



CONSTIPATION OR STYPSIS

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How Do We Define Constipation?

- The American College of Gastroenterology (ACG) definition of constipation:

Unsatisfactory defecation characterized by infrequent stools, difficult stool passage or both. Difficult stool passage includes straining, a sense of difficulty passing stool, incomplete evacuation, hard/lumpy stools, prolonged time to pass stool or need for manual maneuvers to pass stool

- The ACG Chronic Constipation Task Force also clarified what is meant by **chronic**:

Chronic constipation is defined as the presence of these symptoms for at least 3 months

Table 1. Rome II Criteria for Constipation.

Adults

Two or more of the following for at least 12 weeks (not necessarily consecutive) in the preceding 12 months:

Straining during >25% of bowel movements

Lumpy or hard stools for >25% of bowel movements

Sensation of incomplete evacuation for >25% of bowel movements

Sensation of anorectal blockage for >25% of bowel movements

Manual maneuvers to facilitate >25% of bowel movements (e.g., digital evacuation or support of the pelvic floor)

<3 Bowel movements per week

Loose stools not present, and insufficient criteria for irritable bowel syndrome met¹⁰

Infants and children

Pebble-like, hard stools for a majority of bowel movements for at least 2 weeks

Firm stools ≤ 2 times per week for at least 2 weeks

No evidence of structural, endocrine, or metabolic disease

Definition

- Patients describe:
 - Hard stools, infrequent stools, excessive straining, a sense of incomplete bowel evacuation, and excessive time spent on the toilet or in unsuccessful defecation
- Rome II (1999) describes:
 - Inability to evacuate stool completely and spontaneously three or more times per week
- Rome III (2006):
 - Symptoms currently active 3 months
 - Use ***Bristol stool classification*** to define “constipation”

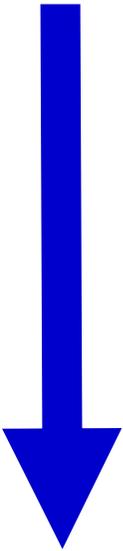
Stewart WF et al. Epidemiology of constipation (EPOC) study in the United States: relation of clinical subtypes to sociodemographic features. *Am J Gastroenterol* 1999;94:3530-3540.

Sandler RS, Drossman DA. Bowel habits in young adults not seeking health care. *Dig Dis Sci* 1987;32:841-845.

Koch A et al. Symptoms in chronic constipation. *Dis Colon Rectum* 1997;40:902-906.

Drossman DA. The functional gastrointestinal disorders and the Rome III process. *Gastroenterol* 2006 130:1377-90.

Stool form correlates with the intestinal transit time

The Bristol Stool Form Scale			
Slow Transit 	Type 1		Separate hard lumps
	Type 2		Sausage-like but lumpy
	Type 3		Sausage-like but with cracks in the surface
	Type 4		Smooth and soft
	Type 5		Soft blobs with clear-cut edges
	Type 6		Fluffy pieces with ragged edges, a mushy stool
	Fast Transit	Type 7	

