

# Abdominal Pain

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# Outline



- Causes of Abdominal pain
- Functional dyspepsia
- Approach to management of dyspepsia
- Management of H pylori
- Irritable bowel syndrome

# Acute abdominal pain

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graph TD; A[Acute abdominal pain] --> B[Surgical]; A --> C[Medical]; B --- B1[○ Appendicitis]; B --- B2[○ Cholecystitis]; B --- B3[○ Bowel obstruction]; B --- B4[○ Acute mesenteric ischemia]; B --- B5[○ Perforation]; B --- B6[○ Trauma]; B --- B7[○ Peritonitis]; C --- C1[○ Cholangitis]; C --- C2[○ Pancreatitis]; C --- C3[○ Choledocholithiasis]; C --- C4[○ Diverticulitis]; C --- C5[○ PUD]; C --- C6[○ Gastroenteritis]; C --- C7[○ Nonabdominal causes]; C --- C8([Functional cause (more of chronic)]);
```

## Surgical

- Appendicitis
- Cholecystitis
- Bowel obstruction
- Acute mesenteric ischemia
- Perforation
- Trauma
- Peritonitis

## Medical

- Cholangitis
- Pancreatitis
- Choledocholithiasis
- Diverticulitis
- PUD
- Gastroenteritis
- Nonabdominal causes

Functional cause  
( more of chronic)

# Case scenario



- A 34 y/o lady who comes to your clinic because of epigastric pain since 5m ago
- She complains of bloating and early satiety too
- There is no alarm symptom in her history
- She use no medications
- Her physical examination is normal

# Epidemiological data about dyspepsia



**ESTIMATED PREVALENCE OF DYSPEPSIA IS  
BETWEEN 20-40%**

**MOST AFFECTED PEOPLE DO NOT SEEK  
MEDICAL CARE**

**25 AND 40% OF INDIVIDUALS WITH  
DYSPEPSIA WILL CONSULT A PCPS**





**Table 2.** Leading Physician Diagnoses for Gastrointestinal Disorders in Outpatient Clinic Visits in the United States, 2009

Rank	Diagnosis	Estimated visits	ICD-9 Codes
1	GERD <sup>a</sup>	8,863,568	530.11, 530.81
2	<del>Abdominal pain</del>	7,170,332	389.04, 789.00, 789.06, 789.07, 789.09
3	<u>Gastroenteritis and dyspepsia<sup>b</sup></u>	4,007,198	008.8, 535.50, 536.8
4	Constipation	3,980,438	564.00
5	Abdominal wall hernia	3,559,932	550.90, 553.10, 553.20
6	Diverticular disease	2,682,168	562.10, 562.11
7	Diarrhea	2,402,350	787.91
8	Inflammatory bowel disease	1,893,799	555.9, 556.9
9	Colorectal neoplasm	1,744,089	153.9, 154.0, 154.1, 211.3
10	Nausea and vomiting	1,678,515	787.02, 787.03
11	Rectal bleeding	1,667,653	569.3, 578.1
12	Irritable colon	1,550,072	564.1
13	Hepatitis C infection	1,230,420	070.54, 070.70
14	Hemorrhoids	1,071,430	455.0, 455.4, 455.6, 455.8
15	Dysphagia	1,020,743	787.20
16	Appendicitis	663,930	541.0
17	Cirrhosis	635,463	571.5
18	Barrett's esophagus	440,605	530.85
19	Hepatitis, unspecified	379,062	573.3
20	Gallstone disease	303,606	547.10

# DEFINITION ( Rome III Committee )



There is a new classification including two distinct diagnostic categories:

- ✓ Postprandial distress syndrome (PDS)
- ✓ Epigastric pain syndrome (EPS) which indicate meal-related and unrelated symptoms.

# ETIOLOGY



## Diagnosis

Functional dyspepsia (up to 60 percent)

### **Dyspepsia caused by structural or biochemical disease**

Peptic ulcer disease

Gastroesophageal reflux disease (GERD)

Biliary pain

Chronic abdominal wall pain

Gastric or esophageal cancer

Gastroparesis

Pancreatitis

Carbohydrate malabsorption

Medications (including potassium supplements, digitalis, iron, theophylline, oral antibiotics [especially ampicillin and erythromycin], NSAIDs, corticosteroids, niacin, gemfibrozil, narcotics, colchicine, quinidine, estrogens, levodopa)

Infiltrative diseases of the stomach (eg, Crohn's disease sarcoidosis)

Metabolic disturbances (hypercalcemia, hyperkalemia)

Hepatoma

Ischemic bowel disease

Systemic disorders (diabetes mellitus, thyroid and parathyroid disorders, connective tissue disease)

Intestinal parasites (Giardia, Strongyloides)

Abdominal cancer, especially pancreatic cancer



# CLINICAL APPROACH



- **History**
  - Ulcer-like or acid dyspepsia (eg, burning, epigastric hunger pain with food, antacid, and antisecretory agent relief)
  - Dysmotility-like dyspepsia (with predominant nausea, bloating, and anorexia)
  - Unspecified dyspepsia
- **Physical examination** :*usually normal*
  - *A palpable mass*

# Alarm symptoms



- Unintended weight loss
- Persistent vomiting
- Progressive dysphagia
- Odynophagia
- unexplained anemia or iron deficiency
- Hematemesis
- Palpable abdominal mass or lymphadenopathy
- Family history of upper gastrointestinal cancer
- Previous gastric surgery
- Jaundice
- NPV=99%

# Routine laboratory tests



- Routine blood counts and
- blood chemistry
  
- Invasive procedure Endoscopy

# Endoscopy



- Gold standard test to exclude gastroduodenal ulcers, reflux esophagitis, and upper gastrointestinal cancers.
- Beneficial because up to **40 percent** of patients have an organic cause of dyspepsia.
- It also provides reassurance to patients

# Endoscopy



- Disadvantage:
- Expensive
- Invasive
- Not cost-effective in young patients without alarm symptoms
- UP TO 50% are normal



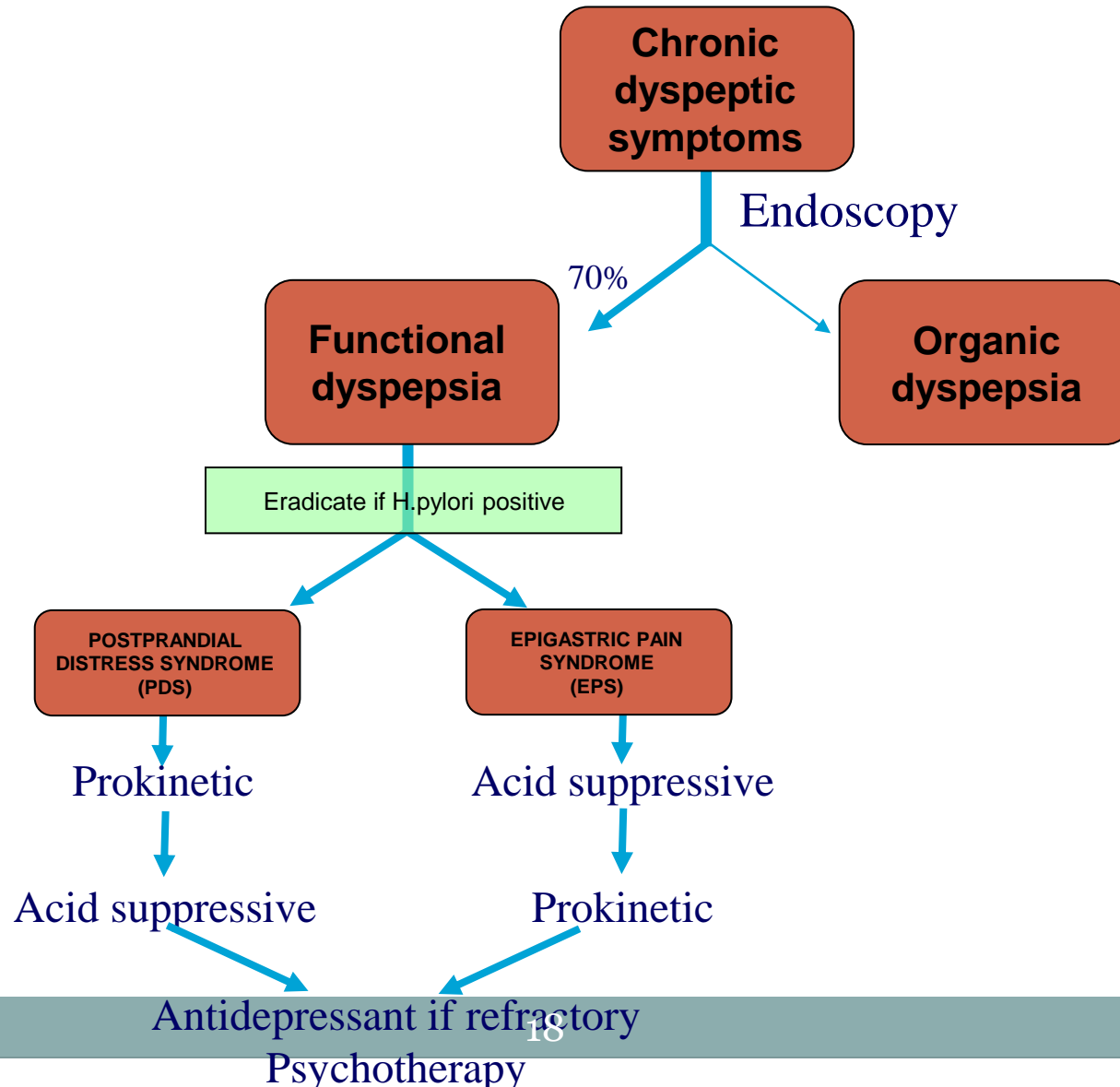
- Patient is a 34 y/o lady who comes to your clinic because of epigastric pain since 5m ago
- She complains of bloating and early satiety too
- There is no alarm symptom in her history
- She use no drug
- Her physical examination is normal



- What do you do for our patient?
