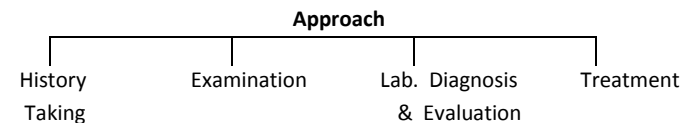


## INTRODUCTION

Originated from the Greek word “diárrhoia”, which correctly means: “to flow through”, Diarrhoea (both acute & chronic) is one of the major ailments of the modern society. According to American Gastroenterologists Association, chronic diarrhoea should be defined as “a decrease in fecal consistency lasting for four or more weeks”.<sup>1</sup> Chronic diarrhoea is present at a rate of 3-5% in the general population, has a major bearing on the life quality and increases the financial burden on the

patients. The uniqueness in its diagnosis is that it can be differentiated from acute diarrhoea in not being self-limited and persists until treated.<sup>2</sup> The causes are given in Table 1.

Table 1: Causes of Diarrhoea	
Inflammatory:	<ul style="list-style-type: none"> <li>• Inflammatory Bowel Disease (Crohn’s Disease, Ulcerative colitis)</li> <li>• Immune-mediated mechanism for inflammation (Graft vs Host Reaction, Allergy due to food, etc)</li> <li>• Bacterial, Viral &amp; Fungal Infections</li> <li>• Injury due to Radiation exposure</li> <li>• Neoplasias of the gut</li> </ul>
Secretory:	<ul style="list-style-type: none"> <li>• Exogenous, osmotic &amp; endogenous laxatives</li> <li>• Chronic ingestion of ethanol</li> <li>• Tumors which cause the production of hormones (Gastrinomas, Mastocytosis, Carcinoid, etc.)</li> <li>• Deficiencies of disaccharides</li> <li>• Intolerance to gluten, saccharides, polyols</li> <li>• Decreased absorption from the bowel due to resection, disease or fistula</li> <li>• Addison’s disease</li> </ul>
Dysmotility:	<ul style="list-style-type: none"> <li>• Prokinetic Drugs</li> <li>• Irritable bowel syndrome</li> <li>• Thyroid disorders</li> <li>• Vagotomy operations</li> </ul>
Steatorrhoea:	<ul style="list-style-type: none"> <li>• Digestion problems in the lumen</li> <li>• Malabsorption from the mucosa</li> <li>• Lymphatic obstruction</li> </ul>
Self-induced:	<ul style="list-style-type: none"> <li>• Disorders of diet and eating</li> <li>• Munchausen syndrome</li> </ul>
Iatrogenic:	<ul style="list-style-type: none"> <li>• Vagotomy</li> <li>• Cholecystectomy</li> <li>• Ileal resection</li> </ul>



## HISTORY TAKING

The following questions should be specifically asked when one is taking the history of a suspected case of chronic diarrhoea:

- Duration of illness ( >4 weeks pointing towards presence of chronic diarrhoea)
- Constant/Episodic Diarrhoea
- Age of the patient (as old age patients can be suffering from chronic diarrhoea due to some malignancy)
- Whether the patient gets up from his sleep in the night to defecate (secretory/inflammatory diarrhoea)
- Is diarrhoea affected by fasting? (pointing towards food intolerance, etc)
- Source of water consumption (eg. well water can cause giardiasis)
- History of travel (eg. camping in endemic parasitic areas)
- History of hospitalization (iatrogenic)
- History of supplementary medications (sorbitol, used as a base in certain supplements, can cause diarrhoea as it is an osmotically active sugar)
- Is the patient an alcoholic? (alcoholic patients can have insufficiency of the pancreas)
- Is the patient diabetic? (motility of the gut is affected)

## EXAMINATION

### General Examination

Examination for lymphadenopathy, can help significantly as it is a major sign pointing towards neoplasias and chronic infections. Significant weight loss can be a feature of malignancies or chronic infections.

### Eye examination

If there are signs of episcleritis, the diarrhoea can be linked to inflammatory bowel disease. Signs of exophthalmos can be attributed to hyperthyroidism as a cause for the diarrhoea.

### Skin examination

Blistering rashes of itchy nature (dermatitis herpetiformis), are present in one-fourth patients who suffer from celiac disease.<sup>5</sup> Particular skin changes can also be seen in patients suffering from Carcinoid syndrome, Addison's disease and glucagonoma.<sup>6</sup>

### ABDOMINAL EXAMINATION

- Look for scars (Post-surgical causes of diarrhoea)
- Bowel sounds (Hypermotile causes of diarrhoea)
- Presence of tenderness (Infectious causes, inflammatory causes)
- Presence of mass (Malignant causes)

### RECTAL EXAMINATION

For presence of blood

- Anoscopy: Presence of ulcers & impacted stools can be detected by anoscopy.

