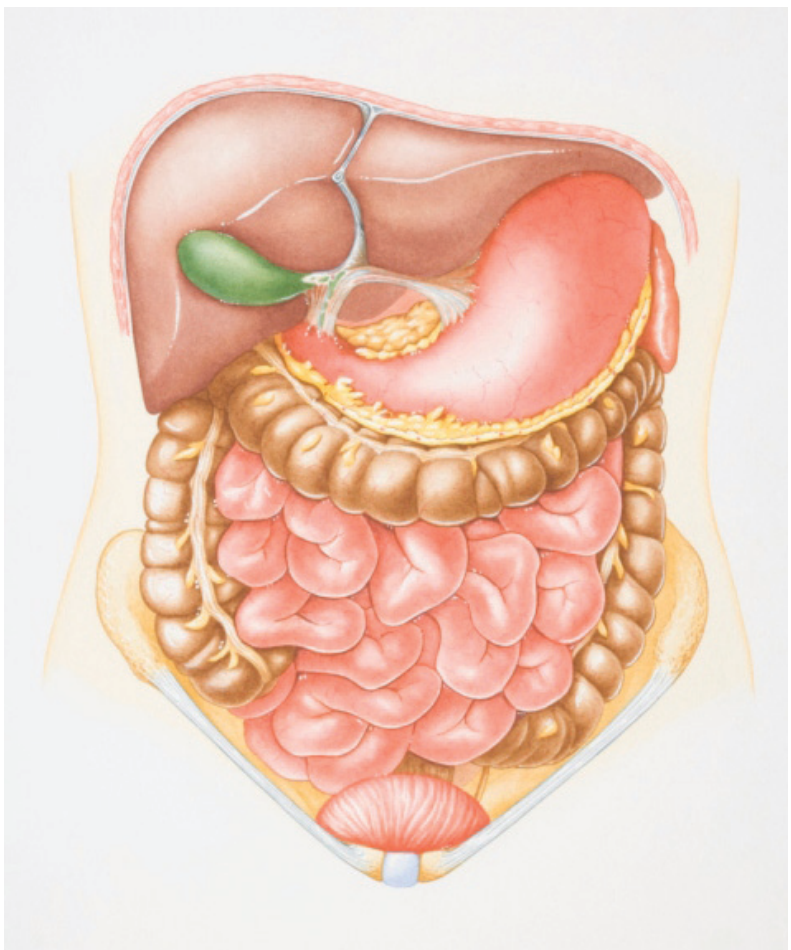


International Journal of **MS**CARE

The Official Publication of the Consortium of Multiple Sclerosis Centers

Elimination Dysfunction in Multiple Sclerosis

Proceedings of a Consensus Conference held October 28-29, 2011 in Short Hills, New Jersey



Supported by an educational grant through the Foundation of the Consortium of Multiple Sclerosis Centers from Allergan and Biogen Idec.

Elimination Dysfunction in Multiple Sclerosis

- 3 Introduction
- 4 Bladder and Bowel Issues in MS: An Overview
- 6 Patient Questionnaire on Bladder and Bowel Issues
- 8 Assessment and Treatment for Bladder Dysfunction
- 15 Assessment and Treatment for Bowel Dysfunction
- 20 Conclusion and References
- 22 Patient Education Handouts



CHAIRPERSON

Marie Namey, APN, MSN, MSCN

Advanced Practice Nurse
Mellen Center for Multiple Sclerosis Treatment
and Research
Cleveland Clinic Foundation
Cleveland, Ohio
President of the International Organization of MS
Nurses

MODERATOR

June Halper, MSN, APN-C, MSCN, FAAN

Executive Director
Consortium of Multiple Sclerosis Centers
Hackensack, New Jersey

PARTICIPANTS

Philip J. Aliotta, MD, MSHA, FACS, CHCQM

Chief of Urology
Sisters of Charity Hospital
Director, Pelvic Floor and Bladder Dysfunction
Jacobs Neurologic Institute
Clinical Instructor, Male Infertility,
Department of Urology
Instructor, Department of Neurology
SUNY at Buffalo School of Biomedical Sciences and
School of Medicine
Assistant Clinical Professor, Urology
New York College of Osteopathic Medicine
Buffalo, New York

Klaus Bielefeldt, MD, PhD

Associate Professor of Medicine
Director, Neurogastroenterology and
Motility Center
Division of Gastroenterology, Hepatology
and Nutrition
University of Pittsburgh MS Center
Pittsburgh, Pennsylvania

Elsie E. Gulick, PhD, FAAN, RN

Professor Emerita
Rutgers, the State University of New Jersey
College of Nursing
Newark, New Jersey

Jodie K. Haselkorn, MD, MPH

Director, MS Center of Excellence West
Veterans Health Administration
Professor, Rehabilitation Medicine
Adjunct Professor, Epidemiology
University of Washington
Seattle, Washington

Jason Kavountzis, MPT, CCS

Director of Rehabilitation Services
MS Center at Holy Name Hospital
Teaneck, New Jersey

David Levinthal, MD, PhD

Gastroenterology Fellow
Division of Gastroenterology, Hepatology,
and Nutrition
University of Pittsburgh
Pittsburgh, Pennsylvania

Sangeeta Mahajan, MD

Assistant Professor
Head, Division of Urogynecology
Directory, Joint fellowship in Female Pelvic
Medicine and Reconstructive Surgery
Department of Obstetrics and Gynecology
University Hospitals Case Medical Center
Case Western Reserve University
School of Medicine
Cleveland, Ohio

Lynn McEwan, NP, MScN, CNNc, MSCN

Nurse Practitioner
London Health Sciences Centre
London, Ontario, Canada

Courtenay Moore, MD

Staff, Female Pelvic Medicine and
Reconstructive Surgery
Director, Female Pelvic Medicine & Reconstructive
Surgery Fellowship
Cleveland Clinic
Assistant Professor, Department of Surgery
Cleveland Clinic Lerner College of Medicine of
Case Western Reserve University
Cleveland, Ohio

Margie O'Leary, RN, MSN, MSCN

Clinical Supervisor, Department of Neurology
University of Pittsburgh Medical Center
Pittsburgh, Pennsylvania

Michelle Stern, MD

Chairman
Department of Physical Medicine and
Rehabilitation
North Bronx Healthcare Network
Bronx, New York

Matthew H. Sutliff, PT, MSCS

Physical Therapist, Rehabilitation Manager
Mellen Center for Multiple Sclerosis Treatment
and Research
Cleveland Clinic Foundation
Cleveland, Ohio

Tracy Walker, NP, WOC, MCSN, FNP-C

Nurse Practitioner
MS Institute at Shepherd Center
Atlanta, Georgia

PUBLISHERS

Joseph J. D'Onofrio
Frank M. Marino
Delaware Media Group
66 South Maple Avenue • Ridgewood, NJ 07450
Tel: 201-612-7676 • Fax: 201-612-7676
Website: www.delmedgroup.com
Email: jdnonofrio@delmedgroup.com

EDITORIAL DIRECTOR

Nancy Monson

ART DIRECTOR

James Ticchio

Cover Art: © Dorling Kindersley / Getty

Copyright © 2012 by the Consortium of Multiple Sclerosis Centers and Rehabilitation in Multiple Sclerosis. All rights reserved. None of the contents of this publication may be reproduced without prior written permission from the publisher. Statements and opinions expressed in this publication are those of the participants and not of the publisher or supporters.

Introduction

Marie Namey, APN, MSN, MSCN and June Halper, MSN, APN-C, MSCN, FAAN

Bladder and bowel dysfunction are common issues for individuals with multiple sclerosis in all stages of the disease, but particularly as it advances and mobility becomes impaired. With the more recent focus on disease-modifying medications, many MS clinicians may not give full attention to symptoms that can affect quality of life or that can influence quality of general health. However, elimination dysfunction and its symptoms should be addressed as a component of the comprehensive care of persons with MS. Thus, it is important to note that symptomatic management remains as important as disease modification in MS.

It is important to note that symptomatic management remains as important as disease modification in MS.

In October 2011, the Consortium of Multiple Sclerosis Centers (CMSC) convened a two-day multidisciplinary consensus panel to discuss the current state of knowledge on elimination dysfunction in MS, identify gaps in knowledge and practice, and create simple, time-efficient, “best practice” algorithms (including assessment and interventions) for MS clinicians on both topics. This meeting was the second in a series of meetings seeking to examine the characteristics, consequences, and treatment of elimination dysfunction in MS. (The first was convened in March 2010.) Prior to the meeting, an extensive literature review was carried out identifying studies related to bladder and bowel function in the MS population. The 15 experts were separated

into bowel and bladder panels, where they individually examined the topics and then reported back to the



Marie Namey



June Halper

entire group. There was general discussion of the breakout sessions’ recommendations and proposed algorithms were developed. This supplement contains the consensus statements and algorithms from this concerted activity and reflects the philosophy of the Consortium of Multiple Sclerosis Centers: comprehensive care in MS with the team approach.

This supplement contains the consensus statements and algorithms from this concerted activity and reflects the philosophy of the Consortium of Multiple Sclerosis Centers: comprehensive care in MS with the team approach.

Note: Both meetings and this supplement were supported by an educational grant from the Foundation of the Consortium of Multiple Sclerosis Centers, which obtained educational grants from Allergan and Biogen Idec. No representatives of these companies were present at either meeting or involved in the preparation of this manuscript.

