FEEDING AND COLIC

HOW TO HELP YOUR PATIENTS
What Should Babies Eat???

- WHO Recommendations: Strictly Breast Feed x 6 mo
- AAP Recommendations: complimentary food introduction should be delayed until >4 mo; exclusive breast feeding is preferred until 6 months of age
- European Food Safety Authority: complimentary foods may be safely introduced between 4-6 mo
Breast Feeding Benefits

- "Optimal source of nutrition for infants during the first six months of life”

- No studies showing benefit of hypoallergenic formulas in preference to breast milk for the prevention of allergic disease

- Breast fed infants are more familiar with novel flavors and changing flavors partly explaining the effect of breast feeding on food acceptance (Hausner, et al)

- Early flavor learning through breast feeding may confer an advantage to the infant by early exposure to healthy foods, provided the mother has a healthy diet (Forestell & Mennella, Cooke and Fildes)
Types of Formula

- Conventional Cow’s Milk (CM) Formulas

- Partial whey hydrolysate formulas (pHF) – Good Start and Gentlease – are not considered hypoallergenic as they contain significantly large peptides. In one study, pHF caused allergic reactions in 50% of CM allergic infants.

- Extensive casein or whey hydrolysate formulas (eHF) – Alimentum, Nutramigen, and Pregestimil – are considered hypoallergenic because they contain peptides that are sufficiently small that at least 90% of children with CM allergy with tolerate them.
- Soy based formulas

- Amino-acid based formulas – Neocate, Elecare, and Nutramigen AA are the closest to being nonallergenic. They have been approved for use in children who still react to eHFs, and are an excellent source of nutrition for highly allergic children. High cost, low palatability.
What’s Covered by WIC??

- Enfamil Lipil and Gentlease are covered without a prescription.

- Soy formulas are covered by WIC without a prescription.

- Other formulas require an Rx secondary to cost.
Formula Selection for High Risk Infant (allergies)

- An infant is defined as “high risk” for developing allergic disease if there is at least one first degree relative with a documented allergic condition (atopic dermatitis, asthma, allergic rhinitis, or food allergy)

- Studies comparing the effects of pHFs and CM formulas on the prevention of allergy suggest a preventive effect of pHFs.

1. Incidence of atopic manifestation in 67 high risk infants fed either pHF formula versus CM formula was 6% versus 40% in the first 6 mo and 22% versus 49% at 1 year of life.

2. Meta analysis of risk of atopic dermatitis and formula showed lower risk in babies fed pHFs than those fed CM formula. (Summary Relative Risk Estimate 0.45)
So WHEN can Babies start eating?

And

WHAT should we feed them??
How about Solids – When, what and how to advance??

Early Introduction (< 4 mo)

Lack of Benefit
- Addition of rice cereal did not in a randomized trial increase duration of sleep

Potential Harms
- Aspiration
- Inadequate or excess intake of nutrients and increased renal solute load
- Increased rate of obesity in some studies
- Increased risk of islet cell antibodies or celiac disease autoimmunity in high risk infants
Delayed Introduction (> 6 mo)

Potential Harms

- Decreased growth because of inadequate energy intake
- Iron deficiency in the breast-fed infant
- Delayed oral motor function
- Aversion to solid foods
Studies re: introduction @ 4-6 mo and future food preference

- There is a hypothesis that there are “Sensitive Periods” for the introduction of solids.

- One study showed a positive relationship between consumption of fruits at 4-6 months with the future consumption of fruits at 18 mo.

- Another study showed that early introduction to fruit or vegetables was associated with higher consumption of fruits or vegetables at 2-5 years of age.
Studies re: number of exposures

- Repetition is one of the Primary Determinants of its acceptance

- First study in 1994 demonstrated an increase in acceptance of a novel green vegetable (green beans or peas) after 10 exposures. Recent studies show up to 15 exposures may be necessary before a new food is accepted.

- Has been shown to be effective even for foods which were initially refused by the infant.
Order to Introduce Foods

- Single ingredient foods should be introduced first.

- AAP recommends infant cereals and pureed meats be offered first because they provide iron and zinc, which are the nutrients most likely to be deficient in infant diets in the U.S.

- Once these foods are accepted, strained or pureed fruits and vegetables may be added.

- Fat and cholesterol intake are not restricted in infants. ESPGHAN recommends that fat = 25% of energy intake in infants.

- The addition of sugar and salt is discouraged.
Role of variety in food acceptance

- Some interesting new studies are looking at increasing variety as a way to increase food acceptance.

- Once study showed increased acceptance of a less-liked food (green beans) if pairs of foods were presented together instead of different foods on different days.

