



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 and Notable Classic Articles

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" \(demonstrating techniques on youtube\)](#)

Infantile Colic

DONNA M. ROBERTS, M.D., MICHAEL OSTAPCHUK, M.D., and JAMES G. O'BRIEN, M.D.
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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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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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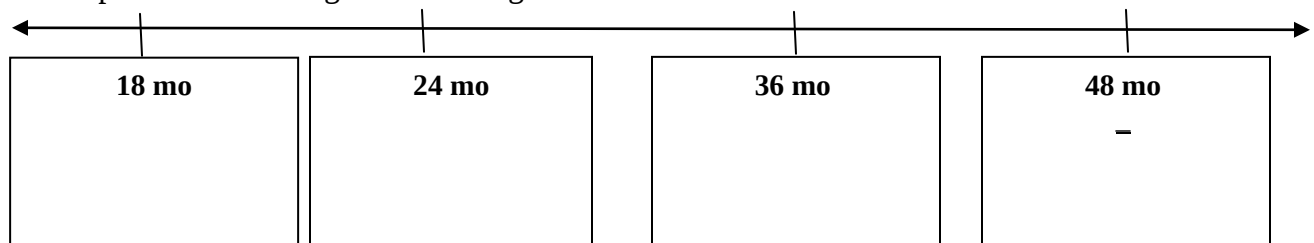
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Behavior II Quiz:

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

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ORIGINAL ARTICLES

PAROXYSMAL FUSSING IN INFANCY, SOMETIMES CALLED "COLIC"

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INTRODUCTION

"PAROXYSMAL fussing," "irritable crying," "compulsive crying," and "infantile colic" are expressions commonly used to describe various manifestations of a poorly defined complaint of early infancy. There is marked disagreement about its causes, incidence and treatment. This suggests that there may be several entities involved. Many pediatricians will agree with Aldrich who feels that there is a great amount of crying in this early period of infancy which must be ascribed to "unknown causes."^{1 (a-d)}

A concise definition of this complaint is lacking. It is usually described in terms of unexplained paroxysms of irritability, fussing, or crying which may develop into agonized screaming. The infant may draw up his knees against his tense abdomen as

if there were abdominal pain. Excessive flatus is common. The infant may appear hungry, but feeding does not always relieve him. In fact, the paroxysms may start shortly after a feeding. Paroxysms come at irregular intervals and last from a few minutes to several hours. They most frequently occur during the late afternoon and evening, and may recur daily for many weeks. Brennemann² states in a discussion of "infantile colic" that it is "an almost infallible occurrence some time in early infancy. Few infants escape it."

The following progress notes written by a nurse on duty in a rooming-in unit vividly describe this type of infant.

"(Age 3 days) From early evening onwards the baby has been quite fussy. He cried very vigorously before feeding, took frequent feedings. He was fussier than any other baby I have ever seen.

"(Age 4 days) Again this evening, the baby has been very fussy during feedings. He trembled slightly at the beginning of feedings, as if ravenous and excited. Placed in his crib after feeding and burping he immediately cried out lustily. Offered more formula, he took it well. After burping, he seemed satisfied, but when put back to bed, he would cry out again. He just seemed unable to make up his

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mind. When picked up, he was quiet, contented, and dozed.

"(Age 6 days) The baby is increasingly unmanageable and more puzzling. Babies never annoy me, but this one does. I have never seen a baby act like this before. It seems that nothing satisfies him but holding him. It was suggested that I'd just have to hold him in one arm and work with the other until he fell asleep. How well I knew that sleep was no guarantee. At nine this evening, Dr. Cobb saw the baby, held him, fed him, burped him, tried putting him in different positions in bed . . . but the baby cried as vigorously as ever. He was taken to the nursery, now not always quiet even when being held. In fact, his cries gradually became deafening and impossible. It was then that I asked Dr. Cobb if this was what you call colic. The doctor ordered 1 cc. of "spiritus frumenti in 30 cc. of 5% glucose. The baby took this fairly well and quieted down considerably, but he still seemed miserable and uncomfortable. He sputtered and whimpered. Within 20 minutes, he burst forth, again in full force. Picked up, patted, almost lulled to sleep he was replaced in his crib. He went to sleep, was quiet, but woke up shortly and suddenly started crying again; dropped off to sleep, and soon again awoke crying; off and on, until midnight when a second dose of spiritus frumenti was given. He took this and it just seemed as if a wave of relaxation swept over him. He seemed momentarily content at last. I picked him up, placed him on his stomach over a hot water bottle wrapped in a towel, with his head down. Soon he stopped crying, went to sleep, and slept for three and one-half hours."

The purpose of this paper is to review the literature and to report observations in relation to paroxysmal fussing from a series of 98 infants observed in the course of a parent-child relationship study (The Yale Rooming-In Project).

REVIEW OF LITERATURE

There have been four main points of view from which physicians have considered the etiology of colic, or paroxysmal fussing, namely, that of congenital hypertonicity, of allergy, of immaturity of the intestinal tract, and of transfer of tension from the adults to the infant.

The Concept of Congenital Hypertonicity

The concept of congenital hypertonicity presupposes a "hypertonic infant" with a congenital imbalance of the autonomic nervous system. Some observers feel that this is a very definite entity.³ Thus Haas⁴ has stated, "It is characterized by hypertonicity of all the skeletal muscles, as shown by the ability to raise the head and grasp objects even in the early days of life, and by general spasticity. The hollow viscus shows increased activity of smooth muscle fibers. There is marked psychic irritability, expressed by insomnia, general restlessness and crying." This concept is closely allied to the clinical entity of "Vagotonia," described by Eppinger and Hess⁵ in 1915. It is postulated that because of abnormal sensitivity of the central nervous system, minimal stimuli which are usually without effect lead to the development of fussiness in certain infants. Neff⁶ represented this point of view. He suggested that the "colicky" spells are an outgrowth of the startle reflex and may be considered as a prolonged reflex reaction during what he describes as the "hyperactive period of infancy." Atropine and phenobarbital are the recommended treatment for these infants.

Further support of constitutional factors is presented by Jorup⁷ who, in 1952, in a detailed comprehensive study described a condition of *Colonic Hyperperistalsis in Neurolabile Infants*. This author presents a picture of hyperactive infants who, in addition to having frequent stools, are extremely sensitive to sound and light, who sleep lightly and awaken easily, and in general are quite similar to the infants described as hyperactive in the American literature.

Allergy

The possible relationship of allergy to the etiology of "colic" was referred to as early as 1901 by Zahorsky.⁸ He stated, "The cause must usually be assigned to excessive proteids in the (breast) milk. These proteids, like those of the bean, very readily undergo gaseous decomposition and the gas causes

the violent peristalsis that causes the infant pain." Rotch⁹ at about the same time stated that certain vegetables and sometimes fish in individual cases affect the milk and cause discomfort to the baby. In 1921, Shannon¹⁰ reported cases of "colic" consisting of fussiness, gaseous distention and mucoid diarrhea in breast-fed infants. By removing certain foods from the maternal diet (namely, eggs in two cases, oatmeal, veal, and beef in others) the symptoms cleared in a few days. Jeans¹¹ in his text stated that food allergy may lead to all the symptoms of "gastroenterospasm."

Todd¹² reported a progressive pattern of sensitivity, starting in infancy with "colic" and pylorospasm and progressing in later childhood to eczema. White in 1929¹³ emphasized the frequency with which "colicky" infants later developed eczema. In a later paper¹⁴ he divided the "colicky" infants in two groups, the allergic and non-allergic, again emphasizing the frequency of eczema and urticaria in "colicky" infants. White felt that "fussiness" in the infants could be due to gastrointestinal spasm on an allergic basis. However, he also called attention to the vagotonic point of view, and classified this condition as "Vagogenic gastro-enterospasm," mentioning similarities between the "vagogenic state" and the "allergic state."

Rubin¹⁵ in 1940 reported a syndrome in infants of gastro-intestinal bleeding related to the ingestion of cow's milk. All of his reported infants experienced a period of "colic" preceding the occurrence of the bleeding.

There has been much interest in the relationship between allergic states in infancy and the occurrence of protein hypersensitivities in the mothers. Rosenau and Anderson¹⁶ in 1906, and Ratner *et al.*¹⁷ in 1926, demonstrated that it was possible to transmit active and passive hypersensitivity from a sensitized guinea pig to her offspring. This sensitivity lasted as long as three months in some of the infant guinea pigs. Clinically, Ratner¹⁸ believes he found evidence of protein sensitivity in human

infants whose mothers ingested high quantities of these specific proteins antenatally. These facts led him to emphasize the occurrence of clinical manifestations of hypersensitivity in early infancy. In his report, 15 infants showed skin sensitivity to ingested proteins, and he mentions two infants who suffered from "colic."