Bladder and Bowel Issues in MS: An Overview

The damaging effects of multiple sclerosis (MS) often extend to the urinary and digestive system, resulting in elimination dysfunction that can significantly impair quality of life and increase the risk for neurological and other complications. Normal micturition and defecation are dependent on coordination between the brainstem and spinal cord, and demyelination can lead to a disconnect along these pathways.¹ Mobility issues can exacerbate elimination dysfunction by slowing transit time through the intestines, as well as hindering the person's ability to get to toilet facilities before urinary or fecal accidents occur.

Bladder and bowel issues fall inside the scope of the MS specialist's practice, and assessment of issues related to these systems is critical to the overall well-being and comprehensive care of the patient with MS. Many of these issues can be treated simply, while others may require a referral to a gastroenterologist or urologist, or a physical or occupational therapist. The goal of this publication is to help identify best practices to simply and effectively deal with elimination dysfunction in the MS clinician's office.

Bladder Dysfunction

Urinary dysfunction is among the most common and frequently underdiagnosed clinical manifestations of MS, while also highly responsive to treatment.² The consequences of urinary dysfunction include both a diminished quality of life and a risk for complications from increased bladder pressure, including irreversible renal damage.² Classic symptoms of urinary tract infections (UTIs)—dysuria, change in the color and odor of urine, abdominal or lower back pain, urgency, and frequency—may or may not be present. UTIs in people with MS may result in temporary worsening of MS symptoms, including increased spasticity or fatigue, or a change in the usual bladder pattern. Patients may not be aware of many of the UTI symptoms due to sensory loss from MS, and thus should be instructed to be on the lookout for changes in the color or smell of their urine, other changes in their bladder function, or an increase in MS symptoms (particularly weakness,

fatigue, or spasticity) and report them to their clinician.³ (Note: An educational handout on UTIs and MS that can be printed and distributed to patients is located at the end of this supplement.)

Urinary dysfunction has been reported in up to 75% of people with MS.² A survey of 9,700 patients in the North American Research Committee on Multiple Sclerosis (CMSC-NARCOMS) database found that 65% reported moderate to severe urinary symptoms, most commonly urinary urgency.⁴ Longer disease duration ($r=0.135$) and increasing physical disability ($r=0.291$) correlated with increasing bladder symptoms.

The goal of this publication is to help identify best practices to simply and effectively deal with elimination dysfunction in the MS clinician's office.

For urination to occur, the bladder detrusor muscle must contract to expel urine stored in the bladder. The sphincter muscle then relaxes and opens, permitting a free flow of urine through the urethra and out of the body. The normal capacity of the bladder is 300 cc to 600 cc of urine, and the first urge to void is felt around 150 cc to 300 cc.⁵ As a result of irritation of the nerves of the sacral spinal cord (controlling storage) and the pontine micturition center, which controls emptying, the majority of people with MS will experience some form of bladder dysfunction (or neurogenic bladder) at some stage of their disease course. There is a modest correlation between MS lesion volume and urinary symptom progression within the first 5 years.⁶ Lesions in the medial frontal lobes, cerebellum, insula, dorsal midbrain, and pons, as well as on the spinal cord, have been associated with urinary dysfunction.^{7,8}

Neurogenic bladder manifests as overactivity or a failure to store, in which detrusor hyperreflexia causes

the bladder to contract when only small amounts of urine are present. In addition to needing to urinate more frequently, people with MS may experience urge symptoms, urinary incontinence, and nocturia. Neurogenic bladder can also present as a failure to empty or ineffective emptying, which is associated with a non-contracting bladder. Patients cannot feel when the bladder is full, and leak small amounts of urine as pressure in the bladder builds. Bladder emptying is incomplete, which leads to urinary retention and an increased risk of UTIs.^{1,2} Other symptoms include urinary hesitancy, urgency, dribbling and incontinence, double voiding, and changes in the amount of urine expelled. Untreated bladder issues can lead to repeated UTIs and renal damage, skin irritation, declining quality of life and inability to participate in normal activities, and social isolation.⁵ Patients may also present with a combined dysfunction of the detrusor muscle, in which the muscle works in opposition to the external sphincter, known as detrusor external sphincter dyssynergia (DESD). The symptoms of DESD can be wide-ranging, including urgency, hesitancy, double voiding, incomplete emptying, dribbling and incontinence, infection, and renal injury.^{1,3}

Bowel Dysfunction

Anorectal (bowel) dysfunction is also common in people with MS, affecting more than 50% of patients during the course of their disease.⁹ Among 502 people with MS from the NARCOMS Patient Registry who were surveyed about bowel dysfunction, 39% reported constipation, 11.4% fecal incontinence, and 35.8% a combination of the two issues.¹⁰ The impact of bowel dysfunction is significant, and the problem can be socially isolating and embarrassing for people with MS. In a UK survey of 47 people with MS, a third reported spending more than 30 minutes a day managing their bowels, and many said that dealing with these issues had as great an impact on their quality of life as mobility problems.¹¹

Anorectal dysfunction in MS typically manifests as constipation and/or fecal incontinence.¹² Constipation often results from impaired neurological function due to MS lesions in the spinal cord that affect the sacral area, resulting in a slowing of transit time in the bowel (“slow bowel”). Weakened abdominal muscles as a result of MS may create more difficulty in “bearing down” strongly enough to evacuate. Decreased activ-

ity because of difficulty walking, fatigue, or a sedentary lifestyle can contribute to the problem. Medications used to treat other MS symptoms, such as anticholinergics, tricyclic antidepressants, antihypertensives, antiarrhythmics, narcotic analgesics, nonsteroidal anti-inflammatory drugs, and sympathomimetics, can also cause constipation. In addition, a patient’s medical and surgical history (e.g., abdominal surgery, childbirth) and concurrent medical conditions such as bladder or thyroid disease or hypercalcemia can impact the bowels. On the other hand, a lack of rectal sensation, making the patient unaware of rectal filling, and inadequate voluntary contractions of the anal sphincter and/or the pelvic floor can lead to fecal incontinence. In addition, fecal urgency and incontinence can result when laxatives are used to treat constipation.¹³

.....

Patients often believe that urinary and bowel problems are related to aging rather than to their MS, and may not know that if left untreated, these conditions can have serious, deleterious effects on their MS symptoms and progression.

.....

Assessment for Bladder/Bowel Incontinence

Many people are not aware that bladder and bowel symptoms are related to MS. Patients often believe that urinary and bowel problems are related to aging rather than to their MS, and may not know that if left untreated, these conditions can have serious, deleterious effects on their MS symptoms and progression. Individuals may also be embarrassed to bring up the subject with MS clinicians. It is therefore essential that clinicians educate patients about the commonality and risks of elimination dysfunction, and ask at every visit if patients are having issues with the bladder or bowel. By acknowledging that bladder and bowel symptoms are common in MS and simply inquiring “Do you have bowel or bladder accidents?”, clinicians may open the discussion with many patients, allowing for educa-

Patient Questionnaire on Bladder and Bowel Issues

Many people with MS have bladder and bowel problems as a result of the effects of the disease on the brain and spinal cord. You may experience a burning sensation when you urinate, feel like you need to urinate or defecate more or less frequently, or leak urine or feces. These are important health and quality-of-life issues. Please complete this questionnaire to discuss your personal concerns.

Bladder Issues

Do you have bladder accidents (urine leakage)? Check all of the appropriate answers.

- Yes, and...
 - They upset me (a little/a lot)
 - They don't upset me
 - They create social problems with friends and family
 - They restrict my ability to leave the house for any length of time
 - They are accompanied by urinary tract infections (rare/occasional/frequent)
 - They force me to wear a pad for urine leakage
 - I leak urine when I cough, stand, or sneeze
 - I have trouble making it to the bathroom in time to prevent leakage
 - I have pain or burning when I urinate
- No

Bowel Issues

Do you experience constipation (infrequent bowel movements)?

- Yes, and...
 - I have to strain when I have a bowel movement
 - I have to use laxatives to have a bowel movement
 - I have rectal bleeding
 - I've lost weight recently
 - This is a new, sudden problem for me
- No

Do you have bowel accidents (fecal leakage, loss of control of your bowels)? Check all of the appropriate answers.

- Yes, and...
 - They upset me (a little/a lot)
 - They don't bother me
 - They create social problems with friends and family
 - They restrict my ability to leave the house for any length of time
 - I have to wear protective garments to prevent soiling of my clothes
 - I experience frequent gas
 - I have no warning prior to an accident
 - I have a feeling of having to go immediately (urgency) prior to an accident
- Please rate the severity of the problem:
 - Mild Intermediate Severe
- No

Table 1. Factors to Consider in Patient Assessment for Bladder/Bowel Incontinence

- Mental/cognitive status
- Functional status (walking ability, spasticity, hand coordination, ADLs, ability to self-catheterize)
- Fluid and fiber intake
- Diet
- Frequency of urination and bowel movements
- Presence of dysfunction or incontinence (symptomatic versus nonsymptomatic, recurrent UTIs)
- Patient awareness or denial of the problem
- Patient understanding and education about bladder/bowel dysfunction in MS
- Mobility and bathroom access issues
- Sexual activity status
- Concurrent illnesses (prostate disease in men, obstetric history and menopausal status in women)

ADLs=activities of daily living; MS=multiple sclerosis; UTIs=urinary tract infections.

tion and further assessment. Clinicians may also find it helpful to use a waiting-room questionnaire to inquire about elimination dysfunction, such as the one provided on page 6, which can be printed and distributed.

