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Implementation and evaluation of a pharmacy driven stress ulcer discontinuation protocol

Michael Genday PharmD

Implementation and Evaluation of a Pharmacy Driven Stress Ulcer Discontinuation Protocol

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The speaker has no actual or potential conflict of interest in relation to this presentation.

Stress Ulceration

Definition

- Ulceration of the upper GI tract related to hospital stay

Prophylaxis

- Acid suppressants
  - Proton-pump Inhibitors (PPI)
  - Histamin-2 Receptor Blockers (H2RA)

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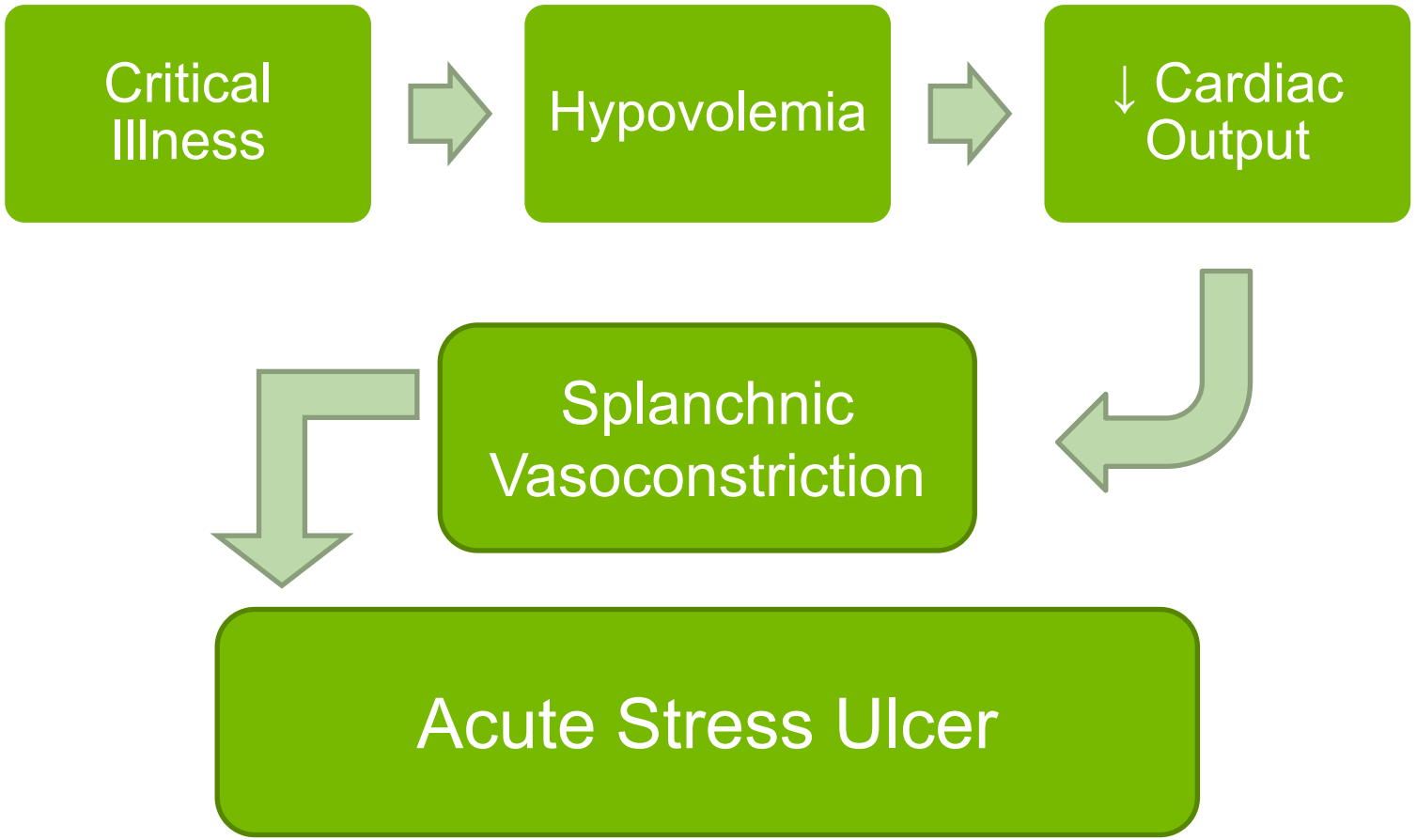
Buendgens L, Bruensing J, Matths M, et al. Administration of proton pump inhibitors in critically ill medical patients is associated with increased risk of developing Clostridium difficile-associated diarrhea. J Crit Care. 2014 Aug;29(4):696.e11-5

