Fecal and anal incontinence associated with pregnancy and childbirth: Counseling, evaluation, and management

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INTRODUCTION

Fecal incontinence (FI) and anal incontinence (AI) affect all age groups of both females and males, including pregnant and postpartum persons, and can create significant distress. Symptoms are more common during the postpartum period than during pregnancy. Two potential contributors to FI and AI are damage to pelvic floor muscles and nerves, especially in those who experience an obstetric anal sphincter injury and/or who undergo an operative vaginal delivery.

This topic will discuss the effects of pregnancy and childbirth on FI and AI, the approach to obstetric management for these individuals, and the treatment of FI and AI during pregnancy and postpartum. Related topics on bowel incontinence related to pregnancy and childbirth include:

- (See "Obstetric anal sphincter injury (OASIS)".)
- (See "Effect of pregnancy and childbirth on urinary incontinence and pelvic organ prolapse".)
- (See "Obstetric fistulas in resource-limited settings".)

In this topic, when discussing study results, we will use the terms "women" or "patients" as they are used in the studies presented. However, we recognize that not all individuals who

experience pregnancy identify as women and we encourage the reader to consider the specific counseling and treatment needs of transgender and gender diverse individuals.

TERMINOLOGY

The International Continence Society provides the following definitions of bowel incontinence [1]:

- Fecal incontinence (FI) is defined as the involuntary loss of feces (liquid or solid). FI is also referred to as accidental bowel leakage [2].
- Anal incontinence (AI) is defined as the involuntary loss of feces and/or flatus.
- Flatal incontinence refers to the involuntary loss of rectal gas (flatus).

CONTINENCE MECHANISMS AND IMPACT OF OBSTETRIC FACTORS

Normal physiology and injury — The mechanisms for continence and defecation (figure 1), as well as injury and dysfunction, are complex and are presented in detail in separate discussions.

- (See "Fecal incontinence in adults: Etiology and evaluation", section on 'Physiology of defecation'.)
- (See "Effect of pregnancy and childbirth on urinary incontinence and pelvic organ prolapse", section on 'Mechanisms of pelvic floor injury'.)

For individuals who do experience FI or AI during pregnancy, pregnancy-specific contributing factors are not well understood. Normal physiologic changes of late pregnancy likely play a role, with increased transit time leading to altered stool consistency and delivery of contents to the rectum. Similarly, the increased intraabdominal pressure of the third trimester may contribute to incontinence for those with preexisting pelvic floor or anal sphincter dysfunction.

Childbirth itself may lead to incontinence through two major mechanisms: nerve and muscle injury. Passage of the fetal head through the pelvis may cause stretching and compression of the pudendal nerve, with demyelination and subsequent denervation for perhaps half of patients delivering vaginally [3,4]. These injuries can be detected using concentric needle electromyography and measurement of pudendal nerve motor latencies. However, routine formal testing for pudendal neuropathy is no longer recommended as it does not impact treatment [5]. Most patients with pudendal neuropathy will spontaneously improve during the first year after delivery, but the factors contributing to persistent neuropathy for a

minority of individuals remain unclear. Direct injury to the anal sphincter (obstetric anal sphincter injury [OASIS]) represents an even more important cause of incontinence, with clear associations between the degree of injury and subsequent symptoms. (See "Obstetric anal sphincter injury (OASIS)".)

The obstetric risk factors for both pudendal neuropathy and OASIS are similar and include nulliparity; midline episiotomy; operative delivery, particularly with forceps; and larger birth weight [6]. The greatest impact on FI and AI is believed to occur with the first vaginal delivery [7], but both objective measures of anal sphincter function and subjective reporting of continence may be worsened by subsequent pregnancies and especially subsequent vaginal deliveries [8,9]. The changes in bowel function resulting from vaginal delivery appear to be long lasting. Measurable differences between nulliparous and parous women have been reported for pudendal nerve latencies, rectal sensation, and voluntary squeeze pressures up to menopause [10,11].

Role of obstetric factors

- **Pregnancy –** There is a lack of convincing evidence that pregnancy alone increases the risk of FI or AI, and indeed, the prevalence of FI in United States adults is equivalent in women and men [12-16].

- **Labor –** Undergoing labor does not appear to increase a patient's risk of AI. In the Mothers' Outcomes After Delivery (MOAD) study, a prospective cohort of over 1000 women recruited 5 to 10 years after delivery of their first child, those who only delivered via cesarean prior to active labor did not have different rates of AI than those who delivered by cesarean prior to complete cervical dilation or cesarean after complete cervical dilation [14]. One study limitation was the use of AI as an endpoint, which includes incontinence of both feces and flatus. It is not known if the FI rates would have differed among the study groups.

- **Mode of delivery –** There are very few randomized trials that have either allocated patients with a cephalic presenting singleton to cesarean or vaginal delivery or that have compared forceps and vacuum delivery, and none that include fecal continence as an outcome. Conclusions about the association of different modes of delivery and FI or AI are largely based on conflicting observational data. Most studies do suggest that operative vaginal delivery (via forceps or vacuum) does increase the risk of FI or AI, especially if there is concurrent OASIS [17].

    - **Vaginal versus cesarean birth –** As large studies, mostly observational, have both supported and refuted an increased risk of FI and AI for persons undergoing vaginal birth compared with cesarean delivery, the answer remains elusive.

Studies reporting an increased risk of FI or AI for vaginal, compared with cesarean, delivery include:

- A 2019 Swedish national population-based study that included over 3.7 million people (parous women, nulliparous women, and age-matched men [control group]) analyzed women who gave birth by either vaginal or caesarean delivery only between 1973 and 2015 and linked the delivery mode data to AI diagnoses between 2001 and 2015 [17]. Women who underwent only vaginal deliveries were 65 percent more likely to be diagnosed with AI compared with women who underwent only cesarean delivery. Exclusion criteria included multiple birth delivery, mixed vaginal delivery and cesarean delivery, and four or more deliveries.

- A 2020 meta-analysis of pregnancy- and obstetric-related risk factors for pelvic floor disorders identified spontaneous vaginal delivery (versus no spontaneous vaginal delivery) to be associated with a 1.41 (1.02, 1.96) odds of postpartum FI in data pooled from 10,708 participants [18]. This association was greatest in the first 18 months postpartum and was no longer statistically significant at 4 to 12 years postpartum.

Studies reporting no difference in FI or AI between vaginal and cesarean delivery routes include:

- A 2010 systematic review of 21 studies, including over 31,500 women, found insufficient evidence that cesarean delivery preserved anal continence and recommended against this criterion as justification for elective primary cesarean delivery [19].

