

Stress Related Disorders of the Gastrointestinal Tract

Dr Mike Mills MBBS DM FACP FACG FRCP



Gut
feeling

Can't eat when
expecting results

Lump in the
throat

Feel
'nervous'

Butterflies in the
stomach

Diarrhea before
a big speech

Gut
wrenching
decision

STRESS!!!



Hans Selye – Hungarian Endocrinologist

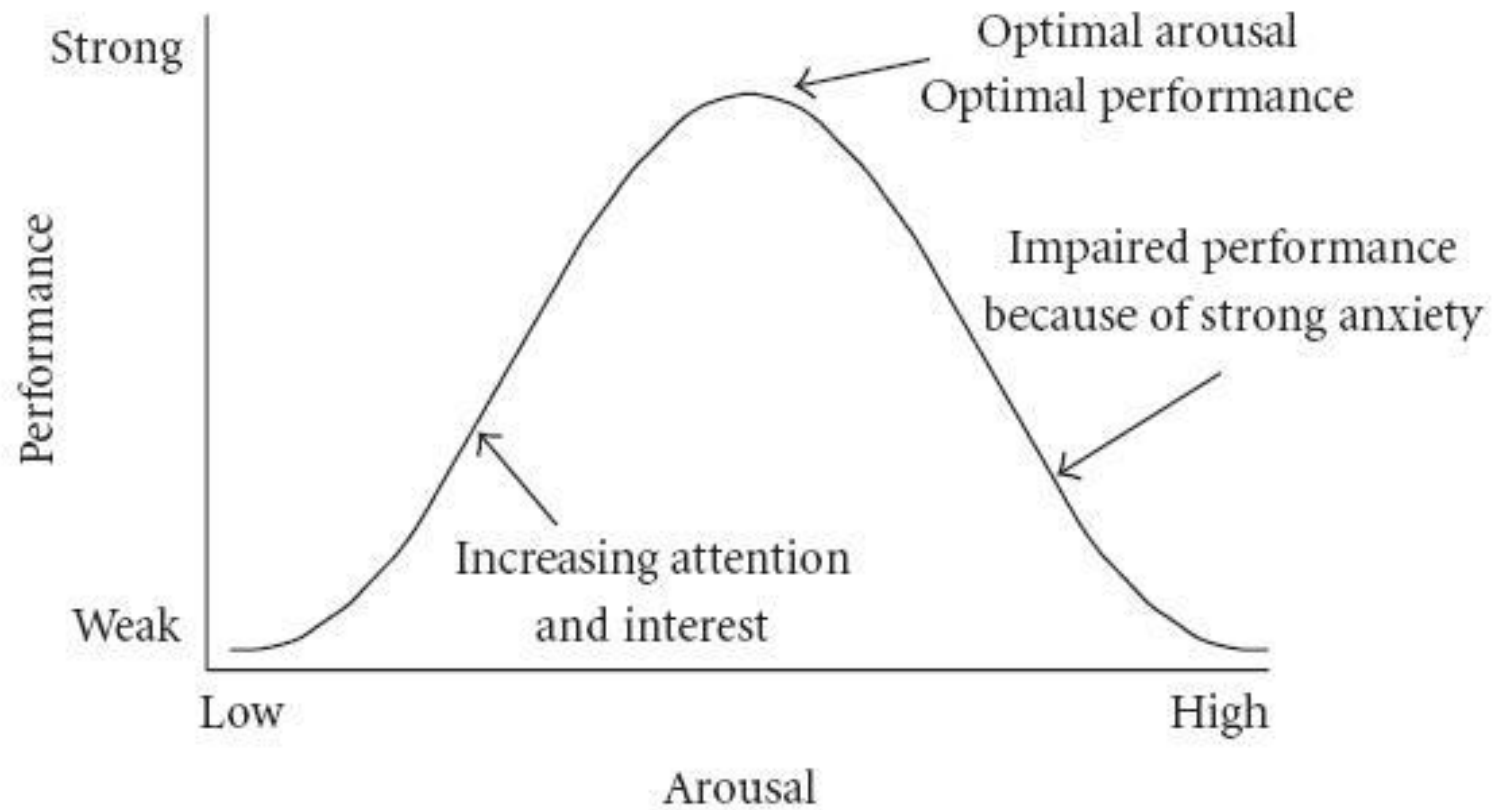
Challenge to the homeostasis of an organism

Stress – body's response to a 'stressor'