Pathophysiology



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Proton Pump Inhibitors

Mechanism

- Irreversibly block H,K-ATPase pump in gastric parietal cells
- Decrease acid production
  - More than H2RA's

Formulary:

- Pantoprazole IV and PO
- Omeprazole PO suspension
- Lansoprazole PO

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Pantoproazole. Lexi-Drugs. Lexicomp. Wolters Kluwer Health, Inc. Riverwoods, IL. Available at: http://online.lexi.com. Accessed March 13, 2018.

Histamine-2 Receptor Blockers

Mechanism

- Competitively and reversibly binding to histamine-2 receptors on gastric parietal cells
- Decrease acid production
  - Less than PPI's

Formulary:

- Famotidine IV and PO
- Ranitidine PO

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Famotidine. Lexi-Drugs. Lexicomp. Wolters Kluwer Health, Inc. Riverwoods, IL. Available at: http://online.lexi.com. Accessed March 13, 2018.

1999 ASHP Guidelines

Major Criteria (1 of the following):

- Mechanical ventilation > 48 hours
- Coagulopathy (Platelet<50, INR>1.5, PTT 2x Baseline)
- TBI (GCS<10)
- Major Trauma
- Spinal Cord Injury
- Use of 2 antiplatelet agents
- Burns
- Partial hepatectomy
- Perioperative solid organ transplant

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ASHP therapeutic guidelines on stress ulcer prophylaxis. Am J Health-Syst Pharm. 1999; 56:347-79.

1999 ASHP Guidelines

Minor Criteria (2 of the following):

- Sepsis
- ICU stay > 7 days
- High dose steroids (>250 mg HCT eq.)

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ASHP therapeutic guidelines on stress ulcer prophylaxis. Am J Health-Syst Pharm. 1999; 56:347-79.

2008 EAST Guidelines

- Level 1-3 recommendations
  - Similar to ASHP
- Continuation until able to tolerate enteral nutrition
  - Level 3 recommendation
- State no difference between H2RA and PPI

Guillamondegui OD, Gunter OL Jr, Bonadies JA, Coates JE, Kurek SJ, De Moya MA, Sing RF, Sori AJ. Practice management guidelines for stress ulcer prophylaxis. Chicago: Eastern Association for the Surgery of Trauma. 2008:1–24.ASHP Commission on Therapeutics.

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Enteral Nutrition

El-Kersh et al (2017)

- RCT
- SUP vs Placebo with EN in mechanically ventilated subjects
- 124 subjects
- GI Bleed: No difference
  - 1.82 vs 2.13; p=0.99
- No difference in:
  - C. Diff

Huang et al (2018)

- Meta Analysis
- SUP vs Placebo with EN
- 7 Studies; 889 Subjects
- GI Bleed: No difference
  - (RR 0.80; 95% CI, 0.49 to 1.31, p = 0.37)
- No difference in:
  - Mortality
  - C. Diff
- Increased risk of hospital pneumonia:
  - (RR 1.53; 95% CI, 1.04 to 2.27; p = 0.03)

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Test Your Knowledge

- Which of the following is the most likely adverse drug reaction related to the use of acid suppression therapy?
  a) Hypotension
  b) Aspiration Pneumonia
  c) Leukocytosis
  d) Venous Thromboembolism

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Test Your Knowledge

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Test Your Knowledge

- Which of the following is a guideline directed indication for stress ulcer prophylaxis?
  a) Mechanical ventilation > 48 hours
  b) Cardiogenic Shock
  c) Adrenal insufficiency
  d) Status epilepticus

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Parkview Health

- Fort Wayne, Indiana
  - 8 hospital health system
  - Study takes place at Parkview Regional Medical Center (PRMC) and Parkview Hospital Randallia (PVR)
- PRMC: 460 beds
  - Medical ICU: 36 Beds
- PVR: 174 beds
  - Medical ICU:12 Beds

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Purpose

To measure the effect a pharmacist driven stress ulcer prophylaxis discontinuation protocol has on acid suppression discontinuation rates in a community hospital.

