

## REVIEW ARTICLE

# Constipation: A Review with Osteopathic Consideration

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## KEYWORDS:

Constipation

Laxative

Osteopathic  
Manipulation

**Abstract:** Constipation, though usually not associated with life-threatening disease, is a common condition that impairs quality of life. Patients describe a variety of symptoms associated with a diagnosis of constipation. Primary constipation may be related to dysfunction of the pelvic floor, anorectal structures or colonic motility while secondary constipation may be related to medications or other etiologies. A complete history and physical examination, including digital rectal examination, will clarify the diagnosis in most cases. Patients with alarming symptoms may require further evaluation with endoscopy. The primary goal is for relief of symptoms with regular bowel movements. Fiber, increased physical activity and laxatives have all been shown to improve functional constipation. Osteopathic manipulative therapy in patients with chronic constipation may reduce symptoms, colonic transit time and the need for laxatives.

## INTRODUCTION

"A halt has come; the bowels have failed in their function; the power to pass out faecal matter is lost or overcome from some cause."<sup>1</sup> - *Andrew Taylor Still*

Constipation is a common gastrointestinal complaint in family medicine.<sup>2</sup> Up to 28 percent of American adults meet criteria for constipation at some time in their lives.<sup>3,4</sup> Among adults, constipation is more commonly associated with nonwhite ethnicity, lower socioeconomic status and older age.<sup>4,5</sup> Constipation is diagnosed in three percent of all children presenting to a pediatrician and accounts for up to 25 percent of referrals to pediatric gastroenterologists.<sup>6</sup> In children, constipation is more likely in males or in association with autism and cerebral palsy.<sup>6</sup> Constipation can both decrease the quality of life and increase health care use and costs.<sup>7,8,9,10</sup>

## DEFINITION

Although physicians usually regard constipation as infrequent bowel movements, patients may describe a broader set of symptoms, including hard stools, straining, abdominal discomfort or bloating.<sup>11,12</sup> The 2006 Rome III criteria can aid in the diagnosis of functional constipation in adults (*Table 1*).<sup>13</sup> To meet this criterion, symptoms must be present for the past three months with symptoms onset at least six months before diagnosis.

In children, constipation may be defined as the presence of two or more of the following criteria in the prior one to two months: two or fewer defecations in the toilet each week, at least one episode of fecal incontinence each week, history of retentive posturing or excessive volitional stool retention, history of painful or hard bowel movements, presence of a large fecal mass in the rectum or history of large diameter stools that may obstruct the toilet.<sup>6,10</sup>

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## ETIOLOGY

"This [current definition of constipation] amounts to very little to an osteopath who well knows the effects of constipation, such as hard feces which are very difficult to expel from the bowels and he mentally asks the question, what is wrong with the machine?"<sup>1</sup> - *Andrew Taylor Still*

Constipation can be classified by primary and secondary causes. The American Gastroenterological Association (AGA) divides primary causes into three categories: normal transit, slow transit and anorectal dysfunction.<sup>7</sup> Normal transit constipation, the most common type of primary constipation, presents with normal anorectal function and normal stool movement through the colon. Patients with slow transit constipation also have normal anorectal function but prolonged transit of stool through the colon due to reduced or uncoordinated colonic activity. Defecatory disorders result from abnormal anorectal function, usually due to structural abnormalities or impaired relaxation or contraction of the pelvic floor or external anal sphincter.

Secondary constipation may be due to endocrine, myopathic, neurologic, structural, psychological and medication-related causes (*Table 2, page 24*).<sup>8,12,14</sup>

## EVALUATION

The evaluation of a patient with constipation should include a history and physical examination. Patients with "alarm" or "red flag" symptoms may require further diagnostic testing.<sup>8,15</sup> Alarm signs and symptoms include acute onset of symptoms, abdominal pain, unintentional weight loss, rectal bleeding or heme-occult positive stools and iron deficiency anemia.<sup>8,12</sup> Figure 1 (*page 24*) demonstrates an algorithm for the initial evaluation of chronic constipation.<sup>8,12,14,15,16</sup>

## HISTORY

A specific history should be elicited, including the current bowel pattern, associated symptoms (such as weight loss or pain) and bowel regimen. Caregivers of pediatric patients should be asked