Stressor – that which causes stress

Eustress & Distress

Interoceptive vs exteroceptive



Yerkes-Dodson Curve

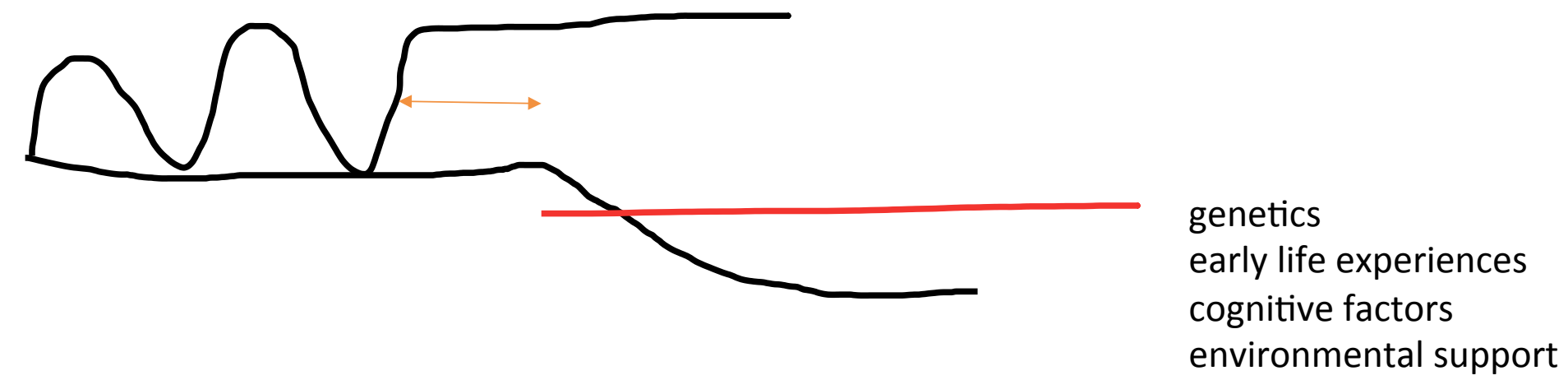
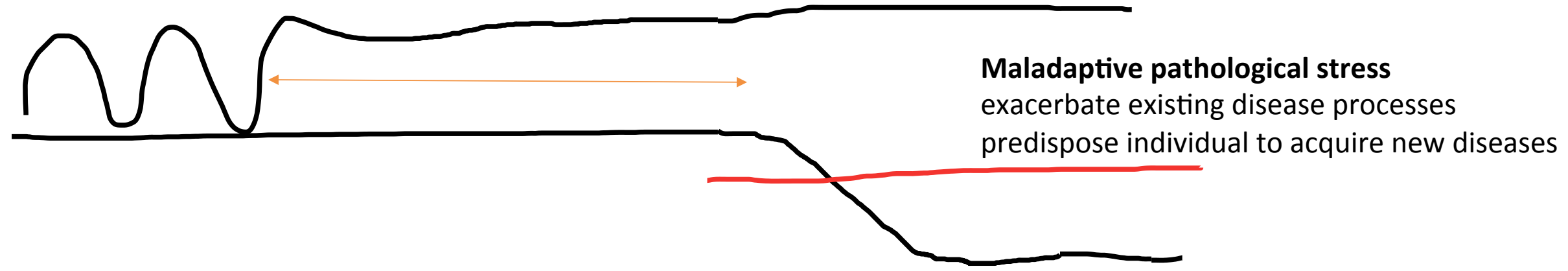
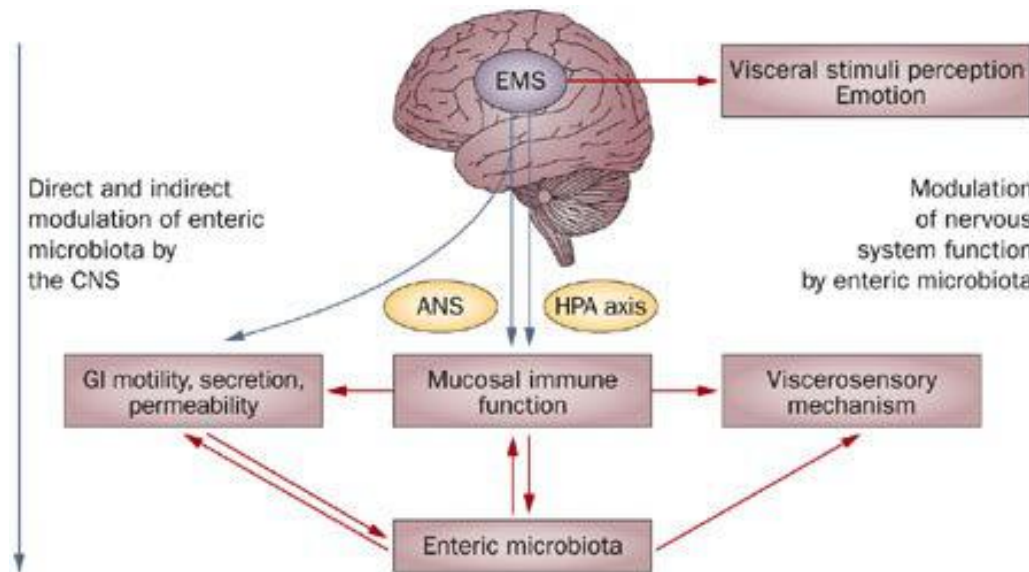