MS clinicians may find it useful to adopt a shared medical visit strategy.

To address these issues in a time-efficient manner, MS clinicians may find it useful to adopt a shared medical visit strategy. Group visits are an active area of research in many chronic diseases, including Parkinson's disease, asthma, diabetes, epilepsy, and hypertension, due to the severe time constraints health care providers face in the effort to offer comprehensive care. The CMSC Consensus Panel discussed and recommended shared medical appointments as a consideration for people with MS and bowel and bladder disorders, due to the need for extensive education and self-management. Such visits typically include five or more patients. After

individual consultation and evaluation, patients can be offered the opportunity to join with others to meet with MS team members in a shared medical appointment environment for a visit lasting one to two hours.

Mental, functional, and mobility assessments should be repeated periodically as the disease progresses and symptomatic treatments adjusted accordingly.

The assessment of the person with MS for bladder and bowel incontinence should incorporate consideration of a number of factors that extend beyond physical findings (**Table 1**). Mental, cognitive, and functional status are important to consider, as many lifestyle or medical interventions are dependent on the patient's ability to comprehend and adhere to them. Mental, functional, and mobility assessments should be repeated periodically as the disease progresses and symptomatic treatments adjusted accordingly.

Assessment and Treatment for Bladder Dysfunction

The first algorithm created by the CMSC Consensus Panel (see page 10) highlights the evaluation of patients with MS who present with urinary complaints.

Table 2 describes a number of treatable causes of incontinence, defined by the acronym DIAPPERS, which should be considered in people who present with urinary complaints.

All patients should be assessed for mobility, dexterity, and functional status (hand function, spasticity), availability of care partner, activities of daily living (ADLs), and the ability to self-catheterize if necessary. If they are found to be impaired, referral to a physical therapist (PT) and/or occupational therapist (OT) for rehabilitative strategies for exercise, energy conservation, balance and mobility training, and recommendation of adaptive aids and clothing is warranted. These professionals can also help patients improve voiding behaviors, strengthen the pelvic floor, and retrain the bladder. Of course, these interventions are only possible among people with uncompromised neural pathways to the pelvic floor muscles. Evidence has suggest-

ed that rehabilitative methods are somewhat effective, and they have demonstrated no harmful outcomes.²

Concurrently, patients should undergo microscopic urinalysis, which is considered the gold standard of infection screening and is more accurate than dipstick testing; it can also screen for kidney dysfunction by detecting the presence of glucose, protein, ketones, or bilirubin in the urine, and evaluating alkalinity and acidity.¹⁴ Important serum screening tests to conduct include the glycolated hemoglobin (HbA1c) test for diabetes, creatinine level to detect kidney dysfunction (normal = 0.8-1.2 mg/dL in males and 0.6-0.9 mg/dL in females), and prostate specific antigen (PSA) for prostate cancer (<4.0 ng/mL is considered normal).

As well as UTI testing, patients who present with urgency and frequency should undergo postvoid residual (PVR) testing using ultrasound or catheterization to distinguish between an overactive and an underactive bladder and guide treatment selection. A normal postmicturition volume is <150 mL. In general, a need to empty with urine volume <100 mL is indicative of

Table 2. Treatable Causes of Incontinence: DIAPPERS

Delirium: Could be related to metabolic causes or infection.

Infection: Perform microscopic urinalysis and culture and sensitivity test. If the patient has >3 UTIs/year, refer to Urology. If microhematuria (>3-5 RBCs) alone or associated with Cytoxan®, refer to Urology for evaluation for bladder cancer.

Atrophic urethritis/vaginitis: Treat with topical estrogen cream, refer to Gynecology/Urogynecology.

Pharmaceuticals: Drugs that can cause retention: alpha agonists, anticholinergics, opiates. **Drugs that can cause stress incontinence:** alpha blockers, ACE inhibitors (cough as a side effect can induce stress incontinence), loop diuretics, and alcohol (both increase urgency and frequency and therefore increase the risk of incontinence).

Psychological: Evaluate for severe depression, Alzheimer's disease, Parkinson's disease, cognitive deficits.

Excess excretion: Evaluate for congestive heart failure, diabetes mellitus, peripheral edema, vascular disease, diuretic use, excessive oral fluid intake.

Restricted mobility: Could be due to arthritis, Parkinson's disease, or multiple sclerosis. Correct access issues, adjust fluid intake and outputs, refer to PT/OT for accessibility evaluation, adaptive equipment and clothing, and pelvic floor education and training.

Stool impaction: Refer to GI specialist if bowel regulation is unsuccessful.

GI=gastrointestinal; OT=occupational therapy; PT=physical therapy; RBCs=red blood cells; UTI=urinary tract infection.

a failure to store, whereas a PVR volume ≥ 100 mL is considered a failure to empty.¹⁵

A positive urinalysis and culture prompts treatment with antibiotics. A culture and sensitivity test determines the preferred antibiotic to treat the specific bacteria. Prophylactic antibiotics are generally not recommended, but cranberry extract tablets may reduce infections.² People with recurrent UTIs (>3 in a 12-month period) should be referred to a urologist for further assessment and treatment.

If hematuria is detected on two consecutive urinalyses, the patient should be referred to a urologist to rule out kidney damage, blockage, cancer, and other conditions, and to be treated.²

Once infection has been treated or ruled out, PVR status and symptoms dictate treatment. Lifestyle interventions to suggest in all cases of urinary symptoms are summarized in **Table 3**. A variety of bladder diaries can be found on the Internet to suit clinician and patient needs. One sample bladder diary is illustrated on page 12, and can be printed and distributed.

The therapeutic strategy for failure to store with a PVR <100 mL plus urgency symptoms or urge incontinence but no flow complaints involves prescription of anticholinergic agents to relax the detrusor muscle and inhibit involuntary bladder con-

tractions (**Table 4**). These medications are best used among individuals with mild disability.^{16,17} They work by binding to receptors on the detrusor muscle and inhibiting acetylcholine release from the parasympathetic nerves. This results in a decrease of detrusor overactivity and bladder filling pressure and an increase in bladder capacity and improvement in compliance.^{18,19}

In some situations, a referral to a PT for pelvic floor muscle exercises may be helpful, as tension in the pelvic floor muscle can irritate the bladder, exacerbating urgency and frequency.

After initiation of these interventions, the PVR should be rechecked at 3 months. If there is no improvement in the person's symptoms, a referral to a urologist should be considered. Patients may, at this point, be candidates for Botox® (onabotulinumtoxin A) injections, insertion of the InterStim device, or percutaneous tibial nerve stimulation (PTNS) (**Table 5**).^{3,20-27}

The therapeutic strategy for individuals with (A) urge or urge incontinence (UI) with poor flow and a PVR ≥ 100 mL and (B) a PVR >150 mL and urge or UI involves prescription of both an anticholinergic and an alpha-adrenergic blocker (**Table 6**). These agents promote the flow of urine through the sphincter. Studies suggest that they improve both flow rate and PVR.^{2,3,18} A PVR >150 mL without urge or UI is

Table 3. Lifestyle Interventions for Urinary Incontinence^{2,3}

Bladder diary. Have patients maintain a bladder diary, detailing the frequency and approximate amount of urination as well as fluid intake volume and type. This can provide valuable information in identifying and quantifying a urinary problem.

