CHAPTER-I

INTRODUCTION

‘Abdominal pain and altered bowel habits in the absence of any recognized disease is known as Irritable Bowel Syndrome (IBS)’. This is one of the three “functional intestinal disorders” in which psychological assessment procedures could play a major role. According to Berkow and Fletcher (1992) IBS fits into a category of gastrointestinal (GI) illnesses in which a pathological condition is not present, poorly established or does not entirely explain the clinical state. IBS is described as a functional disorder because there is no agreed structural abnormality associated with it. It follows that there is no agreed pathophysiology in IBS (Dent, 2000). Hatch, Fisher and Rugh (1990) defined IBS as “…the presence of abdominal pain and altered bowel habits in the absence of any known pathophysiological symptoms and including symptoms of clinical anxiety and/or depression.”

As described in Jackson gastroenterology (2002) medically, IBS is known by a variety of other terms: Spastic colon, Spastic colitis, mucous colitis and nervous or functional bowel. It includes diseases such as non-ulcer dyspepsia and chronic constipation or diarrhea. These diseases are all characterized by chronic or recurrent gastrointestinal symptoms for which no structural or biochemical causes can be found. But Irritable Bowel Syndrome (IBS) is the most suitable and accurate term currently available, as it emphasizes that the condition is a motor disorder manifesting irritability, that it is not a single disease but a syndrome, and that many areas of the gut are involved.
Many of the other commonly used terms are either inadequate, inaccurate, or both. Nervous colon, unstable colon, spastic colon are inadequate because they describe only some possible etiologic influences (such as nervous factors) or some signs (e.g. spasticity). Furthermore, they ignore the involvement of areas other than the colon. The terms nervous colitis, spastic colitis, and mucous colitis have two additional faults. They are physiologically incorrect, because inflammation is not present, and they are frightening to the patients because they are easily confused with ulcerative colitis. Therefore, the use of the terms “colitis” is to be sharply condemned as both inaccurate and psychologically damaging. Although it may be associated with severe pain and discomfort, IBS does not predispose to other chronic or life-threatening conditions such as inflammatory bowel disease or cancer, and there is no evidence that it interferes with longevity.

The concepts of IBS and its postulated pathogenesis have evolved since the earliest published descriptions of a disorder compatible with it in the nineteenth century (Drossman, 1994; Schuster, 1994). Osler coined the term mucous colitis in 1892 when he wrote of a disorder of mucorrhea and abdominal colic with a high incidence in patients with coincident psychopathology. Initially, excessive colonic mucus production was emphasized as characteristics of IBS, giving rise to the name ‘mucus colitis.’ Since that time, the syndrome has been referred to by sundry terms, including spastic colon, irritable colon, and nervous colon.

In the 1920s, IBS was described as a nervous response to stress, with emphasis on the etiological importance of colonic spasm, which was attributed to autonomic nerve dysfunction. Almy and others later
showed that colonic contractions were increased by physical and psychological stress. (Almy and Tulin, 1947; Deller and Wengel, 1965).

One of the first references to the concept of an "irritable bowel" appeared in the Rocky Mountain Medical Journal in 1950 (Brown, 1950). The term was used to categorize patients who developed symptoms of diarrhea, 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. One paper from the 1980s investigated “learned illness behaviour” in patients with IBS and peptic ulcers (Whitehead, et al., 1982). Another study suggested that both IBS and stomach ulcer patients would benefit from 15 months of psychotherapy (Svedlund and Sjodin, 1985). Later, it would be found that most stomach ulcers were caused by a bacterial infections with Helicobacter pylori (Damianos and McGarrity, 1997).

Additional publications suggesting the role of brain-gut “axis” appeared in the 1990s, such as a study entitled Brain-gut response to stress and cholinergic stimulation in IBS published in Journal of Clinical Gastroenterology in 1993 (Fukudo, et al., 1993). A 1997 study published in Gut magazine suggested that IBS was associated with a “derailing of the brain-gut axis” (Orr, et al., 1997).

The irritable bowel syndrome (IBS) is the prototypic functional bowel disorder in terms of its heterogeneous nature, multi factorial pathogenesis and requirement for individualized diagnosis and treatment (Longstreth, 1998). IBS is one of the most commonly encountered gastrointestinal disorders, and it is also one of the least understood, in part because it is not a disease but a syndrome
composed of a number of conditions with similar manifestations. IBS is a heterogeneous syndrome with many potential mechanisms responsible for its clinical presentations (Cremonini and Talley, 2005).

Psychologists and psychiatrists worldwide use either the ICD-10 or DSM-IV systems of classification to diagnose mental illness. In DSM IV irritable bowel syndrome is mentioned on Axis one with a category called somatoform disorder. It is given a code number that is 300.81 and in ICD 10 it is mentioned in two chapters. In chapter five block F45 (somatoform disorders) and in chapter eleven block K58 (irritable bowel syndrome)

Baron (2003) defined somatoform disorder in his book ‘Psychology’ as ‘an individual would show some physical symptoms (such as deafness or paralysis of some part of the body); yet careful examination would reveal no underlying physical causes for the problem. Such disorders are known as somatoform disorders-disorders in which individuals have physical symptoms in the absence of identifiable physical causes for these symptoms.’ As mentioned in DSM IV the most common characteristic of the somatoform disorder is the appearance of physical symptoms or complaints for which they have no organic basis. Such dysfunctional symptoms tend to range from sensory or motor disability, hypersensitivity to pain. Somatoform disorders are best thought of as multi-factorial in origin. It is rare than one mechanism (be it emotional or physical) is responsible for a patient’s symptoms. Somatoform disorder is further classified into six categories named as somatization disorder, hypochondriacal disorder, somatoform pain disorder and chronic pain, conversion (or dissociative motor) disorder, body dysmorphic disorder and functional somatic syndromes. The functional somatic syndromes refer to a number of related syndromes
that have been characterized by the reporting of somatic symptoms and resultant disability rather than on the evidence of underlying conventional disease processes. Irritable bowel syndrome is one of the functional somatic syndrome.

**Types of IBS**

Two of the leading medical researchers in the field of IBS, Drossman and Thompson (1992), divided the IBS patient population into three parts on the basis of severity and impact on the patients life and gave different treatment recommendation for each part.

**Mild IBS:** About 70% of IBS patients are estimated to fall into this category. They are not believed to suffer from noticeable psychological or psychiatric comorbidity and their disorders are episodic not greatly interfering with their lives. For these patients, Drossman and Thompson recommends, a). Education, b). Reassurance that the patient does not have a serious disease and, c). Possibly a dietary intervention to detect food sensitivities or the additional of fiber or bulking agents to the diet. Drossman and Thompson believe these patients do not need psychological help.

**Moderate IBS:** About 25% of IBS patients fall into this category, they are likely to have psychological or psychiatric comorbidity and their lives are probably disrupted noticeably by their symptoms. They are more likely to be found in the practices of the specialist, the gastroenterologist. Drossman and Thompson makes some cautious Pharmacotherapy recommendations for these patients and also suggests referral for mental health (e.g. Psychological Services).
Severe IBS: The last 5% of IBS patients fall into this category. They are seen having noticeable psychological and psychiatric co morbidity. Drossman and Thompson imply that these patients will not readily take a referral for mental health services. Their treatment recommendations are for a multidisciplinary approach.

Patients with IBS have traditionally been described as being "constipation predominant," "diarrhea predominant," or as having an alternating pattern of constipation and diarrhea (i.e. so-called "alternators"). According to Holten, et al., (2003) IBS can be classified as either diarrhea-predominant (IBS-D), constipation-predominant (IBS-C) or IBS with alternating stool pattern (IBS-A or pain-predominant). In some individuals, IBS may have an acute onset and development after an infectious illness characterized by two or more of the following: fever, vomiting, diarrhea or positive stool culture. This post infective syndrome has consequently been termed “post-infectious IBS” (IBS-PI).

Prevalence and Incident

The diagnosis of IBS is based on the interpretation of clinical criteria, and the prevalence is influenced by social and cultural factors. What is considered disease and the reasons for seeking medical attention varies with populations, and this may explain the differences in the prevalence of IBS worldwide: IBS is as common in China as in the western countries, but less common in Thailand. In South African rural areas, IBS is not as common when compared with the cities. There is a female predominance in the western world, where women are 3 to 4 times more likely than men to be diagnosed with IBS, but females represent only 20 to 30% of IBS patients in India and Sri Lanka (Longstreth, et al., 2006). Race does not appear to be a factor; the
prevalence is similar in whites and blacks. Once IBS is diagnosed, 75% of patients remain symptomatic 5 years later. (Harvey, et al., 1987)

IBS is the most prevalent digestive disease, affecting an estimated 30 million Americans (International foundation of functional gastrointestinal disorders, 2006). It is second only to the common cold as the leading cause of workplace absenteeism in the United States. (Cash, et al., 2005). IBS though affect people of all ages and both the sexes; it is more common in young people; usually the late adolescence or early adulthood. A population based study of 507 middle school and high school students by Hyams, et al. (1996) indicated that 6-14% of the adolescent population note symptoms consisted with IBS.

In the Olmsted County Study, Talley, et al. (1995a) found a prevalence rate of IBS of 17.7% with women out numbering men 1.44 to 1.0%. Studies show that IBS affects about 25 to 55 million people in United States and results in 2.5 to 3.5 million yearly visits to physicians. Approximately 20 to 40% of all visits to gastroenterologists are due to IBS symptoms.

In a Canadian sample Thomson, et al. (2002) reported a prevalence of 13.5% using Rome I and 12.1% using Rome II criteria. In the US householder survey (Drossman, et al., 1993) 11% of those surveyed reported symptoms consistent with IBS. In a large survey (> 41,000 patients) recently conducted in eight European countries (Hungin, et al., 2003) overall prevalence of IBS was 9.6% and ranged from 6.2 to 12% across countries.

The overall prevalence of IBS is estimated to be approximately between 10% and 20% of the population (Talley, et al., 1995b). An illness of young or middle-aged adults, IBS will affect 15% of the
American population – approximately 40 million people (McQuillan, 1995). Studies also show that in non-western countries such as Japan, China, India and Africa, IBS appears to be very common. Prevalence in individuals younger than 50 years of age has been determined to be somewhere between 15% and 20%, and in individuals older than 50 years of age, prevalence is approximately 10% to 12% (Longstreth and Wolde-Tsadik, 1993).

The prevalence of IBS was 11.0%, 10.4%, and 8.6% by Manning (>1 criteria), Rome I and Rome II criteria, respectively. There was a higher prevalence of IBS in those <50 years of age (9.7% vs. 5.8% 50 or > years, p = 0.002), with more than 6 years of education (9.8% vs. 5.9% 6 year or <, p = 0.002) and living in landed property (16.8% vs. 8.2% living in apartments and public housing, p = 0.008). (Gwee, et al., 2004) At least one of the Manning's symptoms was present in 307 out of 370 subjects (83%). The male female ratio was 5.3:1. Among males, 288 (35%) and among females 82 (53.2%) persons had at least some degree of abdominal discomfort. Other common symptoms were: excessive passage of wind (42.2%), irregular bowel habits (33%), excessive belching (30.8%), constipation (27.5%) and feeling of incomplete evacuation (28.1%). About one third of the symptomatic subjects (134 or 36.2%) had seen a doctor or wanted to be seen by a specialist. Overall prevalence of the symptoms consistent with irritable bowel syndrome thus, is 33% though only about a third of these may possibly consult a doctor. (Anand, et al., 1998). A recent large community survey of over 2000 adults in Mumbai also recorded a higher prevalence of IBS in men (7.9%) than in women (6.9%) (Shah, et al., 2001).

According to Mayo clinic (2006) IBS Statistics is as follows:
- 45 - Age by which most new cases of IBS are presented.
- 92% - Percentage of older adults who are troubled by IBS symptoms.
- 500,000 - Number of physician visits per year made by patients 65 years of age or older for IBS.
- 16% - Percentage of students between 11 and 17 years of age who suffer from IBS symptoms.
- 10% - Percentage of annual physician visits annually for IBS.

Irritable Bowel Syndrome (IBS) is a common functional bowel disorder with a 12-month prevalence of about 20% in Western countries (Gwee, 2005) and 2–7% in Asian communities (Ho, et al., 1998; Kumano, et al., 2004; Han, et al., 2006). Its prevalence has long been appreciated in the West; what is new is a recent accumulation of evidence to indicate that IBS is also highly prevalent in the East and even in developing nations like Pakistan (Kang, 2005; Gwee, 2005). These same studies have also revealed some interesting differences in demographics and mode of presentation between East and West. Thus, female predominance, a hallmark of IBS in Europe and North America, is not as striking in the East and may not even exist in certain countries, where male IBS subjects may be in the majority. Furthermore, symptom patterns may vary, with lower abdominal pain and a preoccupation with bowel habit being the foremost pattern in the West, whereas upper abdominal symptoms are common in the East where sufferers also seem less exercised about bowel dysfunction. The latter reminds us of the importance of overlap with another functional disorder, functional or non-ulcer dyspepsia (FD). Some, indeed, would refer to evidence such as this to emphasize the degree of overlap between these conditions and would question whether FD, a disorder which has proven difficult to
define clinically, is really a distinct entity but rather a part of the spectrum of IBS, a much more accepted clinical entity (Quigley, 2007).

