

## REVIEW ARTICLE

# IRRITABLE BOWEL SYNDROME (IBS)

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### Abstract

*Irritable bowel syndrome (IBS), also known as “spastic colon,” is a common disorder. While most people experience digestive troubles once in a while, what sets IBS apart is belly pain and diarrhoea or constipation that comes back again and again. In western populations, up to one in five people report symptoms consistent with IBS. Only approximately 50% will consult their doctors and of these up to 30% will be referred by their GP to a hospital specialist. Up to 40% of all patients seen in specialist gastroenterology clinics will have IBS. In the UK approximately a quarter of IBS patients lose time off work for periods ranging from 7 to 13 days each year.*

### Introduction

Irritable Bowel Syndrome (IBS) is a functional bowel disorder characterized by episodes of abdominal pain associated with altered bowel habits. Other names for this disorder are irritable colon, mucous colitis, spastic colon or spastic colitis, and nervous stomach. Although IBS is not dangerous, the symptoms can be very painful and bothersome. Most people who have IBS have a mild form, which they can cope with quite well. But sometimes the symptoms are so strong that they significantly limit people's daily activities and can cause distress.<sup>1-3</sup>

One of the first references to the concept of an “irritable bowel” appeared in the *Rocky Mountain Medical Journal* in 1950.<sup>4</sup> The term was used to categorize patients who developed symptoms of diarrhoea, abdominal pain, constipation, but where no well-recognized infective cause could be found. Early theories suggested that the irritable bowel was caused by a psychosomatic or mental disorder.

It is not clear why patients develop IBS. Sometimes it occurs after an infection of the intestines. This is called post infectious IBS. There may also be other triggers. Many IBS sufferers believe that diet may play a role in triggering these episodes and may avoid certain foods.<sup>5</sup>

IBS can occur at any age, but it often begins in the teen years or early adulthood. It is twice as common in women as in men. About 1 in 6 people in the U.S.

have symptoms of IBS. It is the most common intestinal problem that causes patients to be referred to a bowel specialist (gastroenterologist).<sup>[1]</sup>

The overall prevalence rates of irritable bowel syndrome (IBS) in Bangladesh are similar (10-20%) in most industrialized countries.<sup>6,7</sup> The prevalence of IBS was 24.4% in the first community-based survey using Rome-II criteria in rural Bangladesh.<sup>8</sup> a variable prevalence of IBS in national (12.1%)<sup>[9]</sup> urban (8.5%)<sup>[10]</sup> and suburban (5%)<sup>[11]</sup> was found.

### Causes and Patho-Physiology of Irritable Bowel Syndrome<sup>12,13</sup>

There are a number of theories about how and why irritable bowel syndrome develops. Despite intensive research, the cause is not clear.

- One theory suggests that irritable bowel syndrome is caused by abnormal contractions of the colon and intestines (hence the term “spastic bowel,”). Vigorous contractions of the intestines can cause severe cramps, providing the rationale for some of the treatments of IBS, such as antispasmodics and fibre (both of which help to regulate the contractions of the colon). However, abnormal contractions do not explain irritable bowel syndrome in all patients, and it is unclear whether the contractions are a symptom or cause of the disorder.
- Some people develop irritable bowel syndrome after a severe gastrointestinal infection (eg, Salmonella

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or Campylobacter). It is not clear how the infection triggers IBS to develop, and most people with irritable bowel syndrome do not have a history of these infections.

- Patients with IBS who seek medical help are more likely to suffer from anxiety and stress than those who do not seek help. Stress and anxiety are known to affect the intestine; thus, it is likely that anxiety and stress worsen symptoms. Some studies have suggested that irritable bowel syndrome is more common in people who have a history of physical, verbal, or sexual abuse.
- Food intolerances are common in patients with IBS, raising the possibility that it is caused by food sensitivity or allergy. This theory has been difficult to prove, although it continues to be studied. The best way to detect an association between symptoms of irritable bowel syndrome and food sensitivity is to eliminate certain food groups systematically (a process called an elimination diet), which should only be considered for patients in the care of a doctor or nutritionist. Eliminating foods without assistance can lead to omission of important sources of nutrition. In addition, unnecessary dietary restrictions can further worsen a person's quality of life.

A number of foods are known to cause symptoms that mimic or aggravate irritable bowel syndrome, including dairy products (which contain lactose), legumes (such as beans), and cruciferous vegetables (such as broccoli, cauliflower, Brussels sprouts, and cabbage). These foods increase intestinal gas, which can cause cramps. Several medications also have effects on the intestines that may contribute to symptoms.

