



NCC Pediatrics Continuity Clinic Curriculum: Behavior II

Overall Goal:

The Good, The Bad, & The Ugly: To identify key behavior issues in infant, toddlers, and children and understand their management.

Overall Outline:

Behavior I:

Temperament
Discipline
Problem Behaviors Potluck

Behavior II:

Infant Colic
Toilet Training
Childhood Habits Potluck

Pre-Meeting Preparation:

- Infantile Colic (AAFP Review Article) -- if you are short on time, substitute PIR article, link under extra credit
- Toilet Training (AAFP Review Article)-- if you are short on time, substitute PIR article, link under extra credit
- **Select a “common childhood habit” from your own clinical experience OR from this [parent-education list](#).** Present the childhood habit and your recommendations for management to the group. *(Please note this link does work but can take a while to load. Research your selected topic PRIOR to your continuity group meeting.)*

Conference Agenda:

- Complete Behavior II Quiz & Case Studies
- **Childhood Habits Potluck:** *Each resident should present.*

Post-Conference: Board Review Q&A

Extra Credit:

- [In Brief: "Colic"](#) (*Pediatrics in Review, July 2012*)
- [In Brief: "Toilet Training"](#) (*Pediatrics in Review, June 2010*)
- [In Brief: "Temper Tantrums and Breath Holding Spells"](#) (*Pediatrics in Review, July 2022*)
- ["Challenging Cases: Behaviors That Concern Parents"](#) (*Pediatrics, May 2004*)
- ["Complimentary, Holistic, and Integrative Medicine: Colic"](#) (*Pediatrics in Review, 2007*)
- ["AAP Practice Guideline on Toilet Training"](#) (1999) and ["Toilet Training"](#) (*AAP Parent Handout*)
- ["Crying and Your Baby"](#) (*AAP Handout for colic*)
- ["Happiest Baby on the Block "](#) (*summary of Harvey Karp, MD's book*)
- ["Harvey Karp's Secrets to Calming a Fussy Baby"](#) (*demonstrating techniques on youtube*)

Updated by C. Carr, 2023.

Updated September 2022, C. Carr

Infantile Colic

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Infantile colic can be distressing to parents whose infant is inconsolable during crying episodes. Colic is often defined by the “rule of three”: crying for more than three hours per day, for more than three days per week, and for longer than three weeks in an infant who is well-fed and otherwise healthy. The physician’s role is to ensure that there is no organic cause for the crying, offer balanced advice on treatments, and provide support to the family. Colic is a diagnosis of exclusion that is made after performing a careful history and physical examination to rule out less common organic causes. Treatment is limited. Feeding changes usually are not advised. Medications available in the United States have not been proved effective in the treatment of colic, and most behavior interventions have not been proved to be more effective than placebo. Families may turn to untested resources for help, and the physician should offer sound advice about these treatments. Above all, parents need reassurance that their baby is healthy and that colic is self-limited with no long-term adverse effects. Physicians should watch for signs of continuing distress in the child and family, particularly in families whose resources are strained already. (Am Fam Physician 2004;70:735-40,741-2. Copyright© 2004 American Academy of Family Physicians.)

► **Patient information:** A handout on colic, written by the authors of this article, is provided on page 741.

See page 633 for definition of strength-of-recommendation labels.

Excessive crying or colic in an infant during the first few months of life can be alarming for physicians and parents. Estimates of the occurrence of infantile colic in community-based samples vary from 5 to 25 percent of infants, depending on study design, definition of colic, and method of data collection.^{1,2} Fussing and crying are normal aspects of development during the first three months of life. During this time, infants cry an average of 2.2 hours per day, peaking at six weeks of age and gradually decreasing.³ Parents who think their infant cries excessively may seek a physician’s help.

Physicians and parents use the term colic to describe an infant with excessive crying, irritability, or fussiness. The most commonly accepted definition of colic, which originated in 1954,⁴ describes using the “rule of three”: crying for more than three hours per day, for more than three days per week, and for more than three weeks in an infant that is well-fed and otherwise healthy. This definition has been used repeatedly in clinical studies of colic. The motor behaviors of infants with colic also were first described in 1954.⁴ Colicky

infants have attacks of screaming in the evening with associated motor behaviors such as flushed face, furrowed brow, and clenched fists. The legs are pulled up to the abdomen, and the infants emit a piercing, high-pitched scream.⁵

Behavior characteristics usually are classified by the timing of the event, paroxysmal crying, and associated behaviors.⁶ Colic typically begins at two weeks of age and usually resolves by four months of age. Crying is concentrated in the late afternoon and evening, occurs in prolonged bouts, and is unpredictable and spontaneous. It appears to be unrelated to environmental events. The child cannot be soothed, even by feeding.

Etiology

The cause of infantile colic remains unclear. Underlying organic causes of excessive crying must be considered during the evaluation. Organic causes account for less than 5 percent of infants presenting with excessive crying (Table 1).^{6,7} Gastrointestinal, psychosocial, and neurodevelopmental disorders have been suggested as the cause of colic.

