# Gastrointestinal System Cheat Sheet

by MJC3 via cheatography.com/212269/cs/46131/

## Potential Causes of Dyspepsia

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| **Dyspepsia** | A non specific term, encompasses a number of symptoms attributable to the upper GI tract. |
| **Oesophagitis** | Gastro oesophageal reflux disease (GORD). Barrett's oesophagus |
| **Gastritis** | Type: A,B,C |
| **Peptic Ulcers** | Gastic ulcers. Duodenal ulcers |
| **Zollinger-Ellison syndrome** | a rare condition caused by tumors (gastrinomas) that produce excessive gastrin, leading to overproduction of stomach acid and peptic ulcers. |
| **Gastric Cancer** | |

## 3 categories of Gastritis

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| **Type A - AUTOIMMUNE** | (antibodies against parietal cells). Reduced or no acid secretion and intrinsic factor. Aplastic anaemia due to Vit B12 deficiency. |
| **Type B - BACTERIAL** | *Helicobacter pylori* infection. Elevated acid secretion |

## 3 categories of Gastritis (cont)

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| **Type C - CHEMICAL** | Chemicals/drugs eg aspirin. Elevated acid secretion |

## Diet & Lifestyle & Other drugs

**Other causes of Dyspepsia**

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| **Caffeine:** | PDE inhibitor promotes acid secretion |
| **Alcohol:** | Dissolves mucous layer |
| **Spicy Food:** | Capsaicin, Activates TRPV1 but may inhibit acid secretion via vagal inactivation. |
| **Concomitant medication (drugs that can relax LOS):** | PDEV inhibitors eg sildenafil like drugs. Nitrates (relaxes LOS via PDE activation). Theophylline (Relaxes LOS via PDE inhibition). Drugs with antimuscarinic properties (block muscarinic receptors). Ca2+ channel blockers (prevent calcium entry). |
| **Obesity and pregnancy** | increased intra--abdominal pressure causing reflux. |

## The Oesophagus

The mucosa of the oesophagus is non-keratinzed stratified squamous epithelium

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| **The type of muscle in the muscularis of the oesophagus varies by region** | the superior 1/3 is skeletal muscle, the intermediate 1/3 is skeletal and smooth muscle, the inferior 1/3 is smooth muscle. |

## The Oesophagus (cont)

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| **Adventitia replaces serosa.** | **Serosa** = a slick covering that helps organs move smoothly (like the outer wrap of your intestines). **Adventitia** = a rougher outer layer that holds the organ in place, usually found where organs are attached to other tissues (like parts of the esophagus or rectum). Meaning that part of the organ is not freely moving inside a cavity anymore, but rather fixed or connected to surrounding structures. |

## Type A Gastritis

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| **Destruction of parietal cells** | Reduced or absent acid secretion. Vitamin B12 deficiency. Anaemia |

## Type A Gastritis (cont)

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| **Other conditions associated with Type A Gastritis** | **Autoimmune thyroiditis** (Hashimoto's disease). **Type I Diabetes. Addison's Disease** (Adrenal glands, reduced cortisol & aldosterone). **Vitiligo** (skin pigmentation disorder) white patches of skin. |
| **Treatment potentially required** | Hydroxocobalamin injections |

## Type C Gastritis - Chemical, Drug and Diet

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| **SAID's** | Steroidal anti-inflammatory drugs (SAID's) inhibit phospholipase A2 by promoting expression of annexin 1 and suppressing expression of COX-2. |
| **NSAID's** | Non-steroidal anti-inflammatory drugs inhibit the cyclo-oxygenase enzymes. **COX-1 COX-2** |

## Barrett's Oesphagus

Long-standing reflux of acid

*About 1 in 10 people with GORD develop Barrett's oesophagus.*

Normal stratified squamous epithelium is replaced with simple columnar epithelium with goblet (mucus cells)

## Acid Secretion

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| **M3 and CCK2 (CCKB; gastrin) receptors** | GTP-binding protein coupled receptor (GPCR). Linked to Gq (stimulates Phospholipase C). Increases intracellular Ca2+ via PIP2 conversion to DAG & IP3. |
| **H2 receptors** | GTP-binding protein coupled receptor (GPCR) Linked to Gs (stimulates adenylate cyclase) Increases intracellular cAMP |
| **Inhibit or Reduce acid secretion:** | Proglumide, Misoprostol, H2 Blockers, Atropine, Proton Pump Inhibitors. |

## Type B Gastritis - Helicobacter pylori

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| **Associated with:** | 80% of gastric ulcers. 95-100%. of duodenal ulcers. 100% chronic antral gastritis. gastric cancer (younger infected, greater chance) |
| **Gram negative spiral bacterium** | colonises mucus in both stomach and duodenum. |

## Type B Gastritis - Helicobacter pylori (cont)

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| **Secretes** | urea from high urease activity (antral pH raised, gastrin & acid secretion increases). PAF (platelet activating factor). |
| **Gram negative** | Doesn't retain Crystal Violet stain! - **Pink stain!!!** |

## Eradication of H.pylori

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| **First Line treatment** | ONE WEEK TWICE DAILY Amoxycillin 300mg **and either** Clarithromycin 500 mg **or** Metronidazole 400 mg **and either** omeprazole 20 mg **or** lansoprazole 30 mg. |
| | Consider lowest acquisition costs and previous exposure to clarithromycin or metronidazole! |
| **If allergic to penicillin ONE WEEK TWICE DAILY** | Clarithromycin 500 mg Metronidazole 400 mg **and either** Omeprazole 20 mg **or** lansoprazole 30 mg |

## Eradication of H.pylori (cont)

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| **If allergic to penicillin and previous exposure to clarithromycin and metronidazole ONE WEEK TWICE DAILY** | Tetracycline 1g and metronidazole 400 mg. Bismuth subsalicylate and omeprazole 20 mg |

## Mucosa aggressors and protectors

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| **Protective** | Mucus, Prostaglandins, Bicarbonate, Mucosal blood flow |
| **Aggressive** | Acid, Pepsin, NSAID's, *H. pylori*, Drugs, Diet |

## Treatment for Dyspepsia

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| **Surgery (1900--1970's)** | Gastric vagotomy & antacids |
| **Drugs (1970's onwards)** | |
| **Barriers/-Protection:** | Alginate and Sucralfate-antacid and barrier |
| **Muscarinic cholinergic receptor antagonists (M3)** | Pirenzepine |
| **Selective H2 receptor antagonists** | Cimetidine, ranitidine, famotidine |
| **Drugs (1990's onwards)** | |
| **Proton Pump Inhibitors** | Omeprazole, Pantoprazole, Lansoprazole, Rabeprazole and Esomeprazole |

| protecting gastric mucosa when taking NSAID's | |
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| **Synthetic PGE2** | Misoprostol + NSAID. Problem – smooth muscle relaxation – diarrhoea. |
| **Antacids eg: TUMS, Rennie.** | Inhibit acid secretion: **H2 antagonists** eg: famotidine. **Proton Pump Inhibitors (PPI's)** eg omeprazole, lansoprazole, esomeprazole, pantoprazole. |
| **Selective COX-II inhibitors** | Diclofenac, refocoxib (Vioxx) |
| **Emerging novel NSAIDS (not clinically used)** | NO-flurbiprofen (nitric oxide releasing derivatives). H2S releasing NSAID's (currently awaiting MAA) |