

ASPEN EDUCATION PROGRAM OUTLINE TEMPLATE

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Presentation Title

Stress Ulcer Prophylaxis in Pediatric Critical Illness: Who, What, When... and why?

Disclosures

- The presenters have no commercial relationships to disclose.

Presentation Overview/Summary

Medications to suppress acid production, thereby, raising gastric pH is a method commonly used to prevent stress-related ulceration in pediatric critical illness. This practice was adapted from early adult studies, however evidence exists that this practice should be revisited in children, given the remarkably low incidence of clinically significant gastrointestinal bleeding. The most commonly used medications include histamine-2 receptor antagonists, such as ranitidine, famotidine and cimetidine, and proton pump inhibitors, such as pantoprazole and omeprazole. To date, there remains little evidence guiding our practice for appropriateness of gastric acid suppression in the pediatric population. It is essential to review current literature to guide appropriate evidence-based use in critical illness.

Learning Objectives

- At the conclusion of the presentation, the learner will be able to:
 1. Understand the background and significance of stress ulcer prophylaxis
 2. Understand the basic physiology of stress ulcers and gastric acid secretion
 3. Identify the Indications and risk factors for stress-related mucosal injury of the GI tract
 4. Describe potential adverse events associated with acid suppressive therapy

Key Takeaways/Fast Facts

1. It is important to consider each patient individually
2. Patients without any bleeding risk factors likely do not need gastric acid suppression
3. Medications can have potentially harmful effects, therefore, should not be used broadly as prophylaxis
4. Patients should be assessed each day on rounds to determine whether their risk factors for stress ulcers have changed and medications should be adjusted accordingly

Learning Assessment Questions

1. Which of the following mechanisms may lead to development of stress-ulcer mucosal damage?
 - A. Hypovolemia
 - B. Decreased cardiac output
 - C. Lack of enteral nutrition
 - D. A and B
 - E. All of the above
2. Ranitidine, a stress ulcer prophylaxis medication, is an example of a proton pump inhibitor?
 - A. True
 - B. False
3. All of the following are **absolute** indications for stress ulcer prophylaxis except:
 - A. Mechanical ventilation
 - B. NPO feeding status
 - C. Coagulopathy
 - D. Burn injury

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4. Potential adverse events from stress ulcer prophylaxis include all the following except:
 - A. Ventilator-associated pneumonia
 - B. Necrotizing enterocolitis
 - C. Gastrointestinal bleeding
 - D. *Clostridium difficile* colitis
 - E. Thrombocytopenia
5. Histamine-2-receptor antagonist medications must be dose-adjusted in patients with renal failure:
 - A. True
 - B. False

Learning Assessment Answers:

1. Answer = D; Rationale: *Hypovolemia and low cardiac output leads to a reduction in blood flow to the gut, which in result, leads to less oxygen delivery, hypoperfusion and mucosal ischemia. This can be seen in disease states such as septic shock. Mucosal ischemia in conjunction with impaired mucosal barriers can lead to stress-related mucosal damage.*
2. Answer = False; Rationale: *Ranitidine is an example of a histamine-2-receptor antagonist medication. Other examples include famotidine and cimetidine. These medications inhibit acid secretion by blocking H2 receptors on the parietal cell of the stomach. Peak serum concentrations occur within one to three hours. Tolerance has been reported to occur with this class of medications.*
3. Answer = B; Rationale: *Mechanical ventilation, coagulopathy and burn injury are absolute indications for stress-ulcer prophylaxis. There is currently insufficient evidence on whether enteral nutrition provides adequate protection against stress-related mucosal bleeding. Patients who are NPO, without other risk factors, do not routinely need stress-ulcer prophylaxis, although greater than 60% of patients admitted to PICU's in the United States are reported to prescribe this medication routinely on admission.*
4. Answer = C; Rationale: *Gastrointestinal bleeding is not an adverse effect of stress ulcer prophylaxis,*
5. Answer = True; Rationale: *Unlike proton pump inhibitors, histamine-2-receptor medications are renally-cleared and should be adjusted for patients in renal dysfunction.*

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