GASTROINTESTINAL

Gastrointestinal disorders have been implicated in colic because of the infant's leg position and grimacing during a crying spell. Excessive crying or increased gas production from colon function can result in intraluminal gas formation and aerophagia. This mechanism does not appear to be the cause of colic, however, because radiographic images taken during a crying episode have shown a normal gastric outline.⁸ There is conflicting evidence showing that colic is caused by allergy to human and cow's milk protein. It also has been speculated that abdominal cramping and colic may be a result of hyperperistalsis. The latter theory is supported by evidence that the use of anticholinergic agents decreases colic symptoms. Gut hormones such as motilin also

may play a causative role in colic. Motilin is thought to cause hyperperistalsis, leading to abdominal pain and colic.⁹

PSYCHOSOCIAL

Although studies have addressed possible psychosocial causes of colic, no evidence has been found in support of this mechanism. Even when colicky infants are cared for by trained occupational therapists, they cry twice as long as infants without colic.^{10,11} The hypothesis that colic is an early manifestation of a difficult temperament is not supported by prospective longitudinal studies.¹⁰

Parents of a colicky infant may think that they have poor parenting skills. However, there is no evidence that maternal (or paternal) personality or anxiety causes colic.¹¹ In families with a colicky infant, there may be problems with communication and family functioning, as well as parental anxiety and fatigue.¹²

NEURODEVELOPMENTAL

Studies have suggested that colic may lie at the upper end of the normal distribution of crying in infants. The crying patterns of colicky infants (i.e., peaking around six weeks

TABLE 1

Organic Causes of Excessive Crying in Infants*

CNS

CNS abnormality (Chiari type I malformation)
Infantile migraine
Subdural hematoma

Gastrointestinal

Constipation
Cow's milk protein intolerance
Gastroesophageal reflux
Lactose intolerance
Rectal fissure

Infection

Meningitis
Otitis media
Urinary tract infection
Viral illness

Trauma

Abuse
Corneal abrasions
Foreign body in the eye
Fractured bone
Hair tourniquet syndrome

CNS = central nervous system

*—Organic causes account for less than 5 percent of infants with colic.

Adapted with permission from Barr RG. Colic and crying syndromes in infants. *Pediatrics* 1998;102(5 suppl E):1283, and Poole SR. The infant with acute, unexplained, excessive crying. *Pediatrics* 1991;88:452.

of age with crying late in the afternoon and evening) are the same in normal infants. However, colicky infants cry longer and are more difficult to soothe once crying has begun. The fact that most infants outgrow colic by four months of age lends support to a neurodevelopmental cause of colic.⁶

Diagnosis

When parents seek advice about a colicky baby, their concerns must be substantiated by the physician. The parents may feel tired and inadequate, and be worried that their child has a serious medical disorder. There may indeed be an underlying organic cause in an infant presenting with excessive crying. A careful history and physical examination

Colic is defined with the "rule of three": crying more than three hours per day, for more than three days per week, and for more than three weeks in an infant that is well-fed and otherwise healthy.

usually are sufficient to determine if there is an organic cause for crying or to relieve parental fears and allow for a diagnosis of colic. The physician should ask about the infant's behavior and the time of day and length of the crying episodes. Parents should be asked to document this information. A history of apnea, cyanosis, or struggling to breathe may suggest previously undiagnosed pulmonary or cardiac conditions. Documentation of frequency and quantity of spitting up is necessary to rule out gastroesophageal reflux or pyloric stenosis.¹³

The physical examination begins with careful observation while the infant is being held on the parent's lap. The infant is observed for lethargy, poor skin perfusion, and tachypnea. A rectal temperature greater than 38°C (100.4°F) or poor weight gain suggests infection, a gastrointestinal disorder, or nervous system disorder, and requires further work-up. During the examination, the infant's clothing should be removed to facilitate inspection of the skin for evidence of trauma and palpation of the large bones for possible fractures, which may indicate abuse. The examination may proceed with the infant in the parent's lap or on the examination table. A thorough gastrointestinal and neurologic examination should be performed.¹³ The examination itself may reassure the parents.

Laboratory tests and radiographic examinations usually are unnecessary if the child is gaining weight normally and has a normal physical examination.¹⁴

Management

The mainstay of colic management is an acknowledgment by the physician of the difficulties the parents are facing and an inquiry into the well-being of the parents.¹⁵

FEEDINGS

Because the incidence of colic in breastfed and bottle-fed infants is similar, mothers who are breastfeeding should be encouraged to continue.¹⁶ Early termination would deny the infant the beneficial effects of breastfeeding without relieving the colic symptoms. A

systematic review¹⁷ of randomized controlled trials (RCTs) found a possible therapeutic benefit from eliminating milk products, eggs, wheat, and nuts from the diet of breastfeeding mothers.

Parents of colicky bottle-fed infants often ask which formula to feed their child. One RCT found an improvement in colic symptoms with soy-based formulas, while another RCT studied only infants hospitalized with colic and did not adequately report results.¹⁷ However, infants may develop an allergy to soy. The American Academy of Pediatrics' Committee on Nutrition does not recommend changing to soy formula in the management of colic.¹⁸ RCTs found that infants who were fed lactase enzyme-treated formula had no significant differences in colic symptoms compared with infants who received placebo.¹⁷ Another RCT found no significant differences in crying behavior in infants fed fiber-enriched formulas and those fed nontreated formulas.¹⁷

There is conflicting evidence about the role of hypoallergenic formulas in children with a family history of atopy. Physicians may choose to recommend a trial of hypoallergenic formula (e.g., casein or whey hydrolysate) for a week.^{19,20} Hypoallergenic formulas also may be tried in infants with cow's milk intolerance who have regurgitation or loose or bloody stools. Infants who respond to the formula change may be tried on cow's milk formula again at three to four months of age. Otherwise, most infants can remain on their original formulas.

