Key Perioperative, Surgical and Administrative Strategies & Challenges

Optimizing the Delivery of Bariatric Care

Same Day Pathway Implementation & Early Experiences

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XXVII IFSO World Congress Melbourne 2024

CONFLICT OF INTEREST DISCLOSURE

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[x] I have no potential conflict of interest to report

Early Discharge + Same Day in Bariatric Surgery

- Bariatric surgery, today, provides the most effective and sustainable weight loss and co-morbidity reduction, compared to pharmacology and lifestyle modification alone.

- Enhanced Recovery protocols have been applied in bariatric surgery to:
  - **standardize post-operative care**
  - **accelerate recovery**
  - **decreases inpatient resources**
  - **increase patient turnover**
  - **shorten waitlists**
  - **maximize program capacities**

Same Day Discharge is a logical evolution of an early discharge initiative but remains in early stages in most North American bariatric programs, **particularly among Canadian Centers of Excellence.**

Same Day Discharge at St. Joseph's Hamilton

- Successful Implementation of an early discharge pathway revealed a subset of patients that were meeting discharge criteria on POD0
- COVID-19 inpatient resource limitations helped us focus on building an ambulatory infrastructure
- Private ambulatory centers in Ontario offering VSG have successfully been discharging patients home the same day.
- Leepalo et al. – reported 398 RYGB undergoing ambulatory surgery demonstrating safety/feasibility over 10yrs, 2.49% complication rate, 3.59% readmission rate
- **Equipped with:**
  - **Stringent selection criteria**
  - **Multi-modal pharmacotherapeutics**
  - **Close follow-up**
  - **Supportive measures in case of complications**

LOS decrease from
2.2 → 1.4 days
No increase in c/o

Operationalizing Same Day Discharge

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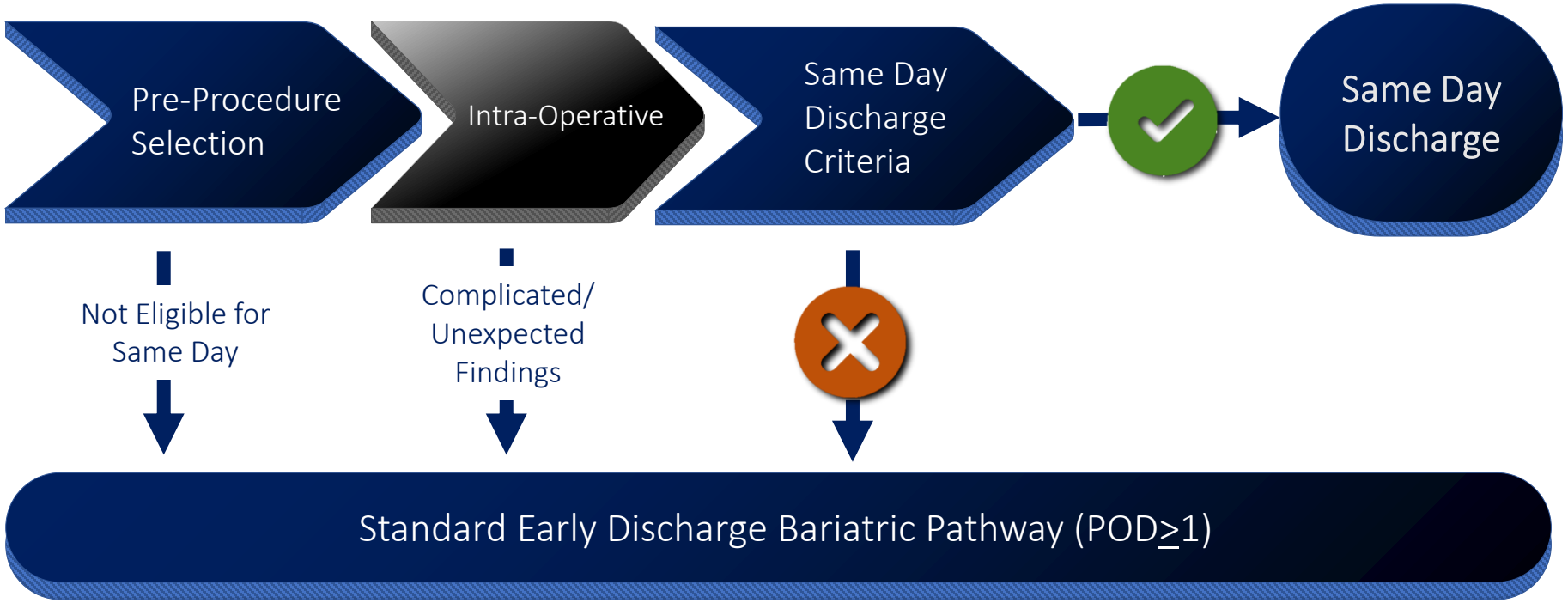
Could we operationalize a Same Day pathway for RYGB?

