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## Abstract

Chronic constipation is a common and disabling problem in many patients all over the world, in particular in elderly. There are two main pathophysiologies, but with possible overlapping situations: disorders of transit and evacuation disorders.

Functional constipation has many causes, including the kind of diet and lifestyle, and it can also be secondary to medications, other many medical conditions, and/or disease. Alarm symptoms sometimes coexist, and it is mandatory to underline these conditions in order to manage the therapeutical approach properly.

Treatment options for chronic constipation include changes in lifestyle, drugs, and rehabilitation of the perineum as well as biofeedback therapies; commonly first-level therapeutical approach is undertaken before the diagnosis of chronic constipation will be cleared, but understanding its etiology is necessary to determine the most appropriate and tailored therapeutic option; history and physical examination of the patients can orientate in an intricate instrumental diagnostic approach which consists of imaging and functional tests.

Our aim is try to clarify on these complicated diagnostic choices in order to optimize therapeutical interventions.

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# 1 Chronic Constipation and Obstructed Defecation: Definition, Diagnosis and Clinical Approach

Chronic constipation is a worldwide problem increasing with age. It can be either primary or secondary. It is often, erroneously, considered as a single disease but it is a complex and multifaceted syndrome. There are many different causes able to induce secondary constipation (Tables 24.1 and 24.2).

The term “primary constipation” itself hides different conditions, such as irritable bowel syndrome with constipation (IBS-C), functional constipation, functional defecation disorders, and rectal hyposensitivity (Bellini et al. 2015; Bharucha et al. 2006; Longstreth et al. 2006) (Tables 24.3 and 24.4).

Particularly IBS-C is characterized by abdominal pain or discomfort improved by defecation, whereas functional constipation is a functional bowel disorder that presents as persistently

difficult, infrequent, or incomplete defecation. Functional defecation disorders are characterized by paradoxical contraction or inadequate relaxation of the pelvic floor muscles during attempted defecation (dyssynergic defecation) or inadequate propulsive forces during attempted defecation (inadequate defecatory propulsion) (Bharucha et al. 2006).

Rectal hyposensitivity is a relatively new disorder defined by Gladman (Gladman et al. 2003) as an elevation beyond the normal range in the perception of at least one of the sensory threshold volumes during anorectal manometry. There are as yet no specific criteria that can differentiate the subtypes of chronic constipation based on history (Bharucha et al. 2006). Also performing a full assessment of defecation using specific tests (e.g., anorectal manometry, colonic transit time, and defecography) may not distinguish these different conditions (Wong et al. 2010; Rey et al. 2014; Jones et al. 2007; Gambaccini et al. 2013). However, a careful attempt to understand the pathophysiological mechanisms underlying the constipation of each patient is mandatory in order to suggest an effective therapy. This should be strictly tailored to each individual patient and therefore different from one patient to another (Bellini et al. 2015).

Even if there are no specific criteria that can definitely distinguish among the different subtypes of chronic constipation, a careful medical history should always be collected. It is the first approach to the patient and is aimed to detect symptoms and events possibly linked to the onset of symptoms themselves (Bove et al. 2012).

**Table 24.1** Medications more commonly related to constipation

Antidiarrheal agents	Antiparkinson drugs
Antiepileptics	Antispasmodics
Antihistamines	Calcium channel blockers
Antidepressants	Diuretics
Antipsychotics	Sympathomimetics
Antiacids with aluminum or calcium	NSAIDs

**Table 24.2** Condition associated to constipation (Diamant et al. 1999)

Mechanical obstruction	Colorectal tumor, diverticulosis, strictures, ab-extrinseco compression, postsurgical abnormalities, volvulus
Pelvic – anal diseases	Levator ani syndrome, rectal prolapse, rectocele, anal abscess, anal fissure, hemorrhoids
Myopathies, neuropathies	Autonomic neuropathy, cerebrovascular disease, spinal cord disease, multiple sclerosis, Parkinson disease, systemic sclerosis
Metabolic conditions	Chronic renal failure, diabetes mellitus, electrolyte disorders, dysthyroidism, Porphyrria
Psychiatric conditions	Cognitive impairment, anorexia, depression
Other conditions	Fluid depletion, low-fiber intake, immobilization, dehydration, cardiac disease