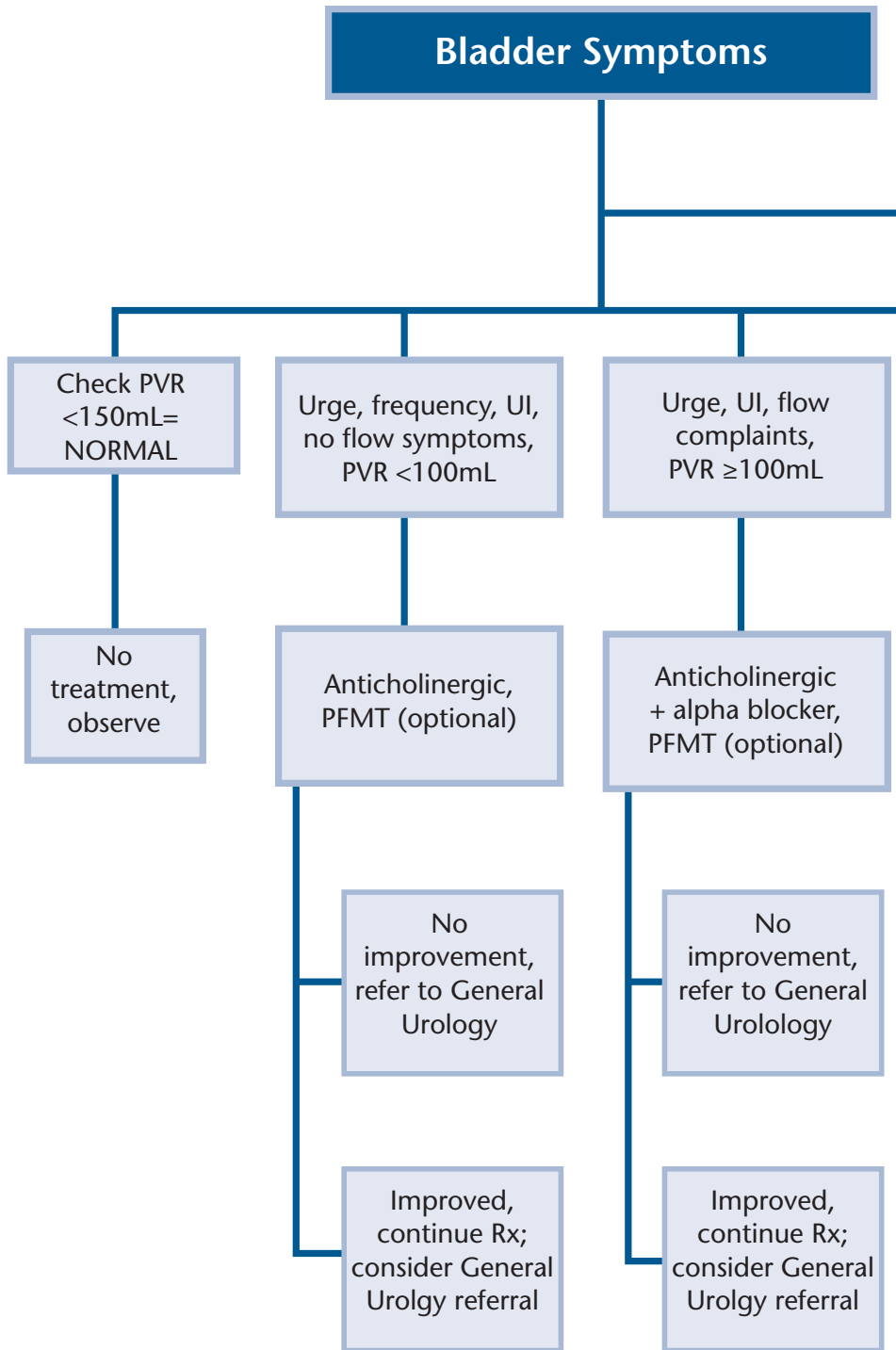
Reduction or elimination of bladder irritants. Patients should be advised that certain products, such as caffeine, aspartame, alcohol, and citrus juices, can irritate the bladder. Patients should also always look at the ingredients of complementary medicines, such as vitamin and mineral supplements, to ensure that they do not contain caffeine. Patients should be made aware that a decrease in fluid or water intake can cause urine to become concentrated, which can cause bladder irritation. Patients should be advised to avoid drinking late in the evening, as this can contribute to an overactive bladder while sleeping.

Scheduled fluid intake. Patients should be instructed to drink eight glasses of water and other non-sugary fluids daily to flush out the urinary tract. It is best to drink a glass or two at a time, rather than sip, to reduce the urge to urinate.

Scheduled voiding. Patients should be advised to urinate every two hours while awake.

Bladder retraining. Teach patients to voluntarily hold urine in the bladder for increasing lengths of time.

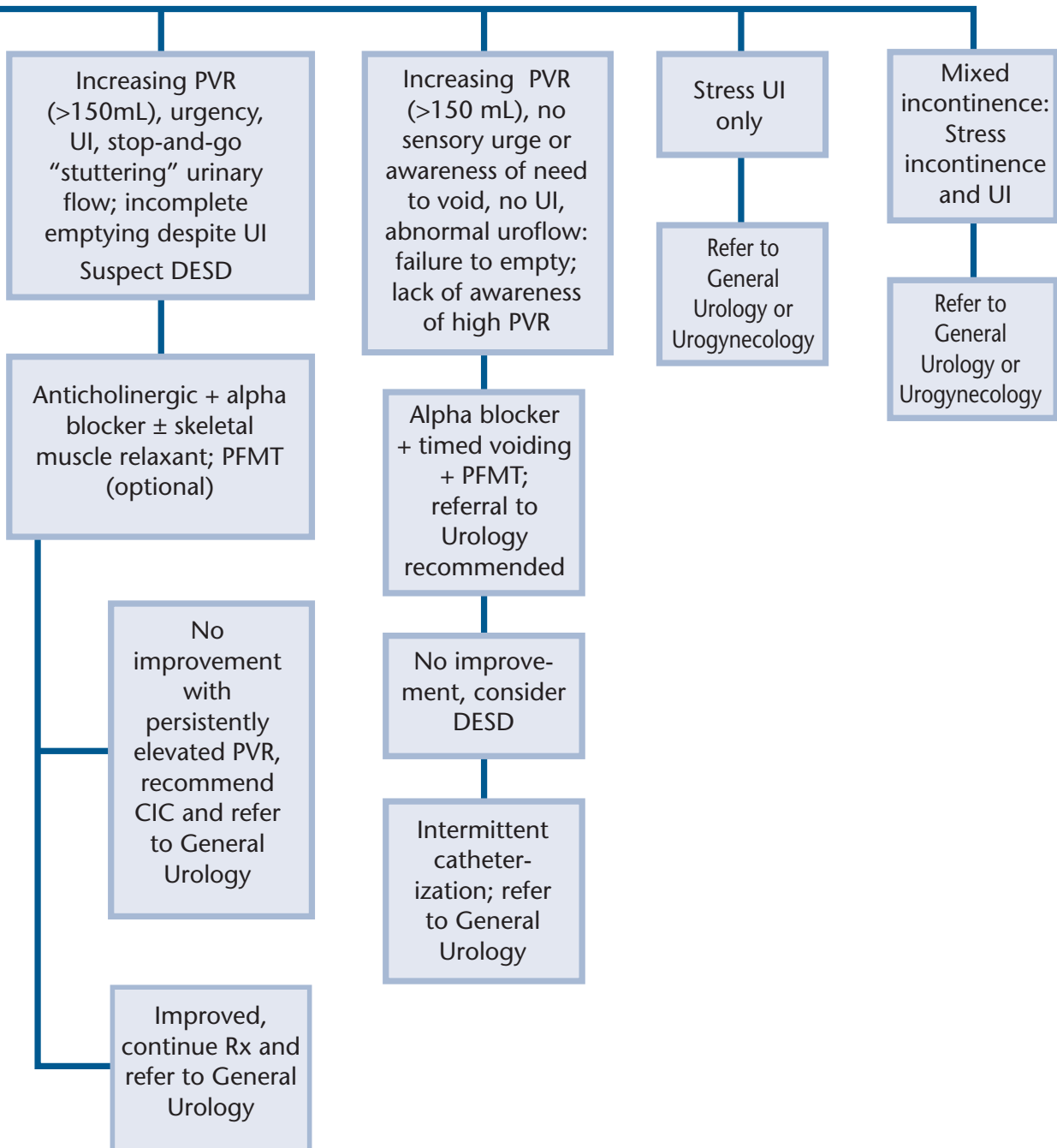
Pelvic floor exercises. Encourage patients to perform Kegel exercises—contracting and releasing the muscles that control urine flow—to strengthen the pelvic floor.



CMSC Consensus Panel Urinary Symptoms Algorithm

CIC=clean intermittent catheterization; DESD=detrusor external sphincter dyssynergia; PFMT=pelvic floor muscle therapy; PVR=post-void residual; Rx=treatment; UI=urge incontinence.

Treatable Causes of Incontinence:
See "DIAPPERS" Table 2



Bladder Diary

Name: _____ Date: _____

Time	Drinks (What you drank and how much)	How much urine did you pass (small, medium, large amount)?	Did you feel a strong and sudden desire to urinate?	Did you have any leakage? How much (small, medium, large amount)?	What were you doing at the time? (Sitting, sneezing, running, lifting, etc.)

Table 4. Anticholinergic/Antimuscarinic Medications to Reduce Urge Incontinence and Frequency Related to Overactive Bladder/Failure to Store Disorders^{3,17}

Generic Name	Brand Name
Fesoterodine	Toviaz [®]
Darifenacin	Enablex [®]
Oxybutin	Ditropan [®] Ditropan XL [®] Oxytrol [®] Transdermal Patch Gelnique [®] Gel
Propantheline bromide	Pro-Banthine [®]
Propiverine hydrochloride	Detrunorm [®]
Solifenacin succinate	Vesicare [®]
Tolterodine	Detrol [®] Detrol LA [®] Detrusitol [®] and Detrusitol XL [®]
Tropium chloride	Sanctura XR [®]

typically treated with an alpha-adrenergic blocker and instruction on timed and/or scheduled voidings.

Antispasmodics such as baclofen (Lioresal[®]) and tizanidine (Zanaflex[®]) may also be prescribed for people with urinary incontinence.

The PVR should be rechecked after 3 months and if there is no improvement, clean intermittent catheterization (CIC), an indwelling catheter, and/or a referral to Urology for consultation should be considered in cases with a PVR >150 mL. Catheter assistance for bladder emptying is typically suggested for individuals with advanced disease; in the NARCOMS survey, one-third of patients reported using a catheter.⁴ Patients with PVRs of >100 mL may be taught the CIC technique, catheterizing every three to six hours. Many people are able to do this successfully and are not adverse to doing it; others find it difficult or burdensome.¹⁸ For some, it may only be necessary for a few weeks, while others may need to self-catheterize every day.³

Self-CIC can be taught by an MS nurse, specialist nurse, a home care nurse, or a continence advisor in an outpatient setting or an individual's home. The basic technique is as follows:

The Role of Urodynamic Studies

Urodynamic studies—multichannel cystometry and pressure/flow voiding studies—are not typically conducted in patients with MS and urinary symptoms unless they are refractory to lifestyle recommendations and medical treatment.² However, the results of a recent study suggest a need for them.