MEDICATIONS

Simethicone (Mylicon), a safe, over-the-counter drug for decreasing intraluminal gas, has been promoted as an agent to decrease colicky episodes. A randomized, placebo-controlled, multicenter trial concluded that treatment with this agent produces results similar to those of placebo.²¹ The perceived improvement may be a placebo effect, and gas may be a marker of colic and air swallowing rather than a cause of the disorder. Two

Hypoallergenic formulas may be tried in infants with cow's milk intolerance who have regurgitation or loose or bloody stools.

other RCTs found no benefit for treatment with simethicone.²¹

Systematic reviews of studies using anticholinergic drugs in the treatment of colic found them to be more effective than placebo.¹⁹ The most commonly used agent, dicyclomine (Bentyl), has been associated with apnea and is no longer indicated for use in infants younger than six months. Cimetropium, which is not available in the United States but is widely used in Italy to treat infantile colic, showed a decrease in duration of crying crises in the treated group compared with placebo. The major side effect was sleepiness; there were no reports of life-threatening events.²²

OTHER TREATMENTS

Herbal teas containing mixtures of chamomile, vervain, licorice, fennel, and lemon balm, used up to three times a day (150 mL per dose) have been shown to decrease crying in colicky infants.^{23,24} Given the multiplicity of herbal products, the **lack of standardiza-**

tion of strength and dosage, and potential interference with normal feeding, parents should be cautioned about their use.

Interventions aimed at decreasing crying in colicky infants have produced varied results. Colicky infants who were placed in car-ride simulators showed no significant improvement in symptoms. Other techniques include early response to crying, gentle soothing motions, avoidance of overstimulation, use of a pacifier, prophylactic holding and carrying, use of an infant carrier, and maintenance of day-night orientation. **Counseling parents about these specific management techniques was not shown to provide benefits above routine advice, support, and reassurance.**²⁵ Crib vibrators have not been shown to decrease crying. Infant massage shows no significant improvement in symptoms and cannot be recommended.²⁶ Chiropractic treatment has shown no benefit over placebo.²⁷

A study to assess the benefits of **increased carrying of colicky infants during noncrying times failed to show any benefit.**²⁸ An earlier study of noncolicky breastfed infants showed an overall decrease in crying time with supplemental carrying, but the effect was not noted in infants with established colic.²⁹

Other methods to reduce infant crying, such as placing a colicky infant near a clothes dryer or vacuum cleaner (for the “white noise”), specific “colic holds” that put pressure on the infant’s abdomen, and taking the infant for a ride in a car or stroller have been proposed. A product called **“Gripe Water,”** which may include any of a variety of herbs and herbal oils, such as cardamom, chamomile, cinnamon, clove, dill, fennel, ginger, lemon balm, licorice, peppermint, and yarrow, is available online and in health food stores. **This product is touted to provide relief from flatulence and indigestion but is not entirely without risk.** Parents who choose to use this product should avoid versions made with sugar or alcohol and look for products that were manufactured in the United States. Noninvasive remedies recommended by family and friends may be beneficial but have not been scientifically evaluated.

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Strength of Recommendation

Key clinical recommendation	SOR labels	References
Eliminating milk products, eggs, wheat, and nuts from the diet of breastfeeding mothers may help relieve symptoms of colic.	B	17
Feeding infants fiber-enriched formula does not significantly improve crying compared with infants who are fed nontreated formulas.	B	17
Counseling parents about specific colic-management techniques does not provide benefits above routine advice, support, and reassurance.	B	26
Infant massage does not significantly improve colic symptoms and is not recommended.	B	26

Internet-savvy parents will run across many opportunities to buy items that have not been proved to be effective in the treatment of colic. Some Web sites advertise products that are “guaranteed” to soothe colic symptoms. It is important that physicians advise parents about these products, because there may be risks associated with their use. Parents should be encouraged to look for Web sites linked to medical references and those maintained by the American Academy of Family Physicians and the American Academy of Pediatrics.

OUTCOMES

At one-year follow-up, a group of colicky infants compared with noncolicky infants showed no differences in behavior in nine dimensions assessed using the Toddler Temperament Scale.¹² An association between infantile colic and later development of asthma or allergic disease has not been shown.³⁰ Once colic resolves, there is little lasting effect on levels of maternal anxiety or depression.² When superimposed on poor communication skills within the family, colic may damage family dynamics. Physicians must watch for signs of family distress and assess the family’s coping resources.

Members of various family medicine departments develop articles for “Practical Therapeutics.” This article is one in a series coordinated by the Department of Family and Geriatric Medicine at the University of Louisville School of Medicine, Louisville, Ky. Guest editor of the series is James G. O’Brien, M.D.

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REFERENCES

- Lucassen PL, Assendelft WJ, van Eijk JT, Gubbels JW, Douwes AC, van Geldrop WJ. Systematic review of the occurrence of infantile colic in the community. *Arch Dis Child* 2001;84:398-403.
- Clifford TJ, Campbell MK, Speechley KN, Gorodzinsky F. Sequelae of infant colic: evidence of transient infant distress and absence of lasting effects on maternal mental health. [published erratum appears in *Arch Pediatr Adolesc Med* 2003;157:486.] *Arch Pediatr Adolesc Med* 2002;156:1183-8.
- Brazelton TB. Crying in infancy. *Pediatrics* 1962;29:579-88.
- Wessel MA, Cobb JC, Jackson EB, Harris GS Jr, Detwiler AC. Paroxysmal fussing in infancy, sometimes called colic. *Pediatrics* 1954;14:421-35.
- Illingsworth RS. Three-months’ colic. *Arch Dis Child* 1954;29:165-74.
- Barr RG. Colic and crying syndromes in infants. *Pediatrics* 1998;102(5 suppl E):1282-6.
- Poole SR. The infant with acute, unexplained, excessive crying. *Pediatrics* 1991;88:450-5.
- Harley LM. Fussing and crying in young infants. Clinical considerations and practical management. *Clin Pediatr [Phila]* 1969;8:138-41.
- Gupta SK. Is colic a gastrointestinal disorder? *Curr Opin Pediatr* 2002;14:588-92.
- White BP, Gunnar MR, Larson MC, Donzella B, Barr RG. Behavioral and physiological reactivity, sleep, and patterns of daily cortisol production in infants with and without colic. *Child Dev* 2000;71:862-77.
- Barr RG. Changing our understanding of infant colic. *Arch Pediatr Adolesc Med* 2002;156:1172-4.
- Raiha H, Lehtonen L, Korhonen T, Korvenranta H. Family life 1 year after infantile colic. *Arch Pediatr Adolesc Med* 1996;150:1032-6.