**Symptoms of IBS**

IBS is a heterogeneous disorder with distinct symptoms presentations. According to Schmulson and Chang (1999), the primary symptoms of IBS are abdominal pain or discomfort in association with frequent diarrhea or constipation, a change in bowel habits. There may also be urgency for bowel movements, a feeling of incomplete evacuation (tenesmus), bloating or abdominal distention (Talley, 2006). People with IBS more commonly than others have gastroesophageal reflux, symptoms relating to the genitourinary system, psychiatric symptoms such as depression and anxiety, fibromyalgia, chronic fatigue syndrome, headache and backache. (Talley, 2006; Whitehead, et al., 2002).

Symptoms are markedly influenced by psychologic factors and stressful life situations. Although diagnosis requires the exclusion of organic diseases, it is conformed by positive clinical, psychological, laboratory, and motility findings. Four symptoms that help distinguish IBS from organic disease are (1) visible abdominal distention, (2) relief of abdominal pain by bowel movement, (3) more frequent bowel movements with the onset of pain, and (4) looser stools with onset of pain. Ninety-one percent of IBS patients have two or more of these four symptoms, whereas only 30 percent with organic disease have two or more (Manning, et al., 1978). However, several studies suggested that these criteria have less validity for men than for women (Smith, et al., 1991; Talley, et al., 1990; Talley, 1991).
Different subsets of IBS can be defined based on the dominant symptoms. Symptoms may be broadly classified in three categories:

1. Gastrointestinal symptoms
2. Non colonic gastrointestinal symptoms
3. Extra-intestinal symptoms
4. Psychological features and stress
5. Inciting events

1. Gastrointestinal Symptoms

A. Altered Bowel Habits

A change in bowel habits is a key element in IBS. Most patients with IBS complain of a change in bowel habits beginning in adolescence or early adult life. Only a small number have had lifelong bowel irregularity. The disturbance in bowel function is gradually progressive, eventually developing a characteristic pattern, which for most is one of alternating constipation and diarrhea, with one of these symptoms predominating. The frequency and quality of each symptom, although highly variable from individual to individual, are fairly consistent for a specific patient. The terms constipation and diarrhea may reflect a wide variety of different symptoms experiences to different patients, and so whenever a patient uses them, an exploration of their meaning is required (Talley, et al., 1994a).

a. **Constipation:** Any combination of infrequent defecation, passage of hard stools, excessive straining, feelings of incomplete rectal evacuation, or rectal discomfort may be referred to as constipation by the patient. Constipation is difficult to define because it has both objective and subjective components. It may be defined objectively as the passage of fewer than three stools per week (Connell, et al.,
The subjective symptom is that of difficult or painful evacuation. Most patients who seek medical attention for constipation complain of both infrequent and difficult passage of stools; pain is viewed as the more troublesome component. Stool consistency (hard stool) is a more variable complaint, and one that is more difficult to evaluate.

The best historical evidence of altered bowel habits is a reliable account of a definite change in frequency, consistency, and ease of passage. Because laxatives are usually taken during periods of constipation, it is sometimes difficult to determine whether the diarrheal phase is part of the natural history or is induced by the laxatives. Likewise, in chronic cases, it is difficult to determine whether the constipation has developed naturally in the course of the illness or whether it is a result of repeated and chronic laxative abuse.

b. Diarrhea: Now let’s talk about diarrhea. Increased stool frequency, urgency, or the passage of liquid or watery stools, or even more frequent small hard stools, may be referred to as diarrhea by the patients. It is more difficult to define diarrhea than constipation objectively, as these symptoms may refer to both altered frequency and altered consistency of stools. However, the number of stools described as diarrheal (that is, loose, mushy, or watery) sometimes is not more than three per day, the accepted upper limit of normal. Indeed, a single abnormal stool daily may be viewed by the patient as diarrhea. To confirm the existence of diarrhea under these circumstances, the physician must determine that established bowel habit has changed.
But now stools form can be measured objectively and graded by patient or physician; the Bristol Stool Form Scale now is routinely used in clinical trials, and changes in stool form (at extreme ends of the scale) roughly correlates with colonic transit time (Degen and Phillips, 1996; Lewis and Heaton, 1997).

In 1962, Chaudhary and Truelove performed a comprehensive clinical study of IBS and subdivided it into spastic colon (pain and bowel habit abnormality) and painless diarrhea. Of additional major importance to clinical practice was the report that certain symptoms distinguish IBS from organic disease (Manning, et al., 1978). The current definition of IBS requires pain (Thompson, et al., 1992) which separates it from functional diarrhea and functional constipation.

According to Saito, et al. (2002) and Lau, et al. (2002) IBS is ubiquitous and has been found in every country in which it has been sought. The balance of diarrhea versus constipation as the main symptom varies in a somewhat unpredictable way, with constipation predominating in rural Bangladesh (Masud, et al., 2001) and Singapore, (Gwee, et al., 2004) while diarrhoea predominates in Southern India (Kapoor, et al., 1985) and Guangzhou City, China (Wei, et al., 2001).

B. Abdominal Pain:

Abdominal pain is considered to be an important feature of IBS. IBS should not be diagnosed in the absence of abdominal discomfort or pain (Drossman, et al., 2000a). It is the commonest symptom. According to Rome II criteria, abdominal pain or discomfort is a prerequisite clinical feature of IBS.
Pain is variously described as vague, bloating, crampy, burning, dull, aching, knife-like, sharp, or steady. It may be of variable intensity, localized, or diffuse. Acute episodes of severe, sharp, knife-like pain may be superimposed on a constant or intermittent background of dull aching pain. The pain is more often located in the left lower quadrant than at any other site and more often in the lower abdomen than in the upper. It is experienced more often in several sites than in one site. It usually does not radiate, but when severe it may be associated with low back pain. Rectal pain or tenesmus may be present and ranges from mildly annoying to extremely disturbing. The locus of this pain is also diffuse rather than discrete.

The intensity and location of abdominal pain in IBS are highly variable, even within an individual patient. Abdominal pain in IBS is localized to the hypogastrium in 25%, the right side in 20%, the left side in 20%, and the epigastrium in 10% of patients (Crouch, 1988). Faull and Nicol (1986) determined the characteristics of abdominal pain in 50 6-year-old children suffering with chronic abdominal pain. The pain in these children was of varying duration (5 minutes to 24 hours per day) and was usually felt in the periumbilical region. Abdominal pain was often associated with other symptoms such as pallor (76%), nausea (52%), anorexia (58%) and tiredness (66%). Most parents (82%) described their children as miserable or listless during an episode of pain. Children ceased to have pain during school holidays about 30% of the time, and 42% of children missed some school because of their pain, although regular absence was uncommon. There was no generalized pattern to the onset of pain in the group as a whole, although some children had a specific time of onset that was typical for them.
Several factors exacerbate or reduce pain in IBS. Many patients report increased symptoms during periods of stress or emotional turmoil such as that associated with job or marital difficulties (Simren, et al., 2001).

C. Abdominal Distention (bloating), Belching and Flatus:

Bloating or perceived abdominal distention is a common complaint in IBS. Belching and “excessive” flatus is also commonly reported. Abdominal bloating is particularly troublesome for IBS patients. Patients usually report bloating in the lower portion of the abdomen. In many, symptoms are less troublesome in the morning and become worse as the day progresses (Maxton and Whorwell, 1992). Patients may even be unable to tolerate wearing a belt at the end of the day because of this feeling of distention, which is thought to represent a heightened awareness of or sensitivity to their distention rather than an increase in abdominal girth. No comparable symptoms have been regularly described in children although clinical experience has suggested similarities.

D. Increased Stool Mucus:

Increased stool mucus is often seen in IBS. The amount of mucus produced by patients with IBS is variable and its pathogenesis obscure. In some instance it goes unnoticed until question draw attention to it, whereas in others it is prominent enough to cause concern to the patient. It can be clear or whitish.

Some of the earliest descriptions of IBS (Bockus, et al., 1928) emphasized this as one of the cardinal features of the disorder and
incorrectly attributed it to inflammation of the intestine – an error that has been perpetuated unfortunately, in continued use of inappropriate terminology, such as “mucous or spastic colitis.”

2. **Non Colonic Gastrointestinal Symptoms**

IBS is accompanied by numerous symptoms referable to other sections of the gastrointestinal tract. These clinical features can help support the diagnosis of IBS but in themselves are not diagnostic. Dyspepsia, heartburn, pyrosis, nausea and vomiting appear in one fourth to one half of patients (Keeling and Fielding, 1975; Watson, et al., 1976), and esophageal symptoms in 44% to 51% (Costantini, et al., 1993). Diminished resting pressure in the lower esophageal sphincter and abnormal contractions in the body of the esophagus have been demonstrated in IBS (Whorwell, et al., 1986a; Ayres, et al., 1989) and may account for some of these symptoms. In IBS motor abnormalities have been demonstrated also in the stomach and gallbladder (Kamath, et al., 1991), small intestine, (Kumar and Windgate, 1985; Kellow and Phillips, 1987; Kellow, et al., 1990) symptoms have been described in all these organs. (Maxton, et al., 1991) another possible mechanism (excessive reflux into the stomach) has been mentioned.

The increased prevalence of IBS symptoms gynecologic patients suggests either that women with IBS are wrongly referred or that some gynecologic disorders may be associated with symptoms of IBS (Hogston, 1987; Prior, et al., 1989; Whitehead, et al., 1990a).

3. **Extra-intestinal Symptoms**

Although gastrointestinal symptoms predominate, extra-intestinal complains are common in IBS. Patients with functional gut disorders
visit primary care physicians 3 times as often for non gastrointestinal problems as do healthy persons and undergo more appendectomies and hysterectomies (Keeling and Fielding, 1975; Sandler, et al., 1984; Drossman, et al., 1988; Whitehead, et al., 1990a). Chronic pelvic pain is more commonly reported by patients with IBS than patients with inflammatory bowel disease. (Walker, et al., 1996)

Dysmenorrhea has been noted in as many as 90 percent of patients with IBS, urinary frequency in 65 percent and dyspareunia in one third (Fielding, 1977). Headaches, usually of the migraine type, may occur with an increased frequency in both children (Oster, 1972) and adults (Kirsen and Palmer, 1958) with IBS. Urodynamic studies reveal urinary bladder dysfunction in 50 percent of IBS patients, compared to 13 percent of controls, and urinary symptoms are significantly more common in IBS patients than in matched controls (Whorwell, et al., 1986b). The frequency of these associated symptoms involving autonomically innervated organs has raised the suspicion of a generalized autonomic disturbance that includes the bowel and genitourinary and vascular systems. The association of IBS and primary fibromyalgia has also been suggested (Vealea, et al., 1991).

Also patients with functional bowel disorders have higher incidences of peptic ulcer disease, hypertension, low back pain, headaches, and rashes than the general population and more commonly reported fatigue, loss of concentration, insomnia, palpitations and unpleasant tastes in the mouth (Whitehead, et al., 1982; Whorwell, et al., 1986a; Crouch, 1988).

4. Psychological Features and Stress
In their study Appley and Naish (1958) observed that patients with chronic abdominal pain had a typical psychological profile. They described them as “timid, nervous, anxious, or over-conscientious,” and stated that in children with this underlying predisposition, school or other difficulties seemed to be the trigger for evoking abdominal pain.

Chaudhary and Truelove (1962) noted abdominal psychological manifestations that influenced the onset of symptoms or exacerbated previously existing symptoms in as many as 80% of the 130 IBS patients they studied. Depression, anxiety, and substitution of somatic complaints for anxiety or depression (somatization) were the commonest psychological manifestations noted. Other researchers found that between 54 and 100% of patients with IBS experience some form of mood or anxiety disorder (Hislop, 1971; Young, et al., 1976; Wender and Kalm, 1983). Walker and coworkers (1990) compared the psychological profiles of 28 patients with IBS and compared these patients with 19 controls with inflammatory bowel disease. They found that patients with IBS had intermittent DSM III R anxiety and depressive disorders and that even between major episodes they retained a substantial but subclinical psychological distress. The lifetime prevalence of psychiatric disorders in the IBS patients they studied was 93%, with a 61% lifetime prevalence of depression. A large percentage of patients with IBS also had a prior diagnosis of anxiety disorders. The authors speculated that these anxiety disorders were due to a dysregulation of autonomic nervous system function, which could be associated with the development of a disorder of enteric nervous system motility.

