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toddler. Infants generally void small volumes of urine approximately every hour, commonly stimulated by feeding, and may have incomplete emptying of the bladder. As the infant matures to be a toddler, bladder capacity increases, and between 1 and 3 years of age, cortical inhibitory pathways develop that allow the child to have voluntary control over reflexes that control the bladder muscles. The ability to have muscular control over the bowel occurs even before bladder control for most toddlers, and the assessment of fecal soiling includes determining whether the clinical presentation occurs with or without chronic constipation and overflow soiling. The normal sequence of developing control over bowel and bladder functions is the development of nocturnal fecal continence, diurnal fecal continence, diurnal bladder control, and nocturnal bladder control. Bowel and bladder control develops gradually over time. Toilet training is affected by many factors, such as a child's intellectual capacity and social maturity, cultural determinants, and the psychological interactions between child and parents. The ability to control bowel and bladder functions depends on the maturation of neurobiological systems, so that children with developmental delays may also display delayed continence of bowel and bladder. When children exhibit incontinence of urine or feces on a regular basis, it is troubling to the child and families, and often misunderstood as voluntary misbehavior. Encopresis (repeated passage of feces into inappropriate places) and enuresis (repeated urination into bed or clothes) are the two elimination disorders described in the Fifth Edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5). These diagnoses are not made until after age 4 years, for encopresis, and after age 5 years for enuresis, the ages at which a typically developing child is expected to master these skills. Normal development encompasses a range of time in which a given child is able to devote the attention, motivation, and physiological skills to exhibit competency in elimination processes. Encopresis is characterized by a pattern of passing feces in inappropriate places, such as in clothing or other places, at least once per month for 3 consecutive months, whether the passage is involuntary or intentional. Up to about 80 percent of children with fecal incontinence have associated constipation. A child with encopresis typically exhibits dysregulated bowel function; for example, with infrequent bowel movements, constipation, or recurrent abdominal pain and sometimes pain on defecations. Enuresis is characterized by repeated voiding of urine into clothes or bed, whether the voiding is involuntary or intentional. The behavior must occur twice weekly for at least 3 months or must cause clinically significant distress or impairment socially or academically. The child's chronological or developmental age must be at least 5 years. 31.10a Encopresis EPIDEMIOLOGY Encopresis has been estimated to affect 3 percent of 4-year-olds and 1.6 percent of 10-

year-old children. Incidence rates for encopretic behavior decrease drastically with increasing age. Between the ages of 10 years and 12 years, it is estimated to affect 0.75 percent of typically developing children. Globally, community prevalence of encopresis ranges from 0.8 to 7.8 percent. In Western cultures, bowel control is established in more than 95 percent of children by their fourth birthday and in 99 percent by the fifth birthday. Encopresis is virtually absent in youth with normal intellectual function by the age of 16 years. Males are found to from three to six times more likely to have encopresis than females. A significant relation exists between encopresis and enuresis. ETIOLOGY Ninety percent of chronic childhood encopresis is considered to be functional. Children with this disorder typically withhold feces by contracting their gluteal muscles, holding their legs together, and tightening their external anal sphincter. In some cases, this is an entrenched behavioral response to previously painful bowel movements due to hard stool, which leads to fear of defecation and withholding behaviors. Encopresis involves an often-complicated interplay between physiological and psychological factors leading to an avoidance of defecation. However, when children chronically hold in bowel movements, the result is often fecal impaction and eventual overflow soiling. This pattern is observed in more than 75 percent of children with encopretic behavior. This common set of circumstances in most children with encopresis supports a behavioral intervention with a focus on ameliorating constipation while increasing appropriate toileting behavior. Inadequate training or the lack of appropriate toilet training may delay a child’s attainment of continence. Evidence indicates that some encopretic children have lifelong inefficient and ineffective sphincter control. Other children may soil involuntarily, either because of an inability to control the sphincter adequately or because of excessive fluid caused by a retentive overflow. In about 5 to 10 percent of cases, fecal incontinence is caused by medical conditions including abnormal innervation of the anorectal region, ultrashort segment Hirschsprung disease, neuronal intestinal dysplasia, or spinal cord damage. One study found encopresis to occur with significantly greater frequency among children with known sexual abuse, and other psychiatric disorders, compared with a sample of healthy children. Encopresis, however, is not a specific indicator of sexual abuse. It is evident that once a child has developed a pattern of withholding bowel movements, and attempts to defecate have become painful, a child’s fear and resistance to changing the pattern are high. Battles with parents who insist that their children attempt to defecate before they are adequately treated may aggravate the condition and cause secondary behavioral difficulties. Children with encopresis who are not promptly treated, however, frequently end up being socially ostracized and rejected. The social consequences of soiling can lead to the development of emotional problems. On the other hand, children with encopresis who clearly can control their bowel function

