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A QUICK REFERENCE GUIDE FOR MANAGING FECAL INCONTINENCE

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Originated By:

WOCN® Continence Committee

Contributing Authors:

- **Margaret M. Willson, MSN, RN, CWOCN,** Manager Clinical Education & Marketing, Hollister Incorporated, Libertyville, Illinois
- **Melissa Angyus, MS, RN, APRN, CWCN-AP, COCN,** Advanced Practice Nurse Wound/Ostomy, Community Hospital, Munster, Indiana
- **Dawn Beals, MSN, APRN, CFCN, CWOCN,** Nurse Practitioner, Kadlec Regional Medical Center, Richland, Washington
- **Laurie Callan, MSN, ARNP, CWOCN, FNP,** Whiteside County Medical Clinic, Rock Falls, Illinois
- **Kathleen Francis, MSN, RN, CWOCN, FNP-BC,** WOC Specialist, Maimonides Medical Center, Brooklyn, New York
- **Michael J. Kingan, MSN, RN, CWOCN,** Nursing Director, MedStar Washington Hospital Center, Washington, D.C.
- **Opal Kathleen Porras, MSN, RN, CWON-AP, CCCN,** Clinical Nurse Specialist, Advanced Practice Nurse Wound Ostomy Services, Community Hospital, Munster, Indiana

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Table of Contents

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Purpose

This reference guide provides an overview about fecal incontinence (FI) and how it is commonly managed. The topics include a definition of FI, prevalence/incidence data, psychosocial impact, costs, a brief description of bowel physiology, causes of FI, skin complications, assessment, management, patient education, and recommendations for future research. This information has been compiled so the nurse can quickly access a wide array of information in a single resource to facilitate patient care and patient/staff education.

Introduction

FI is a serious problem associated with physical and psychological morbidity. Incontinence itself is not a diagnosis and assessment should focus on determining the cause. FI may be successfully treated after assessment and appropriate management, but when continence cannot be fully achieved, containment products are available (Findlay & Maxwell-Armstrong, 2010). While FI can affect an individual at any age, older men and women are more likely to develop this problem (Pretlove et al., 2006). The negative social stigma that surrounds this condition tends to leave sufferers and caretakers to cope quietly with their feelings of embarrassment, humiliation and social isolation (Farage, Miller, Berardesca, & Maibach, 2008).

Background

Definition of FI. FI is defined by some as an affirmative response to the question: “In the past year, have you had any loss of control of your bowels, even a small amount that stained the underwear?” (Goode et al., 2005). FI involves the involuntary loss of flatus and liquid or solid stool (Bellicini, Molloy, Caushaj, & Kozlowski, 2008; Doherty, 2004; Dunberger et al., 2011; Findlay & Maxwell-Armstrong, 2010; Herbert, 2008; Mellgren, 2010; Ostaszkiewicz, O’Connell, & Millar, 2008). Urge bowel incontinence involves a sudden urgent need to defecate and incontinence occurs because the individual is unable to reach a toilet in time (Sharpe & Read, 2010).

Prevalence of FI. Prevalence estimates of FI vary. Throughout the literature, the overall prevalence rates of FI tend to increase with age (Mellgren, 2010). The prevalence of FI is reported at 0.5%–1% for persons less than 65 years of age and 3%–8% in those over 65 years of age (Eva, Gun, & Preben, 2003; Mellgren, 2010). FI is more widely seen in elderly female patients, but can also be seen in younger females, especially in the post-partum period (Dudding, Pares, Vaizey, & Kamm, 2010; Gordon et al., 1999). For women over 50 years of age, the prevalence of FI is 15.2%, the prevalence of urinary incontinence (UI) is 48.4%, and the prevalence of both FI and UI is 9.4% (Farage et al., 2008).

Cognitive impairment, poor general health, surgery, and radiation for prostate cancer have been associated with incontinence in community-dwelling men (Shamliyan et al., 2009). The

prevalence rate of FI is reported at 47%–50% for nursing home residents, and FI is most often associated with dementia and immobility (Findlay & Maxwell-Armstrong, 2010).

Incidence of FI. A higher incidence of FI is found in patients that have an acute illness, or loose or liquid stools (Bliss, Johnson, Savik, Clabots, & Gerding, 2000). In acute care settings, the incidence is 17%–33% (Norton, 2009). The published incidence and prevalence rates for FI may not be entirely accurate because FI is widely underreported (Rees & Sharpe, 2009).

Psychosocial impact of FI. FI affects the quality of life (QOL) of individuals and often their family members. Based on QOL surveys, 6% of patients with mild FI symptoms, 35% with moderate FI, and 82% with severe FI report a moderate to severe impact of FI on their QOL (Bharucha et al., 2005). The unpredictability of FI disrupts a patient's daily routine and affects every aspect of life including: diet, skin health, sexuality, marriage, friendships, employment opportunities, and the ability to exercise (Crowell et al., 2007).

FI leads to social stigmatization and isolation and is a common cause for institutionalization of the elderly (Dunivan et al., 2010). FI is also a strong predictor of falls in the elderly. Examples of psychological distress related to FI include the following problems (Bellicini et al., 2008; Bliss et al., 2000; Crowell et al., 2007; Doherty, 2004; Eva et al., 2003; Farage et al., 2008; Palmieri, Benuzzi, & Bellini, 2005; Whiteley, 2007):

- Reduced self-esteem and confidence.
- Reluctance to share information about the FI problem with others, including health care providers.
- Increased risk of anxiety and depression.
- Feelings of anger, grief, shame, embarrassment, fear, and frustration.
- Dependence on others.
- Poor self-perceived health.

Costs. FI is associated with increased hospital stays and an increased nursing workload to maintain patients' hygiene (McKenna, Wallis, Brannelly, & Cawood, 2001). Therefore, FI is costly to the patient and society due to increases in the following services and products (Goode et al., 2005; Nix & Ermer-Seltun, 2004; Palmieri et al., 2005; Paterson et al., 2003):

- Nursing time.
- Skin care.
- Containment products, protective pads.
- Labor in changing soiled linens.
- Laundry costs.
- Consultations.
- Medical and pharmacy services.
- Long-term care services.