- In the 2011 prospective cohort MOAD study, including slightly more than 1000 women, the rate of AI was not statistically different between women with prior vaginal delivery compared with women who only underwent cesarean delivery before onset of labor (11 versus 8 percent, not significant) [14].

- In 2013, the largest trial of planned cesarean or vaginal delivery, which included over 2800 women with twin pregnancies, reported no difference in fecal or flatal incontinence at either three-month or two-year follow-up [20].

- A 2018 cohort study that recruited over 1500 women 5 to 10 years after their first delivery and followed them for up to nine additional years reported cesarean delivery was associated with a reduced risk of stress urinary incontinence, overactive bladder, and pelvic organ prolapse, but not AI, compared with women who had a spontaneous vaginal delivery [21].

- **Spontaneous vaginal versus operative vaginal birth** – While not all studies demonstrate worsened AI following operative vaginal birth compared with spontaneous vaginal delivery, the overall body of evidence supports that operative vaginal delivery is a risk factor for AI. Supporting data include:

  - In the 2011 MOAD study of women recruited 5 to 10 years from first birth, the AI risk was greater for women with operative compared with spontaneous vaginal delivery (15 versus 11 percent) [14].

  - A 2019 Swedish population-based study that included 3.7 million individuals reported a 70 percent increased odds of AI for individuals undergoing instrumented delivery compared with spontaneous vaginal delivery [17].

  - In a 2020 meta-analysis including 14,873 women, operative vaginal birth conferred a 1.94 (1.53 to 2.45) odds of postpartum FI overall, with the strongest association 2.78 (1.82 to 4.24) in the first two years postpartum. This association remained statistically significant 4 to 12 years postpartum with an odds ratio of 1.65 (1.24 to 2.19) [18].

- **Forceps delivery versus vacuum delivery** – In a planned secondary analysis of 449 women from the MOAD study, AI remained more prevalent in women with at least one forceps-assisted delivery compared with vacuum and spontaneous delivery, but the difference was not statistically significant, perhaps owing to the smaller sample size and multiple study groups [22]. A later study from the MOAD group, including over 1500 women followed for up to nine additional years from initial recruitment, reported operative vaginal birth (combined forceps and vacuum assisted) was associated with a 75 percent higher adjusted risk of AI compared with spontaneous vaginal birth [21]. This result concurred with findings from the only available randomly assigned trial of forceps versus vacuum delivery, which also reported a nearly threefold higher risk of FI at three months postpartum [23].

- **Obstetric anal sphincter injury (OASIS)** – OASIS, especially in the context of operative vaginal delivery, is associated with increased risk of FI and AI in both the immediate postpartum period [18] and throughout the lifespan [24,25]. For some patients, OASIS is not diagnosed at the time of delivery but is detected at a much later date when the patient is evaluated for FI or AI. Even after recognition and adequate primary repair, 25 to 50 percent of individuals with OASIS will have persistent AI [26,27]. The clinical significance, diagnosis, and management of OASIS is discussed in detail elsewhere. (See "Obstetric anal sphincter injury (OASIS)".)

- **Episiotomy** – Data regarding the impact of episiotomy on development of AI are particularly difficult to interpret because of varying types of episiotomy as well as the

high co-occurrence of episiotomy with operative vaginal delivery and OASIS, both of which are established risk factors for FI and AI. Routine use of episiotomy was previously thought to protect against urinary incontinence and AI postpartum. However, a 2005 systematic review concluded that routine use of episiotomy conferred no benefit for prevention of incontinence (urinary and fecal), and potentially caused some harm, when compared with restrictive use, although the long-term data specific to incontinence were limited [28]. A later study that compared the prevalence of postpartum AI in women who delivered at two hospitals, one of which used episiotomy routinely while the other used it restrictively, reported lower AI prevalence rates at four years postpartum in the restrictive group (11 versus 16 percent, respectively), while FI rates were the same for both groups (3 percent) [29]. Similarly, a 2017 meta-analysis of 12 trials reported lower rates of severe perineal trauma with selective use of episiotomy compared with routine use, although rates of subsequent FI were not reported [30].

When episiotomy is performed, its impact on FI and AI may vary with episiotomy type, in part because of differing risk for resultant OASIS. Although the available randomly assigned trial evidence is limited, observational data strongly suggest that mediolateral episiotomy may play a protective role against OASIS for nulliparous persons undergoing operative vaginal delivery. (See "Approach to episiotomy", section on 'Mediolateral versus median (midline) episiotomy'.)

- **Other factors** – Some observational studies report correlations between AI and increasing infant birth weight and maternal age [17,25], but these data are not sufficiently strong to guide clinical management at present, partly because of imprecision in ultrasound estimation of birth weight, particularly for larger babies. Several other potentially modifiable risk factors include induction or augmentation of labor and use of epidural anesthesia, although data from observational studies conflict [6]. A 2020 meta-analysis that pooled data from 4000 or more patients identified newborn weight >4000 g, oxytocin, and maternal age >35 years as being significantly associated with postpartum FI in univariate analysis [18], but further trial data are needed before changes to clinical practice are warranted.

APPROACH TO DELIVERY

Assess incontinence risk factors — Given that the etiology of FI is multifactorial, assessment of nonobstetric risk factors for FI or AI during pregnancy is paramount before making a decision regarding delivery route. Nonobstetric risk factors for postpartum FI/AI include preexisting diarrhea, fecal urgency, urinary incontinence, and diabetes mellitus. In one retrospective cohort of women with irritable bowel syndrome, those with symptoms of

diarrhea and fecal urgency had a twofold increased risk of FI following obstetric anal sphincter injury (OASIS) [31].

We suggest that individuals with these risk factors (diarrhea, fecal urgency, urinary incontinence, diabetes mellitus, and irritable bowel syndrome) be counseled during pregnancy about their increased risk of FI, regardless of delivery route. The increased risk of FI applies not just to the postpartum period but also to menopause and aging in general [25]. Those who experience FI symptoms during pregnancy have significantly higher odds of experiencing FI postpartum [18]. Given that fewer than 30 percent of women with FI seek medical treatment [32], we suggest that this discussion focus not just on mode of delivery but also on the treatability of FI so that patients learn that their obstetrician-gynecologist is a helpful resource if these symptoms develop in the postpartum period or beyond. Detailed discussions of risk factors and relevant history for FI are presented separately.

- (See "Fecal incontinence in adults: Etiology and evaluation", section on 'Etiology and pathogenesis'.)

- (See "Fecal incontinence in adults: Etiology and evaluation", section on 'Evaluation'.)