In a prospective analysis of a case series of 100 patients with relapsing-remitting MS (RRMS), primary-progressive MS (PPMS), and secondary-progressive MS (SPMS) with urinary symptoms, urodynamic assessment revealed urinary tract dysfunction in 78 individuals. The goal of the study was to evaluate the frequency of urinary tract pathology. The average Expanded Disability Status Scale (EDSS) score at entry was 4.52. The mean duration of MS was 10.3 years, whereas the mean duration of urinary symptoms was 6.9 years. A variety of urinary dysfunctions were detected: 26 of the 100 patients had detrusor-sphincter dyssynergia, 21 had increased bladder sensation (without detrusor overactivity), 12 had detrusor hypocontractility, seven had neurogenic detrusor overactivity, and four had detrusor acontractility. An additional eight patients had apparent but ill-defined pathology, while only 22 were found to be normal. The risk factors for pathology were wheelchair dependency (EDSS score ≥ 6.5), use of more than one incontinence pad per day, and any MS type other than RRMS.

The study highlights the need to be on the lookout for urological symptoms and refer patients as needed to urologists to order and repeat urodynamic studies.²⁸

1. Wash hands completely and urinate if able.
2. Wash around the urinary opening with soap and water or a pre-packaged toilette.
3. Insert the catheter into the urinary meatus (opening) and let urine flow into the toilet.
4. Remove the catheter.
5. Use a new catheter each time. (Medicare and many insurers will cover sterile single-use intermittent catheters in quantities up to 200 per month in most states.)

Table 5. Urological Interventions for Failure to Store Disorders

Botox®. Recent research has found that injections of onabotulinum-toxin A (Botox®) into the detrusor muscle are highly effective.²⁰ The treatment is hypothesized to work as a result of preventing neurotransmitter release at presynaptic cholinergic nerve terminals, effectively blocking neuromuscular activity in skeletal muscle. It may also eliminate acetylcholine-mediated detrusor contraction, inhibiting other neurotransmitters active in bladder functioning.^{2,21} Two large, randomized, double-blind, placebo-controlled studies found that individuals receiving Botox® were significantly less likely to experience urinary incontinence, and urodynamic studies and quality-of-life measurements were improved.^{20,22} The medication's effects last about three months.³

InterStim. This device treats urinary retention issues, including overactive bladder, urge incontinence, and symptoms of urgency-frequency.²³ It is often used in people for whom more conservative treatments are not plausible. The device is similar to a pacemaker in that it creates a pulse to stimulate the S3 sacral nerve. First, patients are tested using a percutaneous stimulator to determine whether they will respond to the therapy. If they respond, the device is implanted for permanent pulse generation. A recent systematic decision analysis concluded that InterStim was a reasonable and effective treatment, although large, randomized, controlled trials still need to be completed.²⁴ There is concern, however, that magnetic resonance imaging (MRI) is contraindicated with this device, which is problematic for people with MS.

Percutaneous tibial nerve stimulation (PTNS). This office-based procedure involves the insertion of a device that induces neuromodulation via a stimulating current to the posterior tibial nerve and from there to the sacral nerve plexus, which controls bladder function. Studies have shown that PTNS is associated with improvements in moderate to severe urgency as well as urge incontinence. In one trial, it also improved fecal incontinence symptoms.²⁵ It is often used for patients who do not respond well to more conservative treatments for a variety of reasons.^{26,27}

Table 6. Alpha-adrenergic Blockers for Urge or Urge Incontinence to Facilitate Bladder Emptying

Generic Name	Brand Name
Alfuzosin*	Uroxatral®
Doxazosin+	Cardura XL®
Prazosin+	Minipress®
Silodosin*	Rapaflo®
Tamsulosin*	Flomax®
Terazosin+	Hytrin®

*These agents are uroselective alpha blockers approved by the US Food and Drug Administration (FDA) for men to facilitate bladder emptying.

+These agents are nonselective alpha blockers approved for men and women as antihypertensive agents and used off-label for bladder disorders.

NOTE: Alpha blockers have not been approved by the US FDA for the treatment of bladder disorders in women.

Indwelling urinary catheters are an alternative method for treating refractory MS urinary symptoms when CIC is not possible. Most experts agree a suprapubic catheter should be used rather than a urethral catheter to reduce the risk of potential complications. Although the actual rates of complications are unknown among individuals with MS, many potential complications related to catheterization exist: urethral damage or erosion, UTI, loss of bladder compliance, and a greater risk of bladder cancer. Bacteriuria alone (without symptoms) in patients using catheters can be expected, and is not an indication for antibiotic therapy.^{2,3,18}

Most experts agree a suprapubic catheter should be used rather than a urethral catheter to reduce the risk of potential complications.

Patients with stress urinary incontinence only or mixed incontinence (stress and urge incontinence) should be referred to Urology or Urogynecology for further evaluation.

Assessment and Treatment for Bowel Dysfunction

The second algorithm created by the CMSC Consensus Panel (see page 16) highlights the evaluation of patients with MS who present with bowel complaints, and divides the population into two groups: people with constipation (infrequent bowel movements and difficulty passing stool) and incontinence, and people with bowel incontinence alone. Both of these groups are then addressed according to their mobility status. Page 24 offers an educational handout on bowel function and dysfunction in MS that can be printed and distributed to patients.

Constipation with Incontinence

Constipation is the most common bowel complaint of people with MS. Constipation is signaled by a decrease in the number of bowel movements over the individual's normal schedule. The World Gastroenterology Organisation and the Rome Criteria define constipation as report of any two of the following criteria in a 12-week period by a person who is not taking laxatives:

- Fewer than three bowel movements per week;
- Hard stool in >25% of bowel movements;
- A sense of incomplete evaluation in >25% of bowel movements;
- Excessive straining during >25% of bowel movements; and
- A need to digitally manipulate stool to facilitate evacuation.¹²

Untreated, constipation may cause various complications. Straining during bowel movements can irritate hemorrhoids or lead to rectal prolapse, while hard stools can lead to anal fissures, causing pain, bleeding, or excessive secretion of mucus. Rectal overload and overflow and lessened rectal sensation due to neurogenic bowel can lead to fecal incontinence concurrently with constipation.¹ Another potential complication is fecal impaction, an inability to defecate because the stool has formed a large, dense mass in the colon or rectum.

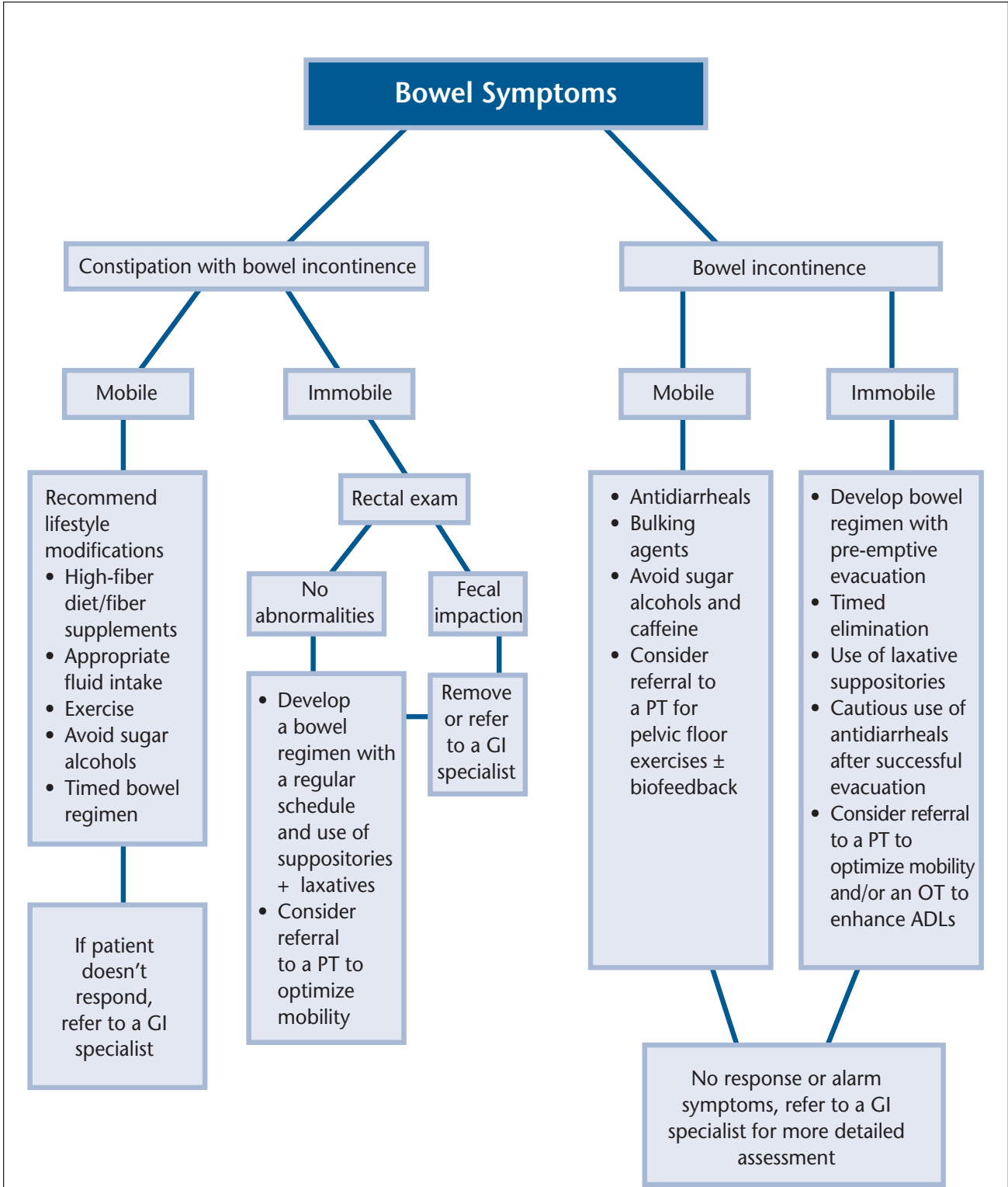
The assessment of individuals who present with constipation begins with questioning about the frequency of spontaneous bowel movements, whether