- Endoscopy
- High dose PPI
- HP testing

# FUNCTIONAL DYSPEPSIA

## Management algorithm







- HP serology was positive. Received eradication therapy
- You treat H.Pylori but symptoms are constant?
- Test for HP eradication was negative

# Management of functional dyspepsia



H. pylori negative functional dyspepsia  
(normal endoscopy) and failed and  
adequate trial of PPI



1. Re-evaluate the symptoms and diagnosis
2. Consider other sources of abdominal pain: pancreas, colon, biliary tract
3. Does the patient have symptoms of delayed gastric emptying?
4. Does the patient have IBS?
5. Does the patient have panic disorder or other psychological issues?



Persistent symptoms  
No other cause established



Consider: Antidepressants, hypnotherapy,  
behavior therapy, prokinetic agents

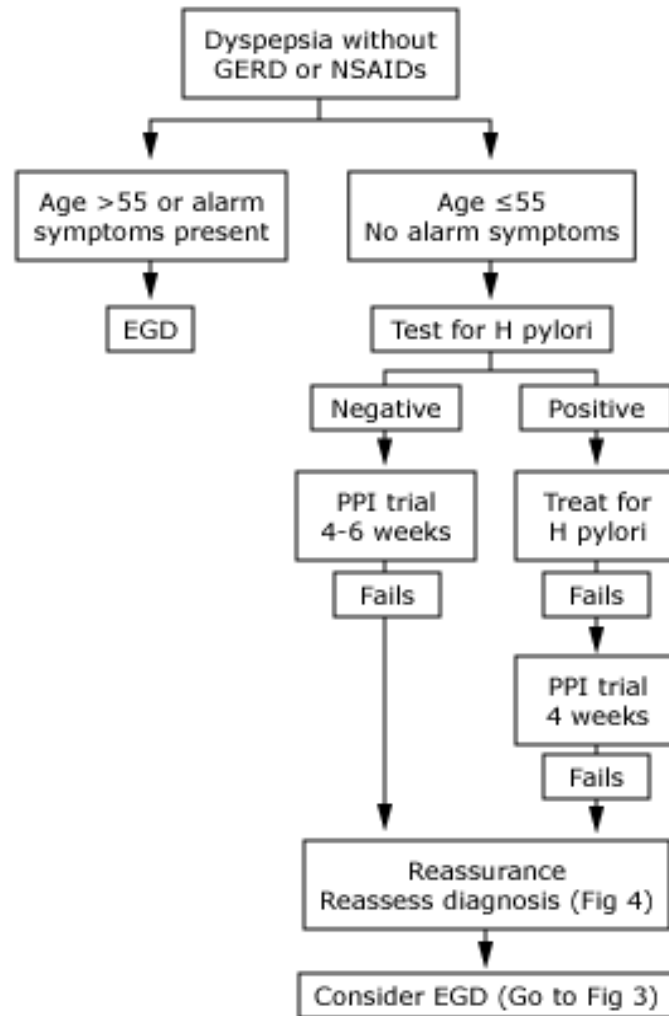
## Case scenario 2



- Patient was a 60 y/o lady who was referred to me because of constant epigastric pain
- She mentioned 6kg wt loss since 3m ago
- She was anemic with ferritin =5
- What is the best diagnostic test?



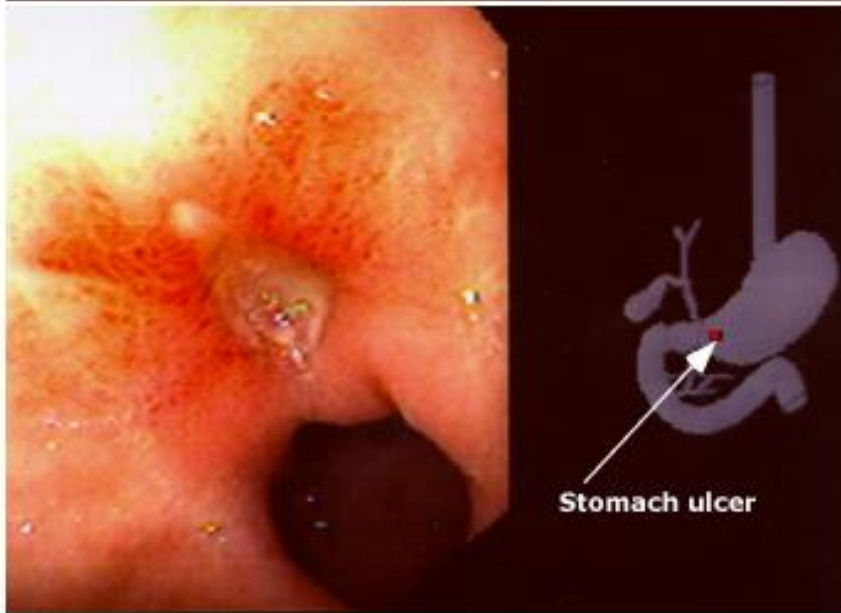
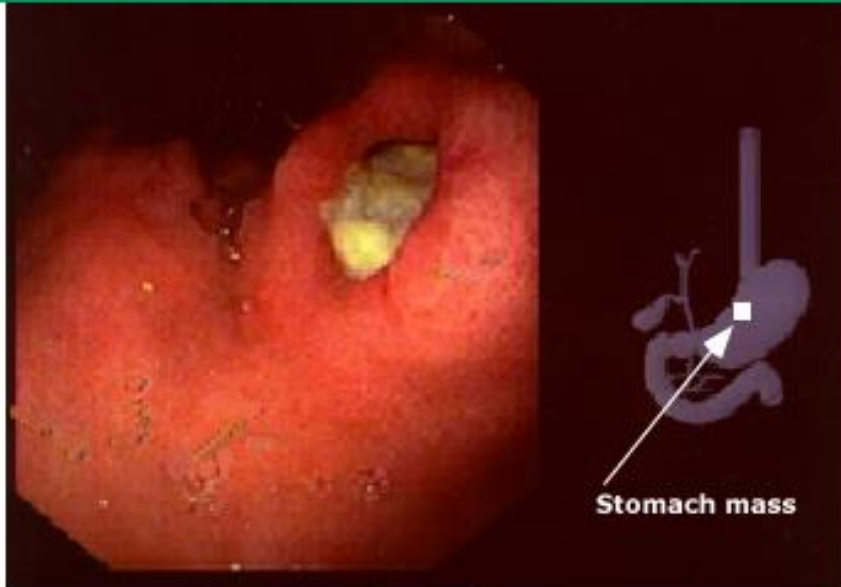
# Management of dyspepsia based on age and alarm features



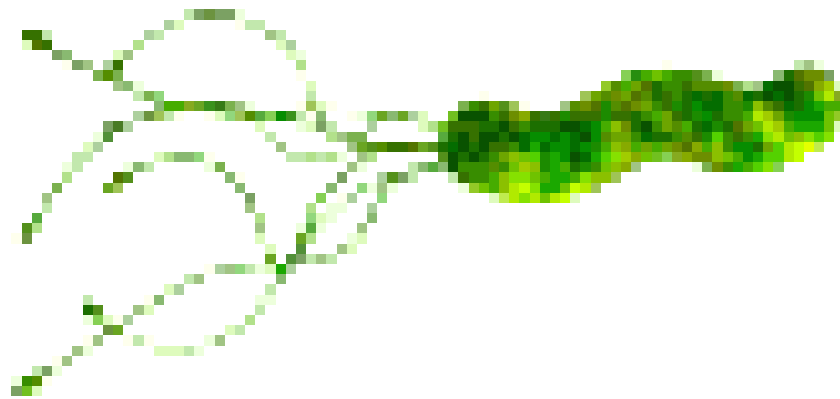
## Case scenario 3



- A 44 y/o lady who was referred to me because of chronic epigastric pain mainly at night and vomiting  
She gave a history of one day history of melena but no other alarm symptoms
- What is the next step?