Choice of delivery route — Clear evidence to guide selection of the optimal delivery mode for specific patient groups is lacking. Shared decision making is needed, with the choice of delivery mode primarily determined by each patient's own values and preferences. Researchers have developed nomograms to help counsel patients about their risk of FI and urinary incontinence in both the immediate postpartum period and decades later, but these predictive models are based on observational data and have not been externally validated, so their results should be interpreted with caution [33,34].

These interactive online predictive models, and information from existing literature [18], can be used to supplement patient counseling about this topic [33-35]. It is important to note that the risk of developing pelvic floor symptoms is only one component of this complex decision; a complete list of the benefits and disadvantages of planned cesarean delivery is discussed elsewhere. (See "Cesarean birth on patient request".)

We take the following approaches to counseling various patient populations:

- **Without symptoms or risk factors for FI/AI –** Individuals without preexisting FI or AI symptoms or risk factors (diarrhea, fecal urgency, urinary incontinence, diabetes mellitus, irritable bowel syndrome, prior OASIS) are at low risk for developing FI or AI regardless of their mode of delivery. Given that epidemiologic data conflict regarding the impact of spontaneous vaginal birth on anal continence, we do not recommend discussion of FI and AI as part of standard counseling about differing maternal and neonatal risks with vaginal and cesarean birth. For patients who inquire about individual risk of postpartum FI/AI, predictive models may be used to aid in counseling,

with the caveat that these tools are still being developed. By contrast, we do inform patients of the increased risk of FI or AI following operative vaginal delivery (using forceps or vacuum), especially with concurrent OASIS. Data do not support offering cesarean delivery for primary prevention of FI. (See "Cesarean birth on patient request".)

- **With symptoms or risk factors for FI/AI –** Patients with FI or AI symptoms or risk factors (diarrhea, fecal urgency, urinary incontinence, diabetes mellitus, irritable bowel syndrome) before or during pregnancy may be at increased risk for new onset or worsening bowel symptoms following vaginal delivery. Trial of labor and elective cesarean delivery are both reasonable options for these patients, given that our best predictive tools are still being optimized. The UR-CHOICE Pelvic Floor Disorders Risk Calculator is useful to help guide discussions about an individual's risk of FI and other pelvic floor disorders in the decades following her delivery, but it has not been externally validated [34,35]. Patients with FI during pregnancy are more likely to experience FI postpartum [18]. Parous persons with a history of transient FI or AI after a previous birth may be more likely to develop FI long term. As most studies focus on those with a history of OASIS (below), there are limited data regarding mode of delivery in persons with FI or AI without a history of OASIS. For patients with bothersome FI or AI who do not plan childbearing beyond the current pregnancy, we offer cesarean delivery to avoid further damage to the sphincter complex but also provide reassurance that trial of labor is reasonable, if desired. For patients planning subsequent pregnancies, we perform shared decision making. After counseling, the patient must balance the risk of persistent or worsening FI following vaginal birth against the risks incurred by multiple cesarean deliveries; the clinician provides the counseling, but the patient ultimately chooses her route of delivery based on what is most acceptable to her.

  Ultimately, the choice of cesarean or vaginal delivery remains highly individual, and either choice should be supported.

- **With prior OASIS –** Patients who have already experienced OASIS are at elevated risk of new or worsening FI or AI symptoms during pregnancy and at risk of recurrent OASIS with vaginal delivery. As OASIS represents the major risk factor for new onset or worsening FI, the choice of mode of delivery is particularly important for patients who have already experienced one OASIS. The risk of recurrent OASIS is equivalent to the OASIS risk of first-time mothers [36,37]. Even asymptomatic patients with prior OASIS may be at risk of new onset FI following a vaginal birth with or without recurrent OASIS [8]. A trial that randomly assigned 222 continent women with prior OASIS (confirmed with endoanal sonography) to either vaginal birth (n = 112) or cesarean delivery (n = 110) reported similar rates of AI in the first six months postpartum [38]. However,

consistent with our recommendation above, a subgroup analysis suggested that patients with pre-existing mild symptoms were more likely to benefit from cesarean delivery.

Counseling these patients regarding mode of next delivery therefore requires assessment of the individual's current symptoms and preferences regarding future risk of incontinence compared with the surgical risks of cesarean delivery and future childbearing plans. The delivery route should ultimately be selected by the patient, and it is reasonable to offer these individuals either cesarean or vaginal delivery. The approach to counseling is discussed in greater detail separately. (See "Obstetric anal sphincter injury (OASIS)", section on 'Approach to future delivery'.)

Obstetric management — Obstetric management of planned vaginal delivery should include standard approaches to reduce perineal injury for all patients [39,40]. Multiple trials support use of both perineal massage and warm compresses to the perineum [41-43]. Although trial data are lacking, observational evidence strongly supports use of manual perineal support at delivery [44]. The evidence for or against routine or restrictive use of mediolateral episiotomy is surprisingly complex, with observational studies reporting conflicting data. (See 'Role of obstetric factors' above.)

For nulliparous persons undergoing operative vaginal delivery, observational evidence strongly suggests a role for routine mediolateral episiotomy in reducing risk of OASIS [45]. However, statements from Canada, the United Kingdom, and the United States continue to support restrictive use of mediolateral episiotomy, even for operative delivery, pending further trials [39,46,47]. When OASIS does occur at vaginal delivery, its management should follow standard guidance, including repair by an appropriately trained clinician in an operating room with use of antibiotics and laxatives to reduce the risk of postoperative infections and wound dehiscence. (See "Obstetric anal sphincter injury (OASIS)".)

PREGNANT PERSONS WITH FI/AI

Symptom prevalence — True FI is rare in pregnancy and impacts approximately 0.6 to 5 percent of women [48,49]. AI is more common during pregnancy, with reported prevalence ranging from 7 to 9 percent [48,50], with 40 percent experiencing flatal incontinence [49]. Fecal urgency is another bothersome complaint for approximately 5 to 10 percent of women during pregnancy [50]. Women who experience anorectal symptoms prior to pregnancy and those with elevated body mass index (BMI) are more likely to experience these symptoms during pregnancy [51].

The most common anorectal symptoms experienced during pregnancy are constipation and hemorrhoids. (See "Maternal adaptations to pregnancy: Gastrointestinal tract", section on

'Bowel, rectum, anus'.)