Bain and Smyth¹⁹ in 1931 reported that in 36 women studied, breast milk failed to transmit sufficient egg antigen to the suckling infant to demonstrate a positive skin reaction to passive transfer tests. Feeding the infants egg albumen did result in a positive skin reaction in the test areas. Donnelly,²⁰ however, found that by concentrating the whey of breast milk obtained from mothers who had ingested raw eggs, it was possible to obtain positive reaction to passive transfer tests in infants when the concentrated material was ingested by the infants.

Physiological Immaturity of the Intestinal Tract

A third avenue of approach has been that concerned with physiological immaturity of the intestinal tract associated with some abnormality of peristaltic activity. Brenne-mann² postulated that the "baby comes into the world more underdone than the young of other mammals," and that the intestinal tract becomes easily overtaxed. Thus over-distention may result in kinking and temporary obstruction of the gastrointestinal tract. He feels that this is responsible for the difficulty in many infants with "colic." This point of view might explain relief by enemas and possibly the relief by the addition of protein to the diet. This latter treatment is said to reduce the amount of putrefactive fermentation which occurs with high carbohydrate milk mixtures. Brackett²¹ postulated that an accumulation of material in the lower ileum can become too great to pass along "autonomously." Also the passage of digesting food material may be blocked by a tight ileo-cecal valve. He believed that the extra strong peristaltic contractions arising to remedy these factors

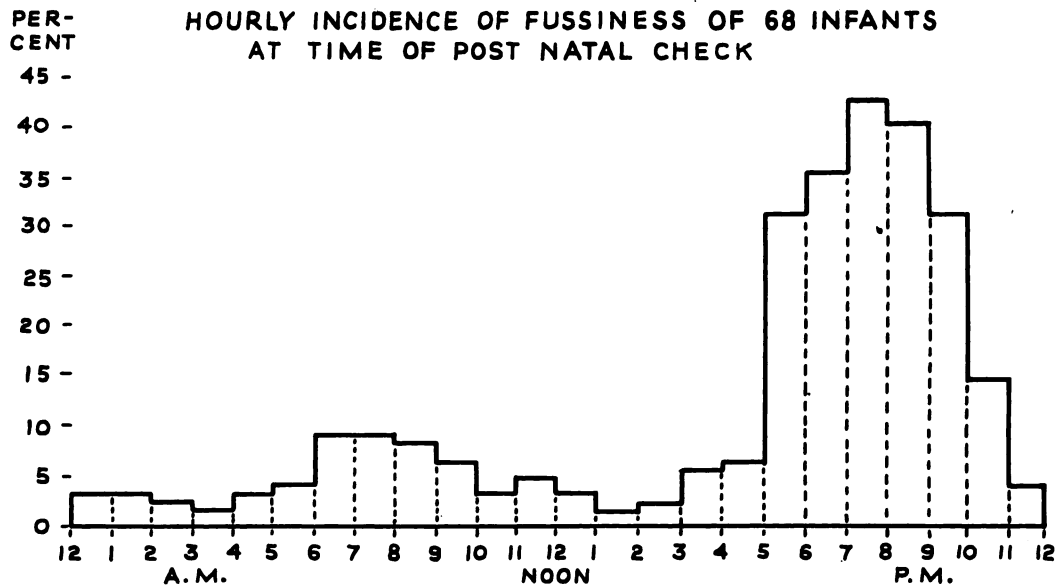


FIG. 1. Hourly incidence of fussiness of 68 infants at time of post-natal check.

which inhibit normal propulsion of material are accompanied by the abdominal pain of "colic."

Parental Influence

The fourth point of view stresses the parental influence. Spock²² states that it is more common in the first born. Brenne-
mann² and Spock²² report that this condition is more common in breast-fed infants. Anderson²³ suggests that infants on a demand schedule are relatively free of this "fussiness." Some physicians have described a characteristic anxious, nervous and tense parent. They have, however, not clarified whether this parental picture is the cause or result of the infant's difficulties.

SOURCE AND CLASSIFICATION OF DATA

The authors' interest in "fussiness" or "colic" was stimulated by an unpublished study made by Kleeman* and Cobb (1948) when affiliated with the Rooming-In project. At the seven weeks post-natal examination of 78 consecutive rooming-in babies, the mothers were questioned as to whether their infants had any special "fussy" period,

* Dr. James A. Kleeman was a Rooming-In Fellow July 1947-July 1948.

and, if so, at what hours. Only 10 of the 78 mothers reported no special "fussy" period. Of the remaining 68 mothers, 50 reported a "fussy" period for the infant sometime during the late afternoon or evening, and 12 during the morning hours; three infants were reported to have fussy periods both in the morning and afternoon, and three were said to be fussy all day. The hourly incidence of fussiness among these 68 infants as reported by their mothers is shown in Figure 1. It will be seen that 42% of these infants were reported to be fussy from 7:00 to 8:00 P.M., while the periods of least fussiness were reported to be between 3:00 and 4:00 A.M., and between 1:00 and 2:00 P.M.

The present study was conceived and planned by one of the authors (J. C. C.) who from clinical experience had formed the impression that allergy was an important contributing factor in the causation of "paroxysmal fussing." Records of families observed in the Rooming-In Project provide most of the data for this report. The details of data collection have been presented elsewhere.²⁴ Between July 1, 1948 and January 1, 1950, 180 mothers were selected in prenatal clinic for follow-up observations. The

BEHAVIOR-DAY CHART

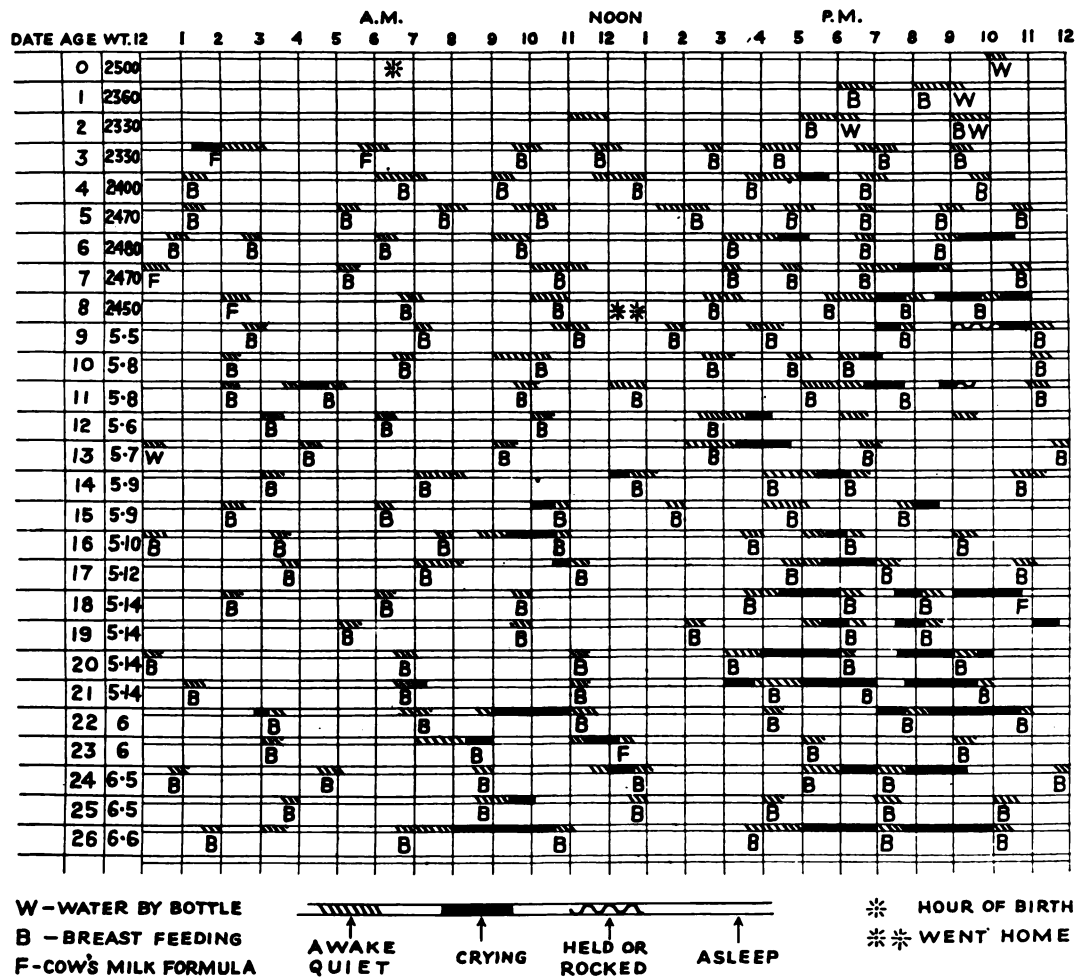


FIG. 2. Behavior day chart. The infant's weight was charted in grams in the hospital and in pounds and ounces thereafter.

data available include the reports of one or more prenatal interviews with the pediatrician; a behavior day chart showing the infant's time of sleeping, waking, crying and feeding during the first week (shown in Fig. 2); daily descriptive notes about mother and infant by nurses and physicians in the rooming-in units; recorded observations by the pediatrician of two or more home visits during the neonatal period (the family history of colic was routinely inquired into during the first visit); report of the pediatric check-up evaluation at seven weeks; child health conference reports during the first year; a detailed questionnaire about the in-

fant's behavior during the first year filled out by the mother when the child was one year of age; a report of information obtained by the psychologist at the time of the one year old developmental evaluation and by a social worker during her visit to the home shortly thereafter. In addition to this body of data, a questionnaire, "Newborn History of Allergy" (shown in Fig. 3) was sent to each of the 180 mothers. Ninety-eight mothers returned the questionnaire. The records of these 98 mothers and their infants form the basis of the present study.