**Table 24.3** Rome III criteria for differential diagnosis between functional constipation and irritable bowel syndrome (Bharucha et al. 2006)

<p><b>Functional constipation</b> <i>Diagnostic criteria</i> *</p> <p>1. Must include two or more of the following: Straining during at least 25 % of defecations a. Lumpy or hard stools in at least 25 % of defecations b. Sensation of incomplete evacuation for at least 25 % of defecations c. Sensation of anorectal obstruction/blockage for at least 25 % of defecations d. Manual maneuvers to facilitate at least 25 % of defecations (e.g., digital evacuation, support of the pelvic floor) e. Fewer than three defecations per week</p> <p>2. Loose stools are rarely present without the use of laxatives</p> <p>3. Insufficient criteria for irritable bowel syndrome</p> <p>* Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis</p>
<p><b>Irritable bowel syndrome with constipation</b> <i>Diagnostic criterion</i> *</p> <p>Recurrent abdominal pain or discomfort ** at least 3 days/month in the last 3 months associated with two or more of the following:</p> <p>1. Improvement with defecation 2. Onset associated with a change in frequency of stool 3. Onset associated with a change in form (appearance) of stool (hard or lumpy stools <math>\geq 25\%</math> and loose or watery stools <math>&lt; 25\%</math> of bowel movements)</p> <p>Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis ** "Discomfort" means an uncomfortable sensation not described as pain</p>

History can also identify alarm symptoms (Table 24.5), such as weight loss, bloody stools, anemia, or a family history of colon cancer and conditions and/or diseases potentially associated with constipation, such as dietary mistakes (Altringer et al. 1995); low physical activity (Diamant et al. 1999); the use of constipating drugs; metabolic, psychiatric, or neurological diseases; and previous perineal-pelvic-abdominal or obstetric-gynecological surgery (Tables 24.1 and 24.2). In case of alarm symptoms/signs, colonoscopy is recommended (Table 24.10).

Also assessing the stool form using the Bristol stool form score (Lewis and Heaton 1997) is of paramount importance to obtain an objective evaluation; moreover stool consistency is considered

**Table 24.4** Roma III diagnostic criteria for functional defecation disorders

<p>Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis</p> <p>The patient must satisfy diagnostic criteria for functional constipation During repeated attempts to defecate must have at least two of the following:</p>
<p>Evidence of impaired evacuation, based on balloon expulsion test or imaging</p>
<p>Inappropriate contraction of the pelvic floor muscles or less than 20 % Relaxation of basal resting sphincter pressure by manometry, imaging, or EMG</p>
<p>Inadequate propulsive forces assessed by manometry or imaging</p>

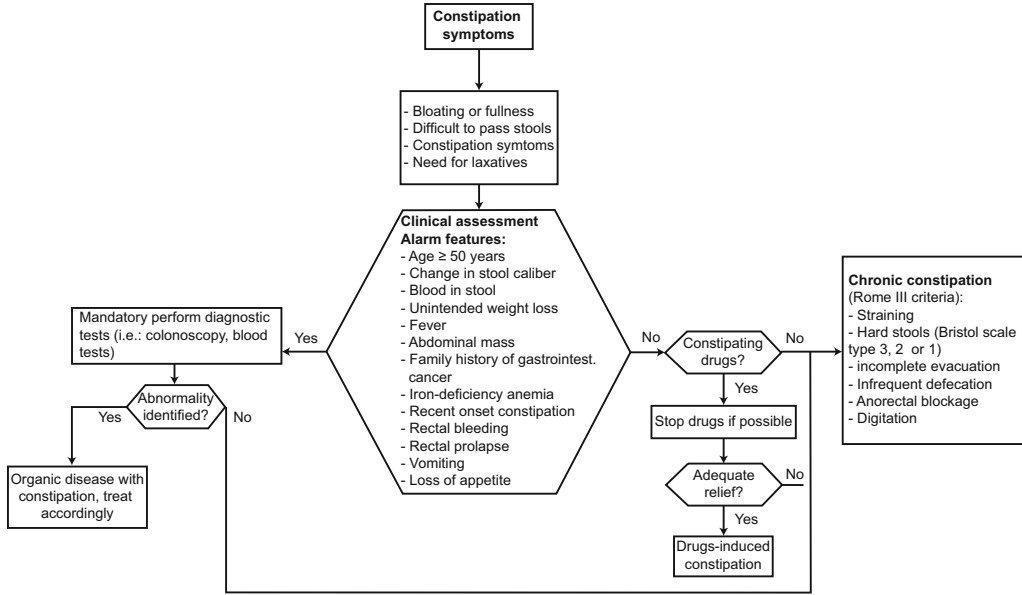
an indicator of colonic transit; hence, it can address the diagnosis.

