



Clinical Safety & Effectiveness

Session # 6

Improving Appropriate Use of Proton Pump Inhibitors as Gastrointestinal Prophylaxis in the Hospital Setting



CENTER FOR PATIENT SAFETY & HEALTH POLICY

UT HEALTH SCIENCE CENTER™

SAN ANTONIO

Educating for Quality Improvement & Patient Safety

The Team

- **Division**-CS&E Participants indicated with (*)
 - *Ramin Poursani, MD-Inpatient Service Director
 - *Betty Corona RN, MSN, FNP-BC-Hospitalist Nurse Practitioner
 - *Oralia Bazaldua, PharmD-Family & Community Medicine
 - Rosa Garcia, RPh-University Hospital
 - Brandon Hartman, MSHA-Administrator, F&CM
- **Sponsor Department**
 - Department of Family and Community Medicine
- **Facilitators**
 - Wayne Fisher, PhD
 - Amruta Parekh, MD, MPH



What We Are Trying to Accomplish?

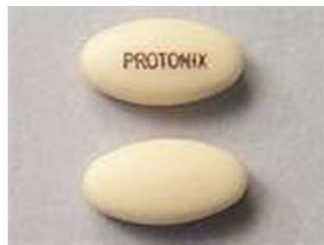
OUR AIM STATEMENT

To decrease inappropriate use of proton pump inhibitors (PPIs) for prophylaxis of upper gastrointestinal tract bleeding in University Hospital family medicine patients by 20% by January 1st 2011.

Project Milestones

- Team Created July 2010
- AIM statement created August 2010
- Weekly Team Meetings August 2010 – January 2011
- Background Data, Brainstorm Sessions, Workflow and Fishbone Analyses August - October 2010
- Interventions Implemented October 13-31 2010
- Data Analysis Nov-Dec 2010
- CS&E Presentation January 20, 2011

Background



- A review of the literature shows increasing concern with overuse of acid suppressive therapy

Overuse of PPI's in hospitalized patients

- Up to 7 of 10 hospitalized patients get acid suppressing drugs (40– 70%)
- 2/3 don't have an indication
- 1/2 of orders are new starts
 - 1/2 of these are continued when patient is discharged

[JAMA 2009;301:2120-28.](#)

Consequences of Overuse for Inpatients

- **Increased risk of pneumonia**
 - there could be one additional case of HAP for every 111 non-ICU patients treated with acid suppressive therapy for at least three days.

[JAMA 2009;301:2120-28](#)

Consequences of Overuse for Inpatients

- **Increased risk of C. difficile infections**
 - PPIs and H₂-blockers increase gastric pH and modify flora in the gastrointestinal (GI) and respiratory tracts.
 - Risk of C. difficile infections is increased by 3-fold
 - Recurrent infection by 4-fold

Am J Gastroenterol 2009;104:S10-S16.

Consequences of Overuse for Outpatients

- **Increased risk of fractures**
 - 1 case for every 1200 patients using PPI x 1yr
- **Increased risk of Community Acquired Pneumonia**
 - 1 case for every 200 patients receiving PPI

Prescriber's Letter 2009;25(7):250720..

Other Consequences

- **Drug interactions**
 - i.e. plavix
- **Decreased absorption of vitamins**
 - B-12, calcium, etc.
- **Increased cost**

Guidelines for Prophylaxis of Nosocomial UGI Bleeding with Proton Pump Inhibitors

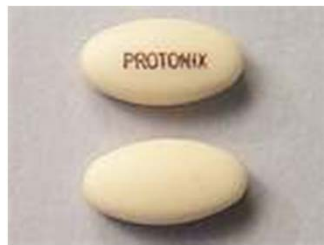
Indicated:

- ICU patients with coagulopathy
- Patients on mechanical ventilation

Consider:

- Patients with history of peptic ulcer disease (particularly if on NSAIDs or antiplatelet)

Background



- The desirable outcome is to avoid adverse effects of PPIs (i.e. CAP, C. difficile colitis, osteoporosis) and decrease costs related to PPI use.

How Will We Know That a Change is an Improvement?