- Many researchers believe that irritable bowel syndrome is caused by heightened sensitivity of the intestines to normal sensations (so-called "visceral hyperalgesia"). This theory proposes that nerves in the bowels are overactive in people with irritable bowel syndrome, so that normal amounts of gas or movement are perceived as excessive and painful. Some patients with severe irritable bowel syndrome feel better when treated with medications that decrease pain perception in the intestine (such as low doses of imipramine or nortriptyline,

In functional diseases of the gastrointestinal tract, the grinding, mixing, digestion, and absorption

functions are disturbed to only a minor degree. These functions are essentially maintained, perhaps because of a built-in over-capacity of the gastrointestinal tract to perform these functions. The most commonly affected function in these diseases is transportation. In the stomach and small intestine, the symptoms of slowed transportation are nausea, vomiting, abdominal bloating, and abdominal distension. The symptom of rapid transportation usually is diarrhoea. In the colon, abnormally slow or rapid transportation results in constipation or diarrhoea, respectively. In addition, there may be increased amounts of mucus coating the stool or a sense of incomplete evacuation after a bowel movement.

Normal sensations may be abnormally processed and perceived. Such an abnormality could result in abdominal bloating and pain. Abnormally processed sensations from the gastrointestinal organs also may lead to motor responses that cause symptoms of slow or rapid transportation.

Slow transportation of food through the small intestine may be complicated, for example, by bacterial overgrowth. In bacterial overgrowth, gas-producing bacteria that are normally restricted to the colon move up into the small intestine. There, they are exposed to greater amounts of undigested food than in the colon, which they turn into gas. This formation of gas can aggravate bloating and/or abdominal distension and result in increased amounts of flatus and diarrhoea.

The gastrointestinal tract has only a few ways of responding to diseases. Therefore, the symptoms often are similar regardless of whether the diseases are functional or non-functional. Thus, the symptoms of both functional and non-functional gastrointestinal diseases are nausea, vomiting, bloating, abdominal distension, diarrhoea, constipation, and pain. For this reason, when functional disease is being considered as a cause of symptoms, it is important that the presence of non-functional diseases be excluded. In fact, the exclusion of non-functional diseases usually is more important in evaluating patients who are suspected of having functional disease. This is so, in large part, because the tests for diagnosing functional disease are complex, not readily available, and often not very reliable.

In contrast, the tests for diagnosing non-functional diseases are widely available and sensitive.

#### SUBTYPES OF IBS<sup>14,15</sup>

IBS with constipation	Hard lumpy stools > 25% and loose (mushy) or watery stools <25% of bowel movements
IBS with diarrhoea (IBS-C)	Loose (mushy) or watery stools > 25% and hard or lumpy stools <25% of bowel movements
Mixed IBS (IBS-M)	Hard or lumpy stools > 25% and loose (mushy or watery stools > 25% of bowel movements
Unsubtyped IBS	Insufficient abnormality of stool consistency to meet criteria for IBS-C, D or M

**Symptoms Of Irritable Bowel Syndrome**<sup>2,5,10,15,16</sup>**The most common symptoms -**

**Abdominal pain** - abdominal pain is typically crampy, varying in intensity, and located in the lower left abdomen. Some people notice that emotional stress and eating worsen the pain, and that having a bowel movement relieves the pain. Some women with irritable bowel syndrome notice an association between pain episodes and their menstrual cycle.

**Changes in bowel habits** - altered bowel habits are a second symptom of irritable bowel syndrome. This can include diarrhoea, constipation, or alternating diarrhoea and constipation. If diarrhoea is the more common pattern, the condition is called diarrhoea-predominant irritable bowel syndrome; if constipation is more common, the condition is called constipation-dominant irritable bowel syndrome.

**Diarrhoea** - A person with irritable bowel syndrome may have frequent loose stools. Bowel movements usually occur during the daytime, and most often in the morning or after meals. Diarrhoea is often preceded by a sense of extreme urgency and followed by a feeling of incomplete emptying. About one-half of people with IBS also notice mucous discharge with diarrhoea. Diarrhoea occurring during sleep is not common with IBS.

**Constipation** -the constipation of irritable bowel syndrome can last from days to months. Stools are often hard and pellet-shaped. You may not feel empty after a bowel movement, even when the rectum is empty. This faulty sensation can lead to straining and sitting on the toilet for prolonged periods of time.

**Other symptoms** - other symptoms of irritable bowel syndrome include-

- bloating, gas, belching, heartburn, difficulty swallowing, an early feeling of fullness with eating, and nausea.
- Non-gastrointestinal symptoms can also occur, including frequent and urgent urination, painful menstrual periods, and pain with sex.

\*Symptoms that awaken patients from sleep also are more likely to be due to non-functional than functional diseases.