These lines of evidence suggest that psychologic factors are not a result of the disorder, but instead contribute to the onset and
exacerbation of symptoms. In 85 percent of patients, psychologic factors either precede or coincide with the onset of gastrointestinal complaints and in only 15 percent do the gastrointestinal complaints come first (Wangle and Deller, 1965; Hislop, 1971). A study comparing people with IBS who do not seek medical care with those who do concluded that psychopathology is less important as a determinant of IBS than as a determinant of who will consult a physician (Whitehead, et al., 1988a). Half of patients also note a relationship between emotional stress and exacerbation of symptoms (Chaudhary and Truelove, 1962; Wangle and Deller, 1965; Waller and Misiewicz, 1969; Hislop, 1971,). No specific personality profile seems to be characteristic of this disorder (Whitehead and Schuster, 1979). Depression, although frequently present, usually is not severe, but suicidal tendencies have been reported to be detectable in over 20 percent of patients (Hislop, 1971).

Hodges and coworkers (1984) attempted to define the pattern of life events in children with recurrent abdominal pain by means of standardized psychological testing with the Coddington Life Events Inventory (Coddington, 1972). They found that children with recurrent abdominal pain and behavioural problems were experiencing high levels of stress, with a Coddington Life Events score between one and two standard deviations above the normative mean for age.

Robinson and coworkers (1988) found that adolescents with functional complaints in general (chest pain, recurrent abdominal pain, limb pain, and hyperventilation syndrome) had lower self esteem, more psychological symptoms, and a lower self-evaluation than did patients coming for physical examination or routine health maintenance.
Psychological disorders are frequently seen concomitantly with patients with IBS (Walker, et al., 1992). No specific personality profile appears to be associated with IBS (Frigerio, et al., 1992). However, specific psychiatric disorders are increasingly associated with IBS. Panic disorder, characterized paroxysmal attacks of intestine fear and autonomic arousal, has been associated with IBS (Lydiard, et al., 1994). In one study, an axis I psychiatric disorder (a major clinical syndrome as described in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association) either preceded or coincided with the onset of gastrointestinal complaints in 77% of patients. The investigators found a high lifetime prevalence of mood disorders (depression) and anxiety disorders, particularly panic disorder, in IBS patients (Lydiard, et al., 1993). Similarly IBS is found in 59% of dysthymic patients (Masand, et al., 1997). A significant overlap of panic disorder and IBS has been observed with similar demographic and clinical characteristic (Lydiard, et al., 1994). In one study, 46% of patients with panic disorder met criteria for IBS versus 2.5% of controls (Kaplan, et al., 1996).

Symptoms of IBS appear after or during periods of stress and emotional tension. Patients with IBS report increased frequency of stressful life experiences (Mendeloff, et al., 1970), more over, an increased state of arousal may add further to the susceptibility of the patients to these onslaughts.

Although emotional stress can trigger hypermotility in normal subjects as well as in patients with IBS, (Almy and Tulin, 1947; Wangle and Deller, 1965) the threshold is lower in IBS patients.

5. Inciting Events
Clearly, there may be an association between exacerbations of IBS and stressful or anxiety provoking experiences. Food intolerances may also play a role, an individual patients often note the association of abdominal pain with the ingestion of specific foods, such as wheat and milk products, as well as alcohol caffeine-containing beverages. Cigarette smoking may exacerbate the symptoms of IBS, and women with IBS report an exacerbation of their symptoms with menses (Whitehead, et al., 1990a).

Although many IBS patients believe that symptoms are caused by specific foods, such relationships are difficult to prove. Unfortunately, many patients restrict diets unnecessarily. However, the avoidance of foods known to produce intestinal gas, particularly legumes, is prudent. Although these foods do not cause IBS, they can lead to abdominal bloating and discomfort.

Symptoms of IBS can be summarized as follows:

- Altered bowel habits
  - Constipation variably results in complaints of hard stools of narrow caliber, painful or infrequent defecation, and intractability to laxatives.
  - Diarrhea usually is described as small volumes of loose stool, with evacuation preceded by urgency or frequent defecation.
  - Postprandial urgency in, characteristically, one feature predominates in a single patient, but significant variability exists among patients.
- Abdominal pain
o Descriptions are protean. Pain frequently is diffuse without radiation. Common sites of pain include the lower abdomen, specifically the left lower quadrant.

o Acute episodes of sharp pain are often superimposed on a more constant dull ache.

o Meals may precipitate pain, and defecation commonly improves pain. Defecation may not fully relieve pain.

o Pain from presumed gas pockets in the splenic flexure may masquerade as anterior chest pain or left upper quadrant abdominal pain. This splenic flexure syndrome is demonstrable by balloon inflation in the splenic flexure and should be considered in the differential of chest or left upper quadrant abdominal pain.

- Abdominal distention
  o Patients frequently report increased amounts of bloating and gas. Quantitative measurements fail to support this claim.
  o People with irritable bowel syndrome (IBS) may manifest increasing abdominal circumference throughout the day, as assessed by CT scan. They may also demonstrate intolerance to otherwise normal amounts of abdominal distention.

- Clear or white mucorrhea of a non-inflammatory etiology is commonly reported.

- Non-colonic and extra-intestinal symptoms
  o Epidemiologic associations with dyspepsia, heartburn, nausea, vomiting, sexual dysfunction (including dyspareunia and poor libido), and urinary frequency and urgency have been noted.
  o Symptoms may worsen in the premenstrual period.
- **Stressor-related symptoms**
  - These symptoms may be revealed with careful questioning.
  - Emphasize avoidance of stressors.

- **Inconsistent symptoms** are an alert to the possibility of an organic pathology. Symptoms not consistent with irritable bowel syndrome include the following:
  - Onset in middle age or older
  - Acute symptoms: Irritable bowel syndrome is defined by its chronic nature.
  - Progressive symptoms
  - Nocturnal symptoms
  - Anorexia or weight loss
  - Fever
  - Rectal bleeding
  - Painless diarrhea
  - Steatorrhea
  - Lactose and/or fructose intolerance
  - Gluten intolerance

**Pathophysiology**

IBS is a biopsychosocial disorder. This means that biological, social, and psychological components play a role in disease perception, symptom generation, and healthcare seeking. For a physician to be truly effective in approaching the patient with IBS, all of these factors need to be considered (Drossman, et al., 2000a).
A number of different mechanisms have been implicated in the pathogenesis of IBS including abnormal motility, visceral hypersensitivity, low-grade inflammation, and stress (Drossman, et al., 2002; Talley and Spiller, 2002; Mayer and Collins, 2002). Genetic factors could modulate the processing of gut signals centrally and the inflammatory and immune responses locally, possibly predisposing to IBS. It seems reasonable to postulate that for IBS to manifest, several abnormalities (multiple “hits”) may need to occur. Some authors, therefore, conceptualize IBS as “a discrete collection of organic bowel disease,” (Talley and Spiller, 2002) whereas other experts are concerned about “organification” of IBS because it may reduce the emphasis on the biopsychosocial model (Drossman, et al., 2002; Drossman, 2003) and imply that biologic factors are not sufficient to causes the disease. It seems likely in IBS that an understanding of the individual, including his or her psychosocial nature and response to environmental factors influences the expression of any biologic determinants (Fig. 1).
**Fig 1.01**: A conceptual model depicting the relationship between early life, psychosocial factors, physiology, symptoms experience and behaviour and outcome (Adapted from Drossman, et al., 2002).

**Biological Factors**

Few researches on the small bowel has identified that this part of the gastrointestinal tract is also important in origin of symptoms (Kellow and Bennett, 1996). In addition, current investigation focuses on the role of increased intestinal smooth muscle reactivity (Lynn and Friedman, 1995) and visceral afferent mechanisms, including central nervous system processing of information (Silverman, et al., 1997) in the pathogenesis of IBS symptoms.
Study done by Blanchand (2001) also suggests that malfunctioning of the autonomic nervous system and especially a tendency towards autonomic hyper-reactivity may play a role in the etiology and possibly the maintenance of IBS. Studies evaluating the electrical response of the colon to various stimuli suggest a difference between normal patients and those with an irritable bowel. IBS patients have a different basal frequency of myoelectric slow waves, different myoelectric and motor response to meals, and a different effect on anticholinergic medication meal induced cholonic activity (Schuster, 1989). IBS patients with constipation and abdominal distension as predominant symptoms had prolonged colonic transit times compared to healthy volunteers and IBS patients with constipation but without distension (Agrawal, et al., 2009)

Motility studies performed in adults with IBS yield varying results, depending on the predominant complex the patient experiences. A pattern of hypermotility exists during symptomatic periods in patients with a pain-predominant symptom complex. High-amplitude pressure waves are found ten times more commonly in patients with this form of IBS than normal (Wangle and Deller, 1965). Balloon dilatation of the rectosigmoid and rectum induces more spastic contractions in IBS patients than in their normal counterparts (Mitra, et al., 1974). For most of the second half of the 20th century, tremendous attention was paid to the concept of altered gut motility as a cause of IBS symptoms (McKee and Quigley, 1993)

Whorwell, et al., (1986b) and Watier, et al., (1983) have demonstrated abnormal urodynamics in patients with IBS. Whorwell, et al., (1986a) have shown an increase in the incidence of orthostatic hypotension in patients with IBS when compared with healthy control
subjects. Fielding and Regan (1984) described an increase in blood pressure response to a “cold pressor” test in patients with IBS when compared with their normal counterparts. White, et al., (1991) investigated smooth muscle function in the lungs of patients with IBS by airway responsiveness to an inhaled methacholine challenge. They found a decrease in the forced expiratory volume of 20% or more in all 11 patients with IBS they studied, compared with 6 of 11 patients with organic bowel disease (duodenal ulcer, short gut, Crohn’s disease, etc) and only four of 11 normal patients. They suggested, as did Read (1987), that IBS may represent the “asthma of the gut”.

Incidental reports of resolution of symptoms in IBS patients placed on fructose-free diets Anderson and Nygren (1978) prompted Rumessen and Gudmand-hoyer (1988) to postulate that fructose-sorbitol malabsorption may play a significant role in the development of IBS. Nelis, et al., (1990) found that 30.1% of IBS patients and 40.2% of healthy controls had evidence of fructose-sorbitol by breath hydrogen testing. Although this suggests that fructose-sorbitol malabsorption may be one of many triggering events in patients with IBS, it does not support the contention that it is of etiologic significance.

Kim, et al., (2003) postulated that polymorphisms of the alpha-2 adrenoreceptors, norepinephrine transporter, and serotonin transporter promoter would be associated with IBS. Minor inflammatory change seems to persist in a subset of patients with IBS (Gwee, et al., 2003; Talley and Spiller, 2002). Hereditary and environmental factors are likely to have a role (Levy, et al., 2001).

Thus, experimental evidence points to some functional physiologic difference between patients with IBS and their healthy
counterparts. The nature of this disturbance, be it a motility disorder or a global smooth muscle dysfunction, has yet to be elucidated.

**Psychological Factors**

Abnormal psychological features are recorded in up to 80% of patients with IBS, especially in referral centers; however, no single psychiatric diagnosis predominates (Everhart and Renault, 1991; Whitehead, et al., 1980; Liss, et al., 1973; Young, et al., 1976). The lifetime incidences for major depression, somatization disorder, generalized anxiety disorder, panic disorder and phobias are higher in patients with IBS than in healthy controls (Walker, et al., 1992; Walker, et al., 1990). An early investigation observed that 80% of patients with IBS had underlying depression or anxiety, whereas another study reported hysteria or depression in 72% of patients with IBS compared to 18% in normal volunteers (Chaudhary and Truelove, 1962; Young, et al., 1976; Creed and Guthrie, 1987). Conversely when depressed patients are examined 25% meet criteria for IBS compared to 2.5% of non-depressed controls (Masand, et al., 1995). Similarly IBS is found in 59% of dysthymic patients (Masand, et al., 1997). A significant overlap of panic disorder and IBS has been observed with similar demographic and clinical characteristics (Lydiard, et al., 1994). In one study 46% of patients with panic disorder met criteria for IBS vs. 2.5% of controls (Kaplan, et al., 1996). Increases in neuroticism and decreases in extroversion are reported in IBS (Creed and Guthrie, 1987). Additional abnormalities associated with IBS include hostility, hypochondriasis, and increased interpersonal sensitivity (Whitehead, et al., 1980). In an illness attitudes assessment, 3 abnormalities specific to IBS were bodily preoccupation, hypochondriacal beliefs, and disease phobia (Gomborone, et al., 1995). Psychological abnormalities predate or occur
simultaneously with the onset of bowel symptoms in 67% to 85% of patients, suggesting that it is not the symptoms of IBS that induce psychiatric disease (Whitehead, et al., 1980; Whitehead, et al., 1988b; Wise, 1982; West, et al., 1970). IBS patients frequently report multiple symptoms that have supported a somatizing perspective (Whitehead, Palsson, and Jones, 2002).