Bristol Stool Chart

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. Entirely Liquid

**Correlates with symptoms
of straining and difficult
evacuation**

**Also correlates with
colonic transit (Type 1 or
Type 7 stool is correlated
with slow or rapid colonic
transit**

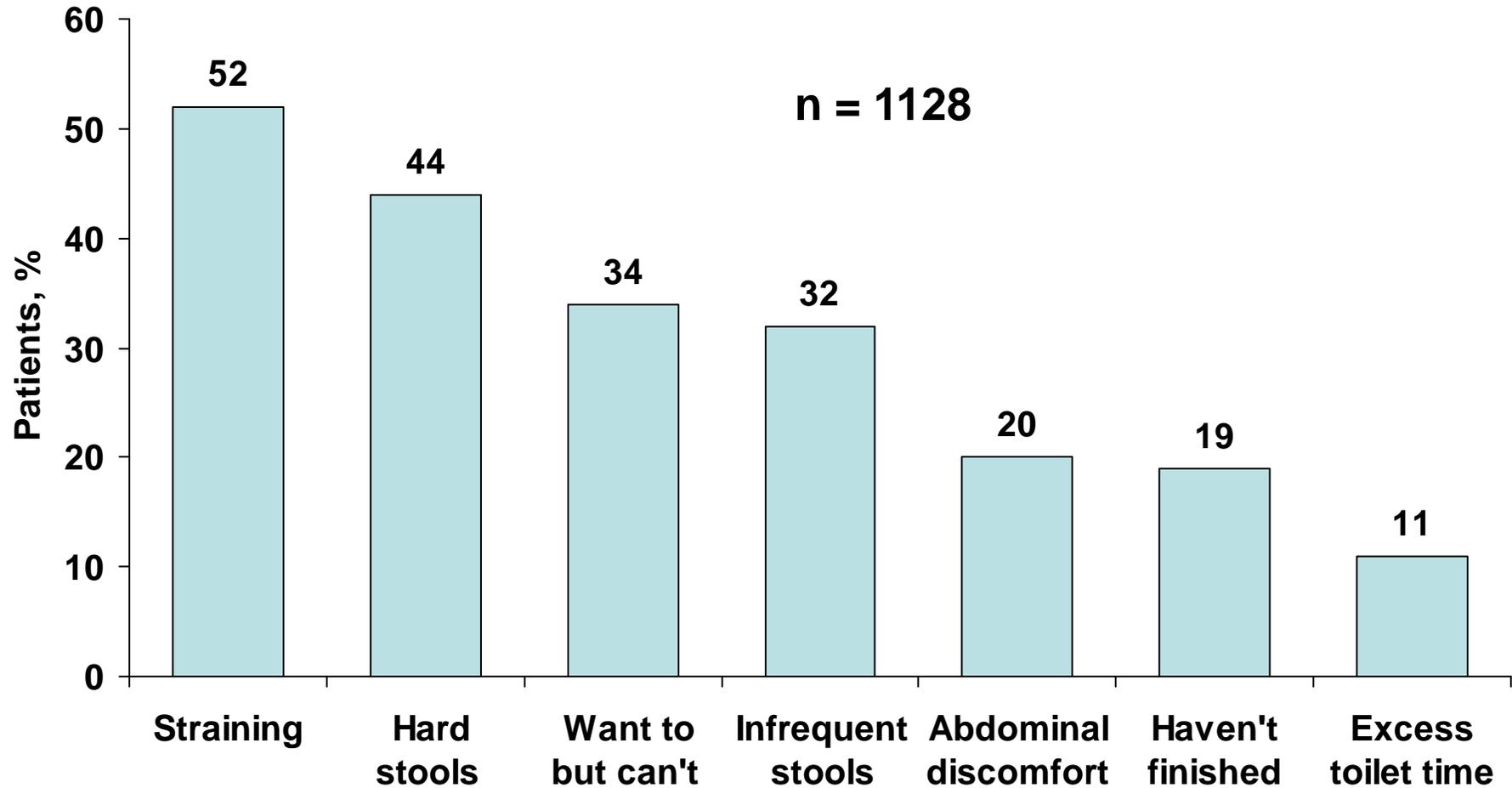
Degen LP, Phillips SF. How well

does stool form reflect colonic transit? Gut

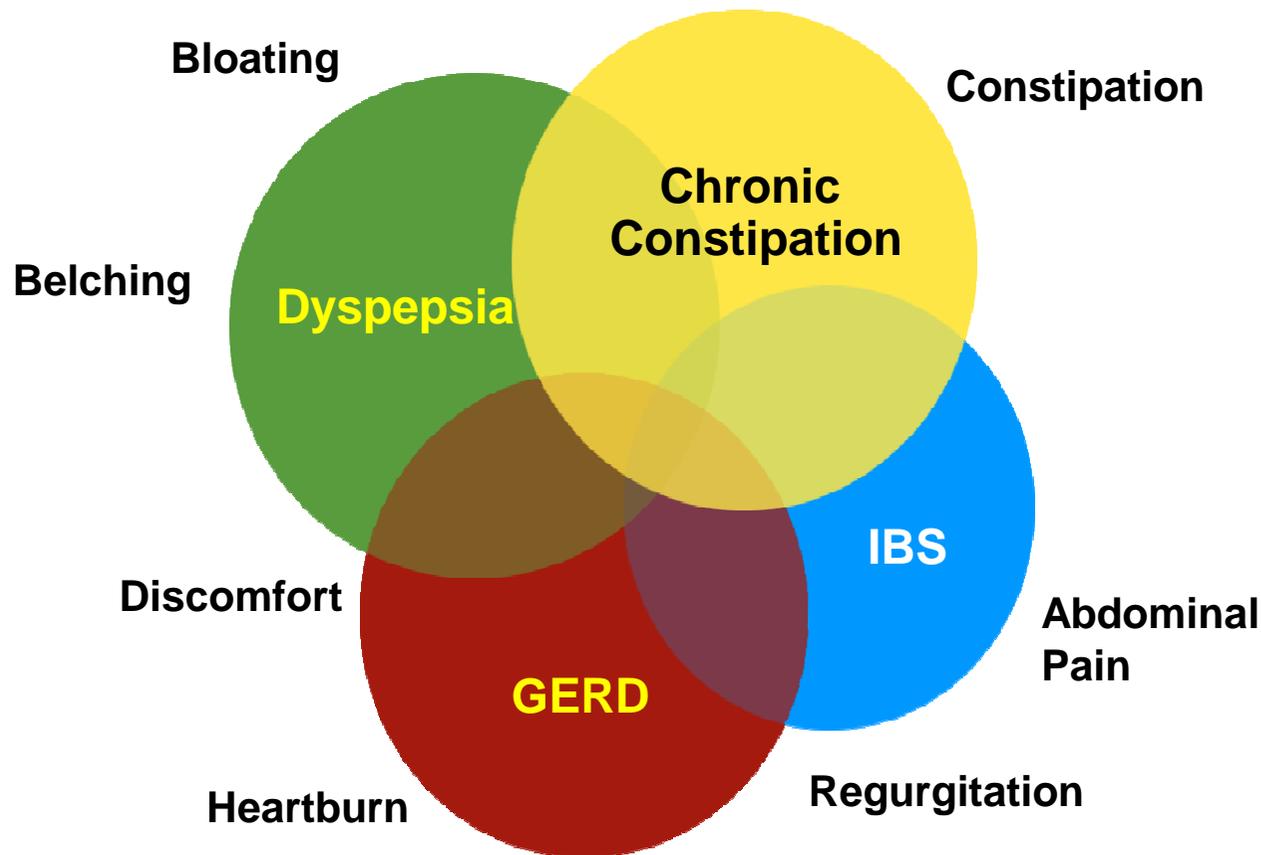
**Majority of “constipated”
patients have stools that
are Type 1-3**

University of Bristol, Scand J Gastroenterol

Most often reported Constipation symptoms



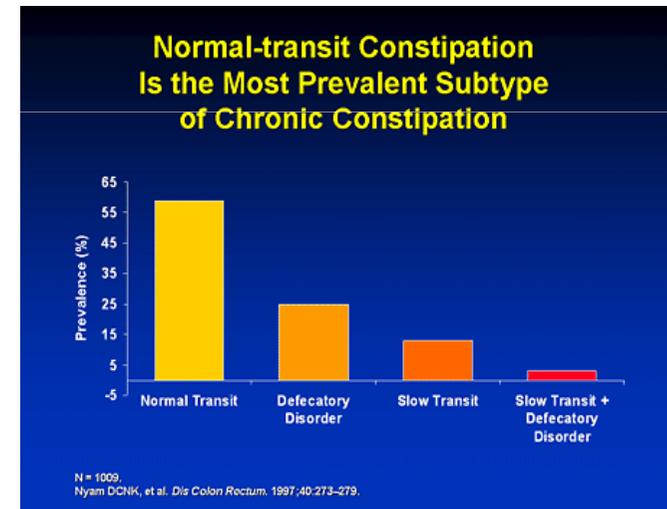
Overlap Between Common Disorders



Primary Constipation

Primary Causes of Chronic Constipation

1. Normal-transit constipation
2. Defecatory dysfunction
3. Slow-transit constipation
4. IBS with constipation



Bosshard W, et al. *Drugs Aging*. 2004
Hadley S.K, et al. *Journal of Am Fam Physician*. 2005