**Complications of irritable bowel syndrome**

- Irritable bowel syndrome causes a significant effect on the individual (reduced quality of life), society (time loss of work) and Health services.
- Since the symptoms are often provoked by eating, patients who alter their diets and reduce their intake of calories may lose weight. Fortunately,

loss of weight is unusual in functional diseases, and it should suggest the presence of a non-functional disease.

- Most commonly, functional diseases interfere with the patients' comfort and daily activities. For example, patients who suffer from morning diarrhoea may not leave their home until the diarrhoea stops. If the diarrhoea is constant, they may go only to places where they know that a toilet is readily available.
- Patients who develop pain after eating may skip lunch. Very commonly, patients associate symptoms with specific foods, such as milk, fat, vegetables, etc. Whether or not such associations are real, these patients will restrict their diets accordingly. Milk is the food that is most commonly eliminated, often unnecessarily and to the detriment of adequate calcium intake.
- The interference with daily activities also can lead to problems with interpersonal relationships, especially with spouses.
- However, most patients with functional disease tend to just live with their symptoms and only infrequently visit physicians for diagnosis and treatment.

**Diagnosis of irritable bowel syndrome (IBS)**<sup>3,12</sup>

The Rome Criteria

The symptoms of IBS are varied and inconsistent among patients. Moreover, there are no characteristically abnormal tests that can be used to diagnose IBS. All of this has made it difficult to define IBS and identify patients, especially for research studies.

In 1992, a group of international investigators of gastrointestinal diseases met in Rome and developed a set of criteria to be used for diagnosing IBS. The criteria were modified in 1999 and again in 2006. These three sets of criteria are known as the Rome, I, II, and III criteria.

The most recent criteria, the Rome III criteria state that in order to be diagnosed with IBS, a patient should have abdominal discomfort or discomfort (not described as pain) at least once weekly for at least two months. The discomfort should be associated with two out of three of the following features:

- 1) Relief with a bowel movement
- 2) Onset associated with a change in the frequency of bowel movement
- 3) Onset associated with a change in the form (appearance) of stool

There should be no evidence of an inflammatory, anatomic (obstructive), metabolic, or neoplastic (tumorous) cause of the symptoms. Symptoms of dyspepsia (defined by Rome III criteria as abdominal discomfort or pain in the upper abdomen), abdominal distension, and increased flatus (passing gas, or flatulence) do not fall within this definition. Nevertheless, many patients have these symptoms along with the symptoms of IBS. It is not clear if these patients have one or more than one problem.

Exclusion of non-functional gastrointestinal disease  
The exclusion of non-functional disease in patients with suspected IBS is an important concern. There are many tests designed to exclude non functional diseases. The primary issue, however, is to decide which tests are reasonable to perform. Tests are selected individually since each case different. Nevertheless, there are some basic tests that are often performed to exclude non-functional gastrointestinal disease. These tests identify anatomic (structural) and histological (microscopic) diseases of the intestines.

- As always, a detailed history from the patient and a physical examination frequently will suggest the cause of the symptoms.
- Routine screening blood tests are performed looking for clues to unsuspected diseases.
- Examination of stool also is a part of the evaluation since it may reveal infection, signs of inflammation, or blood and direct further diagnostic test. Sensitive stool testing (antigen/antibody) for *Giardia lamblia* would be reasonable because this parasitic infection is common and can be acute or chronic.
- Some physicians do blood testing for celiac disease (sprue), but the value of doing this is unclear. Moreover, if an EGD is planned, biopsies (taking samples of tissue) of the duodenum to be done the diagnosis of celiac disease.
- Both X-ray and Endoscopy can identify anatomic diseases. Only endoscopies, however, can diagnose histological diseases because biopsy is taken during the procedure.

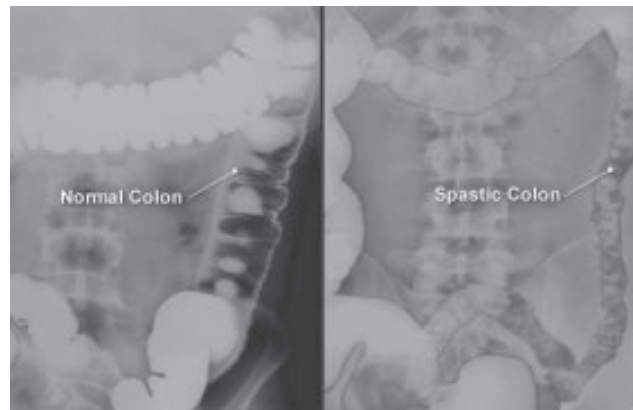
#### The X-ray tests include

- The esophagram and video-fluoroscopic swallowing study to examine the oesophagus
- The upper gastrointestinal series to examine the stomach and duodenum
- The small bowel series to examine the small intestine

- The barium enema to examine the colon and terminal ileum.