- Another study shows that exposure to a variety of fruits increases the acceptance of a new fruit, but unfortunately not of a new vegetable.

- However repeated exposure to green beans increased consumption of green beans, whether or not peach puree was consumed afterwards.
Role of food textures in future diet

- Experimenting with new and varied textures early on in development is associated with less food refusals and a better acceptance of weaning foods later on.

- Introduction of lumpy foods before the age of 9 months was associated with fewer food refusals at the age of 7 yrs old and a higher consumption of fruits and vegetables.

- The best predictor of acceptance of chopped carrots at 12 mo is previous experience with carrots presented in a variety of textures.
How to Improve Food Acceptance

- Role of Repeated Exposure (15 times)
- Role of Variety of Foods Offered
- Role of Food Texture
Supplementation with Vitamins – Is it necessary??

IRON

Breast-fed Infants

- After 4 mo of age, the iron requirements of a full term breast-fed infant may exceed the breast milk. Some form of iron supplementation (e.g. pureed meats, iron fortified cereal, oral iron) is recommended to provide at least 1 mg/kg per day.

- An average of 2 servings of iron fortified cereal or ½ jar of pureed meat is adequate

VITAMIN D - Should be provided to breast fed and formula fed infants

VITAMIN B12 – recommended for breast fed infants of strict vegetarian mothers
Colic and Feeding – Related or Not?
Definition of Colic

- There is no standard definition of the term “colic”.

- From parental diaries, crying lasted approx 2 hours/day at 2 weeks of life, 3 hours/day at six weeks of life and decreased to about 1 hour a day 3 months of age.

- Often occurs in the evening “the bewitching hour” with the thought that the accumulated excitement caused by environmental stimuli during the day was “discharged” in the form of crying during the late afternoon and evening.
Wessel Criteria

RULE of THREE
1. crying that lasts more than 3 hours a day
2. occurs on more than 3 days a week
3. persists for more than 3 weeks

Other authors suggest that the diagnosis of colic require 3 of the 4 additional criteria:
1. Paroxysmal crying
2. Qualitatively different than normal crying
3. Associated with hypertonia
4. Inconsolability
Possible Etiologies

GI

1. CM Protein – allergy to either casin or whey
2. Lactose Intolerant – minimal role
3. Fruit Juice Intolerant – carbohydrate intolerance to sorbitol containing fruit juices
4. Immaturity – incomplete absorption of carbohydrates in the small intestine.
5. Intestinal Motility – hypermotility secondary to presumed autonomic imbalance
6. Fecal Microflora - differences in intestinal microflora
**Biologic Factors**

1. **Feeding Techniques** – underfeeding, overfeeding, infrequent burping, and swallowing air

2. **Motor Regulation** – immaturity of neonatal motor regulation

3. **Increased Serotonin** – elevated serotonin levels

4. **Tobacco Smoke Exposure** – increased risk of colic with mothers who smoked during pregnancy or in the pp period.
Psychosocial

1. Temperament – interactional basis for colic

2. Hypersensitivity – discharge after a long day of intrusive stimuli

3. Parental Variables – family stress and transmission of tension from the mother to the infant
Management of Colic

- **Parental Support**
  - In one controlled, counseling for parents regarding effective responses to crying decreased crying from 2.6 to 0.8 hours/day.
  - In another controlled trial, parental counseling was more effective than dietary changes in the reduction of crying.
  - Home based nursing intervention (REST – rest, assurance, empathy, support, and time-out) decreased crying by 1.7 hours a day.

- **Formulas**
  - Some randomized studies suggest infants with colic may benefit from hypoallergenic formulas.

- **Maternal Diet**
  - One study randomly assigned women to control diet versus hypoallergenic diet (no milk, eggs, nuts, wheat). The mean duration of colic symptoms was reduced by more than 25%.
  - Another study, infants of atopic mothers experienced more colic symptoms on days their mothers drank cow’s milk.
Feeding Techniques

- Feeding the baby in a vertical position in combination with frequent burping may reduce swallowed air. Special bottles may decrease air-swallowing.
- Prolonged emptying of one breast at each feed was compared to equal drainage of both breasts at each feed was shown to decrease colic. (incidence of 12% versus 23%).

Carrying or Swaddling – unlikely to be beneficial

Alternate Sensory Stimulation – possibly beneficial but not proven. Parents may try a pacifier, a ride in the car, a change in scenery, a swing, a warm bath, or a belly massage.

Decreasing Stimulation

- In one randomized controlled trial, 93% of infants improved with decreased stimulation, based on parental diaries.
- Swaddling may calm a baby who is hypersensitive to body movements or touch, or who has cerebral insults.
- Use of a heartbeat or white noise device may soothe and infant hypersensitive to noise.
Herbal Medicines – herbs such as chamomile, fennel, and balm-mint have been shown to have anti-spasmodic properties.