**TABLE 1:**Adapted from Rome III Diagnostic Criteria for Functional Constipation<sup>13</sup>

<b>Two or more of the following are present in at least 25% of defecations:</b>
<ul style="list-style-type: none"> <li>• Straining</li> <li>• Lumpy or hard stools</li> <li>• Sensation of incomplete evacuation</li> <li>• Sensation of anorectal obstruction/blockage</li> <li>• Manual maneuvers to facilitate passage of stool (digital evacuation, support of the pelvic floor)</li> <li>• Fewer than three bowel movements weekly</li> </ul>
<b>Loose stools rarely occur without the use of laxatives</b>
<b>Criteria for irritable bowel syndrome (IBS) are not met</b>

about age at time of meconium passage, growth and development as well as general wellbeing and significant life events at time of onset of constipation.<sup>6,17</sup> Inquiries regarding stool caliber may be helpful. Excessive straining and the need for perineal or vaginal pressure or direct digital evacuation of stools suggests a defecatory disorder.<sup>8</sup> Using a validated symptom questionnaire or patient-reported outcome scale, such as the National Institutes of Health PROMIS Gastrointestinal Symptom Scale, offers an efficient way to gather data in a busy clinical setting.<sup>18</sup>

A record of over-the-counter and prescription medications should be obtained. When possible, medications that have constipation as a side effect (i.e., opiates, anticholinergics, calcium channel blockers) should be discontinued.<sup>9,12,14</sup>

## PHYSICAL

The physical examination should assess for diseases to which constipation is secondary. In addition to examination for clinical signs of anemia or malignancy, the AGA recommends a digital rectal examination that includes assessment of pelvic floor motion during simulated evacuation in adult patients.<sup>8</sup> Anal fissures or thrombosed hemorrhoids may cause pain that precipitates or is secondary to chronic constipation. The absence of an anal "wink" or contraction in response to gently stroking the perianal skin may indicate sacral nerve pathology. The presence or absence of fecal impaction and resting sphincter tone should be noted and the anterior wall checked for a rectocele. When the patient is asked to strain and try to push out the finger, the anal sphincter should relax and the perineum should descend less than 3.5 cm.<sup>19</sup> Rectal examinations should be limited in pediatric patients as they have been shown to limit utility in this population.<sup>17-20</sup>

## ENDOSCOPY

A structural evaluation of the colon with endoscopy is indicated for patients age >50 years without prior screening for colorectal cancer, abrupt onset of symptoms, heme-occult positive stools, iron deficiency anemia, rectal bleeding or prolapse and weight loss.<sup>21</sup>

## OTHER DIAGNOSTIC TESTING

Further clinical evaluation should consider the possibility of secondary constipation. In the absence of other symptoms and signs in adults, the AGA recommends only a complete blood count. Unless other clinical features warrant otherwise, metabolic tests such as thyroid stimulating hormone, serum glucose, creatinine and calcium are not recommended for chronic constipation.<sup>8</sup> Plain abdominal films are not routinely recommended in adult or pediatric patients with constipation.<sup>10,22</sup> Patients with alarming symptoms or who fail to respond to laxatives should be referred to a gastroenterologist.

## TREATMENT

### NONPHARMACOLOGIC

Initial treatment of constipation begins with non-pharmacologic therapies. While increased fluid intake is often recommended as a first-line therapy, there is no evidence that increased fluid intake reduces constipation, unless signs of dehydration are present.<sup>23</sup> The National Health and Nutritional Examination Survey (NHANES) reports increased physical activity to be associated with decreased constipation.<sup>24</sup> Low physical activity may increase risk of constipation by two fold.<sup>9</sup>

Increasing fiber intake by 5 grams/day weekly to a target of 20 to 35 grams daily decreases colonic transit time and increases stool bulk in adults.<sup>25</sup> Soluble fiber such as psyllium appears to be superior to insoluble fiber or placebo in decreasing stool transit time and improving consistency.<sup>26,27,28</sup> Patients should be cautioned a side effect of increased fiber intake might be increased flatulence. While several studies suggest increased fiber improves constipation in children, there is no consensus as to daily-recommended amount.<sup>29,30</sup>

### PHARMACOLOGIC

#### ADULTS

Table 3 (page 25) describes pharmacologic regimens available for treatment of constipation in adults. Osmotic laxatives appear to have long-term efficacy. Osmotic agents increase fluid into the intestinal lumen of the gastrointestinal tract. One commonly used osmotic agent, polyethylene glycol (PEG), showed greater efficacy with fewer electrolyte abnormalities compared to other agents in adults.<sup>2,8,31</sup>

