluxate

- Normal peristalsis is essential for esophageal clearance
  - Gravity plays a minor role in esophageal clearance
  - does have an important role in gastric emptying

Increased Noxiousness of Refluxate

- Acid
  - gastric acid hypersecretion
  - Dietary content
- Pepsin
- Duodenal to Gastric reflux
  - Bile Acids & Salts
  - Pancreatic enzymes

Decreased Mucosal Resistance

- Caused by some medications mostly anti-inflammatory meds
  - Prednisone, Prednisilone
  - Ibuprofen suspension
  - Inhaled/swallowed budesonide

What are Possible Sequelae from GERD?

1. Regurgitation
2. Esophagitis
3. Respiratory Changes
4. Neurobehavioral Changes
5. Sinusitis and Otitis
6. Dentition abnormalities

...Regurgitation

- Regurgitant VS non-regurgitant reflux
  - in infants only 14-17% of pH or scintigraphy diagnosed reflux episodes were associated with regurgitation.
  - Normal and abnormal infant reflux changes with time
    - amount increases to about 4 - 6 months of age then approaches adult levels at 12 -14 months of age.
    - Regurgitation can lead caloric insufficiency excessive loss of ingested calories
  - decreased intake due to pain from esophagitis

... Esophagitis

- Chest pain or heart burn
  - in non-verbal patients crying, sleep problems, irritability, "colic", rumination can all be signs of esophagitis.
- Dysphagia
- Complications of reflux esophagitis
  - Barrett’s Esophagitis
  - Stricture
GER Complications

Esophageal stricture secondary to GERD: radiography and endoscopy

Barrett's esophagus: endoscopy and histology

Sequela... Respiratory Symptoms

- Aspiration of refluxate
- Broncho/Laryngo-spasm response from reflux
  - worse with an airway abnormality such as laryngomalacia

Sequela... Neurobehavioral Response to GER

- Sandifer's Syndrome
  - Can mimic torticollis or opisthotonic posturing

Sequela... Sinusitis, Otitis

- Sinusitis
  - More common in toddlers and younger children
  - More often associated with regurgitant vomiting
- Otitis media
  - More common in infants
  - Associated more often with nocturnal reflux

Dentition Changes

Dental erosion or, more correctly, dental corrosion is described as tooth surface loss produced by chemical or electrolytic processes of non-bacterial origin, which usually involves acids.

GERD is associated with at least 20–30% of patients with tooth erosion.

Numerous studies have shown the association between GERD and erosions, however:
- Only 42% of physicians strongly agree that there is an association in adults
- Just 12.5% strongly agree for children
Dentition erosion from reflux

Differential Diagnosis of Esophagitis
- Gastroesophageal reflux
- Food allergy or food intolerance
- Primary eosinophilic esophagitis
- Drug induced
- Infection
  - Candida
  - Herpes simplex
  - Cytomegalovirus
  - Others...

Diagnostic Techniques
- Radiographic
- Endoscopic
- pH monitoring
- Impedence probes

Diagnosis of GER
- Upper GI
  - $250-450
  - Cannot discriminate between physiologic and nonphysiologic GER episodes
  - Not by itself usually diagnostic of GERD
  - Useful for detecting anatomic abnormalities

Anatomic Abnormalities Detected by an UGI
- Pyloric stenosis
- Malrotation

Diagnosis of GER
- Scintigraphy
  - $500-600
  - Uses radioactive Technetium to passively follow the course of a normal meal
  - Detects acidic and non-acidic GER
  - Evaluates gastric emptying
  - May demonstrate aspiration
  - Lack of standardized techniques
  - Absence of age-specific normative data
  - Periodic evidence of eosinophils in early postprandial period
Diagnosis of GER

- Endoscopy with histologic analysis of biopsy
  - direct visualization of the mucosa, LES and gastric cardia
  - $3000-5000

Reflux Esophagitis
1. basal cell hyperplasia
2. Increased vascular peg height
3. Increased eosinophils

Normal Esophagus

Esophagitis

Diagnosis of GER

- 24-48 hour Esophageal pH Monitoring and impedance monitoring
  - the gold standard
  - 99.9% sensitivity
  - $200-300