# Helicobacter pylori





# Helicobacter Pylori



Gram negative organism with following characteristics:

- Slow growing
- Microaerophilic
- Highly motile
- Spiral
- Urease producing

# Transmission of Helicobacter pylori



Transmission occurs predominantly in children and socio-economic status of the family is the main risk factor as reflected by the level of sanitation and household hygiene. Route of transmission is from person to-person through:

- Fecal-oral route
  - Gastro-oral route
  - Oral-oral route
- 
- One of the commonest human infection



## The Nobel Prize in Physiology or Medicine 2005

"for their discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease"



**Barry J. Marshall**

🕒 1/2 of the prize

Australia

NHMRC *Helicobacter pylori*  
Research Laboratory, QEII  
Medical Centre; University of  
Western Australia  
Nedlands, Australia

b. 1951



**J. Robin Warren**

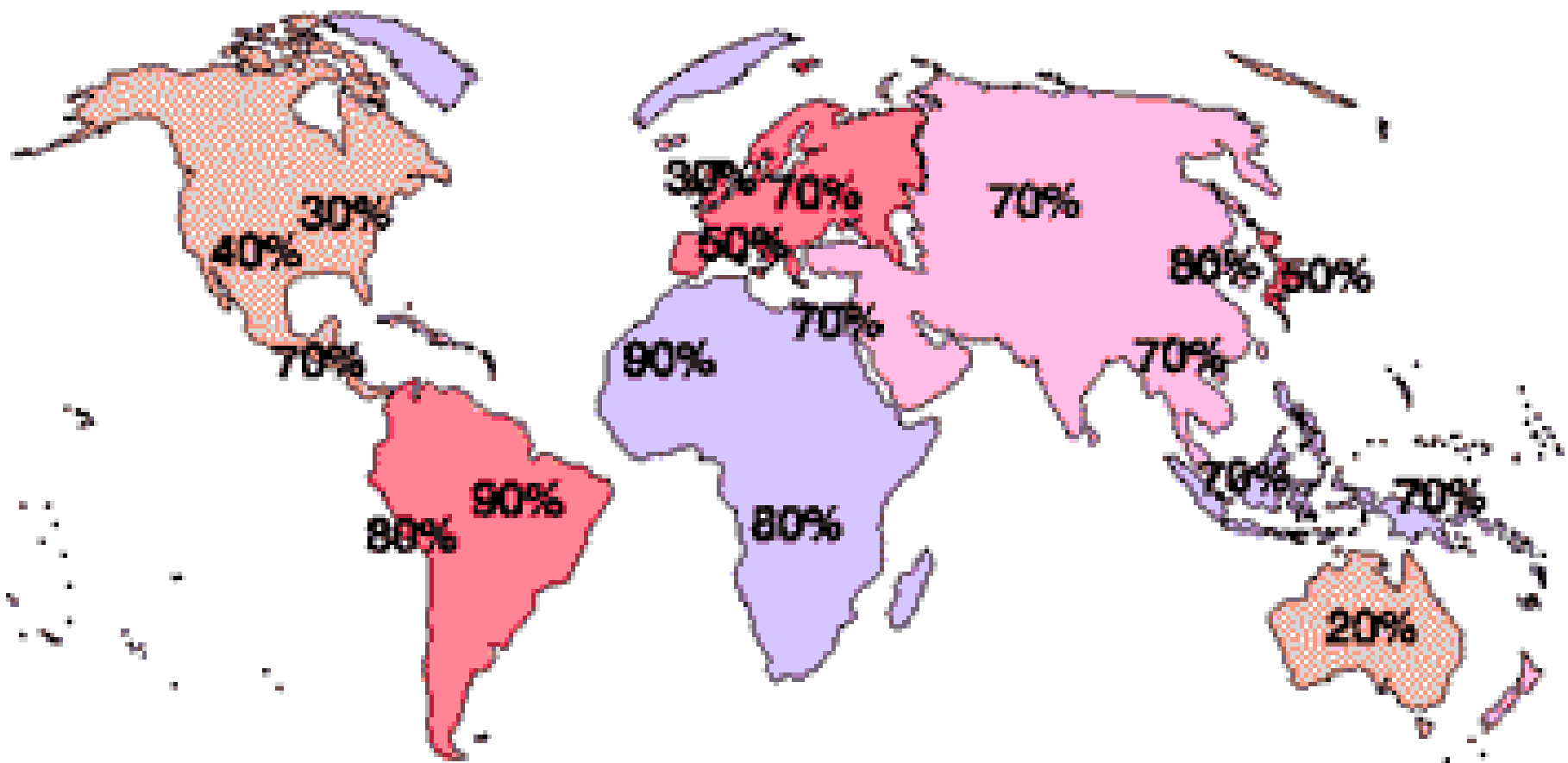
🕒 1/2 of the prize

Australia

Perth, Australia

b. 1937

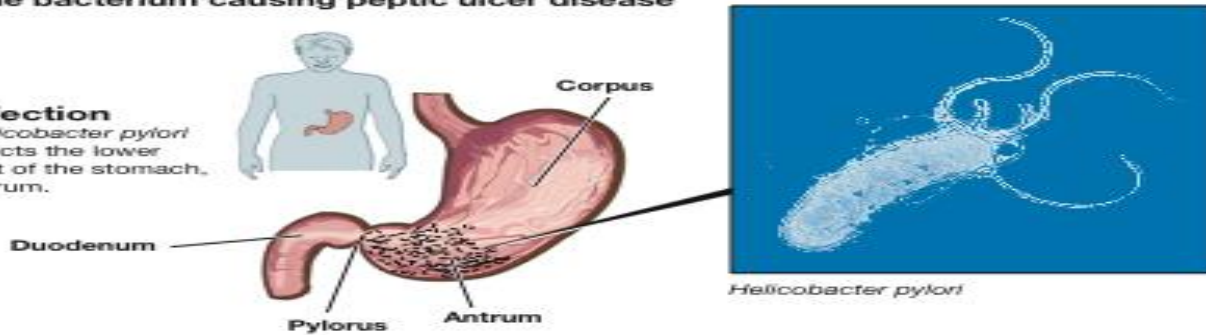
“for their discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease”



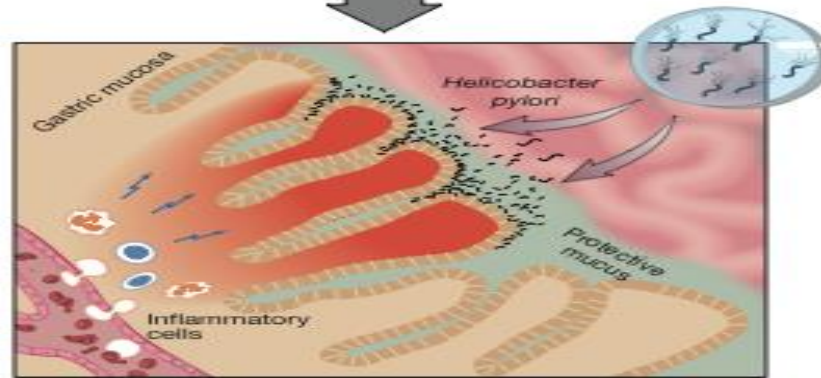
# Helicobacter pylori

— the bacterium causing peptic ulcer disease

**Infection**  
*Helicobacter pylori* infects the lower part of the stomach, antrum.



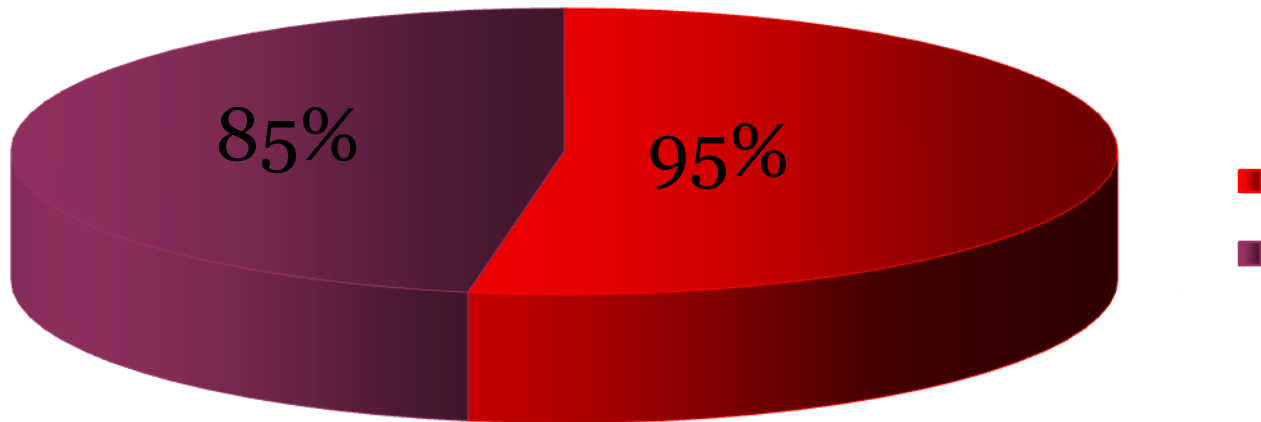
**Inflammation**  
*Helicobacter pylori* causes inflammation of the gastric mucosa (gastritis). This is often asymptomatic.



