

VUMC Trauma Critical Care Stress Ulcer Prophylaxis Protocol

Background

Critically ill patients are at risk of GI hemorrhage primarily from gastric or duodenal ulcers. Cook and colleagues describe the risk of overt bleeding to be 4.4% and clinically significant bleeding to be 1.5%. The incidence of clinically significant bleeding appears to be dependent on severity of illness (ISS > 15 for trauma) and the type of patient population studied.

The most definitive indications for stress ulcer prophylaxis include 1) Traumatic brain injury, 2) Major burn injury, 3) Mechanical ventilation (>48 hrs), 4) Coagulopathy (INR >1.5 or platelet count < 50,000). Other risk factors for GI bleeding in the ICU setting include alcoholism, acute hepatic failure, sepsis, acute renal failure, trauma, prolonged NSAIDs, and high dose steroids.

Literature indicates that H₂ receptor antagonists (H2RA) and proton pump inhibitors (PPI) are equally effective in reducing stress-related gastrointestinal bleeding. Meta-analyses describing superiority of PPIs are controversial. Per the EAST Practice Management Guidelines either H2RAs or PPIs may be used for stress ulcer prophylaxis in critical ill trauma patients.

Numerous analyses describe the role of enteral nutrition (EN) in the prevention of stress-related gastrointestinal bleeding. EN prevents mucosal ischemia and ulceration by increasing splanchnic blood flow and increasing gastric pH (to a lesser degree). Pre and post-pyloric EN should provide some degree of protection against stress-related mucosal ulceration. However, data describing EN as the sole stress ulcer prophylaxis in hypersecretory states, including major head injury and burn patients, is lacking.

Indications for Prophylaxis

High Risk Patient:

- All patients to receive prophylaxis

Moderate Risk Patient:

- Consider prophylaxis

Low Risk Patient or Tolerating PO Diet:

- NO prophylaxis or discontinue prophylaxis

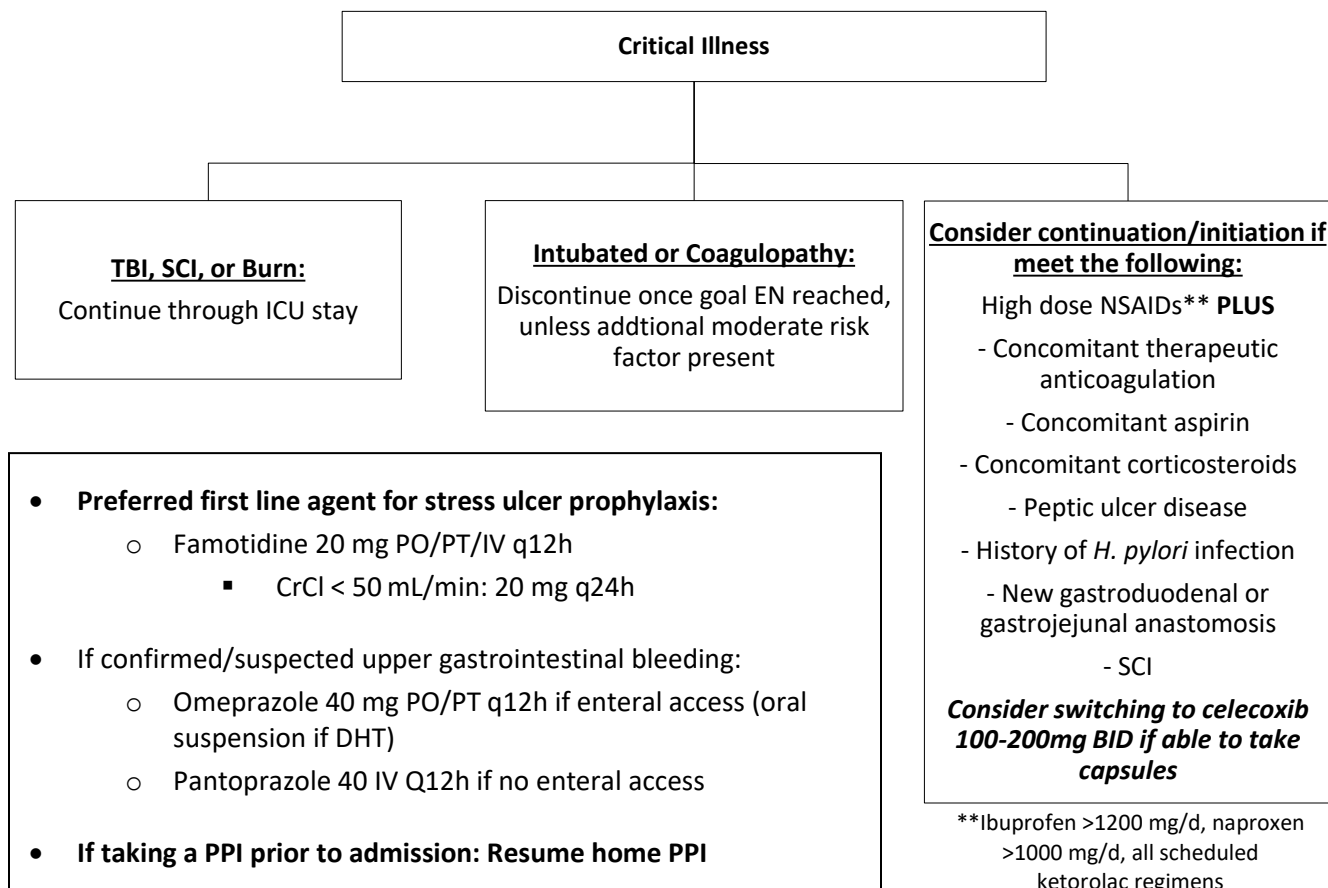
HIGH RISK:

- Mechanical ventilation >48 hours
- Coagulopathy (plt<50,000 or INR >1.5)
- Traumatic brain injury
- Significant burn injury (>20 % TBSA Partial + Full Thickness)
- History of previous gastrointestinal hemorrhage

MODERATE RISK: (≥ 2)

- Chronic NSAID or aspirin use
- Current high dose NSAID therapy (ibuprofen >1200 mg/day, naproxen >1000 mg/day, all scheduled ketorolac regimens)
- Sepsis
- Vasopressor/inotropic therapy
- Corticosteroid therapy (≥250 mg/d hydrocortisone equivalence)
- New gastroduodenal or gastrojejunal anastomosis
- Spinal cord injury

Trauma High Risk Prophylaxis Algorithm



References:

1. Cook DJ, Fuller HD, Guyatt GH, Marshall JC, Leasa D, Hall R et al. Risk factors for gastrointestinal bleeding in critically ill patients. Canadian Critical Care Trials Group. *N Engl J Med*. 1994; 330(6):377-381.
2. Cook DJ, Guyatt G, Marshall J, Leasa D, Fuller H, Hall R et al. A comparison of sucralfate and ranitidine for the prevention of upper gastrointestinal bleeding in patients requiring mechanical ventilation. Canadian Critical Care Trials Group. *N Engl J Med* 1998; 338(12):791-797.
3. Hurt RT, Frazier TH, McClave SA, et al. Stress prophylaxis in intensive care unit patients and the role of enteral nutrition. *J Parenter Enteral Nutr*. 2012;36(6):721-731.
4. Guillaumondegui OD, Gunter OL, Bonadies JA, et al. Practice management guidelines for stress ulcer prophylaxis. Eastern Association for the Surgery of Trauma. 2008. Available at: <http://www.east.org/resources/treatment-guidelines>. Accessed, May2013.
5. Marik PE, Vasu T, Hirani A, Pachinburavan M. Stress ulcer prophylaxis in the new millennium: a systematic review and meta-analysis. *Crit Care Med*. 2010;38:2222-2228.
6. Lin PC, Chang CH, Hsu PI, Tseng PL, Huang YB. The efficacy and safety of proton pump inhibitors vs histamine-2 receptor antagonists for stress ulcer bleeding prophylaxis among critical care patients: a meta-analysis. *Crit Care Med*. 2010;38:1197-1205.
7. Alhazzani W, Alenezi F, Jaeschke RZ, Moayyedi P, Cook DJ. Proton pump inhibitors versus histamine 2 receptor antagonists for stress ulcer prophylaxis in critically ill patients: a systematic review and meta-analysis. *Crit Care Med*. 2013;41:693-705.
8. Liu Y, Li D, Wen, A. Pharmacologic prophylaxis of stress ulcer in non-ICU patients: A systematic review and network meta-analysis of randomized controlled trials. *Clinical Therapeutics*. 2020;42(3); 488-498.
9. Marker M, Perner A, Wettersley J, et al. Pantoprazole in patients at risk for gastrointestinal bleeding in the ICU. *N Engl J Med*. 2018;379(2): 199-208.
10. Gwee K, Goh V, Lima G, et al. Coprescribing proton-pump inhibitors with nonsteroidal anti-inflammatory drugs: risks versus benefits. *Journal of Pain Research*. 2018;11; 361-374

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