adequately but chronically deposit feces of relatively normal consistency in abnormal places are likely to have preexisting neurodevelopmental problems. Occasionally, a child has a specific fear of using the toilet, leading to a phobia. Encopresis, in some cases can be considered secondary, that is, emerging after a period of normal bowel habits in conjunction with a disruptive life event, such as the birth of a sibling or a move to a new home. When encopresis manifests after a long period of fecal continence, it may reflect a developmental regressive behavior based on a severe stressor, such as a parental separation, loss of a best friend, or an unexpected academic failure. Megacolon Most children with encopresis retain feces and become constipated, either voluntarily or secondary to painful defecation. In some cases a subclinical preexisting anorectal dysfunction exists that contributes to the constipation. In either case, resulting chronic rectal distention from large, hard fecal masses can cause loss of tone in the rectal wall and desensitization to pressure. Thus,

children in this situation become even less aware of the need to defecate, and overflow encopresis occurs, usually with relatively small amounts of liquid or soft stool leaking out. DIAGNOSIS AND CLINICAL FEATURES According to DSM-5, encopresis is diagnosed when feces are passed into inappropriate places on a regular basis (at least once a month) for 3 months. Encopresis may be present in children who have bowel control and intentionally deposit feces in their clothes or other places for a variety of emotional reasons. Anecdotal reports have suggested that occasionally encopresis is attributable to an expression of anger or rage in a child whose parents have been punitive or of hostility at a parent. In a case such as this, once a child develops this inappropriate repetitive behavior eliciting negative attention, it is difficult to break the cycle of continuous negative attention. In other children, sporadic episodes of encopresis can occur during times of stress—for example, proximal to the birth of a new sibling—but in such cases, the behavior is usually transient and does not fulfill the diagnostic criteria for the disorder. Encopresis can also be present on an involuntary basis in the absence of physiological abnormalities. In these cases, a child may not exhibit adequate control over the sphincter muscles, either because the child is absorbed in another activity or because he or she is unaware of the process. The feces may be of normal, near-normal, or liquid consistency. Some involuntary soiling occurs from chronic retaining of stool, which may result in liquid overflow. In rare cases, the involuntary overflow of stool results from psychological causes of diarrhea or anxiety disorder symptoms. The DSM-5 includes two specifiers to encopresis: with constipation and overflow incontinence and without constipation and overflow incontinence. To receive a diagnosis of encopresis, a child must have a developmental or chronological level of at least 4 years. If the fecal incontinence is directly related to a medical condition, encopresis is