An association between prior sexual or physical abuse and development of IBS has been reported (Walker, et al., 1995; Drossman, et al., 1990). Rates of severe life time sexual trauma, severe childhood sexual abuse, and any life time sexual victimization are significantly greater in patients with IBS than individuals with inflammatory bowel disease (Walker, et al., 1993). Forms of sexual abuse associated with IBS include verbal aggression, exhibitionism, sexual harassment, sexual touching and rape (Delvaux, et al., 1997). Sexually traumatized patients experience significantly higher rates of life time development of depression, panic disorder, phobia, somatization, ethanol abuse, and sexual dysfunction. Furthermore, they exhibit higher rates of physician visits and more gastrointestinal and non-gastrointestinal symptoms, and they undergo more surgeries (Drossman, et al., 1990). Another study has reported histories of sexual abuse in 40 % of patients with functional lower gastrointestinal disease both in tertiary referral centers and in private gastroenterology practices (Leroi, et al., 1995). Prior sexual abuse is more common in constipated patients and is not prevalent in patients with functional upper gut symptoms. In a complementary study, patients with prior abuse were more likely to report symptoms of IBS than those with no history of abuse (Talley, et al., 1995b). From a pathophysiological standpoint, sexual abuse was not associated with lower pain threshold in patients with IBS (Whitehead, et al., 1997). Patients with IBS who do not seek medical
attention are psychologically indistinguishable from healthy controls; however, those who do seek care exhibit increased anxiety, depression, phobias, and somatization (Folks, 2004) Patients who seek care are also more likely to have a history of physical or sexual abuse (Salmon, et al., 2003)

Only a small fraction of individuals with symptoms of IBS present to a physician. Investigators have attempted to characterize difference between symptomatic individual to seek medical attention and those who do not, known as non-reporters. Patients with IBS have been shown to exhibit more personality abnormalities and grater illness behaviour than non-reporters (Drossman, et al., 1988). Similarly, patients with IBS possess psychiatric disturbances greatly exceeding the general population, however, non-reporters are not different from asymptomatic individuals (Whitehead, et al., 1988b). How a person responds to his or her symptoms determines whether he or she will consult a physician. Patients with IBS have histories of more frequent and serious childhood illnesses resulting in school absences and pediatrician visits and reported that gifts were provided during childhood illness, suggesting that their expectations for illness behaviour involve a reward (Whitehead, et al., 1982; Lowman, et al., 1987).

Approximately 84% of IBS patients reported that stress caused their bowel symptoms to be worse (Drossman, et al., 1982) and more than half believed that an acute episode of stress preceded the onset of IBS. Systematic studies showed a lower but significant association between stress and the severity of bowel symptoms (Whitehead, et al., 1992). In a study done by Arun, et al. (1993) it was found that 90% of the IBS patients (N=30 IBS and 30 control) perceived significantly greater number of stressful life events in the preceding year. Plante, et
al. (1998) also found that IBS sufferers were more sensitive to perceived stress than others. The stressors, most strongly associated with irritable bowel syndrome (IBS), are physical and sexual abuse (Drossman, et al., 1995).

In a German study by Herschbach, et al., (1999), it was found that symptoms of depression and somatization were among the strongest correlates of increased number of doctor visits, and Koloski, et al. (2003) reported that anxiety and worry about abdominal pain predicted frequent health care visits among IBS patients in a community sample. In a community survey by Talley, et al. (1994b) and a clinical population study (Drossman, et al., 1996) showed that IBS sufferers with abuse history are more likely to consult physicians for their bowel symptoms. The same psychosocial factors that cause high health care use by IBS patients (but perhaps especially somatization and abuse history, which have been associated with excess surgeries in non-GI research) are likely to explain why IBS patients have higher rates of many different types of non-GI surgical procedures compared with other medical patients (Drossman, et al., 1996; Longstreth and Yao, 2004; Feld, et al., 2003). Detailed analyses of changes in symptoms and life experiences of IBS patients over time demonstrate that increases in stressful life events are associated with greater bowel symptoms (Whitehead, et al., 1992; Levy, et al., 1997). Higher subjective scores of emotional distress in patients with IBS were also associated with more intense and more persistent IBS symptoms (Koloski, et al., 2003, Jarrett, et al., 1998). Drossman, et al., (2000b) reported that compared with patients with moderate illness, a sample of patients with severe functional bowel disease had greater pain scores, depression, psychological distress, and poorer coping strategies. A study done by Gwee, et al. (1996, 1999) showed that individuals high on neuroticism (and those high on
anxiety, which may be related) were more likely to develop chronic IBS-type symptoms after an acute GI infection supports its role as a predisposing factor in post infectious IBS. Studies have indicated that a history of modeling and reinforcement of the sick role and increased attention to illness in childhood (Lowman, et al., 1987; Whitehead, et al., 1994; Levy, et al., 2000) are unusually common among IBS patients, fostering greater attention to illness and health care-seeking behavior that persists later in life.

It is evident from the review of literature that all the above mentioned factors affect people psychologically, restrict their resourcefulness in coping with events and make them more vulnerable to disorders or may precipitate disorder. So in the present research two psychological factors were taken for investigation. They are emotional maturity, and parenting style. A detailed description of both the variables and their relation with IBS is explained separately as given below:

**IBS and Emotional Maturity**

In the present circumstances, youth as well as children are facing difficulties in life. These difficulties are giving rise to many psychosomatic problems such as anxiety, tensions, frustrations and emotional upsets in day to day life. So, the study of emotional life is now emerging as a descriptive science, comparable with anatomy. It deals with interplay of forces with intensities and quantities.

Actually, emotional maturity is not only the effective determinants of personality pattern but it also helps to control the growth of adolescent’s development. The concept “Mature” emotional behaviour of any level is that which reflects the fruits of normal emotional
development. An emotionally mature person has the capacity to withstand delay in satisfaction of needs. He has belief in long-term planning and is capable of delaying or revising his expectations in terms of demands of situations. An emotionally mature child has the capacity to make effective adjustment with himself, members of his family, his peers in the school, society and culture. But maturity means not merely the capacity for such attitude and functioning but also the ability to enjoy them fully. Self acceptance is an important aspect of maturity, and it must be preceded by acceptance from others.

As one go mature, his emotional stability, depth of social adjustment, vocational and professional aptitude, life’s ambitions, etc. go on developing (Doll, 1938). The emotional maturity begins during adolescence. The adolescents differ in degrees with each other in this development.

Chaube (1983) described the nature of maturity as below:

1. **Power to bear emotional tension**: An emotionally matured man has full control over the expression of his feelings. Those who are emotionally immature often speak and act in an irresponsible manner. No doubt there should be an outlet for the flow of emotional tension, otherwise the individual will continue to suffer mental tension. The emotionally mature persons, however, behave according to the accepted social values and ideas.

2. **Indifferences towards emotional incitements**: Many emotional incitements which disbalance children and adolescents have no effect on emotionally matured persons. They remain perfectly calm and indifferent towards them.
3. **No instability in the expression**: During adolescence one gets excited as well as calm very soon. Adolescents lose temper or burst into laughter on even flimsy things. An emotionally mature person is free from this defect.

4. The entire character of the mature adult is hidden behind his reactions. But this is not the case with an emotionally immature person.

5. Mature adult exercises self-control over emotional reactions, but an immature person fails in this effort.

6. A mature adult may show partial reaction also but the immature fellow will either go all out or will not act at all.

   So the five major components of emotional maturity are:
   a. Knowing our own emotions,
   b. Managing our emotions,
   c. Motivating ourselves,
   d. Recognizing the emotions of other, and
   e. Handling relationships.

   Each of these elements plays an important role in shaping the outcomes we experience in life. Some studies examined the emotional aspect of IBS.

   Emotional stress is known to affect intestinal motility and transit time (Tache, 1989). Several studies have demonstrated that approximately 50% of patients with IBS have a coexisting psychiatric disorder at the time of presentation. These psychiatric illnesses may modulate symptoms of IBS (Blanchard, et al., 1990).
In a study Reilly, et al. (1999) found IBS subjects being more emotionally and socially disturbed. A community-based study of 507 middle school and high school students by Hyams, et al. (1996) found that 6-14 percent of the adolescent population had IBS symptoms. Anxiety and depression scores were significantly higher for this group. Eight percent of all the students in the study had seen a physician for abdominal pain in the previous year.

Emotional distress is a subjective experience that may occur regardless of the presence of psychiatric illness or stressful life events. It can be measured by symptom questionnaires that quantify the frequency and intensity of negative emotions such as anxiety, worry, sadness, or anger experienced in a given time period, or alternatively by just asking subjects to rate their subjective feeling of stress. Both IBS patients and non patients who have IBS have elevated psychological distress levels compared with controls (Jarrett, et al., 1998; Osterberg, et al., 2000; Koloski, et al., 2003; Levy, et al., 1997).

Truae has shown that people who tend to inhibit or in some way minimize their emotional expression are more likely to also suffer from increased tension, or other perceived pain symptoms (Truae and Michael, 1993). A relationship between the inhibition of emotional expression and a variety of psychosomatic illnesses has been found in other correlational studies (Temoshok and Fox, 1984; and Greer and Morris, 1975).

Ali, et al. (2000) also found a relationship between having a tendency to self-silence, or suppress emotional responses to situations and assume personal responsibility for negative events and IBS. These
findings fit with the hypothesis that there is some relationship between
the cognitive and expressive deficits inherent in this construct and a
tendency to somaticize (i.e., psychological distress will be diffuse), at
least in the case of these disorders.

Mayer and his colleagues (2001) have described an *emotional motor system* responsible for *both* the generation of emotional experience and gut dysfunction. Circuits involving fear and anger responses have been mapped out. Fear has its greatest impact on inhibiting upper GI motility and stimulating distal colonic function, while anger is associated with enhanced contractions of the upper and lower bowel and increasing both blood flow in the mucus-filled inner lining of the gut and gastric acid secretion (such as occurs routinely during the digestion of food). In cases of IBS, risk factors associated with pathological or chronic stress in early life, along with genetic factors can add together with other 'trigger' factors, such as current psychological stress, infections, or consumption of antibiotics and allergens contained in food. In chronic cases involving IBS-type symptoms, a negative feedback system develops, as anxiety leading to gut symptoms are perceived as painful and worrisome, which in turn creates more anxiety, and so on.

Blomhoff (2000) of the National Hospital in Oslo, Norway, studied the effects of emotional words on women with IBS. The women's rectal muscles responded by contracting or relaxing in 70% to 77% of cases. The strongest responses were to words that were related to sadness and anxiety.
Houghton et al. (2002) stated that this study shows that emotion can also affect an IBS patient’s perception of rectal distension and demonstrates the critical role of the mind in modulating gastrointestinal physiology. These results emphasise how awareness of the emotional state of the patient is important when either measuring visceral sensitivity or treating IBS.

**IBS and Parenting Style**

The attitude of parents towards children while raising them according to their character, emotions, social status and expectations can be termed as parenting style.

Parenting as the style of child's upbringing refers to a privilege or responsibility of mother and father, together or independently to prepare the child for society and culture (Veenes, 1973) which provides ample opportunity to a child to find roots, continuity and a sense of belonging (Sirohi and Chauhan, 1991).

The two distinctive roles of parents include both mothering and fathering. A child bestows on both mother and father together or independently, the responsibility of upbringing him/her. These perceptions may be referred to apparently direct and immediate knowledge associated to their conscious or unconscious experiences by which they initiate and control behaviour enormously. It is important to note that most of the children have a fairly definite clear-cut concept of ‘father’ which differs markedly from their concept of ‘mother’ (Meltzer, 1943). Therefore it appears to be of utmost importance to study perception regarding their fathering and mothering separately as well as parenting as a whole on different dichotomous modes of parenting.
Fathering

The role of a father or – the style of individual’s upbringing – stands as a bridge by which the child comes into the contact of outside world (Meerto, 1968) encourages curiosity and a will to face the challenges of the world and appears as a symbol of assertive, independent, emotional and psychological support in the realization of truth. To love children is predominantly a feature of fathering in non-deviant families (Jain, 1986) and relates to acceptance, satisfaction and differentiating experiences in the children (Khokhar, 1983) that can also be deemed as conditional one (Fromm, 1956) because it is acquired or earned by the child’s performance of duty, obedience and fulfillment of father’s expectations whereas, inadequate fathering is usually understood to be a prime source of maladjustment (Erickson, 1963), truancy, guilt, self-devaluation and dependency (Coleman, 1970) and chemical dependence (Bharadwaj, 1996).