Toilet Training

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Toilet training is a developmental task that impacts families with small children. All healthy children are eventually toilet trained, and most complete the task without medical intervention. Most research on toilet training is descriptive, although some is evidence based. In the United States, the average age at which training begins has increased over the past four decades from earlier than 18 months of age to between 21 and 36 months of age. Newer studies suggest no benefit of intensive training before 27 months of age. Mastery of the developmental skills required for toilet training occurs after 24 months of age. Girls usually complete training earlier than boys. Numerous toilet-training methods are available. The Brazelton child-oriented approach uses physiologic maturity, ability to understand and respond to external feedback, and internal motivation to assess readiness. Dr. Spock's toilet-training approach is another popular method used by parents. The American Academy of Pediatrics incorporates components of the child-oriented approach into its guidelines for toilet training. "Toilet training in a day," a method by Azrin and Foxx, emphasizes operant conditioning and teaches specific toileting components. Because each family and child are unique, recommendations about the ideal time or optimal method must be customized. Family physicians should provide guidance about toilet-training methods and identify children who have difficulty reaching developmental milestones. (*Am Fam Physician*. 2008;78(9):1059-1064, 1066. Copyright © 2008 American Academy of Family Physicians.)

► **Patient information:** A handout on toilet training, written by the authors of this article, is provided on page 1066.

Mastering toilet training is a milestone in child development. Training occurs when new physical abilities, vocabulary, and self-esteem are rapidly developing.¹ Children must integrate parental and societal expectations with their own evolving needs for independence and self-actualization. All healthy children are eventually toilet trained; most parents and day care providers are involved to some degree.

Currently in the United States and several European nations, toilet training begins significantly later than in the past.² In the 1940s, training commonly started before 18 months of age. Recent data show that training now often starts between 21 and 36 months of age, and that only 40 to 60 percent of children complete toilet training by 36 months of age.³

The influence of race and socioeconomic status on the initiation of toilet training was explored in a recent cross-sectional survey.⁴ The average age at initiation was 20.6 months (range: six to 48 months). White parents indicated that training should begin much later than black parents did

(25.4 months versus 19.4 months, respectively; $P < .0001$). Parents of other races cited 19.4 months as the appropriate age. Family income was independently associated with timing of toilet training. Families with annual incomes of more than \$50,000 identified 24 months as the correct age; lower-income families thought 18 months was appropriate.

The shift toward later toilet training in the United States has several probable causes. The convenience of disposable diapers and training pants likely has led some parents to delay toilet training. Others may train children earlier to save money and increase day care options. Effects of later training include family stress, environmental effects from nonbiodegradable diapers, and increased risk of infectious diarrhea or hepatitis A from more diaper changes at day care facilities.⁵

Counseling and Assessing Readiness

Physicians are often asked for advice on toilet training, especially when problems arise. Anticipatory counseling about toilet training addresses family perceptions and misconceptions and helps parents develop reasonable expectations. Ideally, parents are

SORT: KEY RECOMMENDATIONS FOR PRACTICE

<i>Clinical recommendation</i>	<i>Evidence rating</i>	<i>Reference</i>	<i>Comments</i>
The Brazelton child-oriented approach and the Azrin and Foxx intensive training method are successful methods for toilet training developmentally normal children.	B	1, 5, 9	No studies have compared the effectiveness of the two methods
Research on the impact of stool toileting refusal, stool withholding, and hiding to defecate on toilet training is too limited for conclusions to be drawn.	C	1	—

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <http://www.aafp.org/afpsort.xml>.

counseled at the 18- or 24-month well-child visit. The physician’s role in toilet training is multifaceted. Necessary components include understanding family dynamics, assessing the child’s readiness, providing education and support, and developing short-term and follow-up goals.

Because each child and family are unique, the ideal age for toilet training varies. Parents must judge when their child is ready. Various readiness skills are associated with successful training.⁶ Remaining bowel-movement free overnight is the earliest attained skill, occurring around 22 months of age in girls and 25 months in boys. The ability to pull up underwear or training pants is typically the last skill mastered, occurring around 29.5 months of age in girls and 33.5 months in boys. Girls develop most skills earlier than boys. Usually, children do not master all necessary skills until after 24 months of age, although some do as early as 12 months. Considering the time range for skills acquisition, parents may have difficulty judging when a toddler is ready for toilet training. Children whose parents overestimate readiness may face prolonged training or toileting problems.

Whether the age at which training starts influences training duration is poorly understood. In one study, initiation before 24 months of age resulted in 68 percent of toddlers completing training before 36 months of age, compared with 54 percent who began training after 24 months.⁷ Although earlier initiation of intensive toilet

training is associated with earlier completion, overall training duration increases.⁸ Intensive training is defined as the parent asking the toddler to use the toilet more than three times per day. Although earlier training is not associated with stool withholding, enuresis, or other toilet-training problems, intensive training has little benefit before 27 months of age.⁹ Generalization is limited because these studies included a primarily white, upper-middle-class suburban population.^{7,8}

Training Methods

Several options are available for developmentally normal children who are toilet training for the first time (Table 1).⁹ Common approaches in the United States include the Brazelton child-oriented approach, the guidelines of the American Academy of Pediatrics (AAP), Dr. Spock’s training method, and the intensive “toilet training in a day” method by Azrin and Foxx. Most experts recommend that training start after 18 months of age and conclude by 24 to 36 months of age. Methods differ in techniques and end points. The use of operant conditioning, assisted infant toilet training, and elimination communication is more common in developing nations.