Current pH probe technology

Bravo Capsule wireless pH monitor

Wired naso-esophageal pH probe
Impedance probes

pH probes vs Impedance probes

<table>
<thead>
<tr>
<th>pH probes</th>
<th>Impedance probe</th>
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<tbody>
<tr>
<td>Wireless in patients over 2 yr of age</td>
<td>Naso esophageal wire</td>
</tr>
<tr>
<td>Endoscopically placed</td>
<td>Patient can be awake (uncommon)</td>
</tr>
<tr>
<td>Established normals</td>
<td>More complete data</td>
</tr>
<tr>
<td>Easy to interpret</td>
<td>Difficult to interpret</td>
</tr>
<tr>
<td>Mild discomfort</td>
<td>Nasal wire</td>
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</tbody>
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Treatment of GER

- To change from one treatment regimen to the next
  - Do symptoms correlating to GERD continue to occur
    - 1. Aspiration
    - 2. Choking or Apnea
    - 3. Pain
    - 4. Failure to Thrive
  - Is there a relationship between reflux and a particular symptom?
    - Bronchospasm, Apnea, Stridor

Conservative Treatment of GER

- Positioning
  - upright 20-30 minutes after meals
- Avoidance of aggravating foods
  - fatty foods, citrus, tomato, carbonated drinks, caffeine, all acidic foods
- Thickening infant feeds
  - 1 Tbsp of rice cereal per ounce of formula
Lecture Note: Often 1 tsp. is accepted

Pharmacologic Treatment of GER

- Prokinetic Agents
  - Metoclopramide 0.2 mg/kg/dose QID
  - Bethanechol 0.2 mg/kg/dose QID
  - Erythromycin 3-5 mg/kg/dose QID
- Barrier
  - Sucralfate suspension 20 mg/kg/dose QID
- Anti acid medication
  - H₂ receptor antagonists
    - Cimetidine 10 mg/kg/dose QID
    - Ranitidine 2 mg/kg/dose BID to TID
    - Famotidine 2 mg/kg/dose BID to TID
  - Proton Pump Inhibitors (PPI’s)
    - Lansoprazole 0.5-3 mg/kg/day QD to TID
    - Omeprazole 0.5-3 mg/kg/day QD to TID

Effect of Lansoprazole on GERD Symptoms

Tolia et al, J Pediatr Gastroenterol Nutr 2002 suppl
Effect of Lansoprazole on Esophagitis

Tolia et al, J Pediatr Gastroenterol Nutr 2002 suppl

% Patients With Esophagitis

Baseline Wk 8 Wk 12

100% 0% 22%

N = 28 children with grade > 2 erosive esophagitis treated with lansoprazole 15-30 mg QD-BID for 8-12 weeks

Effect of Omeprazole on Symptoms in Children with Esophagitis

* % of patients with moderate to severe symptoms
Reprinted from Hassall et al, J Pediatr 2000; 137: 800

Overall Heartburn Dysphagia Irritability Coughing

Surgical Treatment

Nissen fundoplication

NICU Consortium Meeting

• Next Meeting – January 25, 2017
9 AM to 11:30 AM

If you would like to present a topic or hear a topic that would be of interest, please let us know.

www.specialkids-specialcare.org
specialkids@sk-sc.org

Thank You to our Grantors, Sponsors, and In-kind Contributors

Newborn Hope for their support of the “Safe Sleep Going Home” Program
MedImmune Advocacy – for the Community Connections – Transitioning Parents from the NICU to the Home and Community” Grant to learn about parents experiences and recommendations for transitioning home from the NICU
Coram – Exhibitor Support for the “Supporting the Development of Infant Feeding from the NICU to Home When G tube Feedings Are Necessary”

HCP – Colorado Department of Public Health and Environment, Program for Children with Special Health Care Needs for their continued support of the NICU Consortium Educational Meetings/Webinar

Tri-county for their support implementing the Consortium and the NICU Outreach and Transition Partnership

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Boulder County Health Department - HCP Coordinator

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❖ NICU Outreach: Safe Sleep Going Home Program: Wearable Sleep Sac; Blanket Requests
❖ Family Support Grant - Applications for newborn cribs, respite care, lactation consultation, or other health support services needed by families

❖ To receive announcement about future NICU Consortium Meetings, the newsletter, or other information, please sign up on the website
❖ Website: www.specialkids-specialcare.org