Incontinence-associated costs in the U.S. are estimated at $16.5 to $19.5 billion, and 9% of that is attributed to costs for absorbent pads (Fader, Cottenden, & Getliffe, 2009). Farage and colleagues (2008) reported similar estimates of costs at $16.4 billion per year for incontinence-related care and $1.1 billion for disposable products.

Bowel Physiology of FI

Ideal bowel activity is defined as a spontaneous or reflex defecation without the aid of an enema or suppository that occurs at least once every 2 days, and is completed within a 30 minute episode. Defecation is a complex process involving the coordination of a variety of muscles, nerves and reflex arcs. Factors that are important to maintaining continence include stool consistency, stool volume, colonic transit time, anorectal sensation, rectal compliance, anorectal reflexes, external and internal muscle sphincter integrity, and mental capability (Bellicini et al., 2008).

When the volume of stool or flatus accumulates to approximately 300 ml in the rectum, an increased intraluminal pressure is detected by receptors in the pelvic floor. Unless inhibited by a higher control (i.e., brain), this leads to relaxation of the internal anal sphincter and the puborectalis muscle, allowing the rectum to straighten. The internal anal sphincter is an involuntary smooth muscle that is fatigue-resistant and maintains a high resting tone that prevents incontinence of flatus or stool (i.e., it contributes to approximately 70%–80% of the resting anal pressure). When a person assumes a squatting position, the pelvic floor descends further. Then as the person applies abdominal pressure, the distal colon contracts and the external anal sphincter relaxes, resulting in expulsion of rectal contents. The sphincters are innervated by the pudendal nerve and pelvic branches of sacral nerves at the S3 and S4 vertebral level. To help maintain continence during a cough or sneeze, the external anal sphincter involuntarily contracts as a result of a spinal reflex (Bellicini et al., 2008; Dudding et al., 2010; Findlay & Maxwell- Armstrong, 2010).

Causes of FI

Predisposing factors. Multiple factors predispose individuals to developing FI. The primary predisposing factors include those related to the integrity of the lower gastrointestinal tract and/or the pelvic floor, health status, procedures, neurological integrity, bowel pattern/function, living situation, and mobility. Other factors that have an impact on FI are age, gender, diet, and exercise. A summary of these predisposing factors is provided in Appendix A.

Diarrhea. Of special interest related to FI is diarrhea. Diarrhea is related to significant mortality and morbidity caused by severe dehydration, electrolyte imbalances, and loss of nutrients. Diarrhea is a physical sign of gastrointestinal distress, resulting in an abnormal increase in stool liquidity, frequency, and weight loss. Acute diarrhea lasts 7–14 days and chronic diarrhea lasts more than 2–3 weeks (Trinh & Prabhakar, 2007). Often diarrhea is associated with loss of bowel control. Diarrhea is a frequent occurrence in people who are acutely ill. It has been reported that on an annual basis over 250,000 hospital admissions in the
U.S. are related to diarrhea (Hallquist & Fung, 2005; Sabol & Friedenburg, 1997).

Grades of diarrhea. The severity of diarrhea has been categorized according to grades 1–5 based on the number of stools per day or ostomy output, and the presence of other life-

threatening sequelae (Hallquist & Fung, 2005). Table 1 provides a summary of a system for grading diarrhea according to the severity of symptoms.

Table 1. Diarrhea Grading (Hallquist & Fung, 2005)

Diarrhea Grade	Symptoms
Grade 1	Less than 4 stools per day over baseline; mild increase in ostomy output.
Grade 2	4–6 stools per day, nocturnal stools; mild increase in ostomy output.
Grade 3	7 or more stools per day; severe increase in ostomy output.
Grade 4	Life-threatening consequences.
Grade 5	Death.

Types of diarrhea. Diarrhea can also be categorized according the type of diarrhea. Five types of diarrhea have been described according to the causative or predisposing factors such as osmotic, secretory, exudative, or motility disorders; and/or infections (Sabol & Friedenburg, 1997; Zoutman & Ford, 2005). Table 2 contains a summary of the types of diarrhea and the associated causative/predisposing factors.

Table 2. Types of Diarrhea and Causative and/or Predisposing Factors
(Sabol & Friedenburg, 1997; Zoutman & Ford, 2005)

Type of Diarrhea	Causative/Predisposing Factors
Osmotic diarrhea	Low fecal sodium; has a tendency to resolve when the inciting solute is removed.
Secretory diarrhea	Disequilibrium between absorptive and secretory functions; usually in response to a tumor, hormonal hyper-secretion, or irritation from enterotoxins.
Exudative diarrhea	Damage to the bowel mucosa allows proteins and blood to spill into the bowel lumen.
Motility disorders	Altered motor function and decreased absorptive processes occur, which can further complicate the condition.
Infective diarrhea	*Clostridium difficile-associated* diarrhea/pseudomembranous colitis*, Campylobacter, Clostridium perfringens,* methicillin-resistant *Staphylococcus aureus (MRSA), Salmonella,* shigellosis.

Clostridium difficile infection (C. difficile). *C. difficile* is an anaerobic, gram-positive bacillus that is not part of the normal flora, and is the most common causative factor for diarrhea in hospitalized patients. It is estimated that 20%–40% of hospitalized patients become colonized with *C. difficile* after entering a hospital (Khanna & Pardi, 2012). *C. difficile* spores have been found on hospital toilets, commodes, metal bedpans, and floors; and can be transmitted by active carriers. Despite treatment, 5%–30% of patients suffer relapse (Khanna & Pardi, 2012). Table 3 provides an overview of the common causative factors and signs and symptoms of *C. difficile* infection.