A physical examination is essential in the initial workup of a patient with chronic constipation (Lindberg et al. 2011). The examination can detect a possible gastrointestinal mass and should include inspection of the anorectal region and exploration of the rectum. This process can provide evidence of external signs of anal disease, pelvic organ prolapse, or descending perineum syndrome. A digital rectal examination should detect any signs of organic disease or obstructed defecation (rectal masses, fecal impaction, stricture, rectal intussusception, or rectocele). The examination is particularly important if functional alterations in defecation are suspected in order to evaluate puborectal and anal sphincter activity.

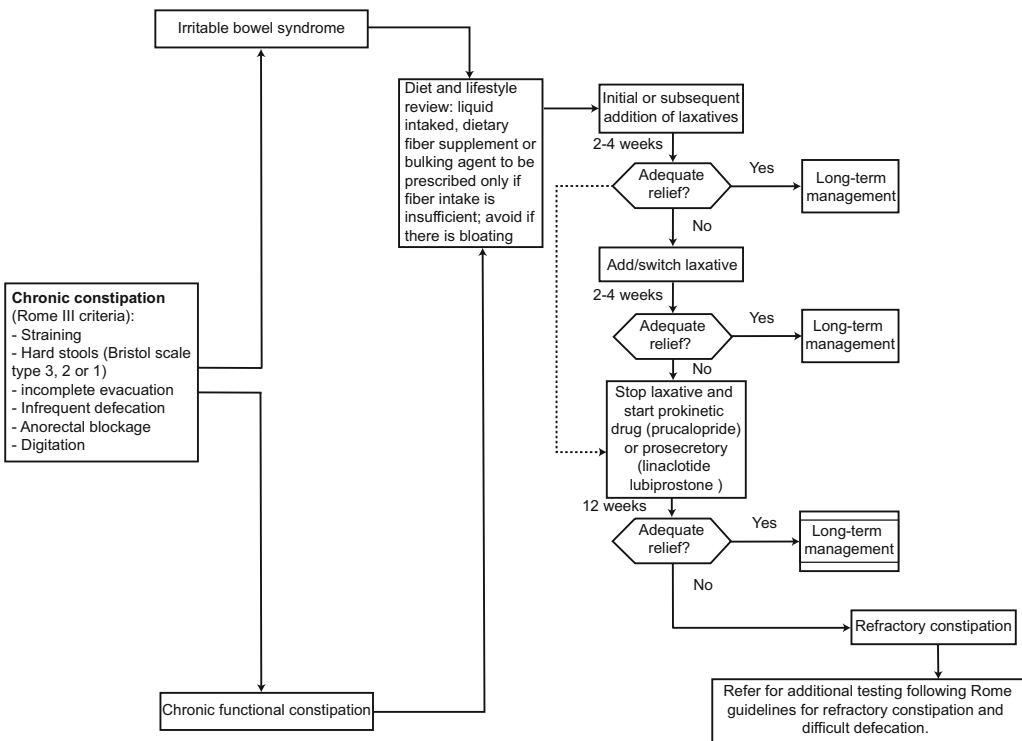
Blood tests do not provide useful input in functional constipation but can be performed to exclude conditions of secondary chronic constipation (Bove et al. 2012) (Table 24.2). They also can be mandatory when alarm symptoms are present.