Figure 1 Schematic representation of the pattern of bidirectional brain–gut–microbe interactions



Rhee SH *et al.* (2009) Principles and clinical implications of the brain–gut–enteric microbiota axis
Nat Rev Gastroenterol Hepatol doi:10.1038/nrgastro.2009.35

CRH

- Central injection of Corticotropin Releasing Hormone
 - can reproduce behavioural and physiological responses similar to those seen in response to acute psychological stress,
- inhibition of CRF mediated responses by antagonists or in knockout animals
 - results in a decrease in the animal's response to stress

Autonomic Nervous System

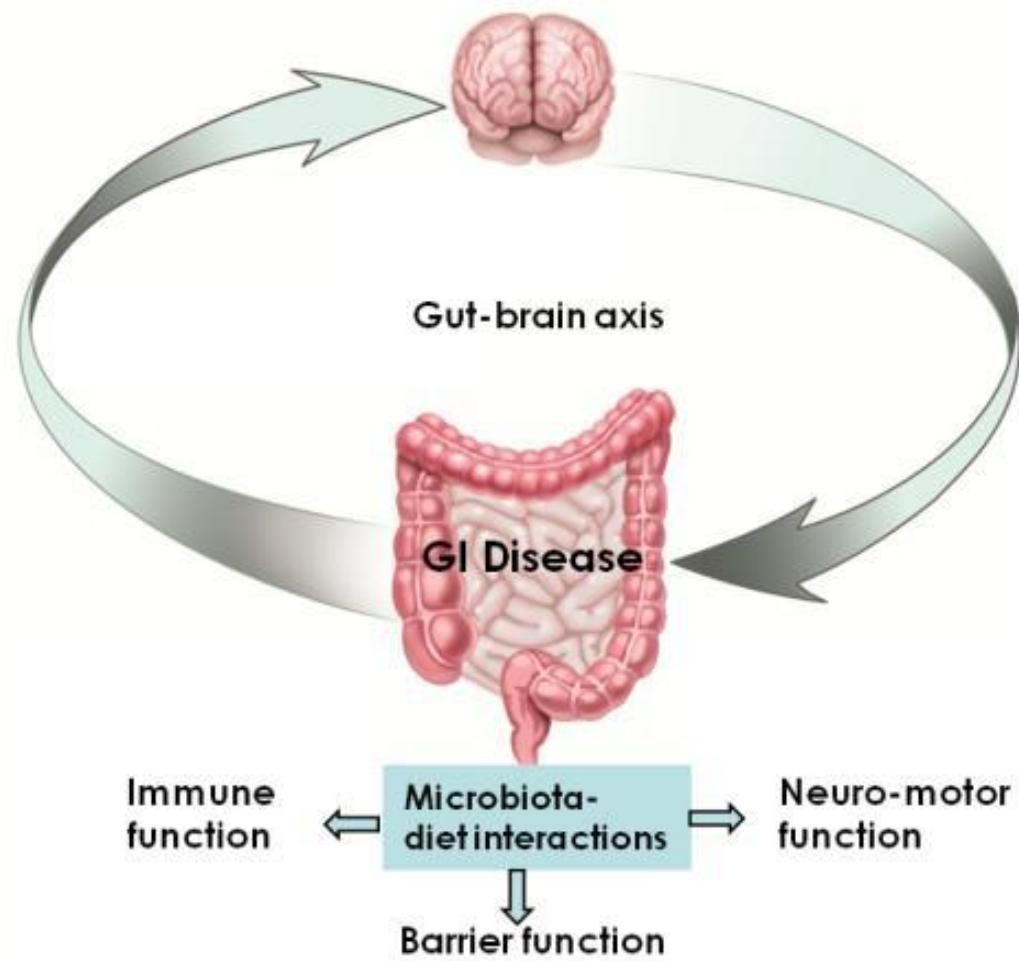
- “fight and flight” response by Cannon - global activation of the sympathetic nervous system
- not necessarily all or none matter, differential recruitment
- In the periphery different functional groups of sympathetic neurones have been identified
 - regulate mucin production by large intestinal goblet cells
 - net water absorption by intestinal epithelial cells
 - mucosal permeability
 - mast cell degranulation
 - release of peptides from enterochromaffin cells

Autonomic Nervous System

- direct immunomodulatory function
- principal neurotransmitter noradrenaline
 - basic immune cell function such as proliferation, differentiation, cell trafficking, and cytokine production
 - acquired immune responses
 - autoimmune reactivity
- activation of the sympathetic system causes systemic secretion of IL-6 from immune cells
 - IL-6, by inhibiting TNF- α and IL-1 β , and by activating the HPA axis, participates in the stress induced suppression of the immune-inflammatory response
- in rats, sympathectomy has been shown to reduce inflammation

