CHAPTER 1 GASTRO-INTESTINAL SYSTEM

1.1 ‘Nil by mouth’ patients – drug administration

- Patients for investigations e.g. OGD (endoscopy): administer usual medicines with a sip of water – caution with medicines normally requiring a full glass of water for oral administration e.g. alendronic acid (best to delay dose).

- Patients with swallowing difficulties e.g CVA: await assessment.

- Take full drug history in pre-operative assessment – this will identify potential interactions between drugs used during surgery and routine medication.

Pre-operatively

- Some medicine may be taken with up to 300mL of plain tap water only, up until 2 hours before surgery, as clear fluids leave the stomach within 2 hours of ingestion.

- Certain medicines may need to be stopped prior to elective surgery. Specific guidance can be found on the Clinical Portal under Anaesthetics (in Anaesthesia Guidelines and Induction pack).

- Check with anaesthetist if unsure.

Examples

Clopidogrel

The peri-operative management of patients taking clopidogrel depends on the indication for clopidogrel and the degree of bleeding risk anticipated. Refer to the anaesthetist and surgeon for specific advice.

Diuretics

Potassium-sparing diuretics such as spironolactone or amiloride should be omitted on the morning of surgery since tissue damage and reduced kidney perfusion in the immediate post-operative period may predispose to the development of hyperkalaemia.

Do not need to withdraw thiazide or loop diuretics – correct any hypokalaemia before surgery.

Oral hypoglycaemics

Please refer to section on surgery in an individual with diabetes (see Chapter 6 section 6.2).

Warfarin

Refer to the warfarin bridging guidance (on Clinical Portal).
Lithium
Discontinue for 24 hours before any major operation. Provided serum electrolytes are in balance, lithium can and normally should be restarted soon after the operation has been carried out.

Peri-operatively – where oral route not available
Consider administering essential drugs by injection, rectally, transdermally, or, if there is no contraindication, via a feeding tube – advice on alternative formulations, bioavailabilities (especially with feeding tubes placed in the jejunum) and equivalent doses can be obtained from your ward pharmacist or Medicines Information on UHW Ext. 42979 or UHL Ext. 25262.

Corticosteroids
Replacement regimen used (usually IV hydrocortisone) to avoid effects of adrenocortical suppression (see BNF).

Anti-Parkinsonian drugs
Always give usual anti-parkinsonian medications before surgery. Dispersible tablets and/or liquids are available for some drugs. Contact your ward pharmacist or Parkinson’s Disease Nurse for further advice.

1.2 Acid suppression therapy

Note: Omeprazole and lansoprazole are currently the proton pump inhibitors (PPIs) in the UHB formulary. Generic omeprazole is currently the cheapest PPI available.

- Omeprazole can occasionally potentiate the effects of phenytoin and warfarin (monitor INR).
- If initiating a patient on a PPI then please state on the Discharge Advice Letter (DAL), the indication, duration of required treatment and if, or when, step-down treatment should be considered.

Gastrooesophageal reflux disease (GORD)

- stepped approach:
  - Initially life style advice (stopping smoking, low fat diet, weight loss if obese and raising the head of the bed [using 3 bricks] for nocturnal symptoms) plus
  - Simple antacids e.g. magnesium trisilicate.
  - Gaviscon Advance, 5-10mL after meals and at bedtime or Gastrocote, a low sodium alternative (1.8mmol Na+/5mL), are rafting antacids.
  - Ranitidine 150mg bd, which is the cheapest H₂ antagonist.
  - If ineffective switch to omeprazole 20mg daily or lansoprazole 30mg od.
  - Recommend a 4-week course of full dose PPI for new onset symptoms. If symptoms recur, continue at the lowest dose that controls symptoms e.g. omeprazole 10mg od, lansoprazole 15mg od.

Gastro-intestinal System

The online Good Prescribing Guide is updated as new guidance becomes available and agreed and therefore may contain more up to date information than the printed copy. The online Guide is available via the intranet or via www.wmrc.wales.nhs.uk.
Severe GORD symptoms or oesophagitis

- Omeprazole 20mg or lansoprazole 30mg daily until symptoms controlled.
- Step-down the dose to the lowest that maintains control of symptoms.
- Higher doses may be required if endoscopically proven oesophagitis fails to heal.
- Patients with peptic oesophageal strictures should remain on full dose PPI long term.