For the purpose of this study a "fussy" infant was defined as one who, otherwise

YALE UNIVERSITY DEPARTMENT OF PEDIATRICS - NEWBORN FAMILY HISTORY OF ALLERGY

To be filled in by Baby's Mother, Mrs.

Delivery Date:

ALLERGY is unusual sensitivity to such things as dusts, pollens, or other substances in the air; clothing, cosmetics, or other things coming in contact with our skin; or food, medicines, or other things we swallow.

PLEASE USE THE FOLLOWING DEFINITIONS to fill in the kinds of allergy in the form below:

HAY FEVER, runny nose or eyes at certain times of year or in certain localities.

ASTHMA, choking up of the lungs with wheezing.

ECZEMA, itching or burning skin irritation, sometimes with redness, swelling, blisters, crusting, scaling, and/or thickening of the skin. Lasts more than a week.

HIVES, puffy red itching blotches on the skin which come and go within a few days.

DERMOGRAPHIA, sensitive skin which swells up and gets red when scratched even lightly.

GASTRO-INTESTINAL ALLERGY, any of various forms of indigestion such as heartburn, bloating with gas, colicky cramps, vomiting, or diarrhea. Usually lasts a day or two.

MIGRAINE HEADACHES, throbbing aches usually on one side of the head, lasting more than a day, not helped by aspirin.

	Age now approx.	Little or No Allergy	Mild Allergy State what kind	Severe Allergy State what kind	Not sure (Remarks)
✓ Myself	26		HAY FEVER		
My Mother	DECEASED	✓			
My Father	DECEASED				✓
My Brothers 1)	31		HAY FEVER		
and/or Sisters 2)	33		GASTRO-INTESTINAL		
(If more than 5, use the back of sheet) 3)	35		ECZEMA AS A CHILD		
4)	37	✓			
5)	39	✓			
My Husband	35	✓			
His Mother	65		ASTHMA		
His Father	DECEASED	✓			
His Bros. & Sisters 1)	39	✓			
(If more than 5, use the back of sheet) 2)	41	✓			
3)					
4)					
5)					
Our Children 1)	34 mos.		ECZEMA DISAPPEARING		
2)	21 mos.	✓			
3)					
4)					

FIG. 3. Newborn family history of allergy questionnaire.

healthy and well-fed, had paroxysms of irritability, fussing or crying lasting for a total of more than three hours a day and occurring on more than three days in any one week. If an infant had no such paroxysms or if the paroxysms were less than the above in total duration, he was classified as "contented." The "contented" group thus includes some mildly fussy babies. Each

of the records was read independently by two authors in relation to specific items which are listed below. In case of disagreement, the record was re-read jointly, and agreement was usually reached. In the few instances where agreement was not reached, the items in question were not counted. In 19 records there were insufficient data regarding the age of onset and disappearance

ONSET AND CESSATION OF FUSSINESS BY WEEKS

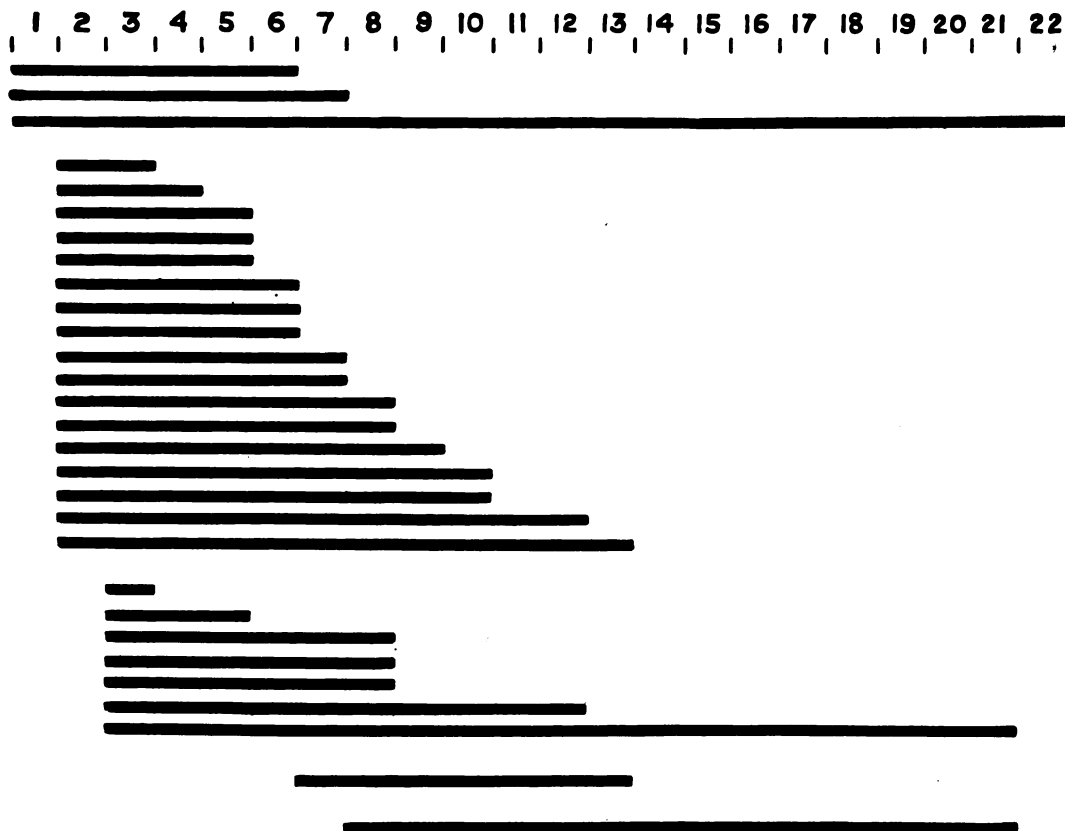


FIG. 4. Onset and cessation of fussiness by weeks in 29 infants.

of "fussing." In three records, the allergy questionnaire was inadequately filled out (less than 2 members of each side of the family were known well enough to be rated as to the presence or absence of allergy). In 13 records the notes were not detailed enough to make a clear-cut evaluation of the presence or absence of family tension. The two readers reached easy agreement on all of the other items. The agreed-upon data were then classified and analyzed according to various individual and family factors. The individual factors are: 1) Incidence of fussiness; 2) daily pattern; 3) duration; 4) intercurrent physical phenomena; 5) hyperactivity of infant; 6) allergic conditions of infant; 7) type of feeding; 8) weight gain; 9) sex, and 10) order of birth. The family factors studied in relation to the incidence

of fussing are: 1) Family history of allergy; 2) family history of colic; 3) educational status of mothers, and 4) family tension.

RESULTS

Individual Factors

Incidence: Fifty of the total 98 infants were classified as "contented" and 48 were classified as "paroxysmal fussers." Of these 48 "fussers," 25 were considered to be "seriously fussy," in that their paroxysms continued to recur for more than three weeks, or became so severe that the pediatrician felt that medication was indicated.*

Daily Pattern: Sixty-four of the 98 infants had a regular diurnal period of fussiness,

* It is the authors' opinion that these 25 "seriously fussy" infants would be classified as "colicky" by most pediatric observers.

the majority of which occurred in the late afternoon or evening hours. Twenty-one infants had a daily fussy period with no regularity of time. Thirteen infants were reported to have no period of fussiness. The time distribution and frequency of diurnal regularity are similar for the mild fussy periods of the "contented babies," and for the more prolonged periods of the "fussy infants."

Duration: Figure 4 shows the duration of the complaint for the 29 infants on whom sufficient data were available. Three of the infants were noted to be fussy in the first week of life, while still in the hospital; 17 began their fussiness during the second week; six during the third week; one during the fourth week; and one each during the seventh and eighth weeks. Symptoms usually diminished to a point where the infant would no longer be considered "fussy" by the end of the second month of life, although in six instances the fussing extended beyond the end of the third month.

Intercurrent Physical Phenomena: Five of the "fussy" infants had concurrently a waxy papular rash on the face. Mucoid diarrhea accompanied the "paroxysmal fussing" in three. Seven mothers commented that periods of rapid and congested or "snuffly" breathing often preceded the paroxysms of "fussing."

Hyperactivity of Infant: Ten of the 98 infants studied were noted to be more than usually active at the time of the neonatal examination at seven weeks of age, and nine these infants were in the "fussy group."