- **Equipped with:**
  - **Stringent selection criteria**
  - **Multi-modal pharmacotherapeutics**
  - **Close follow-up**
  - **Supportive measures in case of complications**

Same Day: Multi-stage Selection Criteria

A patient must fulfill all pre-op, intra-op and post-op criteria to qualify for SAME DAY discharge



Pre- Procedure Selection Criteria

- Patient is keen on a potential same day discharge
- Patient has good supports (family or friend) in place to care for the patient POD 1-3
- Patient lives within a 1.5-hour drive from SJHC
- Age <55
- Patient does not have significant cardio-respiratory co-morbidities
- If patient has sleep apnea, they are compliant with CPAP use
- Patient is a not an insulin-dependent diabetic
- Patient does not suffer from any major Psychiatric illness or require post-op monitoring of Mental Health associated medications
- Patient does not require extended DVT/PE prophylaxis

- **Patients are identified by pre-op internist and consulting surgeon during pre-op visit and educated about the benefits/risks/options/interest in SDD**

✓ Lower Risk Patients

✓ No Co-Morbidities that require close monitor

Intra- Operative Eligibility Criteria

- Patient is the 1st or 2nd case of the day
- No revisional or conversion procedures
- No additional procedure during operation, including hiatal hernia repairs, removal of Lap-Band, cholecystectomy
- No intra-operative complications occurred
- No drains were placed intra-operatively

Lower Risk Procedure

No unexpected events

Same Day Discharge Eligibility Criteria

- Patient has had no HR >110 BPM since OR
- Patient has been afebrile (T < 38 degrees C) since OR
- Patient has no oxygen requirements
- Patient can tolerate clear fluids with no vomiting and minimal nausea
- Patient's pain can be managed on oral analgesics alone
- Patient has voided independently
- Patient can mobilize independently
- **Patient motivated for home discharge on POD 0**

No compromise on discharge criteria

Same Day Discharge Pathway

Pre-operative

- Consenting surgeon confirms patient's candidacy for SDD with patient based on recommendations from Internal Medicine pre-op
- Surgeon reviews pre-op, intra-op and post-op pathway for patient and answers questions
- Surgeon confirms patient is interested/motivated for SDD
- Patient delivered **Aprepitant 80mg PO 2hrs prior to OR**
- Upon induction, patient administered **15mg/kg single bolus dose of TRANEXAMIC ACID (up to 2g)**

Intra-operative

- Bilateral Transversus Abdominis Plane (TAP) Blocks
  - **performed by surgeon via laparoscopic approach**
  - 0.25% bupivacaine + epinephrine – 20mL injected on each side using 18-21 gauge spinal needle at appropriate dermatomal sites, lateral to ports.
  - Operating team leaves note in EMR that patient either does not or continues to meet criteria for SDD based on Intraoperative Eligibility Criteria