Empiric data comparing the various methods of toilet training are limited. In 2006, the Agency for Healthcare Research and Quality (AHRQ) developed an evidence report on toilet training to evaluate the effectiveness

of various toilet-training methods and the factors that influence their effectiveness.⁹ Of 772 relevant citations, analysis included only 26 observational studies and eight randomized controlled trials (RCTs). Meta-analysis was not possible because of the extreme heterogeneity and poor methodologic quality of these studies. No trials directly compared the child-oriented method with the Azrin and Foxx method; however, one study showed the Azrin and Foxx method to be more effective than Dr. Spock's method.¹⁰ The report concluded that the child-oriented and the Azrin and Foxx methods appear to be successful in achieving toilet training in healthy children. Some evidence suggests that toddlers using the latter, more intensive method achieve continence sooner, but how long these outcomes are sustained is unclear.

CHILD-ORIENTED APPROACH

The Brazelton child-oriented approach is strongly supported in the pediatric literature. Introduced in 1962, it emphasizes gradual toilet training beginning only after specific physical and psychological milestones are achieved.¹¹ It requires the participation of both parent and child. Supporting evidence comes from a 1950s retrospective chart review of Brazelton's clinic patients. Whether his patients actually used this approach is unknown, because parents were encouraged to find methods that worked best for their families. Few outcome studies on the child-oriented approach have been published over the past 40 years. A large, prospective, cohort study (n = 482) found that 61 percent of children trained with the Brazelton approach were continent by 36 months of age and 98 percent by 48 months of age; training duration was not discussed.⁷ Specifics of the Brazelton approach are outlined in *Table 2*.⁹

AAP GUIDELINES

Guidelines from the AAP incorporate many components of the child-oriented approach.^{1,12} The AAP strongly recommends that children not be forced to start training until they are behaviorally, emotionally, and developmentally ready. The

guidelines recommend that training begin after 18 months of age using a potty-chair, and that parents assess readiness by looking for signs that suggest interest in toilet training (*Table 3*).⁶ AAP training steps are similar to the Brazelton approach, although the AAP suggests using praise for reinforcement rather than treats.

Table 1. Selected Toilet-Training Methods

Child-oriented approaches

The Brazelton child-oriented approach*

American Academy of Pediatrics toilet-training guidelines (2000)

Begin when child shows signs of readiness (generally after 18 months of age)

Praise success using positive terms

Avoid punishment, shaming, or force

Make training positive, nonthreatening, and natural

Dr. Spock's *The Common Sense Book of Baby and Child Care*

Train without force

Begin training between 24 and 30 months of age

Allow child to accompany family members when they use bathroom

Make process relaxed and pleasant; avoid criticism

Avoid making negative comments about stool or criticizing child

Let child use potty-chair voluntarily; once child shows interest, take him or her to the potty-chair two to three times daily

Praise success

Operant conditioning*

The Azrin and Foxx "toilet training in a day" method†

Goal: establish proper behavior using positive reinforcement/rewards (e.g., parental affection, toys, candy)

Negative reinforcement through punishment or decreased positive attention for accidents

Other methods

Assisted infant toilet training*

Parent-oriented training method

Begin bowel and bladder training at two to three weeks of age

Place infant on toilet after large meal or if shows signs of eliminating

Reward successful voids with food or affection

Most commonly used in China, Africa, India, and South and Central America

Elimination communication*

Begin at birth

Learn to recognize infant body language, noises, and elimination patterns

Place infant over sink, toilet, or special miniature potty-chair while parent makes sound of running water

Some increased interest for this method in the United States since 2005

*—Less commonly used in North America.

†—For more information, see *Table 2*.

Information from reference 9.

Table 2. Comparison of the Brazelton Child-Oriented and the Azrin and Foxx Toilet-Training Methods

The Brazelton child-oriented method

Equipment

- Potty-chair
- Snacks or treats (optional)

Method

- Begin training when specific physical and psychological milestones are met (usually around 18 months of age; introduce potty-chair and teach child to associate it with the toilet)
- Ask child to sit on potty-chair fully clothed; child may sit in close proximity when a parent is using the toilet; use potty-chair in any room or outside to accustom child to sitting on it; allow child to get off the chair at any time; talk to child or read a story during sits
- After one to two weeks of fully clothed sits, remove diaper and have child sit on potty-chair; do not insist that child use the potty-chair at this point
- If child soils his or her diaper, take both child and soiled diaper to potty-chair and empty diaper into chair; explain that this is where stool goes
- Once child understands, take him or her to potty-chair several times daily
- As child becomes more confident, remove diaper for short intervals; place potty-chair in close proximity to child and encourage independent use; provide gentle reminders as needed
- After these steps are mastered, use training pants, instructing child on how to pull them up and remove them

Azrin and Foxx method

Equipment

- Training area with minimal distractions and interruptions
- Child's preferred snacks/drinks
- Potty-chair with removable/replaceable collection bin
- Doll that wets pants
- Training pants
- Short T-shirt
- List of real or imaginary characters admired by child