Allergic Condition of Infant: There were six infants whose "paroxysmal fussing" was markedly reduced by the removal of specific foods, either by limiting the mother's diet in the case of breast-fed infants, or by changing the protein in the artificially-fed infant. The "fussiness" promptly returned when the food was again ingested. This seemed to indicate an allergic etiology in the case of these six infants.

Type of Feeding: There was no significant difference in the incidence of "fussi-

ness" in relation to the type of feeding. However, the great majority of the infants were breast-fed: 67 were wholly breast-fed; 23 were breast-fed with some cow's milk mixture; and 8 were fed completely on cow's milk mixture.* Orange juice on a few occasions appeared to cause fussiness, but there was no higher incidence in the group fed orange juice as compared to the infants maintained on multivitamin drops or ascorbic acid.

Weight and Weight Gain: There were no significant differences between the "fussy" and "contented" groups of infants as regards average birth weight, average weight gain, and average per cent weight gain during the neonatal period. The infants gained an average of 46% of their birth weight by the time of the neonatal check-up visit, at about seven weeks of age.

Sex: The incidence of "paroxysmal fussing" was equally divided between male and female infants, and there was no significant difference in the duration of symptoms between the two sexes.

Birth Order: Analysis of birth order revealed that of the 76 first-born infants, 42 or 55% were "fussy," while of the 22 who had older siblings, only 6 or 27% were "fussy." This difference is significant at the .05 level (Chi square 4.26).

Of the individual factors, the only three which appear to have a significant relationship to the incidence of fussing are hyperactivity, allergic reaction, and order of birth.

Familial Factors

Family History of Allergy: The frequency and degree of allergy among the known members of the families of the 95† infants is shown in Table 1. There appears to be

* The frequency and amount of feedings were determined by the mother on the basis of the infant's apparent needs. The standard milk mixture was 2 parts of evaporated milk, 3 parts of water, and 5% added carbohydrate, usually in the form of corn syrup.

† Three of the 98 questionnaires returned were inadequately filled out.

TABLE 1
NUMBER OF INFANTS WITH FAMILY HISTORY OF MUCH, SOME OR LITTLE ALLERGY

	"Much Allergy"	"Some Allergy"	"Little Allergy"	Total
45 "Fussy" infants	7	30	8	45
50 "Contented" infants	7	33	10	50
Total	14	63	18	95

The following scheme served to classify each infant's Family History of Allergy:

"Much Allergy": 25% or more known members of the family had "severe" allergies and/or 75% or more had "mild" or "severe."

"Some Allergy": There was some allergy in the family, but less than 25% of the known members had "severe" allergy.

"Little Allergy": All of the known members of the family were classified as having "little or no allergy."

little difference in the degree of frequency of allergy noted between the family members of the "fussy" infants as compared to those of the "contented" group.

Family History of Colic: A family history of "colic" was noted in 14 of the 48 "fussy" infants and in only three of the "contented" infants. This would appear to be a significant relationship, but the authors feel that the history of the presence or absence of colic in the parents or relatives of infants visited by the pediatricians is difficult to obtain with any degree of reliability. A mother's memory of the infantile behavior of a child now grown is very likely to be colored by many subsequent events.

Educational Status of Mothers: The educational background of the mothers of the "fussy" infants was the same as that of the mothers of the "contented" infants. Approximately two-thirds of the mothers were college graduates in each group.

Family Tension: The classification "family tension" was applied to the families in which the presence of emotional turmoil and tension was evident to various observers. In the initial review of the records, the authors were struck by the frequent suggestion of family tension as a possible contributing etiological factor to the incidence of "fussiness." Therefore a systematic effort to re-evaluate each record in regard to the presence of such tension was made. Two of the authors (M. A. W. and A. C. D.)

re-read the records for this purpose a year after the first reading. Clearly in any family, the presence of a very "fussy" infant can produce tension or intensify pre-existing conflicts and anxieties. The tension described here, however, was noted both before and after the weeks during which the infant was "fussy." The following are four typical situations which were classified as "Family Tension":

A. A newborn infant was taken home from the hospital by his 20-year-old mother to a small house where the paternal grandparents, the maternal grandmother, a three-year-old cousin, and a 30-year-old uncle lived. The mother was an effusive, explosive, happy-go-lucky appearing girl who did not seem tense on first impression. Closer contact revealed considerable feeling and conflict about her relationship to her own mother. She referred to her childhood as "very unhappy" and stated, "If it hadn't been so unhappy at home, I probably never would have gotten married so soon." She described her mother as one who "wouldn't give in; even if she was wrong, she wouldn't admit it." The uncle was a post-encephalitic mute who sat in the middle of the living room from morning to night. The three-year-old was suffering from severe bronchitis.

B. A 20-year-old mother had sought psychiatric help before she became pregnant because of phobias, fear of insanity, of suicide, and of harming her husband. She was found to have strong hostility toward her husband who had been previously married and divorced. She had suffered from spastic colitis and

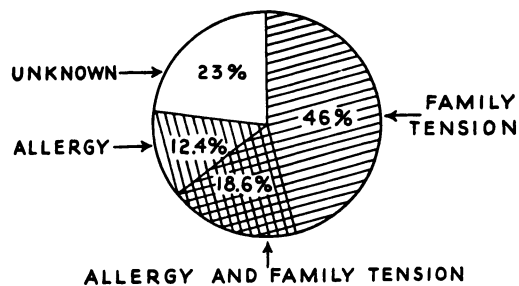


FIG. 5. Proportion of allergy and family tension in family history of 48 fussy infants.

morning nausea even before her marriage. Four months after her baby was born, she sought psychiatric help again, complaining of her insecurity in handling the baby and of her fears of drowning him.

C. According to the record of Mrs. C, there was marked friction in the relationship between her husband and her parents. During pregnancy, this became so strained that Mrs. C's mother refused to enter the house unless Mr. C apologized. Therefore Mrs. C visited with her mother only at the bus station. Both Mr. and Mrs. C were in conflict about their relationships to their own parents, and struggled desperately to maintain their independence. Mrs. C displayed a great deal of tension as she talked about the family relationships.

D. A 29-year-old southern society girl on a trip abroad met and married Mr. D, a foreign medical student. In spite of his aristocratic birth, he was not accepted by her family. Political upsets had cut him off from home, and her parents refused to help financially. The couple who had been used to much luxury were forced to work and pinch every penny so that he could finish medical school. The pregnancy was emphatically not planned and meant even greater hardship. A male child was of greatest importance to the D family to perpetuate the family name; but a girl was born.

Mrs. D made the interesting observation that when she and her husband had fights and she "blew off at him," then she was able to nurse the baby without trouble. On the contrary, however, when she got annoyed by her own parents who were visiting, and was unable to blow off steam, she got tense and nervous; then, after nursing, the baby would fuss and vomit.

There were 13 records which were in-

adequate for evaluating the family tension, either because the one-year interviews were lacking or because the notes were too brief or not clear. Six of these were for infants who were "fussy" and seven were for infants in the "contented" group. Of the 85 remaining records, four were classified as showing "family tension."

In the 43 families whose records revealed "family tension," 31 (72%) of the infants were "fussy." In the 42 families in whose records "family tension" was not prominent, there were only 11 "fussy" infants (26%). This difference is statistically significant (Chi Square 17 - $p < 0.001$).

Of the factors associated with paroxysmal fussing in the 48 infants, family tension alone or together with allergic reaction of the infant stands out most prominently. In 22 of the 31 "fussy" infants with a tense family background, the family tensions were judged to be the predominant factor in the infant's "fussiness." In nine infants, the "fussiness" seemed to be due in part to family tensions and in part to an allergic reaction, since the removal of specific food substances provided some relief. In addition, there were six infants (see above) whose "paroxysmal fussing" was thought to be due predominantly to allergy, because of the definite relief after removal of specific foods. For the remaining 11 "fussy" infants, there was no obvious contributory cause. These data are presented in Figure 5. It is of interest that of the nine babies described as hyperactive, who were also "fussy," six were in the family tension group and three in the group where both family tension and allergy seemed to be etiologically important.

TREATMENT

Since no controlled study was made, it is only possible to report the various methods of treatment which were used with some success. In most cases, several forms of therapy were used concurrently, so that the relative value of any one was difficult to assess. The number of infants whose "paroxysmal fussing" seemed to respond to various types of treatment was as follows:

	Infants
Motion (rocking, bouncing, walking, etc.)	25
Drugs (alcohol, phenobarbital, antihistamines, carminatives, etc.)	20
Change of diet	15
Pacifier or water (oral gratification) ...	14
Warmth to abdomen	8
Pressure to abdomen	7
Monotonous noise or music	4
Increased caloric intake	4
Enema	1

Rocking is the age-old remedy, but in many modern houses, no rocker is to be found. A mechanical rocking cradle seemed to help babies in the nursery, but when the mechanism failed, it appeared that the monotonous sound of the motor had as much effect as did the rocking motion. Similarly, many mothers have told the writers that the sound of the vacuum cleaner, the washing machine, running water, or even the buzzing of an electric clock, appeared to help. Recently, one of the Rooming-In Staff members* noted that a blinking light placed near the crib may be effective in quieting a fussy baby.