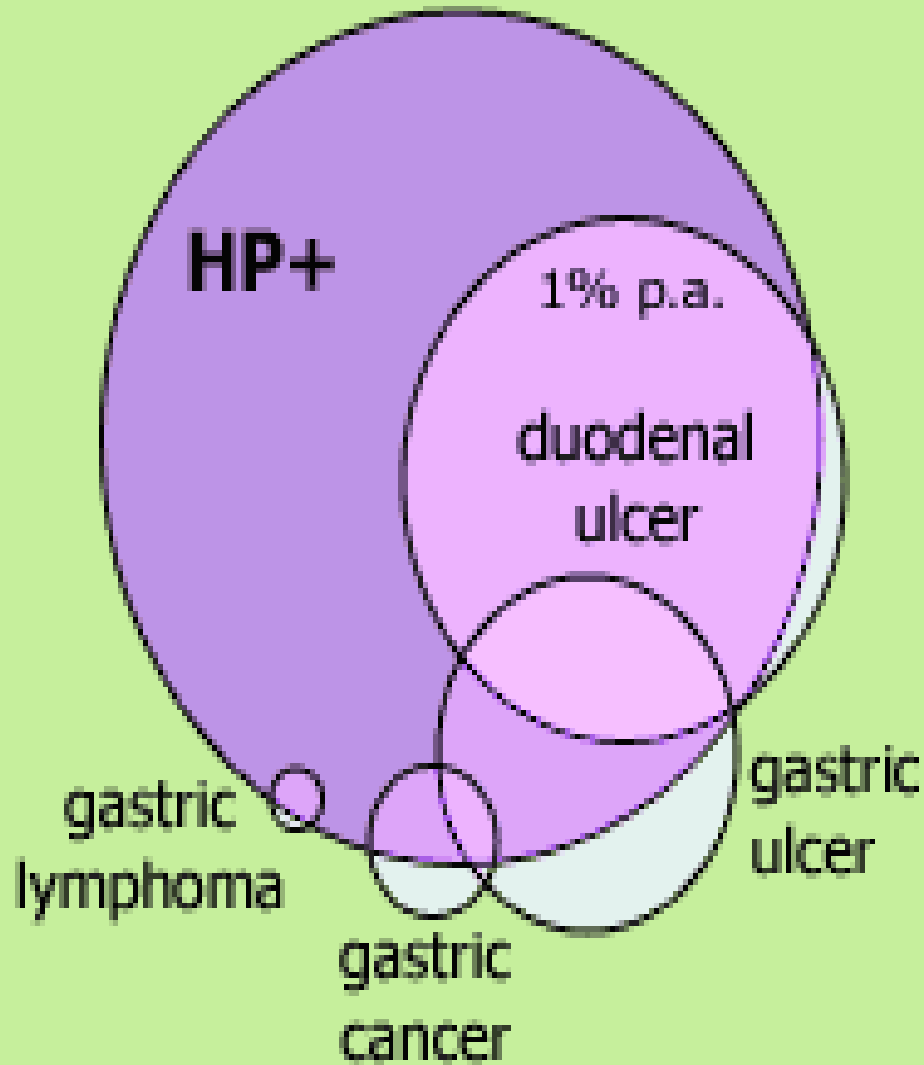
**Ulcer**  
Gastric inflammation may lead to duodenal or gastric ulcer. Severe complications include bleeding ulcer and perforated ulcer.



# *H. pylori* as a cause of PUD



HP-





## ***Helicobacter Pylori* in Peptic Ulcer Disease**

National Institutes of Health  
Consensus Development Conference Statement  
February 7-9, 1994

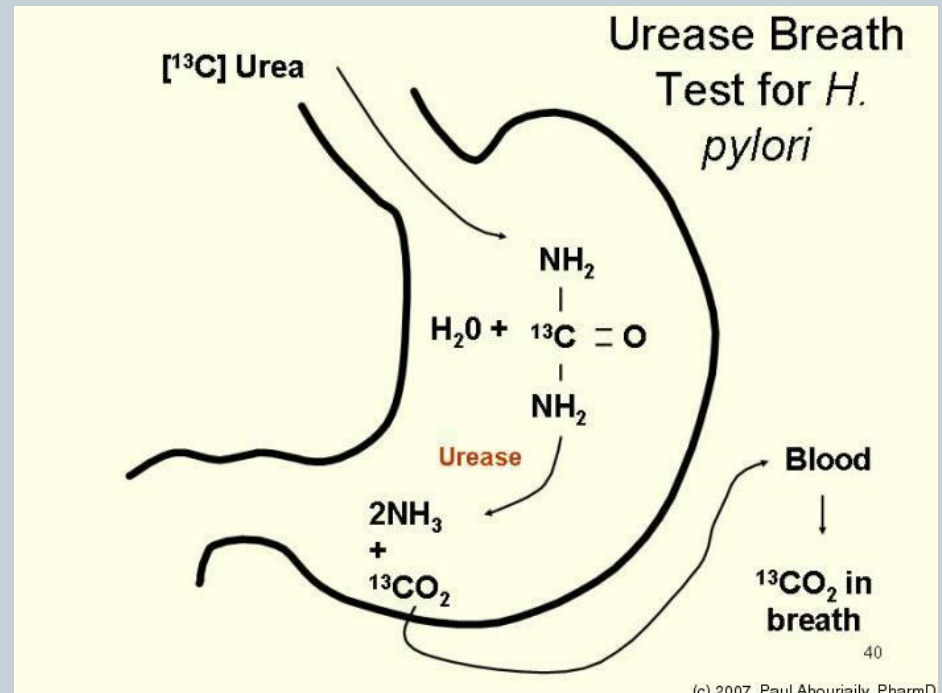
The strongest evidence for the pathogenic role of *H. pylori* in peptic ulcer disease is the marked decrease in the recurrence rate of ulcers following the eradication of infection.



# Diagnosis



- Non endoscopic methods
- Serum antigen
- UBT
- Stool antigen



# Diagnosis...



- Endoscopic
- Histology
- Rapid urease test
- Culture
- PCR

# European Helicobacter Pylori Study Group Guidelines



- Triple therapy with omeprazole (20 mg twice daily), amoxicillin (1 g twice daily), and clarithromycin (500 mg twice daily) for 7 to 14 days.
- A longer duration of treatment (14 versus 7 days) may be more effective in curing infection but this remains controversial.

Regimen	Comment
PPI, amoxicillin 1 gm, clarithromycin 500 mg all twice daily for 7-14 days	1st line treatment regimen of choice (can substitute metronidazole 500 mg twice daily for amoxicillin but only in penicillin allergic patients)
Bismuth 525 mg, metronidazole 500 mg, tetracycline 500 mg all four times daily with a PPI twice daily for 7-14 days	Can be used as 1st line treatment (7-14 days) but generally reserved for retreatment (14 days)
PPI, amoxicillin 1 gm, metronidazole 500 mg all twice daily for 14 days	1st line treatment in macrolide allergic patients and retreatment if failed 1st line treatment of choice

# Treatment Regimens

**Treatment Regimen**



**Duration  
(days)**

**Eradication Rate  
(%)**

Omeprazole 20mg BID +  
Amoxicillin 1g BID +  
Clarithromycin 500 mg BID

14

80-86

Lansoprazole 30mg BID +  
Amoxicillin 1g BID +  
Clarithromycin 500 mg BID

10-14

86

Bismuth subsalicylate 525mg  
QID + Metronidazole 250mg  
QID + Tetracycline 500mg +

PPI for another  
14 taken OD or  
BID)

80

**PPI**



- Pooled data from 20 studies involving 1975 patients treated with standard triple therapy showed an eradication rate of **88%** in clarithromycin-sensitive strains *vs 18% in clarithromycin-resistant strains*
- **Mégraud F. H pylori antibiotic resistance: prevalence, importance, and advances in testing. *Gut* 2004; 53: 1374-1384**

# Clarithromycin-resistant bacteria



- A 10-day **sequential regimen** (a PPI and amoxicillin 1 g, each given twice daily for the first 5 days, followed by the PPI, clarithromycin 500 mg, and tinidazole 500 mg, each given twice daily for the remaining 5 days)
- Improved overall eradication rates compared with standard PPI triple therapy (89% vs. 77 %), but was particularly better for clarithromycin-resistant bacteria (**89%** vs. 29%).

Jafri NS, Hornung CA, Howden CW: Meta-analysis: Sequential therapy appears superior to standard therapy for *Helicobacter pylori* infection in patients naive to treatment. *Ann Intern Med* 2008; 148:923-31.

# Concomitant therapy



- Novel regimen which was proved successful in the presence of clarithromycin resistance. This is a 4-drug regimen containing a PPI ,*clarithromycin (500 mg, b.i.d.)*, *amoxicillin (1 g, b.i.d.)* and *metronidazole (500 mg, b.i.d.)* which are all given for the entire duration of therapy.

- **Essa AS, Kramer JR, Graham DY, Treiber G. Meta-analysis: four-drug, three-antibiotic, non-bismuth-containing “concomitant therapy” versus triple therapy for *Helicobacter pylori* eradication. *Helicobacter* 2009; 14: 109-118**





**Eradicated**

<b>Analysis Population</b>	<b>N</b>	<b>N</b>	<b>Percent</b>	<b>95% CI for Percent Eradicated</b>
<b>Intention to Treat (ITT)</b>	<b>1463</b>			
14-day Standard	488	401	82.2%	78.5%, 85.5%
5-day Concomitant	489	360	73.6%	69.5%, 77.5%
10-day Sequential	486	372	76.5%	72.5%, 80.2%

Lancet. 2011 August 6; 378(9790): 507–514



- Poor compliance with medication, and patient demographics such as younger age, smoking, prior antibiotic use, and underlying condition (functional dyspepsia vs. peptic ulcer).

Broutet N, Tchamgoue S, Pereira E, et al: Risk factors for failure of *Helicobacter pylori* therapy—Results of an individual data analysis of 2751 patients. *Aliment Pharmacol Ther* 2003; 17:99-109.

Suzuki T, Matsuo K, Ito H, et al: Smoking increases the treatment failure for *Helicobacter pylori* eradication. *Am J Med* 2006; 119:217-24.

# Rescue therapy



Regimen	Comment
PPI, levofloxacin 250 to 500 mg, amoxicillin 1 gm all twice daily for 14 days	"Rescue" therapy for those failing two course of above treatments
PPI, rifabutin 150 mg, amoxicillin 1 gm all twice daily for 14 days	Alternative "rescue" therapy
Based on Culture	

## Case scenario 4

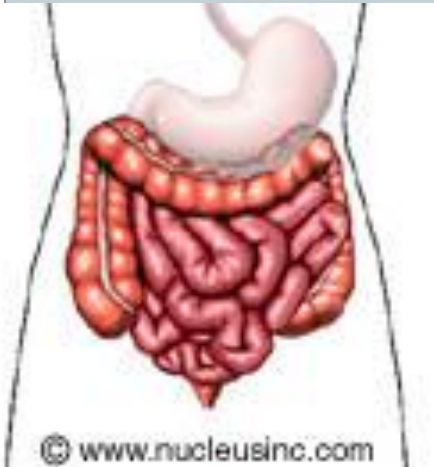


- A 30 years old lady with chronic abdominal pain mainly central associated with bloating . Alternating bowel habit and history of passing mucus with loose motions no Wt loss no blood/rectum
- What is the likely diagnosis?