The Endoscopic tests include

- Upper gastrointestinal endoscopy (esophago-gastro-duodenoscopy, or EGD) to examine the oesophagus, stomach, and duodenum.
- Colonoscopy to examine the colon and terminal ileum.
- Endoscopy also is available to examine the small intestine, but this type of endoscopy is complex, not widely available, and of unproven value in suspected IBS.
- For examination of the small intestine, there is also a capsule containing a tiny camera that can be swallowed (capsule endoscopy). As the capsule travels through the intestines, it sends pictures of the inside of the intestines to an external recorder for later review. However, the capsule is not widely available and its value in IBS has not yet been proven.



#### Exclusion of non-intestinal disease

Patients with suspected IBS often undergo abdominal ultrasonography (US), computerized tomography (CT or CAT scans), or magnetic resonance imaging (MRI). These tests are used primarily to diagnose non-intestinal diseases. (Although these tests also may diagnose intestinal diseases, their value for this purpose is limited) Tests to exclude non-intestinal diseases may be appropriate in specific situations, although certainly not in most patients.

#### Evaluation of intestinal transportation

If abnormal function of the muscles of the small intestine is suspected, tests to evaluate transportation through the small intestine or the colon (small intestinal and colonic transit studies, respectively) are available. These studies are done with either radioactive compounds or markers that

can be seen on X-rays of the abdomen. It also is possible to pass catheters into the stomach and small intestine or the colon to determine if the muscles of these organs are working normally (antro-duodenal and colonic motility studies, respectively). Finally, constipation due to malfunction of the anal muscles can be diagnosed by ano-rectal motility studies.

### **Psychiatric illness**

The possibility of a psychiatric (psychosomatic) illness often arises in patients with IBS because the symptoms frequently are subjective, and no objective abnormalities can be identified. Psychiatric illness may complicate IBS, but it is unclear whether psychiatric illness causes IBS. If there is a possibility of psychiatric illness, a psychiatric evaluation is appropriate.

### **TREATMENT**<sup>15,23</sup>

Treatments are often combined to reduce the pain and other symptoms of irritable bowel syndrome, and it may be necessary to try more than one combination to find the one that is most helpful for the patient.

Treatment is usually a long-term process; during this process, it is important to communicate with healthcare provider about symptoms, concerns, and any stressors or home/work/family problems that develop.

**Monitor symptoms** - the first step in treating irritable bowel syndrome is usually to monitor symptoms, daily bowel habits, and any other factors that may affect your bowels. This can help to identify factors that worsen symptoms in some people with IBS, such as lactose or other food intolerances and stress. A daily diary can be helpful.

**Diet changes** - it is reasonable to try eliminating foods that may aggravate irritable bowel syndrome. Eliminating foods without assistance can potentially worsen symptoms or cause new problems if important food groups are omitted.

**Lactose** - Many clinicians recommend temporarily eliminating milk products since lactose intolerance is common and can aggravate irritable bowel syndrome or cause symptoms similar to IBS. The greatest concentration of lactose is found in milk and ice cream, although it is present in smaller quantities in yogurt, cottage and other cheeses, and any prepared foods that contain these ingredients. All lactose containing products should be eliminated for two weeks. If IBS symptoms improve, it is reasonable to continue avoiding lactose. If symptoms do not improve, Patient may resume eating lactose-containing foods.

**Foods that cause gas** - Several foods are only partially digested in the small intestines. When they reach the colon, further digestion takes place, which may cause gas and cramps. Eliminating these foods temporarily is reasonable if gas or bloating is bothersome.

The most common gas-producing foods are legumes (such as beans) and cruciferous vegetables (such as cabbage, Brussels sprouts, cauliflower, and broccoli). In addition, some people have trouble with onions, celery, carrots, raisins, bananas, apricots, prunes, sprouts, and wheat.

**Increasing dietary fibre** - Increasing dietary fibre (either by adding certain foods to the diet or using fibre supplements) may relieve symptoms of IBS, particularly in constipation. Fibre may also be helpful in people with diarrhoea predominant symptoms since it can improve the consistency of stools. A bulk-forming fibre supplement (such as psyllium or methylcellulose) may also be recommended to increase fibre intake since it is difficult to consume enough fibre in the diet. Fibre supplements should be started at a low dose and increased slowly over several weeks to reduce the symptoms of excessive intestinal gas, which may occur in some people with the beginning of fibre therapy. Fibre can make some people with irritable bowel syndrome more bloated and uncomfortable. If this happens, it is best to decrease fibre intake and consider other laxative treatments for constipation.