Non-ulcer dyspepsia (Functional dyspepsia)

- Do not routinely treat with a PPI.
- If symptoms appear to be acid-related use an antacid or lowest dose of an acid suppressor to control symptoms.
- Only patients with clear response to acid suppression should continue treatment.
- If H. pylori present, consider eradication therapy (see below).

1.3 Peptic ulceration

1.3.1 H. pylori related ulcers:
- Treat with triple therapy for one week using:
  - omeprazole 20mg bd or lansoprazole 30mg bd
  - amoxicillin 1g bd
  - metronidazole 400mg bd or clarithromycin 500mg bd
- (if patient has penicillin allergy change amoxicillin to clarithromycin 500mg bd or if patient has an intolerance to metronidazole, change metronidazole to clarithromycin).

For extensive ulceration complicated by haemorrhage or perforation continue omeprazole 20mg or lansoprazole 30mg daily for four weeks only. Note: All gastric ulcers should have follow up gastroscopy with biopsies until healed, initially at 6 weeks. For duodenal ulcers follow up endoscopy is not indicated if asymptomatic.

1.3.2 Non-steroidal anti-inflammatory drug (NSAID)-related ulcers:
- Treat with omeprazole 20mg or lansoprazole 30mg daily for 4-8 weeks and stop NSAID if at all possible.
- For patients with a NSAID-induced ulcer who need to continue NSAID treatment, a PPI should continue to be co-prescribed.
- NSAIDs should be taken with food and used at the lowest effective dose for the shortest duration necessary.
  - First choice: ibuprofen
  - Second choice: naproxen
  - Not recommended: azapropazone

- If H. pylori positive prescribe triple therapy (see above) in both NSAID and aspirin related bleeds, and give PPI prophylaxis if aspirin or NSAID continued.
• Selective serotonin re-uptake inhibitors (SSRIs) should be used with caution in patients who have an increased risk of gastrointestinal bleeding, especially in patients taking NSAIDs or aspirin. A non-SSRI antidepressant may be an appropriate choice in such patients.

• Oral anticoagulants or corticosteroids should be used with caution in patients at risk from gastrointestinal bleeding especially in those taking aspirin or NSAIDs.

• Consider prophylaxis of NSAID-related ulceration with lansoprazole or omeprazole for patients with high risk factors e.g. elderly, history of peptic ulcer, other underlying disease, concomitant steroids.

• Selective Cox 2 inhibitors (e.g. celecoxib) should not routinely be used. They should only be used for patients who are at a particularly high risk of developing gastroduodenal ulcer, perforation or bleeding AND after an assessment of cardiovascular risk. Selective Cox 2 inhibitors and diclofenac should not be used in patients who have ischaemic heart disease, cerebrovascular disease, peripheral arterial disease or congestive heart failure.

• If NSAID-related ulcer suspected, please complete a yellow adverse drug reaction reporting form.

1.4 Acute upper gastrointestinal haemorrhage

• Assess risk using Blatchford score (at presentation) and Rockall score (after gastroscopy)
• Keep patient nil by mouth until endoscoped (should be next day, or as emergency if severe bleeding)
• If platelets below 50 and active bleeding, give platelet transfusion.
• If fibrinogen below 1 g/L, or PT or APTT >1.5 normal, and active bleeding, give fresh frozen plasma.