the person has difficulty with evacuation (i.e., strains to have a bowel movement), has associated discomfort (e.g., abdominal distention), or is positive for warning symptoms of a serious bowel issue (e.g., cancer, infection, inflammatory bowel disease, diverticular disease), such as rectal bleeding, weight loss, or acute onset of constipation and/or incontinence. Patients also need to be assessed for sensory issues related to the impact of MS on the bowels (e.g., numbness in the lower extremities and pelvic areas, sexual dysfunction), and whether they are able to sense when their bowels are full and they need to defecate. They should be questioned about medication use (e.g., anticholinergics, antidepressants), concurrent illnesses, surgeries that can affect the bowel, anus, and perineum, childbirth history, and food and fluid intake. It may be useful to request that patients keep a bowel diary (see page 17 for sample diary) recording the timing of bowel movements, foods and fluids consumed, and exercise habits.

Persons who are mobile. The first line of treatment for constipation with incontinence is lifestyle modification or a bowel training program. According to Namey and Halper, a bowel training program, which can take three to four weeks to establish, should:

- (1) normalize stool consistency;
- (2) establish a regular pattern for defecation;
- (3) stimulate rectal emptying before rectal overload and overflow lead to incontinence;
- (4) avoid diarrhea, constipation, and incontinence as side effects;
- (5) improve the patient's quality of life.¹³

Lifestyle changes begin with an increase in fiber consumption. The Institute of Medicine recommends that young men consume 38 grams of fiber daily and men over 50 consume 30 grams per day. Likewise, the Institute recommends 25 grams for young women, and 21 grams per day for women older than 50. Fiber holds fluid, so it adds bulk to the stool and softens its texture, making it easier and less uncomfortable to expel. It also increases transit time. Good sources of fiber to recommend include whole grains, bran cereal, beans, fresh fruits and vegetables, and prune juice or



CMSC Consensus Panel Bowel Symptoms Algorithm

ADLs=activities of daily living; GI=gastrointestinal; OT=occupational therapy; PT=physical therapy.

Bowel Diary

Name: _____

Date: _____

When did you have a bowel movement(s)?	Foods and fluids you consumed before the bowel movement(s) (types and amounts)	Physical activity/ exercise performed	Did you feel a strong and sudden desire to have a bowel movement?	Did you have any fecal leakage? How much (small, medium, or large amount)?	How would you characterize the bowel movement or leakage? 1-Liquid 2-Toothpaste-like 3-Formed but soft 4-Formed and hard 5-Pebble-like

dried prunes. Over-the-counter fiber supplements (**Table 7**) add bulk to the stool and are safe to recommend for daily use. They typically produce defecation within six to eight hours.^{9,13} Fiber-rich foods and supplements should be introduced into the diet slowly to avoid excess gas production, and it is important that patients concurrently increase fluid intake to 1.5 to 2 quarts per day (six to eight cups of clear liquids such as water, broth, and tea) so that the increased fiber intake is effective. However, this increase in fluid intake must be done with an eye to the potential for exacerbation of urinary incontinence.^{9,13} Patients should be advised to avoid sugar alcohols/substitutes (e.g., lactitol, maltitol, sorbitol, and xylitol), caffeine,

Table 7. Products to Relieve Constipation

Fiber Supplements/Bulk-Formers

Benefiber®
 Citrucel®
 Fiberall®
 FiberCon®
 Metamucil®
 Naturacil®
 Perdiem®

Stool Softeners

Colace®
 Chronulac® syrup
 Surfak®

Osmotically Active and Saline Laxatives

MiraLAX®
 Milk of Magnesia®
 Modane®
 Pericolace®

Harsher products to be avoided in patients with MS

Castor oil
 Correctol®
 Dulcolax® tablets
 Ex Lax®
 Feen-a-Mint®

and alcohol, which can contribute to constipation and cause gas and bloating.

Exercise is a cornerstone of a bowel regimen, as it helps to improve digestion, stimulates the contraction of intestinal muscles, and speeds transit time, lessening the amount of water absorbed from the stool into the body (and thus the occurrence of hard, dry, painful stools). Walking for 10 to 30 minutes a day is a reasonable strategy; more vigorous aerobic activity such as swimming, dancing, or running and yoga may also be recommended if patients are capable to improve bowel health. For people with MS who are not as mobile, a home exercise program can be devised by a PT to encourage them to move on a daily basis.

Finally, patients should be instructed in strategies for timing elimination. They should be advised to eat regularly and choose a convenient time about 20 to 30 minutes after a warm meal or beverage, when the gastrocolic reflex produces an urge to defecate, to try and have a bowel movement. They should devote 15 to 30 minutes to the effort, sitting in an upright position with their feet on the floor or a stool, but without straining, which can do more harm than good.¹³ Timed voiding schedules are particularly useful in patients who do not sense the urge to eliminate.

If lifestyle modifications are not effective, nonprescription stool softeners that add moisture to the stool may be considered. They typically act within 24 to 48 hours after ingestion and should be used regularly for optimal benefit.¹³

Over-the-counter stimulant or osmotically active laxatives that cause rhythmic contractions in the intestines can also be used and typically produce bowel movements within eight to 12 hours. Stimulant laxatives can be habit-forming, unlike bulking laxatives and stool softeners, so they should be used with caution. Preferred gentler products are stool softeners, saline laxatives, or osmotic laxatives (**Table 7**).¹³ There is also a risk of urge incontinence with aggressive laxative therapy, so these products should be used cautiously and judiciously.¹³

If a person does not respond to these interventions, the Consensus Panel recommended referral to a gastrointestinal (GI) specialist for further assessment and treatment.

Persons who are immobile. Patients in wheelchairs or using power mobility aids may have more advanced bowel issues than those who are mobile due to their inability to be physically active and more advanced disease. The CMSC Consensus Panel recommended a rectal examination as the first step in evaluating the immobile patient with MS and constipation complaints. If no abnormalities are detected, the person should be instructed in the establishment of a regular bowel elimination schedule based on rectal stimulation. This might consist of an every-other-day regimen with a bisacodyl suppository (e.g., Dulcolax®) to chemically stimulate the rectum to eliminate stool. The suppository should be inserted against the rectal wall and not into the stool. Alternatively, a glycerin suppository can be recommended to lubricate the stool and provide local stimulation. Cautious use of osmotically active laxatives may also be considered. Enemas may be recommended as a last resort, but should only be used as needed since the bowel can become dependent on them to eliminate stool.¹³ The MS expert should also consider referral to a PT to help patients optimize their mobility and perhaps offer instruction in abdominal massage, both of which can improve their bowel function. A recent randomized study of 30 patients with MS from Northern Ireland demonstrated the feasibility of abdominal massage for the alleviation of constipation. The control group received bowel management advice, and the intervention group received both bowel management advice and they or their caregivers were taught how to deliver daily abdominal massage lasting approximately 15 minutes. After 4 weeks, both groups showed an improvement in constipation symptoms, but the massage group improved significantly more than the control group (mean difference between groups in Constipation Scoring System value -5.0, $P=0.003$).²⁹ The CMSC Consensus Panel felt this intervention had the potential to help wheelchair-bound patients have more predictable bowel movements and might be delivered by the caregiver, a PT, or a massage therapist.

Individuals who are found to have a fecal impaction on rectal exam should have the impaction removed manually with a gloved finger, and should receive an aggressive bowel management program as described

previously or be referred to a GI specialist for follow-up and further treatment.

Bowel Incontinence

Bowel incontinence or involuntary bowel movements without constipation also occur frequently in people with MS, particularly as the disease progresses, as a result of sphincter dysfunction or diminished rectal sensation.¹ Diarrhea, although less common in MS than constipation, can also precipitate urge incontinence, and therefore can have a substantial effect on an individual's quality of life due to the risk of embarrassing bowel leakage or accidents due to the inability of the sphincter to contain liquid stool.⁹ Frequent diarrhea in MS is believed to result from reflexive activity caused by demyelinating lesions, leading to recurrent emptying of the rectum; it can also be caused by viral and bacterial infections, fecal impaction, certain medications, and dietary irritants.^{1,9}

The assessment of patients who present with bowel incontinence begins with questioning about the severity and frequency of the problem (flatus, minor soiling, frank incontinence with no warning sensation, frank incontinence and urgency), the need to wear protective garments, the impact on the problem on the person's social and work life, and mobility issues (e.g., problems reaching the toilet in time). Cognitive function should be considered so the level and extent of education can be customized, along with confounders such as dietary factors, medications (e.g., spasticity medications), presence of diarrhea, and prior surgeries that may have weakened the rectum and anal sphincter. Rectal examination should be considered to look for overflow incontinence and fecal impaction. The person should also be questioned about alarm symptoms (e.g., weight loss, acute onset of symptoms, diarrhea with dehydration, rectal bleeding); if he or she responds positively regarding these symptoms, a referral should be made to a GI specialist.