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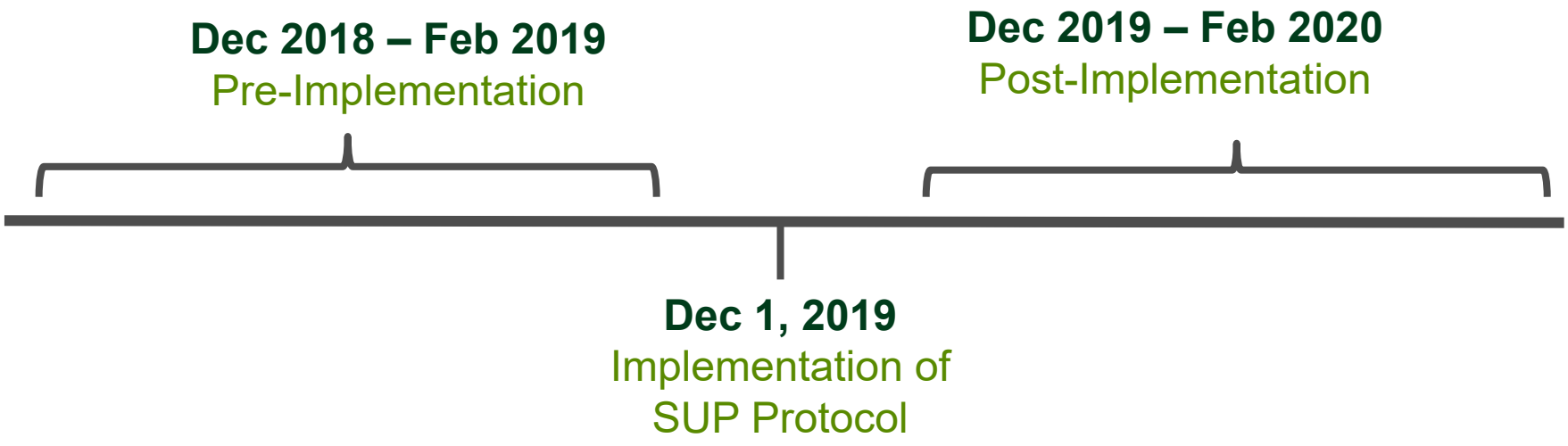
Protocol Timeline



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The Protocol

ON Enteral Nutrition (EN)

- <u>May be discontinued IF:</u>
  - Tolerating EN for 48 hours
    - At least 1 stool, no vomiting
  - Age > 18
  - Not being managed by GI
  - Not on PTA list
  - No other indication

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The Protocol

No Active Nutrition

- May be discontinued if no longer indicated
  - ASHP/EAST Guideline directed indications