not diagnosed. Studies have indicated that children with encopresis who do not have gastrointestinal illnesses have high rates of abnormal anal sphincter contractions. This finding is particularly prevalent among children with encopresis with constipation and overflow incontinence who have difficulty relaxing their anal sphincter muscles when trying to defecate. Children with constipation who have difficulties with sphincter relaxation are not likely to respond well to laxatives in the treatment of their encopresis. Children with encopresis without abnormal sphincter tone are likely to improve over a short period. Jack was a 7-year-old boy with daily encopresis, enuresis, and a history of hoarding behaviors, along with hiding the feces around the house. He lived with his adoptive parents, having been removed from his biological parents at age 3 years because of neglect and physical abuse. He was reported to be cocaine addicted at birth, but was otherwise healthy. Jack’s biological mother was a known methamphetamine and alcohol user, and his father had spent time in jail for drug dealing. Jack had always been enuretic at night, and until this year, he had a history of daytime enuresis as well. Jack had a short attention span, was highly impulsive, and had great difficulty staying in his seat at school and remaining on task. He had reading difficulties and was placed in a contained special education classroom because of his disruptive behavior as well as his academic difficulties. Despite experiencing physical abuse, he has not experienced flashbacks or other symptoms that would indicate the presence of posttraumatic stress disorder. Jack was treated for attention-deficit/hyperactivity disorder (ADHD) with good response to methylphenidate (Concerta 36 mg per day). Jack’s adoptive family sought help at a university hospital’s outpatient program that had expertise in the behavioral treatments of many psychiatric disorders including encopresis. The treatment program combined use of regular laxatives and a bowel training method with cognitive-behavioral therapy for Jack and for his family. Jack was started on a regimen of daily polyethylene glycol (PEG) solution and was seen by a

pediatrician who was able to perform a manual disimpaction under sedation. Following that, Jack was continued on daily PEG solution combined with therapy. He learned to empty his bowel while sitting on the toilet for 10 minutes after each meal, whether or not he felt like he had to go. He soon was eager to stay on this regular bathroom schedule, and felt proud when he was able to have a bowel movement in the toilet. Over a period of 3 months, Jack was noticeably improved, and at 6 months, he was almost completely better. (Courtesy of Edwin J. Mikkelsen, M.D. and Caroly Pataki, M.D.) PATHOLOGY AND LABORATORY EXAMINATION Although no specific test indicates a diagnosis of encopresis, clinicians must rule out medical illnesses, such as Hirschsprung's disease, before making a diagnosis. It must be determined whether fecal retention is responsible for encopresis with constipation and

overflow incontinence; a physical examination of the abdomen is indicated, and an abdominal X-ray can help determine the degree of constipation present. Tests to determine whether sphincter tone is abnormal are generally not conducted in simple cases of encopresis. DIFFERENTIAL DIAGNOSIS In encopresis with constipation and overflow incontinence, constipation can begin as early as the child's first year and can peak between the second and fourth years. Soiling usually begins by age 4. Frequent liquid stools and hard fecal masses are found in the colon and the rectum on abdominal palpation and rectal examination. Complications include impaction, megacolon, and anal fissures. Encopresis with constipation and overflow incontinence is rarely caused by faulty nutrition; structural disease of the anus, rectum, and colon; medicinal adverse effects; or nongastrointestinal medical (endocrine or neurological) disorders. The chief differential medical problem is aganglionic megacolon or Hirschsprung's disease, in which a patient may have an empty rectum and no desire to defecate, but may still have an overflow of feces. The disorder occurs in 1 in 5,000 children; signs appear shortly after birth. COURSE AND PROGNOSIS The outcome of encopresis depends on the etiology, the chronicity of the symptoms, and coexisting behavioral problems. In some cases, encopresis is self-limiting, and it rarely continues beyond middle adolescence. Encopresis in children who have contributing physiological factors, such as poor gastric motility and an inability to relax the anal sphincter muscles, is more difficult to treat than that in those with constipation but normal sphincter tone. Encopresis is a particularly objectionable disorder to family members, who may assume that the behavior is due to "laziness," and family tensions are often high. Peers are intolerant of the developmentally inappropriate behavior and typically taunt and reject a child with encopresis. Many affected children have abysmally low self-esteem and are plagued by constant social rejection. Psychologically, a child may appear blunted toward the symptoms or less frequently, may be entrenched in a pattern of encopresis as a mode of expressing anger. The outcome of encopresis is influenced by a family's willingness and ability to participate in treatment without being overly punitive and by the child's ability and motivation to engage in treatment. TREATMENT A typical treatment plan for a child with encopresis includes daily oral administration of laxatives such as PEG at 1 g/kg per day, and often a surgical disimpaction under general anesthesia before maintenance laxatives can be administered. In addition, an ongoing cognitive-behavioral intervention to begin regular attempts to have bowel movements in the toilet, and to diminish anxiety related to bowel movement. By the