As with constipation, patients also need to be assessed for sensory issues related to the impact of MS on the bowels, and whether they are able to sense when their bowels are full and they need to defecate. They should be questioned about medication use, concurrent illnesses, and food and fluid intake.

Persons who are mobile. Over-the-counter antidiarrheal agents can be prescribed for people with diarrhea, especially in those with softer stools (**Table 8**).

Table 8. Antidiarrheals and Bulking Agents

Antidiarrheals (Loperamide)

Imodium® and Imodium AD®

Kaopectate II®

Maalox Antidiarrheal®

Pepto Diarrhea Control®

Bulking Agents

Natural bran

Benefiber®

Citrucel®

Fiberall®

FiberCon®

Metamucil®

Naturacil®

Perdiem®

Anticholinergic medications taken for urinary problems can also be beneficial because a hyperactive bowel is the cause of both issues.⁹

Bulking agents are also useful for combatting diarrhea; they effectively increase stool mass while also stretching the bowel wall, which stimulates colon wall contraction. A wide variety of bulking agents are available and easy to use (Table 8).

Patients should be instructed to avoid dietary irritants such as sugar substitutes, alcohol, and caffeine, which can exacerbate incontinence. A referral to a PT for pelvic floor exercises and/or biofeedback may be considered. If the person does not respond to these measures or has alarm symptoms (acute onset of symptoms, diarrhea with dehydration, weight loss, or rectal bleeding), the MS team should refer him or her to a GI specialist for a detailed assessment.

Persons who are immobile. Patients in wheelchairs or those who use power mobility aids should be helped to develop a bowel regimen with pre-emptive evacuation and timed elimination (e.g., every other day) via use of laxative suppositories and cautious use of antidiarrheals after successful evacuation. Referral to a PT to optimize mobility and upper body strength to improve the ability to transfer from the wheelchair to the toilet and/or an OT to enhance ADL functioning should be considered. An OT may also teach the person about

adaptive garments to enhance voiding function. As with the mobile patient, if the immobile patient does not respond to these measures or has alarm symptoms, the MS team should refer him or her to a GI specialist for a detailed assessment.

Conclusion

As MS progresses, individuals are challenged not only by decreased mobility and more disability, but also by bladder and bowel issues that can exacerbate the disease course and lead to relapses. The MS team needs to routinely assess for and address these elimination dysfunctions as a component of the comprehensive care of patients and to improve quality of life. The algorithms presented herein, created by a multidisciplinary team of MS experts, offer time-efficient, “best practice” guidelines for clinicians on both bladder and bowel problems that can and should be detected by the MS team. Many of these issues can be resolved fairly simply by educating people about lifestyle changes to enhance bladder and bowel function, and with conservative first-line medications, although they can require persistence to find the right mix of interventions for each individual. If these strategies fail to improve the dysfunction, patients should be referred to urology and GI specialists for further work-up and intervention. □

References

1. Kim J-H. Management of urinary and bowel dysfunction in multiple sclerosis. In: Halper J, Holland NJ, eds. *Comprehensive Nursing Care in Multiple Sclerosis*. 3rd ed. New York, New York: Springer Publishing Company. 2010, pp 197-209.
2. Fowler CJ, Panicker JN, Drake M, et al. A UK consensus on the management of the bladder in multiple sclerosis. *Postgrad Med J*. 2009;85:552-559.
3. Holland NJ, Reitman NC. *Urinary Dysfunction & MS. Managing Specific Issues*. Bladder dysfunction in multiple sclerosis. *Clinical Bulletin: Information for Health Professionals*. National Multiple Sclerosis Society. 2011. Accessed April 3, 2012 at: www.nationalmssociety.org.
4. Mahajan ST, Patel PB, Marrie RA. Under treatment of overactive bladder symptoms in patients with multiple sclerosis: An ancillary analysis of NARCOMS patient registry. *J Urol*. 2010;183:1432-1437.
5. Ben-Zacharia A. Urinary incontinence slide presentation. Private communications.
6. Brex PA, Ciccarelli O, O’Riordan JI, et al. A longitudinal study of abnormalities on MRI and disability from multiple sclerosis. *N Engl J Med*. 2002;346:158-164.
7. Charil A, Zijdenbos AP, Taylor J, et al. Statistical mapping analysis of lesion location and neurological disability in multiple sclerosis: Application to 452 patient data sets. *Neuroimage*. 2003;19:532-544.

8. Tartaglino LM, Friedman DP, Flander AE, et al. Multiple sclerosis and the spinal cord: MR appearance and correlation with clinical parameters. *Radiology*. 1995;195:725-732.
9. Holland NJ, Kennedy P. Bowel management in multiple sclerosis. *Clinical Bulletin: Information for Health Professionals*. National Multiple Sclerosis Society. 2012. Accessed April 3, 2012 at: www.nationalmssociety.org.
10. Gulick EE. Comparison of prevalence, related medical history, symptoms, and interventions regarding bowel dysfunction in person with multiple sclerosis. *J Neurosci Nurs*. 2010;42:E12-E23
11. Norton C, Chelvanayagam S. Bowel problems and coping strategies in people with multiple sclerosis. *Br J Nurs*. 2010;19: 221-226.
12. World Gastroenterology Organisation. World Gastroenterology Organisation Practice Guidelines: Constipation. 2007. Accessed April 4, 2012 at: <http://www.worldgastroenterology.org>.
13. Namey MA, Halper J. Bowel disturbance. In: Burks J, Johnson, K, eds. *Multiple Sclerosis Diagnosis, Medical Management, and Rehabilitation*. New York, New York: Demos Publishing, 2000, pp 453-459.
14. Multiple Sclerosis Council for Clinical Practice Guidelines. *Urinary Dysfunction and Multiple Sclerosis: Evidence-Based Management Strategies for Urinary Dysfunction in Multiple Sclerosis*. Washington, DC: Paralyzed Veterans of America, 1999.
15. Samkoff LM, Goodman AD. Symptomatic management in multiple sclerosis. *Neurol Clin*. 2011;29:449-463.
16. DasGupta R, Fowler CJ. Bladder, bowel, and sexual dysfunction in multiple sclerosis: Management strategies. *Drugs*. 2003;63: 153-166.
17. Kalsi V, Fowler CJ. Therapy insight: Bladder dysfunction associated with multiple sclerosis. *Nat Clin Pract Urology*. 2005;2: 492-501.
18. Stoffel JT. Contemporary management of the neurogenic bladder for multiple sclerosis patients. *Urol Clin N Am*. 2010;37:547-557.
19. Cameron AP. Pharmacologic therapy for the neurogenic bladder. *Urol Clin N Am*. 2010;37: 495-506.
20. Cruz F, Herschorn S, Aliotta P, et al. Efficacy and safety of snabotulinumtoxinA in patients with urinary incontinence due to neurogenic detrusor overactivity: A randomised, double-blind, placebo-controlled trial. *Eur Urol*. 2011;60:742-750.
21. Schurch B, DeSeze M, Denys P, et al. Botulinum toxin type A is a safe and effective treatment for neurogenic urinary incontinence: Results of a single treatment, randomized, placebo controlled 6-month study. *J Urol*. 2005;174:196-200.
22. Herschorn S, Gajewski J, Ethans K, et al. Efficacy of botulinum toxin A injection for neurogenic detrusor overactivity and urinary incontinence: A randomized, double-blind trial. *J Urol*. 2011; 185:2229-2235.
23. Medtronic. Interstim® therapy for bladder control. Accessed April 2, 2012 at: <http://www.everyday-freedom.com/>. 2012.
24. Shepherd JP, Lowder JL, Leng WW. InterStim sacral neuromodulation and Botox botulinum-A toxin intradetrusor injections for refractory urge urinary incontinence: A decision analysis comparing outcomes including efficacy and complications. *Female Pelvic Med Reconstr Surg*. 2011;17: 199-203.
25. Peters KM, Carrico DJ, Perez-Marrero RA, et al. Randomized trial of percutaneous tibial nerve stimulation versus sham efficacy in the treatment of overactive bladder syndrome: Results from the SUmT trial. *J Urol*. 2010;183:1438-1443.
26. Charnow JA. PTNS safe and effective for overactive bladder. *Renal & Urology News*. April 1, 2010. Accessed April 2, 2012 at: <http://www.renalandurologynews.com/ptns-safe-and-effective-for-overactive-bladder/article/167447/>
27. Hotouras A, Thaha MA. Short-term outcome following percutaneous tibial nerve stimulation (PTNS) for faecal incontinence: A single-centre prospective study. *Colorectal Dis*. 2011; epub ahead of print.
28. Weidemann A, et al. Which clinical risk factors determine a pathological urodynamic evaluation in patients with multiple sclerosis? An analysis of 100 prospective cases. *W J Neurol*. 2012[Epub ahead of print].
29. McClurg D, Hagen S, Hawkins S, et al. Abdominal massage for the alleviation of constipation symptoms in people with multiple sclerosis: A randomized controlled feasibility study. *Mult Sclerosis*. 2011;17(2):223-233.