Lactulose is an indigestible carbohydrate agent that may improve stool frequency.<sup>34,35,36</sup> A Cochrane Database review showed lactulose to be inferior to PEG in reducing constipation symptoms in adults.<sup>37</sup>

Stimulant laxatives increase colonic peristalsis and intestinal motility. Stimulant laxatives improve frequency and consistency compared to placebo in adults.<sup>38</sup>

Lubiprostone (Amitiza) and linaclotide (Linzess) both increase intestinal chloride secretion. Both improve stool frequency and decrease abdominal discomfort and bloating in chronic idiopathic constipation compared to placebo.<sup>39,40</sup> Lubiprostone is also approved for opioid-associated constipation.

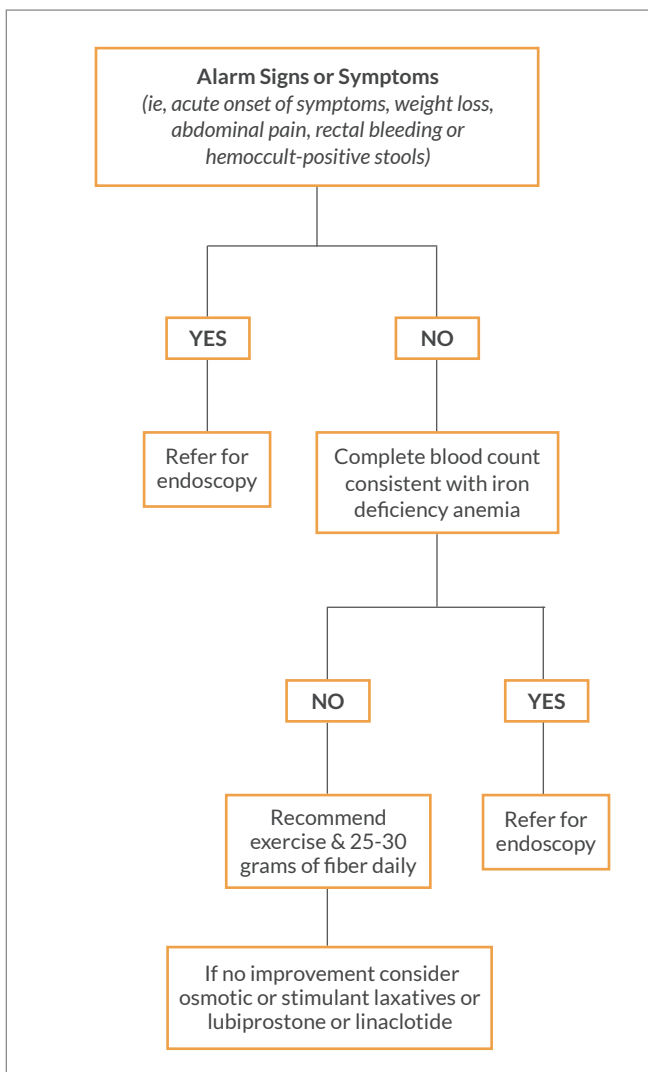
**TABLE 2:**

Secondary causes of constipation in children and adults<sup>8,12,14</sup>

ENDOCRINE	MYOPATHIC	NEUROLOGIC	STRUCTURAL	PSYCHOLOGICAL	MEDICATIONS
Diabetes Mellitus	Scleroderma	Cerebrovascular Disease	Anal Fissures	Anxiety	Opiates
Hypothyroidism	Amyloidosis	Multiple Sclerosis	Hemorrhoids	Depression	Calcium channel blockers
Hyperparathyroidism	Myotonic Dystrophy	Parkinsons' Disease	Colonic Stricture		Iron
Hypercalcemia		Spinal cord injury	IBS		Aluminum or calcium antacids
		Hirschsprung's Disease	Rectal Prolapse		
		Cognitive impairment	Malignancy		
			Immobility		

**FIGURE 1:**

Initial evaluation of chronic constipation<sup>8,12,14,15,16</sup>



**CHILDREN**

In children with constipation, a Cochrane Database review showed PEG to be superior to placebo, lactulose and milk of magnesia, while causing fewer side effects than other agents.<sup>32</sup> A Cochrane Database review showed no randomized controlled data demonstrating efficacy of stimulant laxatives for the treatment of chronic constipation in children.<sup>32,40</sup>