Drug treatment was reserved for the more severe cases. For some babies, small doses of phenobarbital at regular intervals around the clock seemed to work best. In others, a little alcohol during the "fussy period" seemed to help.† For a few infants, small doses of an antihistamine worked extraordinarily well. On two occasions, lactating mothers reported that their infants slept for unusual lengths of time and ceased "fussing" when the baby was nursed within a few hours after the mother had taken an antihistamine drug. One case of atropine poisoning with high fever and flushing has inhibited the authors from further use of this drug.

* Gordon D. Jensen, M.D.

† If an elixir of phenobarbital is used, it should be checked for alcoholic content, because some preparations run as high as 25% alcohol. The effect of the alcohol may be as important as that of the phenobarbital. Phenobarbital alone occasionally caused a "barbiturate jag."

Management of diet must of course include the mother's diet if the baby is breast-fed. Removal from the mother's diet of such aromatic foods as cabbage, Brussels sprouts, turnips, onions, garlic, asparagus, etc., has sometimes relieved the baby's fussiness. In other cases it has been necessary to stop the mother from eating such antigenic foods as eggs, chocolate, nuts, milk, tomatoes, strawberries, and shrimp. In the bottle-fed infants, dietary treatment included altering the milk protein by prolonged boiling, and in one case by the substitution of a soybean preparation (Mull-soy). Dietary changes appeared to be most successful for the babies who presented mucoid diarrhea as an additional symptom.

The use of a pacifier was very helpful in quieting many of the infants, who found relief from their fussiness when additional sucking satisfaction was provided. None of the mothers in this series found it difficult to discontinue the use of the pacifier later on. In this series, the infants were generally fed on a flexible schedule. Only four "fussy" infants seemed to be helped somewhat by increased caloric intake. Water alone may in some instances be more effective than milk. Warmth and pressure to the abdomen were usually achieved by wrapping the infant tightly, holding him close to the body, or by placing him prone on a warm water bottle. These methods worked very well in some instances.

If a "fussy" infant has a strong family history of allergy and, in addition, has mucoid diarrhea, it is worth while to try eliminating possible allergens. Minor changes in the formula or method of feeding probably succeed only if at the same time the mother is given reassurance and her tension is relieved, temporarily at least. How often a change in formula works well for only a few days! In severe cases, a vicious cycle is set up where the baby's fussing makes the mother more tense and the mother's tension makes the baby more fussy. Anything that can be done to relieve the situation is in the interest of the child's future emotional development.

DISCUSSION

The authors recognize that there are probably various factors related to the development of "paroxysmal fussing." In this study, allergy and family tension stood out as important contributing factors. The high correlation of the presence of fussiness in the infant and tension in the family were the most surprising of the findings. It is important to consider some of the ways in which these results may have been influenced.

First, the mothers in this study were a select group. Two-thirds of them were college graduates, but "fussy" babies appeared as frequently among the mothers who had no college degree.* It is true that there is a bias in terms of the selection based on the interest of mothers who returned the allergy questionnaire. How this bias may effect the results is unknown. Second, all of the infants started life on a flexible feeding schedule. Comparison with infants fed on a rigid schedule is therefore lacking. The authors' definition of "fussiness" ruled out the babies who fussed simply because of hunger alone and were relieved by feeding. Hunger seemed to contribute to the fussiness of only four infants in the group. Overfeeding did not appear to be a contributing factor. Third, the authors were obviously interested in the occurrence of "fussiness" or "colic." Thus some of the mothers may have been inclined to stress the "fussiness" of their babies, because they were gratified by the interest shown in their problem. On the other hand, the authors have noted some mothers have the feeling that "fussiness" in infants is not a disease and is therefore not to be discussed with the doctor.

•Fourth, the question may legitimately be raised whether the individuals reading the

records for evidence of family tension were unduly influenced by their knowledge of whether or not the infant was "fussy." It will be remembered that the original direction of the study was toward an evaluation of the importance of allergy as a cause of "colic." Family tension, however, with no prior bias in its favor, forced itself on the readers of the records as a matter for consideration. In view of these influences, the authors feel that their results are inconclusive, but strongly suggest that the relationship between "family tension" and "fussiness" of the infant merits further study.

The higher incidence of fussiness toward the end of the day suggests a physiological contributing factor. Kleitman,²⁵ Jorup,⁷ and Brennemann² have reported similar findings. Perhaps fatigue increases the kind of tension which is sensed by infants. The onset of "paroxysmal fussing" usually in the second or third week of life also suggests a physiological factor. Glaser²⁶ has interpreted this period as the time required for allergic sensitization to take place. It might equally well be interpreted as the time required for the infant to develop his sensitivity to stimuli resulting from "family tension." These stimuli probably have to do with the way the mother handles and talks to the baby. It is sometimes observed that "paroxysmal fussing" or "colic" ceases when the baby is hospitalized or cared for by a different person.

Of those cases where the "family tension" seemed to contribute to the "paroxysmal fussing" of the infant, it might well be asked why the "fussing" stops at about two months of age when the "family tension" continues in full force. Many mothers have told the writers that as the infant grows older, the evening "fussy" period yields to a play period, or a period when the child seems restless and demands extra attention, but does not actually cry as if in pain. The cessation of the "paroxysmal fussing" may be related to the achievement of a certain level of motor and social development. When the infant begins to be able to use

* One of the authors (J. C. C.) who is currently working with medically indigent families in Baltimore has formed the clinical impression that "paroxysmal fussing" is just as common in the infants of this group as it was among the much better educated group in New Haven.

his eyes and hands to amuse himself, he apparently no longer needs to call on adults to comfort him.

The relationship between "paroxysmal fussing" and "hyperactivity" needs further exploration. Perhaps the "hyperactivity" observed in nine of the "fussy" infants at seven weeks of age was not simply a result of the "fussiness" but one of its causes. It is interesting that one of the "hyperactive" infants was not "fussy."

The association of vomiting, mucoid diarrhea, and difficulty in breathing with "serious paroxysmal fussing" in several instances suggests an allergic etiology. Hence the use of antihistaminic drugs at times seems to be beneficial. On the other hand, these same symptoms could arise from parasympathetic overactivity.

SUMMARY AND CONCLUSIONS

The literature on "infantile colic" or "paroxysmal fussing" is reviewed.

The frequent occurrence of a regular evening fussy period in two groups of infants is reported as indicative that this is a normal physiological event of the first few weeks of life.

The longitudinal records of 98 infants who were study subjects of the Yale Rooming-In Project were analyzed with respect to incidence, duration, and severity of "paroxysmal fussing." Forty-eight of the infants were classified as "fussy" and 50 as "contented."

The "fussy" babies typically began to have their paroxysms in the second week of life and ceased to have them at about eight weeks. Almost all of them were more fussy in the evening hours than in the morning. The rationale of various methods of treatment is discussed.

The "fussy" group was similar to the "contented" group as regards details of feeding, birth weight, weight gain, sex, educational level of the mother, and family history of allergy.

Of the 48 "fussy" infants, family tension was judged to be an important contributing

cause in 22 cases, allergy in six cases; both allergy and family tension together in nine cases; in 11 cases there was no apparent cause.

"Paroxysmal fussing" or "infantile colic" is possibly one of the earliest somatic responses to the presence of tension in the environment. The particular degree to which any infant reacts is probably determined by constitutional factors.

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SPANISH ABSTRACT

Irritabilidad Paroxística de la Infancia, en Ocasiones llamada Cólico

Con frecuencia se observa en lactantes pequeños un padecimiento llamado en formas diversas, caracterizado por paroxismos inexplicables de irritabilidad, excitabilidad, llanto, quejido o grito intenso; así, por ejemplo, se han empleado los términos de excitabilidad paroxística, llanto irritable o convulsivo, cólico infantil, dispepsia transitoria del lactante, etc.; hay distensión abdominal, el niño parecetener hambre y sin embargo no se calma con el biberón, los paroxismos son irregulares en aparición y duración, generalmente por la tarde y al anochecer y persisten durante las primeras semanas de la vida. El problema se ha enfocado en la literatura universal desde los siguientes cuatro puntos etiológicos: hipertonia congénita, alergia, inmadurez de las vías digestivas y por último transmisión al niño de la tensión familiar. El concepto de hipertonia congénita presupone un lactante con desequilibrio congénito del sistema nervioso autónomo, debido al cual los más pequeños estímulos, generalmente sin posibilidad de excitación en la mayoría de los niños, provocan en él gran excitabilidad y molestia; se recomienda una terapéutica a base de atropina y fenobarbital. Su relación a un fondo alérgico también ha sido citado por varios autores durante muchos años; se manifiesta principalmente por cólicos y diarrea, seguido en épocas posteriores de eczema y urticaria; se culpa preferentemente a los proteínas, tanto de la leche materna como de alimentos artificiales. El tercer enfoque ha sido a través de una inmadurez fisiológica del tracto intestinal asociada a actividad peristáltica anormal, del que resulta meteorismo exagerado, incurvamiento y hasta obstrucción temporal de las asas intestinales; de aquí el alivio ocasional que se observa en estos niños con los enemas. El

último punto de vista, la influencia familiar, ha venido estudiándose ultimamente; los padres nerviosos, ansiosos, con problemas de adaptación familiar, transmiten su ansiedad al niño; queda en pie la duda sobre si tal inquietud (se a) la causa o el resultado de las dificultades del niño.