- Types of measures
 - *Chart reviews to determine # of inappropriate PPIs used
- How we will measure
 - *Review charts prior to and after change in guidelines to determine improvement or not.
- Specific targets for change
 - *Medical knowledge of providers (attending physicians and residents)
 - *Discharge process

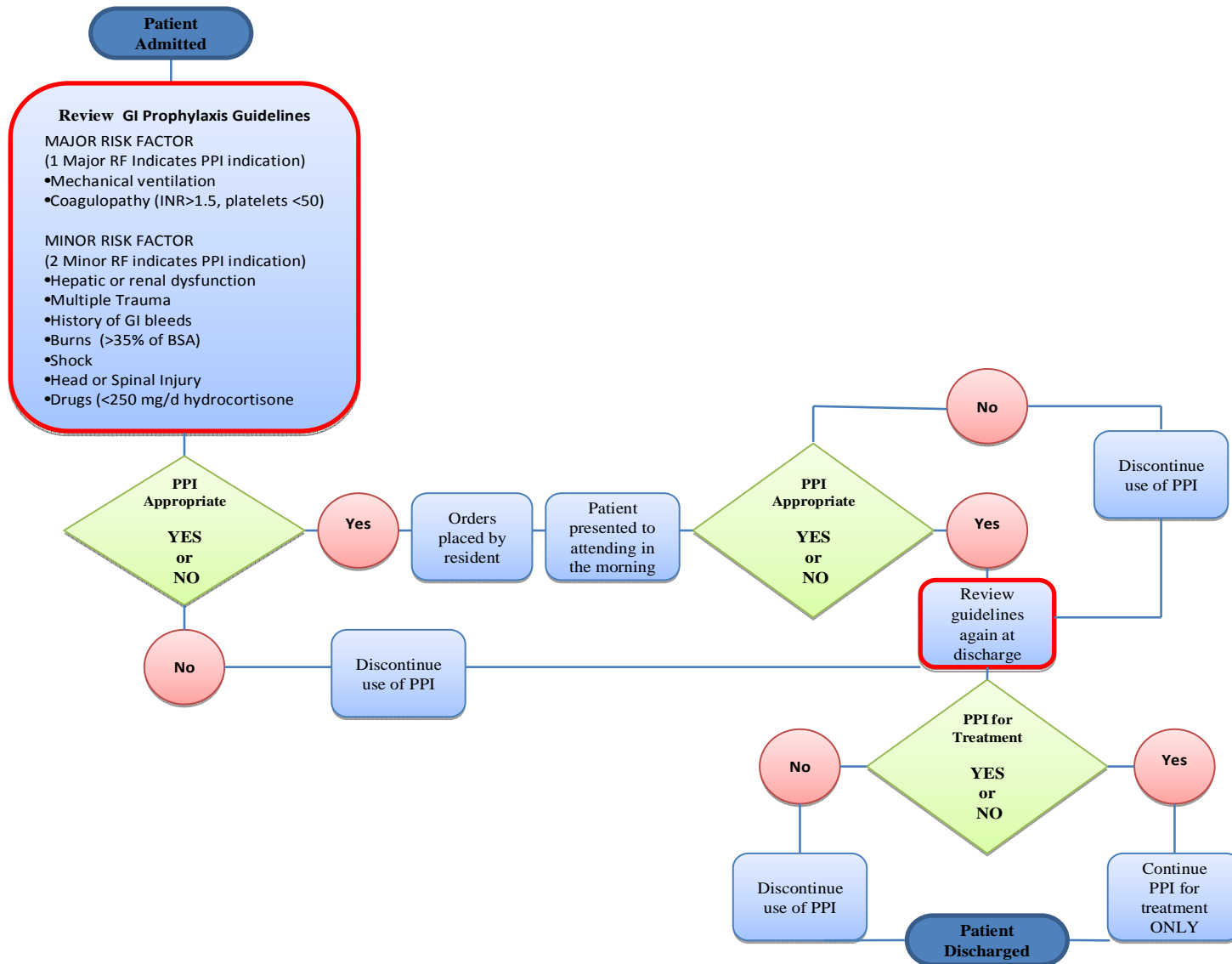
Selected Process Analysis Tools

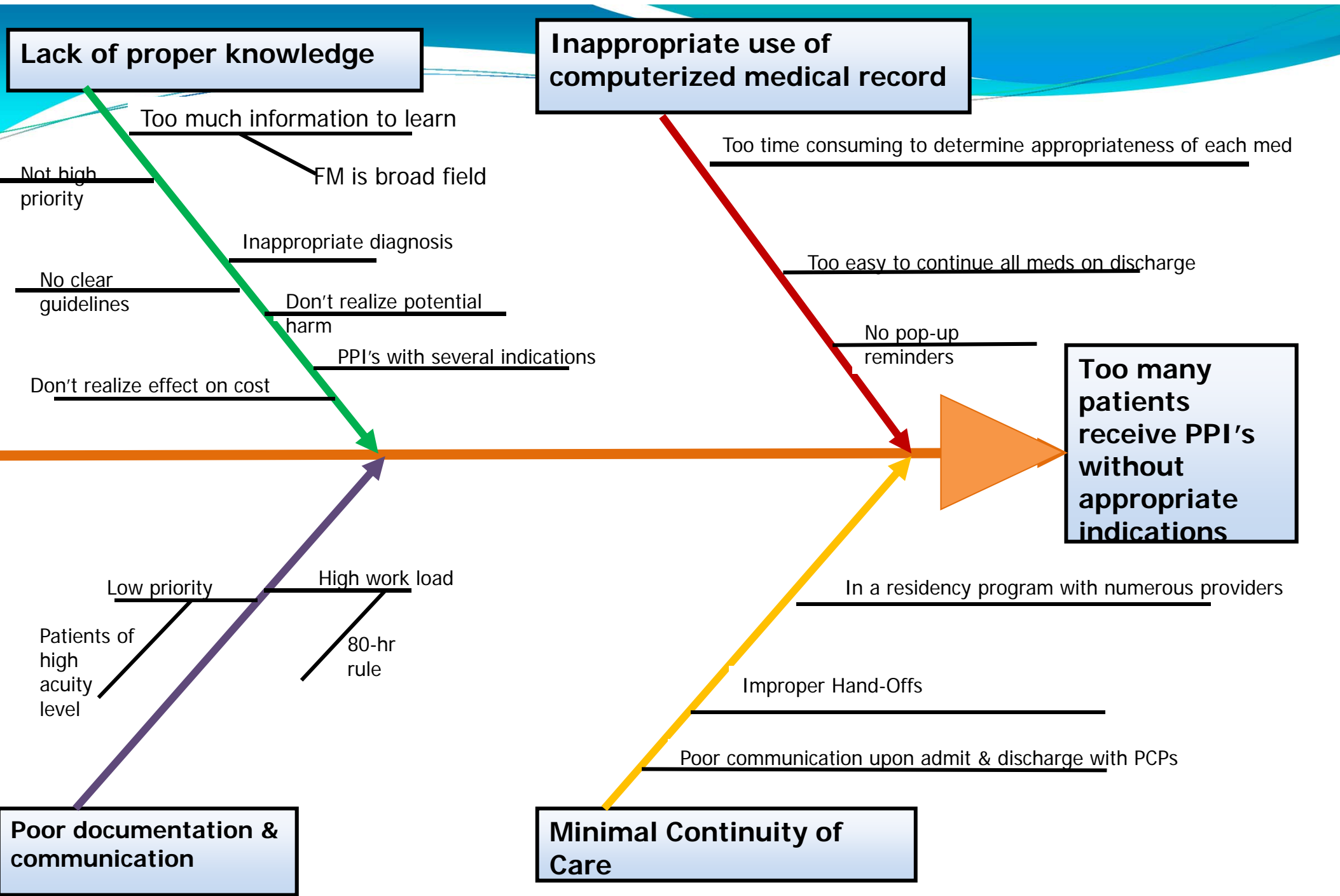
- Brainstorming
- Process Flowchart
- Fishbone
- Chart Review
- Review of existing guidelines

What Changes Can We Make That Will Result in an Improvement?

We will **educate** attending physicians and residents regarding newly implemented guidelines for GI prophylaxis in the hospital setting as well as the risks of inappropriately prescribing PPIs by **routine discussion during rounds, reminder posters, pocket cards and re-evaluation of PPI need on discharge** if currently on PPI in hospital.