Hypothalamic Pituitary Adrenal axis

- activated by both interoceptive and exteroceptive stressors
- peripheral glucocorticoid response to stress plays a prominent role in suppression of the inflammatory response



Functional gastrointestinal disorders

- Irritable bowel syndrome
- Functional dyspepsia

Irritable Bowel Syndrome /IBS

- chronic abdominal pain related to bowel movements
- change in bowel habit
 - diarrhoea
 - constipation
 - alternating
 - Tenesmus -a sense of incomplete rectal evacuation
 - passage of mucus with stool
 - abdominal bloating and distention
- The prevalence of this disorder in most countries is approximately 10%

IBS

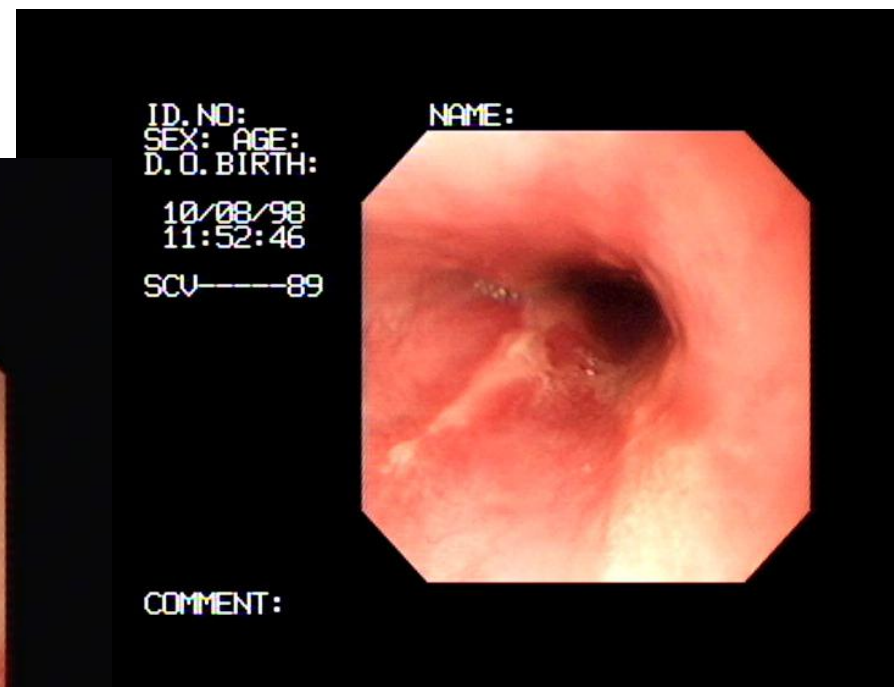
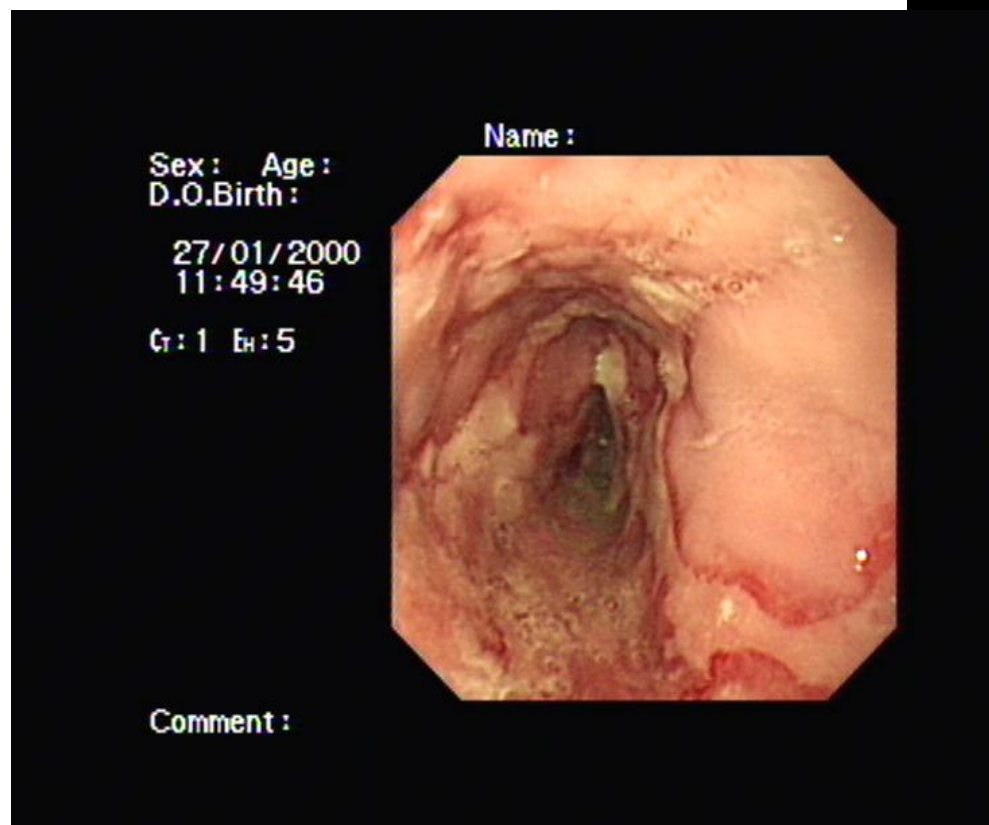
- 2:1 female predominance
- Ensure no alarm symptoms or red-flags
 - Weight loss, bleeding, over 45yrs, lab abnormalities
- Imaging
- Colonoscopy
- Management – symptom driven
 - Education, low FODMAPS diet, gluten-free, food allergy testing
 - Constipation- Fiber, PEG, laxatives
 - Diarrhoea – loperamide, cholestyramine
 - Pain – antispasmodics , antidepressants
 - Antibiotics
 - Probiotics