**OSTEOPATHIC CONSIDERATIONS IN CONSTIPATION**

Several small studies investigating the efficacy of osteopathic manipulation (OMT) in the treatment of chronic constipation showed reduction in constipation symptoms, laxative use, colonic transit time, and overall improvement in quality of life scores.<sup>43,43</sup> Multiple case reports have shown significant improvement in postoperative ileus<sup>45,46,47,48</sup> with partially standardized OMT. A recent retrospective study showed a significant decrease in length of hospitalization in the manipulation treatment group.<sup>44</sup>

Treatment techniques in each study include mobilization of thoracolumbar spine and sacro-pelvic areas.<sup>43,44</sup> Visceral treatments in studies vary but include treatment of the ileocecal valve, colon, and celiac, superior mesenteric and inferior mesenteric ganglia.<sup>44</sup> Treatment of the psoas muscle is also a commonly described treatment.<sup>41</sup> Some reports include cranial manipulation.<sup>43,44</sup> The average reported length of treatment time is 30 to 40 minutes.

While these studies suggest a role for OMT in the management of constipation, additional research is needed to optimize specific treatment recommendations. Until then, it may be prudent to follow the wisdom of founder A.T. Still, "I have given the student a general rule of procedure in cases of constipation, with the expectation that he will use some intellectual skill as he proceeds."<sup>1</sup>

**TABLE 3:**

Treatment of chronic constipation in adults <sup>25,26,27,28,29,34,35,36,37,39,48,49</sup>

MEDICATION	DOSE	POTENTIAL ADVERSE REACTIONS
Fiber	25-30 mg daily	Potential adverse reactions
Stool Softeners	Variable	Bloating, increased flatulence
Osmotic Laxatives ( <i>PEG, lactulose, sorbitol, magnesium hydroxide, sodium biphosphate</i> )	Begin with lowest dose and titrate to response or maximal dose	Diarrhea, electrolyte abnormalities
Stimulant Laxatives ( <i>bisacodyl, glycerin suppository, senna</i> )	Variable	Abdominal pain, cramping
Lubiprostone	24 mcg twice daily	Diarrhea, nausea
Linaclotide	24 mcg twice daily	Diarrhea

## RECOMMENDATIONS

Daily fiber intake of 25 to 30 grams is associated with reduced risk of constipation. SOR A.

Polyethylene glycol has superior long-term efficacy compared to lactulose and stimulant laxatives for constipation in children and adults. SOR A.

Colonoscopy is indicated for patients with constipation who are aged >50 years without prior screening for colorectal cancer or who have abrupt onset of symptoms, heme-occult positive stools, iron deficiency anemia, rectal bleeding or prolapse and weight loss. SOR B.

Osteopathic manipulation may reduce symptoms of constipation. SOR C.

SOR = *Strength of Recommendation*

### Strength of Recommendation Taxonomy<sup>49</sup>

Grade	Basis of recommendation
A	Consistent, good-quality patient-oriented evidence
B	Inconsistent or limited-quality patient-oriented evidence
C	Consensus, disease-oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

## REFERENCES

1. Still AT. Osteopathy, research and practice. Kirksville, MO: The author. 1902. 206-207.
2. Ford A and Suares N. Effect of laxatives and pharmacological therapies in chronic idiopathic constipation: systemic review and meta-analysis. Gut. 2011; 209-218.
3. Stewart WF, Liberman JN, Sandler RS, Woods MS, Stemhagen A Chee E, et al. Epidemiology of constipation (EPOC) study in the united states: relation of clinical subtypes to sociodemographic features. Am J Gastroenterol 1999; 94: 3530-40.
4. Johanson JF, Sonnenberg A, Koch TR. Clinical epidemiology of chronic constipation. J Clin Gastroenterol 1989; 11: 525-36.
5. Hsieh C. Treatment of constipation in older adults. Am Fam Phys. 2005; 72(11): 2277-2284.
6. Tabbers M, Boluyt N, Berger M, & Benninga M. Nonpharmacologic treatments for childhood constipation: systematic review. Pediatrics. 2011; 128: 753-761.
7. Drossman DA, Li A, Andruzzi E, et al. U.S Householder survey of functional gastrointestinal disorders. Prevalence, sociodemography, and health impact. Dig Dis Sci 1993; 38: 1569-80.
8. Bharucha AE, Dorn SD, Lembo AL and Pressman A. American Gastroenterological Association Medical Position Statement on Constipation. 2013; 144(1): 211-217.
9. Liu LWC. Chronic constipation: current treatment options. Can J Gastroenterol. 2011; 25 (Suppl B): 22B-28B.
10. Reuchlin-Vroklage LM, Bierma-Zeinstra S, Benninga MA, Berger MY. Diagnostic Value of Abdominal Radiography in Constipated Children: A Systematic Review. Arch Pediatr Adolesc Med. 2005; 159(7):671-678.
11. Irvine J, Ferrazzi S, Pare P, Thompson WG and Rance L. Health-related quality of life in functional GI disorders. Focus on constipation and resource utilization. Am J Gastroenterol 2002; 97: 1986-93.
12. Jamshed N, Lee Z and Olden KW. Diagnostic approach to chronic constipation in adults. Am Fam Physician. Aug 2011. 84 (3): 299-306.