Method

- Provide immediate positive reinforcement (e.g., food, drinks, hugs, small toys) for:
 - Asking about, approaching, or sitting on potty-chair
 - Manipulating pants
 - Urinating or defecating in potty-chair
- Do not reinforce refusal or other uncooperative acts
- Tell child that a real or imaginary person "is happy that you are learning to keep your pants dry"
- Consequences for accidents:
 - Omit reinforcements
 - Verbal reprimand
 - Child changes wet pants by him- or herself
 - Performance of 10 "positive practice sessions"
- Demonstrate correct steps for toileting using a doll
 - When doll wets, have child empty potty-chair basin into toilet, flush, replace basin, and wash hands
- Teach child to differentiate between wet and dry; perform pants checks every three to five minutes and reward dry pants
- Give child enough fluids to cause strong, frequent desire to urinate
- Encourage child to go to potty-chair, pull down pants, sit for several minutes, and then get up and pull up pants; if child urinates or defecates in potty-chair, reward with praise or a treat
- After a productive sit, have child empty potty basin and replace it
- Perform pants checks every five minutes and have child help
- Start with child sitting on potty-chair for 10 minutes; after several productive sessions, reduce duration
- Move toward child initiating request to use potty-chair
- As child masters the task, provide praise only for successfully completed sits
- Check pants before naps and meals for the following three days; praise child for dry pants; for wet pants, have child change him- or herself and perform additional positive practice sessions

Information from reference 9.

AZRIN AND FOXX METHOD

An alternative approach is "toilet training in a day," a parent-oriented, intensive method by Azrin and Foxx.¹³ It evolved from a toilet-training study of institutionalized persons who were mentally disabled.¹⁴ In a later study of 34 developmentally normal children (20 to 36 months of age) who were considered difficult to train, toilet training was accomplished in an average of 3.9 hours using this intensive method; accidents were rare with similar findings at the four-month follow-up.⁶ Initially designed for bladder continence, this method has been successfully adapted for bowel control as well. Many parents are

familiar with the approach from the book, *Toilet Training in Less Than a Day*.¹⁵

Azrin and Foxx recommend operant conditioning and the use of training components that facilitate learning. Their method was the first to describe objective criteria for determining training readiness. Specifics of the method are described in *Table 2*.⁹

Although the Azrin and Foxx method is the subject of more research, its acceptability is less understood than other methods. According to one survey of 103 pediatricians, the intensive method of toilet training is less likely to be recommended to patients.¹⁶ Of the 29 percent of physicians who recommended

intensive training, most did not suggest using consequences for accidents or overcorrection techniques. Three RCTs of the Azrin and Foxx method show rapid training and minimal recidivism at 10 weeks.⁹ Several cohort studies estimate success rates from 74 to 100 percent in toddlers younger than 25 months, and 93 to 100 percent in older toddlers; follow-up success is 96 to 97 percent.¹⁷

All methods seem equally capable of achieving toilet-training success in healthy children. Parents who want quick results may have more success with the intensive method, although being comfortable with the regimen and emphasizing positive reinforcement increase the odds of success. Parents with less time or fewer resources may prefer the child-oriented approach, although a longer training duration is likely. Tailoring the method to the individual family situation is essential.

Toilet-Training Complications

Approximately 2 to 3 percent of children develop problems during toilet training.² Only four studies in the AHRQ review specifically address problems related to toilet training.^{11,17-19} Difficult-to-train children are less adaptable, have a more negative mood, and are less persistent than easy-to-train children; no differences in parenting styles between easy- and difficult-to-train children are described.²⁰ These children have higher rates of stool toileting refusal, stool withholding, or hiding during defecation.

STOOL TOILETING REFUSAL

Stool toileting refusal is diagnosed when a child who has been trained to urinate in the toilet refuses to defecate in the toilet for at least one month. The authors of one RCT of suburban children found that stool toileting refusal affected 22 percent of those studied.¹⁷ The presence of younger siblings, parental issues with setting limits, and completion of training after 42 months of age are associated with stool toileting refusal.¹⁷ Children with stool toileting refusal are more likely to be constipated and to have painful bowel movements.²¹ Dietary changes, including the addition of dietary

fiber, and use of stool softeners are options for decreasing constipation.

One RCT examined an intervention to treat stool toileting refusal in children 17 to 19 months of age.²² Parents of children in the treatment group used only positive language when referring to feces and praised the child for defecating in the diaper. The duration of stool toileting refusal and time to completion of training were significantly shorter in the treatment group. However, parents may not consider stool toileting refusal to be a problem because it usually resolves without intervention and is not linked with behavioral issues.^{7,21}

STOOL WITHHOLDING

Stool withholding involves the child doing physical maneuvers in an attempt to avoid defecation (e.g., “potty dance,” crossing the legs). Voluntary constriction of the sphincter during bladder or rectal contraction can lead to constipation. The most common interventions for stool withholding include aggressively treating constipation and resuming diaper use. A high-fiber diet may be helpful to decrease constipation.²³

HIDING

Some children who are toilet trained ask for training pants or hide while defecating rather than using the toilet. Onset of

Table 3. Signs of Toilet-Training Readiness in Developmentally Normal Toddlers

Asks to use potty-chair or wear “big kid” underwear
Can put on/take off clothes
Demonstrates independence and uses the word “no”
Follows parent into bathroom and expresses interest in the toilet
Has regular and predictable bowel movements
Imitates parental behavior
Is able to follow simple instructions, sit, and walk
Reports soiled diapers and wants a clean diaper
Stays dry for two hours at a time or is dry following naps
Uses words, facial expressions, or movements indicating the need to urinate or defecate

Information from reference 6.

this behavior is most common around 22 months of age. Children who hide are more likely to have stool toileting refusal, constipation, stool withholding, and later completion of training.²⁴ Although this behavior is not well studied, children may hide because of embarrassment or fear, or because they think that defecation is a private behavior.