# What Is IBS



- **Irritable bowel syndrome (IBS)** is an intestinal disorder that causes abdominal pain or discomfort, cramping or bloating, and diarrhea or constipation. Irritable bowel syndrome is a long-term but manageable condition.



## Introduction

- **First described in 1771.**
- **50% of patients present <35 years old.**
- **70% of sufferers are symptom free after 5 years.**
- **GPs will diagnose one new case per week.**
- **GPs will see 4-5 patients a week with IBS.**
- **Point prevalence of 40-50 patients per 2000 patients.**

# Who Gets IBS?



- It is estimated that between 10% and 15% of the population of North America, or approximately 45 million people, have irritable bowel syndrome.
- only about **30%** of them will consult a doctor about their symptoms.
- IBS tends to be more common in women, IBS is 2 to 3 times more common than in men.



# Diagnostic Criteria

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- **Rome III Diagnostic criteria.**
- **Manning's Criteria.**



# Rome III Diagnostic Criteria.

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- **At least 12 weeks history, which need not be consecutive in the last 12 months of abdominal discomfort or pain that has 2 or more of the following:**
  - Relieved by defecation.
  - Onset associated with change in stool frequency.
  - Onset associated with change in form of the stool.

# Rome II Diagnostic Criteria.

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- **Supportive symptoms.**
  - **Constipation predominant: one or more of:**
    - ✦ **BO less than 3 times a week.**
    - ✦ **Hard or lumpy stools.**
    - ✦ **Straining during a bowel movement.**
  - **Diarrhoea predominant: one or more of:**
    - ✦ **More than 3 bowel movements per day.**
    - ✦ **Loose [mushy] or watery stools.**
    - ✦ **Urgency.**

# Rome III Diagnostic Criteria.

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## ○ **General:**

