



Pediatrics and Infant Care

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Pediatric Lecture Objectives

- Discuss challenges within pediatric OTC medication use
- Identify key points that can aid in overcoming these challenges

Infant Care Lecture Objectives

- Identify variations in infant formula
- Identify key points for the use of infant formula
- Determine appropriate nonpharmacological and pharmacological therapy for self-care of
 - Teething
 - Cradle cap
 - Diaper dermatitis

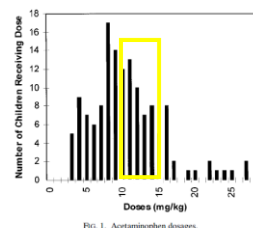
Challenges of Medication Use in Children

- Physiological and pharmacokinetic differences
- Lack of clinical data
- Insufficient dosing information
- Variation among age groups
- Illness potentially more serious
- Dosage form/palatability
- Different adverse drug events
- Unique adherence issues
- Preemptive treatment
- Inaccurate dosing/measuring

Inaccurate Dosing

- Acetaminophen and ibuprofen dosing by parents
 - Cross-sectional study in pediatric ED
 - Caregivers asked to report how much medication given in last 24hrs for fever
 - Where did they find the dosing information?
 - 55% doctor
 - 28% package labeling
 - 8% guessing
 - 4% based on time of last dose

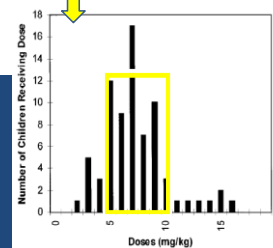
Li SF, Lacher B, Crain E. Acetaminophen and ibuprofen dosing by parents. *Pediatr Emerg Care.* 2000 Dec;16(6):394-7.



47% too little, 15% too much

12% too little, 14% too much

Overall 51% took an incorrect dose



Measurement is key!

- NEVER use silverware
 - Kitchen spoon can vary between 2-10ml
- DO use a medication syringe, dropper, or cup
- Know your conversions
 - 1teaspoon = 5ml
 - 1tablespoon = 15ml
- Doses based on age and weight or body surface area (BSA)



*Dosing of OTC products in the pediatric population.
Pharmacist's Letter/Prescriber's Letter 2006;22(1):220107.*

Increase Palatability

- Flavor
- Liquids
- Tablets/Capsules
 - Can they be crushed
 - Can they be opened and sprinkled on food
 - Any problems?
- Rinse with flavored drink or water
- Chill

Other Important Points

- Beware of brand names
- Consider interactions
- Beware of multiple ingredients
- Beware of concentrations
- Never call medications “candy”
- Give the child some control
- Don't alternate antipyretics

Infant Care



Benefits of Breast Milk

- Study by AHRQ in 2005
 - Screened > 9000 abstracts from developed countries
 - Looked at infant and maternal outcomes
 - Breastfeeding led to reduction in...
 - Acute otitis media
 - Gastroenteritis
 - Respiratory infections
 - Atopic dermatitis and asthma
 - Obesity
 - Diabetes
 - Any many more...



Why formula?

- Maternal medical problems
- Lack of suckling reflex in infant
- Need to go back to work
- Caregiver is not biological mother
- Medications!
 - Citalopram
 - Metronidazole
 - Tamoxifen
 - Lamotrigine

Main Ingredients

- Water (may have to reconstitute, ~85%)
- Carbohydrates
 - Milk based vs. lactose free
- Protein
 - Casein and whey (maybe soy)
- Fat
 - Corn oil, soy oil, safflower oil, etc.
 - Medium-chain triglycerides (MCT)
 - DHA and ARA debate



Additional Ingredients

- Vitamins and Minerals
 - No additional supplementation needed
 - FDA and AAP recommend against low iron products
- Prebiotics and probiotics?
- Carnitine and taurine
- Nucleotides

Specialized Formulas

- Preterm formulas
- Predigested formulas
- Hypoallergenic formulas
- Antireflux formulas (thickened)

Important Points

- Longer intervals between feedings
- Misconception of brand names
- Never use expired, degraded product
- Any change in taste, smell, consistency, or color do not use
- Store in cool, indoor location



Formula Prep

- Wash hands and prepare on a clean surface
- READ container
 - NEVER over or under dilute
 - Don't give water on top of formula
- If use household tap or bottled water, bring water to a boil for one minute and then cool
- Never warm in microwave



- Boil new bottles and nipples for 5 minutes
 - wash with hot, soapy water each use
- Discard any remaining after feeding
- Refer to container for storage of reconstituted formula (usually 48 hours refrigerated)



<http://www.infantformula.org>

Questions?