Aquí se presentan las observaciones recogidas de 98 madres y 98 niños. Los datos se analizaron según factores individuales y familiares. Se consideraron factores individuales la incidencia, el tipo y la duración de las crisis paroxísticas; los fenómenos físicos intercurrentes; la hiperactividad, el fondo alérgico, tipo de alimentación, aumento de peso, sexo y orden de nacimiento en la familia, de los lactantes estudiados. Los factores familiares analizados fueron la presencia de fondo alérgico y cólicos en la familia, el grado de cultura de las madres y la tensión intrafamiliar. De los 98 niños, 50 se clasificaron como "tranquilos" y 48 como "irritables."

1.—Factores individuales.—El cuadro paroxístico fué de intensidad variable, generalmente se presentó al atardecer o a las primeras horas de la noche, a partir de la primera semana de la vida y prolongándose hasta la octava; ocasionalmente se observaron manifestaciones alérgicas de la piel, diarrea mucosa, respiración nasal ruidosa o exceso de actividad; en seis niños las crisis paroxísticas se redujeron notablemente con dietas de alimentación, reapareciendo al suspenderse; el tipo de alimentación no fué factor determinante en la incidencia del cuadro; no hubo diferencias notables en el aumento de peso entre el grupo de niños inquietos y el de los tranquilos; el sexo se encontró igualmente distribuido; de 76 primeros hijos, 42 (55%) fueron irritables e inquietos, en tanto que de 22 con hermanitos, sólo 6 (27%) lo fueron.

2.—Factores familiares.—La frecuencia del fondo alérgico familiar fué muy semejante en ambos grupos estudiados, en tanto que la historia de cólicos pareció predominar en el de niños inquietos y necios; el grado cultural de las madres fué el mismo, aproximadamente las dos terceras partes de las cuales eran universitarias en ambos; por último, se observó como factor de gran interés, la tensión intrafamiliar, con frecuencia de 72% en el grupo de los niños inquietos en contraste con el 26% para el grupo de niños tranquilos.

Desde el punto de vista del tratamiento, se recurrió a diversos procedimientos; físicos (meceros, cargarlos, acariciarlos, calor, enemas, presión sobre el abdomen, ruidos y música monótonos, etc.), medicamentosos (fenobarbital, antihistamínicos, etc.), dietéticos (cambios de dietas, aumento en la ingestión calórica, etc.), todos de acuerdo con las condiciones del niño y con más o menos buena respuesta cuando se emplearon.

Los autores reconocen la posibilidad de existencia de varios factores relacionados al desarrollo de este cuadro paroxístico de inquietud y molestias en los niños durante las primeras semanas de la vida; en su estudio destacan la alergia y la tensión intrafamiliar, en particular este último, sobre el que hacen algunas consideraciones y sugieren más observación. La mayor incidencia de las crisis al final del día sugiere algún factor fisiológico determinante, como fatiga; y la iniciación generalmente en la segunda ó tercera semana, el establecimiento de sensibilización alérgica y facilidad de captación del niño de la tensión familiar. El cesar el cuadro alrededor de la octava o novena semana de la vida, puede relacionarse con la adquisición de campos más amplios y nuevos de desarrollo motor y social, como, por ejemplo, entretenerse consigo mismo, con sus ojos o sus manos y olvidarse de los adultos para consolarse. La asociación de vómitos, diarrea mucosa y trastornos respiratorios en algunos casos sugiere una etiología alérgica que puede neutralizarse con el empleo de drogas antihistamínicas.

Los autores concluyen que la presencia por las noches de este cuadro paroxístico en muchos niños, debe aceptarse como un fenómeno fisiológico normal en las primeras semanas de la vida. Ambos grupos de niños estudiados presentaron similitud en los factores de alimentación, peso al nacer, aumento de peso, sexo, nivel cultural de la madre e historia alérgica familiar; de los 48 niños "irritables" 22 presentaron un factor franco de tensión familiar, seis de alergia y 9 de alergia y tensión familiar combinadas; en once casos no se encontró causa definida. Por último, sugieren que esta manifestación paroxística o de cólico infantil, es quizá una de las respuestas somáticas más tempranas al ambiente de tensión familiar, siendo su grado de intensidad probablemente determinado por factores constitucionales.

A CHILD-ORIENTED APPROACH TO TOILET TRAINING

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PEDIATRICIANS have a unique opportunity to prevent problems for the child in the area of bowel and bladder control. Since the advent of streamlined diaper care has liberated mothers in our culture from the real need to "train" their children early, this step may be viewed more honestly as a major developmental task for the child. Proper timing of this may enable him to achieve mastery for himself. The ultimate value of such self-achievement can be easily weighed against the adverse effects of inopportune training by an adult society. The pediatric and psychiatric literature reports complications resulting from adverse toilet training.¹⁻¹² This paper will present the results of a program for training in which utilizing the child's developmental capacities and interest was the primary goal.

Parents and pediatricians are aware that the child's autonomous achievement in any developmental area frees him to progress to more advanced areas. Faulty mastery may leave him with a deficit that results in regression under stress. The relationship of coercive toilet training to chronic constipation has been pointed out.⁷ Garrard and associates^{4,11} presented six cases of functional megacolon with psychogenic etiology, in which the environmental pressure expressed in training practices were a primary factor. Glicklich⁵ summarized psychogenic factors in enuresis. Encopresis^{2,4,9,11} and urinary incontinence^{6,13,14} can be traced to adverse or punitive training practices. Such pathologic symptoms usually reflect a fundamental psychologic disturbance in the child's adjustment. But in healthful situations, parents can be encouraged to produce a positive reaction in the child to his control of bowel and bladder.

This paper will outline a *child-oriented* approach to "toilet training" at around 2 years, geared to each child's developmental capacities. The results from 1,170 children in 10 years of pediatric practice, for whom this program was suggested, are summarized.

THEORY

The method suggested was constructed on several assumptions based on observations of physical and emotional maturation in children.

Voluntary Control of Sphincters

Local conditioning of reflex sphincter control can be effectively elicited as early as 9 months and has been the basis for an early introduction of training.^{7,8} Voluntary co-operation may be elicited as early as 12 to 15 months, and this period has been suggested^{7,9,12,15} as optimal for training. However, myelination of pyramidal tracts to these areas is not completed until the twelfth to eighteenth month.¹⁶ Associated with the transition from reflex compliance to a more voluntary type of developmental accomplishment, there is usually a perceptible time lag. In this period there is a kind of subtle inner resistance to outside pressure on the part of the child. This may be seen in many other developmental areas, such as reflex standing at 5 months to voluntary standing at 10 months, and vocalizations in the first year to verbal expressions in the latter half of the second year. This period is probably an important period of incorporation and of gathering inner forces for the child. In a complex area such as toilet training, it would be even more likely that any training based on early reflex compliance would go through a subsequent period

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of lag and breakdown before voluntary compliance on the part of the child could ensue.

Postponed breakdown in a control achieved before 12 to 18 months is much more frequent than that seen when control is accomplished after 18 months.^{7, 8, 20} That this breakdown in control can be circumvented by pressure from the environment is easy to see in some European cultures, where the incidence of postponed breakdown is much lower than in our own less rigid culture.^{13, 14, 19} However the severity and intractability of the symptoms produced in the deviant cases in these countries is good evidence for the strength of the child's inner resistances, which bring about such breakdowns. The incidence of failure in England is reported as varying from 10 to 15%.^{2, 13}

Motor Adjuncts to Training

Other aspects of motor development participate in the ease with which a child achieves training. He must be able to sit and to walk in order to maintain some degree of autonomy about leaving the potty chair, and some understanding of verbal communication is a help.

The developmental energy invested in learning to walk on his own is freed after 15 to 18 months and can be transferred to the more complex mastery of sphincter control and toilet training.

Impulse Control

There must be a psychologic readiness associated with a desire to control the impulses to defecate and urinate. These impulses are associated with a kind of primitive pleasure and an immediacy. The realization of and wish to control them is dependent on influences from the environment. Chief among them are 1) security and gratification in the relationship with parent figures, resulting in a desire to please them; 2) the wish to identify with and imitate his parents and other important figures in his environment; and 3) the wish to develop autonomy and mastery of himself and his primitive impulses.^{8, 17, 21, 22}

These psychologic processes come to the fore in the latter half of the second year and appear to reach a peak of readiness in most children beginning at 18 months and increasing to 30 months.