Process Flowchart Before Intervention





Previous GI Prophylaxis Guidelines*

Major Risk Factor (1 major RF indicates PPI)

- Mechanical ventilation
- Coagulopathy (INR >1.5, platelets <50)

Minor Risk Factor (2 minor RF indicates PPI)

- Hepatic or renal dysfunction
- Multiple trauma
- History of GI bleeds
- Burns (>35% of BSA)
- Shock
- Head or spinal injury
- Drugs (>250 mg/d hydrocortisone, NSAIDs)

Anderson FA, Spencer FA. Risk Factor for Venous Thromboembolism. *Circulation* 2003; 107:I-9-I-16.

Geerts WH, et al. Prevention of Venous Thromboembolism: 7th ACCP. Conference on Antithrombotic and Thrombolytic Therapy. *Chest* 2004;126:338S-400S.



Implemented Guidelines for GI Prophylaxis in Hospital Setting

- Once-daily oral or enteral PPI is indicated for:
 - Intensive care patients with coagulopathy
 - Patients requiring mechanical ventilation
- Once-daily oral or enteral PPI may be considered for:
 - Patients with history of peptic ulcer disease, (particularly those on NSAID or antiplatelet therapy)

Yachimski PA, Farrell EA, Hunt DP, Reid AE. Proton Pump Inhibitors for Prophylaxis of Nosocomial Upper Gastrointestinal Tract Bleeding. *Archives Internal Medicine*. 2010;170-9:779-783.

Intervention

Plan

Educate attending physicians and residents on appropriate use of PPIs for GI prophylaxis according to new guidelines by **emails, posters** and providing with **pocket cards** with new guidelines as well as implementing a plan to review all PPIs prescribed on discharge from hospital.



Implementing the Change

Do

- October 15, 2010**-Emailed Family Medicine listserv with current guidelines. (Needed to make sure was short and succinct so everyone would read.)
- October 18, 2010**-Posted posters with current guidelines for GI prophylaxis by all computers in Family Medicine call room.
- October 20, 2010**-Provided the residents with pocket cards with current guidelines for GI prophylaxis.