Same Day Pathway Highlights

Pre-operative

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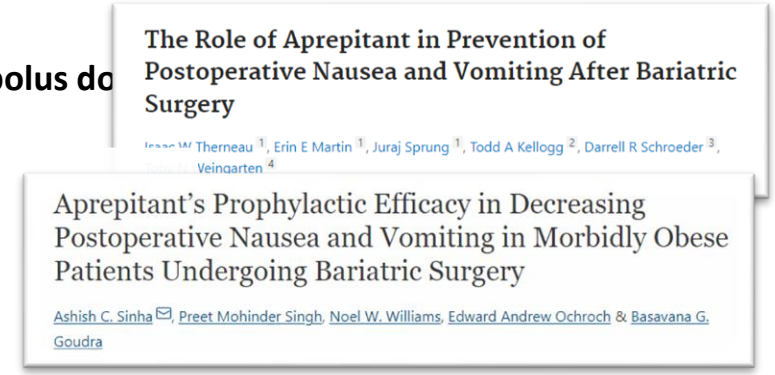
- **Anti-emetic, NK1 receptor inhibitor**
- **Augments anti-emetic activity of 5HT3 receptor agonists and corticosteroids**
- **Proven effective particularly when combined with other anti-emetic regiments**
- **T1/2: 9-13hrs, S/E: fatigue**


The Role of Aprepitant in Prevention of Postoperative Nausea and Vomiting After Bariatric Surgery

Isaac W Therneau [1], Erin E Martin [1], Juraj Sprung [1], Todd A Kellogg [2], Darrell R Schroeder [3], Veingarten [4]

Aprepitant's Prophylactic Efficacy in Decreasing Postoperative Nausea and Vomiting in Morbidly Obese Patients Undergoing Bariatric Surgery

Ashish C. Sinha, Preet Mohinder Singh, Noel W. Williams, Edward Andrew Ochroch & Basavana G. Goudra

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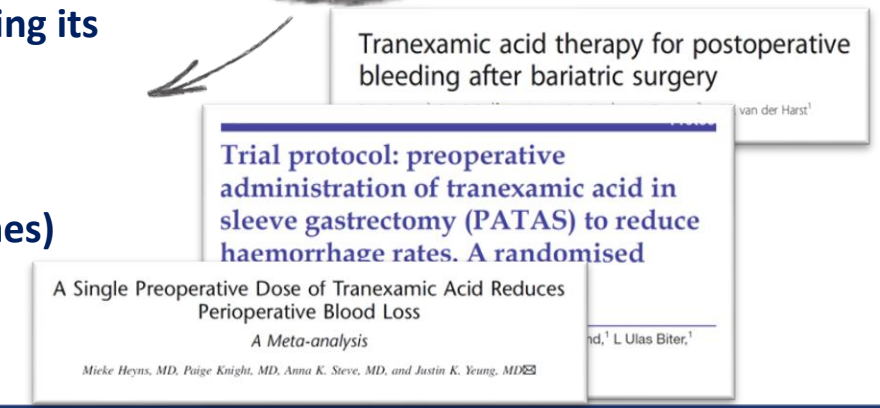
- **Competitively binds to plasminogen slowing its conversion to plasmin – maintaining the FIBRIN CLOT**
- **No universal standard on dosing /timing**
- **Considered 15mg/kg – 10-20mg/kg (Heynes)**
- **1.5mg PATAS double blind trial**



Post-operative

- Start clear fluids POD #0 when patient can tolerate
  - No straws, no carbonated beverages
  - Can consider protein shakes if patient tolerates clears
- Encourage POD #0 early mobilization
- Weight adjusted Tinzaparin DVT prophylaxis
- Acetaminophen - Tablet 975mg PO *or* Liquid 960mg PO QID x 72hrs, then PRN
- Celecoxib 200mg PO BID x 48hrs
  - **Contraindicated for chronic kidney disease, GFR < 60**
- Ice packs/Heating Pad – apply to incisions for 10-20mins q2H PRN while awake for POD#0-2
- *Breakthrough pain:*
  - Moderate-to-severe:
    - Dilaudid liquid 1-2mg PO Q4h PRN for moderate to severe pain.
      - If pain score from 5 or above, please give 1mg.
      - If insufficient response within 30 mins please administer additional 1mg.
    - Dilaudid 0.5-1mg IV q3h PRN for severe pain *or* when patient NPO x 24hrs
      - For pain score 8 and above, give 0.5mg.
      - If insufficient response within 10 mins, give additional 0.5mg.
- Ondansetron 4mg IV TID x 24hrs, then TID PRN
- Dimenhydrinate 25-50mg PO/IV q4hrs PRN
- Lansoprazole FasTabs BID for all patients
- Prescriptions as per individual surgeon/team