### OTHER SIGNS<sup>6</sup>

- Patients suffering from amyloidosis show signs of orthostatic hypotension and peripheral neuropathy.
- Patients of Inflammatory Bowel disease and Whipple's disease show signs of arthritis.
- Presence of tremors indicate hyperthyroidism.
- A patient of colitis can present with signs of chronic liver disease.

### LABORATORY DIAGNOSIS & EVALUATION

#### Blood Tests

Complete Blood Count

Erythrocyte Sedimentation Rate

Fasting, post-prandial sugar with HbA<sub>1c</sub>

HIV I & II (ELISA)

Kidney Function Tests

Electrolytes

Liver Function Tests

Thyroid Function Tests

Vitamin B<sub>12</sub> and Folic acid

Ferritin

C-Reactive Protein

- Presence of organic diseases can be detected by an increase in the ESR, decrease in albumin levels and hemoglobin.<sup>8,9</sup>
- A decrease in the iron levels in the blood points

towards the presence of small bowel disease, celiac diseases.<sup>10</sup>

- Serological testing can be done to detect the presence of celiac disease.
- If diarrhoea is more than a liter per day, estimation of vasoactive intestinal polypeptide, histamine, calcitonin & substance P should be done.<sup>7</sup>

### STOOL TESTS

Based on clinical diagnosis, stool tests should be conducted specifically, but in complicated cases, a "broad nest" method of testing the stool should be applied. Categorization of the diarrhoea on the basis of its cause is an important pre-requisite in the management of a patient with chronic diarrhoea. Although a planned collection is preferable but random stool collection is more practical and possible.

The stool sample should be checked for the following:

- Presence of occult blood
- Presence of white blood cells
- pH level of the sample
- Sudan stain for detection of fat in the sample
- Culture of the stool sample
- Laxative Abuse
- Electrolyte levels and osmolality of the sample

#### A. Occult Blood & White Blood Cells:

- Basically show the possibility of inflammatory type of diarrhoea
- Wright stain: Sensitivity 70%, specificity 50% for leucocytes
- White Blood cells in the stool also point towards the probability of ulcerative colitis
- Blood in the stool may be caused by bleeding in the digestive tract

#### B. pH:

- A low pH of less than 6 is suggestive of a malabsorption of carbohydrates

#### C. Detection of fats :

- Sudan stain is the gold standard test for the quantitative evaluation of fat in stool of the sample collected

- A three day collection of the stools for evaluation of the fat unabsorbed by the gut has been a practiced test for malabsorption for a long time and is still used by gastroenterologists.<sup>11</sup>

- The faecal fat concentration which is gram faecal fat/100 grams of wet stool weight, usually corresponds well with the total fat excretion.<sup>12-16</sup> Breath Test for fat malabsorption<sup>7</sup> :

Breath tests for fat malabsorption offer an inviting substitute to stool tests.

Absorption of  $^{14}\text{C}$ -triolein is used as a substitute to fecal fat. The test evaluates absorption as well as lipolysis. Fat absorption tests established on isotopes without radioactivity have been produced employing a variety of  $^{13}\text{C}$  substrates. A triglyceride with a long chain collected from algae  $^{13}\text{C}$  Hiolein is being employed for these tests involving its administration orally in the quantity of 2mg/kg with a rice preparation, and consequently the breath having  $^{13}\text{CO}_2$  is evaluated using mass spectrometry. This test is equally sensitive and specific as compared with that of  $^{14}\text{C}$ -triolein.

D. Evaluation of laxative abuse<sup>4</sup>:

- Barium enema to test for cathartic colon (abnormal right colon)
- Sigmoidoscopy for gross presence of melanosis coli (microscopic form is often a normal variant)
- Alkalinization assay of stool: phenolphthalein, some anthraquinones, and rhubarb turn red; bisacodyl turns purple-blue
- Spectrophotometry\* or thin-layer chromatography of urine or stool water: detects anthraquinones, bisacodyl, phenolphthalein; can detect anthraquinones 32 hr after one dose
- Measurement of stool osmolality: only useful if  $<250$  mOsm per kilogram (implying dilution of stool with water or urine)

\*These tests are usually done in a commercial or referral laboratory. The stool specimen should be liquid and frozen. A "laxative survey" request will usually result in chromatographic, spectrophotometric, and other methods of detecting anthraquinones, bisacodyl, phenolphthalein, castor oil, mineral oil, magnesium, and phosphate. Docusate sodium, the active ingredient in Colace, can be detected by thin-layer chromatography but is not measured in the currently available laxative screens.