Mothering

The role of mother or – the style of upbringing – is largely associated with congenial development of personality because the child first comes in contact with mother and always depends on her to satisfy his basic needs. The role of mother shows better control over the children and stands for friendship with less punishment and dominance (Kegan, 1965), symbol of emotional support, interpersonal sensitivity and helps (Farren and Ramsey, 1977) and plays an important role in making a person more productive and imaginative. Whereas, patterns of inadequate maternal behaviour seem to be responsible for the problem of children’s behaviour and chemical dependence (Bharadwaj, 1995a).
Many experts differentiate parenting style on the basis of behavior. Such as on the basis of two dimensions called parental demandingness and parental responsiveness Baron (2003) classified parenting style into four types- authoritarian, authoritative, permissive and rejecting/neglecting. Authoritarian parents are high in demandingness (controlling) and low in responsiveness. They establish strict rule for their children and don’t give them much say in decisions. Authoritative parents, in contrast, are high in both demandingness and responsiveness. They establish rules for their children but show great interest in, and responsiveness to, them. Permissive parents are high in responsiveness but low in demandingness. They are warm and responsive, but they set no rules or standards for their children and don’t hold them accountable for their actions. Finally, rejecting/neglecting parents are low in both responsiveness and demandingness. They just don’t seem to care what children do or what they become.

Authoritarian control and permissive non control may both shield the child from the opportunity to engage in vigorous interaction with people. Demands, which may not be met and no demands, suppression of conflict or side stepping of conflict, refusal to help or too much help, unrealistically high or low standards, all may curb or under stimulate the child so that he fails to achieve the knowledge and experience, which could realistically reduce his dependence upon the outside world. The authoritarian and permissive parents may both create, in different ways, a climate in which the child is not desensitized to the anxiety associated with non conformity (Mead, 1970).

In a study done by Elder, (1962) of 7400 adolescents in Southern and Mid-western states, adolescent ratings of parents’ behaviour were
employed to study parental variations in child-rearing techniques, ranging from complete parental domination to complete self-direction. Seven parental structures were defined:

a) **Autocratic**: No allowance is provided for youth to express their views on a subject nor for them to assist leadership or initiative in self-government.

b) **Authoritarian**: Although the adolescents contribute to the solutions of problems, the parents always decide issues according to their own judgment.

c) **Democratic**: The adolescent contributes freely to discussions of issues relevant to his or her behaviour, and may even make decision, however, in all instance the final decision is either formulated by parents or meets their approval.

d) **Equalitarian**: This type of structure represents minimal role differentiation. Parents and the adolescents are involved to a similar degree in making decisions pertaining to the adolescents’ behaviour.

e) **Permissive**: The adolescent assumes a more active and influential position in formulating decision that concern him or her then do the parents.

f) **Laissez-faire**: The position of the adolescent in relation to that of the parents in decision-making is clearly more differentiated in terms of power and activity. In this type of relationship the youth has the option of either subscribing to or disregarding parental wishes in making decisions.

g) **Ignoring**: This type of structure, if it can be legitimately considered as
such, represents actual parental divorcement from directing the adolescent’s behaviour.

Cobb and Grannis (2005) stated that there are various parenting styles but they fall into three basic categories. Most parents will have one primary parenting style but you will most likely see aspects of your particular parenting style in all of them.

1) **Giving Orders**: This is an authoritarian parenting style. Parents who use this style feel they must be in control all the time. They parent by a set of rules that must be followed. Children have little or no freedom. Discipline is usually a form of reward and punishment. Children learn early to please their parents to gain a reward. They may behave because they fear their parents. Children either go along and have a hard time learning to think for themselves or they may rebel in reaction to the controlling methods of their parents.

2) **Giving In**: This is permissive parenting style. Parents who adopt this style have concerns that their children will not like them if they set limits or they see themselves as their children’s friend and not their parent who is there to guide and set limits. Children without limits have no sense of responsibility, have trouble with relationships and the rights of others and can find the world a difficult place. It is unfair to raise a child without limits or to keep changing the limits that are set. Children do not need or want freedom without limitations.

3) **Giving Choices**: Today’s children will benefit most from a respectful, democratic parenting style. The days of “Do what I say without question” are over. This means seeing both parents and children as equals. Not in the sense of sameness but in value. Giving choices balances freedom with responsibilities. From an early age children
learn their consequences of their choices and that their decision counts. When children feel some ownership in their lives they are more cooperative. Parents can discipline without resorting to reward and punishment.

According to Shah (1981) “authoritarian parents rely too heavily on overt means to enforce obedience. For this purpose they use many repressive restraints. They hold a strong conviction that children must obey and that it is the responsibility of the parents to make the children obey their parents. Authoritarian parents take advantage of the child’s weakness to secure compliance, even subservience. This type of attitude on the part of parents cramps the wholesome development of the child.”

Under authoritative or democratic child-rearing methods, the child or adolescent “contributes freely to discussions of issues relevant to his behaviour, and may even make decisions” (Clark and Seligmann, 1968).

A major source of confusion in many discussions of the role of adult authority in contemporary child rearing appears to involve a failure to distinguish clearly between authoritarian and authoritative parental behaviour. And yet, the distinction is a valid and important one (Conger and Petersen, 1984). As Baumrind (1968) has observed the authoritarian or in more extreme form autocratic parent “attempts to shape control and evaluate the behaviour attitudes of the child in accordance with a set standard of conduct, usually absolute standard (often) theologically motivated and formulated by a higher authority.” He or she believes in reinforcing such instrumental values as “respect for
authority, respect for work, and respect for the preservation of order and traditional structure.”

Any sort of two-way interaction between parent and child, any encouragement of verbal give and take is negatively reinforced in the conviction that the child should accept unquestioningly the parent’s word for what is right (Baumrind, 1968).

In contrast, the authoritative (democratic but not permissive) parent assumes ultimate responsibility for the child’s activities, but in a rational, issue-oriented manner. Such a parent values both autonomous self-will and disciplined behaviour. Verbal give and take are encouraged, and the parent attempts to provide “legitimacy” (Elder, 1963; Raven and French, 1958) in the exercise of parental authority by frequent explanations of reasons for demands or prohibitions (Elder, 1963).

Particular attention has been focused on two major dimensions of parental behaviour (Martin, 1975; Scheafer, 1965). The first dimension may be termed love, hostility, although the exact label employed has varied from one investigator to another (e.g. “Warmth-hostility” (Becker, 1964; Martin, 1975), “acceptance-rejection” (Scheafer, 1959, 65) “loving-rejecting” (Conger, 1971; Cooper, 1970). At its positive end, this dimension refers generally to such characteristics as “accepting, affectionate, approving, understanding, child-centered, frequent use of explanations, positive response to dependency behaviour, high use of reasons in discipline, high use of praise in discipline, low use of physical punishment” (Becker, 1964).

Indeed, any number of studies makes clear that without strong and unambiguous manifestations of parental love, the child (or
adolescent) has far more difficulty developing self-esteem, constructive and rewarding relationships with other and a confident sense of his or her own identity (Coopersmith, 1967; Martin, 1975; Rosenberg, 1965; Rutter, 1979, 80).

Beside love-hostility, the other major dimension emerging from studies of parent-child relationships may be broadly termed autonomy-control, although again, precise labels have varied from one investigator to another (e.g. “permissiveness-restrictiveness” (Becker, 1964; Martin, 1975; Roe and Siegelman, 1963). At its restrictive or controlling end, this dimension refers generally to parental behaviours that involve “many restrictions and strict enforcement of demands” (Becker, 1964) including rigid insistence on neatness, orderliness, obedience and inhibition of aggression (verbal or otherwise) towards parents, siblings, or peers. Restrictiveness foster inhibition not only in such obvious areas as social behaviour, but also in curiosity (Maw and Maw, 1966), creativity (Becker, 1964; Kegan and Moss, 1962; Watson, 1957), initiative (Becker, 1964; Kagan and Moss, 1962) and flexibility in approaching intellectual, academic and practical everyday problems (Becker, 1964; Mussen, et al., 1979).

Although it has proved possible to make meaningful though limited generalizations about the probable effects of variations in parental behaviour of each of these dimensions, more precise and meaningful generalizations become possible when interactions between, or combinations of there two dimensions are considered. For example, a child who is subjected to covertly hostile, restrictive parental child rearing practices is more likely to internalize angry feelings (as in the case of many neurotic children and adolescents) (Baumrind, 1975; Becker, 1964; Martin, 1975); in contrast, the child who is reared under
hostile but lax conditions is more likely to act out resentment (as in the case of many delinquents) (Becker, 1964; Conger and Miller, 1966).

The behaviour of the child whose parents are high on the dimensions of love (warmth) may also vary, depending on co-existing conditions. Thus, children reared in warm but restrictive (as opposed to autonomy-encouraging) homes are likely to be complaint, polite and neat, but also more dependent and conforming; less aggressive, dominant and competitive with peers; less friendly; less creative; and more hostile in their fantasies (Becker, 1964; Kegan and Moss, 1962; Martin, 1975; Sears, et al., 1957). In contrast, those reared in homes where parental love is evident though not cloying, and where the children are given considerable age-appropriate autonomy, are likely to emerge as more active, outgoing, socially assertive, independent, friendly, creative and lacking in hostility towards others and themselves (Becker, 1964; Elder, 1971; Kagan and Moss, 1962; Mussen, et al., 1979; Sears, 1961). Such children also tend to be somewhat disobedient, disrespectful, and rebellious on occasion, but these behaviour appears to result largely from feelings of security and lack of severe punitive response from parents and are “more easily turned on and off in response to reinforcing conditions” (Becker, 1964).

Hurlock (1999) mentioned some typical parental attitude:

1. **Over-protectiveness**: Parental over-protectiveness consists of excessive care control over the child. This fosters over-dependency in children. Dependency on all people, not parents alone, lack of self confidence and frustrations.

2. **Permissiveness**: Parental permissiveness is shown by the parents' willingness to permit children to do things much as they with few
restraints. This leads to a child-centered home. “If permissiveness is reasonable, it encourages children to be resourceful, self reliant and well adjusted socially. It also encourages self confidence, creativity and poise.

3. **Indulgence**: Excessive permissiveness- indulgence- makes children selfish, demanding and often tyrannical. They demand attention and service from others’ behaviour that leads to poor social adjustments in the home and outside.

4. **Rejection**: Rejection may be expressed by unconcern for the child’s welfare or by excessive demands on the child and open hostility. This leads to resentment, feelings of helplessness, frustration, nervous mannerisms and hostility to others, especially those who are smaller and weaker.

5. **Acceptance**: Parental acceptance is characterized by a keen interest in and love for the child. The accepting parent provides for the development of the child’s abilities and takes into account the child’s interest. The accepted child is generally well socialized, cooperative, friendly, loyal, emotionally stable and cheerful.

6. **Domination**: The child who is dominated by one or both parents is honest, polite and careful but tends to be shy, docile, easily influenced. Dominated children often develop inferiority complexes and feel martyred.

7. **Submission to child**: Parents who submit to their children permit the children to dominate them and the home. Children boss their parents and show them, little consideration, respect or loyalty. They learn to defy all authority and try to boss people outside the home.
8. **Favoritism**: Inspite of claims that they love all their children equally, most parents have their favorites. This makes them more indulge and loving to the favorites than to the other children of the family. Favored children tend to play up to their parents but are aggressive and dominating in sibling relationships.

9. **Parental Ambitions**: Almost all parents have ambitions for their children- often unrealistically high. These are often influenced by thwarted parental ambitions and parental desires to have their children rise on the social ladder. When children cannot live up to parental ambitions, they tend to become resentful, irresponsible underachievers. In addition they develop feelings of inadequacy often colored by feeling of martyrdom stemming from parental criticism for their level of achievements.

The child uses his parents as models for his adjustment to life and fundamental pattern once established at home, cannot be eradicated completely yet modified or changed as the child grows up. Thus, relationships between the parents and the child happen to be a central factor in the social upliftment of the individual. Parents are supposed to create a most congenial, happy, democratic, lucid and warm atmosphere (Becker, 1964; Erickson, 1974), where a child can blossom his own hidden potentialities and may also develop social interaction skills (Bharadwaj, 1995b).

It is the attitude towards the child (love, affection) that determines how well the child will adjust outside (being wanted, appreciated, trusted or accepted as a person) the home (Stout and Langdon, 1950). Parental unfavourable attitude towards the child, as in case of dominant, the possessive or the ignoring parent becomes harmful, as
the child’s adjustment outside the home is likely to be poor. Even harsh parenting may cause some serious problem in them. Pelzer (1997) made a study to examine the relationship between the reports of IBS diagnosis of parents, a somatizing language pattern and history of harsh or punitive toilet training and the presence or absence of IBS. Result showed that persons with IBS were predicted to be more likely to report that their parents checked on their bowel habits throughout childhood and adolescence, than persons without IBS.

In a study done by Crane and Maryanne (2004) on IBS patients it was found that higher levels of behavioural passive coping were associated with higher levels of parental reinforcement of illness behaviours. According to the study of Lackner, et al. (2004) negative care-giving may be associated with the occurrence of adult-IBS. They found that higher levels of rejection and / or hostility among fathers (not mothers) were more strongly correlated with somatization than was abuse. Further, paternal parenting behaviours were more predictive of somatization than abuse, age, and gender. Based on the Lackner study, IBS was added to a long list of mental and physical disorders where negative parenting behavior predisposes for the future development of the disorder. So called risky families are characterized by parent child interactions that are hostile, aggressive, rejective, cold and/or neglectful (Meaney, 2001).