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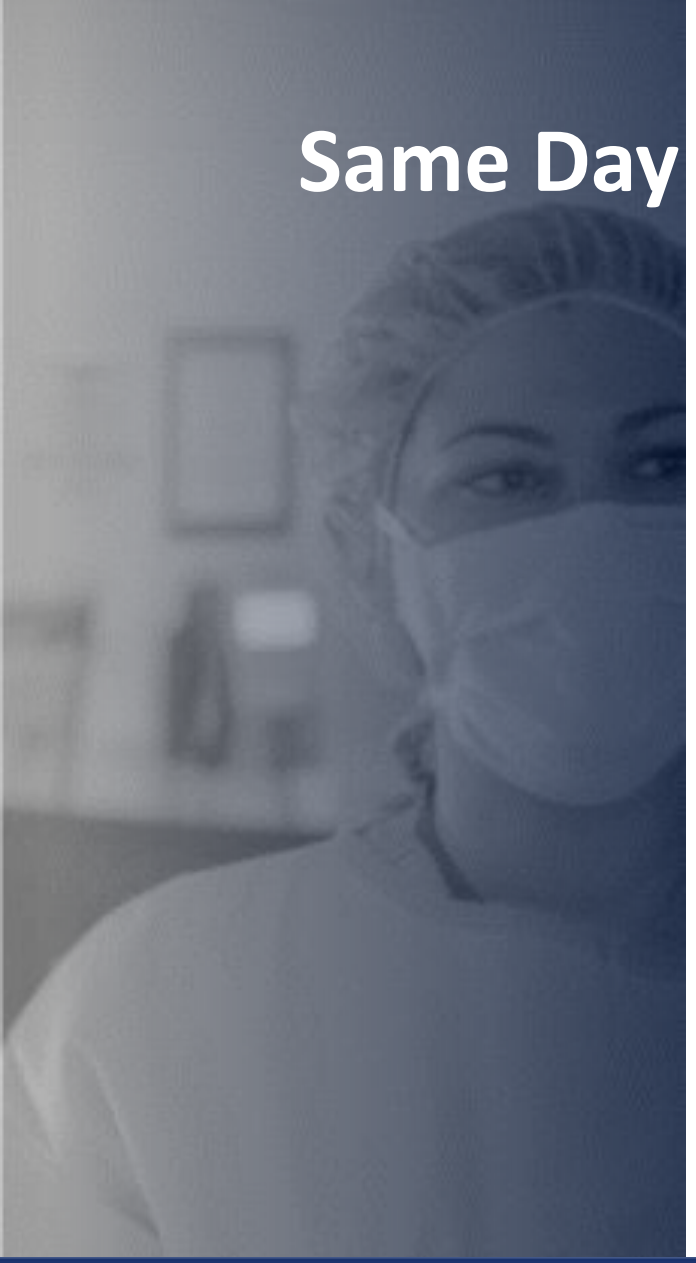
Our strategy

- **"Rational opioid" vs. Opioid free strategy**
- **Opioids remain potent analgesics**
- **Offered more prescriptive guidance to nursing on analgesia management**
- **We avoided gabapentinoids – issues with over-sedation, no reversal agent, limited evidence**