Acid suppression therapy

• PPIs are indicated if an ulcer is strongly suspected. Only use IV bolus omeprazole in patients who cannot physically swallow an oral PPI.
• Treat peptic ulceration (see section 1.3)

IV omeprazole following endoscopic haemostasis of bleeding peptic ulcers

• After therapeutic treatment for bleeding ulcer (if recommended by endoscopist), give IV omeprazole 80mg bolus followed by a continuous infusion of 8mg/hour for 72 hours (ie 40mg omeprazole in 100mL sodium chloride 0.9% or glucose 5% w/v over 5 hours – then set up another infusion).
• Initiate oral PPI therapy after 72 hours for a minimum of 4 weeks e.g. omeprazole 20mg od or lansoprazole 30mg od.
Anticoagulants and antiplatelet drugs in acute GI bleeding

- Offer prothrombin complex concentrate to patients who are taking warfarin and are actively bleeding.
- Discuss the management of patients on treatment doses of the new oral anticoagulants (apixaban, dabigatran, rivaroxaban) with the haematologist on call.
- Stop aspirin at initial assessment, but if haemostasis is achieved: aspirin may be restarted.
- Stop clopidogrel, prasugrel, ticagrelor and dipyridamole at initial assessment, but discuss risk/benefits of continuing with cardiologist/haematologist once bleeding controlled.
- Stop apixaban, dabigatran, rivaroxaban at initial assessment but discuss risks/benefits of continuing with cardiologist/haematologist once bleeding is controlled.

1.5 Terlipressin for oesophageal varices

- If oesophageal varices known or strongly suspected use terlipressin 2mg IV bolus every 4-6 hours for up to 72 hours.
  
  Note: In patients with angina or known coronary artery disease a GTN patch 10mg should be applied ONCE DAILY whilst the patient is receiving terlipressin

1.6 Use of PPIs in patients nil by mouth

- Do not use IV PPIs for treatment of reflux oesophagitis or peptic ulcers in patients nil by mouth. IV PPIs should only be used if recommended by the duty endoscopist.
- Use PPIs via NG tube wherever possible e.g. lansoprazole orodispersible tablets.
- Patients “nil by mouth” prior to surgery – consider oral PPI.
- Patients “nil by mouth” post-op – consider oral PPI or ranitidine 50mg IV tds.
- For prophylaxis of stress ulceration – consider sucralfate.

1.7 Management of hepatic encephalopathy

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>grade 1</td>
<td>mild confusion</td>
</tr>
<tr>
<td>grade 2</td>
<td>drowsy, gross mental ability defects</td>
</tr>
<tr>
<td>grade 3</td>
<td>somnolent, rousable, speech incomprehensible</td>
</tr>
<tr>
<td>grade 4</td>
<td>coma</td>
</tr>
</tbody>
</table>

Seek precipitating cause including GI bleed, sepsis, abnormal electrolytes, or drugs (e.g. sedative use)
Assessment: All jaundiced patients should complete 5-pointed star and document hand-writing on admission. This should be repeated daily to monitor degree of encephalopathy.

Treatment: lactulose oral or via NG tube. Increase dose until 2-3 loose stools per day. If unable to give by oral route, use lactulose washouts PR daily (300mL made up to 1L in water). All jaundiced patients should receive normal protein diet i.e. 1g/kg body weight. Do not restrict protein intake unless failure to respond to aggressive treatment. Consider therapeutic trial of flumazenil if recent benzodiazepines, e.g. for gastroscopy.

1.8 Laxatives

- **Identify and where possible correct cause** of constipation, consider:
  - Underlying disease
  - Decreased mobility
  - Change in diet
  - Pregnancy
  - Dehydration
  - Mechanical obstruction - confirmed faecal mass by PR
  - Drugs - opiates, anticholinergics, calcium channel blockers, iron

- **Educate patient**: mobilise where possible; refer to dietician for increased fluid and fibre intake.

- **Acute constipation** (suitable for short term use)
  a. Senna tabs 2 nocte prn.
  b. Glycerin 4g supp 1 daily prn.
  c. Micro-enema 1 daily prn.
  d. Phosphates Enema 1 daily prn.