Parental rejection, parental history of somatization disorder, and history of abuse are associated with higher risk of IBS (Levy, et al., 2000; Drossman, et al., 1990; Drossman, et al., 1995). In a recent overview of family dynamics and structure with regard to health, Weihs, et al. (2002) note that family conflict and criticism are among the most important risk factors for a variety of health outcomes. Gerson and
Gerson (2005) incorporated a family systems perspective in a group treatment program for IBS patients. The presence of depth and support in a patient’s relationships may facilitate reflection on emotional factors and free the patient from an exclusive physical preoccupation. Those who experience conflict in relationship may be less willing to acknowledge the complexities of emotional life, be less equipped to cope with their IBS as a mind–body illness. It is important to highlight the gender effect of relationship distress on physiological functioning, characteristically more common in women (Kielcolt-Glazer and Newton, 2001).

**Sociocultural Factors and IBS**

There are many sources of pathogenic social influences, some of which stem from socioeconomic factors such as socioeconomic class, economic and employment problems, social change and uncertainty etc. and some other stem from socio-cultural factors regarding temperament, conditioning, role expectations, not adopting the prevailing cultural patterns etc. (Carson, et al., 1998). As the importance of these factors can not be underestimated so an important social factor i.e. socioeconomic status is examined in relation with IBS in the present study.

**IBS and Socio-economic Status**

Socioeconomic status, sometimes shortened to SES, is a sociological classification indicating the close relationship between someone’s relative wealth and that person’s social status. The Socio-economic status (SES) is an important determinant of health and nutritional status as well as of mortality and morbidity. Socio-economic status also influences the accessibility, affordability, acceptability and
actual utilization of various available health facilities. There have been several attempts to develop different scales to measure the socioeconomic status. (Cattell, 1942; Cantirl, 1943)

A family’s socioeconomic status is based on family income, parental education level, parental occupation, and social status in the community (such as contacts within the community, group associations, and the community's perception of the family) (Demarest, et al., 1993).

The association of social class with health has been extensively studied over the past two decades. There is now persuasive linking social position to adult mortality and morbidity, with persistent trends of poorer health among the lower social classes. These trends have emerged with most measures of social classes (for example, occupation, education and income).

Bytzer, et al. (2001) found clear trends for the prevalence rates of all gastrointestinal symptoms to increase with decreasing social class in his study. Lower social class was associated with a significantly (p<0.0001) higher number of symptoms reported overall and with a higher proportion of individuals reporting 1-2 symptoms and more than five symptoms (oesophageal symptoms; upper dysmotility symptoms; bowel symptoms; diarrhoea; and constipation).

The epidemiology of gastrointestinal systems has recently described in detail by population surveys (Agreus, et al., 1994; Talley, et al., 1991; Talley, et al., 1993; Talley, et al., 1998). The vast majority of gastrointestinal symptoms in the general population are functional dyspepsia, with symptoms due to structural aetiologies comprising less than a few percent of all cases. A US survey found strong associations between low income and reporting of symptoms compatible with
functional gastrointestinal disorders (Drossman, et al., 1993). A recent Canadian study reported a higher prevalence of upper gastrointestinal symptoms in respondents with lower income or low educational level (Tougas, et al., 1999) but this was based on a very selected sample as most subjects refused participation. Some studies suggested that IBS prevalence is lower in patients with a higher socio-economic status (Drossman, et al., 1993; Kruis, et al., 1999; Longstreth, et al., 2001). A few other studies have investigated the association between social class and a single distinct gastrointestinal symptom, such as constipation (Stewart, et al., 1999; Johanson, 1998) or dyspepsia (Kay and Jorgensen, 1994; Jones, et al., 1990; Johnsen, et al., 1988).

There are reasons to believe that the distribution of gastrointestinal symptoms varies by social class. It has been well documented that peptic ulcer disease is associated with low socioeconomic status (Nasiry and Piper, 1983; Levenstein, et al., 1995; Johnsen, et al., 1994). That association may be explained, at least in part, by a higher risk of Helicobacter pylori infection among the less advantaged groups (Graham, et al., 1991; Buckley, et al., 1998), probably due to crowded living conditions and poor standards of hygiene (Goodman and Correa, 2000). Psychological stress, health risk behaviours, analgesic use, and hard physical work may be important additional risk factors for peptic ulcer in low socioeconomic populations (Levenstein and Kaplan, 1998).

The aetiology of functional gastrointestinal disorders is essentially unknown but a number of candidate risk factors are likely to be unevenly distributed across social classes. These include dietary factors (Mathers, 1994), smoking (Mathers, 1994; Comino and Howell, 1999),
use of medication, risk factors for infection and psychosocial distress (Blaxter, 1987; Murphy, et al., 1991).

An affluent childhood environment is an independent risk factor for adult IBS. Childhood social class was significantly associated with IBS according to Manning Criteria (p = 0.05) and Rome II Criteria (p = 0.05) (Howell, et al., 2004).

In a recent study in the US, lower educational level was found to correlate with a higher prevalence of IBS (Wigington, et al., 2005).

Troublesome gastrointestinal symptoms are linked to socioeconomic status with more symptoms reported by subjects in low socioeconomic classes. Low socioeconomic class should be considered a risk factor for both upper and lower gastrointestinal symptoms. (Bytzer, et al., 2001). Individuals with lower income and less education had a higher prevalence of IBS than individuals with higher SES (e.g. higher income, higher education), and unmarried individuals and heads of households had a higher prevalence of IBS than married individuals and non-heads of households.

**Risk Factors for IBS**

The best accepted risk factor for IBS is bacterial gastroenteritis (Ilnyckyj, et al., 2003; Gwee, et al., 1996; Dunlop, et al., 2003a), Depression (Dunlop, et al., 2003b), adverse life events and hypochondriasis (Gwee, et al., 1999), female gender, younger age, and prolonged duration of diarrhea following the initial attack (Neal, et al., 1997) have been reported to increase the risk of post-infectious IBS. Bacterial factors may also be important, and there is evidence to suggest post-infectious IBS more commonly follows infection with
Campylobacter than with other pathogens. Other possible risk factors for IBS include an affluent childhood environment (Howell, et al., 2004), estrogen use post menopausal (Ruigomez, et al., 2003), recent antibiotic use (Mendall and Kumar, 1998), food intolerance (Nanda, et al., 1989; Locke, et al., 2000), and extra-intestinal somatic symptoms (Locke, et al., 2000). In contrast, oral gluco-corticoid users may be at a lower risk of IBS (Huerta, et al., 2003). IBS is associated with an approximately three fold increased risk of ischemic colitis (Cole, et al., 2004), however, a cause-and-effect relationship has not been established and the absolute risk remains very small (43 per 100,000 person years).

**Diagnosis of IBS**

One of the difficulties in dealing with suspected IBS patients is the perceived ambiguity associated with establishing the diagnosis. There is no specific laboratory or imaging test which can be performed to diagnose irritable bowel syndrome (Yawn, et al. 2001). Diagnosis of IBS involves excluding conditions which produce IBS-like symptoms and then following a procedure to categorize the patient’s symptoms. Once other causes have been excluded, the diagnosis of IBS is performed using a diagnostic algorithm. Well-known algorithms include the Manning criteria, the Rome I criteria, the Rome II process, the Kruis criteria, and studies have compared their reliability (Fass, et al. 2001). The more recent Rome III process was published in 2006. Physicians may choose to use one of these criteria, or may include additional tests to guard against misdiagnosis of other diseases as IBS. Such “red flag” symptoms may include weight loss, GI bleeding, anemia, or nocturnal symptoms. However, researchers have noted that red flag conditions may not always contribute to accuracy in diagnosis – for instance, as
many as 31% of IBS patients have blood in their stool (Fass, et al., 2001).

In a classic study from the United Kingdom, Manning and associates first reported that six symptoms were more frequent in those subsequent documented to have IBS, although only four were statistically significant in the initial report (table 1.01) (Manning, et al., 1978). Later studies showed that these symptoms were specific, but not sensitive, for identifying IBS and were of greater diagnostic value in women (Hammer and Talley, 1999; Talley, et al., 1990). In an effort to build on the diagnostic utility of the Manning criteria, the Rome (I and II) criteria were created following a formal consensus process to provide a standard for clinical research (see table 1.01) (Drossman, et al., 2000a). Despite limited data on validity, it was proposed subsequently that the Rome criteria be used in clinical practice (Drossman, et al., 2002). Comparisons of the criteria have shown that both the Rome I and Rome II criteria identify similar patient populations, although the Rome II criteria appear to be more restrictive in some studies (Boyce, et al., 2000; Hillila and Farkkila, 2004; Saito, et al., 2002). The Manning criteria identify additional patients with IBS-like symptoms who arguably also should be classified as true IBS. (Boyce, et al., 2000; Hillila and Farkkila, 2004; Saito, et al., 2002).

Table 1.01 Comparison of the major diagnostic criteria for the irritable bowel syndrome (IBS)

<table>
<thead>
<tr>
<th>Manning Criteria</th>
<th>Rome I Criteria</th>
<th>Rome II Criteria</th>
</tr>
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<tbody>
<tr>
<td>• Abdominal pain that is relieved after a bowel movement*</td>
<td>• ≥ 3 months of continuous or recurrent symptoms of abdominal pain or</td>
<td>• ≥ 12 weeks, which need not be consecutive, in the preceding 12</td>
</tr>
<tr>
<td>• Looser stool at pain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
onset*  
- More frequent stools at pain onset*  
- Abdominal distention (visible)*  
- Sensation of incomplete rectal evacuation  
- Passage of mucus

discomfort relieved with defecation or associated with change in frequency or consistency of stool and
- Disturbed defecation ($\geq 2$ of the following):
  → Altered stool frequency  
  → Altered stool form (hard or loose/watery)  
  → Altered stool passage (straining or urgency, feeling of incomplete evacuation)  
  → Passage of mucus  
  → Bloating

months of abdominal discomfort or pain that has at least 2 of the 3 following features:
  → Relieved with defecation  
  → Onset associated with a change in frequency of stool  
  → Onset associated with a change in stool form

* Significant discriminators in original report.

Adapted from Drossman, et al., (2000a) and Manning, et al., (1978)

In 1978, Manning and Colleagues reported a set of symptoms based criteria that they believed separated patients with IBS from those with structural diseases of the gastrointestinal (GI) tract, but some have suggested that this criterion may only be valid in women.
In an effort to develop criteria for all functional gastrointestinal (GI) disorders, intentional working teams were developed in 1990, and one team convened in Rome, Italy in 1991 to develop criteria specifically for the functional bowel disorders. This ‘Rome I’ criteria were difficult to apply, because of their relative complexity, using symptoms factor analysis, literature review, and further international consensus efforts, the ‘Rome I’ criteria were modified to the ‘Rome II’ criteria.

**Diagnostic Criteria for IBS (Rome II criteria)**

1. At least 12 weeks, which need not be consecutive in the preceding 12 months, of abdominal discomfort or pain that has two out of three features:
   a. Relieved with defecation and/or
   b. Onset associated with a change in frequency of stool matter and/or
   c. Onset associated with a change in form (appearance) of stool.

   And

2. Symptoms that cumulatively support the diagnosis of IBS:
   a. Abdominal stool frequency (more than three bowel movements per day and less than three bowel movements per week).
   b. Abdominal stool form (lumpy, hard, loose, or watery).
   c. Abdominal stool passage (straining, urgency, feeling of incomplete evacuation).
   d. Passage of mucus and,
   e. Bloating or feeling abdominal ‘distention’.

   According to Rome II criteria, IBS was diagnosed in 0.2% of children (mean age, 52 months) seen by primary care pediatricians and
in 22%–45% of children aged 4–18 years presenting to tertiary care clinics (Walker, et al., 2004; Miele, et al., 2004; Caplan, et al., 2005).

Most researchers and clinicians accept the ability of the multinational Rome symptom criteria to identify IBS in epidemiological surveys and play a dominant diagnostic role in clinical practice. Their predictive value in distinguishing IBS from organic diseases improves as the number of criteria increase (Manning, et al., 1978; Poynard, et al., 1992). The symptoms criteria have reported them to be less accurate (Talley, et al., 1990) and even useless (Smith, et al., 1991) in men. Notably, the possible reduced accuracy of the criteria in men is mitigated by the preponderance of female patients. The concept of IBS as a distinct syndrome is further supported by the finding of clusters of all or most of the symptom criteria in community samples of women (Taub, et al., 1995; Whitehead, et al., 1990b). In addition, a diagnosis of IBS based predominantly on the symptom criteria holds up well over time. For example, no case of misdiagnoses occurred in patients diagnosed by symptom criteria, sigmoidoscopy and only basic laboratory tests during at least five years of follow-up (Harvey, et al., 1987).