Primary Constipation

1. Normal-Transit Constipation

- Frequent type of constipation
- Intestinal transit and stool frequency are within the normal range
- Misperception of bowel habit ...
- Often psychosocial stresses are present

Primary Constipation

2. Defecatory Dysfunction (30%)

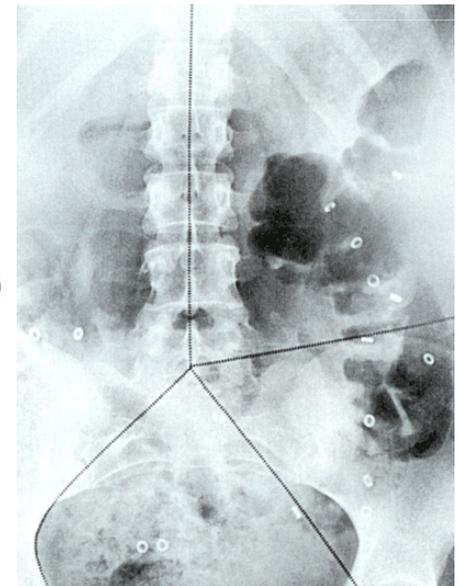
- More common in older women: child-birth trauma
- Pelvic floor dysynergia
- Excessive perineal descent
- Contributing factors include: anal fissures, hemorrhoids, rectocele, rectal prolapse, posterior rectal herniation
- Abnormal anorectal manometry and/or defecography



Primary Constipation

3. Slow-transit Constipation (60%)

- Characterized by prolonged intestinal transit time
- Altered regulation of enteric nervous system
- *Serotonin metabolism alteration*
- *Decreased nitric oxide production*
- *Impaired gastrocolic reflex*
- *Alteration of neuropeptides (VIP, substance P)*
- Decreased number of interstitial cells of Cajal in the colon



Primary Constipation

4. Irritable Bowel Syndrome (IBS) with Constipation

- *Alterations in brain-gut axis*
- *Stress-related condition*
- *Visceral hypersensitivity*
- *Abnormal brain activation*
- *Altered gastrointestinal motility*
- *Role for neurotransmitters, hormones*
- Presence of non-GI symptoms: Headache, back pain, fatigue, myalgia, dyspareunia, urinary symptoms, dizziness



Rome III Criteria for IBS-Constipation

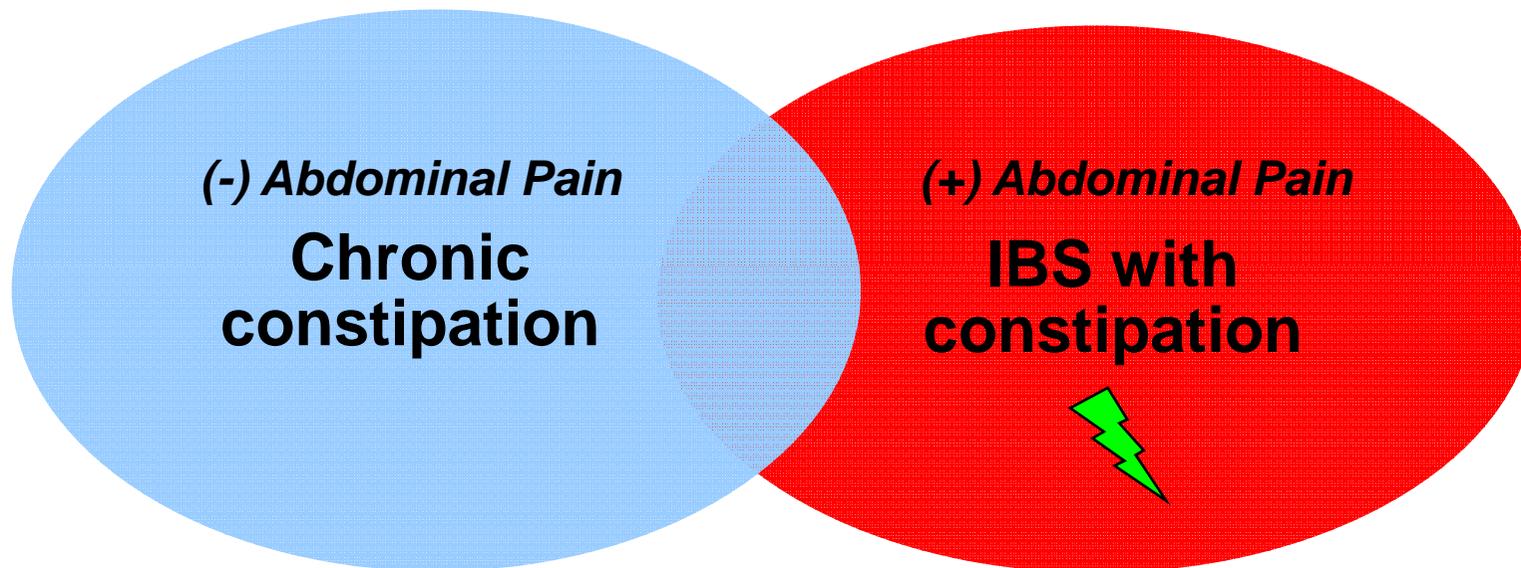
Recurrent abdominal pain or discomfort (an uncomfortable sensation not described as pain) at least 3 days per month in the last 3 months associated with 2 or more of the following:

- 1. Improvement with defecation***
- 2. Onset associated with a change in frequency of stool***
- 3. Onset associated with a change in form of stool***

Criteria must be fulfilled for the last 3 months, with symptom onset at least 6 months prior to diagnosis

Note: In pathophysiology research and clinical trials, a pain/discomfort frequency of at least 2 days a week during screening for patient eligibility

Abdominal pain: a salient feature absent in chronic constipation



**Presence or absence of abdominal pain seems to be
the major differentiating feature**

Risk factors for Constipation

- Inherited or aquired neuromuscular disorders
- **Metabolic diseases**
- Pathophysiologic changes with **Ageing**
- **Medications**
- **Gender: female (hormonal and structural causes)**
- **Physical inactivity**
- Low income
- Limited education
- **History of sexual abuse**
- **Symptoms of depression**
- **Low dietary fiber**

Risk Factors for Constipation in older Population

- **Reduced fiber and liquid intake**
- **Reduced mobility associated with functional decline**
- **Decreased functional independence**
- **Pelvic floor dysfunction**
- **Chronic conditions**
 - *Parkinson's disease*
 - *Dementia*
 - *Diabetes mellitus*
 - *Depression*
- **Polypharmacy**: both OTC and prescription medications, such as NSAIDs, antacids, antihistamines, iron supplements, anticholinergics, opiates, Ca.C blockers, diuretics, antipsychotics, anxiolytics, antidepressants.

Secondary Constipation

Secondary Constipation

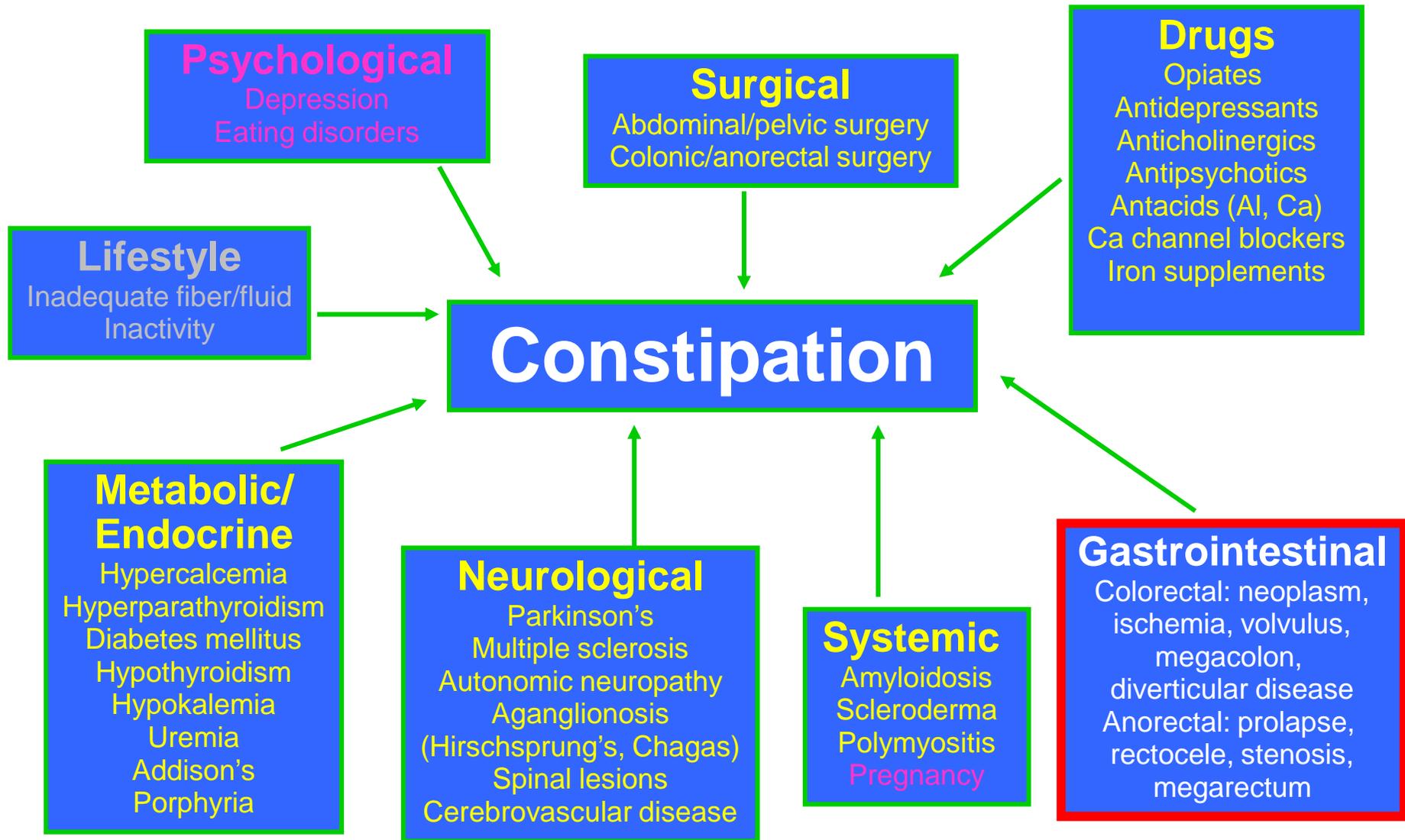


Table 1

Common causes of constipation.

Subtypes	<i>Medicine (2018) 97:20(e10631)</i>
Primary cause (Idiopathic)	
Primary colorectal dysfunction	
Slow transit	
Dyssnergic defecation	
IBS	
Immobility	
Overuse of laxatives	
Low-fiber diet	
Sedentary lifestyle	
Ignoring urge to defecate	
Inadequate fluid intake	
Changes in routine	
Lack of regular exercise	
Stress	
Pregnancy	
Secondary cause	
Endocrine/metabolic disorders (hypothyroidism)	
Neurologic	
Myogenic disorders	
Medications	
Obstruction	
Colon disease (IBS, diverticulitis)	
Chronic idiopathic constipation	
Multiple environmental, biological, and pharmaceutical precipitants	

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Table 2

Medications associated with constipation.