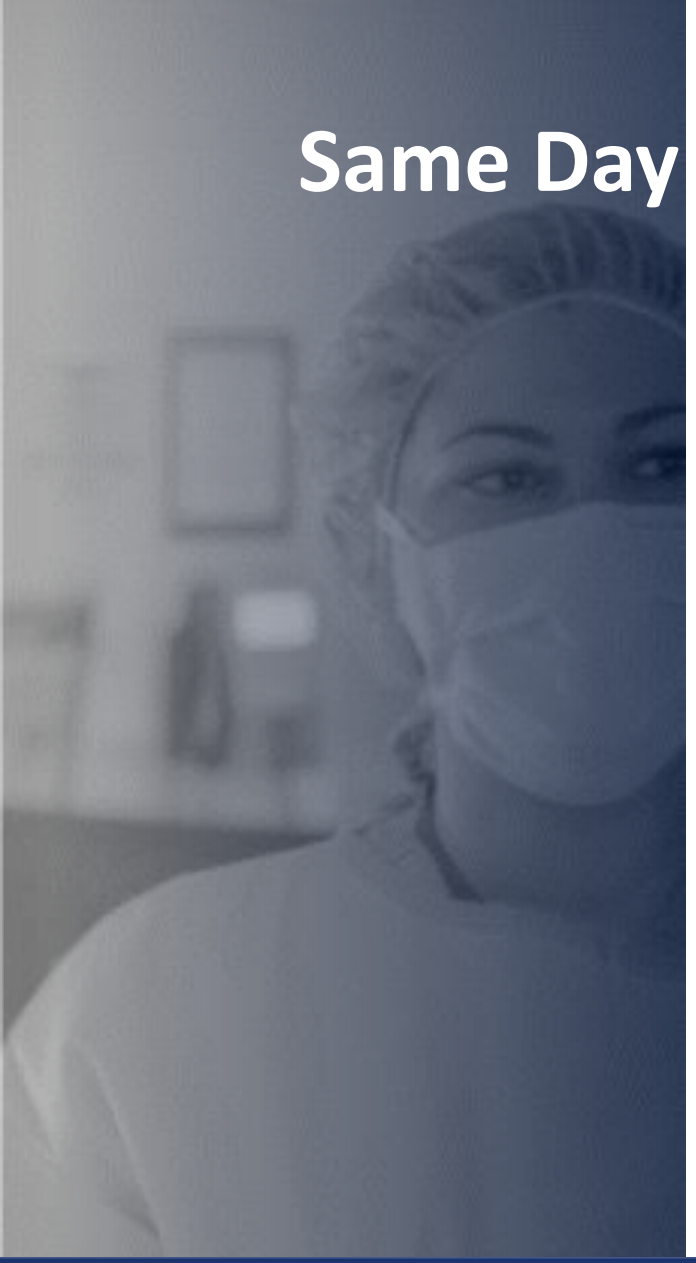
Same Day Discharge Pathway Post-operative

- **Patient educated by nursing** about SDD pathway and signs/symptoms that should prompt return to hospital upon discharge
- Patient education reinforced by Faculty or Bariatrics Fellow
- Patient assessed by Faculty or Bariatrics Fellow and Nurse to determine whether they meet **Discharge eligibility**
  - No Oxygen requirements
  - Tolerating oral fluids
  - Pain controlled
  - Mobilizing appropriately
  - Patient and family are motivated for SDD

Discharge Prescriptions

- **Tylenol 1000mg Liquid or Tablet PO QID x 3 days**
- **Hydromorphone Liquid 1mg q6hrs PO PRN x 8 doses**
- **Celebrex 200mg PO BID x 3 days**
- **Ondansetron 4mg PO TID x 3 days**
- **Lansoprazole Fast tabs 30mg BID x 3months or**

Rabeprazole EC 20mg tab BID x 3months



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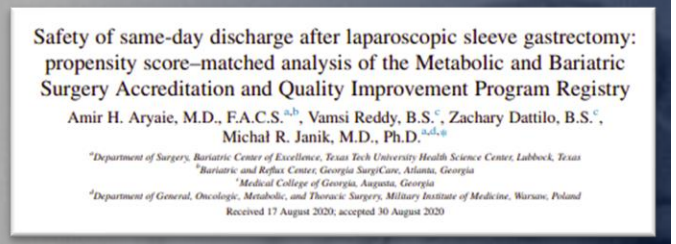
Same Day : Acknowledging the Risk of Readmission



Safety of same-day discharge after laparoscopic sleeve gastrectomy: propensity score–matched analysis of the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program Registry

Amir H. Aryaie, M.D., F.A.C.S.[a,b], Vamsi Reddy, B.S.[c], Zachary Dattilo, B.S.[c], Michał R. Janik, M.D., Ph.D.[a,d,e]

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[b]Bariatric and Reflux Center, Georgia SurgiCare, Atlanta, Georgia
[c]Medical College of Georgia, Augusta, Georgia
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Received 17 August 2020; accepted 30 August 2020

- **30 day ED visits rate 4.08% (5.65%)**
- **30 day readmit rate 3.35% (2.79%)**
- **Most common causes:**
  - **Nausea/vomiting**
  - **Fluid/electrolyte depletion**