### **Psychosocial therapies**

Stress and anxiety can worsen irritable bowel syndrome in some people. The mind-body or brain-gut interaction has been proposed for irritable bowel syndrome and is gaining increasing research attention.<sup>6,7 16</sup> or some patients psychological therapies may help with symptoms.

- Some people benefit from formal counselling, with or without antidepressant or anti-anxiety medications. Have an open discussion with physician about the possible role that stress and anxiety could be having on symptoms, and together decide upon the best course of action.
- Hypnosis and cognitive behavioural therapy may also be helpful. Hypnosis can improve mental wellbeing and cognitive behavioural therapy can provide psychological coping strategies for dealing with distressing symptoms as well as help suppress thoughts and behaviours that increase the symptoms of irritable bowel syndrome.<sup>[16,17]</sup>
- Stress relief-<sup>18</sup> Reducing stress may reduce the frequency and severity of IBS symptoms.

Techniques that may be helpful include:

- Relaxation techniques such as meditation
  - Physical activities such as yoga or tai chi
  - Regular exercise such as swimming, walking or running
- Participation in a support group can also be valuable.
  - Many patients find that daily exercise is helpful in maintaining a sense of well-being.
  - Exercise can also have favourable effects on the bowels.

### **Irritable bowel syndrome medications<sup>15</sup>**

Although many drugs are available to treat the symptoms of irritable bowel syndrome, these drugs do not cure the condition. They are primarily used to relieve symptoms. The choice among these medications depends in part upon whether patients have diarrhoea, constipation, or pain-predominant irritable bowel syndrome.

\*As a general rule, medications are reserved for people whose symptoms have not adequately responded to more conservative measures such as changes in diet and fibre supplements.

**Anticholinergic medications**— Anticholinergic drugs block the nervous system's stimulation of the gastrointestinal tract, helping to reduce severe cramping and irregular contractions of the colon. Drugs in this category include dicyclomine and hyoscyamine. These drugs may be helpful for prevention and thus are most helpful if patients can predict the onset of symptoms. Common side-effects include dry mouth and eyes and blurred vision.

### **Antidepressants**

**TCAs** – There is conflicting evidence about the benefit of antidepressants in IBS. Some meta-analysis have found a benefit while others have not.<sup>[9]</sup> Many tricyclic antidepressants (TCAs) have a pain relieving effect in patient with irritable bowel syndrome. It is believed that these drugs reduce pain perception when used in low doses, although the exact mechanism of their benefit is unknown.

- Commonly used TCAs include amitriptyline, desipramine, and nortriptyline. It is common to experience fatigue when starting a TCA; this is not always an undesirable side effect since it can help improve sleep when TCAs are taken in the evening. TCAs are generally started in low doses and increased gradually & 3-4 weeks is required for its full effect.

- TCAs also slow movement of contents through the gastrointestinal tract and may be most helpful in people with diarrhoea-predominant irritable bowel syndrome.

### **SSRIs—**

- Another class of antidepressants, the selective serotonin reuptake inhibitors, may be recommended if patients have both irritable bowel syndrome and depression. Common SSRIs include fluoxetine, sertraline, paroxetine, citalopram and escitalopram.

**Others**—Other antidepressant medications that may be recommended include mirtazapine, venlafaxine and duloxetine.

### **Antidiarrheal drugs—**

- The drugs loperamide or diphenoxylate with atropine can help slow the movement of stool through the digestive tract. Loperamide and diphenoxylate/atropine are most helpful if patients have diarrhoea predominant IBS. These drugs should only be used as needed rather than on a continuous basis.

### **Anti-anxiety drugs —**

- Diazepam, lorazepam, and clonazepam belong to this class of drugs. Anti-anxiety drugs are occasionally prescribed for people with short-term anxiety that is worsening their IBS symptoms. The use of opioids is controversial due to the lack of evidence supporting their benefit and the potential risk of tolerance, physical dependence and addiction.<sup>21</sup> these drugs should only be taken for short periods of time.