GERD

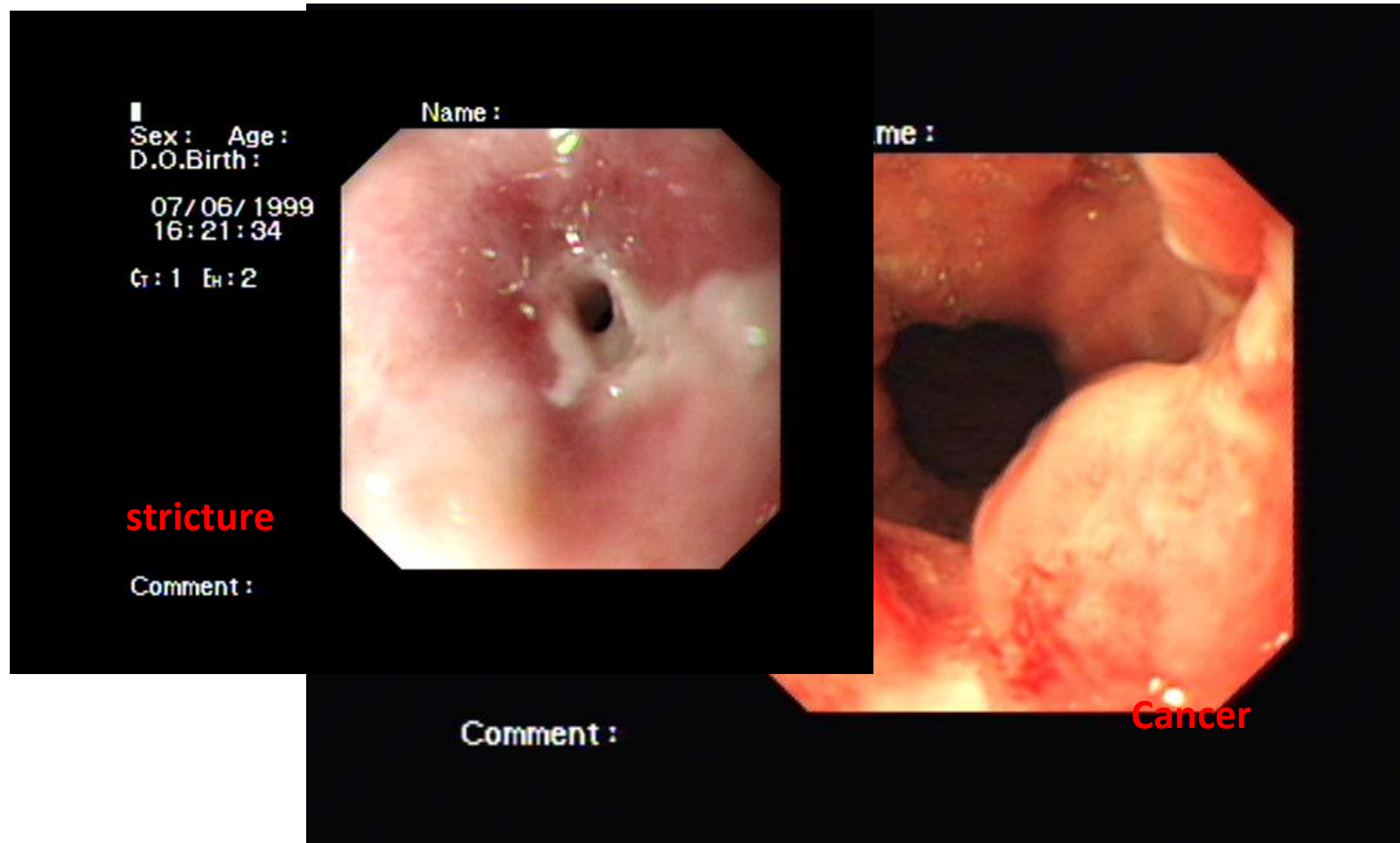
- “Reflux of stomach contents causes troublesome symptoms and or complications” – Montreal group
- Clinical diagnosis – typical symptoms of heartburn, acid reflux, water brash
 - Postprandially, posturally, certain foods, amounts, times.