Table 3. Causative Factors and Signs/Symptoms of *C. difficile* Infection (Khanna & Pardi, 2012)

Causative Factors	Signs and Symptoms of *C. difficile* Infection
• Use of antibiotics such as clindamycin, ampicillin, amoxicillin, cephalosporins, or prolonged use of any single antibiotic.* • Malignant tumors and chemotherapy. • Abdominal surgery or gastrointestinal procedures. • Severe underlying disease and/or comorbidities.* • Age over 65 years.* • Use of enemas, stool softeners, and gastrointestinal stimulants. • History of hospitalizations, or residing in long term facilities. • Inflammatory bowel disease, liver disease, or chronic kidney disease.* • Malnutrition.* * Predictors of *C. difficile* infection.	• Severe abdominal pain. • Fever. • Leukocytosis. • Dehydration and electrolyte imbalance. • Six or more watery stools within 24 hours or three unformed stools within 24 hours for 2 consecutive days. • Ten or more watery movements per day. • Hypotension indicating toxic megacolon.

C. difficile prevention and management. Nursing management for infection control is essential to protect the individual and prevent subsequent contamination of others. Staff, patients and visitors need to adhere to strict isolation precautions. Stool containment with pouches or indwelling devices to prevent transmission to others should be considered (Khanna & Pardi, 2012). Treatments for CDI include the following interventions (Khanna & Pardi, 2012):

- Discontinue the antibiotic, or if antibiotic therapy is required, switch to an alternative antibiotic.
- Discontinue any antidiarrheal, and do not start antimotility drugs.
- Begin antimicrobial therapy with Flagyl (Pfizer, New York, NY) or vancomycin hydrochloride.

Skin Complications of FI

Dermatitis. Incontinence-associated dermatitis (IAD) is a painful, inflammatory change in the skin in the groin, perineum and buttocks region associated with fecal or urinary incontinence (Norton, 2009; Schmitz, 2010). The dermatitis ranges in severity and may present with one or all of the following symptoms: erythema, swelling, weeping, vesiculation, crusting and scaling; and it may progress rapidly to ulceration and secondary infection (Nix & Haugen, 2010; Whiteley, 2007).

Fecal leakage has a mixed consistency that is not easily absorbed by containment products and is highly irritating to the skin. The irritant alters the skin's protective pH and increases permeability of the stratum corneum (Fader, Bliss, Cottenden, Moore, & Norton, 2010; Nix,

2006). Over hydration of the skin is aggravated by chemical, bacterial and mechanical irritation associated with FI. In addition, the digestive enzymes in feces attack lipids and proteins in the skin, further breaking down the skin barrier (Ronner, Berland, Runeman, & Kaijser, 2010). Therefore, absorptive products that contain fecal contents can contribute to irritation due to greater exposure of the skin to irritants and moisture.

FI is among the explicit risk factors for skin breakdown included in the Norton and Waterlow scales. The Braden scale does not specifically mention FI, but moisture is included in the evaluation of pressure ulcer risk, which includes moisture from incontinence (Wishin, Gallagher, & McCann, 2008).

Assessment of FI

History. A comprehensive assessment of FI should include a thorough history addressing the following conditions and factors (Fader et al., 2010; Mellgren, 2010):

- Past history: diarrhea, types of leakage, use of laxatives, obstetrical history, hemorrhoids, rectal prolapse, malignancy, bowel disorders, and neurological impairments.
- Reversible risk factors: infection, urinary retention, fecal impaction, and initiation of enteral feedings.
- Functional ability: mobility, dexterity, visual and mental acuity, and any issues with the living environment.

Physical examination. The physical examination should include a thorough abdominal exam, an evaluation of anorectal anatomy, and a digital rectal exam to determine sphincter tone, presence of stool or masses, perineal sensation, and the anocutaneous reflex (i.e., anal wink sign). Assessment of the patient's perineal skin is also necessary on admission, and thereafter on a periodic basis (Nix & Haugen, 2010). Additional diagnostic tests may include the following laboratory tests or examinations:

- Laboratory tests (Sabol & Friedenburg, 1997):
  - Stool testing for ova and parasites.
  - Cultures for *Salmonella, Shigella, Campylobacter, Escherichia coli, Entamoeba. histolytica,* and *C. difficile*.
  - Blood work: Complete blood count (CBC), electrolytes, calcium, phosphate, and albumin.
- Other diagnostic tests may include the following (Bellicini et al., 2008; Belmonte-Montes, Hagerman, Vega-yepez, Hernandez d-Anda, & Fonseca-Morales, 2001; Bharucha, Zinsmeister, Schleck, & Melton, 2010; Dudding et al., 2010; Roberson, Gould, & Wald, 2010):
  - Endorectal ultrasound to determine structural abnormalities.
  - Anorectal manometry to test physiological pressures.
  - Electromyography to determine innervation problems.
  - Defecography to demonstrate the dynamics of rectal emptying.
- **Note:** Measures to ameliorate bowel disturbances and other potentially reversible risk factors should be implemented before anal imaging is performed.

Assessment tools. There are multiple assessment tools that have been developed for assessing FI and its impact on patients and their quality of life. The Wexner Faecal Incontinence Symptom Severity Scoring System is the most commonly used tool that scores a patient's continence based on the frequency of incontinence, use of pads, and alteration in lifestyle (Findlay & Maxwell-Armstrong, 2010). A list and brief overview of available assessment tools, including the Wexner is provided in Appendix B.

Bowel diaries should also be used. Bowel diaries allow the clinician to understand the patient's symptoms over time in order to determine the severity of the FI and the effectiveness of therapeutic procedures (Findlay & Maxwell-Armstrong, 2010).

Management of FI

Nurses caring for patients with transient and long-term FI need to ensure that care is appropriate and maintains the patient's dignity (Rees & Sharpe, 2009). Patients deserve to have their privacy protected and receive dignified care, and it is a nurse's responsibility to ensure this happens. Treatments should focus on correcting the underlying cause(s) of FI and minimizing injury to the patient. Steps should be taken to reduce pain, prevent and treat skin breakdown, address nutrition and fluid/electrolyte status, and implement measures to contain stool and control odor so the patient can confidently leave his/her home (Fader et al., 2010; Leung & Schnelle, 2008; McKenna et al., 2001) Nurses should implement bowel management protocols that can be used in all care environments to help identify and improve the management of patients with diarrhea and constipation (McKenna et al., 2001).