**Misdiagnosis**

Published research has demonstrated that some poor patient outcomes are due to treatable causes of diarrhea being misdiagnosed as IBS. Common examples include infectious diseases, coeliac disease (Spiegel, et al., 2004), helicobacter pylori (Su, et al., 2000; Gerards, et al., 2001), parasites (Stark, et al., 2007; Grazioli, et al., 2006; Vernia, et al., 1995).
Coeliac disease in particular is often misdiagnosed as IBS. The American College of Gastroenterology recommends that all patients with symptoms of IBS be tested for coeliac disease (American College of Gastroenterology Task Force on Irritable Bowel Syndrome, 2009). Chronic use of certain sedative-hypnotic drugs especially the benzodiazepines may cause irritable bowel like symptoms which can lead to a misdiagnosis of irritable bowel syndrome (Ashton, 1987).

**Treatment of IBS**

It is generally accepted that IBS is multi-factorial in origin, with a combination of biological and psychosocial factors operating within any particular individual to produce or at least affect the expression of symptoms (Drossman, 1996). Nearly all people with IBS can be helped, but no single treatment works for everyone. (Lewis, 2001) Because each individual is unique in terms of symptoms experienced, treatment strategy is based on the nature and severity of symptoms, how the symptoms correlate with food intake and/or bowel habits, the level of impairment and any other conditions or problems that may accompany IBS (Drossman, et al., 2002). Most clinicians start with patient education and lifestyle or diet modification. Within the first few visits, a firm diagnosis of IBS can usually be established. The manner in which this is done and the way in which it is explained to the patient can profoundly influence the patient’s reaction to the illness, cooperation with and relationship to the physician, and the quality of the response to treatment.

Treatment involves a collaborative effort between patient and physician. In one long-term follow-up of cohort IBS patients, a positive physician-patient interaction was associated with positive outcome. The
patients who had notations in their medical records regarding precipitation factors, psychosocial history, and diagnosis and treatment plans were more likely to have fewer return visits for IBS-related symptoms. The patients who were perceived by the investigators as having a positive interaction with their physicians were also likely to have fewer hospitalizations over time (Owens, et al., 1995). The value of a positive, supportive, and respectful doctor-patient relationship with good communication cannot be underestimated in treating these patients.

In the absence of an accepted cause for irritable bowel syndrome (IBS), the goal of therapy is symptom management, with emphasis on reducing the frequency and severity of episodes or “bouts” of symptoms. Effective management of IBS symptoms may lead to remission for many years and there is a wide range of treatment methods available, including patient education, dietary modifications, medications and psychological intervention.

- **Approach to the Patient**

  Education, reassurance, and emotional support by the physician can play a key role in the treatment of IBS. If an inappropriate term, such as *colitis*, has been employed, it is helpful to explain why the term *irritable bowel syndrome* is preferred. IBS can be described as a disorder involving spastic responses of the intestine to a number of stimuli including meals, infection, and emotional stress. Treatment entails eliminating or diminishing stressful situations when possible, improving the patient’s response to stress, modify the diet, or using drugs to suppress spasm. It must be understood that the therapeutic program for IBS is comprehensive, utilizing a number of treatment
methods that can provide relief even though (as with many chronic disorders) there is no single magical cure.

Repeated explanation and reassurance may be needed. The patient should be assured that IBS does not lead to more serious underlying disorders, such as colitis or cancer, and does not in any way shorten the lifespan. The symptoms can be controlled, although usually not completely or permanently.

Reassurance and psychological support are key factors in dealing with the anxiety and stress. It is particularly important to explore with the patient not only possible precipitating factors but also the patient’s reaction to them. In the treatment of IBS, emotional catharsis often is more beneficial than physical catharsis. A caring and steady interest not only serves to uncover important factors but also is inherently therapeutic. Frequent, although not necessarily prolonged, follow-up visits may initially be required, with gradual reduction becoming possible as rapport is established and the patient develops more effective coping mechanism. Other techniques, such as relaxation exercises and physical exercise, may be useful adjuncts. Formal psychiatric treatment usually is not required, the combination of medical treatment and short term behavioural therapy may improve long term outcome compared with medical treatment alone.

- Education and Support

IBS tends to be life-long disorder, and establishment of a strong physician-patient relationship is a key to providing the best clinical care (Table 1.02) (Talley and Spiller, 2002). Indeed, patients with IBS often perceive their physician as having a highly negative medical belief about the disorder and this perception per se impedes best care
(Dixon–Woods and Critchley, 2000; Bertram, et al., 2001). Other common patient perceptions of the care they receive include that they have been mislabeled as psychologically disturbed and that they have not been provided with adequate medical information or support (Dixon–Woods and Critchley, 2000; Bertram, et al., 2001). A good physician-patient relationship has been associated with reduced use of medical services (Owens, et al., 1995).

Table 1.02: Management Recommendations for Irritable Bowel Syndrome

- Make a positive diagnosis based on symptoms and the absence of alarm features
- Establish the effect of illness on the patient and on the patient’s psychosocial resources (e.g., family support)
- Establish if there is a comorbid psychiatric disease or an unresolved major loss or trauma
- Assess the patient’s expectations and hidden fears (e.g., find out why he or she has presented now despite long-standing symptoms) and try to address all concerns
- Provide education, including an understandable explanation of why symptoms might arise, emphasizing that the patient is not alone in his or her suffering and the prognosis is benign
- Provide firm reassurance, emphasizing that the symptoms are known to be real (not just “in the patients head”) and that irritable bowel syndrome is a recognized bowel disease.
- Avoid giving mixed messages (e.g., by reassuring the patient and then ordering extensive tests without an adequate explanation).
- Avoid repeated tests unless a new development of structural disease is suspected (e.g., presentation with new alarm features).
- Base treatment on the principle of patient-based responsibility for care.
Set realistic treatment goals; consider referral to a patient support group.
Organize a continuing care strategy if symptoms have been chronic or disabling.
Consider psychological treatments for patients with moderate-to-severe symptoms.

Adapted from Talley and Spiller (2002).

It is important to discover why the patient has decided to visit at this time. The reason can vary: new life stressors; exacerbating factors in the diet or changes in medications; increased fear of serious disease; and the development of treatable psychiatric comorbidity. A hidden agenda such as seeking disability or new narcotic abuse sometimes may explain the consulting behavior. In terms of providing optimal reassurance, it is important first to educate the patients and then to actively reassure them. Patients typically want to understand why their symptoms have occurred; they also want to obtain validation that their symptoms are “real”. Specific education classes designed for those with IBS appear to be useful therapeutic interventions (Saito, et al., 2004; Colwell, et al., 1998), although randomized, controlled trials have not been done to prove the effectiveness of these interventions.

A stepped-care approach depending on the severity of the presenting symptoms provides a useful guide for considering therapies (Table 1.03) (Drossman and Thompson, 1992).

Table 1.03: Treatment of irritable bowel syndrome (IBS): a stepped care approach

| Step | Severity | Level of | Clinical and Management |
|------|----------|----------|------------------------|------------------|

62
<table>
<thead>
<tr>
<th>of symptoms</th>
<th>care</th>
<th>psychological issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>Primary</td>
<td>Fear of serious disease, anxiety, worry, stress</td>
</tr>
<tr>
<td>Moderate</td>
<td>Secondary</td>
<td>Uncertainty regarding diagnosis; disturbed lifestyle</td>
</tr>
<tr>
<td>Severe</td>
<td>Tertiary</td>
<td>Coexistent psychiatric disease; possible secondary gain; disability, chronic pain</td>
</tr>
</tbody>
</table>

*SSRI selective serotonin reuptake inhibitor

Adapted from Drossman and Thompson (1992).

- **Dietary Fiber**
High-fiber diets are widely accepted in treating IBS, especially for patients with constipation. The standard of care for IBS typically has been a high-fiber diet (Mertz, 2003; Thompson, 2002; Talley, 2003; Brandt, et al., 2002; Fass, et al., 2001). The patient may start with smaller doses of unprocessed Miller’s bran and gradually increase to 12 to 16 g (i.e., 2 tablespoons four times daily) until the desired effect is achieved. The literature on the effectiveness of fiber in IBS is controversial. Indeed 15% to 25% of patients complain that a high fiber diet aggravates symptoms, particularly bloating and distention. These undesirable effects usually disappear spontaneously after two to three weeks but may necessitate diminishing the quantity of fiber or eliminating fiber completely. Data from the available randomized, controlled trials, however, indicate that fiber is not helpful for pain or diarrhea, although it may benefit constipation and provide some global symptom benefit (Jailwala, et al., 2000; Bijkerk, et al., 2004).

Problematic dietary substances often include coffee, alcohol, carbonated drinks, disaccharides, beans, and leafy vegetables (Drossman, et al., 2002).

Patients are advised to eat slowly, not to chew gum or drink carbonated beverages, and to avoid artificial sweeteners (such as sorbitol and fructose) (Ravich, et al., 1983), legumes, and foods of the cabbage family. Caffeine should be avoided because it tends to cause diarrhea and has a tendency to produce anxiety. A lactose elimination diet is frequently helpful.

- **Psychological Treatment in IBS**
The current American Gastroenterological Association medical position on IBS (2002) states that psychological treatments should be initiated for patients with IBS under two conditions:
1. When symptoms are severe enough to create significant impairment in health-related quality of life and
2. When there are comorbid psychiatric conditions that interfere with adjustment to the illness.

These two conditions require a different approach to referral, as the goals are different. In the first case, the goal is to improve the clinical picture of IBS, and in the second, to improve the mental health and life functioning of the patient regardless of detectable direct role of psychiatric illness in the IBS condition.

Psychological treatment most often is saved as a last line therapy for IBS or may be used as adjunctive therapy (in addition to current treatment) anywhere throughout treatment depending on the individual situation. Psychotherapy, hypnotherapy, and cognitive behavioural therapy (CBT) have been proposed to be useful treatments for IBS (Drossman, et al., 2002). Psychological treatment should be considered for severe symptoms, for patients who fail to respond to other therapies or for whom stress significantly contributes to episodes of symptoms. To be successful, the patient must understand the need for therapy and must want to participate in the treatment. Psychological treatment can be very expensive and time consuming, which may decrease its utilization as a standard practice. A systematic review concluded that only hypnotherapy was of established benefit because of methodological limitations (Talley, et al., 1996). Hypnotherapy may improve cognition in IBS (Gonsalkorale, et al., 2004). Better efficacy data have since appeared for CBT (Drossman, 2003; Drossman, et al.,
albeit not at all controlled trials (Boyce, et al., 2003). As mentioned in Alternative Medicine Encyclopedia psychological counseling or behavioral therapy may be useful for some patients to reduce anxiety and to learn to cope with the pain and other symptoms of IBS. Relaxation therapy, hypnosis, biofeedback, and cognitive-behavioral therapy are examples of behavioral therapy.

1. Stress Reduction/Relaxation

Stress also can cause a shift in blood flow away from the gut, as muscles tense and heart rate accelerates. Daily exercise is a well-known stress reliever through a variety of mechanisms, including boosting the release of endorphins. The same neurotransmitters and receptors that dictate mood in the brain exist in great abundance in the gut and influence digestion.

Relaxation is a key component of behavioral therapy for many disorders and is currently being used as part of a holistic approach to managing functional gastrointestinal disorders. Relaxation training aims to help patients reduce their own physical tension and emotional distress through techniques such as progressive muscle relaxation, autogenic training, meditation, or biofeedback. It is a particularly suitable option for IBS patients who have a clear association of their symptoms with stress or anxiety. Research has shown that relaxation provides several health benefits, including: decreased anxiety, help with insomnia, managing stress and increasing tolerance to pain (Burke, 2003). Two studies (Shaw, et al., 1991; Voirol, et al., 1987) demonstrated that IBS symptoms improved more compared with standard medical management groups. Some examples of relaxation techniques include: yoga, meditation, self-hypnosis and biofeedback.
2. Biofeedback

As written in Alternative Medicine Encyclopedia, biofeedback teaches an individual to control muscle tension and any associated pain through thought and visualization techniques, it is also a treatment option for IBS. In biofeedback treatments, sensors placed on the forehead of the patient are connected to a special machine that allows the patient and healthcare professional to monitor a visual and/or audible readout of the level of muscle tension and stress in the patient. Through relaxation and visualization exercises, the patient learns to relieve tension and can actually see or hear the results of his or her efforts instantly through a sensor readout on the biofeedback equipment. Once the technique is learned and the patient is able to recognize and differentiate between the feelings of muscle tension and muscle relaxation, the biofeedback equipment itself is no longer needed and the patient has a powerful, portable, and self-administered treatment tool to deal with pain and tension.

3. Psychotherapy

Psychotherapy is indicated as a treatment for patients with concomitant psychiatric illness and for patients who have not responded to first-line medical therapy. Psychotherapy can reduce overall levels of stress, can help heal psychic trauma from previous physical or sexual abuse, and can target symptoms such as panic disorder and major depressive disorder.