PATIENT EDUCATION HANDOUT

What Is a UTI and How Is It Treated?

A UTI, or a urinary tract infection, is a bladder infection that often occurs in individuals who cannot completely empty their bladder. An inability to empty the bladder happens when the spinal cord cannot communicate properly with the brain or bladder to signal the need to release urine. When urine stays in the bladder for a long period of time, it is prone to the breeding of bacteria. This can cause infection or even bladder stones, which can lead to tissue irritation.

UTI Symptoms

The symptoms commonly associated with UTIs include urgency of urination, frequency of urination, a burning sensation, pain in the lower back or abdomen, raised body temperature, and dark-colored, foul-smelling urine. In people who

have MS, a UTI may cause an increase in MS symptoms, especially fatigue and spasticity.

Causes of UTIs in People with MS

It is estimated that anywhere from 75% to 90% of people with MS experience a UTI at some point in their lives. Due to the damage to the spinal cord caused by MS, the signaling process from the brain to the urinary system can be impaired. This can cause problems with urine excretion, and incomplete emptying of the bladder can lead to recurrent UTIs.

Having a UTI is unpleasant for anyone, but it can be especially problematic for individuals with MS due to mobility problems and something called pseudo-exacerbation. Pseudo-exacerbation is a term describing the occurrence of infec-

tion symptoms that in turn cause MS symptoms to flare up for a short period of time. You may believe you are having true MS symptoms, but in reality, the symptoms are related to the rise in body temperature due to the infection—not the disease itself. There is also a risk that the infection can spread to the kidneys.

UTI Tests and Treatments

Two methods are commonly used to detect a UTI: urinalysis and dipstick testing. A urinalysis is simply a microscopic study of a urine sample. A dipstick test utilizes a chemically treated paper stick that changes color if infection is detected in a urine sample. It is a quick and simple test, but it is less reliable than urinalysis. If you are experiencing symptoms and a screening test is positive, a clinician will most likely prescribe an antibiotic to treat the infection. It is very important to take the entire antibiotic regimen according to instructions because even if symptoms ease, they may come back if not properly treated. A culture and sensitivity test identifies the exact organism (usually a bacteria) that is causing the infection and the antibiotic that will work best to treat the illness or

infection. If these forms of treatment do not work, your MS clinician may refer you to a urologist.

Preventing UTIs

Prevention *is* the best medicine, so:

- Drink about eight glasses of fluid per day—water is best. This practice helps to keep the urinary system functioning normally by flushing out waste, bacteria, and mineral deposits.
- Develop a schedule for drinking fluids. To minimize the number of bathroom trips you need to make, drink large amounts of fluids at a few points during the day rather than sipping all day long.
- Avoid large amounts of caffeine, alcohol, citrus juices, and sugar substitutes, which can irritate the bladder.
- Take cranberry tablets or drink cranberry juice regularly to prevent UTIs. The fruit boosts acidity in the urine, which lowers the risk of bacterial growth.



PATIENT EDUCATION HANDOUT

What Is Bowel Dysfunction and How Is It Treated?

Bowel dysfunction affects more than half of individuals with multiple sclerosis (MS). This may be an underestimate since many people choose not to discuss the problem with their clinicians due to embarrassment or other reasons.

Common Constipation Symptoms

- Infrequent bowel movements (less than three a week)
- Hard stool
- Straining during bowel movements
- Bloating
- Abdominal discomfort or pain
- A sense of incomplete emptying
- Excessive gas

The bowel describes the lower portion of the digestive system, which is responsible for the storage and elimination of feces. When the bowel cannot eliminate properly, constipation (hard stools and infrequent elimination) can occur; this is the most common type of bowel dysfunction seen in people with MS. When the bowel cannot store fecal matter sufficiently,

incontinence (bowel accidents or fecal leakage) can occur. And when waste material moves through the bowel too quickly, or not enough water is removed before the stool reaches the rectum, diarrhea (loose or runny stools) can occur.

What Causes Bowel Dysfunction in MS?

Individuals with MS are at a high risk for bowel dysfunction, and this may be due to a number of factors related to the disease. Bowel activity is dependent on communication pathways between the brain, spinal cord, and intestines. Since MS affects this pathway, muscle signals related to bowel emptying can be hindered. Many medications also list constipation as a potential side effect. Likewise, if you have a bladder issue as a result of MS, you may be inclined to drink fewer fluids, which can result in varied stool consistency. People with MS often experience fatigue and mobility issues, which limit their physical activity levels, impacting the bowel system. Psychological and emotional factors can also lead to bowel dysfunction. For instance, if someone is feeling depressed, they may

avoid using the bathroom at that moment because it is too much effort.

Warning Signs

It is very important to see your clinician if you experience:

- Sudden onset of gastrointestinal (GI) problems
- Diarrhea with dehydration
- Weight loss
- Rectal bleeding

These problems could be related to bowel dysfunction, and they may require additional assessment and treatment.

Bowel Treatments

Treatment typically begins with an assessment of your food, fluid, and medication intake as well as a discussion of your usual bowel habits. Your MS clinician will suggest lifestyle changes, such as increasing your fiber intake to manage constipation and soften stools. Be sure to also increase your fluid intake: Fiber without enough fluid will just worsen your constipation. Fiber will also help if you have diarrhea, because the bulk makes stools more solid. To get more fiber, eat whole grains and fruits and vegetables such as:

- Oats
- High-fiber cereals
- Whole-wheat bread, crackers, and pasta
- Brown rice
- Barley, rye, bulgur, and wheatberries
- Beans
- Peas
- Broccoli

- Carrots
- Potatoes with skins
- Citrus fruits
- Apples and pears with their skin
- Prunes

Other recommended lifestyle changes include establishing a regular bowel routine. Try to create a regular time to use the bathroom—for instance, a half hour after consuming a warm meal or drink is the best time for the emptying reflex. Exercise is also a great way to stimulate the gut, which can help regulate bowel activity.

Most people also have to add a supplement to their diet to get enough fiber on a regular basis. Luckily, fiber supplements are now available in many different forms, such as tablets, wafers, and powders that have no taste, and can be added to salad dressings, sauces, soups, etc.

Some people find that active-culture yogurt can also ease constipation and diarrhea by balancing the bacteria normally found in the bowel that aid in digestion. Look on the label for the phrase “live and active cultures” to determine the brands that contain active cultures (also known as probiotics).

If you have the tendency to swing from constipation to diarrhea and back despite following these recommendations, you may need to see a gastrointestinal specialist to rule out irritable bowel syndrome (known as IBS) or other problems unrelated to MS.

Fax form to (201) 612-8282

Scan and email completed form to: jdonofrio@delmedgroup.com

Print and mail form to: Delaware Media Group, 66 S. Maple Avenue, 3rd Floor, Ridgewood, NJ 07450

EVALUATION FORM

Elimination Dysfunction in Multiple Sclerosis

Delaware Media Group and the Consortium of Multiple Sclerosis Centers (CMSC) respect and appreciate your opinions.

To assist us in evaluating the effectiveness of this activity and to make recommendations for future educational offerings, please take a few minutes to complete this evaluation form.

Please answer the following questions by circling the appropriate rating:

5 = Outstanding 4 = Good 3 = Satisfactory 2 = Fair 1 = Poor

Overall Effectiveness of the Activity

- | | | | | | |
|---|---|---|---|---|---|
| 1. The topic was current and relevant to my area of professional interest. | 5 | 4 | 3 | 2 | 1 |
| 2. The activity enhanced my current knowledge base. | 5 | 4 | 3 | 2 | 1 |
| 3. The activity will help me improve patient care. | 5 | 4 | 3 | 2 | 1 |
| 4. The activity provided new ideas or information I expect to use. | 5 | 4 | 3 | 2 | 1 |
| 5. The activity addressed my most pressing questions. | 5 | 4 | 3 | 2 | 1 |
| 6. The program was free of commercial bias. | 5 | 4 | 3 | 2 | 1 |

7. As a result of this activity (check only one):

- I will modify my practice.
 I will wait for more information before modifying my practice.
 The program reinforces my current practice.

8. Please indicate any changes you plan to make in your practice of medicine as a result of the information you received from this activity: _____

9. How committed are you to making these changes? (Very committed) 5 4 3 2 1 (Not at all committed)

In what time frame do you anticipate making these changes? Immediately 1-2 months 3-6 months At some point in the future

10. If this activity did not give you strategies to be better able to practice medicine, please list the factors acting as barriers: _____

11. Please provide general comments about this activity and suggest how it might be improved. _____

12. Please list other clinician- or patient-oriented topics (e.g., patient education handouts) that would be of interest to you: _____

Follow-up

As part of our continuous quality improvement effort, we conduct post-activity follow-up surveys to assess the impact of our activities on professional practice. Please check one:

- Yes, I would be interested in participating in a follow-up survey.
 No, I would not be interested in participating in a follow-up survey.

Name _____ Degree: _____

Organization _____ Specialty _____

Address _____

City _____ State _____ ZIP _____

Phone _____ Fax _____ Email _____

Signature _____ Date _____

Fax form to (201) 612-8282

Scan and email completed form to: jdonofrio@delmedgroup.com

Mail form to: Delaware Media Group, 66 S. Maple Avenue, 3rd Floor, Ridgewood, NJ 07450

Thank you for completing this program.

Supplement to the International Journal of MS Care