INTEGRATION OF PHARMACY SERVICES IN THE PERIOPERATIVE SETTING: A PROSPECTIVE STUDY

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DISCLOSURES

- IRB status: not required
- Co-Investigators:
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- Conflicts of Interest: None
- Project sponsorship: None

LEARNING OBJECTIVES

1. Identify aspects of the perioperative process in which pharmacy may be involved
2. List strategies to improve patient care in the perioperative setting

BACKGROUND

- SPH is a rural community hospital serving a population of ~90,000
- In 2020, there were a total of 3520 elective surgical procedures
- Elective procedures available at SPH include: orthopedic, urologic, gastrointestinal, gynecologic/obstetric, skin/soft tissue, vascular, endoscopic, and plastic/reconstructive

BACKGROUND

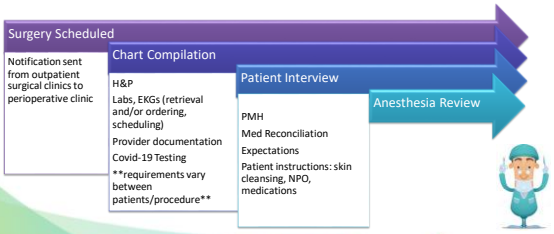
- In 2020, a total of 996 elective procedures were canceled
- 56 were identified as preventable cancellations, resulting in an estimated loss of $840,000 ($15,000/procedure)

Preventable Cause of Cancelation	Number
Medication Administration	4
Cardiac Clearance (EKGs, cardiology consults)	10
Medical Clearance (neurological, diabetes)	25
Lab Values (missing, abnormal)	17
Total	56

BACKGROUND

- Analysis of 2020 surgical cancellations and associated financial impact led to an ongoing restructuring of perioperative clinic
  - Restructured roles of perioperative nursing staff
  - Identified potential role of pharmacist in perioperative process
  - Redesign and relocation of perioperative home

BACKGROUND: PERIOPERATIVE CLINIC PROCESS



BACKGROUND: PERIOPERATIVE CLINIC PROCESS

- Medication instructions per anesthesia protocol:
  - NSAIDs, ASA, anticoagulation: surgeon discretion
  - Medications to hold day of procedure:
    - PO anti-hyperglycemic medications, ACEi, ARBs, diuretics
    - Insulin:
      - ½ daily dose of long-acting insulin
      - 1/3 daily dose of short-acting insulin
      - Insulin Pumps: no change

BACKGROUND: PERIOPERATIVE CLINIC PROCESS

- Medications to continue (hold if stomach upset anticipated)
  - All cardiac and blood pressure except those restricted
  - Steroid, thyroid, hormones, seizure medications, PPI, H2 blockers
  - Pain medications unless otherwise directed
  - All medications for mood control unless otherwise directed
  - All topical medications and inhaler(s)
    - patient to bring inhaler to hospital day of surgery

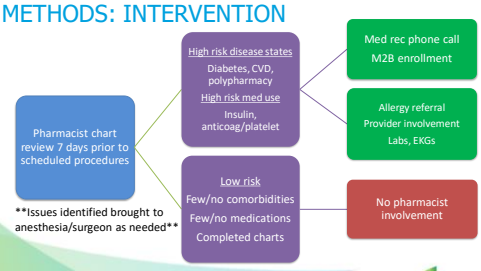
PURPOSE

- Implementation of clinical pharmacist services in the perioperative setting to evaluate impact on surgical cancellations and improved patient care

METHODS

- Single center, prospective study evaluating the impact of pharmacist involvement within the perioperative clinic at a rural hospital
  - Interventional cohort included procedures scheduled from 1/18-3/8/2021
- Inclusion criteria: all patients scheduled for elective procedures
- Exclusion criteria: patients with no perioperative pharmacist contact within study period

METHODS: INTERVENTION



METHODS: INTERVENTION

Pharmacist Phone Call to Patient

- **Medication reconciliation:** insulin regimens, blood glucose logs, consistent medication instructions, antibiotic allergy clarification
- **Meds-2-Beds Pilot**: enrollment and discharge prescription delivery and medication counseling after surgery

- **Allergy Clinic Referral:** cephalosporin allergy testing prior to procedure
- **Labs, EKGs:** ordering, scheduling, follow-up evaluation
- **Provider Contact:** clarification of perioperative instructions with surgeon

OBJECTIVES

- Primary Objective
  - Pharmacist impact on surgical cancellations
- Secondary Objective
  - Pharmacist interventions outside of those that fall under the primary objective
    - Quantity of interventions
    - Type of interventions
  - Provider and staff positive feedback

RESULTS: STUDY SUBJECTS

- For the time period of project implementation, there were 637 surgical procedures

Patients With Pharmacist Involvement (n=279)	
Average Age	57.9 years old, range 1-87
Male	110
Female	169
Average Number of Home Medications	11.3, range 0-42
Average Days of Pharmacy Contact Before Scheduled Procedure	6.5 days, range 2-7
High Risk Disease State or Medication Regimen	183
Reported Cephalosporin Allergy	10

RESULTS: PRIMARY OBJECTIVE

Pharmacist Intervention	Total	Details
Anticoagulation/Antiplatelet Clarification	1	DOAC use: correction to date of last dose
Blood Glucose/A1C	4	• Repeat A1C, ambulatory care referral • U-500 Insulin Dosing • Patient admission for BG management • Insulin pump use
Cardiac Clearance	1	Referral to cardiology for evaluation and clearance
Laboratory values	1	Chronic hypocalcemia, coordination with endocrinologist for management with anesthesia
Other	1	Gout identified during recent ED visit affecting area of operation, referral back to surgeon for evaluation
Total	8	