### **Serotonin antagonists**

- **Alosetron** — a selective 5-HT<sub>3</sub> antagonist for IBS-D that is involved in intestinal contractions and sensations. It is approved to treat women with irritable bowel syndrome whose predominant symptom is diarrhoea. Due to severe adverse effects, namely ischemic colitis and severe constipation, they are not available or recommended for irritable bowel syndrome.<sup>[16,17]</sup>

### **Laxatives**

- **Lubiprostone**— Lubiprostone (Amitiza), is a gastrointestinal agent used for the treatment of idiopathic chronic constipation and constipation-predominant IBS. It is well-tolerated in adults, including elderly patients. Lubiprostone is a bicyclic fatty acid (prostaglandin E1 derivative) that acts on the apical aspect of gastrointestinal epithelial cells, producing a chloride-rich fluid

secretion. These secretions soften the stool, increase motility, and promote spontaneous bowel movements (SBM). Unlike many laxative products, Lubiprostone does not show signs of tolerance, dependency, or altered serum electrolyte concentration. Lubiprostone is available for treatment of severe constipation and irritable bowel syndrome in women over 18 years who have not responded to other treatments. It is expensive compared to other agents.

### Serotonin agonists

- **Tegaserod:** — Tegaserod (Zelnorm), a selective 5-HT<sub>4</sub> agonist for IBS-C, Tegaserod was previously used for relieving IBS constipation in women and chronic idiopathic constipation in men and women. However, it was removed from the market in the United States in March 2007 due to concerns about an increased risk of heart attack, stroke, and severe chest pain.

### Antibiotics —

The role of antibiotics in the treatment of irritable bowel syndrome remains unclear. There appear to be some patients whose irritable bowel syndrome symptoms are due to overgrowth of bacteria in the intestines and who benefit from antibiotic treatment. However, more research is needed before antibiotics are recommended for treatment of irritable bowel syndrome. Patients with IBS may have alterations in the intestinal bacteria. Leading investigators consider targeting the intestinal bacteria for the treatment of this condition.

**Neomycin:** Some patients have had improvement with neomycin therapy but marginal efficacy and side effects limit the use of the drug.

**Systemic antibiotic:** Has been reported with mixed results. So limitations of available therapies bring an unmet medical need for novel therapeutic approaches.

**Rifaximin:**<sup>17,27-19</sup> Non aminoglycoside, semi-synthetic, non-systemic antibiotic targets the gut, associated with low risk of bacterial resistance. Study with rifaximin at a dose of 550 mg 3 times daily for 12 weeks was associated with on the basis of daily assessments of IBS symptoms, the proportion of patients with a response to treatment, was significantly greater in the rifaximin group than in the placebo group.<sup>5, 26</sup>

- Adequate Relief of IBS-related bloating
- Relief of IBS- related abdominal pain and loose or watery stools significantly more patients in the rifaximin group than in the placebo group.

- More patients in the rifaximin group than in the placebo group had adequate relief in the first month, with continued relief during the first 2 months
- The safety profile of rifaximin was similar to that of placebo.
- Serious adverse events were recorded in 10 patients in the rifaximin group (1.6%) and 15 patients in the placebo group (2.4%).
- There were no cases of *Clostridium difficile*-associated diarrhoea or ischemic colitis. No deaths were reported.
- Treating IBS is important because the symptoms cause substantial impairment in health-related quality of life, leading to increased use of health resources and reduced work productivity.
- These studies showed that a short course of rifaximin leads to sustained amelioration of the symptoms of IBS without constipation in a subgroup of affected patients.
- The antibiotic effect of rifaximin is the presumed mechanism for its sustained beneficial effects in patients with IBS.
- A response to antibiotic therapy in patients with IBS has been shown to correlate with normalization of the results of lactulose hydrogen breath tests . Rifaximin affects gut bacteria. The durable effects suggest that rifaximin is affecting an underlying cause of IBS that is linked to an alteration in the intestinal microbiota. Treatment with rifaximin at a dose of 550 mg three times daily for 14 days provides better relief of symptoms of IBS for up to 10 weeks after completion of therapy.

**Domperidone-** a dopamine receptor blocker and a parasympathomimetic, has been shown to reduce bloating and abdominal pain as a result of an accelerated colon transit time and reduced faecal load, that is a relief from *hidden constipation*; defecation was similarly improved.<sup>[31]</sup>

### Herbs and Natural Therapies<sup>32,34</sup>

A number of herbal and natural therapies have been advertised for the treatment of irritable bowel syndrome. Unfortunately, there is no evidence supporting their benefit. Although small studies may support some of these therapies, the studies are either too small or have major flaws that make definitive conclusions impossible.

- Peppermint oil -There is some evidence supporting the use of peppermint oil, although it is difficult to make definitive conclusions. Peppermint oil can cause or worsen heartburn.