Alarm findings — During pregnancy, most antenatal bowel symptoms can be managed conservatively within an obstetric service, but certain symptoms require prompt referral to colorectal specialists. Although many pregnant persons may experience some change in bowel habits or minor rectal bleeding (associated with hemorrhoids), clinicians should be mindful of the possibility of colorectal carcinoma or new onset inflammatory bowel disease. Heavy rectal bleeding, weight loss, or physical examination findings suggestive of cancer or inflammatory bowel disease (rectal mass, perianal fistula) should prompt immediate referral to colorectal surgery and gastroenterology specialists. Similarly, while rectocele can be managed with pessaries or pelvic floor training, patients with rectal prolapse, stricture, or complaints in the setting of prior anorectal radiation should be immediately referred for colorectal evaluation. In the presence of alarm findings, the benefits of endoscopy outweigh its risks during pregnancy.

Evaluation — For most pregnant individuals with FI or AI, evaluation includes a thorough history and physical examination without need for additional testing. (See "Fecal incontinence in adults: Etiology and evaluation", section on 'Evaluation'.)

- **History –** A relevant history includes questions that focus on the onset, duration, frequency, volume of leakage (small stain, moderate amount, full bowel movement), type of leakage (solid, liquid, or gas), presence of urgency, nocturnal episodes, and precipitating events (such as diarrhea, medication use, dietary triggers). Patients should also be asked about tissue bulging from the anal canal, which can indicate possible hemorrhoids or rectal prolapse. The presence of lower back or perineal pain, motor or sensory symptoms in the lower extremities, and urinary incontinence are suggestive of a neurologic cause of incontinence (eg, spinal cord lesion). Relevant past medical, surgical, and obstetric histories should be obtained, including anorectal surgery, pelvic irradiation, diabetes, neurologic disease, prior vaginal and operative vaginal deliveries, prolonged labor, and perineal laceration history (including degree and episiotomy type, if available), as these are risk factors for FI/AI.

- **Physical examination –** The physical examination should include pelvic examination, inspection of the perianal area, and a digital rectal examination.

    - **Pelvic examination –** Pelvic examination should include visualization of the vagina, pelvic organ prolapse quantification (POP-Q) assessment, and evaluation of resting and squeeze tone of pelvic floor muscles. While examination is typically performed in the dorsal lithotomy position, individuals with a history suggestive of prolapse or hemorrhoids may benefit from evaluation in a standing position as well. Prolapse may vary substantially both day by day and across trimesters, and examination for

prolapse may need to be repeated if findings are not concordant with the patient's reported symptom of a bulge in the vagina.

- **Perianal inspection –** Inspection of the perianal area may reveal dermatitis, fistula, prolapsing hemorrhoids, or rectal prolapse. Perianal sensation should be tested by evoking the anocutaneous reflex (anal wink sign) by gently stroking the skin immediately surrounding the anus and observing a reflexive contraction of the external anal sphincter. The absence of a bilateral anal wink reflex suggests nerve damage and interruption of the spinal arc. Presence of a dovetail sign can also indicate a disrupted external anal sphincter (picture 1).

- **Digital rectal examination –** Digital rectal examination should be performed to detect obvious anal pathology (eg, hemorrhoid, mass) and provide an assessment of anal resting tone (mostly due to internal anal sphincter tonic contraction). Patients should be instructed to bear down and then squeeze against the finger, which permits appreciation of the movement and angle of the puborectalis muscle, pelvic floor descent, and squeeze pressure. The accuracy of these components of the physical examination is highly dependent upon experience [42,44].

- **Laboratory –** No laboratory studies are indicated for FI itself, though stool studies may be indicated for evaluation of diarrhea in individuals with persistent symptoms.

  - (See "Approach to the adult with chronic diarrhea in resource-abundant settings", section on 'Initial evaluation'.)

  - (See "Approach to the adult with acute diarrhea in resource-limited settings".)

- **Imaging –** We do not perform either conventional or magnetic resonance imaging defecography during pregnancy or for 12 weeks postpartum. Some experts advise evaluation during pregnancy with endoanal ultrasound, with or without anorectal manometry, to detect functional and structural abnormalities (eg, anal sphincter injury), although the supporting data are extrapolated from women with obstetric anal sphincter injury (OASIS) [52]. These test results may provide additional information to allow patients to make an informed choice regarding mode of delivery. If a significant sphincter defect already exists (ie, a gap in the muscle that represents more than one hour on a clockface on the ultrasound) or there is evidence of low incremental mean squeeze pressure (<20 mmHg) on anorectal manometry, some providers would advise cesarean delivery to prevent further damage to pelvic floor musculature and nerves. However, patients may just as reasonably conclude that they would prefer cesarean delivery to preserve normal anal sphincter anatomy and function. In our practice, we do not routinely perform these additional diagnostic tests. Although occult sphincter

injuries are common in parous patients, the predictive value of these tests in individuals without a history of prior anal sphincter injury remains unknown.

Additional information on anal sphincter imaging, anorectal manometry, and OASIS can be found separately.

- (See "Fecal incontinence in adults: Etiology and evaluation", section on 'Endorectal ultrasound/magnetic resonance imaging'.)
- (See "Fecal incontinence in adults: Etiology and evaluation", section on 'Anorectal manometry'.)
- (See "Obstetric anal sphincter injury (OASIS)".)

- **Endoscopy –** Endoscopy is indicated in pregnant persons when alarm findings are present or if FI does not resolve with the conservative management options outlined below (see 'Management during pregnancy' below). Data are limited on endoscopy during pregnancy, but it is thought to be safest during the second trimester. Sigmoidoscopy during pregnancy should be strongly considered for chronic diarrhea or suspected inflammatory bowel disease flare [53].

Management during pregnancy

Our approach — Initial management of FI consists of supportive care and medical therapy. If initial management fails to improve symptoms after four weeks, we suggest referral for pelvic floor muscle therapy (PFMT). We do not advise fitting a patient with a vaginal bowel control device during pregnancy because her symptoms may resolve postpartum and because the contours of the vagina change during and after pregnancy [54]. While use of the vaginal bowel control insert has not been studied during pregnancy, those who used it prior to pregnancy are likely safe to continue its use if they wish, but we counsel them about the lack of data. Sacral neuromodulation (SNM) and posterior tibial nerve stimulation are generally contraindicated during pregnancy because of their theoretical risk of stimulating uterine contractions, although SNM has been continued in a few cases [55]. We defer initiation of treatments other than those listed below until at least three months after delivery. (See "Fecal incontinence in adults: Management".)

Initial treatment — Initial treatment consists of behavioral changes and medical therapy.