Medications. Medications are typically used to treat the underlying causes of FI such as constipation, diarrhea or infection; or to enhance the sphincter's function (Findlay & Maxwell-Armstrong, 2010). Prior to starting antidiarrheal medications, it is important to determine if an infectious agent is the cause of diarrhea. Many medications that are prescribed to treat other diseases can affect gastric or colonic motility and cause diarrhea or constipation, which can contribute to FI. Appendix C provides a list of some common medications and their effect on gastric or colonic motility.

Dietary considerations. Bowel habits should be evaluated and modified to establish predictable elimination by monitoring foods and liquids, and attempting defecation after meals (Findlay & Maxwell-Armstrong, 2010). Many foods increase or decrease bowel activity and can affect the thickness of fecal output. Appendix D includes a list of common foods and their effect on gastric or colonic motility.

Skin care. Skin care for incontinent patients must be individualized based on an assessment to determine the type and frequency of fecal output, whether FI is in combination with urinary incontinence, the condition of the perineal skin, and the patient's response to various products. Patients with diarrhea need a durable skin barrier, a containment device and skin barrier paste (Nix, 2006)

Proper and prompt skin care is important to prevent IAD. Skin that comes in contact with stool should be cleansed promptly after each incontinent episode. Three key steps for skin care of patients with FI are cleansing, moisturizing, and protecting the skin from irritants such as excessive moisture and fecal material (Wound, Ostomy and Continence Nurses Society [WOCN], 2011).

Incontinence cleansers are beneficial to rapidly and thoroughly remove organic matter from the skin. Cleansing products are available in varied forms such as liquids, emulsions, foams, and towelettes. Some cleansers contain humectants (i.e., products that retain moisture) such as glycerin, methyl, glucose esters, lanolin, and mineral oil. “No rinse” cleansers minimize drying of the skin if they contain humectants. Also, because no rinse products are left on the skin rather than being rinsed away and combine a skin cleanser with a barrier, they reduce care time (Nix & Haugen, 2010). The pH level of the cleanser is important because normal, intact skin has a slightly acid pH. Therefore, it is best to use non-alkaline cleansers that support the skin’s proper pH and antimicrobial activity. Scented cleansers may reduce odor, but can irritate the skin (Wishin et al., 2008). Cleansing with water and regular soap, which is too alkaline, is harsh to the skin and should be avoided (Whiteley, 2007).

Moisturizers can be used to hydrate intact skin and replace oils, and products with emollients will soften the skin. Creams and ointments such as petrolatum, lanolin, and dimethicone will protect the skin from excess moisture (Wishin et al., 2008). Moisturizers and moisture barrier products need to be applied after the skin is cleansed to replenish the absent oils (Makic, 2011).

Products/devices for collection and containment. There are a variety of devices/products to manage FI. FI devices can be divided into two groups according to whether their primary purpose is prevention of fecal leakage on the skin or collection/containment of the stool:

- Prevention of stool leakage on the skin: External fecal collection devices, intra-anal devices, anal plugs, rectal tubes, and rectal trumpets.
- Collection or containment: Absorbent pads and briefs, and skin care products to prevent incontinence-associated dermatitis.

External fecal collectors. External fecal collectors are products designed to collect and contain liquid fecal material away from the skin. The most recommended strategy for managing large-volume, intractable leakage is the containment of the drainage through pouching techniques (Fruto, 1994).

An external pouch device provides the least risk to the patient’s rectal sphincter because it adheres directly to intact skin around the anus, and it is usually in place approximately 1–2 days between pouch changes. Often, two experienced caregivers are required to apply a rectal pouch: one to position the patient and one to apply the device correctly. Fecal pouches are not recommended for patients with impaired skin integrity because removal of the pouch can disrupt additional layers of the skin. Examples of some external fecal collectors and their manufacturers are provided in Appendix E.

Intra-anal management systems. Intended for use primarily in acute care settings, intra-anal management systems are developed for insertion into the rectal vault for diversion of liquid stool away from the skin in immobile patients. At the proximal end of the intra-anal device, there is a soft silicone catheter with a retention balloon that is inserted into the rectum. At the distal end, the catheter has a connector for attaching the collection bag.

When choosing to use the device, the patient's anticoagulant status should be considered (Page, Boyce, Deans, & Camilleri-Brennan, 2008; Sparks, Chase, Heaton, Coughlin, & Metha, 2010). Application and removal of the device should be performed with strict adherence to the manufacturer's instructions. It is essential that caregivers demonstrate competence in placement and management of the devices. Routine assessment should be performed to ensure the device is not under tension, and patient transfers performed carefully to avoid traumatic removal of the device (Sparks et al., 2010). Examples of some of the available intra-anal systems/products and manufacturers are provided in Appendix E.

Intra-anal devices decrease exposure to fecal material thus helping to prevent skin breakdown, minimize odor, track output, minimize caregivers' time, and enhance patients' comfort (Makic, 2011). There are increased direct costs associated with an intra-anal management device. However, the costs may be minimized or offset by the savings from the decreased use of linens, lower laundry costs, less nursing time required for care, and fewer patients with skin problems. Table 4 provides a summary of advantages, disadvantages, and contraindications for this type of management device.

Table 4. Advantages, Disadvantages, and Contraindications of Intra-anal Fecal Incontinence Management Systems (Echols et al., 2007; Leung & Rao, 2011; Nix, 2006; Norton 2009; Padmanabhan et al., 2007; Page et al., 2008; Sparks et al., 2010; Wishin et al., 2008)

Advantages	Disadvantages	Contraindications
• Reduces the risk of skin breakdown and discomfort. • Enhances patients' dignity. • Protects wounds, surgical sites, and burns from fecal soiling. • Minimizes soiling of beds and linens. • Minimizes exposure to infectious microorganisms. • Reduces catheter- associated urinary tract infections. • Allows for fecal sampling. • Allows for medication administration and irrigation.	• Damage to the rectal mucosa. • Risk of bleeding associated with use of anticoagulant and antiplatelet medication; and/or traumatic removal. • Blockage of the tube. • Expulsion of the device. • Leakage around the device.	• Do not use for more than 29 consecutive days. • Intra-anal devices should not be used on the following individuals: o Patients known to be sensitive or allergic to any components within the system. o Patients who have had lower large bowel or rectal surgery in the last year. o Patients with rectal or anal injury, severe rectal or anal stricture or stenosis (i.e., any patient if the distal rectum cannot accommodate the inflated cuff), confirmed rectal or anal tumor, severe hemorrhoids, or fecal impaction. o Patients with suspected or confirmed rectal mucosa impairment (i.e., severe proctitis, ischemic proctitis, mucosal ulcerations). o Patients with indwelling rectal or anal devices (e.g., thermometer), delivery mechanisms (e.g., suppositories), or enemas in place.