- Acidophilus [35]-There is increasing interest in the possible beneficial effects of “healthy” bacteria (probiotics) in a variety of intestinal diseases including IBS. Whether supplements containing these bacteria are of any benefit is unproven.
- **Unproven** - *Chamomile tea* is of unproven benefit in irritable bowel syndrome. Furthermore, chamomile can aggravate allergies in people who tend to be allergic to grasses. Evening *primrose oil*, a supplement containing gamma linolenic acid, is of unproven benefit. *Fennel seeds* are of unproven benefit.
- **Potentially unsafe** - Wormwood is of unproven benefit and may be unsafe. *Wormwood oil* can cause damage to the nervous system. Comfrey is of unproven benefit and can cause serious liver problems.

### Prognosis

Although irritable bowel syndrome can produce substantial physical discomfort and emotional distress, most people with irritable bowel syndrome do not develop serious long-term health conditions. Furthermore, the vast majority of people with irritable bowel syndrome learn to control their symptoms. It is important to work with a clinician to monitor symptoms over time. If symptoms change over time, further testing may be recommended. Over time, less than 5% of people diagnosed with irritable bowel syndrome will be diagnosed with another gastrointestinal condition.

### References

1. David C. Dugdale, George F. Longstreth, David Zieve, MD, MHA. Irritable bowel syndrome: Spastic colon; Irritable colon; Mucous colitis; Spastic colitis. - A Review. A.D.A.M. Medical Encyclopedia. Last reviewed : July 22, 2011.
2. Barbara P Yawn \*1, Eva Lydick 2, G Richard Locke 3, Peter C Wollan 1, Susan L Bertram 1 and Margary J Kurland 1. Do published guidelines for evaluation of Irritable Bowel Syndrome reflect practice? : *BMC Gastroenterology*. 26 October 2001, 1:11. available from: <http://www.biomedcentral.com/1471-230X/1/11>
3. Irritable bowel syndrome, NICE Clinical Guideline (February 2008); *Irritable bowel syndrome in adults: diagnosis and management of irritable bowel syndrome in primary care*.
4. Brown PW. “The irritable bowel syndrome”. *Rocky Mountain medical journal*. 1950; 47(5):343–6. PMID 15418074. From Wikipedia, the free encyclopedia.
5. Elizabeth A Williams 1 †, XuiLi Nai 1 †, Bernard M Corfe 2\*. Dietary intakes in people with irritable bowel Syndrome. *BMC Gastroenterology* 2011; 11:9. available from <http://www.biomedcentral.com/1471-230X/11/9>
6. Stewart WF, Liherman JM, Sandler RS, Woods MS, Stemhagen A, Chee E, *et al*. Epidemiology of constipation (EPOC) study in the United States: Relation of clinical subtypes to socio-demographic features. *Am J Gastroenterol* 1999; 94:3530-40.
7. Maxwell PR, Mandel MA, Kumar D. Irritable bowel syndrome. *Lancet* 1997; 350:191-5.
8. Masud MA, Hasan M, Khan AK. Irritable bowel syndrome in a rural community in Bangladesh: Prevalence, symptom pattern, and health care seeking behaviour. *Am J Gastroenterol* 2001; 96:1547-52.
9. Thompson WG, Irvine EJ, Pare P, Ferrazzi S, Rance L. Functional gastrointestinal disorders in Canada. First population - based survey using Rome II criteria with suggestions for improving the questionnaire. *Dis Dig Sci* 2002; 47:225-35.
10. Boyce PM, Natasha A, Koloski BA, Talley NJ. Irritable bowel syndrome according to varying diagnostic criteria: Are the new Rome II criteria unnecessary restrictive for research and practice. *Am J Gastroenterol* 2000; 95:3176-82.
11. Kay L, Jorgensen T, Jensen KH. The epidemiology of irritable bowel syndrome in a random population: Prevalence, incidence, natural history and risk factors. *J Intern Med* 1994; 236:23-30.
12. Mariette Bengtsson\*1,2, Bodil Ohlsson†1,3 and Kerstin Ulander†4. Development and psychometric testing of the Visual Analogue Scale for Irritable Bowel Syndrome (VAS-IBS); *BMC Gastroenterology* 3 May 2007, 7:16 .available from: <http://www.biomedcentral.com/1471-230X/7/16>
13. Andrea K Roalfe\*, Lesley M Roberts and Sue Wilson. Evaluation of the Birmingham IBS symptom questionnaire. *BMC Gastroenterology* 23 July 2008, 8:30 available from: <http://www.biomedcentral.com/1471-230X/8/30>
14. Mayer EA. “Clinical practice. Irritable bowel syndrome”. *N. Engl. J. Med.* April 2008; 358 (16): 1692–9.
15. Irritable bowel syndrome at the Open Directory Project, From Wikipedia, the free encyclopedia [show] · v · d · e Digestive system · Digestive disease · Gastroenterology (primarily) K20–K93, 530–579.
16. Dlugosz et al. Chlamydia trachomatis antigens in enteroendocrine cells and macrophages of the small bowel in patients with severe irritable bowel syndrome, *BMC Gastroenterology* 2010; 10:19. <http://www.biomedcentral.com/1471-230X/10/19>
17. Ford AC, Talley NJ, Spiegel BM, et al; Effect of fibre, antispasmodics, and peppermint oil in the treatment