- **Behavioral changes –** Behavioral changes include avoiding foods or activities known to worsen symptoms and improving perianal skin hygiene. We discuss avoidance of incompletely digested sugars (eg, fructose, lactose, FODMAPs (table 1) (see "Treatment of irritable bowel syndrome in adults", section on 'Low FODMAP diet')) as well as caffeine [1]. Patients should be advised to keep a food and symptom diary to

help identify factors that cause diarrhea and incontinence so that they can avoid their personal triggers. The anoderm should be kept clean and dry, without excessive wiping or use of astringent cleaners. Some patients find use of premoistened pads or tissues helpful for cleaning. Application of a barrier cream (eg, zinc oxide) to the perianal skin can help protect it from injury. Incontinence pads can be used to protect both skin and clothing from fecal soiling [27]. These behavioral changes can continue for as long as the patient has symptoms.

- **Medical therapy** – Medical therapy should be aimed at reducing stool frequency and improving stool consistency. No specific medication has been proven to be of benefit for FI, except for antidiarrheal drugs in patients with liquid stools [6,7].

  - **Fiber bulking agent** – Based on supporting data from small clinical trials in nonpregnant patients, we supplement the patient's diet with a bulking agent (eg, psyllium) to improve stool consistency, especially in patients who have low-volume, loose stools [56,57]. In a trial of 189 adults (majority female) with FI of loose or liquid stool, psyllium fiber supplementation reduced episodes of FI by 51 percent compared with placebo [57]. Bulking agents are not absorbed systemically and are considered safe in pregnancy. (See "Fecal incontinence in adults: Management", section on 'Medical therapy'.)

    We use the Bristol stool chart [58] to help patients identify their current stool consistency and optimal goal consistency (type 3 or 4). Bulking agents should be added gradually to minimize discomfort from bloating and gas. We recommend 1 teaspoon two times daily initially, with gradual titration to attain goal type 3 or 4 stool consistency rather than attaining a specific dose. One tablespoon of psyllium powder contains 5 g of psyllium. If patients continue to have type 5 to 7 stools after two weeks of psyllium supplementation, we recommend a trial of loperamide [56].

    Of note, as fiber increases stool volume, it may exacerbate incontinence in patients with decreased rectal compliance (eg, radiation proctitis, rectal stricture). Patients with such a history should be referred to a gastroenterologist rather than being managed primarily by their obstetrician.

  - Loperamide – Antidiarrheal drugs have been reported to reduce FI in men and women with liquid stools and are also safe in pregnancy [56,59,60]. We offer the antidiarrheal agent loperamide to reduce FI in pregnant patients who have loose stools as a contributing factor. Loperamide acts through opioid receptors to inhibit peristalsis and prolong transit time. As compared with diphenoxylate, loperamide may be more effective at reducing urgency associated with incontinence and has fewer central nervous system side effects. (See "Fecal incontinence in adults: Management", section on 'Medical therapy'.)

We begin individuals with loose stools on 2 mg loperamide daily and gradually increase the dose to a goal of Bristol type 3 or 4 stool consistency. The maximum dose is 16 mg daily. We advise them to divide the total dose and take the medication throughout the day. The medication is held if stools approach Bristol type 2 to avoid subsequent constipation and can be resumed when stools are at type 4 [58]. If patients continue to have loose stools (type 5 to 7) after a two-week trial of loperamide, we refer the patient for a gastroenterology consult. Those with acute diarrhea lasting for more than 14 days are also referred for gastroenterology evaluation. (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Symptomatic therapy'.)

Other antidiarrheal agents, such as bile acid binders (eg, cholestyramine, particularly for patients with a history of cholecystectomy or ileocolonic resection), may be useful for alleviating symptoms [10]. Bismuth subsalicylate is avoided after the first half of pregnancy because of the potential impact of salicylates on the fetus [61]. We usually consult with a gastroenterologist before trying these second-line antidiarrheal agents.

- **Disimpaction and fiber supplements –** Patients with fecal impaction should be gently disimpacted, and concomitant constipation should be treated to prevent recurrent episodes [11,12]. (See "Management of chronic constipation in adults".)

  Evacuation of the rectum by using suppositories or enemas may reduce incontinence episodes [62]. For patients with chronic constipation resulting in overflow FI, treatment depends on correcting underlying constipation so that the rectum evacuates regularly (at least twice per week). (See "Prenatal care: Patient education, health promotion, and safety of commonly used drugs", section on 'Constipation'.)

Secondary treatment — For patients whose symptoms persist despite initial treatment as outlined above, we offer PFMT and anal inserts, typically in that order.

- **Pelvic floor muscle therapy –** We suggest supervised PFMT for all patients with symptoms of FI or AI during pregnancy because of its low cost, minimal risk, and potential to improve overall pelvic floor function. However, studies specific to FI and AI during pregnancy are limited and often include the indirect outcome of urinary incontinence. Supporting data mainly come from small trials reporting successful treatment of FI in postpartum women, most of whom experienced OASIS [63-67]. PFMT does not appear to be harmful, but treatment effects may be influenced by the training and experience of the therapist.

A 2017 meta-analysis of six trials was unable to come to definitive conclusions regarding the impact of PFMT for FI/AI in pregnant and postpartum women, although the data indicated nonsignificance of treatment, in part because of the mixed study methods and outcomes, different patient populations, and risk of study bias. Specifically, the authors reported uncertain outcomes with regards to antenatal PFMT for reduction of FI prevalence in late pregnancy (risk ratio [RR] 0.61, 95% CI 0.30-1.25, 2 trials, 867 women) [68]. Importantly though, no harmful effects have been reported for PFMT, including no impact on labor or delivery.

Pelvic floor muscle strength is lower in gravid than nulliparous women [69], and pelvic floor muscle training has been shown to significantly increase pelvic floor muscle strength during pregnancy [70,71]. Given that the puborectalis muscle contributes to anal continence and is strengthened during PFMT, referral is reasonable. In our practice, we counsel individuals with normal resting tone and normal strength and endurance that they may be less likely to see benefits than those who have abnormal resting tone and/or strength, but we offer referral to all patients, given the low risk of PFMT coupled with the bothersome nature of FI and AI.

Biofeedback therapy, which includes the use of intravaginal or intrarectal stimulation, has not been studied during pregnancy, and thus, we have not used it in our practice.

- **Anal inserts –** For patients who continue to have bothersome FI after medical management and who have completed PFMT, a trial of anal inserts (also known as anal plugs) may be considered. Supporting efficacy data are limited and not specific to pregnant or postpartum individuals. A 2015 meta-analysis of four trials, totaling 136 participants, concluded that anal inserts were possibly helpful for patients who could tolerate them. Definitive conclusions could not be made because of the relatively high dropout rate (35 percent), incomplete data sets, and small number of study participants [72]. A different trial comparing 12 weeks of anal insert use versus routine care reported that 62 percent of patients using the insert achieved ≥50 percent reduction in incontinence frequency compared with placebo in intent-to-treat analysis [73]. The dropout rate was approximately 20 percent.