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REFERENCES

1. Stadtler AC, Gorski PA, Brazelton TB. Toilet training methods, clinical interventions, and recommendations. American Academy of Pediatrics. *Pediatrics*. 1999;103(6 pt 2):1359-1368.
2. Bakker E, Wyndaele JJ. Changes in the toilet training of children during the last 60 years: the cause of an increase in lower urinary tract dysfunction? *BJU Int*. 2000;86(3):248-252.
3. Blum NJ, Taubman B, Nemeth N. Why is toilet training occurring at older ages? A study of factors associated with later training. *J Pediatr*. 2004;145(1):107-111.
4. Horn IB, Brenner R, Rao M, Cheng TL. Beliefs about the appropriate age for initiating toilet training: are there racial and socioeconomic differences? *J Pediatr*. 2006;149(2):165-168.
5. Simon JL, Thompson RH. The effects of undergarment type on the urinary continence of toddlers. *J Appl Behav Anal*. 2006;39(3):363-368.
6. Schum TR, Kolb TM, McAuliffe TL, Simms MD, Underhill RL, Lewis M. Sequential acquisition of toilet-training skills: a descriptive study of gender and age differences in normal children. *Pediatrics*. 2002;109(3):E48. <http://www.pediatrics.org/cgi/content/full/109/3/e48>. Accessed August 6, 2008.
7. Taubman B. Toilet training and toileting refusal for stool only: a prospective study. *Pediatrics*. 1997;99(1):54-58.
8. Blum NJ, Taubman B, Nemeth N. Relationship between age at initiation of toilet training and duration of training: a prospective study. *Pediatrics*. 2003;111(4 pt 1):810-814.
9. Klassen TP, Kiddoo D, Lang ME, et al. The effectiveness of different methods of toilet training for bowel and bladder control. Rockville, Md.: Agency for Healthcare Research and Quality; December 2006. AHRQ publication no. 07-E003.
10. Candelora K. An evaluation of two approaches to toilet training normal children. *Diss Abstr Int*. 1977;38(05-B):2355-2441.
11. Brazelton TB. A child-oriented approach to toilet training. *Pediatrics*. 1962;29:121-128.
12. American Academy of Pediatrics. *Toilet Training. Guidelines for Parents*. Elk Grove Village, Ill.: American Academy of Pediatrics; 1998.
13. Foxx RM, Azrin NH. Dry pants: a rapid method of toilet training children. *Behav Res Ther*. 1973;11(4):435-442.
14. Azrin NH, Foxx RM. A rapid method of toilet training the institutionalized retarded. *J Appl Behav Anal*. 1971;4(2):88-99.
15. Azrin N, Foxx R. *Toilet Training in Less Than a Day*. New York, NY: Simon & Schuster; 1974.
16. Polaha J, Warzak WJ, Dittmer-Mcmahon K. Toilet training in primary care: current practice and recommendations from behavioral pediatrics. *J Dev Behav Pediatr*. 2002;23(6):424-429.
17. Butler JF. The toilet training success of parents after reading *Toilet Training in Less Than a Day*. *Behav Ther*. 1976;7(2):185-191.
18. Kaffman M. Toilet-training by multiple caretakers: enuresis among kibbutz children. *Isr Ann Psychiatr Relat Discip*. 1972;10(4):340-365.
19. Bakker E, Van Gool JD, Van Sprundel M, Van Der Auwera C, Wyndaele JJ. Results of a questionnaire evaluating the effects of different methods of toilet training on achieving bladder control. *BJU Int*. 2002;90(4):456-461.
20. Schonwald A, Sherritt L, Stadtler A, Bridgemohan C. Factors associated with difficult toilet training. *Pediatrics*. 2004;113(6):1753-1757.
21. Blum NJ, Taubman B, Osborne ML. Behavioral characteristics of children with stool toileting refusal. *Pediatrics*. 1997;99(1):50-53.
22. Taubman B, Blum NJ, Nemeth N. Stool toileting refusal: a prospective intervention targeting parental behavior. *Arch Pediatr Adolesc Med*. 2003;157(12):1193-1196.
23. Gorski PA. Toilet training guidelines: parents—the role of the parents in toilet training. *Pediatrics*. 1999;103(6 pt 2):1362-1363.
24. Taubman B, Blum NJ, Nemeth N. Children who hide while defecating before they have completed toilet training: a prospective study. *Arch Pediatr Adolesc Med*. 2003;157(12):1190-1192.

Behavior II Quiz:

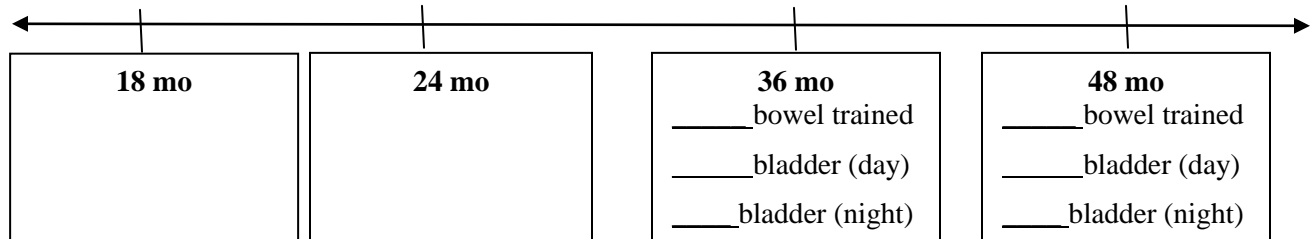
1. What is the “rule of 3”? according to Wessel's 1954 article?