Medications

Medicine (2018) 97:20(e10631)

5-HT₃ receptor antagonists (ondansetron)

Calcium channel blockers (nifedipine, verapamil)

Antidepressants, tricyclic antidepressants (Amitriptyline > nortriptyline), other antidepressants (monoamine oxidase inhibitors).

Opiates (morphine)

Anticholinergic agents: anticonvulsants (carbamazepine), antipsychotics (phenothiazine derivatives, chlorpromazine, clozapine, haloperidol, risperidone), antispasmodics, (dicyclomine, mebeverine, peppermint oil)

Analgesics (opiates, tramadol, NSAIDS)

Antiparkinsonian drugs, dopaminergic agent, (bentropine, dopamine agonists)

Diuretics (thiazides, loop diuretics, furosemide, hydrochlorothiazide)

Antacids (calcium and aluminum)

Antidiarrheals (oveuse) (bile acid resins)

Chemotherapy agents (vincristine, cyclophosphamide)

Miscellaneous compounds (oral contraceptives, polystyrene resins, barium sulfate.

Endocrine medications (pamidronate and alendronic acid)

Sympathomimetics (ephedrine, terbutaline)

NSAIDS = nonsteroidal anti-inflammatory drugs.

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Remember OTC Medications

- Sympatho-mimetics (for cold and flu)
- NSAIDS
- Antacids: aluminum, calcium
- Ca supplements
- Iron supplements
- Antidiarrheals: loperamide; bismuth



In Hospital causes constipation

- Decreased exercise/mobility
- Hospital food (not eating enough fibers)
- Not drinking enough fluid
- Lack of privacy
- Limited toilet access
- Depression / grief / anxiety



ALARM Signs and Symptoms

- **Hematochezia**
- Family history of colon cancer
- Family history of inflammatory bowel disease
- **Anemia**
- Positive fecal occult blood test (RSO)
- **“Unexplained” weight loss ≥ 5 Kg**
- **Severe, persistent constipation that is unresponsive to treatment**
- **New-onset constipation in elderly patient**

Physical Examination

“Intelligent Rectal Exam” (M Camilleri, Mayo clinic)

- **Inspection**

- Anal pathology: hemorrhoids, prolapse
- Check for sensation
- Ask patient to strain: anus moves laterally, ballooning of perineum (rectocele)

- **Palpation**

- Increased anal tone and pressure, anal fissure
- mucosal prolapse or anterior rectal wall defect
- Ask to strain: perineum descends on finger <1.0 or > 3.5cm

Laboratory Tests

- Thyroid function tests
- Electrolytes
- Calcium
- CBC
- Urine analysis
- Screen for colorectal cancer if none in last 5 years



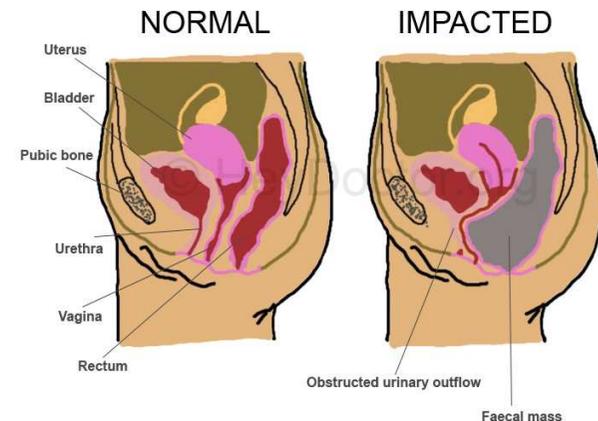
Indications for Endoscopy

- **New onset constipation:**
 - Weight loss, macroscopic or microscopic blood, family h/o colon Ca, anemia, undiagnosed abdominal pain
- **Chronic constipation:**
 - Anemia, weight loss, change in stool pattern, undiagnosed abdominal pain
- Failure of multiple laxatives
- Undiagnosed fecal incontinence



Complications of Chronic Constipation

- Fecal impaction
 - Identified in up to 40% of elderly adults hospitalized in United Kingdom
- Intestinal volvulus/obstruction
- Urinary and fecal incontinence
- Stercoral ulceration/ischemia
- Bowel perforation
- Possible increased risk of colorectal cancer (but it is really controversial)



1. Read NW, et al. *J Clin Gastroenterol.* 1995
2. De Lillo AR, Rose S. *Am J Gastroenterol.* 2000
3. Roberts MC, et al. *Am J Gastroenterol.* 2003
4. Dukas L, et al. *Am J Epidemiol.* 2000