RESULTS: SECONDARY OBJECTIVES

Intervention	Number	Details
Anticoagulation/Antiplatelet Clarification	17	Medication planning (bridging, antiplatelet use, NSAIDs)
Blood Glucose/A1C	3	A1C, BG during phone interview
Patient labs	23	Missing, abnormal
EKG and Cardiac Clearance	12	Missing, abnormal
Antibiotic Allergy Clarification and Referral	12	B-lactams, 3 referrals
Covid-19 Testing	12	Facilitation of testing
Other	14	Medication counseling, pain medication clarification, rheumatology and immunosuppressive medications
Total	93	

RESULTS: SECONDARY OBJECTIVES

- Meds-2-Beds services expanded to same day joint patients demonstrated a 410% increase in prescription volume compared with same time period in 2020

Period of Evaluation	2020 prescriptions (service not available)	2021 prescriptions
January (1/25-1/31)	6	15
February (2/1-2/28)	39	103
March (3/1-3/31)	0	112
Total	45	230

Prescriptions included are those written by same provider for post-operative purposes filled at SPH outpatient pharmacy in 2020 and 2021

DISCUSSION

- Pharmacist role targeted two key aspects of perioperative process
  - Efficiency
    - Perioperative medication reconciliation
    - Identification of high risk patients requiring further medical evaluation
  - Patient safety and optimizing medication use
    - Consistent medication instructions
    - Antibiotic allergy clarification and referral
    - Meds-2-Beds services

DISCUSSION: INTERPRETATION OF RESULTS

- 279 patients were included for analysis for this pilot study
- 3 procedures of 279 were cancelled
  - Cardiac Clearance
  - Elevated blood glucose day of procedure
  - Elevated Hgb
- There were 8 pharmacist interventions identified as those that prevented a cancellation, an estimated savings of $120,000

DISCUSSION: STRENGTHS AND LIMITATIONS

- Strengths:
  - Support from perioperative staff and providers
  - Cost savings resulting from pharmacist interventions
  - Staff positive feedback and patient safety
- Limitations:
  - Short duration of study
  - Limited preparation time prior to implementation
  - Lack of consistency between anesthesia providers

CONCLUSION

- Pharmacist involvement in the perioperative setting was shown to provide a positive impact on perioperative processes and patient care
- The results of this pilot resulted in approval of a 1.0 FTE pharmacist position within the perioperative setting

FUTURE DIRECTIONS

- Workflow and expansion of services
  - Antibiotic allergies: referral and testing for allergies prior to scheduled procedures
  - Meds-2-Beds services for all elective surgical patients
- Protocol Development:
  - Antibiotic interchange for surgical prophylaxis
  - Pharmacist driven Pre and Post-Operative Glycemic Management
  - Perioperative Medication Use Protocol

FOLLOW-UP

- Future metrics:
  - Surgical cancellations
  - Prescriptions filled as a result of Meds-2-Beds services
  - Post-surgical readmissions
  - Provider and patient satisfaction

QUESTIONS?

Thank you for your time and attention!

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REFERENCES:

- Gourang P, Hyland S, Birrer K, et al. Perioperative clinical pharmacy practice: responsibilities and scope within the surgical care continuum. J Am Coll Clin Pharm. 2020;3:501-519.
- Health care guideline: perioperative. Institute for clinical systems improvement 6th edition. Available at: Perioperative | ICSI. Web. Accessed: January 11, 2021.
- Horner M, Duane T, Ehlers A, et al. American college of surgeons' guidelines for the perioperative management of antithrombotic medication. American college of surgeons. 2018.
- Beltran B, Kato H, Chovanec T, et al. Penicillin allergy and surgical prophylaxis: Cephalosporin cross-reactivity risk in a pediatric tertiary care center. Journal of Pediatric Surgery. 2015; 856-859-50.
- Harmon et al. "The clinical and financial impact of a pharmacist-driven penicillin skin testing program on antimicrobial stewardship practices." Hospital Pharmacy. 2018.
- Shenoy et al. "Evaluation and management of penicillin allergy: a review." JAMA. 2019.
- Blumenthal et al. "Outcomes from an inpatient beta-lactam allergy guideline across a large US health system." Infection Control & Hospital Epidemiology. 2019. Macy et al. "Who needs penicillin allergy testing?" Ann Allergy Asthma Immunol. 2018.
- Macy et al. "Who needs penicillin allergy testing?" Ann Allergy Asthma Immunol. 2018.
- Chen et al. "A proactive approach to penicillin allergy testing in hospitalized patients." 2016.
- Salkind AR, Cuddy PG, Foxworth JW. Is This Patient Allergic to Penicillin?An Evidence-Based Analysis of the Likelihood of Penicillin Allergy. JAMA. 2001.
- Joint Task Force on Practice Parameters representing the American Academy of Allergy, Asthma and Immunology; American College of Allergy, Asthma and Immunology; Joint Council of Allergy, Asthma and Immunology. Drug allergy: an updated practice parameter. Ann Allergy Asthma Immunol. 2010.
- Unger, Nathan, et al. Penicillin Skin Testing: Potential Implications for Antimicrobial Stewardship. Pharmacotherapy 2013.
- Jones BM, Bland CM. Penicillin skin testing as an antimicrobial stewardship initiative. Am J Health Syst Pharm. 2017.