- ✦ **Feeling of incomplete evacuation.**
- ✦ **Passing mucus per rectum.**
- ✦ **Abdominal fullness, bloating or swelling.**

# Associated Symptoms

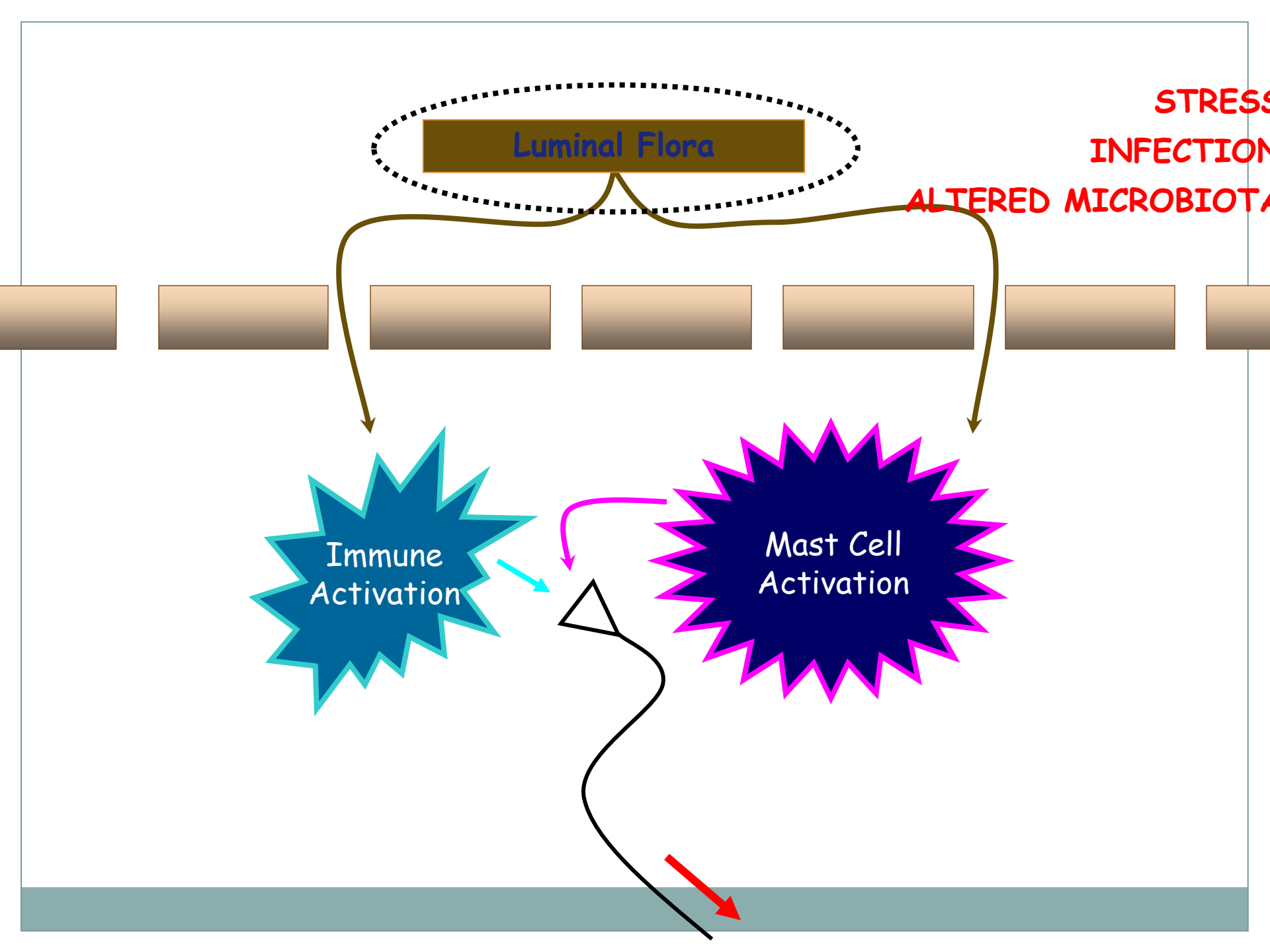
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- **In people with IBS in hospital OPD.**
  - 25% have depression.
  - 25% have anxiety.
  
- **In one study 30 % of women IBS sufferers have fibromyalgia**

# IBS Pathophysiology



HEREDITY; NATURE VS NURTURE  
DYSMOTILITY, “SPASM”  
VISCERAL HYPERSENSITIVITY  
ALTERED CNS PERCEPTION OF  
VISCERAL EVENTS  
PSYCHOPATHOLOGY  
INFECTION/INFLAMMATION  
ALTERED GUT FLORA



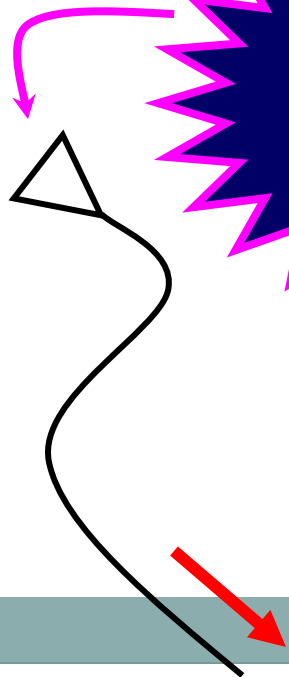
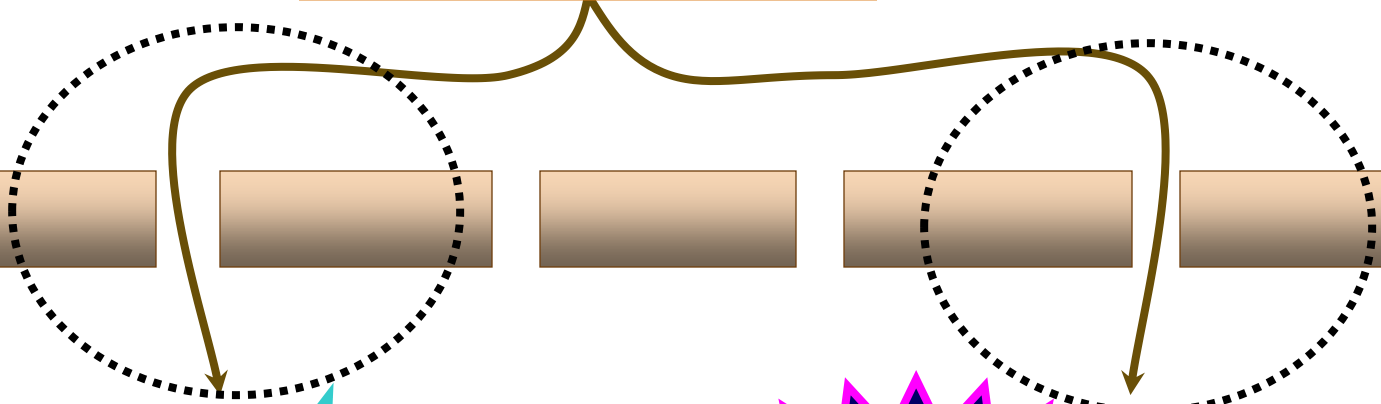
Luminal Flora

Immune  
Activation

Mast Cell  
Activation

STRESS  
INFECTION  
ALTERED MICROBIOTA

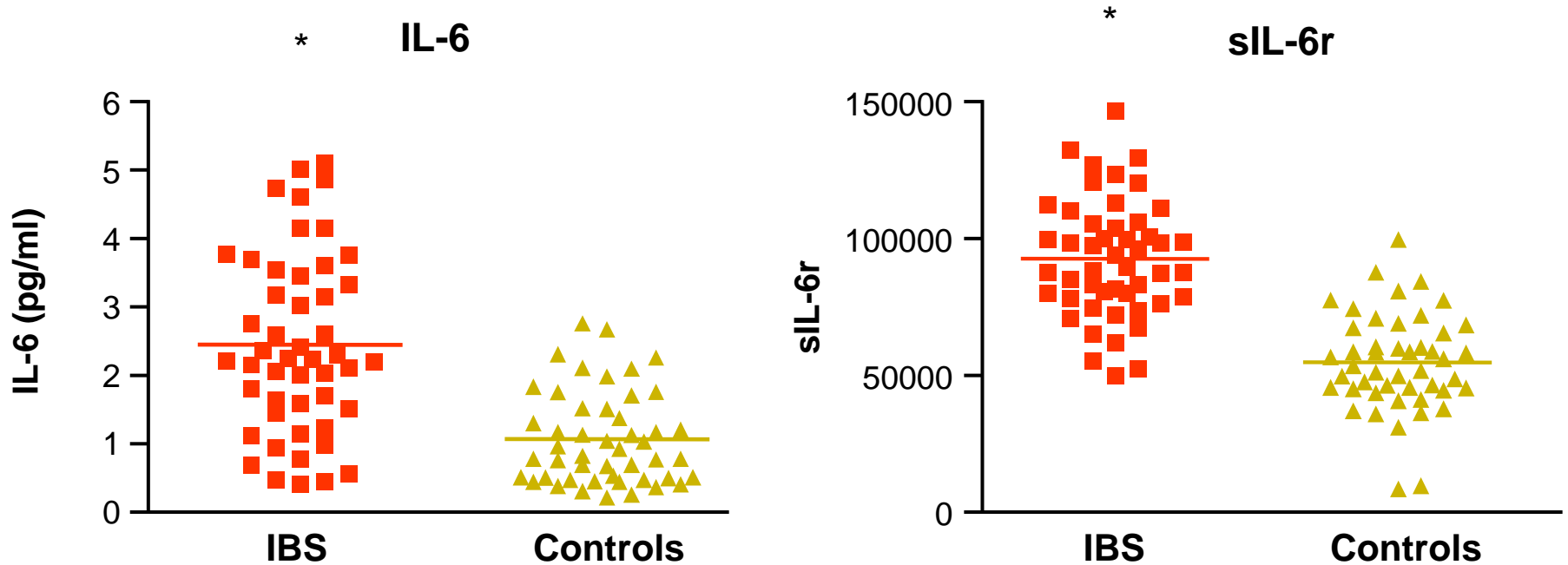
Luminal Flora





# Systemic Immune Compartment in IBS

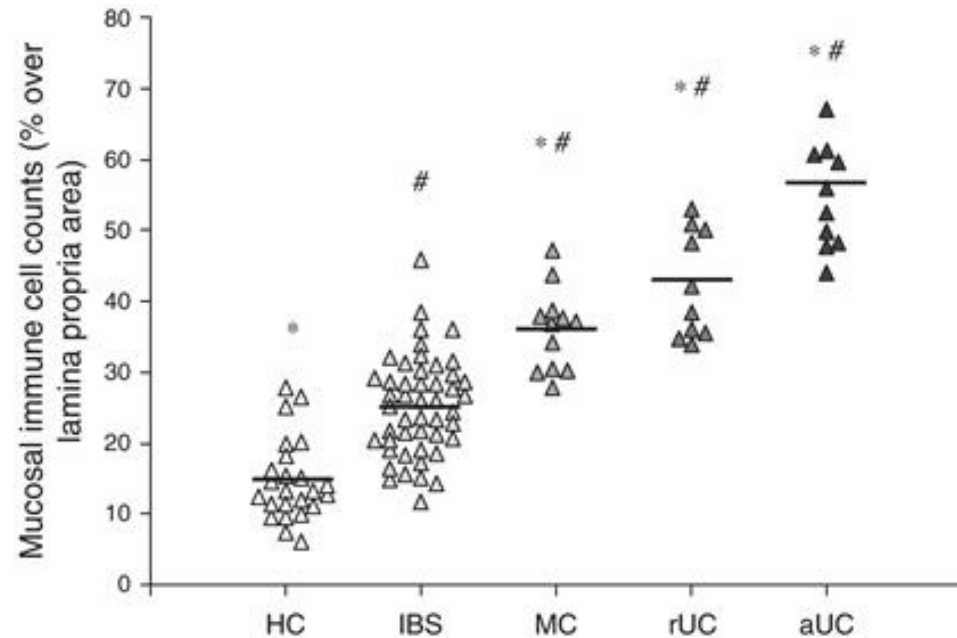
## Serum Cytokines



Dinan, et al. *Gastroenterology*. 2006.

# Mucosal Compartment

- Frank inflammation
  - Immune Activation
    - ↑ IEL's
    - ↑ CD3<sup>+</sup>, CD25<sup>+</sup>
  - Decreased IgA<sup>+</sup> B Cells
  - Altered expression of genes involved in mucosal immunity
- Chadwick et al, 2002
- Forshammar et al, 2008
- Aerssens et al, 2008



# Evidence for a role for the Gut Flora in IBS



- **Direct evidence of an altered gut flora:**
  - Post-Infectious IBS (PI-IBS)
  - Small Intestinal Bacterial Overgrowth (SIBO)
  - Altered Colonic Flora
- **Evidence of physiological effects of an altered flora:**
  - Changes in stool volume/consistency
    - ✦ Bile salt deconjugation
  - Alterations in gas volume/composition
    - ✦ Fermentation
- **Mediator of pro-inflammatory state**
- **Therapeutic impact of altering flora**

# Post-Infectious IBS

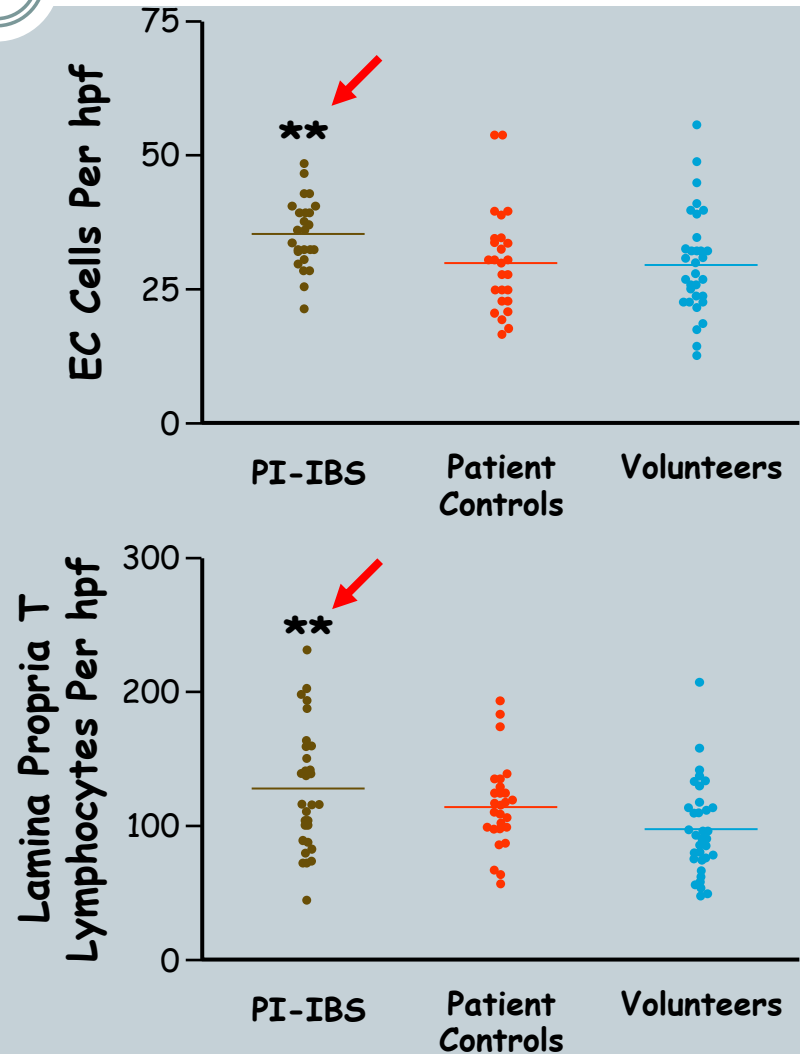
- 10-14% incidence following confirmed bacterial gastroenteritis

Dunlop, et al. 2003.