Results/Impact

Check

June 1-July 31, 2010

51 pts with 9 inappropriately prescribed PPIs =17.6%

October 30-December 31, 2010

88 pts with 1 inappropriately prescribed PPI=1.1%

16.5% improvement post-intervention

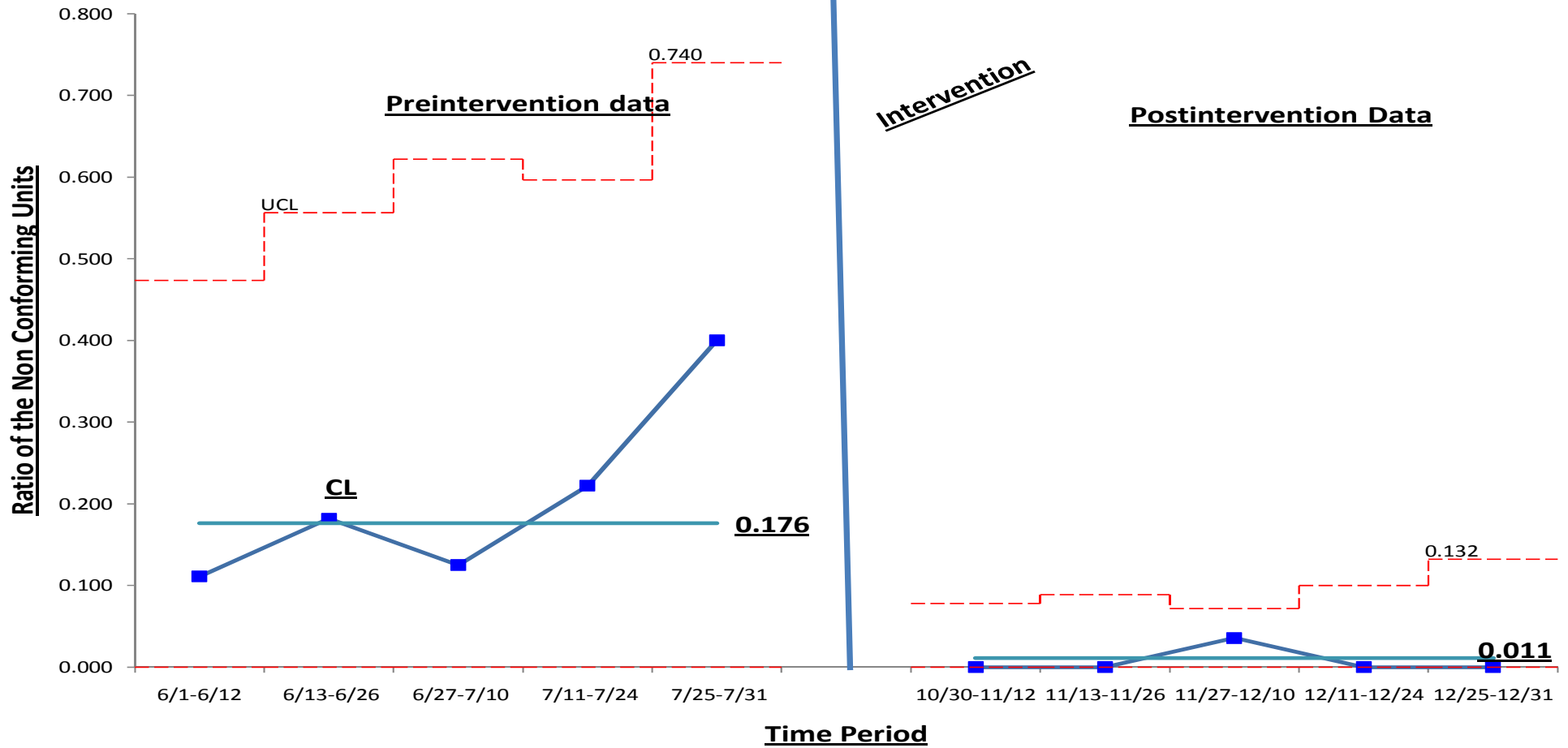
Selected Decision Making Tools

Statistical Process Control Chart

-p Chart

The p Chart allowed us to show percentages of inappropriate PPIs used in the reviewed patient charts.

Preintervention and Postintervention data showing a decrease in the # Nonconforming Units



Expansion of Our Implementation

Act

- Would like to implement throughout University Hospital in hopes of decreasing risks from longterm use.
- Benefit from clinical decision support module in the EMR (Sunrise).



Return

on

Investment

Estimating Just the Cost of PPI

Pre-intervention Cost

29 days of inappropriate PPI use

Protonix cost for tablet $0.21 \times 29 = \$6.09$

Nexium cost for tablet $0.32 \times 29 = \$9.28$

Post-intervention Cost

1 day of inappropriate PPI use

Protonix cost for tablet $0.21 \times 1 = \$0.21$

Nexium cost for tablet $0.32 \times 1 = \$0.32$

Return on Investment

ROI=DIFFICULT TO CALCULATE

Not able to quantify costs for prevention of:

- Pneumonias
- Osteoporosis
- Complications from drug interactions
- C. difficile infections
- Decreased absorption of vitamins/minerals

This prevention would obviously save thousands to hundreds of thousands of dollars.

LESSONS LEARNED

- Data collection is very difficult unless able to utilize an EMR that can easily extract information needed. Because of difficulties with data collection from EMR:
 - analysis was difficult
 - had to be repeated many times to ensure accuracy
 - very time-consuming
 - Aim statement was not appropriate initially because of error in data collection → analysis

Conclusion/What's Next

*Successful in
Decreasing PPI use
in Hospital!!*

Future Benefits:

- Hope to decrease outpatient use of PPIs by decreasing number of inpatients discharged on a PPI resulting in decrease in comorbidities over time.
- Implemented evaluation of discharge medications by FM NP or upper level resident prior to discharge to decrease inappropriate prescriptions for outpatient use of PPIs.

Barriers:

- Difficult to extract data from EMR.
- Establishing EMR decision support system.
- Involving nursing and residents on team due to difficulty finding a time when they could attend meetings.



Thank you!



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