- Randomized double blind controlled trial of tea made with chamomile, vervain, licorice, fennel and balm-milk was compared to placebo. After 7 days of treatment, the incidence of colic in the “tea group” decreased from 57% to 26%.

- 125 infants with colic were randomized to either placebo or fennel seed oil emulsion. Resolution of colic occurred in 65% of the fennel seed group versus 24% of the placebo group.

Homeopathic Remedies

- Not been proven effective and may contain dangerous compounds such as ethanol, propanolol, and pentanol, in addition to three potentially toxic substances *colocynthis*, *veratrum album*, and *strychnos nux-vomica*. *Colocynthis* is also found in Coccyntal and Hyland colic tablets.
• Simethicone – little possible benefit. One of three RCTs noted a decrease in crying with simethicone however the other two did not.

• Probiotics – the potential benefits of treatment with *Lactobacillus reuteri* have been demonstrated in 2 RCTs.
  • 90 breast fed infants were randomized to *L. reuteri* or simethicone. Median daily crying time was lower in the *L. reuteri* group at day 7 (159 min versus 177 min) and more so at day 28 (51 min versus 145 min)
  • 50 breast fed infants were randomized to *L. reuteri* or placebo for 21 days. Crying decreased in both groups however greater reduction in *L. reuteri* group (370 min to 30/day). Treatment with *L. reuteri* caused an increase in fecal lactobacilli and decrease in fecal *E.Coli* and ammonia.

• Infant Massage – no specific data to support.

• Spinal manipulation – 2 RCTs show conflicting evidence on spinal manipulation.

• Cranial Osteopathy – no RCTs however one prospective controlled study.
  • 28 infants were treated with osteopathic manipulation once a week for a 4 week period and demonstrated statistically significant decline in crying time and an improvement in sleeping compared to those who did not receive the treatment.
CASE 1

Antenatally:

Maria Johnson is a 24 y/o G2P1 @ 37 weeks and has many questions re: her new upcoming baby. She has an extensive history of food allergies and is wondering what she can do to decrease the incidence of allergic/atopic diseases in her newborn. She is wondering if it might be better to use hypoallergenic formula instead of breast feeding. What is your advice??
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*Answer: There is no data to support that hypoallergenic formulas are any better in the prevention of atopic disease than breast milk.*
1 Month NB Visit:

Mrs. Johnson is back in your office for a 1 mo NB visit. She is frustrated, fatigued, and concerned. She states that the baby cries ALL THE TIME. She states that she is breast feeding, has a good milk supply, and baby appears to latch well. You document good weight gain, nl stools and UO, nl vital signs, and physical exam is wnl. What questions will you want to ask and what can you recommend??
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Wessel’s Criteria of 3’s: Crying > 3 hours a day, more than 3 days a week, lasting more that 3 weeks.

Data on colic, ? Changing mom’s diet, comfort measures
What kind of “stuff” do I need Doctor??

- Car Seat
- Binkies/Bottles
- Carriers
- Jumpers/Walkers/Exersaucers
- Strollers
- Creams/lotions/shampoos
- Sunscreen, mosquito repellant
New Mexico Child Restraint Act: 66-7-369

- Children under 1 year of age must be properly secured in a rear-facing seat that meets federal standards in the back seat of the vehicle. If the vehicle does not have a back seat, the child may ride in the front seat of the vehicle if the passenger-side air bag is deactivated if possible.

- Children under 5 years of age, regardless of weight, and children under 40 pounds, regardless of age, shall be properly secured in a child safety seat (car seat or booster seat) that meets federal standards.

- Five and six year olds, regardless of weight, and children under 60 pounds, regardless of age, shall be properly secured in either a child booster seat or other appropriate car seat that meets federal standards.
Car Seat Recommendations

- All infants and toddlers should ride in a rear-facing car safety seat until they are 2 years of age or until they have reached the highest weight (normally 35 pounds) or height allowed by the manufacturer.

- All children 2 years or older, or those younger than 2 years who have outgrown the rear-facing weight of height limit for their car seat, should use a forward facing car seat as long as possible, up to the highest weight (40-80 pounds) or height allowed by the manufacturer.