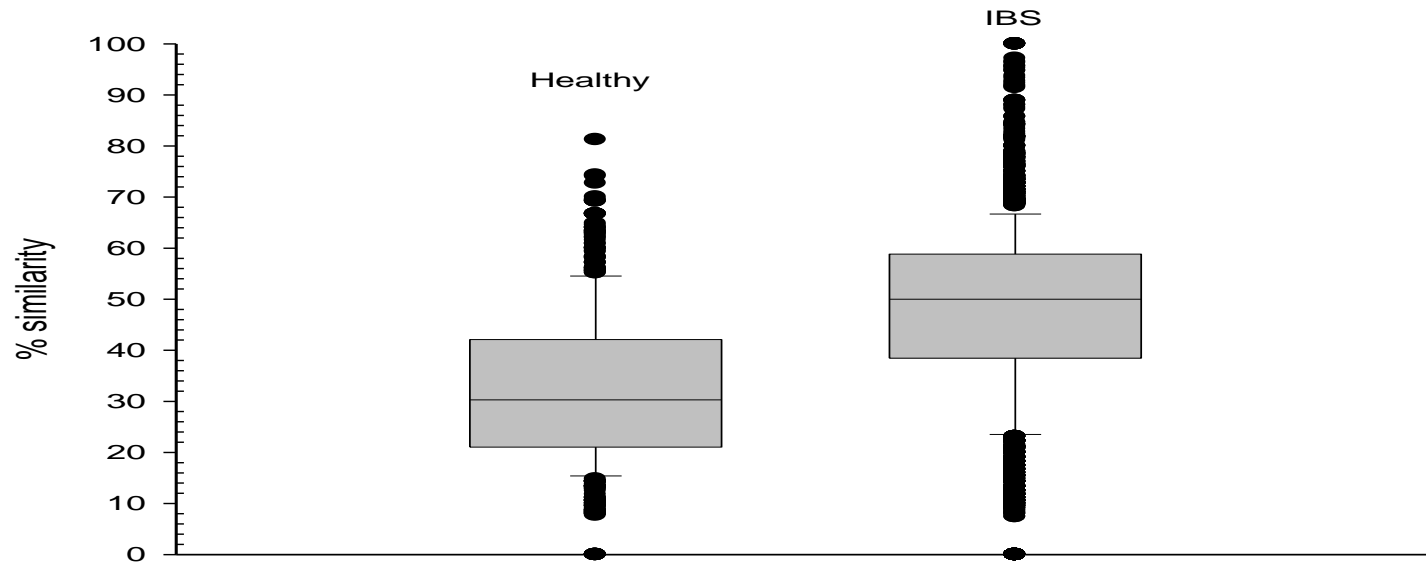
Mearin, et al. 2005.

- Risk factors

- Female
- Severe illness
- Pre-morbid psyche
  - ✦ Depression
- *Persistent inflammation*
  - ✦ EC cells
  - ✦ T lymphocytes



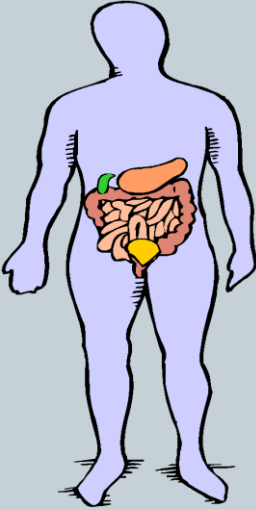
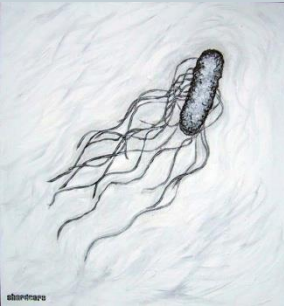
# Variability in Flora



Codling et al, 2010



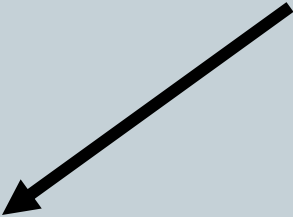
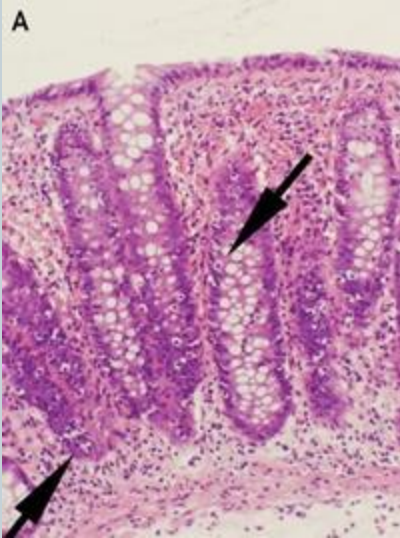
Disturbed Flora



Susceptible Host



Inflammatory Response



Myo-Neural Dysfunction

**SYMPTOMS**



## Subtypes

- **Diarrhoea predominant.**
- **Constipation predominant.**
- **Pain predominant.**

# Differential Diagnosis

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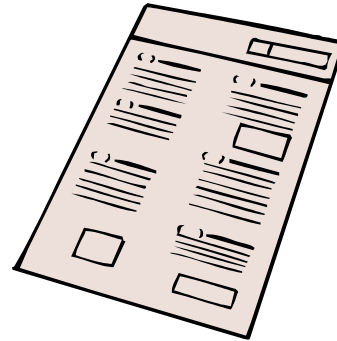
- **Inflammatory bowel disease.**
- **Cancer.**
- **Diverticulosis.**
- **Endometriosis.**
- **Celiac disease**



# Assessment

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- **Results should be normal or non-specific.**
- **Abdomen and rectal examination.**



# Diagnostic Testing in IBS

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- CBC, LFT
- Stool analysis
- TFT
- Celiac Ab
- Summary of the use of blood tests for the diagnosis of IBS: Current best evidence does not support the routine use of blood tests to exclude organic gastrointestinal disease in patients who present with typical IBS symptoms without alarm features.

# Hydrogen Breath Testing

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- ▶ lactose malabsorption (typically diagnosed via abnormal hydrogen breath testing) is estimated to be approximately 25% in western countries and perhaps as high as 75% worldwide

# Abdominal Imaging

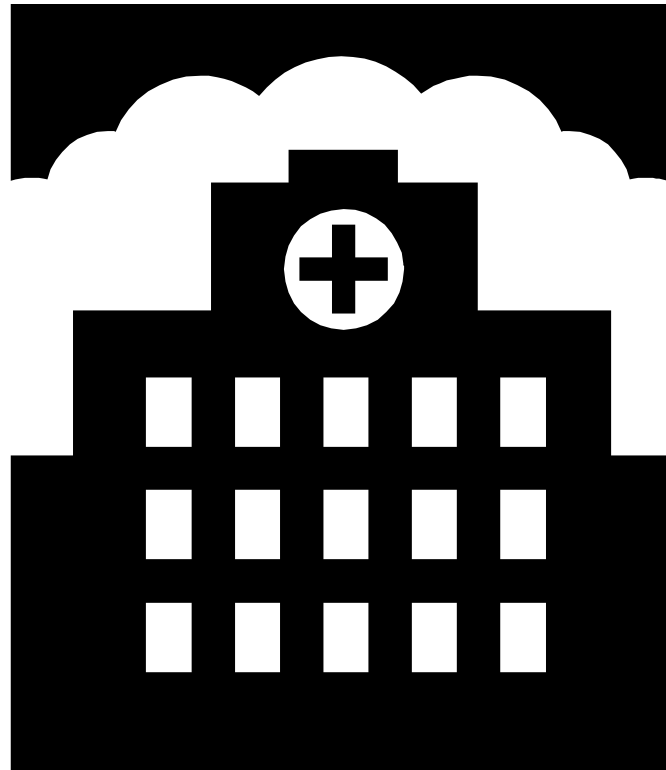
70

- US
- Barium enema
- Colonoscopy
- prevalence of colorectal cancer in these studies was low, ranging from 0 to 0.51%.

# Reasons to Refer

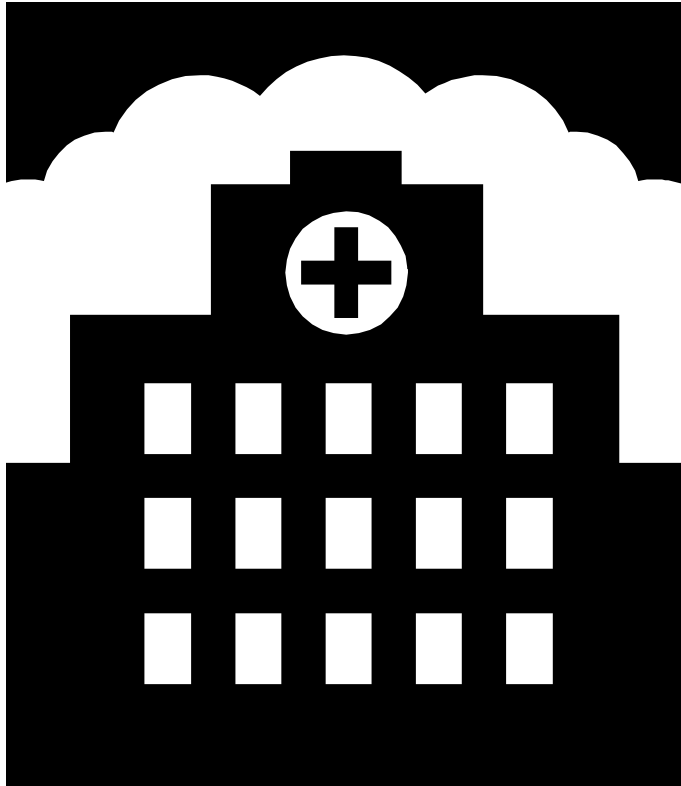
71

- ▶ **Age > 45 years at onset.**
- ▶ **Family history of bowel cancer.**
- ▶ **Failure of primary care management.**
- ▶ **Uncertainty of diagnosis.**
- ▶ **Abnormality on examination or investigation.**



# Urgent Referral

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- ▶ **Constant abdominal pain.**
- ▶ **Constant diarrhoea.**
- ▶ **Constant distension.**
- ▶ **Rectal bleeding.**
- ▶ **Weight loss or malaise.**

# Treatment

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- **Patients' concerns.**
- **Explanation.**
- **Treatment approaches.**



# Treatment Approaches.

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- **Placebo effect of up to 70% in all IBS treatments.**
- **Treatment should depend on symptom sub-type.**



# Pain Predominant.

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- **Antispasmodics will help 66%.**
- **Mebeverine is probably first choice.**
- **Hyoscine 10mg qid can be added.**



- A recent meta-analysis of 22 studies involving 1778 patients and 12 different antispasmodic agents demonstrated modest improvements in global IBS symptoms and abdominal pain
- . However, up to 68% of patients suffered side effects when given the high dose required to improve abdominal pain

Page and Dirnberger, 1981

# Antidepressants

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- **Poor evidence for efficacy.**
- **Better evidence for tricyclics.**
- **Very little evidence for SSRIs.**

# Selective Serotonin Reuptake Inhibitors (SSRIs)



- six studies have been conducted to date, two each involving fluoxetine, paroxetine and citalopram
  - Talley *et al.* 2008; Tack *et al.* 2006; Vahedi *et al.* 2005; Tabas *et al.* 2004; Kuiken *et al.* 2003; Masand *et al.* 2002].