Same-day discharge on laparoscopic Roux-en-Y gastric bypass patients: an outcomes review

Maykong C. Leepalao[1,2] · Daniela Arredondo[1] · Fredne Speights[1] · Titus D. Duncan[1]

Received: 11 April 2019 / Accepted: 17 September 2019 / Published online: 24 September 2019

- **398 patients from 2008 - 2018**
- **Readmission rate: 3.59% n=13**
- **Most common causes:**
  - **Anastomotic leak**
  - **Nausea/vomiting**

Leak rate ~1%, Bleed rate ~1%, Readmit rate 3-4%,
Timely management is critical
Could we create a suitable safety net for patients?

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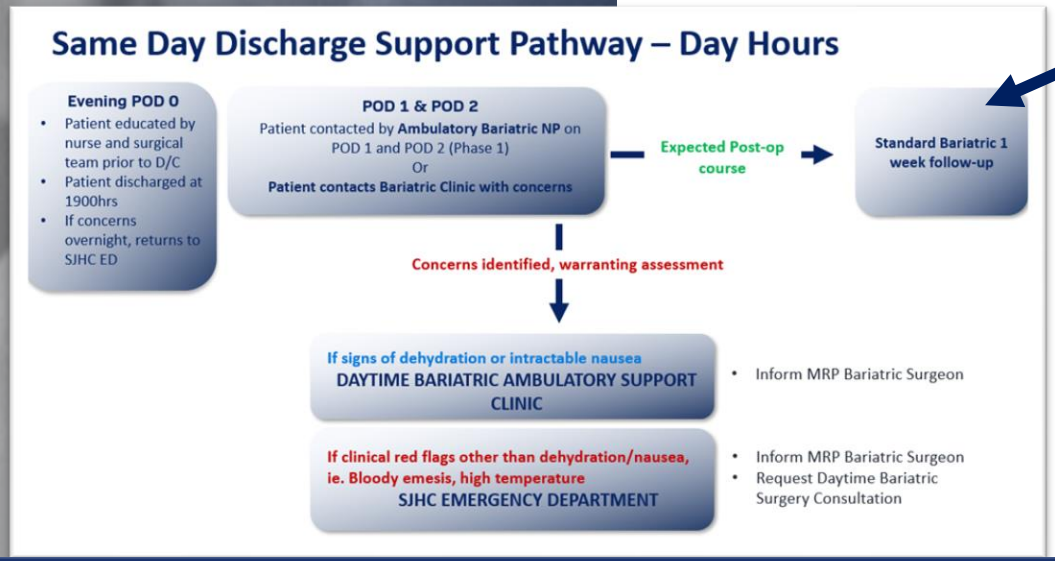

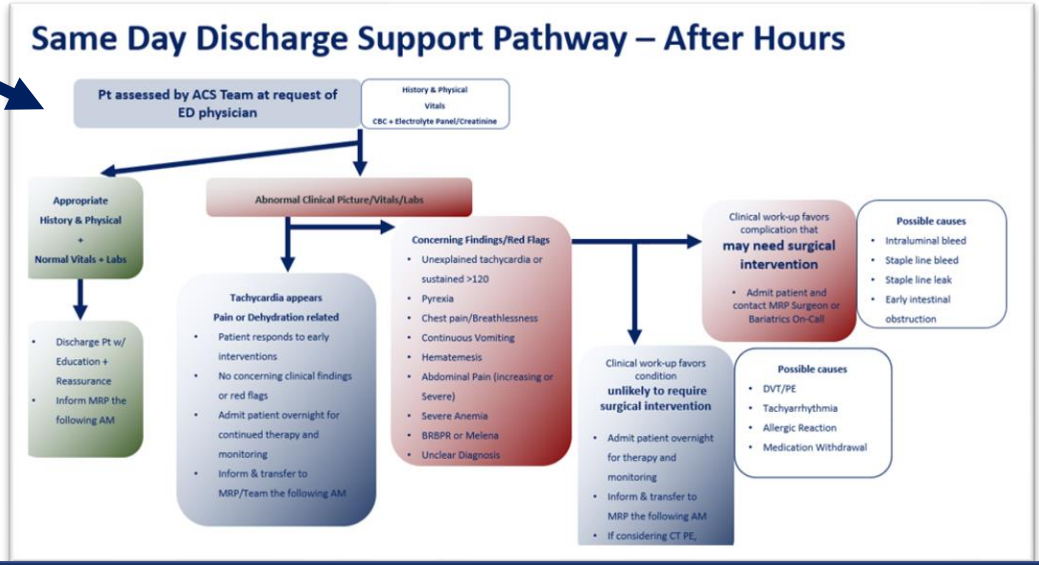

“ In God we trust. All others bring data.”