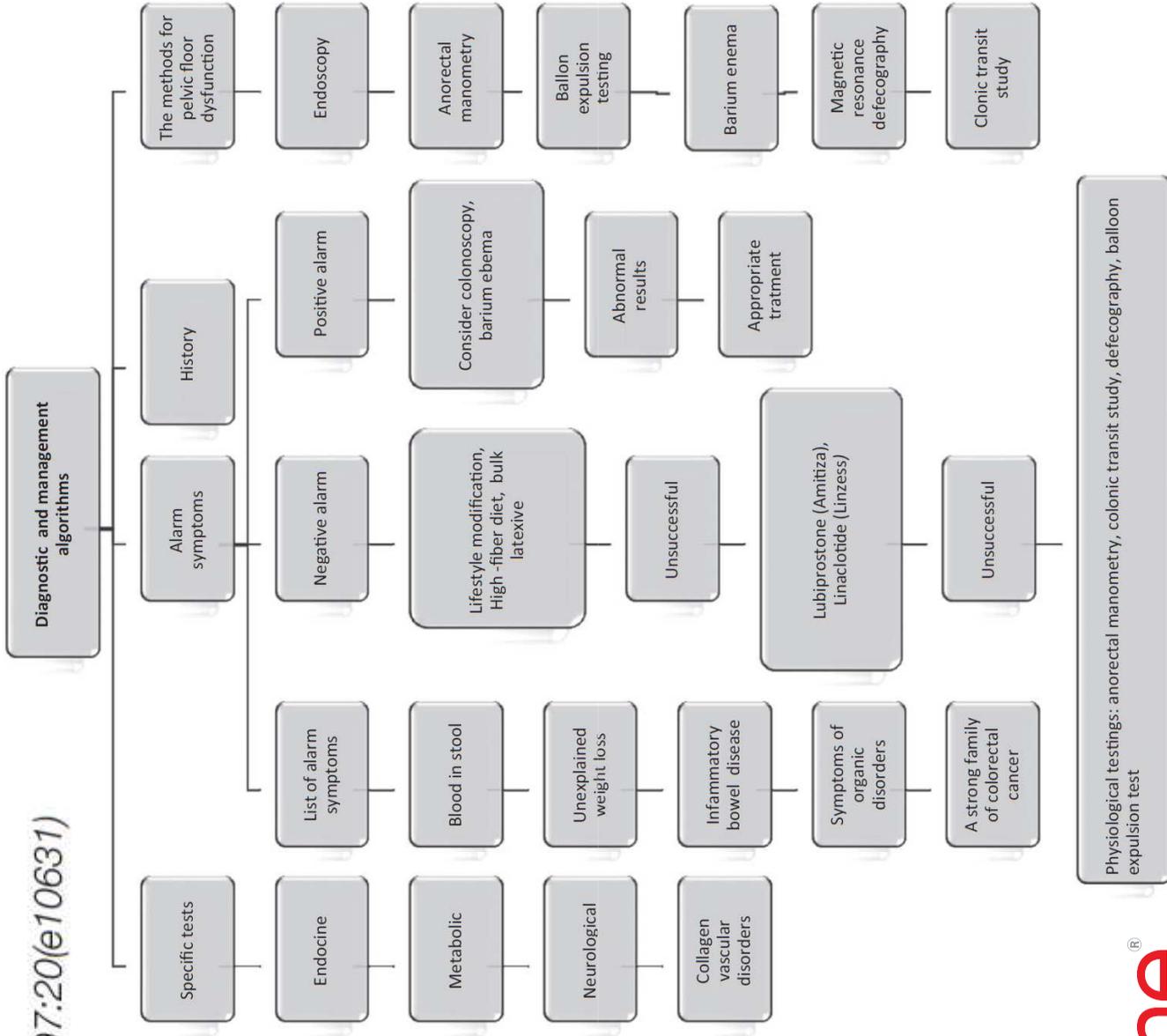


Figure 2. Suggested diagnostic and management algorithm for chronic constipation.

Treatment of Chronic Constipation

Lifestyle Modifications ... ?

Modification	Targeted Mechanism	Efficacy
Increase fluid intake	Increase stool volume by augmenting luminal fluid	<i>Limited</i> ; majority of fluid is absorbed before reaching the colon and is expelled via urine
Increase exercise	Improve motility by decreasing transit time through the GI tract	<i>Moderate</i> ; some evidence suggests this is beneficial; however, not sufficient to treat
Increase dietary fiber	Increase water and bulk stool volume	<i>Limited benefit</i> compared with placebo

Chung BD, et al. *J Clin Gastroenterol.* 1999

Dukas L, et al. *Am J Gastroenterol.* 2003

ACG Chronic Constipation Task Force. *Am J Gastroenterol.* 2005

Treating Constipation With Laxatives

Laxative	Description
Bulking Agents	Absorbs liquids in the intestines and swells to form a soft, bulky stool; the increase in fecal bulk is associated with accelerated luminal propulsion
Osmotic Laxatives	Draws water into the bowel from surrounding body tissues providing a soft stool mass and improved propulsion [saline, poorly absorbed mono-disaccharides) (polyethylene glycol)
Stimulant Laxatives	Cause rhythmic muscle contractions in the intestines, increase intestinal motility and secretions (senna, cascara, etc,)
Lubricants	Coats the bowel and the stool mass with a waterproof film; stool remains soft and its passage is made easier
Stool Softeners	Helps liquids mix into the stool and prevent dry, hard stool masses; has been said not to cause a bowel movement but instead allows the patient to have a bowel movement without straining (polyethylene glycol)
Combinations	Combinations containing more than 1 type of laxative; for example, a product may contain both a stool softener and a stimulant laxative