13. Drossman DA, Corazziari E, Delvaux M, Spiller RC and Talley NJ. Rome III: The functional gastrointestinal disorders. Yale University Section of Digestive Disease: Degnon Associates, 2006. 3rd Ed.
14. Pare, P. The approach to diagnosis and treatment of chronic constipation: Suggestions for a general practitioner. *Can J Gastroenterol*. Oct 2011. 25 Suppl B; 36-40.
15. Black, TP, Manolakis CS and DiPalma JA. "Red flag" evaluation yield in irritable bowel syndrome. *J Gastrointestin Liver Dis*. June 2012; 21(2): 153-156.
16. Basilisco G and Coletta M. Chronic constipation: a critical review. *Dig Liv Dis*. 2013; 45: 886-893.
17. Marcus K, Vora R, Farrelly P and Baillie C. Childhood constipation. *BMJ*. 2012: 1-11.
18. Spiegel BMR, Hays RD, Bolus R, Melmed GY, Chang L et al. Development of the NIH patient-reported outcomes measurement information system gastrointestinal symptom scales. *Am J Gastroenterol*. Nov 2014. 109 (11); 1804-41814.
19. Talley NJ. How to do and interpret a rectal examination in gastroenterology. *Am J Gastroenterol*. 2008. 103; 820-2.
20. National Institute for Health and Clinical Excellence. Constipation in children and young people. Diagnosis and management of idiopathic childhood constipation in primary and secondary care. RCOG Press. 2010, updated 2012.
21. Qureshi W, Adler DG, Davila RE et al. ASGE guideline on the use of endoscopy in the management of constipation. *Gastrointest Endosc*. 2005. 62(2): 199-201.
22. Berger M, Tabbers M, Kurver M, Boluyt N, and Benninga M. Value of abdominal radiography, colonic transit time, and rectal ultrasound scanning in the diagnosis of idiopathic constipation in children: a systematic review. *J Pediatrics*. 2012; 161(1): 44-50.
23. Muller-Lissner SA, Kamm MA, Scarpignato C, et al. Myths and misconceptions about chronic constipation. *AM J Gastroenterol*. 2005; 100:232-242.
24. Everhart JE, Co VL, Johannes RS, Fitzsimmons SC, Roth HP, White LR. A longitudinal survey of self-reported bowel habits in the United States. *Dig Dis Sci*. 1989; (34):1153-62.
25. Thomas DR, Forrester L, Glother MF, Gruber J, Krause RA, Prather C, et al. Clinical consensus: the constipation crisis in long term care *Ann Long-Term Care* 2003; Suppl: 3-14
26. Bijkerk CJ, Muris JWM, Knottnerus JA, et al. Systematic review: the role of different types of fiber in the treatment of irritable bowel syndrome. *Aliment Pharmacol Ther*. 2004; 19: 245-251.
27. Bijkerk CJ, de Wit NJ, Muris JWM, et al. soluble or insoluble fiber in irritable bowel syndrome in primary care? Randomized placebo controlled trial, *BMH*, 2009; 339:b3154.
28. Cheskin Lj, Kamal N, Crowell MD, Schuster MM, Whitehead WE. Mechanisms of constipation in older persons and effects of fiber compared with placebo. *J Am Geriatr Soc* 1995; 43: 666-9
29. Loening-Baucke V, Miele E, and Staiano A. Fiber (glucomannan) is beneficial in the treatment of childhood constipation. *Pediatrics*. 2004;113(3):259-264.
30. Stewart M. and Schroeder N. Dietary treatments for childhood constipation: efficacy of dietary fiber and whole grains. *Nutrition Rev*. 2013:71(2), 98-109.
31. Corazziari E, Badiali D, Bazocchi G, et al. Long term efficacy, safety, and tolerability of low daily doses of isosmotic polyethylene glycol electrolyte balanced solution (PMF-100) in the treatment o functional chronic constipation. *Gut* 2000; 46:522-526.