2. Flashback: What is the “rule of thumb” for weight increase in infants/toddlers?

3. What percentage of “excessive crying” is due to organic causes? _____
Name 4 general categories of organic causes for “excessive crying” and an example of each:

4. Which of the following is the best approach to managing colic?
 - A. Prescribing Simethicone
 - B. Recommending 24/7 Baby Bjorn usage
 - C. Educating parents on colic and assessing their well-being
 - D. Switching to soy formula
 - E. None of the above

5. Complete the following toilet-training timeline:



6. What percentage of children develop problems during toilet training? Name some examples.

7. Flashback: What behavioral techniques are utilized by the following toilet-training methods:

- Child-oriented approach (Brazelton, AAP): _____

- Azrin & Foxx: _____

Behavior II Cases:

Case 1: Infantile Colic

You see a 2 mo male for the first time in clinic for his well baby check. He was the product of a full-term gestation, is neuro-developmentally normal, and has been breastfed with adequate weight gain since birth. The parents appear haggard and endorse “exhaustion” because their son has been crying “all the time since he was born”. There seems to be nothing they can do to comfort him. He is most upset in the evenings; although, at times he will wake up in the early morning and cry for 1-2 hours. The parents are wondering if “they are doing something wrong” or if he is “lactose intolerant”.

What information will you obtain on further history & physical exam to exclude organic causes of excessive crying?

His physical exam is normal, and you diagnose colic. **Would you recommend that the family switch to formula? If this were a cow’s-milk formula-fed infant, would you recommend switching to soy formula? How would you know if milk protein intolerance is present?**

What other interventions might you recommend? Which are proven to improve colic? *Be sure to address “gripe water” and probiotics.*

The parents are wondering when they will get some reprieve. **By what age should colic resolve?**

What is the long-term outcome of patients with colic?

Case 2: Toilet Training

A mother and her daughter, Patricia, come into your clinic for her 4-year annual checkup. She has no medical problems, and her shots were up-to-date at his 3-year checkup. Her weight is 16.6 kg and her height is 99.7 cm. Her physical exam is otherwise unremarkable, and her development seems appropriate. In talking further with mom, however, you learn that although she has tried to help Patricia to become potty-trained, she "refuses to pee or poop in the potty". She has bought a potty chair which the family has had since Patricia turned 2; it is "next to the big person potty" in the bathroom.

What other history would you obtain?

After taking the remainder of the history, you find that she was almost completely potty-trained (urine and stool) about 6 months ago. She wore "big girl underwear" during the day and training pants at night. Since her father moved out of the house 6 months ago, however, she has needed diapers during the day and has developed a dislike for sitting on the potty. Her father has half-custody of Patricia; the child spends one month with her mother followed by one month with her father. The mother and father are not on speaking terms and thus mom cannot give information about the father's present parenting habits.

What overall advice would you provide to Patricia's mom regarding toilet training?

Patricia's mother agrees to be patient with her; however, she asks you about "[Elimination Communication](#)", which some of the other mothers in her neighborhood had done with their infants. She wonders whether Patricia would have been more successful if they started earlier.

How do you respond?

What is Patricia's BMI and BMI percentile?

How would you counsel regarding weight?

Behavior II Board Review:

1. The mother of a 2-year-old girl is very concerned that her daughter is developmentally delayed. She explains that the girl speaks in two- to three-word phrases. She can feed herself with a spoon, but is unable to button her clothing. She can follow simple two-step commands and can climb stairs. However, she is not yet toilet trained. Findings on physical examination are unremarkable.

Of the following, you are MOST likely to

- A. discuss the normal developmental milestones of a 2-year-old child
- B. refer the child for a neurodevelopmental evaluation
- C. refer the child for audiologic evaluation
- D. refer the child for occupational therapy
- E. schedule a 6-month follow-up evaluation to see if the child has reached the milestones

2. The parents of a 30-month-old girl are concerned because she has sucked her thumb constantly since she was an infant. They ask you if they should intervene to decrease this behavior.

Of the following, the MOST appropriate response is to

- A. have them discipline her every time she sucks her thumb
- B. have them put a bitter-tasting substance on her thumb
- C. have them put gloves on her hands when she sleeps
- D. reassure them that most children stop thumb sucking by 4 years of age
- E. refer her to the dentist for an appliance to decrease thumb sucking

3. A 4-year-old boy cannot attend a local nursery school because he is not toilet trained. His development is otherwise normal. His parents explain that when they attempt to put him on the toilet, he refuses and runs out of the bathroom. They ask how they can train him to use the toilet.

Of the following, the MOST appropriate approach is to

- A. develop a behavioral modification program to encourage him to use the toilet
- B. have the parents gently scold him when he has accidents
- C. insist he sit on the toilet every 2 hours during the day
- D. recommend the family find a different school that allows children who are not toilet trained
- E. tell the parents to have him clean his own clothes after toilet accidents

4. A mother brings in her 10-year-old daughter and 8-year-old son because they are fighting constantly. The son says he hates having a sister and complains that his parents favor her and give her everything she wants. The daughter says that her brother is spoiled and always touches her stuff. The mother is frustrated by their constant fighting and asks for assistance in handling the children.

Of the following, the BEST initial guidance for the mother is to

- A. explain that this is typical of siblings and she should ignore the behavior
- B. give her a list of books on parenting
- C. refer her to a behavioral therapist to improve her parenting skills
- D. suggest she use behavioral modification techniques to diminish fighting
- E. tell her to return in 6 months if the siblings are still fighting