Treating Constipation With Laxatives

Table 4. Summary of Medications Commonly Used for Constipation

Type	Generic name	Trade name	Dosage	Side effects	Time to onset of action (h)	Mechanism of action
Fiber	Bran	—	1 cup/day	Bloating, flatulence, iron and calcium malabsorption	—	Stool bulk increases, colonic transit time decreases, gastrointestinal motility increases
	Psyllium	Metamucil	1 tsp up to 3 times daily	Bloating, flatulence	—	
	Methylcellulose	Konsyl	1 tsp up to 3 times daily	Less bloating	—	
	Calcium polycarbophil	Citrucel	2–4 tablets once daily	Bloating, flatulence	—	
	Docosate sodium	FiberCon	100 mg twice daily		12–72	
Stool softener	Sorbitol	—	15–30 mL once daily or twice daily	Sweet tasting, transient abdominal cramps, flatulence	24–48	Nonabsorbable disaccharides metabolized by colonic bacteria into acetic acid and other short-chain fatty acids
	Lactulose	Chronulac	15–30 mL once daily or twice daily	Same as sorbitol	24–48	
	PEG	Golytely Colyte Miralax	8–32 oz once daily	Incontinence due to potency	0.5–1	
Stimulant	Glycerin	—	Suppository; up to once daily	Rectal irritation	0.25–1	Evacuation induced by local rectal stimulation Bisacodyl and sodium picosulfate are prodrugs that are hydrolyzed by colonic bacteria (sodium picosulfate) or intestinal and colonic brush border enzymes (bisacodyl) to the active metabolite (bis-(p-hydroxyphenyl)-pyridyl-2-methane, which has anti-absorptive/secretory and prokinetic effects Similar to bisacodyl
	Bisacodyl	Dulcolax	10-mg suppositories or 5–10 mg by mouth up to 3 times/wk	Incontinence, hyperkalemia, abdominal cramps, rectal burning with daily use of suppository form	0.25–1	
	Picosulfate	—	—	—	8–12	
	Anthraquinones (senna, cascara)	Senokot Perdiem (plain) Peri-Colace	2 tablets once daily to 4 tablets twice daily 1–2 tsp once daily 1–2 tablets once daily	Degeneration of Meissner's and Auerbach's plexus (unproven), malabsorption, abdominal cramps, dehydration, melanosis coli	8–12 8–12 8–12	
Saline laxative	Magnesium	Milk of magnesia	15–30 mL once daily or twice daily	Magnesium toxicity, dehydration, abdominal cramps, incontinence	1–3	Fluid osmotically drawn into small bowel lumen; cholecystokinin stimulated; colon transit time decreases
		Hailey's M-O (with mineral oil)	15–30 mL once daily or twice daily		1–3	
Lubricant	Mineral oil	—	15–45 mL	Lipid pneumonia, malabsorption of fat-soluble vitamins, dehydration, incontinence	6–8	Stool lubricated
Enemas	Mineral oil retention enema	—	199–250 mL once daily per rectum	Incontinence, mechanical trauma	6–8	Stool softened and lubricated
	Tap water enema	—	500 mL per rectum	Mechanical trauma	5–15 min	Evacuation induced by distended colon; mechanical lavage
	Phosphate enema	Fleet	1 unit per rectum	Accumulated damage to rectal mucosa, hyperphosphatemia, mechanical trauma	5–15 min	
	Soapsuds enema	—	1500 mL per rectum	Accumulated damage to rectal mucosa, mechanical trauma	2–15 min	

Adapted from Locke GR, Pemberton JH, and Phillips SF. AGA technical review on constipation. *Gastroenterology* 2000;119:1766–1778, with permission from the American Gastroenterological Association.

BULKING AGENTS

- Add bulk to the stool
- Absorb water and increase faecal mass
- Soften stool and increase frequency
 - **Ispaghula (Fybogel)**
 - **Psyllium (Psyllugel, Metamucil)**
 - **Guar gum (Benefibre)**
 - **Sterculia (Normafibe)**
 - **Methylcellulose**
 - **Calcium polycarbophil**
- Not helpful in opioid induced, may worsen incipient constipation



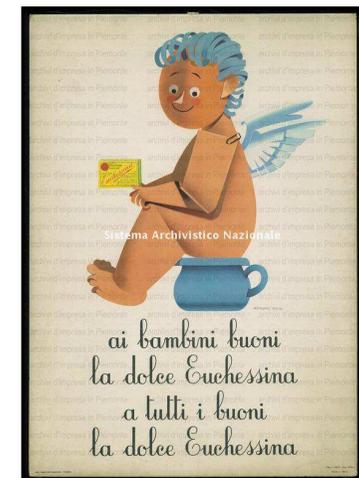
OSMOTICS

- Osmosis keeps water within the intestinal lumen
- Attract also water into the bowel - depending on dilution ...
- Improve stool consistency and frequency
 - **Lactulose (Actilax, Duphalac, Genlac, Lac-dol)**
 - **Sorbitol (Sorbilax)**
 - **Magnesium sulfate (“Epsom - English salt”)**
 - **Glycerol (Glycerol / Glycerin suppositories)**
 - **(PEG o MACROGOL: Movicol, Selg, Isocolan)**
- Lactulose can take up to 3 days
- Can get bloating and colic wind



STIMULANTS

- Increase intestinal motor activity
- Alter mucosal electrolyte, fluid transport
 - **Senna, Cascara**
 - **Aloe, Rabarbaro**
 - **Castor oil, picosulfate**
 - **Bisacodyl**
- 6-12 hour latency
- Good in opioid with stool softener
- Excessive use may cause hypokalemia, protein losing enteropathy, salt overload



Patients Treated With Opiates

Special Considerations

- **Constipation is a common and troubling side effect**
- Opioids inhibit GI propulsive motility and secretion: GI effects of opioids are mediated primarily by μ -opioid receptors within the bowel
- Patients do not develop tolerance to the effects of opiates on the bowel

Treatment Strategy

1. **Laxative therapy should be initiated proactively with start of opiate use**
2. Magnesium hydroxide, senna, lactulose, bisacodyl, stool softener
3. **A combination of a stimulant and stool softener** is often required
4. Laxative doses may need to be increased along with increased doses of opioids
5. Titrate doses of laxatives according to response prior to changing to an alternative laxative. When laxative therapy is inadequate, consider methylnaltrexone

Patient With Dementia

Contributing Factors

- *Immobility*
- *Dehydration*
- *Inadequate food intake*
- *Depression*
- *Cannot find the bathroom*
- *Inability to undress*
- *Cannot ask for help*
- *Cannot sense the urge to defecate*
- *Use of psychotropic drugs*



Treatment Strategy

1. Appropriate assessment of bowel function
2. Establish a bowel routine, regular toileting program
- 3. Suppositories, stool softeners, bulking agents**
4. Careful documentation (bowel diary, effectiveness of treatments, etc.)
5. Involve family or health care team (in a nursing facility)
6. Address nutritional/fluid needs