  The inserts can be used continuously or as needed and are inserted and removed by a patient herself. They should not be used at the same time as a suppository or within four weeks of rectal surgery. Anal inserts have not been studied during pregnancy. Their use should be discontinued in the event of bleeding hemorrhoids; anorectal bleeding, pain, irritation, spasms, or fissures; or insert migration leading to retention beyond the following bowel movement.

POSTPARTUM INDIVIDUALS WITH FI/AI

Prevalence — FI and AI are more common in the immediate postpartum period than during pregnancy. A prospective study of approximately 1200 Australian women who delivered by all routes reported FI rates of 8, 7, and 7 percent at 3, 6, and 12 months, respectively, after delivery [74]. Although cesarean is not clearly protective against long-term FI, the risk of postpartum FI is higher in individuals who undergo vaginal delivery, especially operative vaginal delivery, or delivery complicated by obstetric anal sphincter injury (OASIS). (See 'Role of obstetric factors' above.)

The rate of FI symptoms appears to increase with increasing number of deliveries, although the rise does not appear to be linear. A national survey of nonpregnant United States women (n = 1961) reported increasing rates of at least monthly FI by parity: 6.3 percent for nulliparous women, 8.8 percent after one birth, 8.4 percent after two births, and 11.5 percent after three or more births [9].

Alarm findings — As during pregnancy, most postnatal bowel symptoms can be managed conservatively within an obstetric or urogynecologic service, but certain symptoms require prompt referral to colorectal specialists.

Heavy rectal bleeding, weight loss, or physical examination findings suggestive of cancer or inflammatory bowel disease (rectal mass, perianal fistula) should prompt immediate referral to colorectal surgery or gastroenterology consultants. Patients with rectal prolapse, stricture, or complaints in the setting of prior anorectal radiation should be immediately referred for colorectal evaluation. Complaints of feculent vaginal discharge or passage of vaginal flatus should prompt evaluation for possible rectovaginal fistula. There are no contraindications to endoscopy in the postpartum period.

Evaluation — The evaluation of FI or AI in the postpartum period is similar to the evaluation performed during pregnancy, with the critical addition of evaluation for rectovaginal fistula and occult anal sphincter injury. For individuals in whom occult anal sphincter injury is suspected on physical examination, endoanal ultrasound may be obtained to confirm the diagnosis but is not necessary. Routine formal testing for pudendal neuropathy is no longer recommended as it does not impact treatment [5]. (See 'Evaluation' above and "Obstetric anal sphincter injury (OASIS)", section on 'History, examination, and imaging' and "Fecal incontinence in adults: Etiology and evaluation", section on 'Evaluation'.)

- **Physical examination –** The diagnosis of rectovaginal or anovaginal fistula can usually be made through careful vaginal and rectal examination in the office. Adequate lighting and exposure of the posterior vaginal wall are important. The posterior blade of a speculum (Graves or Sims) may be used to assist with vaginal exposure; a lighted anoscope may be used to assist with rectal visualization. To aid in detection of smaller fistulae, we massage lubricant dyed with methylene blue into the anterior rectal wall

and examine the posterior vagina for extrusion of blue lubricant. A colposcope may be used for magnification.

If office examination is limited by patient discomfort or visibility, we suggest either examination under anesthesia or magnetic resonance imaging (MRI). Examination under anesthesia has previously been considered the gold standard for diagnosis of anorectal fistulae, but several studies suggest that MRI may be superior. Compared with endoanal ultrasound, MRI provides information about both the fistula (size, location, track) and anorectal sphincter integrity. (See "The role of imaging tests in the evaluation of anal abscesses and fistulas", section on 'Magnetic resonance imaging' and "Rectovaginal and anovaginal fistulas" and "Rectovaginal and anovaginal fistulas", section on 'Evaluation and diagnosis'.)

- **Imaging –** We do not suggest either conventional or MRI defecography during pregnancy or for 12 weeks postpartum. During the initial postpartum period, the pelvic floor is healing, which may result in inaccurate findings. Outside of pregnancy and beyond the immediate postpartum period, defecography should be reserved for individuals with refractory symptoms or patients who are considering surgery. Although the benefits of these tests are unproven compared with normal clinical examination, the identification of intussusception or enterocoele may provide useful information regarding potential success of surgery.

- **Endoscopy –** If endoscopy to evaluate FI has been deferred until after delivery, we suggest waiting until perineal lacerations have healed in the absence of alarm symptoms. There are no data regarding postpartum colonoscopy or flexible sigmoidoscopy. Once the patient is beyond 12 weeks postpartum, she is evaluated as any other FI patient. (See "Fecal incontinence in adults: Etiology and evaluation", section on 'Evaluation'.)

Management postpartum — In our experience, most anorectal symptoms, such as hemorrhoids, resolve with routine postpartum perineal care. (See "Postpartum perineal care and management of complications".)

No OASIS — Postpartum persons with FI/AI but without OASIS are offered initial medical therapy followed by physical therapy once any obstetric lacerations have healed.

- **Medical therapy –** For those with postpartum FI or AI unrelated to OASIS, initial treatment is similar to that during pregnancy. Psyllium, loperamide, and cholestyramine are compatible with lactation [61]. We avoid atropine/diphenoxylate in breastfeeding individuals because of the theoretical potential of atropine to decrease milk production and the similarity of diphenoxylate to opioids. Bismuth salicylate and

kaopectate are also avoided in breastfeeding persons because of the excretion of salicylate in breastmilk.

- **Pelvic floor muscle therapy (PFMT) –** In addition to medical therapy, we suggest initiation of PFMT for all postpartum patients with pelvic floor disorders within four to six weeks of delivery, ideally for a duration of at least five months. While abdominal, back, and hip stretches and exercises are safe in the immediate postpartum period, internal vaginal or rectal manipulation should be deferred until acute obstetric lacerations have healed. Isolated sphincter weakness without anatomic defect is likely related to peripartum nerve compression, ischemia, or injury and should resolve over 6 to 12 weeks with expectant management.