  *For impaction use Micro-enema at night to soften stool then Phosphates Enema next morning.*

- **Chronic constipation** (suitable for long term use)
  a. Isphaghula husk sachets (e.g. Fybogel) 1 bd
  b. Senna tabs 2 nocte 2x a week

*Long term use of senna is not recommended in younger people.*

**Opiate-induced constipation**

a. Senna tabs 2 nocte
b. Senna tabs 2 nocte or 2 bd (or Senna liquid 10mL nocte or 10mL bd if patient unable to swallow tablets) + magnesium hydroxide 10mL bd *

c. Co-danthramer strong suspension or capsules†

*The cost of senna/magnesium hydroxide liquids is 15 times that of senna tablets and are suggested second line

† expensive – should not be used first line; co-danthramer and co-danthrusate are only licensed for constipation in terminally ill patients of all ages (avoid in patients with faecal incontinence)
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- LACTULOSE is not recommended in the routine management of constipation. It has limited efficacy in acute constipation, is unpalatable to some patients and its' daily cost is 20 times that of senna tablets. It may be used to prevent hepatic encephalopathy in a dose of 30mL tds, adjusted to produce 2-3 soft stools daily.

1.9 Bowel preparation

- Clear fluids only from day before procedure and nil by mouth on the day of procedure.
- Klean-Prep – 2 sachets in 2 litres of water during the afternoon and 2 sachets in 2 litres of water during the evening of day before procedure. If patient on afternoon list, 2 sachets in 2 litres of water during the evening before the procedure and 2 sachets in 2 litres of water during the morning of the day of the procedure. Give metoclopramide 10mg IM or IV (over 2 minutes) if the patient develops nausea and vomiting.
- Moviprep – morning procedure: 2 sachets in one litre of water during afternoon before, and 2 sachets in one litre of water in early evening. If patient on afternoon list, 2 sachets in one litre during the evening before the procedure and 2 sachets in one litre during the morning of the day of the procedure. Patient should continue to drink plenty of water or clear fluids (at least 500mL extra with each litre of Moviprep).
- Inpatients: if necessary add Phosphates Enema on the morning of procedure.

1.10 Octreotide for enterocutaneous or pancreatic fistulae
(Unlicensed indications)

- Warm vials to room temperature prior to injection to reduce pain and irritation.
- Commence treatment with a small dose, i.e. 50 micrograms SC bd.
- Monitor and document beneficial and adverse effects.
- Dose may need to be increased to 200 micrograms SC tds to achieve maximal response.
- Benefit should be seen within 48 hours. Consider withdrawing octreotide if response is poor at the maximum dose.
- Stop octreotide when fistula closed.
- Depot preparations of octreotide are available as 10mg, 20mg and 30mg vials for longer term use.

1.11 Administration of drugs through a gastrostomy/jejunostomy tube

For administration of drugs via a gastrostomy/jejunostomy tube contact ward pharmacist or Medicines Information on UHW Ext 42979 or UHL Ext 25262.

1.12 Use of pancreatic enzymes to unblock feeding tubes
(Unlicensed indication)

1. Open a Creon 10000 capsule (or equivalent) and dissolve contents of capsule in 5-10mL sodium bicarbonate 8.4%.
2. Instill the solution into the feeding tube.
3. After 5 minutes, flush feeding tube with 30mL water.
1.13 Severe acute colitis

- Start IV hydrocortisone 100mg qds and Predsol enemas one bd.
- Enoxaparin prophylaxis 40mg SC od (due to increased thrombotic risk) unless contraindicated.
- Stool cultures to exclude infection. Test for *C. difficile*.
- Abdominal x-ray to exclude toxic megacolon.
- Check ESR, CRP, FBC and LFTs.
- Refer to Gastroenterology team as soon as possible for continuing treatment and liaison with GI surgeons.

1.14 Omnipaque for in-patient CT scanning

- Omnipaque 350 is a specially formulated non-ionic gastro-intestinal contrast agent that is used to opacify bowel prior to CT. It is diluted in water and taken over a period of time to ensure that, in particular, the small bowel is opacified in order to optimise image interpretation. If colonic pathology is suspected, a longer period of preparation is required.

- Omnipaque 350 can be taken orally or given via an NG tube. Patients who are unable to swallow, or at risk of aspiration, must be given Omnipaque via the NG route. If aspirated, Omnipaque can cause a chemical pneumonitis.

- Contraindications include hypersensitivity to iodine-containing contrast media and manifest hyperthyroidism.

- Omnipaque 350 must be prescribed before being given. Prescribe on the ‘stat’ side of the chart as “Omnipaque 350 prior to CT scan”, “Dose – as per CT protocol”.

