

Generic/TRADE/Pregnancy Category	Comments / Drug Interactions (DI) / Side Effects (SE)	Dose (Adult) <sup>5,6</sup> , Use, ~Duration	\$ / 30d
<b>H2-Receptor Antagonists (H2RA's) : particularly effective for nocturnal acid suppression (have been used daily at HS in patients on a daytime PPI regimen)</b>			
<b>Cimetidine</b> <b>TAGAMET</b> 200* ▽, 300, 400, 600, 800* ▽ mg tab; 60mg/ml soln [B]	•few significant differences between H2RA's: <b>ranitidine</b> (or cimetidine) may be preferred H2RA's due to comparable safety, efficacy and lower cost - <b>may avoid cimetidine</b> in patients who are <b>elderly</b> or at ↑ <b>risk of DI's</b>	<b>800mg po HS</b> –GU acute x 8wk, DU acute x 4-8wk <b>600mg po BID</b> –GERD	<b>15</b> 17
<b>Famotidine</b> <b>PEPCID</b> 20, 40mg tab {20mg, 40mg Vial} [B]	• <b>DI's:</b> <b>Cimetidine</b> ☞ inhibition of CYP <sub>450</sub> system e.g. warfarin, phenytoin, theophylline, etc. (Ranitidine has minor effect on the CYP <sub>450</sub> system); nizatidine/famotidine little or no effect on CYP <sub>450</sub> system). - space <b>antacid</b> administration 30-60 minutes apart from H2RA's	<b>40mg po HS</b> –GU acute x 8wk, DU acute x 4-8wk <b>20mg po HS</b> –PUD maint. [†] <b>20mg po BID</b> –GERD <b>20mg IV q12h</b>	<b>37</b> 24 40 250
<b>Nizatidine</b> <b>AXID</b> 150, 300mg cap [B]	• <b>SE:</b> Uncommon: diarrhea, constipation, headache, fatigue, confusion (risk increased in elderly and in patients with decreased renal function)	<b>300mg po HS</b> –GU acute x 8wk, DU acute x 4-8wk <b>150mg po HS</b> –PUD maint. [†] <b>150mg po BID</b> –GERD	<b>41</b> 24 39
<b>Ranitidine</b> <b>ZANTAC</b> 150, 300mg tab; 15mg/ml oral solution {50mg Vial} [B]	<b>SE:</b> <b>Cimetidine</b> ☞ slightly higher side effect risk seen with higher doses for a prolonged time; reversible gynecomastia (< 1%); weak antiandrogenic effect; may cause <b>transient</b> ↑ in SCr & LFTs •↓ <b>dosage</b> in patients with ↓ <b>renal fx</b> , ↓ <b>hepatic fx</b> , or <b>elderly</b> •higher dosages may be suitable for some patients/conditions	<b>150mg po bid or 300mg po HS</b> –GU acute x 8wk, DU acute x 4-8wk <b>150mg po HS</b> –PUD maint. [†] <b>150mg po BID</b> –GERD <b>50mg IV q12h or 150mg oral solution BID</b>	<b>27 or 26</b> 17 27 120
<b>Proton Pump Inhibitors (PPI's):</b> <b>DI's:</b> levels ↓ for drugs dependent on low pH for absorption → [itraconazole/ketoconazole, calcium carbonate, iron]; can be given with antacids. GERD: often <b>od</b> rather than <b>bid</b> dose needed. <sup>6</sup> <b>Long term use:</b> serum B12 levels can be decreased especially in the elderly. More effective than H2RA's for daytime/meal related acid secretion.			
<b>Esomeprazole</b> <b>NEXIUM</b> [B] 20, 40mg Delayed Release tab	• <b>S-isomer of omeprazole:</b> ↑ bioavailability, 40mg has ↑ efficacy vs omeprazole 20mg (control of intragastric pH/healing rates in GERD); similar SE's <sup>7</sup>	<b>40mg po OD</b> –GERD acute x 2-8wk <b>20mg po OD</b> –GERD maint.	<b>82</b> <b>82</b>
<b>Lansoprazole</b> <b>PREVACID</b> [B] 15, 30mg Delayed Release cap <small>can mix in applesauce for swallowing difficulties</small>	• <b>DI:</b> ↓ theophylline levels by 10%; also some inhibition of CYP2D6 • <b>SE:</b> diarrhea 4.1%, HA 2.9%, nausea 2.6%, rash. •Long-term safety established •effective in <b>hypersecretory conditions</b> e.g. ZES: dose range 30-90mg po BID •may provides more rapid symptom relief (compared to omeprazole) but healing rates/outcomes similar •may give contents via <b>NG tube</b> in apple juice	≤30mg po OD –GU acute x 4-8wk <b>15mg po OD</b> –DU acute x 2-4wk <b>30mg po OD</b> –PUD <sup>refract</sup> x8-12wk, GERD acute x2-8wk ≥15mg po OD –GERD maint.	79 <b>79</b> 79 79
<b>Omeprazole</b> <b>LOSEC, APO</b> <small>not interchangeable</small> [C] 10, 20mg Delayed Release tab <small> Losec MUPS (micropellets):available "hospital only"</small>	• <b>DI:</b> inhibition of CYP2C19 (↑ levels of phenytoin, diazepam, warfarin) • <b>SE:</b> HA 2.4%; diarrhea 1.9%; nausea 0.9%, rash •Long-term safety established •effective in <b>hypersecretory conditions</b> eg. ZES: dose range: 60 <sub>mg</sub> OD–120 <sub>mg</sub> TID • <b>NG tube:</b> use • <b>MUPS</b> or <b>Susp</b> <small>compounded</small> or mix tab with sodium bicarbonate	≤40mg po OD –GU acute x 4-8wk <b>20mg po OD</b> –DU acute x2-4wk, GERD acute x2-8 wk <b>40mg po OD</b> –PUD <sup>refract</sup> x 8-12 wk ≥10mg po OD –GERD maint.	<b>106</b> <small>APO, 165</small> <b>57</b> <small>APO, 86</small> <b>165</b> 70
<b>Pantoprazole</b> <b>PANTOLOC</b> [B] 40mg Enteric tab, 20mg* ▽ tab; 40mg Vial}	• <b>rapid onset / similar outcomes vs omeprazole</b> <b>SE:</b> HA; diarrhea; nausea; pruritus • <b>less DI's</b> as less CYP450 effect • <b>IV</b> 40mg IV od or GI bleed <small>80mg bolus; 8mg/hr x72hr</small> •effective in <b>hypersecretory conditions</b> e.g. ZES: Dose range 40-120mg po BID	<b>40mg po OD</b> –GU acute x4-8wk, DU acute x2-4wk, GERD acute x2-8 wk ≥20mg po OD –GERD maint. <b>40mg IV OD</b>	<b>75</b> 63 430
<b>Rabeprazole</b> <b>PARIET</b> [B] 10mg  ▽, 20mg *  Enteric coated tab	• <b>SE:</b> HA 2.4%, rash, diarrhea <b>NIHB full formulary</b> status •(currently <b>lowest cost</b> PPI if 10mg tablet strength used)	<b>20mg (2x10mg) po OD</b> –GU & DU acute, GERD x 4-8 wk <b>10mg po OD</b> –GERD maint	<b>54</b> <b>30</b>

