MEDICATION USE EVALUATION: PROTON PUMP INHIBITORS

BACKGROUND
Proton pump inhibitors (PPIs) are often used in the hospital setting for both treatment and prophylaxis modalities. PPIs will often be used in the treatment of various disease states, such as gastrointestinal (GI) bleeding, gastric and duodenal ulcers, and gastroesophageal reflux syndrome (GERD). Many times, PPIs will also be employed in high risk patients to prevent stress ulcers that can develop during a hospital stay. Most often, PPIs will be utilized as prophylaxis in mechanically ventilated patients, patients who have a coagulopathy (platelets <50,000 or INR >1.5), or in patients who have a history of GI bleeding.

Several studies have evaluated the use of PPIs and whether their indications and durations of therapy are appropriate for the setting. Yachimiski and colleagues evaluated the implementation of guidelines to help with appropriate PPI utilization. Data was gathered before guideline implementation to serve as a point of comparison. Their study then looked at a cohort of 942 patients being prescribed a PPI while they were inpatients. After the implantation of guidelines, therapy continuation at discharge declined from 27% to 16% (among those patients not on outpatient therapy at admission). This result was found to be statistically significant and helped to reduce the rates of PPI prescriptions at discharge.

Additionally, Hatch and colleagues conducted a follow-up retrospective medical record review of 356 patients admitted to the intensive care unit. Their main objective was to utilize education to both the pharmacy and medical staff about the appropriate use and discontinuation of PPIs at transfer and at discharge. Pharmacists would also conduct medication reconciliation during daily rounds to monitor medication use. The results would then be compared to a similar study completed previously. Of the 356 patients evaluated, 308 received PPIs and stress ulcer prophylaxis in the hospital. It was found that 11% of these patients had therapy continued at discharge, of which 8.7% had no clear indication. Overall, this was a 64% reduction from the 24.4% found in the original study.

Wohlt and colleagues supported these findings with the results of a retrospective chart review of ICU patients at a tertiary medical center. Their study found that of 357 patients, 80% were still receiving PPI therapy after being transferred from the ICU, with 60% of these being inappropriate indications. Additionally, 24.4% of the patients were discharged from the hospital inappropriately on a PPI. They also found that the additional costs accrued by inappropriate PPI continuation was approximately $14,000.

Based on this information, it is pertinent to evaluate the use of PPIs at Blanchard Valley Hospital and make improvements where necessary.

METHODS
For this medication utilization evaluation (MUE), any patients who were admitted to the hospital during the stated time period and were started on a PPI were included for evaluation. If a patient was on a PPI as outpatient therapy (home medication) and continued on a PPI inpatient, this was considered to be an appropriate use of the medication. For those patients not utilizing a PPI as a home medication, their records were reviewed to find an appropriate indication for the initiation of a PPI. This indication was then noted. If there was no clear or appropriate reason for the initiation of a PPI, this was also noted. Each of the patients who were initiated on a PPI in the hospital were then evaluated at discharge to see if the PPI was continued.
Time: March 1, 2012 – April 30, 2012

Total Number of Patients: 274

Continuation of outpatient therapy (home medication): 186

Total Number of Patients Evaluated: 88

Inappropriate or unclear indication for PPI: 35  \(\frac{35}{88} = 39.7\%\)
Inappropriate continuation at discharge: 14  \(\frac{14}{88} = 15.9\%\)

CONCLUSIONS
There was a similar previous MUE, conducted in April 2010, which looked at H2 antagonists and PPI’s. This MUE found that 83% of patients during the month of April received inappropriate acid-suppression therapy in regards to stress ulcer prophylaxis. Among these patients, 27% of them had their medication continued upon discharge. Therefore, based on the results of current the MUE, Blanchard Valley Hospital has improved its utilization of PPIs in the inpatient setting, however, there is still more that can be accomplished.

RECOMMENDATIONS
Limiting the use of PPIs to appropriate patients is a key goal to therapy, especially when PPIs are becoming implicated in causing such conditions as pneumonia, *Clostridium difficile* infections, and increasing fracture risk. Each of these conditions puts the patient at a higher risk for readmission to the hospital and a resultant increase in healthcare dollars. It is recommended that patients only begin PPI therapy if a true indication exists for treatment or prophylaxis. According to the current guidelines, the appropriate indications for stress ulcer prophylaxis include two or more of the following risk factors: mechanical ventilation, coagulopathy, acute renal or hepatic failure, sepsis, prolonged hypotension, history of GI bleed, severe head trauma, extensive burns, or lengthy surgery. It should also be noted that if a PPI is initiated for prophylaxis, the PPI should be discontinued as soon as the elevated risk has passed.

Currently, the guidelines for the use of stress ulcer prophylaxis are being updated. Interestingly, the focus of the updates will include potential recommendations of using H2 antagonists as first line therapy and saving PPIs for specific patients (such as those who have failed an H2 in the past). Additionally, there is a focus on discontinuing medications for stress ulcer prophylaxis at an appropriate time (especially before discharge). With the pending update of the guidelines, close monitoring by the healthcare team will increase the quality of care that is provided at Blanchard Valley Hospital.

REFERENCES
*Crit Care Med.* 1999; 27: 2812-2817


Wohlt PD, Hansen LA, and Fish JT. Inappropriate Continuation of Stress Ulcer Prophylactic Therapy After Discharge. *Ann Pharmacother 2007; 41.*