time a child is brought for treatment, considerable family discord and distress are common. Family tensions about the symptom must be reduced, and a nonpunitive atmosphere established. Similar efforts should be made to reduce the child's embarrassment at school. Many changes of underwear with a minimum of embarrassment should be arranged. Education of the family and correction of misperceptions that a family may have about soiling must occur before treatment. Laxatives are

not necessary for children who are not constipated and do have good bowel control, but regular, timed intervals on the toilet may be useful with these children as well. A report confirms the success of an interactive parent–child family guidance intervention for young children with encopresis based on psychological and behavioral interventions for children younger than age 9 years. Supportive psychotherapy and relaxation techniques may be useful in treating the anxieties and other sequelae of children with encopresis, such as low self-esteem and social isolation. Family interventions can be helpful for children who have bowel control but who continue to deposit their feces in inappropriate locations. An optimal outcome occurs when a child achieves a feeling of control over his or her bowel function. REFERENCES Bahar RJ, Reid H. Treatment of encopresis and chronic constipation in young children: Clinical results from interactive parent-child guidance. Clin Pediatr. 2006;45:157. Benninga MA, Voskuijl WP, Akkerhius GW, Taminiau JA, Buller HA. Colonic transit times and behaviour profiles in children with defecation disorders. Arch Dis Child. 2004;89:13. Brazzeli M, Griffiths P. Behavioural and cognitive interventions with or without other treatments for the management of fecal incontinence in children. Cochrane Database Syst Rev. 2006;19:CD002240. Di Lorenzo C, Benninga MA. Pathophysiology of pediatric fecal incontinence. Gastroenterology. 2004;126[Suppl 1]:S533. Har AF, Croffie JM. Encopresis. Pediatr Rev. 2010;31:368–374. Kajiwara M, Inoue K, Kato M, Usui A, Kurihara M, Usui T. Nocturnal enuresis and overactive bladder in children: An epidemiological study. Int J Urol. 2006;13:36. Klages T, Geller B, Tillman R, Bolhofner K, Zimerman B. Controlled study of encopresis and enuresis in children with a prepubertal and early adolescent bipolar-I disorder phenotype. J Am Acad Child Adolesc Psychiatry. 2005;44:1050. Mellon MW, Whiteside SP, Friedrich WN. The relevance of fecal soiling as an indicator of child sexual abuse: A preliminary analysis. J Dev Behav Pediatr. 2006;27:25. Mikkelsen EJ. Elimination disorders. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock’s Comprehensive Textbook of Psychiatry. 9th ed. Vol. II. Philadelphia: Lippincott Williams & Wilkins; 2009:3624. Mugie SM, Di Lorenzo C, Benninga MA. Constipation in childhood. Gastroenterol Hepatol. 2011;8:502–511. Rajindrajith S, Devanarayana NM, Benninga MA. Review article: Faecal incontinence in children: Epidemiology, pathophysiology, clinical evaluation and management. Aliment Pharmacol Ther. 2013;37:37–48. Reiner WG. Pharmacology in the management of voiding and storage disorders, including enuresis and encopresis. J Am Acad Child Adolesc Psychiatry. 2008;47:491–498. Rowan-Legg A. Managing functional constipation in children. Paediatr Child Health. 2011;16:661–665. Von Gontard A, Hollmann E. Comorbidity of functional urinary incontinence and encopresis: somatic and behavioral associations. J Urology. 2004;171:2644.

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