  Data supporting PFMT in postpartum patients without OASIS are extrapolated from small trials, mostly including postpartum individuals with OASIS, that have reported successful treatment of FI [63-67]. However, a meta-analysis of six trials was unable to come to definitive conclusions regarding the impact of PFMT for FI/AI in postpartum persons (the data indicated nonsignificance of treatment), in part because of the mixed study methods and outcomes, different patient populations, and risk of study bias. Specifically, the authors reported uncertain outcomes with regards to PFMT for treatment of persistent FI in postnatal women compared with usual care (RR 0.68, 95% CI 0.24-1.94, 2 trials, 620 women) or postnatal PFMT for reduction of FI in the late postnatal period in a mixed population (RR 0.73, 95% CI 0.13-4.21, 1 trial, 107 women) [68]. No harmful effects were reported for PFMT. A subsequent trial of 109 postpartum women with AI reported that women receiving supervised PFMT had reduced AI symptoms compared with women given written PFMT instructions [63]. A trial of 84 primiparous postpartum women with urinary incontinence, of whom 59 had AI, reported that supervised PFMT did not decrease AI and bowel-related bother six months postpartum but did increase muscle strength and endurance [75]. Improvements have not been shown to persist beyond the first year following delivery [63,67,76].

  PFMT does not appear to be harmful, but treatment effects may be influenced by the training and experience of the therapist. (See "Myofascial pelvic pain syndrome in females: Pelvic floor physical therapy for management", section on 'Referral to physical therapy'.)

- **Biofeedback –** Biofeedback is a painless, noninvasive means of cognitively retraining the pelvic floor and the abdominal wall musculature through use of electrical or mechanical devices [1]. Treatment can focus on strength, sensory, and/or urge resistance training. Biofeedback may reduce FI symptoms by enhancing the ability to perceive rectal distension and improving coordination of the sensory and strength

components that are required for continence. It is particularly helpful in individuals with intact anal sphincters and urge incontinence or decreased rectal sensation. Treatment may be initiated once obstetric lacerations have healed.

While studies have reported success rates between 38 and 100 percent, these studies have been small, lacked a control group, defined endpoints differently, or had significant other methodological limitations [77-81]. In a trial of 157 nonpregnant adults with FI, majority female, more patients improved with home biofeedback treatment than with supportive care (57 versus 37 percent) [82]. Combining biofeedback treatment with either PFMT or electrical stimulation appears to be more effective at treating FI than either treatment alone [83,84]. However, an effect on anal pressures has not been consistently demonstrated [22,85].

- **Other –** We defer fitting with a vaginal bowel control device and surgical procedures, such as sacral nerve stimulation or anal bulking injection, until at least 12 weeks postpartum because symptoms may resolve as physiology returns to the nonpregnant state. By 12 weeks postpartum, patients with persistent FI or AI are managed like all other adults with FI. (See "Fecal incontinence in adults: Management".)

With OASIS — For patients with OASIS, guidelines for management are outlined separately. (See "Obstetric anal sphincter injury (OASIS)", section on 'Evaluation and management'.)

PROGNOSIS

Most patients who experience FI or AI in the immediate postpartum period will see improvement in symptoms in the year following delivery, especially with the conservative management strategies outlined above.

A prospective cohort study of 1011 nulliparous women enrolled in early pregnancy and followed at intervals to 48 months postpartum reported that FI prevalence was highest in the first three months postpartum and fecal urgency and flatal incontinence were highest in the first six months postpartum. At the end of the first postpartum year, 17 percent of women experienced some FI symptoms, but only 7 percent reported symptoms four years later [86].

However, patients should be cautioned that this improvement may not be permanent, as the prevalence of FI increases with age and with development of comorbidities that predispose to altered stool consistency or neuromuscular function. Maintaining a well-formed stool consistency, ensuring that the rectum is emptied regularly, and maintaining pelvic floor and anorectal neuromuscular function are critical to optimizing and sustaining anal continence. Patients should be warned about the possibility of symptom recurrence, especially after

menopause, and should be counseled about the prevalence and treatability of FI, if symptoms should occur later in life.

RESOURCES FOR PATIENTS AND CLINICIANS

Public resources available to both patients and clinicians include:

- International Urogynecological Association (IUGA) Patient Information Leaflets, particularly for fecal incontinence, maternal pelvic floor trauma, and third- and fourth-degree perineal tears.
- American Urogynecologic Society (AUGS) Voices for PFD information on bowel control.
- US National Institute of Diabetes and Digestive and Kidney Disease: Digestive Diseases information on Bowel Control Problems (fecal incontinence).

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Beyond the Basics topics (see "Patient education: Fecal incontinence (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- Fecal incontinence (FI) is defined as the involuntary loss of feces (liquid or solid). FI is also referred to as accidental bowel leakage. Anal incontinence (AI) is defined as the involuntary loss of feces and/or flatus and/or mucous. (See 'Terminology' above.)

- Pregnancy and labor are not associated with an increased risk of FI and AI, but operative vaginal delivery, episiotomy, and obstetric anal sphincter injury (OASIS) appear to worsen risk. The risk of FI and AI from spontaneous vaginal delivery remains controversial. (See 'Role of obstetric factors' above.)

- To help educate individuals regarding risk of postpartum FI or AI and counsel regarding modes of delivery, we assess preexisting symptoms and risk factors, particularly prior OASIS. FI during pregnancy is strongly associated with FI postpartum. (See 'Approach to delivery' above.)

- For most pregnant persons with FI or AI, evaluation includes a thorough history and physical examination without need for additional testing. Those with symptoms suggestive of colorectal carcinoma or new onset inflammatory bowel disease are referred for specialist evaluation. In the presence of alarm findings, the benefits of endoscopy outweigh its risks during pregnancy. (See 'Evaluation' above and 'Alarm findings' above.)

- Initial treatment of FI and AI in pregnancy consists of behavioral changes, such as avoiding dietary triggers and use of hygiene aids, and medical therapy, similar to the approach taken for nonpregnant females. (See 'Initial treatment' above and "Fecal incontinence in adults: Management", section on 'Initial management'.)

  - For pregnant individuals with FI or AI, particularly of loose stool, we supplement the patient's diet with a bulking agent (eg, psyllium). Bulking agents are not absorbed systemically and are considered safe in pregnancy. (See 'Initial treatment' above.)

  - For pregnant individuals who have loose stools as a contributor to FI, we suggest the antidiarrheal agent loperamide. Patients whose diarrheal symptoms persist for more than 14 days are referred for gastroenterology evaluation. (See 'Initial treatment' above.)

- For pregnant persons whose FI/AI symptoms persist despite behavioral changes and medical therapy, we suggest pelvic floor muscle therapy (PFMT) (**Grade 2C**) because of its low cost, minimal risk, and potential to improve overall pelvic floor function, although data demonstrating efficacy specific to FI and AI in pregnancy are limited. We offer anal inserts at the same time as we refer to PFMT, though many patients opt to try PFMT first. (See 'Secondary treatment' above.)

- For postpartum persons with FI/AI, the evaluation is similar to that performed during pregnancy, with the critical addition of evaluation for rectovaginal fistula and OASIS. (See 'Evaluation' above.)