GERD

LA classification of severity



GERD



GERD

Extraoesophageal manifestations

ENT

Laryngitis
Sinusitis
Otitis
Hoarseness
Throat clearing
globus

Pulmonary

Asthma
Chronic cough
Pneumonia
bronchitis

Chest pain

Dental erosions

You may have to ask about GERD symptoms

Pathophysiologic mechanisms of gastroesophageal reflux disease

- Barrier function of lower esophageal sphincter
 - Basal lower esophageal sphincter pressure
 - Transient lower esophageal sphincter relaxations (TLESR)
 - Hiatal hernia
- Acid clearance
 - Peristaltic action of tubular esophagus
 - Saliva production
- Mucosal defense
- Gastric emptying
 - Ulceration or stricture
 - Neuromuscular disorders
 - Idiopathic gastroparesis
 - Pyloric dysfunction
- Abdominal pressure
 - Obesity
 - Pregnancy
- Gastric hypersecretion

GERD

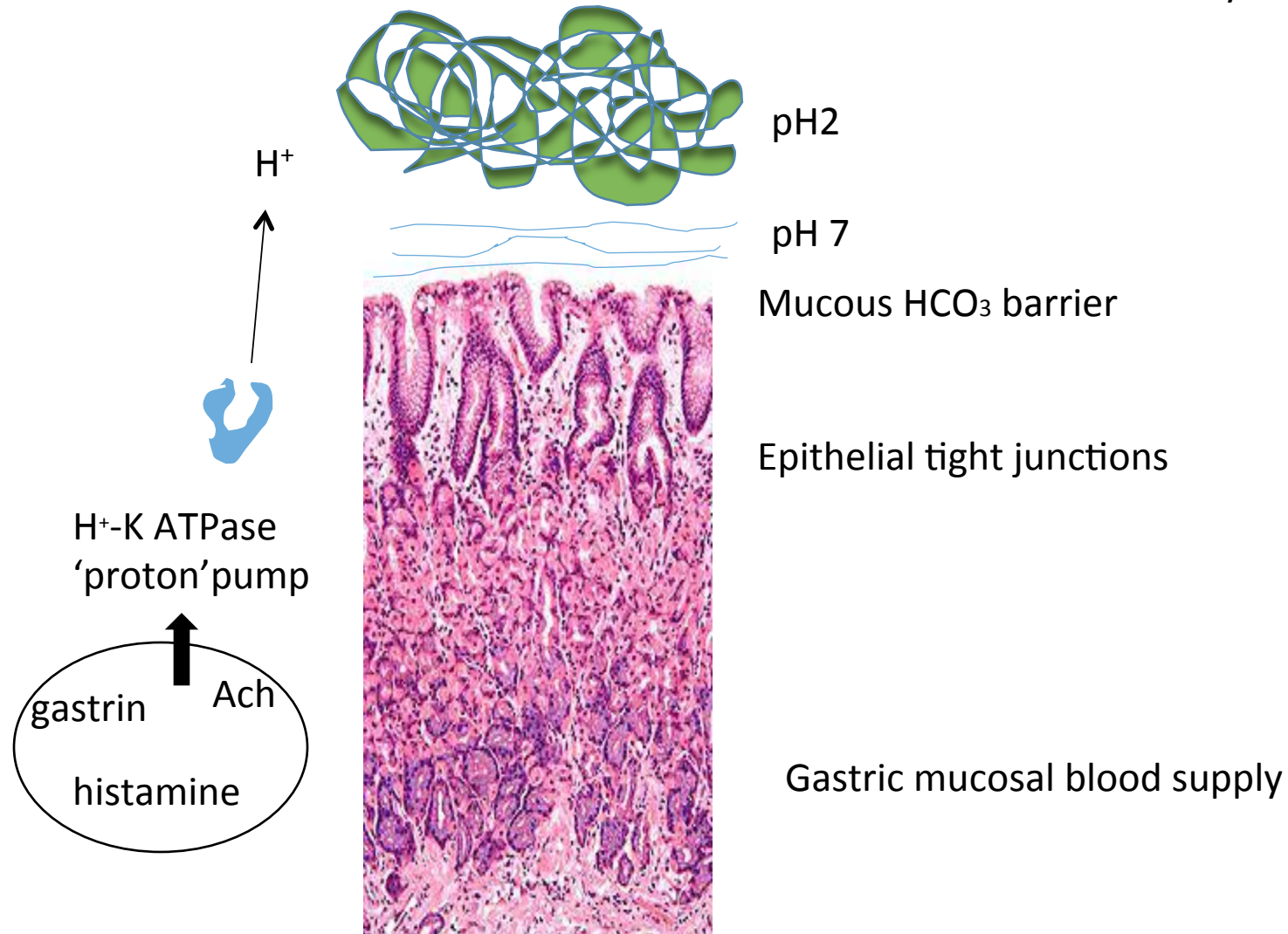
- Mechanisms to reduce ACIDITY
 - Antacids
 - Mucosal protectants
 - H₂ RECEPTOR blockers
 - Proton pump inhibitors