Teething

- Definition: eruption of baby teeth through the gingival tissue
- Goal: relieve pain and irritation to improve infant's mood and sleep patterns
- Exercise restraint in treatment

Eruption cysts are a normal process



Nonpharmacological Therapy

- Recommended first-line
- Massaging the gum around the eruption
- Give them something to chew
 - Teething rings (AAP recommend firm rubber)
 - Cold, wet cloth
 - Dry food (toast) if old enough



Pharmacological Therapy

- Benzocaine 7.5% or 10%
 - Baby Anbesol Gel, Baby Orajel, Baby Orajel Teething Nighttime Formula
- Gels are easiest to apply
- No more than 4 times daily
- Watch for additional irritation caused by drug



FDA Warning

- Benzocaine use can cause rare, but serious methemoglobinemia
 - Largest risk in **children under 2**
- Symptoms to watch for
 - pale, gray, or blue-colored skin, lips and nail beds
 - shortness of breath
 - fatigue
 - confusion
 - headache
 - light-headedness
 - rapid heart rate

- FDA now recommends avoiding all OTC benzocaine use in children under two unless under the advice of a health care professional
- AAP also recommends against pharmacological treatment of teething

Questions?



Seborrheic Dermatitis

- Known as cradle cap
- Subacute or chronic inflammatory disorder
 - Red, scaly rash
 - Usually within first 3 months
 - Often on scalp and lateral neck



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Treatment

- Usually clears without treatment by 8-12 months of age
- Removal
 - Apply emollient (white petrolatum, mineral oil, baby oil) and leave on overnight
 - Frequent washing with non-medicated shampoo
 - Removal of scales with soft brush or fine-toothed comb

– In severe cases, refer to physician

- Cracked or bleeding skin
- May recommend medicated shampoo
 - Salicylic acid, ketoconazole
- May also prescribe low dose topical steroid
 - 1% hydrocortisone cream
 - Remember OTC hydrocortisone not recommended in kids <2



Questions?



Diaper Dermatitis

- Known as diaper rash
- Can appear on any skin surface enclosed
- Extremely common
 - > 1 million doctor visits annually
 - 2/3 of infants will get at some point
 - Has improved with disposable diapers

Causes

- Occlusion
- Moisture
- Bacteria
- Chafing and friction
- Change in pH (ammonia)
- Enzymes and bile salts from GI tract
- Infrequent changing, cloth diapers
- "Tropical Area"



Clinical Presentation

- Red, wet-looking patches and lesions
- Purplish on darker skin
- Generally skin covered by diaper
 - May spread to outside areas
- Can present in hours
- May take weeks to resolve
- Can progress to more serious diseases

Treatment Goals

- Get rid of rash
- Relieve the symptoms
- Prevent reoccurrences

Only self-treat if uncomplicated, mild-moderate presentation



Nonpharmacological

- Increase frequency of diaper changes (≥ 6 /day)
- Flushing of skin with plain water
 - Shower sprayer, over sink
- May wipe with bland soft cloth or baby wipe
- Gently dry area thoroughly
- Change to disposable diapers
- If still using cloth...
 - Beware of detergents and softeners



Pharmacological Therapy

- Protectants – barriers, absorb/repel moisture

Allantoin	Calamine	Cocoa butter
Cod liver oil	Colloidal oatmeal	Dimethicone
Glycerin	Hard fat	Kaolin
Lanolin	Mineral oil	Petrolatum
Topical starch	White petrolatum	Zinc acetate
Zinc carbonate	Zinc oxide	

- A+D Ointment = Zinc oxide + dimethicone
- Desitin Diaper Rash Ointment = zinc oxide, cod liver oil, petrolatum, lanolin

Key Information

- Over- application preferred
- Reapply as needed and with every diaper change
- Removal of the product will likely require mild soap and water
- Completely cover areas already effected
- Ointment or powder?

Contraindicated

Don't use the following OTC for diaper dermatitis

- Antibiotics
- Antifungals
- Hydrocortisone
- Topical analgesics



Why?

Maalox and Aquaphor

- No studies done
- Often recommended by pediatricians and parents (50:50 mixture)
- Theory:
 - Maalox: aluminum dries up rash, neutralizes pH
 - Aquaphor: acts as a protected barrier
- Risks
 - Aluminum and magnesium toxicity, especially if broken skin

Thank you!

- Good Resources
 - <http://www.aap.org>
 - <http://www.infantformula.org>

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