Maimonides Medical Center
Surgical Intensive Care Unit
Stress Ulcer Prophylaxis Guideline

Purpose: To develop a standardized, evidence-based guideline for stress ulcer prophylaxis in the intensive care unit including patient qualifications, medications, and discontinuation.

Background: Stress ulcers can be a complication of intensive care unit (ICU) stay with incidences reported between 0.1 and 39% when no prophylaxis was administered. Certain risk factors put patients at a much higher risk of clinically important bleeding from stress ulcers, namely mechanical ventilation for > 48 hours or coagulopathy (not induced by therapeutic anticoagulation). For these groups the risk of bleeding has been determined to be 3.9% compared to 0.1% when these risk factors are not present.

Several studies have been conducted comparing medications used for stress ulcer prophylaxis. While proton pump inhibitors (PPIs) have been shown to provide better pH control (more time at a pH > 6) this has not correlated with a decreased incidence of clinically important bleeding compared to histamine$_2$ (H_2) receptor antagonists. Sucralfate has also been shown to be equally as effective as H_2 receptor antagonists at preventing stress ulcer related clinically important bleeding.

Acid suppressive therapy may be implicated in the increased incidence of several infections, namely **C*lostridium difficile* associated diarrhea** and **ventilator-associated pneumonia**, potentially leading to **increased morbidity, mortality, length-of-stay, and cost**. These side effects are thought to be related to elevated pH and proton pump inhibitors have been linked to these infections more often than H_2 receptor antagonists. Sucralfate does not affect gastric pH and thus has not been linked to infectious complications. This agent however, contains aluminum, should be avoided in patients with renal insufficiency, and has the potential for drug interactions and interactions with tube feeds making it a less than ideal agent for use in the ICU.

Recommendations:

1. Based on the available evidence stress ulcer prophylaxis should be initiated for patients with **1 of the following:**
    a. Coagulopathy (not induced by therapeutic anticoagulation) or
    b. Receiving mechanical ventilation with an anticipated duration > 48 hours
2. Based on the available evidence stress ulcer prophylaxis should be initiated for patients with **2 or more of the following:**
    a. Major trauma
    b. Requiring vasopressors
    c. Steroid therapy > 250 mg hydrocortisone equivalent per day
    d. Acute traumatic brain or spinal cord injury
    e. Burns to >30% of the body
    f. Renal failure
    g. Liver failure
3. Prophylaxis should be initiated with a H_2 receptor antagonist such as famotidine 20 mg Q12H (renally adjusted to 20 mg Q24H) or ranitidine 150 mg Q8-12H (renally adjusted to 150 mg daily) and given via the oral route whenever feasible since better pH control has been shown with this route of administration
4. For patients with a history of GI bleed, PUD, taking a PPI at home, or receiving triple therapy with aspirin, clopidogrel or other thienopyridine, and warfarin a PPI should be started such as pantoprazole 40 mg PO daily (IV if not tolerating PO) no adjustment for renal dysfunction

5. Stress ulcer prophylaxis should be discontinued once these risk factors are no longer present to prevent the development of infectious complications such as *C. difficile* associated diarrhea and hospital-acquired pneumonia

Note: The intended use of this guideline is for stress ulcer prophylaxis only and does not apply to treatment of active bleeding. In the case of a history of gastroesophageal reflux disease or peptic ulcer disease the use of a proton pump inhibitor may be indicated and the patient's home medications should be reviewed.

References:

1. Cook DJ, Fuller HD, Guyatt GH, et al: Risk factors for gastrointestinal bleeding in critically ill patients: Canadian Critical Care Trials Group. *N Engl J Med* 1994; 330:377–381

2. Cook DJ, Reeve BK, Guyatt GH, et al: Stress ulcer prophylaxis in critically ill patients. Resolving discordant meta-analyses. *JAMA* 1996; 275:308–314

3. Lin P, Chang C, Hsu P, Tseng P, Huang Y. 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 Vol. 38, No. 4

4. Howell M, Novack V, Grgurich P, Soulliard D, Novack L, Pencina M, Talmor D. Iatrogenic Gastric Acid Suppression and the Risk of Nosocomial *Clostridium difficile*Infection. *Arch Intern Med.* 2010;170(9):784-790

5. Miano T, Reichert M, Houle T, MacGregor D, Kincaid E, Bowton D. Nosocomial Pneumonia Risk and Stress Ulcer Prophylaxis A Comparison of Pantoprazole vs Ranitidine in Cardiothoracic Surgery Patients. *CHEST* 2009; 136:440–447

6. Morrison RH, Hall NS, Said M, Rice T, Groff H, Brodine SK, *et. al*. Risk Factors Associated With Complications and Mortality in Patients With Clostridium difficile Infection. *CID* 2011:53 (15 December)

7. Almadi MA, Barkun A, Brophy J. Antiplatelet and Anticoagulant therapy in Patients with Gastrointestinal Bleeding. *JAMA*. 2011;306(21):2367-2374

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