Anal plugs. The anal plug is an absorbent device that sits in the anal-rectal canal to prevent accidental leakage. It is a small, white, suppository-like device that is worn for 12 hours. When activated by moisture from the rectal mucosa, the plug expands into a "tulip" shaped structure. The anal plug requires a prescription and is available in large and small sizes.

The rectal vault should be empty prior to placement of the plug to allow for its full expansion. The plug has an attached string that is positioned between the buttocks and is used to remove the plug. After removal, the plug should be placed in the garbage for disposal and not flushed in the toilet.

Adequate time should be spent on education of the patient so they have the skills and confidence to use the plug correctly. Although the plugs have been found to be helpful in preventing stool leakage is some patients, they can be difficult to tolerate and have other disadvantages including the following (Cazemier, Felt-Bersma, & Mulder, 2007; Deutekom & Dobben, 2012; Doherty, 2004; Evans, 2006; Fader et al., 2010; Herbert, 2008):

- Displacement of the plug.
- Leakage during diarrhea.

- Abdominal cramps.
- Expulsion of the device from high pressure peristalsis.
- Cumbersome insertion and removal procedure.

Rectal trumpets. Nasopharyngeal airways have been used *off-label* by insertion of the "trumpet" end of the airway into the anus and connecting the straight end of the tube to a straight drainage system. This device should not be used in patients with leukopenic precautions, perirectal abscess, or gastrointestinal bleeding. The device should be changed every 2 days, waiting 1 hour before reinsertion. Use of a barrier cream around the anus helps protect the surrounding skin (Faller, 2005).

Rectal tubes. Balloon-type catheters and rectal tubes have been used in the past for FI, but are now considered risky and no longer safe due to the potential for rectal necrosis, bowel perforation, and damage to the anal sphincter (Nix & Haugen, 2010; Rees & Sharpe, 2009). The primary purpose of rectal tubes is to decrease flatus, or to administer enemas or medications.

Absorptive products. Caution should be used when considering "body-worn" products for an individual with FI as the use of some products may contribute to the development of skin irritation (WOCN, 2011). When a patient is found to be an appropriate candidate for containment products/devices, the full range of available products and the patient's needs must be considered. In addition, stool characteristics, leakage frequency and whether or not urinary incontinence is also an issue needs to be assessed (WOCN, 2011). Often disposable, absorptive products are utilized to manage incontinence. Disposable body-worn pads are considered medical devices and practitioners must be able to demonstrate competence in their use, and ensure that patients are competent in their use by providing training and supervision (Gilbert, 2005).

Incontinence garments/products can be classified into four main types: disposable briefs with liners, reusable briefs with liners, disposable underpads, and reusable underpads (Brazzelli, Shirran, & Vale, 2002; Whiteley, 2007). Garments are commonly available in a "one size fits all" style that is not designed to address specific leakage needs or patients' individual preferences. Some garments/products are specifically designed to contain fecal matter, which allows individuals to participate in swimming activities. There are also pant liners, which are thin products that are good for slight incontinence or fecal staining. Also, specialty, discrete pad products are available that can be worn between the buttocks to capture small amounts of fecal leakage.

No single product has been designed for both fecal and urinary incontinence: nor is there one that can absorb feces or eliminate exposure of the skin to solid wastes (Brazzelli et al., 2002; Whiteley, 2007). Because there are no products that can completely mask the odor associated with feces, soiled briefs or pads should be changed as quickly as possible. Although most of the body-worn type products are not reimbursable, they are readily available over-the-counter in many groceries, pharmacies or durable medical supply stores (Bliss & Savik, 2008; Evans, 2006; Fader et al., 2010; Whiteley, 2007).

Absorptive products should be stored at room temperature in their plastic package. They should not be kept in bathrooms because with excess humidity, moisture in the air can be

absorbed into the product and lessen the absorptive capacity of the product. Also, they should not be kept near heat/radiators that can lead to excessive drying of the pads, which can also lessen their effectiveness.

Clinicians should not assume that patients/families have been provided adequate information regarding their product options to manage incontinence (Evans, 2005). Patients need to be made aware of the available products, irrespective of the preferences of the clinician or caregiver. Patients should be allowed to make their own decisions about products based on their desires or needs, which can change over time or the situation (Evans, 2006; Paterson et al., 2003). If patients are not capable of making a determination about the products, then the caregiver's preferences along with the needs of the patient must be considered. Patients/caregivers must receive clear instructions on the correct use, fitting, storage, and disposal of the FI product; and verbal instructions should be supported with written educational materials (Gilbert, 2005; Herbert, 2008).

Patient Education

It is important that patients receive education and information about the causes of FI (e.g., chronic disease, transient problem), diagnostic evaluations/tests, the medical plan for treatment, skin care strategies, and options/products for fecal containment (Paterson et al., 2003). If patients are to be self-managed, issues such as impaired cognition, poor mobility, co-morbid illnesses, and psychosocial needs must also be addressed during the educational process (Leung & Rao, 2011).

Education may also include information about biofeedback as a treatment option. Biofeedback can help train the patient to recognize sensory thresholds, condition the pelvic musculature; and improve the magnitude, duration, and speed of contraction of the external sphincter. Biofeedback requires some rectal sensation and the ability to voluntarily contract the sphincter. Biofeedback has been found to be a beneficial and safe way to treat urge and passive FI (Bellicini et al., 2008; Findlay & Maxwell-Armstrong, 2010; Mellgren, 2010). For patients that have severe chronic FI and conservative measures are not an option or have not been successful, referrals for additional neurological or surgical workup are warranted.