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Protocol Process

Identification

Identify SUP that can be stopped

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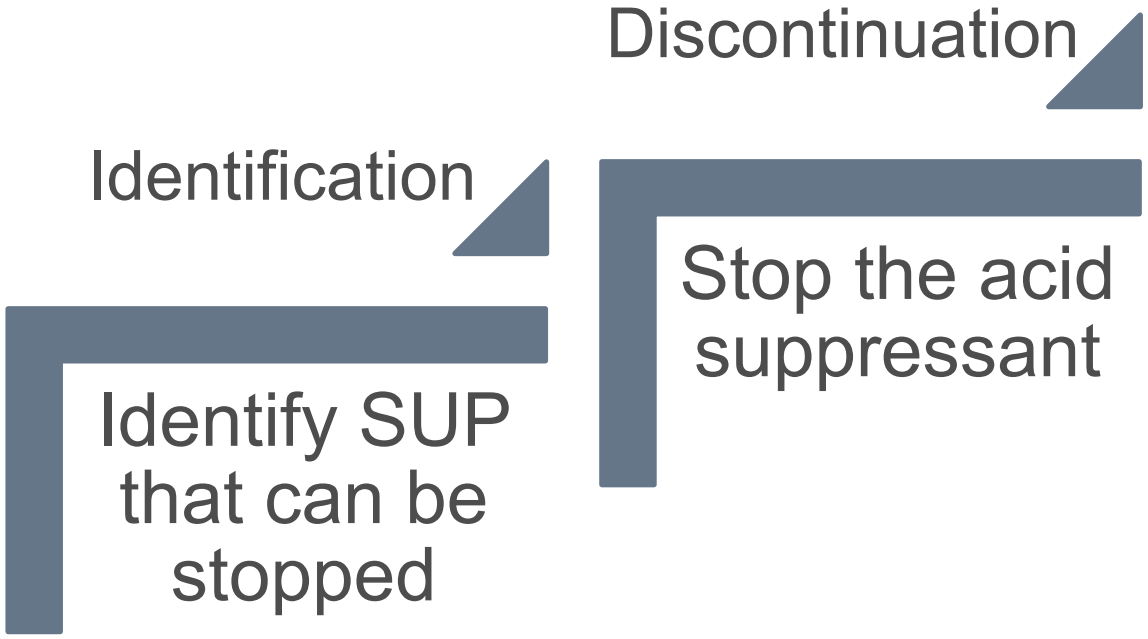
Protocol Process



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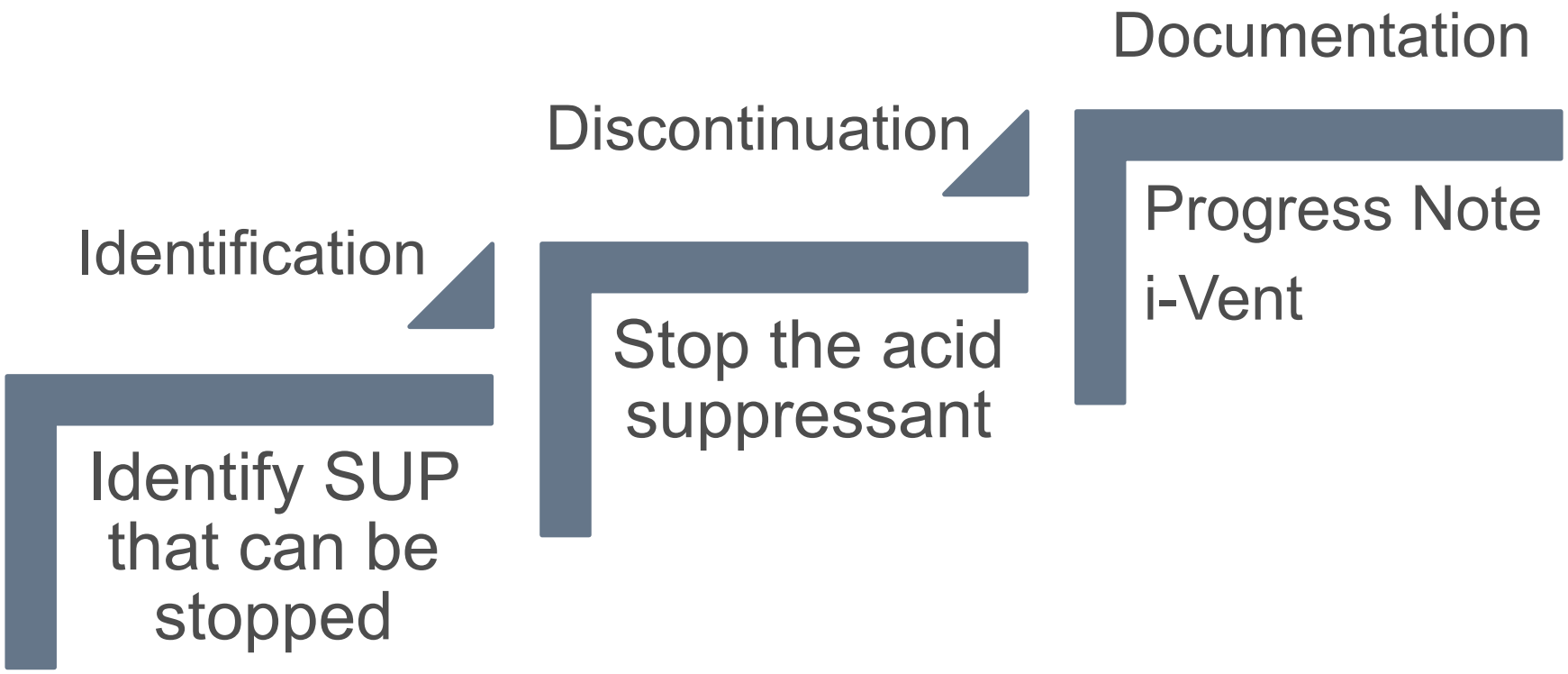
Protocol Process