= ↓dose for renal dysfx **Cost**=total cost in Sask.; Considerations of cost should be given to the potential for shorter duration of therapy & ↑ efficacy of PPIs vs H2RAs. ▽ =covered by NIHB =not covered by NIHB  
 =Max. allowable cost =Exception Drug Status in SK. =non-formulary in SK. =prior approval required for NIHB coverage **CYP**=cytochrome P<sub>450</sub> enzymes **DI**=drug interaction **DU**=duodenal ulcer  
**GERD**=gastroesophageal reflux disease **GI**=gastrointestinal **GU**=gastric ulcer **HA**=headache **LFTs**=liver function tests **PUD**=peptic ulcer disease **SCR**=serum creatinine **SE**=side effect **ZES**=Zollinger-Ellison Syndrome  
 =*H. pylori* eradication preferable to long-term acid suppression in PUD; **PREVENT NSAID induced ulcers** in high GI risk patients: **usual dose PPI**<sup>17</sup> or misoprostol 200ug TID \$38 (range BID-QID)

<b>OTC H2-Receptor Antagonists</b>			
Famotidine* <b>PEPCID AC</b> coated / chewtab	10mg Tab	x30/ ≥ \$12	
Ranitidine <b>ZANTAC-75</b>	75mg Tab	x30/ ≥ \$12	
Generic versions of famotidine/ranitidine available; cost of 30 tablets/ <\$10			

\* Pepcid Complete Formula (famotidine/calcium carbonate/magnesium hydroxide; 10 tabs ≅ \$9) =may use if benefit outweighs risk =avoid if possible  
 = Risk Factor B: no evidence of risk (in animal studies or uncontrolled human studies) = Risk Factor C: possible risk to fetus (evident in animal studies)