Future FI Research Needs

Future priorities for FI research include studies about incontinence products and their materials and how they interact with skin, feces, and/or urine. To develop better absorbent products for feces and/or feces and urine with properties that can be tailored to meet different needs, more data are needed about volume, flow rates, fecal consistency, and frequency of incontinence. When evaluating different products, investigators should take into account factors such as the amount and type/composition of incontinence leakage that may alter the performance of the products.

Studies are needed to identify and evaluate the efficacy and value of noninvasive interventions to manage nursing home residents with chronic constipation and/or FI (e.g., diet, pharmaceutical interventions, changes in toileting schedules, increased physical activity). The

scientific documentation of the efficacy of such noninvasive interventions and the associated labor costs for implementing the measures could lead to major changes in how nursing care is provided and funded. There is also a need for research and development of minimally invasive devices, with low risk and high patient tolerance, that can prevent fecal leakage, control odor and sound, protect the skin; and are made of eco-friendly, biodegradable materials.

Conclusion

Just as there are multiple causes of FI, there are multiple strategies to manage its causes and consequences. The key to a thorough, compassionate approach to management of patients with FI is a meticulous assessment of the patient and his/her needs. This reference guide is meant to provide information and tips to assist clinicians in the assessment and management (including education) of patients with FI.

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Appendix A
Predisposing Factors for Fecal Incontinence

Predisposing Factors	Reference Citation
1. Factors related to the integrity of the lower gastrointestinal tract and/or pelvic floor	
Obstetrical internal and/or external sphincter injury.	Altman, Falconer, Rossner, & Melin, 2007; Erekson, Sung, & Myers, 2008; Groutz et al., 1999; Leung & Rao, 2011; Mellgren, 2010
Pelvic organ prolapse.	Altman et al., 2007; Findlay & Maxwell-Armstrong, 2010
Vaginal parity.	Erekson et al., 2008; Findlay & Maxwell-Armstrong, 2010
Pelvic floor injury in younger women related to vaginal deliveries.	Groutz et al., 1999
2. Factors related to health status or procedures.	
Obesity (e.g., increase in transit, change in flora).	Altman, et al., 2007; Bharucha, 2010; Gallagher, 2005
Medications, laxatives, stool softeners, polypharmacy.	Doherty, 2004; Farage et al., 2008; Gallagher, 2005; Leung & Schnelle, 2008
Hysterectomy.	Altman et al., 2007
Diabetes.	Altman et al., 2007
Hemorrhoidectomy, anorectal surgery.	Doherty 2004; Erekson et al., 2008
Poor general health.	Bellicini et al., 2008
Prostate disease.	Bellicini et al., 2008
Enteral tube feedings.	Bellicini et al., 2008
Infection: *Campylobacter, Clostridium perfringens,* pseudomembranous colitis, *Salmonella,* shigellosis.	Farage et al., 2008; Findlay & Maxwell-Armstrong, 2010; Sabol & Friedenburg, 1997; Wishin et al., 2008
Malignancy.	Findlay & Maxwell-Armstrong, 2010
Mixed urinary incontinence.	Bharucha, 2010; Erekson et al., 2008
Increased severity of illness.	Bliss et al., 2000
3. Factors related to neurological integrity.	
Dementia, alteration in cognitive function.	Farage et al., 2008; Leung & Schnelle, 2008; Mellgren, 2010
Neurological impairment: stroke, parkinsonism, spinal cord injury, multiple sclerosis, spina bifida, etc.	Bellicini et al., 2008; Coggrave, 2007; Findlay & Maxwell-Armstrong, 2010; Finne-Soveri, Sørbye, Jonsson, Carpenter, & Bernabei, 2008; Formal, Cawley, & Stiens, 1997; Mellgren, 2010; Sharp & Read, 2010

Appendix A
Predisposing Factors for Fecal Incontinence

Predisposing Factors	Reference Citation
4. Factors related to bowel pattern or function.	
Accelerated colonic transit, bowel resection.	Bharucha, 2010; McKenna et al., 2001
Alteration in intestinal and colonic bacterial flora after bariatric surgery.	Bharucha, 2010; Roberson et al., 2010
Diarrhea.	Bharucha, 2010; Bliss et al., 2000; Erekson et al., 2008; McKenna et al., 2001; Mellgren, 2010
Cholecystectomy.	Bharucha, 2010
Fat malabsorption.	Bharucha, 2010
Constipation, fecal impaction.	Leung & Schnelle, 2008
Congenital anorectal anomalies.	Bellicini et al., 2008
Colorectal disease, inflammatory bowel diseases, acute diverticulitis, superior mesenteric bowel disease, venous thrombosis, ischemic bowel disease.	Bellicini et al., 2008; Doherty, 2004; McKenna et al., 2001; Sabol & Friedenburg, 1997
Anal sphincter dysfunction.	Palmieri et al., 2005
5. Factors related to the living situation.	
Use of restraints.	Leung & Schnelle, 2008
Lack of timely toileting assistance.	Leung & Schnelle, 2008
Inability to toilet themselves.	Leung & Schnelle, 2008
6. Factors related to mobility.	
Impaired mobility, physical disability.	Bellicini et al., 2008; Finne-Soveri et al., 2008; Gallagher, 2005; Leung & Schnelle, 2008; Wishin et al., 2008
Overuse/misuse of absorbent pads and undergarments.	Leung & Schnelle, 2008
7. Other factors.	
Older age.	Bellicini et al., 2008; Bliss et al., 2000; Erekson et al., 2008; Farage et al., 2008
Female gender.	Bellicini et al., 2008
Diet: lack of dietary fiber, high fat diet.	McKenna et al., 2001
Lack of exercise.	McKenna et al., 2001