E. Evaluation of the loss of protein<sup>7</sup>: Proteins are broken down into amino acids in the lumen of the gut with the help of enzymes released by pancreas before absorption starts actively. A problem in digestion of these products is a rare phenomenon and hence, evaluation of protein malabsorption is a rarity in clinical settings. Even then, few methods which have been explained are:

- Faecal clearance of  $\alpha 1$ -antitrypsin<sup>107</sup>
- Faecal clearance of radiolabelled albumin,<sup>108</sup>

F. Stool Culture:

- Infections usually point towards inflammatory diarrhoea

- Bacterial infection is an unusual cause of chronic diarrhoea in hosts which are immunocompetent.
- Plesiomonas and Aeromonas require special techniques.
- Stool ELISA can be done to detect GIARDIA.
- Ova and parasites can be detected

G. Stool electrolyte level

Stool osmotic gap:  $290 - 2([\text{Na}^+] + [\text{K}^+])$

- Gap  $< 50$  mOsm/Kg: Pure secretory diarrhoea
- Gap  $> 125$  mOsm/Kg: Pure osmotic diarrhoea
- Gap 50-125 mOsm/kg: Mixed or mild carbohydrate malabsorption

Osmolality of the sample

- Not used to calculate gap
- Useful in cases of unexplained diarrhoea
- Low measured stool osmolality ( $< 290$  mOsm/Kg) suggestive of contamination with water or dilute urine

H. Endoscopic & Histological evaluation:

- In a patient of chronic diarrhoea, where there is a probability of malabsorption, diagnostic checkups should be in the direction of pancreatic or small bowel malabsorption.
- In an outpatient department, to evaluate rectum, unprepared rigid sigmoidoscopy was employed for a long time, but in chronic diarrhoea patients, the preferred choice is flexible endoscopy.
- If the symptoms point towards colorectal malignancies, screening colonoscopy can be employed.<sup>17-20</sup>
- If the patient is below the age of 45 years, a positive diagnosis can be made with the help of characteristic symptoms of functional bowel disease, normal screening blood tests and normal examination.
- However, patients below the age of 45 years with abnormal symptoms and chronic diarrhoea should resort to flexible sigmoidoscopy as the diagnostic results are different from the use of colonoscopy in this age segment.
- If the patient is above this age-group, suffering from chronic diarrhoea, colonoscopy is the choice of evaluation. It is more sensitive than the use of barium enema.
- For celiac disease, Antiedomysium antibody testing is the choice of investigation. To examine for the presence of small bowel enteropathies, upper gastrointestinal endoscopy with distal duodenal biopsies should be employed.
- Enteroclysis or barium follow through should be reserved for suspected patients of small bowel

If there is chronic diarrhea, adopt the following approach:

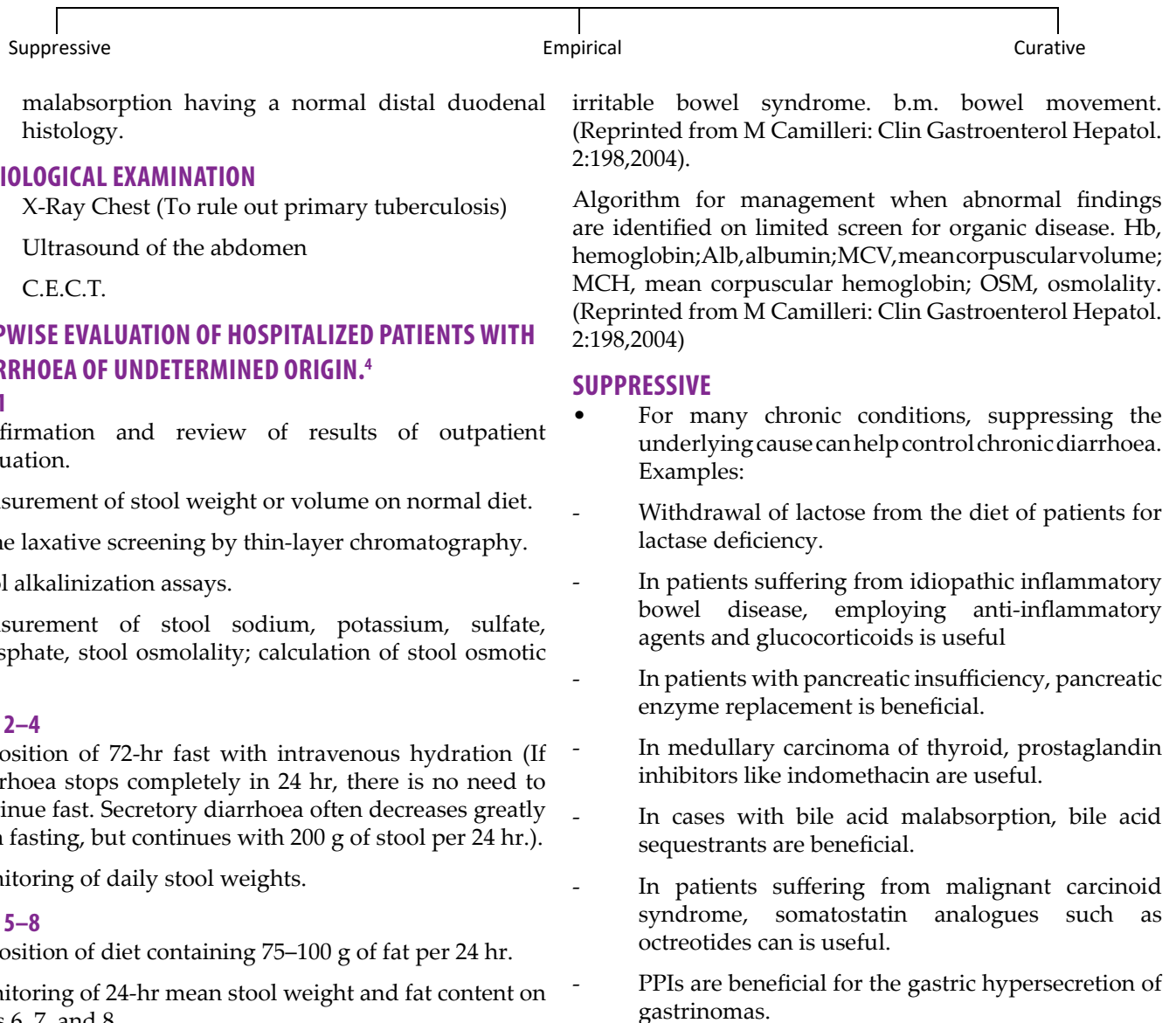
1. Exclude hospital based problems (drugs, operative procedures)
2. Look for blood per rectum (Biopsy, colonoscopy)
3. If the features suggest malabsorption, do biopsy, aspiration and imaging (small bowel)
4. If the pain increases or subsides after movement of bowel, suspect incomplete evacuation, test for IBS
5. If there are no features of malabsorption, consider functional diarrhea, exclude lactose, sorbitol

Initial management algorithm based on features accompanying diarrhea.

(Taken from M Camilleri: Clin Gastroenterol Hepatol. 2:198,2004)

### TREATMENT

Can be of the following types:



### **TREATMENT OF CHRONIC DIARRHOEA**

Initial management algorithm based on features accompanying diarrhoea. p.r., per rectum; IBS,

### **EMPIRICAL**

- If the specific cause of chronic diarrhoea cannot be found, empirical therapy may be employed.

- Loperamide, diphenoxylate and other mild opiates are beneficial in watery diarrhoeas of mild to moderate nature.
  - Tincture of opium or codeine can be employed for treatment of watery diarrhoeas of severe nature.
  - To avoid toxic megacolon, in patients with severe Inflammatory bowel disease, application of antitomotility drugs should be avoided.
  - In diabetic patients suffering from chronic diarrhoea,  $\alpha_2$ -adrenergic agonists like clonidine should be used. Its adverse effect includes postural hypotension.
  - In patients of Inflammatory bowel disease, suffering from chronic diarrhoea, diarrhoea and urgency can be alleviated with the help of drugs like Alosetron and other 5-HT<sub>3</sub> receptor antagonists.
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### CURATIVE

- If the etiology is assessed correctly, treatment is curative like resection of a colorectal cancer, discontinuation of a specific drug, antibiotic administration for Whipple's disease or tropical sprue.

### NOTE

- For all chronic diarrhoea patients, an important part of the management is the repletion of fluid and electrolytes.
- In patients suffering from chronic steatorrhea, replacement of fat-soluble vitamins is also beneficial.

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