**NSAID ulcer Risk Factors:** (x= ↑ in odds ratio risk) History of ulcer complications x13.5, Multiple NSAIDs x9, High dose NSAIDs x7, Concomitant anticoagulant use x6.4, Age ≥70 x5.6, Age ≥60 x3.1, Concomitant steroids x2.2, History of heart Disease x1.8

<b>Special Considerations</b> <sup>8,9</sup>
• <b>Pregnancy:</b> H2RAs  -all [B]; ranitidine preferred. <sup>9</sup> PPIs : lansoprazole & pantoprazole are [B]; omeprazole [C]
• <b>Lactation:</b> H2RAs  -famotidine may be preferred. PPIs  - avoid due to lack of data & potential adverse effects
• <b>Pediatrics:</b> H2RAs -caution in children <12 years; PPIs -caution, not well established; omeprazole  (1 study) <sup>10</sup>

• **Lifestyle changes for DIET, EXERCISE, moderate alcohol use & stop SMOKING!**

# Acid Suppression - Comparison Chart Supplement

## *The Rx Files* - Loren Regier, Brenda Schuster

### References

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<sup>1</sup> AHFS 2004, Micromedix 2004

<sup>2</sup> [http://www.oregonrx.org/OrgrxPDF/PPI%20review/PPI%20FINAL%20EPC%20report/PPI%20Final%20Report11\\_221.pdf](http://www.oregonrx.org/OrgrxPDF/PPI%20review/PPI%20FINAL%20EPC%20report/PPI%20Final%20Report11_221.pdf)

<sup>3</sup> <http://www.oregonrx.org/OrgrxPDF/PPI%20review/PPI%20EPC%20UPDATE/Update%20Report%20PPIs.pdf>

<sup>4</sup> Hunt RH, Barkun AN, Baron D, Bombardier C, Bursey FR, Marshall JR, Morgan DG, Pare P, Thomson AB, Whittaker JS. Recommendations for the appropriate use of anti-inflammatory drugs in the era of the coxibs: defining the role of gastroprotective agents. *Can J Gastroenterol.* 2002 Apr;16(4):231-40.

<sup>5</sup> AHFS 2003, Micromedix 2004

<sup>6</sup> Inadomi JM, et al. Step-down from multiple- to single-dose PPIs: a prospective study of patients with heartburn or acid regurgitation completely relieved with PPIs. *Am J Gastroenterol.* 2003 Sep;98(9):1940-4.

<sup>7</sup> Spencer CM, Faulds D. Esomeprazole. *Drugs.* 2000 Aug;60(2):321-9; discussion 330-1.

<sup>8</sup> Briggs GG, Freeman RK, Sumner JY. *Drugs in Pregnancy and Lactation* 6<sup>th</sup> Edition. Williams & Wilkins, Baltimore, 2002.

<sup>9</sup> Larson JD, Patatianian E, Miner PB, et al. Double-blind, placebo controlled study of ranitidine for gastroesophageal reflux symptoms during pregnancy. *Obstet Gynecol* 1997;90:83-7.

<sup>10</sup> Giacomo CD, Bawa P, Franceschi M et al. Omeprazole for severe reflux esophagitis in children. *J Ped Gastroent Nutr* 1997;24:528-532.

<sup>11</sup> Richardson P, Hawkey CJ, Stack WA. Proton Pump Inhibitors: Pharmacology and rationale for use in gastrointestinal disorders. *Drugs* 1998;56(3):307-335.

<sup>12</sup> Peghini PL, Katz PO, Castell DO. Ranitidine controls nocturnal acid breakthrough on omeprazole: a controlled study in normal subjects. *Gastroenterology* 1998;115:1335-9.

<sup>13</sup> Langtry HD, Wilde MI. Lansoprazole: An update of its pharmacological properties and clinical efficacy in the management of acid-related disorders. *Drugs* 1997;54(3):473-500.

<sup>14</sup> Chan FK, Leung WK. Peptic-ulcer disease. *Lancet.* 2002 Sep 21;360(9337):933-41.

<sup>15</sup> **Treatment Guidelines:** Drugs for Peptic Ulcers. **The Medical Letter:** February, **2004**; 2(18) pp. 9-12.

<sup>16</sup> Dekel R, Morse C, Fass R. The role of proton pump inhibitors in gastro-oesophageal reflux disease. *Drugs.* 2004;64(3):277-95.

<sup>17</sup> Chan FK, Hung LC, Suen BY, Wu JC, Lee KC, Leung VK, Hui AJ, To KF, Leung WK, Wong VW, Chung SC, Sung JJ. Celecoxib versus diclofenac and omeprazole in reducing the risk of recurrent ulcer bleeding in patients with arthritis. *N Engl J Med.* 2002 Dec 26;347(26):2104-10.