Appendix B
Fecal Incontinence Assessment Tools

Abbreviation	Tool Name	Description	Author(s)/Developer(s)	Reference Citation
AQoL	Assessment of Quality of Life	Designed for use in economic evaluation, specifically cost-utilities studies; it can also be used as a health-status profile instrument.	G. Hawthorne and J. Richardson, University of Melbourne Heidelberg, West Victoria, Australia	Thomas et al., 2006
AUASI, also known as the IPSS	American Urological Association (AUA). Symptom Index, or International Prostate Symptom Score	A symptom measure for lower urinary tract symptoms (LUTS), such as benign prostatic hyperplasia.	Michael J. Barry, Institute for Health Policy, Massachusetts General Hospital, Boston, MA	Thomas et al., 2006
BFLUTS	Bristol Female Lower Urinary Tract Symptom Assessment	Questionnaire to assess symptomatology of the female lower tract, particularly symptom severity impact, on quality of life and treatment outcomes.	Dr. Simon Jackson and colleagues, John Radcliffe Hospital, Oxford, UK	Thomas et al., 2006
HRQOL	Health related quality of life	Multi-item questionnaires that assess perceived health status and overall physical and emotional well-being; not specific to any disease.		Busija et al., 2011

Appendix B
Fecal Incontinence Assessment Tools

Abbreviation	Tool Name	Description	Author(s)/Developer(s)	Reference Citation
ICS-male, and ICS-male short form	International Continence Society Male Assessment, and International Continence Society Male Short Form Assessment	The tool was developed to measure the symptomatology and "bothersomeness" of lower urinary tract problems for men with prostatic disease.	Professor Jenny Donovan, University of Bristol, UK	Thomas et al., 2006
I-QOL	Urinary Incontinence-Specific Quality of life Measures	A condition-specific quality of life measurement for urinary incontinence.	Donald L. Patrick, University of Washington, Seattle, WA	Thomas et al., 2006
ISI	Incontinence Severity Index	To assess urinary incontinence severity in population surveys and for individualized clinical assessment.	Dr. Hogne Sandvik, University of Bergan, Norway	Thomas et al., 2006
KHQ	King's Health Questionnaire	To assess the impact of urinary incontinence symptoms on the quality of life of affected people.	Professor Linda Cardozo, London, UK	Thomas et al., 2006
NPH	Nottingham Health Profile	Measures the impact of illness.	S. Hunt, J. McEwen, and S. P. McKenna, Nottingham University, UK	Hunt, McEwen, & McKenna, 1985

Appendix B
Fecal Incontinence Assessment Tools

Abbreviation	Tool Name	Description	Author(s)/Developer(s)	Reference Citations
SF-12	Short Form Health Survey, 12-item	Multi-item generic health survey intended to measure general health concepts; not specific to any age, disease or treatment group. Uses 12 questions to measure functional health and wellness from the patient's perspective.	RAND Corporation, health insurance experiment	Busija et al., 2011
SF-36	Short Form Health Survey, 36-item	Multi-item generic health survey intended to measure general health concepts; not specific to any age, disease or treatment group.	RAND Corporation, health insurance experiment	Busija et al., 2011
UDI/IIQ	Urogenital Distress Inventory/Incontinence Impact Questionnaire	To assess the degree to which symptoms associated with incontinence are troubling to women.	Professor Jean F. Wyman, University of Minnesota, and Sally A. Shumaker, Wake Forest University School of Medicine, Winston-Salem, NC	Thomas et al., 2006
Wexner or CCF-FIS	Wexner Faecal Incontinence Symptom Severity Scoring System, or the Cleveland Clinic Florida Faecal Incontinence Score	To assess symptom severity and QOL impact of faecal incontinence symptoms.	Steven D. Wexner, Cleveland Clinic, Florida	Thomas et al., 2006

Appendix C
Medications that Affect Gastric and Colonic Motility and their Effects

Medication	Pharmacological Effect on Gastric/Colonic Motility	Reference Citation
Antidiarrheal Medications		
Codeine	Opioid agonist: Binds to opioid receptors, inhibiting peristalsis.	Epocrates, 2013
Diphenoxylate hydrochloride and atropine sulfate (Lomotil, Pfizer, New York, NY)	Difenoxin binds gut wall opioid receptors, inhibiting peristalsis.	Epocrates, 2013
Difenoxin/atropine sulfate (Motofen, Valeant Pharmaceuticals, Quebec, Canada)	Difenoxin binds gut wall opioid receptors, inhibiting peristalsis.	Epocrates, 2013
Loperamide (Imodium, Janssen Pharmaceutical, Titusville, NJ)	Binds gut wall opioid receptors; inhibits peristalsis; increases anal sphincter tone.	Epocrates, 2013
Octreotide acetate (Sandostatin, Novartis Pharmaceutical, Basel, Switzerland)	Synthetic analog of somastostatin.	Epocrates, 2013
Bismuth subsalicylate (Maalox, Novartis, Basel Switzerland; Pepto- Bismol, Proctor & Gamble, Cincinnati, OH; Kaopectate, Chattem, Inc., Chattanooga, TN)	Reduces secretions; possesses antimicrobial effects.	Epocrates, 2013
Cholestyramine (Questran, Bristol- Meyers Squibb, NY; Prevalite, Upsher-Smith Laboratories, Minneapolis, MN)	Binds intestinal bile acids.	Epocrates, 2013
Medications to Treat Constipation		
Bulk-forming laxatives • Psyllium (Metamucil, Proctor & Gamble, Cincinnati, OH) • Methylcellulose (Citrocel, GlaxcoSmithKline, Brentford, Middlesex, UK) • Calcium polycarbophil (FiberCon, Pfizer, New York, NY)	Increase bulk; increase water absorption; may take several days to work; require adequate fluid intake.	Epocrates, 2013; Marpels, 2011; Woodward, 2012
Osmotic laxatives • Sodium phosphate, magnesium hydroxide, magnesium citrate, polyethylene glycol, lactulose. • Lubiprostone (Amitiza, Takeda Pharmaceuticals, Deerfield, IL.)	Increase intestinal fluid secretion via osmosis; decrease intestinal permeability.* *Patient needs to have adequate fluid intake for these to be effective.	Epocrates, 2013; Marpels, 2011; Woodward, 2012

Appendix C
Medications that Affect Gastric and Colonic Motility and their Effects