GERD

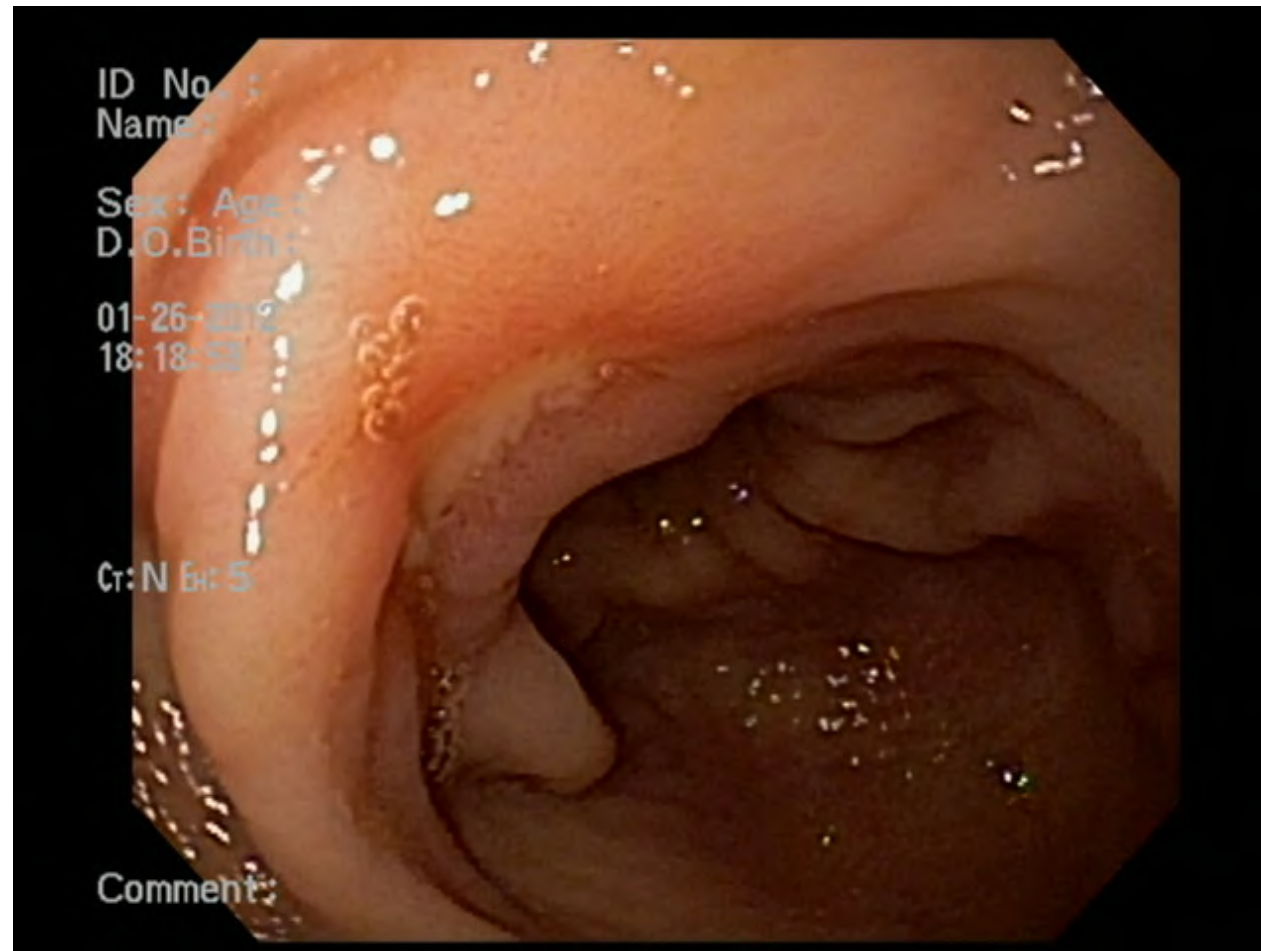
- population based survey in which 64% of patients with GERD indicated that stress increased their symptoms.
- GERD patients who are anxious and are exposed to long periods of stress are more likely to notice stress induced symptom exacerbation