Other Psychologic Processes

At about 2 years of age there is a period in most children in our culture that is characterized by organizing and setting things in their proper places. Even a trend toward personal cleanliness may develop. These trends are useful in understanding a readiness for toilet training.

There is an ebb and flow of negativism in this period of development, and it must be accounted for in urging new accomplishments. As it is difficult for a parent or physician to evaluate the degree of negativism that is active at any particular time, it is necessary to pace any such program slowly and with enough elasticity to allow for these subtle variations.

PARENTAL INVOLVEMENT

Sears *et al.*¹⁸ pointed to many of the complexities of parental feelings about toilet training in our culture. The child's ability to learn by imitation is complicated by taboos centered around modesty and the sexual feelings of the parents. For parents who wanted to train their children early in order to avoid such complex areas as 1) sexuality, 2) cultural pressure from older generations, or 3) strong compulsive feelings about cleanliness, pressure to delay training increased the parents' anxieties. They found, however, that many of their group of young parents were "in transit between old and new theories" (p. 109) and were in conflict about the age at which training might best be instituted. The "new" theories^{12, 20} suggested waiting for the child's readiness. In the group who were able to postpone training, less time was required to complete it. But Sears *et al.* wondered whether parents who were pushed to delay against their wishes might not increase the tension around this area for the child.

We have found that a "child-oriented"

approach in the group of parents in our study could divert some of their own anxiety, provided there was the "guiding ear" of a third person, such as the pediatrician. The conviction that this was "better for the child" undoubtedly acted as a counterbalance to the older cultural influences, as well as to their own sexualized taboos in this area. Since the child's autonomous achievement was constantly the focus, there was the implication that there was less parental responsibility for failure in the child's lack of accomplishment. Tension could be reduced by airing parental conflicts and by assurance that the child would achieve control in his own time.

PROCEDURE

Advice was geared to each individual situation. At the 9-month visit the question of future toilet training was raised with the parents. Because the grandparents' generation usually began to press them at this time, it has proven to be an optimal period for the discussion of future plans in this area. With a program planned, the parents were better able to withstand outside pressure to institute an early attempt at training the child.

Before suggestions were introduced, the parents' own feelings in this highly-charged area were explored. A repeated opportunity for them to express their own resistances and anxieties about toilet training was important in preventing their expressing them unconsciously to the child. The importance of a relaxed, unpressured approach to training for the child was constantly stressed.

This method was presented as an adjunct to helping the child meet society's demands in this area. Because there is little innate in the child that leads him to want to be clean and dry, it must be understood as a kind of compliance to external pressure. The act of giving up the instinctual method of wetting and soiling to comply is evidence of 1) healthy maturation in the child, coupled with 2) a wish to identify with an adult society.¹⁷ Hence the optimal timing for such pressure must be geared to each child's physical and psychological readiness

to cooperate. With his autonomous achievement of this major task, the reward for him is equivalent to that seen with his mastery of standing and walking and becomes a valuable step in his developmental progress. The danger of residual symptoms is then at a minimum.

The importance of timing the introduction of this method to the child's readiness, and of allowing him freedom to master each step at his own pace, was reiterated at each subsequent visit. Problems with the child and resistances or questions from the parent were discussed at each opportunity. Since this was not necessarily an attempt to prejudice parents for this particular approach to toilet training, every effort was made to help them with their own method. However, when problems arose, the child's interests were placed foremost in the discussion.

Method of Training

At some time after the child is 18 months of age, a "potty chair" on the floor is introduced as the child's "own chair." During the period of getting familiar with it, association between it and the parents' toilet seat is made verbally. At some routine time, the mother takes him each day to sit on his chair *in all his clothes*. Otherwise, the unfamiliar feeling of a cold seat can interfere with any further co-operation. At this time, she sits with him, reads to him or gives him a cookie. Since he is sitting on a chair on the floor, he is free to leave at will. There should never be any coercion or pressure to remain.

After a week or more of his co-operation in this part of the venture, he can be taken for another period *with his diapers off*, to sit on the chair as the routine. Still no attempt to "catch" his stool or urine is made. "Catching" his stool at this point can frighten him and result in his "holding back" for a longer period thereafter. This gradual introduction of the routine is made to avoid setting up fears of strangeness and of loss of "part of himself."

When his interest in these steps is achieved, he can be taken to his pot a sec-

ond time during the day. This can be after his diapers are soiled, to change him on the seat, dropping his dirty diaper under him into the pot, and pointing out to him that this is the eventual function of his chair.

When some understanding and wish to comply coincide, there will be verbal or active compliance on the first routine trip. Then he can be taken several times a day to "catch" his urine or stool, provided he remains willing.

As interest in performance grows, the next major step becomes feasible. All diapers and pants are removed for short periods, the toilet chair is placed in his room or play area, and his ability to perform by himself is pointed out. He is encouraged to go to his own pot when he wishes and *by himself*. He may be reminded periodically that this is indicated. When he is ready to perform alone, this becomes an exciting accomplishment, and many children take over the function entirely at this point. Training pants can be introduced, the child instructed as to their removal, and they become an adjunct to his autonomous control. The excitement which accompanies mastering these steps by himself is well worth the postponing until he can accept them.

Teaching a boy to stand for urination is an added incentive. It becomes a part of identifying with his father, with other boys, and is often an outlet for a normal amount of exhibitionism. It is most easily learned by watching and imitating other male figures. It is better introduced *after* bowel training is complete. Otherwise, the excitement of standing for all functions supercedes.

Nap and night training are left until well after the child shows an interest in staying clean and dry during the day. This may be 1 to 2 years later, but it often becomes coincident with daytime achievement. When the child evidences an interest in night training, the parent can offer to help him by rousing him in the early evening and offering him a chance to go to the toilet. A pot painted with luminous paint

by his bedside is often a useful "gimmick." He is reminded that this is there for early morning use also. Some children who are eager and ready to remain dry at night have needed further help from the parents to awaken in the early morning for an interval. When this is not forthcoming, they fail in their efforts at night, lose interest and feel guilty in their failure. Then, enuresis and "giving up" may follow.

These steps are stressed as the child's achievement, and when there is a breakdown the parent is urged to stop the process and to reassure the child. He needs the reassurance that he is not "bad" in his failure to achieve, and that someday he will co-operate when he is "ready."

RESULTS

The results are compiled from unselected records of 1,170 patients over 10 years of pediatric practice (1951-1961) in Cambridge, Massachusetts. Upper-middle-class well-educated parents comprised the major portion of patients in this group. They lived under economic pressure, and mothers were washing their own diapers, so there was some practical pressure to achieve training. But their desire to give their children a thoughtful environment freed them in most cases to want to follow the suggested method.

The sample consisted of 672 (57.4%) male and 498 (42.6%) female children, of whom 660 (56.4%) were first children and 450 (43.6%) were second or later. It was found that the position in the family was a factor in determining the kind of environmental pressure which existed. With the first child there was usually more anxiety shown by the parents about waiting to train the child, more ambivalence about this "delayed" method, but surprise and relief when training was accomplished. The later children were given more freedom to train themselves at their own speed. However some pressure on these later children to conform came from the older siblings. Imitation of the older children often facilitated training in the younger ones.

The daytime training of first children

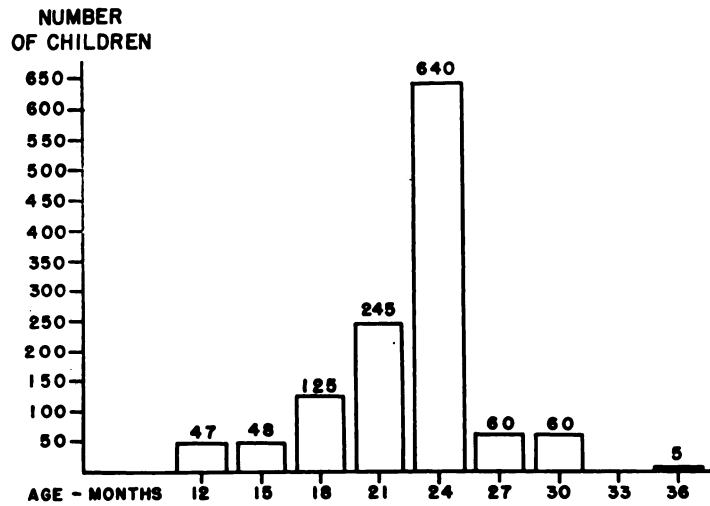


FIG. 1. Ages at which toilet training was instituted.

was effected 1 to 2 months later than in their younger siblings. Night training was delayed 1 to 7 months longer in first children than in subsequent siblings. Figure 1 summarizes the ages at which training was started. The preponderance of patients who started around 24 months reflects these parents' willingness to accept this advice, and, with second children, their own choice about such timing. Figure 2 summarizes the ages at which parents reported the

child's initial success, which was maintained. One hundred forty-four (12.3%) achieved bowel training first, 96 (8.2%) were trained for urination first, and 930 (79.5%) were reported as training themselves simultaneously for bowel and bladder control. Of the 930, some 839 (90.3%) were between 24 and 30 months of age. The average age of the total group who accomplished initial success was 27.7 months.