Medication	Pharmacological Effect on Gastric/Colonic Motility	Reference Citation
Medications to Treat Constipation Continued		
Stimulant laxatives • Bisacodyl • Castor oil • Sennosides, senna	Increase peristalsis; increase water absorption from large intestine; can cause electrolyte imbalance in frail elderly.	Epocrates, 2013; Marpels, 2011; Woodward, 2012
Stool softeners • Ducosate calcium, ducosate sodium • Mineral oil	Soften stool; facilitate mixture of stool, fat, and water; make stool easier to pass; little evidence to support use.	Epocrates, 2013; Marpels, 2011; Woodward, 2012
Probiotics	Improve stool consistency and bowel regularity.	Marpels, 2011; Woodward, 2012
Medications that Contribute to FI		
Anticholinergics • Antihistamines • Antispasmodics • Tricyclic antidepressants • Antipsychotics	Can contribute to constipation; possess anticholinergic properties; prolong colonic transit time; have antiemetic and sedative effects.	Bliss, Doughty, & Heitkemper, 2006; Epocrates, 2013; Wuong, 2012
Cardiovascular medications • Calcium channel blockers • Beta-adrenergic antagonists • Diuretics • Antiarrhythmics	Can contribute to constipation.	Bliss et al., 2006; Epocrates, 2013
Central nervous system depressants • Anticonvulsants • Anti-parkinsonian drugs	Can contribute to constipation.	Bliss et al., 2006; Epocrates, 2013
Narcotic analgesics • Opiates • Barbiturates • Opioid derivatives (methadone, morphine, oxycodone)	Opioid agonists: Bind to opioid receptors, inhibiting peristalsis.	Bliss et al., 2006; Epocrates, 2013
Antineoplastics • Vinca alkaloids	Can cause constipation and/or diarrhea as a side effect.	Bliss et al., 2006; Epocrates, 2013
Cholestyramine	Bile acid binding agent.	Bliss et al., 2006; Marpels, 2011
Nonsteroidal anti-inflammatory drugs • Ibuprofen • Naproxen	Constipation.	Bliss et al., 2006; Epocrates, 2013
Oxybutynin	Constipation; parasympathetic blocker; possesses anticholinergic properties.	Bliss et al., 2006; Epocrates, 2013

Appendix C
Medications that Affect Gastric and Colonic Motility and their Effects

Medication	Pharmacological Effect on Gastric/Colonic Motility	Reference Citation
Medications that Cause Loose Stools/Diarrhea		
Oral hypoglycemics	Cause diarrhea as a side effect; delay or decrease intestinal absorption of glucose.	Bliss et al., 2006; Epocrates, 2013
Alzheimer's disease medications Acetylcholinesterase inhibitors (donepezil)	Can cause diarrhea as a side effect; reversibly bind to and inactivate acetylcholinesterase (cholinesterase inhibitor).	Bliss et al., 2006; Epocrates, 2013
Antibiotics • Ampicillin • Cefazolin, cephalexin, ceftriaxone, ceftazidime • Ciprofloxacin • Clindamycin, erythromycin	Alter intestinal mucosa.	Bliss et al., 2006; Epocrates, 2013

Appendix D
Foods that Affect Gastric or Colonic Motility and their Effects

Food	Effect on Gastric/Colonic Motility	Reference Citation
Caffeine	Stimulates gastrointestinal motility; can cause diarrhea and FI, but if taken in excess can cause dehydration and constipation.	Crosswell, Bliss, & Savik, 2010; Hansen, Bliss, & Peden-McAlpine, 2006
Alcohol	Stimulates gastrointestinal motility; increases FI.	Crosswell et al., 2010; Hansen et al., 2006
Lactose	Intolerance and malabsorption of lactose results in diarrhea. FI is secondary to diarrhea.	Crosswell et al., 2010; Hansen et al., 2006
Spicy foods	Increase gastric mobility; increase FI secondary to loose stools.	Crosswell et al., 2010
Nuts (high in insoluble fiber)	Increase gastric mobility.	Hansen et al., 2006
Foods high in insoluble fibers: Unprocessed bran, bran cereals, whole wheat fiber, popcorn, nuts, cabbage, green beans, wax beans, eggplant, apples, carrots	Increase stool bulk, but do not absorb water; can move through the GI system basically intact.	Hunter, Jones, Devereux, Rutishauser, & Talley, 2002; Wisten & Messner, 2005
Foods high in soluble fibers (fruit fiber/pectin): Oats, dried beans, squash, pectin, apples, citrus fruits, psyllium	Absorb water and have high water retention, thicken stool, reduce bowel transit time, slow digestion; have a lubricating effect on the intestinal mucosa.	Wisten & Messner, 2005
Chocolate	Increases gastric motility and FI.	Crosswell et al., 2010; Hansen et al., 2006
Foods with both soluble and insoluble fiber: Onions, cabbage, brussel sprouts, cauliflower, apricots	Cause flatus.	Crosswell et al., 2010
Greasy/fatty foods: Fast food, pizza, bacon, gravy, fried foods	Increase gastric motility and FI.	Crosswell et al., 2010

Appendix D
Foods that Affect Gastric or Colonic Motility and their Effects

Food	Effect on Gastric/Colonic Motility	Reference Citation
Fruits: Fresh fruit (raisins), fruit juice (orange, prune)	Increase gastric motility and FI.	Crosswell et al., 2010
Cheeses, dairy products	Increase in FI if lactose intolerant; can cause constipation if eaten in large amounts (taking place of high fiber foods).	Crosswell et al., 2010; Woodward, 2012; Wuong, 2012

Appendix E
Examples of Available Fecal Incontinence Management Systems, Fecal Collectors, and Manufacturers

Manufacturers	Fecal Incontinence Management Systems and Collectors
C. R. Bard Medical, Inc., Murray Hill, New Jersey	Dignishield Advance Stool Management System; Dignicare Stool Management System; Fecal Containment Device
ConvaTec, Division of E.R. Squibb & Sons, LLC, Princeton, New Jersey	Flexi-Seal Fecal Management System
Hollister Incorporated, Libertyville, Illinois	InstaFlo Bowel Catheter System; ActiFlo Indwelling Bowel Catheter System; Drainable Fecal Incontinence Collector
Tecnoline, Concordia, Modena, Italy	Anal Bag