- of irritable bowel syndrome: systematic review and meta-analysis. *BMJ*. 2008 Nov 13; 18.
18. Poynard T, Regimbeau C, Benhamou Y Meta-analysis of smooth muscle relaxants in the treatment of irritable bowel syndrome. *Aliment Pharmacol Ther*. 2001 Mar; 15 (3):355-61.
  19. Böhmer CJ, Tuynman HA “The effect of a lactose-restricted diet in patients with a positive lactose tolerance test, earlier diagnosed as irritable bowel syndrome: a 5-year follow-up study”. *Eur J Gastroenterol Hepatol*. August 2001; 13 (8): 941-4.
  20. Kennedy T, Jones R, Darnley S, Seed P, Wessely S, Chalder T “Cognitive behaviour therapy in addition to antispasmodic treatment for irritable bowel syndrome in primary care: randomised controlled trial”. 2005; *BMJ* 331 (7514): 435.
  21. Heymann-Mönnikes I, Arnold R, Florin I, Herda C, Melfsen S, Mönnikes H “The combination of medical treatment plus multicomponent behavioral therapy is superior to medical treatment alone in the therapy of irritable bowel syndrome”. *Am J Gastroenterol* . 2000; 95(4): 981-94.
  22. Shen, YH.; Nahas, R. “Complementary and alternative medicine for treatment of irritable bowel syndrome.”. *Can Fam Physician* . Feb 2009; 55 (2): 143-8.
  23. Ducrotté, P. “[Irritable bowel syndrome: current treatment options]”. *Presse Med*. Nov 2007; 36 (11 Pt 2): 1619-26.
  24. *Clin Gastroenterol* 40 (1): 37-43.
  25. Jones R; Treatment of irritable bowel syndrome in primary care. *BMJ*. 2008 Nov 13; 337: a2213.
  26. Warfield, Carol A.; Zahid H. Bajwa (2003). *Principles and Practice of Pain Medicine*. McGraw-Hill Professional. ISBN 0071443495.
  27. Pimentel M, Park S, Mirocha J, Kane SV, Kong Y (2006). “The effect of a nonabsorbed oral antibiotic (rifaximin) on the symptoms of the irritable bowel syndrome: a randomized trial”. *Ann. Intern. Med.* 145 (8): 557-63. PMID 17043337.
  28. Pimentel M, Lembo A, Chey WD, et al; Rifaximin therapy for patients with irritable bowel syndrome without N Engl J Med. 2011 Jan 6;364(1):22-32.
  29. Sharara AI, Aoun E, Abdul-Baki H, Mounzer R, Sidani S, Elhajj I. “A randomized double-blind placebo-controlled trial of rifaximin in patients with abdominal bloating and flatulence”. *Am J Gastroenterol* 2006; 101 (2): 326-33.
  30. Raahave D, Christensen E, Loud FB, Knudsen LL. Correlation of bowel symptoms with colonic transit, length, and faecal load in functional faecal retention 2009;56:83-8.
  31. Madisch A, Holtmann G, Plein K, et al; Treatment of irritable bowel syndrome with herbal preparations: results of a double-blind, randomized, placebo-controlled, multi-centre trial. *Aliment Pharmacol Ther*. 2004 Feb 1;19(3):271-9.
  32. Madisch A, Holtmann G, Plein K, Holz J (2004). “Treatment of irritable bowel syndrome with herbal preparations: results of a double-blind, randomized, placebo-controlled, multi-centre trial”. *Aliment Pharmacol Ther* 19 (3): 271-9.
  33. Quigley EM. Germs, gas and the gut; the evolving role of the enteric flora in IBS”. *Am J Gastroenterol* 2006 (2): 334-5.
  34. Brenner DM, Moeller MJ, Chey WD, Schoenfeld PS. “The utility of probiotics in the treatment of irritable bowel syndrome: a systematic review”. *Am. J. Gastroenterol*. April 2009; 4(4): 1033-49; quiz 1050.
  35. Nikfar S, Rahimi R, Rahimi F, Derakhshani S, Abdollahi M (). “Efficacy of probiotics in irritable bowel syndrome: a meta-analysis of randomized, controlled trials”. *Dis. Colon Rectum*. December 2008; 1 (12): 1775-80.