- Most patients noted an improvement in overall wellbeing, although none of the studies showed any benefit with regards to bowel habits, and abdominal pain was generally not improved

# Constipation predominant IBS



- ▶ **Lifestyle Modifications**
- ▶ **Bowel Training and Education**
- ▶ **Fibre**
- ▶ Twelve randomized controlled trials have been performed to date evaluating the efficacy of fiber in the treatment of IBS. Four of these studies noted an improvement in stool frequency (polycarbophil and ispaghula husk), while one noted an improvement in stool evacuation
  - ▶ *Toskes et al. 1993; Jalihal and Kurian, 1990; Prior and Whorwell, 1987; Longstreth et al. 1981*].
- ▶ No improvement in abdominal pain
- ▶ 30-50% of patients treated with a fiber product will have a significant increase in gas



- **Lubiprostone** stimulates type 2 chloride channels in epithelial cells of the gastrointestinal tract thereby causing an efflux of chloride into the intestinal lumen
- It was approved by the FDA for the treatment of adult men and women with chronic constipation in January 2006
- Nausea and diarrhea 6-8%

# Diarrhoea Predominant

81

- **Increasing dietary fibre is sensible advice.**
- **Fibre varies, 55% of patients will get worse with bran.**

# Diarrhea



- **Loperamide** inhibiting intestinal secretion and peristalsis, loperamide slows intestinal transit and allows for increased fluid reabsorption, thus improving symptoms of diarrhea





- **Alosetron** is 5-HT<sub>3</sub> receptor antagonist that slows colonic transit
- meta-analysis of eight randomized controlled trials involving 4842 patients determined that alosetron provided a significant reduction in the global symptoms of diarrhea, abdominal pain, and bloating in patients with IBS and diarrhea
- four-fold increased risk for ischemic colitis compared
- [Ford *et al.* 2008]

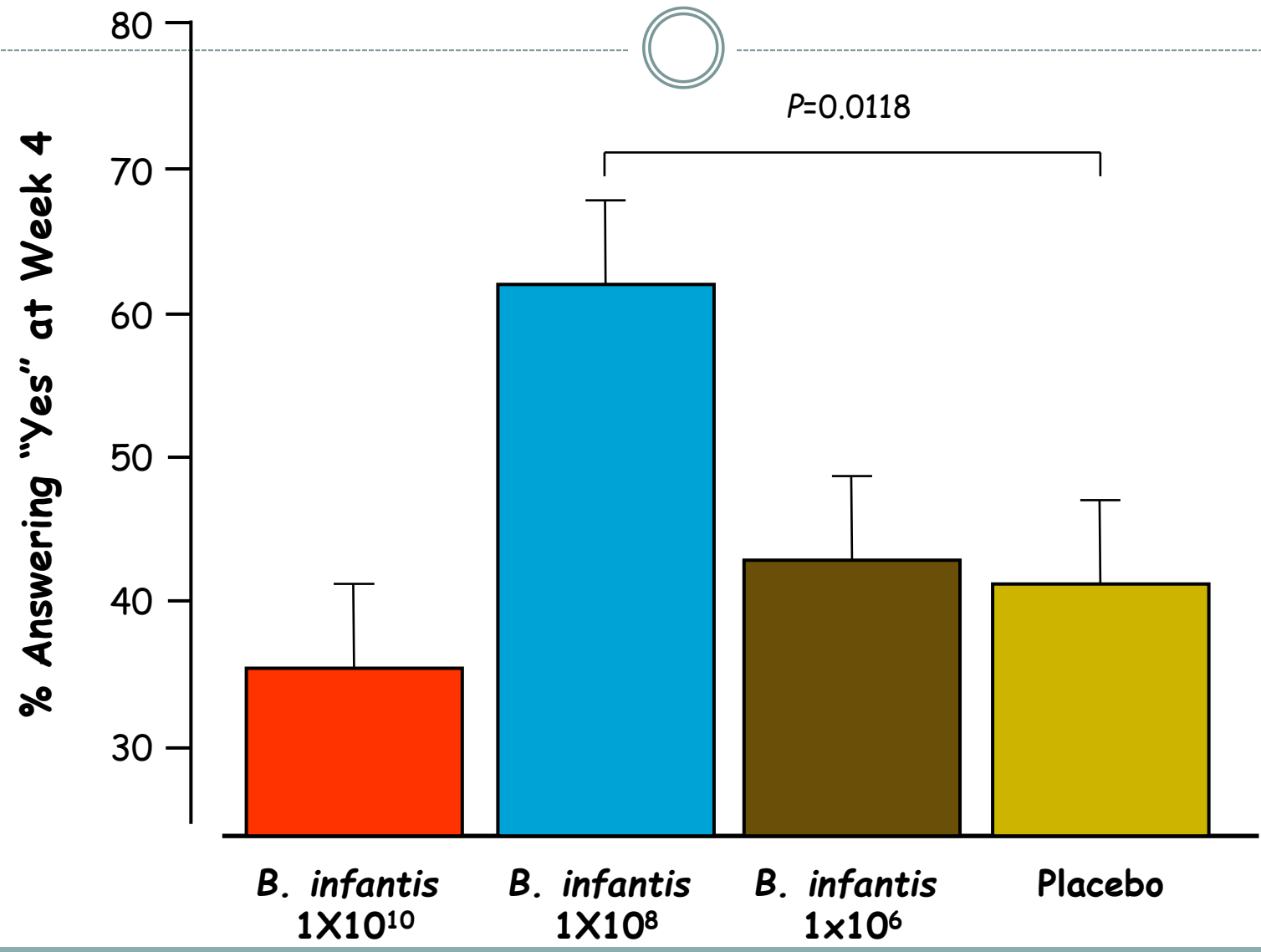


# Probiotics

# Mode of Action of Probiotics?

- Competition with, and exclusion, of pathogens
- Anti-bacterial:
  - Produce bacteriocins
  - Destroy toxins
- Enhance barrier function, motility
- Enhance host immunity
  - Immune modulation
  - Cytokine modulation
  - IgA production
- Metabolic functions

# Global Assessment of Symptom Relief



# What about diet?



- Avoid caffeine.
- Limit your intake of fatty foods.
- If diarrhea is your main symptom, limit dairy products, fruit, or the artificial sweetener sorbitol.
- Increasing fiber in your diet may help relieve constipation.
- Avoiding foods such as beans, cabbage, or uncooked cauliflower or broccoli can help relieve bloating or gas.

# Alternative and Complementary Medicine



- ▶ Peppermint, germanium, lavender oils
- ▶ RCT of 57 IBS patients randomized to receive either peppermint capsules or placebo demonstrated a significant benefit for the peppermint-treated group after 4 weeks.
- ▶ Seventy-five percent of the study group versus 38% of the placebo group reported a greater than **50%** reduction in total IBS symptoms

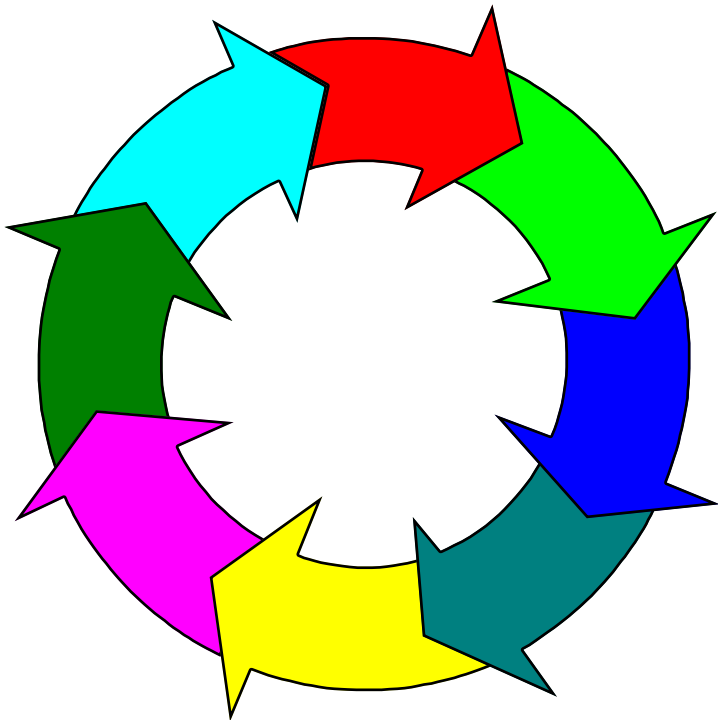
*Cappello et al. 2007].*

# Alternative Medicine



- **Hypnosis.** Hypnosis can help some people relax, which may relieve abdominal pain.
- **Relaxation or meditation.** Relaxation training and meditation may be helpful in reducing generalized muscle tension and abdominal pain.
- **Biofeedback.** Biofeedback training may help relieve pain from intestinal spasms. It also may help improve bowel movement control in people who have severe diarrhea.

# Self-help



- **IBS network,**
- **IBS support group**
- **Awareness**



**Thank You**