32. Gordon M, Naidoo K, Akobeng A, and Thomas A. Cochrane Review: Osmotic and stimulant laxatives for the management of childhood constipation. *Evidence Based Child Health: A Cochrane Review Journal*. 2013; 8(1): 57-109.
33. Wesselius-De Casparis A, Braadbaart S, Bergh-Bohken GE, Mimica M. Treatment of chronic constipation with lactulose syrup: results of a double-blind study. *Gut* 1968;9:84-6
34. Sanders JF. Lactulose syrup assessed in a double -blind study of elderly constipated patients. *J Am Geriatr Soc* 1978; 26: 236-9
35. Freedman MD, Schwartz HJ, Roby R, Fleisher S. Tolerance and efficacy of polyethylene glycol 3350/electrolyte solution versus lactulose in relieving opiate induced constipation: a double-blinded placebo controlled trial. *J Clin Pharmacol* 1997; 37: 904-7
36. Lee-Robichaud H, Thomas K, Morgan J, et al. Lactulose versus polyethylene glycol for chronic constipation. *Cochrane database syst rev*. 2010; 7: CD007570.
37. Mueller-Lissner S, Kamm MA, Wald A, et al. Multicenter, 4-week, double-blind, randomized, placebo-controlled trial of sodium picosulfate in patients with chronic constipation. *Am J Gastroenterol*. 2010; 105:897-903.
38. Lembo AJ, Schneider HA, Shiff SJ, et al. Two randomized trials of linaclotide for chronic constipation. *N Engl J Med* 2011; 365:527.
39. Johanson JF, Ueno R. Lubiprostone, a locally acting chloride channel activator, in adult patients with chronic constipation: a double-blind, placebo-controlled, dose-ranging study to evaluate efficacy and safety. *Aliment Pharmacol Ther* 2007; 25:1351.
40. Price KJ, Elliot TM. Stimulant laxatives for constipation and soiling in children. *Cochr Database Syst Rev*. 2011; (3).
41. Attar A, Lemann M, Ferguson A, Halphen M, Boutron MC, flourie B, et al. Comparison of a low dose polyethylene glycol electrolyte solution with lactulose for treatment of chronic constipation. *Gut* 1999; 44: 226-30.
42. Winfield D. Examining the effects of osteopathic treatment on the symptoms of chronic functional constipation – a placebo-controlled, randomized, cross over pilot study. *The 9th Chiropractic, Osteopathy and Physiotherapy Annual Conference*. 2012: 192.
43. Brugman R, Fitzgerald K, and Fryer G. The effect of osteopathic treatment on chronic constipation – a pilot study. *Intl Journ Osteo Medicine*. 2010: 13, 17-23.
44. Crow W and Gorodinsky . Does osteopathic manipulative treatment (OMT) improve outcomes in patients who develop postoperative ileus: A retrospective chart review. *Intl Journ Osteo Medicine*. 2009; 12: 32-37.
45. Tilley RM, Young GS, Eble JN. Practical aspects of viscerosomatic reflex interchange with special reference to surgery in American college of osteopathic surgeons thirty first annual clinical assembly. Boston Massachusetts: American Academy of Osteopathy Yearbook; 1959. p. 9-13.
46. Young G. Post-operative osteopathic manipulation. *Academy of Applied Osteopathic Yearbook*; 1970. p. 77-82.
47. Tomajan K. Osteopathic therapy in the post operative case: manipulative treatment reduces bad after effects to a minimum. *The Osteopathic Profession*. 1935. 14- 17, 35.
48. Siehl D. Surgery: preoperative as well as postoperative osteopathic treatment speeds recovery. *The Osteopathic Profession*. 1946. 20-23, 44.
49. Adapted from Ebell MH, Siwek J, Weiss BD et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *AmFamPhysician* 2004; 69:549-57.