Initial success reflects an understanding

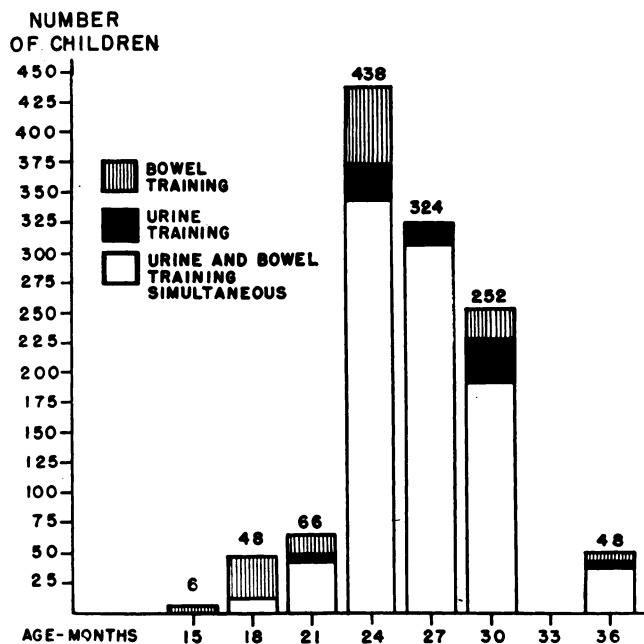


FIG. 2. Area of first achievement in training.

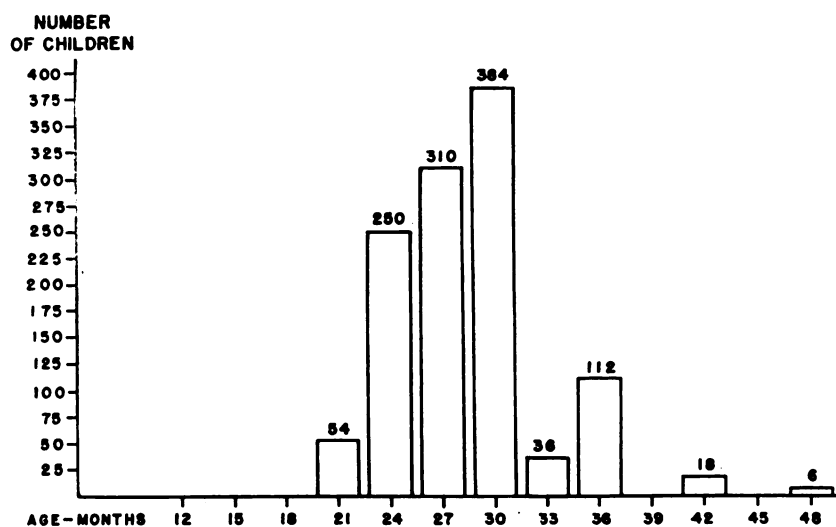


FIG. 3. Ages at completion of daytime training.

of the use of the toilet rather than a mastery of the process. Figure 3 summarizes the ages of completion of daytime training. Nine hundred forty-four (80.7%) accomplished this between the ages of 2 and 2½ years. The average was 28.5 months. No significant difference was noted between males and females. Day training means an absence of accidents under the usual stresses. When a breakover occurs under stress, it is of temporary duration only (less than 1 month).

Night training implies 1) that subsequent failure was reduced to less than once a week and 2) that enuresis returned under

unusual stress only, *e.g.*, a new baby, moving, absence of a parent, etc., and resolved itself again in a short time (less than 2 months). Figure 4 summarizes the ages of night training. Sixteen (1.4%) children are included who had residual problems of enuresis, encopresis and constipation beyond the age of 5 years. In the total group 940 (80.3%) were completely trained by the age of 3 years. The average age of all training was 33.3 months. Females were completely trained 2.46 months before males.

There were 150 children in this group whose training was not completed until 3½ years. Forty-eight, or approximately one-

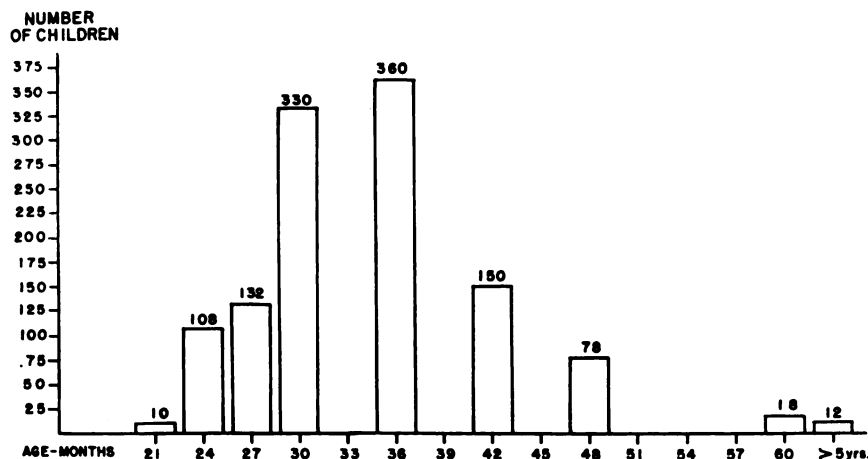


FIG. 4. Ages at completion of night training.

third of these, were started to be trained before 18 months. One hundred and eight (9.2%) were untrained by 4 years. Of these 70 or two-thirds had started training before 18 months. Of the 16 problem children only two had started early, and the time of training them seemed to have little influence in creating their more severe difficulties.

Of these 16 children, 12 were enuretic after 5 years of age, 4 soiled in stress situations, and 8 had chronic constipation. There were environmental problems in all of these cases, and it was obvious that in each of these children the above symptoms reflected deeper disturbances of a psychogenic nature. But of the other 1,154 in the group, there were often similar environmental stresses present, and it is encouraging that these did not produce problems in the training area. This suggests that by allowing the child more freedom to develop his controls at his own speed, problems in such an area may be prevented, provided parental anxiety in this area can be averted also. It is not possible in this paper to present the details of techniques available to pediatricians which can facilitate the handling of incipient problems, but these results lead one to believe that such a child-oriented approach does divert environment tension from this area and may reduce the incidence of subsequent difficulties.

SUMMARY

Results of toilet training obtained from the records of 1,170 children in pediatric practice over a 10-year period are summarized. The suggested method stressed the child's interest and compliance in developing autonomous control. This was instituted at about 2 years of age and depended on his physiologic and psychologic readiness.

Initial success was achieved simultaneously in both bowel and urinary control in 79.5% of the cases, 12.3% in bowel control alone, and 8.2% in urinary control. This first accomplishment was reached at an average

age of 27.7 months. Daytime training was completed between 2 and 2½ years of age in 80.7% of this group. The average age for day training was 28.5 months; males and females showed no significant difference; first children were 1.2 months slower than their siblings. Night training was accomplished by 3 years in 80.3% of cases. The average age for completion of all training was 33.3 months. Males took 2.46 months longer for complete training. First children were delayed 1.7 months in complete training in relation to their siblings.

Of the children who had chronic difficulties in this area, 76 (6.5%) were untrained at 4 years, and 16 (1.4%) were failures by the age of 5 years. The value of such a child-oriented program in preventing residual symptoms is stressed.

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BOOK REVIEW

A PRACTICAL OUTLINE FOR PREPARING MEDICAL TALKS AND PAPERS, Robert M. Zollinger, M.D., William G. Pace, III, M.D., and George J. Kienzle, B.A. New York, Macmillan, 1961, 57 pp., \$1.95.

This booklet of 64 pages is as simple, practical, and prosaic as the reminders inside its front and back cover for the medical man when (A) returning from meetings ("Answer accumulated mail. Report interesting and new information to staff. Outline plans for new projects.") and when (B) preparing for visitors ("Plan coffee breaks. Special honorarium must be arranged well in advance."). Between these covers there is a wealth of useful detail, some of it also a little self evident, but well worth the time of any speaker or writer, and required

reading for most.

The eight pages devoted to medical writing are scarcely enough for their purpose, but the rest of the booklet, with its brief sections on the various sorts of self-made slides and of those requiring technical assistance, is excellent. Perhaps most welcome of all is the section on projection screens, with its diagrams of proper relationships between screen size, room size, wattage of bulb, and focal length projector.

The Director of the Department of Visual Education of the Children's Hospital Medical Center tells us: "This booklet is well done, authentic. I approve heartily." Coming from F. B. Harding, this approval is impressive.

C.A.S.