Usual instructions and timings in relation to CT scan are as below:-

- **Abdomen & Pelvis CT scans (including pancreatitis follow-up)**
  20mL of Omnipaque 350 diluted to 500mL with water or squash.
  250mL of this should be taken 60 minutes before the scan, and the remaining 250mL should be taken 30 minutes before the scan.

- **Minimal preparation CT scans** – requires prolonged oral preparation from 24 hours before the scan to opacify the colon.

  **On the day before the scan:**
  25mL of Omnipaque 350 to be diluted to 500mL with water or squash.
  250mL to be taken 24 hours before the scan, and the other 250mL to be taken 12 hours before the scan.

  **On the day of the scan:**
  25mL of Omnipaque 350 to be diluted to 500mL with water or squash.
  250mL to be taken 60 minutes before the scan and the other 250mL to be taken 30 minutes before the scan.
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- **Extended preparation** - Occasionally a 2 hour preparation is required
  50mL of Omnipaque 350 to be diluted to 1 litre with water or squash.
  500mL to be taken 2 hours before the scan,
  250mL 1 hour before the scan,
  250mL 30 minutes before the scan.
- Further Omnipaque 350 or water will be given to the patient in the department before any scan if required.

For further advice contact Radiology on **UHW Ext 45557 or UHL Ext 25279**

1.15 Anti-emetics

1.15.1 Ondansetron
**Drug Safety Update, August 2012**

- Ondansetron should be avoided in patients with congenital long QT syndrome.
- Use with caution in patients with risk factors for QT interval prolongation or cardiac arrhythmias, e.g. electrolyte abnormalities, use of medicines that prolong QT interval (including cytotoxic drugs) or that may lead to electrolyte abnormalities, congestive heart failure, bradyarrhythmias or use of medicines that lower heart rate.
- Hypokalaemia and hypomagnesaemia should be corrected before ondansetron administration.

1.15.2 Metoclopramide
**Drug Safety Update, August 2013**

- Metoclopramide is indicated for postoperative nausea and vomiting, radiotherapy-induced nausea and vomiting, delayed (but not acute) chemotherapy-induced nausea and vomiting, and symptomatic treatment of nausea and vomiting, including that associated with acute migraine.
- Intravenous doses should be administered as a slow bolus over at least 3 minutes to reduce the risk of adverse effects.
- In order to minimise the risk of potentially serious neurological adverse effects
  - metoclopramide should only be prescribed for short-term use (up to 5 days)
  - For adults, the maximum dose in 24 hours is 30mg (or 0.5mg per kg bodyweight). The usual dose is 10mg up to three times a day.
1.16 Guidelines for Postoperative Nausea & Vomiting (PONV)

Cardiff and Vale UHB, Directorate of Anaesthetics

Guidelines for Postoperative Nausea & Vomiting (PONV)

Prophylaxis of PONV in adults

<table>
<thead>
<tr>
<th>Basic Risk Factors</th>
<th>High Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>History of PONV</td>
</tr>
<tr>
<td>Female gender</td>
<td>History of motion sickness</td>
</tr>
<tr>
<td>Non smoker</td>
<td>Squint surgery</td>
</tr>
<tr>
<td>History of migraine</td>
<td>Gynae surgery</td>
</tr>
<tr>
<td>Oral surgery</td>
<td>Laparoscopic surgery</td>
</tr>
<tr>
<td>ENT surgery</td>
<td></td>
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</tbody>
</table>

Patients at risk of PONV (1 basic risk factor) → Follow treatment flow-chart if PONV occurs

Patients at high risk of PONV (1 high risk factor or >1 basic risk factor) → Prescribe IV ondansetron 4mg (intraoperatively*)

Patients at very high risk of PONV (>1 high risk factor) → Prescribe IV ondansetron 4mg Plus IV dexamethasone 8mg (intraoperatively*)

*consider prescribing the same dose orally as pre-medication on ward
Gastro-intestinal System

Treatment of PONV in adults

Patient nauseous/vomiting

Consider likely cause(s)/exacerbating factors* and treat where possible

Has cyclizine been administered in the last 4 hrs?