Once excluded on a clinical basis organic lesions and secondary constipation, many patients will benefit from abolishing or reducing medications that cause constipation and recommending changes in lifestyle and diet with correct fluid (at least 1.5 l/day) and fiber (25 mg/day) intake (Table 24.6).

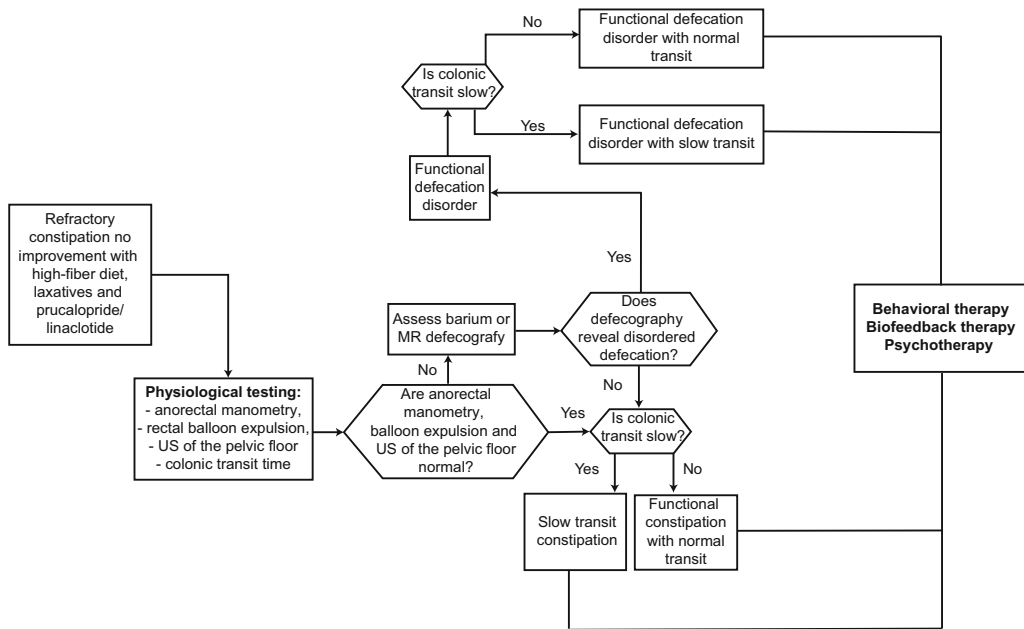
**Table 24.5** Clinical approach to constipation



**Table 24.6** Stepwise approach to chronic constipation



**Table 24.7** Stepwise approach to constipation refractory to high-fiber diet, laxatives, and prokinetic/prosecretory drugs



**Table 24.8** Diagnostic tools and relevant information provided (Pehl et al. 2002)

Diagnostic tool	Provided information
Rx colonic transit time, entero-defecography, RM defecography, DTP-US	Morphological and dynamic
Anorectal manometry	Anorectal sensitivity and motility
Balloon expulsion test	Dynamic abdominoperineal synergy

If this management is not sufficient, it is mandatory to move to a second step encompassing the use of fiber supplementations and osmotic laxatives.

If also these therapies are ineffective, it is possible to use old (stimulant, softening, or saline) laxatives or new prokinetics or prosecretory agents even if in this subset of patients, further tests such as anorectal manometry and/or entero-defecography and/or colonic transit time are advisable, in order to better characterize the type of constipation (Tables 24.7, 24.8, and 24.9) and to evaluate other therapeutic options (e.g., pelvic floor rehabilitation, sacral nerve stimulation, anorectal surgery) (Ratto et al. 2015); colpocysto-entero-defecography (Altringer et al. 1995;

Maglinte et al. 1997), magnetic resonance (MR) defecography (Lienemann et al. 1997), and dynamic transperineal ultrasonography (DTP-US) (Beer-Gabel et al. 2002, 2004; Dietz and Steensma 2005; Bruscianno et al. 2007) are also available and increasingly utilized. Colonic and/or gastrojejunal manometry should be performed in patients with serious slow-transit constipation because they can be helpful in the diagnosis and in decisions regarding therapy (whether conservative or surgical) (Bove et al. 2012).