How the stomach protects itself

Gastric Physiology



PUD

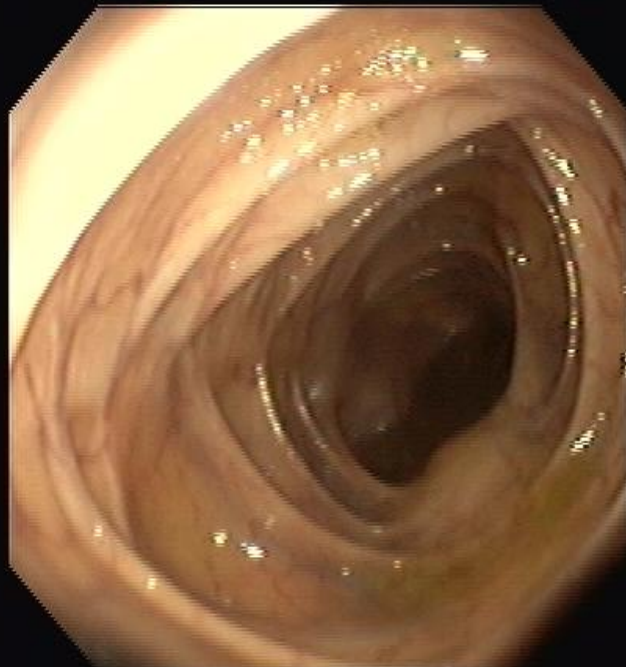


PUD and stress

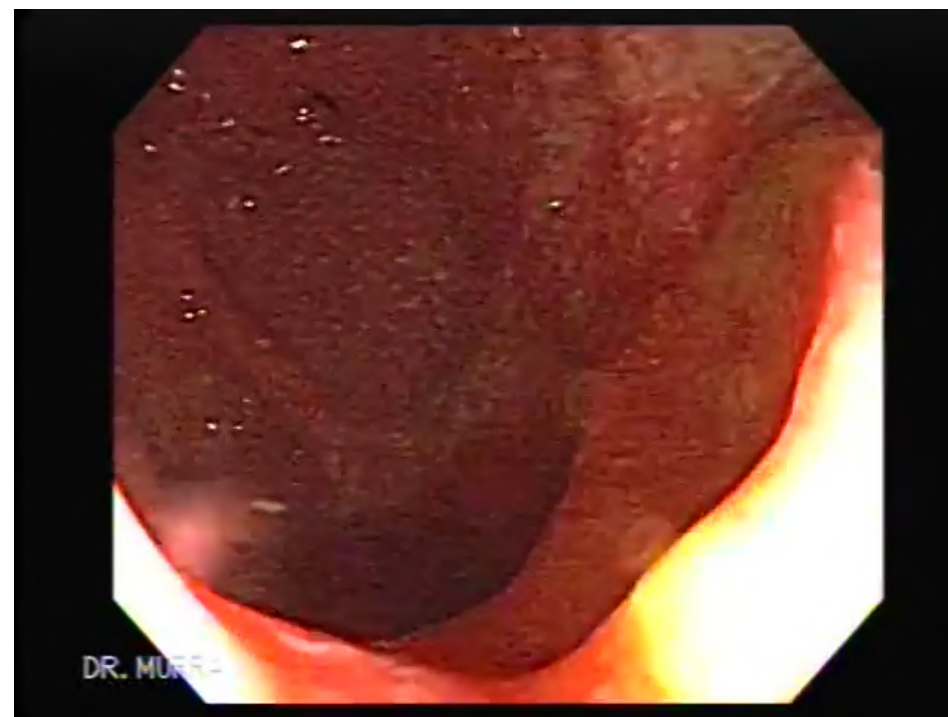
- Stress ulcer
- recent focus on *Helicobacter pylori*
 - abolished interest in role of stress
 - >80% of *H pylori* infected and the majority of NSAID users never develop an ulcer
 - at least 10% of non-NSAID related PUD are not infected with *H pylori*
- No real evidence for exteroceptive stress but interoceptive
 - burns, major trauma, ICU

ID No. :
Sex: Age:
D. O. Birth:

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Comment:



Inflammatory Bowel Disease

- Ulcerative colitis and Crohn's disease
- Acute and chronic stress in mouse models has profound effects on mucosal barrier function, leading to mucosal ingress of luminal commensals and subsequent activation of the mucosal gut immune system, which could theoretically worsen inflammation in IBD

OPTIONS - Biologics

- **ADALIMUMAB VS INFLIXIMAB VS CERTOLIZUMAB**
 - similar results ,No head-to-head studies.
- (TNF) therapy is influenced by patient preference with regards to the convenience and availability of sc administered adalimumab and certolizumab

Ulcerative colitis- biologic

- Golimumab – Indicated in moderate to severe UC

Stress and IBD

- Evidence of stress exacerbating symptoms and leading to flares of IBD

Stress and disease