- For postpartum individuals with FI or AI but no OASIS, we suggest PFMT within four to six weeks of delivery (**Grade 2C**). (See 'No OASIS' above.)

- We defer fitting patients with a vaginal bowel control device or surgical procedures, such as sacral nerve stimulation or anal bulking injection, until at least 12 weeks postpartum because symptoms may resolve as physiology returns to the nonpregnant state. (See 'No OASIS' above.)

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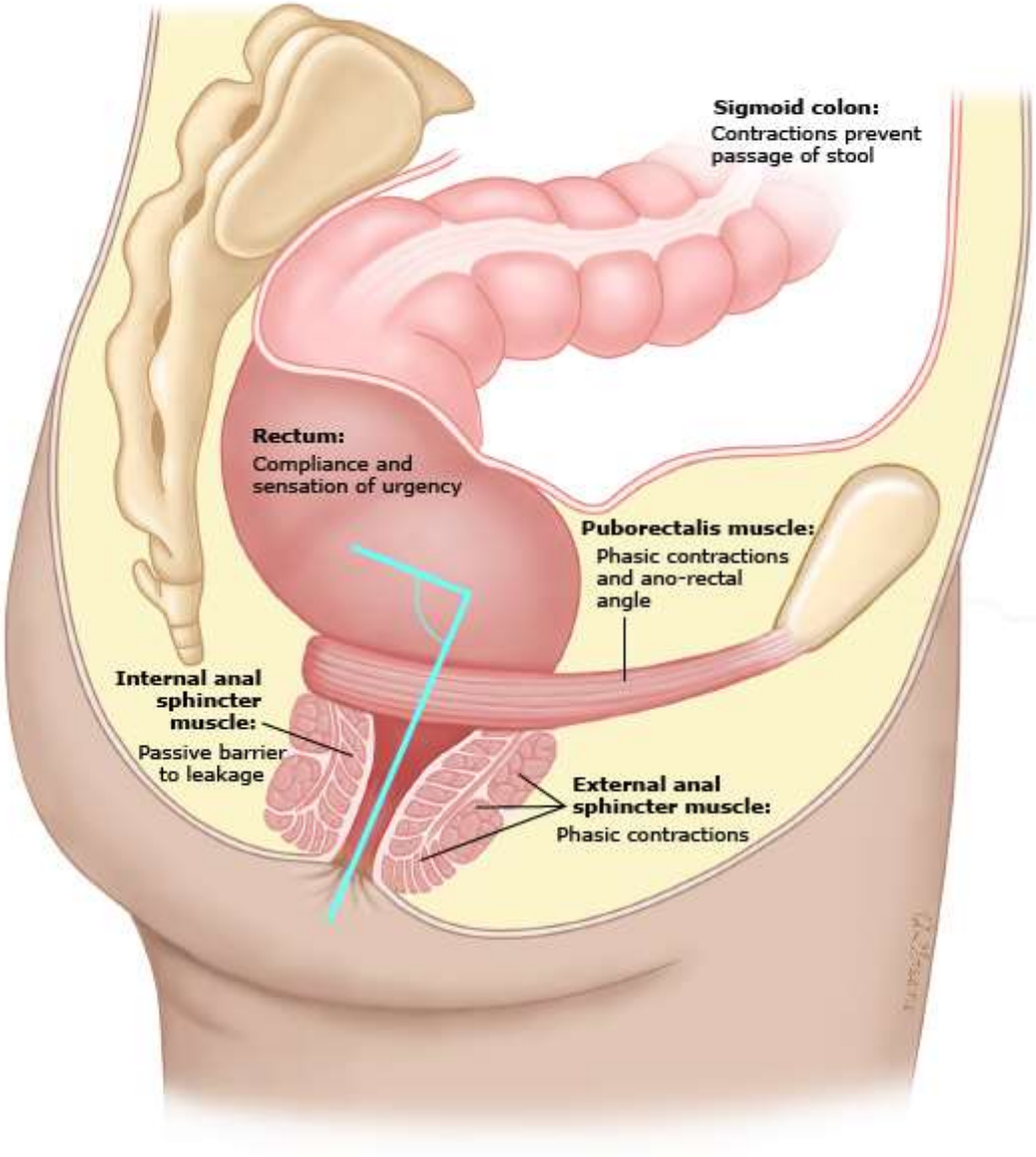
GRAPHICS

Factors contributing to stool continence



Anatomy of the anal canal, rectum, and distal colon illustrating the factors that contribute to stool continence.

Modified from: Whitehead WE, Schuster MM. Gastrointestinal disorders: Behavioral and physiological basis for treatment. Academic Press, Orlando 1985.

Graphic 119391 Version 1.0

Dovetail sign suggesting underlying anal sphincter laceration

Note the absence of anal folds along the perineal aspect of the sphincter, which suggests that the external anal sphincter at least partially separated.

Courtesy of Milena M Weinstein, MD, FACOG, FPMRS, and Helai Hesham, MD.

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Characteristics and sources of common FODMAPs

	Word that corresponds to letter in acronym	Compounds in this category	Foods that contain these compounds
F	**F**ermentable		
O	**O**ligosaccharides	Fructans, galacto-oligosaccharides	Wheat, barley, rye, onion, leek, white part of spring onion, garlic, shallots, artichokes, beetroot, fennel, peas, chicory, pistachio, cashews, legumes, lentils, and chickpeas
D	**D**isaccharides	Lactose	Milk, custard, ice cream, and yogurt
M	**M**onosaccharides	"Free fructose" (fructose in excess of glucose)	Apples, pears, mangoes, cherries, watermelon, asparagus, sugar snap peas, honey, high-fructose corn syrup
A	**A**nd		
P	**P**olyols	Sorbitol, mannitol, maltitol, and xylitol	Apples, pears, apricots, cherries, nectarines, peaches, plums, watermelon, mushrooms, cauliflower, artificially sweetened chewing gum and confectionery

FODMAPs: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols.

Graphic 90186 Version 2.0

Contributor Disclosures

Heidi Brown, MD, MAS No relevant financial relationship(s) with ineligible companies to disclose. **Rufus Cartwright, MBBS, MRCOG, MD, PhD** No relevant financial relationship(s) with ineligible companies to disclose. **Linda Brubaker, MD, FACOG** Grant/Research/Clinical Trial Support: National Institutes of Health [Prevention of lower urinary symptoms]. Other Financial Interest: Editor in Chief for Urogynecology journal [Urogynecology]; Journal of the American Medical Association [Women's health]. All of the relevant financial relationships listed have been mitigated. **Kristen Eckler, MD, FACOG** No relevant financial relationship(s) with ineligible companies to disclose.

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