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Objectives

Primary

Median percent time on SUP in ICU

Secondary

Cost savings from pre to post protocol (3 month)

Median percent time on SUP in hospital

Difference in pharmacy SUP interventions made

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Study Design and Statistical Analysis

Study Design

- Institution Review Board Approved
- Pre-Post Intervention
- Cohort Study

Statistical Analysis

- Primary Outcome
  - T-Test
- Secondary Outcome
  - T-Test

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Inclusion Criteria

- Subjects ≥ 18 years old
- Admitted to Parkview Regional Medical Center or Parkview Randallia Medical ICU
- Receiving ≥ 1 dose of a PPI or H2RA

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Exclusion Criteria

- Taking an acid suppressant prior to admission (PTA)
- Other indication(s)
  - GI Bleed
  - Esophagitis
  - H. Pylori
  - Ulceration
  - GERD
  - Varices

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RESULTS

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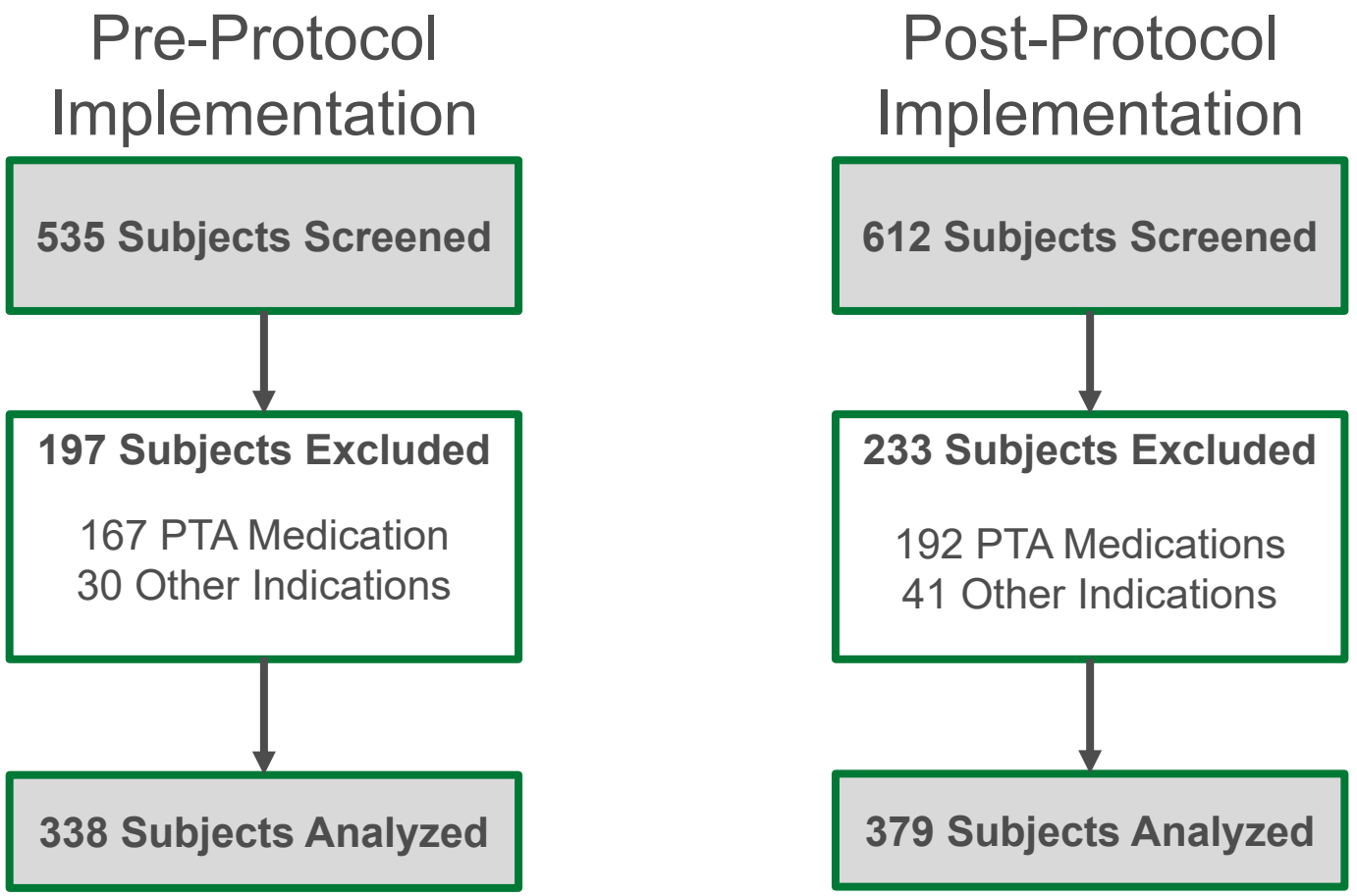
Study Population