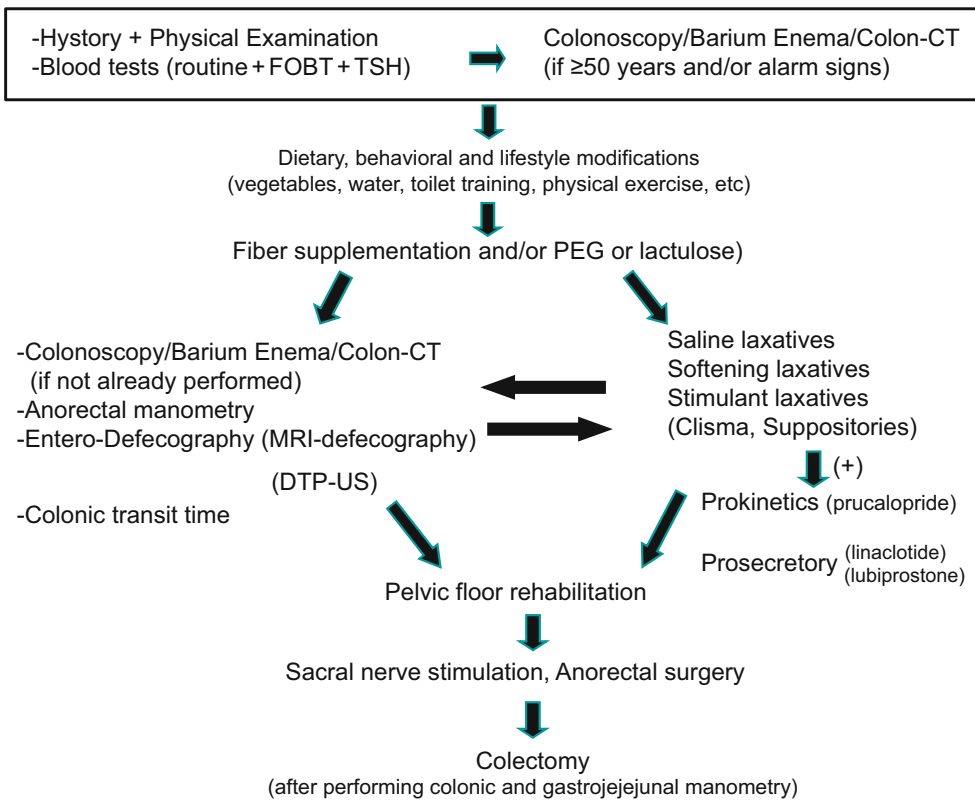
The global approach to chronic constipation integrating available tests and treatments is summarized in Table 24.10.

**Table 24.9** Interpretation of the manometric data (Bove et al. 2012)

Test	Parameter evaluated	Interpretation
Resting pressure	IAS (70 % of resting pressure) and EAS (30 % of resting pressure)	P increased: Hypertonic sphincters (IAS and/or EAS) Oral nitroglycerin can identify the sphincter involved because it relaxes IAS, but not EAS
Squeeze pressure	EAS	The fatigue rate index can be calculated based on the pressure and duration of the contraction. However, the usefulness of the test in both constipated and incontinent patients is disputed
Rectoanal inhibitory reflex	IAS relaxation during rectal inflation	Absent: Possible Hirschsprung If present with elevated volume inflation: Megarectum
Rectal sensitivity	Rectal sensory function at different volumes	Elevated sensory thresholds may be linked to changes in rectal biomechanics (megarectum) or to afferent pathway dysfunction
Rectal compliance	Mechanical rectal function	Increased compliance: Megarectum
Attempted defecation	Synchronization between the increase in rectal pressure and the decrease in anal pressure during attempts to defecate	Three types of dysfunction may be detected: Type 1: Adequate rectal P increase but associated with anal P increase Type 2: Inadequate rectal P increase associated with anal P increase or inadequate anal P decrease Type 3: Adequate rectal P increase but inadequate anal P decrease

IAS: Internal anal sphincter; EAS: External anal sphincter; P: Pressure

**Table 24.10** Global stepwise approach to chronic constipation



Legend: FOBT: Fecal occult blood test

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