Title: What is the incidence rate of GI bleed in the PICU?

GI bleed secondary to stress ulceration is a known risk associated with critical illness. Its mechanism involves decreased splanchnic perfusion leading to mucosal damage1. It is common practice among intensivists to administer GI prophylaxis to patients admitted to the PICU, however the prophylactic agents used varies and determination of who receives prophylaxis varies across institutions as well. This variability is reported on retrospective chart review encompassing 42 children's hospitals nationwide by Costarino et al (2015)2. There are many different aspects that requires consideration in determining whether to administer GI prophylaxis to a patient admitted to the PICU, one of which is understanding the overall incidence rate of GI bleeding in this patient population. The PICO question explored in this appraisal is: In all patients admitted to the PICU what is the effect of critical illness on incidence of GI bleeding?

A literature search was performed on PubMed using MeSH terms “Intensive care units, pediatric”, AND “GI bleed” OR “Peptic Ulcer Hemorrhage” OR “Peptic Ulcer”. This yielded 24 results. Bibliographies from these articled were also referenced to search for further articles. 3 articles were selected for appraisal as described below:

Lacroix et al. “Frequency of Upper Gastrointestinal Bleeding in a Pediatric Intensive Care Unit”. Critical Care Medicine Vol.20 No1 Jan 19923 – This was a prospective descriptive study performed in Sainete Justine Hospital PICU over a one year period from 1988-1989 on all patients admitted to the PICU during this period. The main objective of the study was to determine overall incidence of GI bleed in PICU patients and to identify factors that put patients at higher risk of GI bleed. Exclusion criteria included newborn, patients older than 18yrs, esphageal or gastric surgery prior to admission, and active bleeding from nose or throat. After eclusions applied 984 patients were included in the analysis and followed for 3 days post discharge. GI bleeding was defined as hematemesis or blood in G tube. Clinically significant bleed was defined as hypotension, death and requiring transfusion within 24hours after GI bleed. The study reported incidence of clinically significant GI bleed of only 0.4%, and identified coagulopathy, pneumonia, high PRISM score and multitrauma as risk factors for GI bleeds.

Chaibou et al. “Clinically Significant Upper Gastrointestinal Bleeding Acquired in a Pediatric Intensive Care Unit: A Prospective study”. Pediatrics vol 102 No 4 October 19984 – This study was a follow up to the Lacroix at al paper mentioned above performed at the same institution to study if the initial study under reported the incidence rate of GI bleed. The study was conducted between July 1 1991 to July 31 1992 in Sainte Justine Hospital PICU on patients between ages 3days to 18yrs old. Exclusion criteria included GI bleeding within 5 days of admission, brain death on admission, obstetric, esophageal or gastric surgery, and active bleeding from nose or throat. Patients were followed from day of admission to 5 days post discharge. GI bleed was defined as hematemesis or blood in G tube. Clinically significant bleed defined as containing at least one of the following complications: decrease in hemoglobin, requiring RBC transfusion, change in blood pressure, or end organ dysfunction as per Wilkinson et.al. This study reported a higher overall incidence of GI bleed of 10.2%, however only 1.6% of total cases were clinically significant GI bleed. They identified Respiratory failure, coaguloapathy and higher prism PRISM score (over 10) as risk factors for developing GI bleed, and therefore only recommend prophylaxis for patients deemed high risk.

Nithwathanapong et al. “Prevelence and Risk Factors of Stress-Induced Gastrointestinal Bleeding in Critically Ill Children”. World Journal of Gastroenterology 2005; 11(43): 6839-6842 – This was a restrospecitve chart review performed in Thailand, and only included patients less than 15yrs old admitted to their PICU over 48hrs. Exclusion criteria were less than 48hrs of admission, history of previous GI bleeding, recent GI tract surgery, brain death, epistaxis and oropharyngeal bleeding. GI bleeds were defined as hematemesis, coffee ground gastric content. The study was performed in Thailand and included substantial amount of patients with hemorrhagic fever. They reported 43% of cases with GI bleeding, with 5.3% with Clinically significant bleeding. It is important to note that 22% of these clinically significant bleeding was associated with dengue hemorrhagic fever. GI prophylaxis in these cases did not reduce risk of bleeding.

In conclusion the 3 appraised articles all demonstrated low incidence of clinically significant GI bleeds when all patients admitted to PICU were considered. They have all identified risk factors for GI bleed such as coagulopathy, respiratory failure, and high level of critical illness represented by high PRISM score. Overall the data is applicable to our population, however limitations include: the studies being performed outside of US with different disease prevalence, and first 2 articles were both performed in the 90s. Recommendation from this acritical appraisal is to use GI prophylaxis only in those patients with identified risk factors for clinically significant GI bleed.

Reference:

1. Neil Stollman and David C. Metz. “Pathophysiology and prophylaxis of stress ulcer in intensive care unit patients”.
2. Costarino et al. “Gastric acid suppresant prophylaxis in pediatric intensive care: current practice as reflexted in a large administrative database”. Pediatric Critical Care Medicine 2015.
3. Lacroix et al. “Frequency of Upper Gastrointestinal Bleeding in a Pediatric Intensive Care Unit”. Critical Care Medicine Vol.20 No1 Jan 1992
4. Chaibou et al. “Clinically Significant Upper Gastrointestinal Bleeding Acquired in a Pediatric Intensive Care Unit: A Prospective study”. Pediatrics vol 102 No 4 October 1998
5. Nithwathanapong et al. “Prevelence and Risk Factors of Stress-Induced Gastrointestinal Bleeding in Critically Ill Children”. World Journal of Gastroenterology 2005; 11(43): 6839-6842