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Baseline Characteristics

	Pre-Implementation (n = 338)	Post-Implementation (n = 379)
Gender, male [n (%)]	172 (53)	205 (54)
Age, years [median (IQR)]	63 [52 – 73]	63 [50 – 72]
Weight, kilograms [median (IQR)]	84 [71 – 103]	96 [82 – 112]
ICU Length of Stay [median (IQR)]	2.9 [1.7 – 5.8]	4.5 [2.8 – 7.3]
Hospital Length of Stay [median (IQR)]	7.4 [4.0 – 12.9]	6.2 [3.4 – 10.3]

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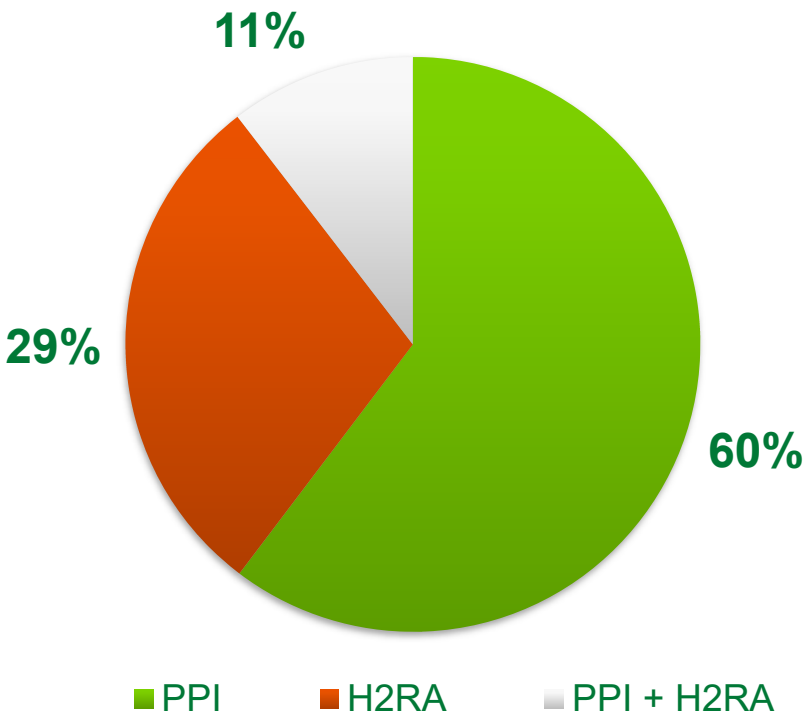
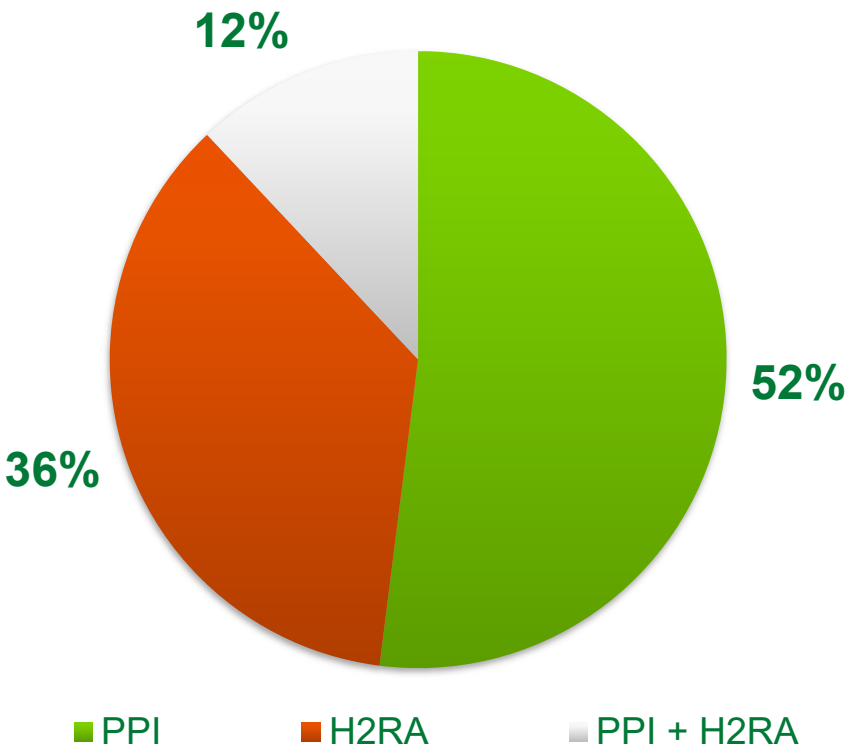
Acid Suppression Rates

Pre-Implementation (n = 383)



Post-Implementation (n = 379)



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Results – Primary Outcome

	Pre-Implementation	Post-Implementation	
	[Median, IQR] (n = 338)	[Median, IQR] (n = 394)	P-Value
Percent Time on SUP in the ICU	67.4	56.1	0.001

SUP = Stress Ulcer Prophylaxis
ICU = Intensive Care Unit

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Results – Secondary Outcome

	Pre-Implementation	Post-Implementation	
	[Median, IQR] (n = 383)	[Median, IQR] (n = 379)	P-Value
Percent Time on SUP in the Hospital	79.7	79.4	0.41
	Total Number	Total Number	Δ
Total Pharmacist Interventions on SUP	129	183	54

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Results – Financial Outcomes

	Pre-Implementation (n = 383)	Post-Implementation (n = 379)	Savings
Cost of Acid Suppression ($)	8,610.49	4,981.38	3,629.11
Projected Annual Cost Savings ($)	14,615.44		

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Discussion

- The addition of a pharmacy driven stress ulcer prophylaxis discontinuation protocol significantly improved discontinuation rates and cost savings.
- Pharmacist presence significantly impacts discontinuation rates.

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Limitations

- Small sample size
- Restrictive timeline
- High prevalence of transfers to floors with reduced pharmacy presence

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Future Direction

- Expanding into other units (STICU, CVICU)
  - Protocol
  - Pharmacist presence
- Long term protocol assessment
  - 1 year +

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- Luke Keller, PharmD, BCPS, BCCCP
- Will Armstrong, PharmD, BCPS
- Sarah Ferrell, PharmD

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