In one study, 102 IBS patients were randomized to short term dynamic psychotherapy and relaxation treatment, in addition to standard medical treatment, as opposed to standard medical treatment alone. The psychological treatment group had a significant reduction in
bowel complaints, in time off work, and in degree of anxiety and depth of depression compared with controls (Guthrie, et al., 1991). The treatment group also had a dramatic decrease in health care utilization. Similar results have been reported using cognitive behavioral therapy (Greene and Blanchard, 1994). Purely behavioral interventions such as hypnotherapy have also shown promise in open trials in the treatment of IBS but have not been evaluated in randomized clinical trials (Drossman and Thompson, 1992). The role of psychotherapeutic treatment of IBS remains unclear, however. In one review of eight studies reporting positive outcomes of psychological treatment trials, only one was free of methodologic flaws as defined by the investigators (Talley, et al., 1996). Accordingly, and like medical therapy, further treatment trials of psychological interventions need to be conducted. However, behavioral treatment of IBS, particularly when it is part of “multicomponent” treatment composed also of psychopharmacologic and medical management, is quite promising. This approach builds on the concept that the treatment of IBS patients must be individualized. There is evidence from randomized controlled trials to suggest that psychotherapy may be as effective as serotonin-selective antidepressants for some patients and more cost-effective than antidepressant medication (Creed, et al., 2003; Drossman, et al., 2003). Patients who have significant severe psychosocial issues, such as a history of being physically or sexually abused, or patients with diagnosable psychiatric disorders accompanying their IBS, such as depression or severe anxiety disorders like panic disorder may benefit from psychotherapy (Heymann-Monnikes, et al., 2000).

4. Hypnotherapy
Hypnosis treatment uses an altered mental state of heightened receptivity, problem-specific therapeutic imagery, and targeted verbal suggestions to achieve mental and physiological changes. In IBS therapy, this treatment is typically a course of 7 to 12 weekly or biweekly sessions. Each session consists of a hypnotic induction followed by trance-deepening instructions and imagery and hypnotic suggestions designed to produce overall physical relaxation, gut-specific relaxation, reduction in the perception of life threat, lessened attention to gut discomfort, and enhanced sense of control over symptoms. (Palsson and Drossman, 2005).

Hypnosis for IBS has been tested in three small controlled trials and 12 uncontrolled studies. Whorwell, et al., (1984) randomized 30 severe and refractory IBS patients to either seven individual sessions of hypnotherapy or seven sessions of individual psychotherapy combined with placebo pills. The control group showed a small but significant improvement in abdominal pain, distension and general well-being, but showed no change in constipation or diarrhea. In contrast, the hypnotherapy patients showed significantly greater improvement in all central IBS symptoms, including bowel activity symptoms. The other two randomized controlled studies (Galovski and Blanchard, 1998; Palsson, et al., 2002) used symptom-monitoring waiting list members as controls, and both found hypnotherapy patients to improve substantially more in GI and psychological symptoms compared with the waiting groups. Improvement was well-maintained at follow-up in both studies. Recent published reports (Gonsalkorale, et al., 2002, 2003) on the long-term outcomes for more than 200 consecutive IBS patients treated with hypnosis in England have added substantially to the knowledge of the potential benefit from hypnosis for IBS. Seventy-one percent of patients responded to treatment. Among those responders, 81% fully maintained
improvement at follow-up 1 to 5 years later, and many of the remaining 19% had experienced only modest relapse in symptoms. Treatment responders also used significantly less medication and had fewer health care visits long-term. In a study done by Houghton et al 2003 it was found that hypnotherapy in particular has produced a long-lasting benefit in treating IBS.

Mahoney (2000) a hypnotherapist wrote in his article “Just dealing with the symptoms of IBS is not enough, the individual has to learn to rebuild internal energy, many sufferers feel drained emotionally, life issues and responsibilities continue to deplete inner emotional strength, leading in some cases to anxiety or even some forms of depression. Before the sufferer even thinks of working through the IBS, they invariably need an emotional ‘top up’, they need their batteries charged, after perhaps years of pain and discomfort, of being told by various medical professionals that there is nothing that can be done, even though intrusive and sometimes painful examinations have been undergone, many sufferers feel emotionally drained. Work and family relationships can be eroded and strained, social life and love life can be virtually non-existent, concentration and recall, may be almost impossible compared to how it used to be, confidence and self esteem of the individual is often very low, and the ability to see things in perspective is greatly reduced. Therefore to tell a sufferer that they must do this or that, without preparing for the journey is almost certain failure.

Hypnotherapy, when conducted correctly can increase self-esteem, confidence, and allow the sufferer to begin a journey of self improvement and management, by changing their thoughts, changing negative thoughts and feelings for positive ones and thereby equip
themselves emotionally to move away from the symptoms and thoughts of IBS and begin moving forward, a journey that many sufferers have or are taking at this moment, with positive changes.”

It was found in a study that hypnosis improved associated extra-colonic symptoms and quality of life measures, with more patients returning to work and having fewer visits to the doctor for IBS or other symptoms (Houghton, et al., 1996). Similar findings have also been independently reported by others using an identical (Harvey, et al., 1989; Galovski and Blanchard, 1998) or similar approach (Palsson, et al., 2002, Vidakovic-Vukic, 1999) to the original study (Whorwell, et al., 1984).

5. Cognitive Behaviour Therapy

Cognitive (or cognitive–behavior) therapy is a semi structured form of psychotherapy where the therapist helps patients to correct biased and negative thought patterns that amplify physical symptoms and undermine effective life functioning and psychological well-being. This is done by increasing awareness of the association between stressors, thoughts, and symptoms; by examining and correcting irrational beliefs; by countering automatic negative thoughts; and by identifying and implementing more adaptive coping strategies to handle challenging life situations and deal with bowel symptoms. These cognitive interventions often are combined with behavioral interventions like encouraging patients to engage in activities that counter the disability associated with the bowel disorder (Palsson and Drossman, 2005).

Overall cognitive behavioural therapy (CBT) is known to be an efficacious treatment for the range of the conditions loosely grouped
under the somatoform disorders (Sumathipala, 2007). CBT and similar therapies have shown specific usefulness in the treatment of irritable bowel syndrome (Brandt, et al., 2002). In IBS treatment, cognitive therapy is usually a course of 8 to 12 sessions (Toner, et al., 1998). Six controlled studies have been reported on cognitive or cognitive–behavior therapy for IBS. The largest and most methodologically sophisticated of these studies was conducted by Drossman, et al., 2003; Clouse, 2003. They randomized 431 women with functional bowel disorders (most met Rome criteria for IBS) to a 12-week course of cognitive–behavior therapy or the same amount of education intervention (and simultaneously compared the effects of these interventions to the tricyclic antidepressant desipramine versus placebo capsules). Cognitive–behavior therapy resulted in treatment response rate that was almost twice as high (70% versus 37%) as seen in the education control group on a broad composite outcome index that included bowel symptoms, quality of life, and patient satisfaction with treatment. The treatment response was not significantly different between desipramine and cognitive–behavior treatment (Drossman, et al., 2003; and Clouse, 2003). Drossman, et al. (2003) reported the results of a large and successful multicenter, randomized trial comparing cognitive behavioral therapy with education in moderate-to-severe functional bowel disorder. Authors concluded that 12-week cognitive behavioral therapy was more effective than education therapy -- regardless of symptom severity or abuse status

Two cognitive therapy studies (Payne and Blanchard, 1995; Greene and Blanchard, 1994) yielded very positive results for cognitive therapy. One of these (Payne and Blanchard, 1995) randomized 34 patients to 8 weeks of cognitive therapy, a self-help support group, or a waiting-list control group. Cognitive therapy patients had 66% reduction
in the composite bowel symptom score after treatment, twice the reduction among control patients, and this improvement was maintained at 3-month follow-up. The second study by this group (Greene and Blanchard, 1994) studied 20 patients and found that patients who received cognitive therapy had greater improvement in psychological and GI symptoms compared with a waiting-control group.

Three additional controlled trials of cognitive–behavior therapy for IBS have produced less impressive results. Two showed no differences between patients treated with cognitive–behavior therapy and standard medical care controls (Corney, et al., 1991; and Boyce, et al., 2003), and one found psychological improvement over control groups but no significant IBS symptom improvement (Toner, et al., 1998).

Toner, et al., (1998) provide a useful review of the literature. Of a total of ten controlled studies, they note that four found that CBT reduced gastrointestinal symptoms and psychological distress to a greater extent than did a symptom monitoring or waiting list control condition (Lynch and Zamble, 1989; Neff and Blanchard, 1987; Bennett and Wilkinson, 1985; van Dulmen, et al., 1996). Three studies found improvement in gastrointestinal symptoms at least as great as that found in response to medical treatment (Bennett and Wilkinson, 1985; Shaw, et al., 1991; Corney, et al., 1991).

In a recent study, Heymann-Monnikes, et al. (2000) found that a programme, including IBS information, progressive muscle relaxation, cognitive coping strategies, problem solving and assertiveness training, added significant benefit when given in combination with standard medical care, in terms of effects on patients’ quality of life, sense of
control over their difficulties, feeling of well-being and IBS symptoms (as recorded in diaries).

Medical Treatment in IBS

There is a long list of medications that have been studied and continue to be used in the treatment of patients with IBS. Pharmacological treatment usually is reserved for IBS patients with moderate to severe symptoms or those who fail to get adequate relief from diet and lifestyle modifications recommended by a physician. First line therapy is typically geared toward managing the most bothersome symptom and then addressing the remaining symptoms, due to the fact that there is currently not a drug that treats all the symptoms related to IBS. In practice, many gastroenterologists find the use of anticholinergics helpful in alleviating the symptoms of their IBS patients.

Recently, a number of reviews have been conducted to evaluate the efficacy of various treatments of IBS (Jailwala, et al., 2000). The most recent of these is a systematic review using evidenced-based medicine guidelines published by the American College of Gastroenterology (ACG) (Brandt, et al., 2002). In reviewing the available literature, the ACG task force concluded that clinical trials of antispasmodic agents were thought to have significant methodological deficiencies, such as short trial duration, small study numbers, and results that demonstrated inconsistent effectiveness (Brandt, et al., 2002). The task force also noted that adverse events, particularly sedation and constipation, limited the dose range of these agents. This same task force reviewed the available evidence for bulking agents, such as wheat bran, and corn fiber, and found that bulking agents were no more effective than placebo at relieving overall IBS symptoms.
However, they also concluded that bulking agents could be helpful for IBS-related constipation. The antidiarrheal agent loperamide, the only antidiarrheal agent that has been systematically studied in IBS, was found to be helpful in terms of relieving IBS-related diarrhea, but no better than placebo at relieving the global symptoms of IBS, such as abdominal pain or discomfort, bloating, rectal urgency, and cramping (Efskind, et al., 1996).

Eight randomized control trials (Heefner, et al., 1978; Steinhart, et al., 1981; Myren, 1982; Greenbaum, et al., 1987; Vij, et al., 1991; Rajagopalan, et al., 1998; Drossman, 2003) and one meta-analysis (Jackson, et al., 2000) have evaluated the efficacy of tricyclic antidepressants in IBS. The data demonstrated significant improvement of abdominal discomfort in patients treated with antidepressants, as compared against placebo treatment. Four randomized control trials (Lembo, et al., 2001; Camilleri, et al., 1999; Camilleri, et al., 2000; Jones, et al., 1999) have evaluated the effectiveness of alosetron in IBS management. All trials demonstrated significant improvement in global IBS symptoms, stool frequency, consistency and abdominal discomfort among women with diarrhea-predominant IBS.

- **Treatment of Child and Adolescent**

  Therapeutic principles and practices outlined for adults are equally applicable to children; however, additional considerations are also appropriate. Children have many fears, some rational and some irrational, and these must be recognized and allayed. Much time may be required for the child (and particularly the teenager) to develop confidence in the physician. It is best achieved by private discussions with the patient. This approach may help to overcome the child's natural
suspicion of authority figures and his or her concept that all adults have the same (i.e., parental) attitudes.

Most important is the establishment of a bowel training program that can be facilitated by utilizing breakfast or supper as a gastrocolic stimulus, asking the child to attempt a movement after one of these meals on a regular basis. Here a relationship of mutual trust greatly facilitates the physician’s program to help the child achieve a more normal bowel habit. The physician also must deal with the parents, who often have unexpressed guilt about the possibility of having transmitted the disorder to the child.

To conclude it can be said that IBS is a functional gastrointestinal disorder with a high prevalence rate and some specific symptoms. IBS is a complex disorder with both physiological and psychosocial components. Treatment is best delivered in an individualized manner and tailored to each patient’s need. The importance of psychosocial as well as medical interventions is now better understood and can be extremely helpful in managing these patients. It is important to detect and to manage factors that reinforce the illness and promote disability. Mobilization of a patient’s social and other assets, including family members, can promote quality of life.