- Yes
  - Give prochlorperazine 3mg buccal or 12.5mg IM stat
  - **Ineffective**

- No
  - Has < 150mg cyclizine been administered in the last 24 hrs?
    - Yes
      - Give cyclizine 50mg IV/IM stat
      - **Ineffective**
    - No
      - Give ondansetron 4mg slow IV stat
      - **Ineffective**

Prescribe regular Buccastem (max 3-6mg bd)

Prescribe ondansetron 4mg IV prn 8 hourly with regular cyclizine (max. 50mg tds)

Refer to Acute Pain Service

Prescribe cyclizine PO/IM (max:50mg tds)

**Has < 150mg cyclizine been administered in the last 24 hrs?**

**Please allow a minimum of 1 hour to establish treatment failure.**

Regular assessment of treatment is essential.

**N.B PONV should only affect the patient for around 72 hours post op.**

* Potential causes of nausea: dehydration, low/high blood glucose, U&E imbalance, morphine sensitivity (contact Acute Pain Service), antibiotic/drug therapy, pain, anxiety, hypoxia, ileus, hypotension

** Please allow a minimum of 1 hour to establish treatment failure.

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## 1.17 Mesalazine prescribing guidance: mild to moderate Ulcerative Colitis

The most cost effective mesalazine preparation should be chosen. Issues of compliance and tablet burden may occasionally impact. There is a lack of proven clinical superiority between brands.

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Acute $^1$</th>
<th>Maintenance $^3$</th>
<th>Cost (8 weeks treatment) acc to BNF No.66</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ORAL TREATMENT</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>If able to use granules:-</strong></td>
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</tr>
<tr>
<td>Salofalk granules: 1.5 and 3g sachets</td>
<td>3g OD (1 x 3g sachet)</td>
<td>1.5-3g sachet OD</td>
<td>3g £91</td>
</tr>
<tr>
<td></td>
<td>1.5g £46</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>If tablets required:-</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Salofalk 500mg tablets or Pentasa 1g tablets</td>
<td>3g OD (6 Salofalk tablets)</td>
<td>1.5-3g OD (3-6 Salofalk tablets OD)</td>
<td>3g Salofalk £109</td>
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<tr>
<td></td>
<td>1.5g Salofalk £54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4g OD (4 Pentasa tablets)</td>
<td>2-4g OD (2-4 Pentasa tablets OD)</td>
<td>4g Pentasa £138</td>
</tr>
<tr>
<td></td>
<td>2g Pentasa £69</td>
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<td></td>
</tr>
<tr>
<td><strong>If tablet burden is a major concern (consultant approval only)</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Asacol 800mg tablets or Mezavant 1.2g tablets</td>
<td>2.4g OD (3 Asacol tablets)</td>
<td>2.4g OD</td>
<td>2.4g Asacol £110</td>
</tr>
<tr>
<td></td>
<td>2.4g Mezavant £117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4g OD (2 Mezavant tablets)</td>
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</tbody>
</table>

**RECTAL TREATMENT** (4 weeks treatment at commonly used dose – BNF No 66.)

See INFORM for approved rectal steroid treatments – prednisolone and budesonide

- 1g Asacol foam £108
- 1g Salofalk foam £121
- 1g Pentasa liquid £71
- 2g Salofalk liquid £120

**Suppository therapy**
(Use in proctitis +/- oral therapy)

- 1g Salofalk £56
- 1g Pentasa £40
1) Addition of enemas to oral therapy gives additional benefit, both in left-sided and extensive disease, with best evidence for Pentasa oral and enema.

2) No evidence that 4.8g Asacol is better than 2.4g for mild acute UC; for moderate acute UC there is some evidence that symptom resolution is slightly faster. No evidence of benefit for 4.8g Mezavant over 2.4g in mild or moderate acute UC. Consider higher doses in patients who flare on 2.4g maintenance.

3) After 8 weeks consider reducing dose for patients in complete clinical remission. Some advise continuing induction dose for one year, and generally relapse risk increases as dose is lowered.

4) Mesalazine enemas are more effective than steroid enemas in most analyses. Most patients tolerate foam enemas better than liquid, although liquid can be inserted gently, and foam is by metered dose at fixed pressure.