New Laxatives

Table 5. Newer Pharmacologic Approaches for Constipation

Generic name (chemistry)	Mechanism of action	Metabolism, bioavailability	Pharmacodynamic effects	Clinical trials	Common side effects	Cardiovascular safety*
Secretagogue						
Lubiprostone (protonic) [†]	Stimulate intestinal chloride and fluid secretion by activating chloride channels	Intestinal degradation, minimal oral bioavailability	Accelerated small bowel and colonic transit in health	Phases 2 and 3 in OC, IBS-C	Diarrhea, nausea	No arrhythmic effects
Linaclotide	Stimulate intestinal chloride and fluid secretion by activating Cl ⁻ TR	Intestinal degradation, minimal oral bioavailability	Dose-related acceleration of colonic transit in IBS-C	Phases 2 and 3 in OC, IBS-C	Diarrhea	No arrhythmic effects
Serotonin 5-HT₄ receptor agonists						
Prucalopride (benzofuran carboxamide)	High selectivity and affinity for 5-HT ₄ receptors; much weaker affinity for human 5HT _{2A} and α1 and mouse 5-HT _{2A} receptors	Limited hepatic, not CYP3A4	Accelerated colonic transit in health and OC	Phases 2 and 3 in OC	Diarrhea, headache	No arrhythmic activity in atrial cells; inhibits hERG w/ very high μmol/L concentration; no clinically relevant adverse cardiac effects in large trials (>4000 subjects)

Myths and Misconceptions About Chronic Constipation

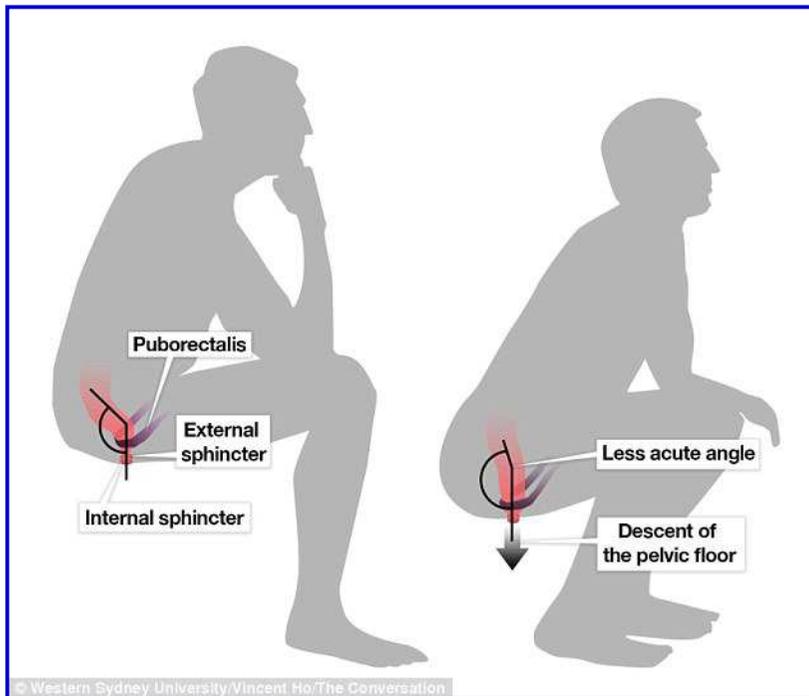
Misconception	Reality
Diseases may arise from autointoxication by retained stools	<ul style="list-style-type: none">• NO serious evidence to support this theory
Fluctuations in hormones contribute to constipation	<ul style="list-style-type: none">• Fluctuations in sex hormones during menstrual cycle have little impact on constipation, although are associated with changes in other GI symptoms• Changes in hormones during Pregnancy may play a role in slowing gut transit
A diet poor in fiber causes constipation	<ul style="list-style-type: none">• A low fiber diet may be a contributory factor in a subgroup of patients with constipation• Some patients may be helped by an increase in dietary fiber, others with more severe constipation may get worse symptoms with increased dietary fiber intake!
Increasing fluid intake is a successful treatment for constipation	<ul style="list-style-type: none">• No evidence that constipation can be treated successfully by increasing fluid intake, unless there is a clear evidence of Dehydration

Myths and Misconceptions About Chronic Constipation

Misconception	Reality
Stimulant laxatives damage the enteric nervous system and increase the risk of cancer	<ul style="list-style-type: none">• Unlikely that stimulant laxatives at recommended doses are harmful to the colon• No data support the idea that stimulant laxatives are an independent risk factor for colorectal cancer
Laxatives cause electrolyte disturbances	<ul style="list-style-type: none">• Laxatives can cause electrolyte disturbances, but appropriate drug and dose selection can minimize such effects
Laxatives induce tolerance	<ul style="list-style-type: none">• Tolerance <i>is uncommon</i> in most laxative users, however tolerance to stimulant laxatives can occur in patients with severe constipation and slow colonic transit
Laxatives are addictive	<ul style="list-style-type: none">• No potential for addiction to laxatives, but laxatives may be misused

The right position ...

It seems that squatting widens the anorectal angle more than sitting and allows a clearer and straighter passage for stools to pass through the anal canal



SQUATTING POSITION

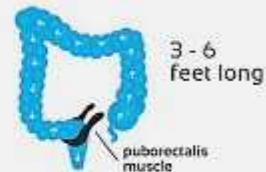
We are designed to squat



Our ancestors squatted for centuries before the invention of the modern day toilet.

In fact, the majority of the world's population still squats today!

This is your colon



The colon has the main purpose of removing waste from the body.

It features a natural bend (anorectal angle) which aids continence.

Sitting Keeps it Kinked



The puborectalis maintains the anorectal angle. Sitting only **partially relaxes** the muscle, meaning that the colon is still kinked. It therefore remains difficult for faeces to pass through.

Relax with Squatty Potty



When squatting, the puborectalis muscle **loosens** creating a straight passageway into the rectum.

This ensures quick and comfortable elimination.