- All children above the height and/or weight limits for their car seat should use a booster seat with the lap/shoulder belt until 4 feet 9 inches in height and are between 8 and 12 years of age.
Car Seat Info


- [http://safernm.net/Top/Contact/Statewide_Fitting_Stations.html](http://safernm.net/Top/Contact/Statewide_Fitting_Stations.html)

Albuquerque NE; 8445 Wyoming NE  Second and fourth Fridays of each month  BY APPOINTMENT ONLY  (505) 856-6143

Albuquerque SW; Albuquerque Fire Station #14  9817 Eucariz SW (Map & Directions)  Third Thursday of each month  BY APPOINTMENT ONLY  (505) 856-6143

Albuquerque Central; University of New Mexico Hospital  Camino de Salud (Map & Directions)  First Friday of each month  BY APPOINTMENT ONLY  (505) 272-6024
Bottles and Binkies
Bottle Information

- Some popular brands

1. Dr. Brown’s Bottles
2. Avent
3. Evenflo
4. Born Free

Most Important is Low Flow Nippes, best for moms doing breast/bottle

Binkies and SIDS

- Use of a pacifier ("dummy," "soother") during sleep appears to reduce the risk of SIDS. This was shown in a meta-analysis of seven studies, in which the multivariate summary odds ratio was 0.71 [95% CI 0.59-0.85] for usual pacifier use and 0.39 [95% CI 0.31-0.50] for pacifier use during last sleep.

- The mechanism for this association is unclear; it may be related to the lowered arousal threshold during pacifier use.

- Because of this apparent reduction in risk, the AAP suggests offering a pacifier during sleep, provided that it does not interfere with establishment of breast feeding.
Infant Carriers

- Many Different Types of Carriers and Slings
- Cultural Differences play a role
  - Rebozo, cradle board, etc.
  - May be a desire to not appear “old fashioned”

Common Types of Carriers in the U.S

1. Baby Bjorn
2. Ergo
3. Moby
4. Snugli
5. Slings
Cautions re: Slings

- The Consumer Product Safety Commission said it has investigated at least 13 deaths associated with sling-style infant carriers over the last 20 years, including three deaths last year. One other case involving a fatality is still being investigated. Twelve of the deaths involved babies younger than four months.

- A sling’s fabric can press against a baby’s nose and mouth, blocking the baby’s breathing and suffocating a baby within a minute or two, the agency said.

- The other scenario involves slings where the baby is cradled in a curved or “C-like” position, nestling the baby below mom’s chest or near her belly. That curved position can cause a baby who doesn’t have strong neck control to flop its head forward, chin-to-chest, restricting the infant’s ability to breathe. “The baby will not be able to cry for help and can slowly suffocate,” said the commission’s warning.
Other “Gear”
There is no “medical” reason that parents need all of this gear however it is marketed HEAVILY to new parents and often they will seek your advice.

Of all baby gear, the most concerning medically are baby walkers.

In 2008, 3298 children under 24 months of age were treated in emergency departments for injuries associated with walkers.

Most injuries are related to falling down stairs (75-96%) however children can also be injured if the walker tips over.

In addition, walkers provide increased access to other safety hazards (i.e. hot surfaces or containers, pools, poisons)
AAP Recommendations

- “if parents insist on using baby walkers, they should chose one meeting the ASTM standards.

- ASTM standards
  - must be wider than a 36 inch doorway
  - must have a braking mechanism to stop the walker if one or more wheels drop off the riding surface (preventing a fall)

SAFETY TIPS for PARENTS

- Close the door or gate at the top of the stairs
- Keep children within view
- Keep children away from hot surfaces and containers
- Beware of dangling appliance cords
- Keep children away from toilets, swimming pools, and other sources of water
- Stationary activity centers provide a safer alternative to baby walkers
Diaper creams and Baby Lotions

- **Diaper Creams**

  - Most diaper creams have active ingredients that are either zinc oxide, petroleum jelly, lanolin and dimethicone.

  - They can vary greatly in price however the active ingredients is often the same in generic brands.

- **Body Lotions**

  - Most baby lotions are similar to adult lotions in many cases.

  - Most important thing is buying a lotion that is not going to irritate baby’s skin – ideally something without a lot of color and perfumes.
What about Baby Powder??

- Talc that has asbestos is generally accepted as being able to cause cancer if it is inhaled. This type of talc is not used in modern consumer products. The evidence about asbestos-free talc, which is still widely used, is less clear.

- International Agency for Research on Cancer (IARC) is part of the World Health Organization (WHO). Its major goal is to identify causes of cancer.

- Based on limited evidence from human studies, IARC classifies the perineal (genital) use of talc-based body powder as "possibly carcinogenic to humans".

- Additionally, there have been numerous reports of babies having life-threatening episodes and rarely deaths associated from inhaling the powder.
Sunscreen/Mosquito Repellant

- Most pediatricians do not recommend either sunscreen or mosquito repellent prior to 6 months of age.

- Infant/baby sunscreen is normally “no tears” and will have a higher SPF than for adults.