- Dr. Edward R. Fisher

Same Day Discharge Outcomes: Patient Selection

Pre-operative Characteristics	All Bariatric surgery patients (Jan-Apr 2021)	Patients Selected for Same Day Discharge	p-value	Same Day Discharge	≥ POD1 Discharge	p-value
N	127	36	-	20	16	-
Age; mean (range)	42.5 (20–74)	37.6 (22–52)	**0.008**	36.0 (22–58)	38.3 (24–56)	0.507
Female	107 (84.3%)	33 (91.7%)	0.261	18 (90.0%)	15 (93.8%)	0.686
BMI; mean (range)	44.9 (35–67)	44.5 (36–55)	0.687	44.2 (36–53)	44.9 (37–55)	0.677
Distance from Hamilton, ON (km); mean (range)		31.2 (0–138.6)	-	36.3 (0–138.6)	24.9 (0–84.2)	0.337
Comorbidities						
Hypertension	38 (29.9%)	4 (11.1%)	**0.023**	3 (15.0%)	1 (6.3%)	0.416
Diabetes Mellitus	26 (20.5%)	1 (2.8%)	**0.012**	1 (5.0%)	0 (0.0%)	0.371
Obstructive Sleep Apnea	40 (31.5%)	8 (22.2%)	0.281	4 (20.0%)	4 (25.0%)	0.724
GERD	45 (35.4%)	14 (38.9%)	0.701	7 (35.0%)	7 (43.8%)	0.596
Other		9 (25.0%)	-	6 (30.0%)	3 (18.8%)	0.447
History of Psychiatric Illness	68 (53.5%)	15 (41.7%)	0.213	10 (50.0%)	5 (31.3%)	0.265
Anxiety		12 (33.3%)	-	8 (40.0%)	4 (25.0%)	0.350
Depression		4 (11.1%)	-	4 (20.0%)	0	0.061
Borderline Personality Disorder		2 (5.6%)	-	2 (10.0%)	0	0.199
PTSD		1 (2.8%)	-	0	1 (6.3%)	0.262

Same Day Discharge Outcomes: Intra-Op

Intra-operative Patient Characteristics	Same Day Discharge	POD1 Discharge	p-value
N	20	16	-
Operative Time (min); mean (range)	79.9 (55–111)	85.7 (59–133)	0.368
Estimated total blood loss (mL)	23.8 (0–200)	29.7 (0–150)	0.716
Lysis of Adhesions (LOA)	1 (5.0%)	0 (0.0%)	0.371
Hiatal Hernia Repair	0 (0.0%)	1 (6.3%)	0.262
Intraoperative Endoscopy	0 (0.0%)	0 (0.0%)	1.000
Bilateral TAP	20 (100.0%)	16 (100.0%)	1.000
# of Patients that Received 80mg Pre-operative Aprepitant	20 (100.0%)	16 (100.0%)	1.000
# of Patients that Received Weight based Sugammadex	6 (30.0%)	0 (0.0%)	**0.018**
# of Patients that Received 2g Tranexamic acid at induction	9 (45.0%)	9 (56.3%)	0.506
Time Out of OR to Time of Discharge (min)	529.6 (310–810)	>1 day	

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5 – 13 hours post sx.
Mean: 8h 48 mins

Same Day Discharge Outcomes: Intra-Op

Efficacy and Safety of Sugammadex versus Neostigmine in Reversing Neuromuscular Blockade in Morbidly Obese Adult Patients: A Systematic Review and Meta-Analysis

Yamini Subramani,[1] Jill Querney,[1] Susan He,[2] Mahesh Nagappa,[1] Homer Yang,[1] and Ashraf Fayad[1]

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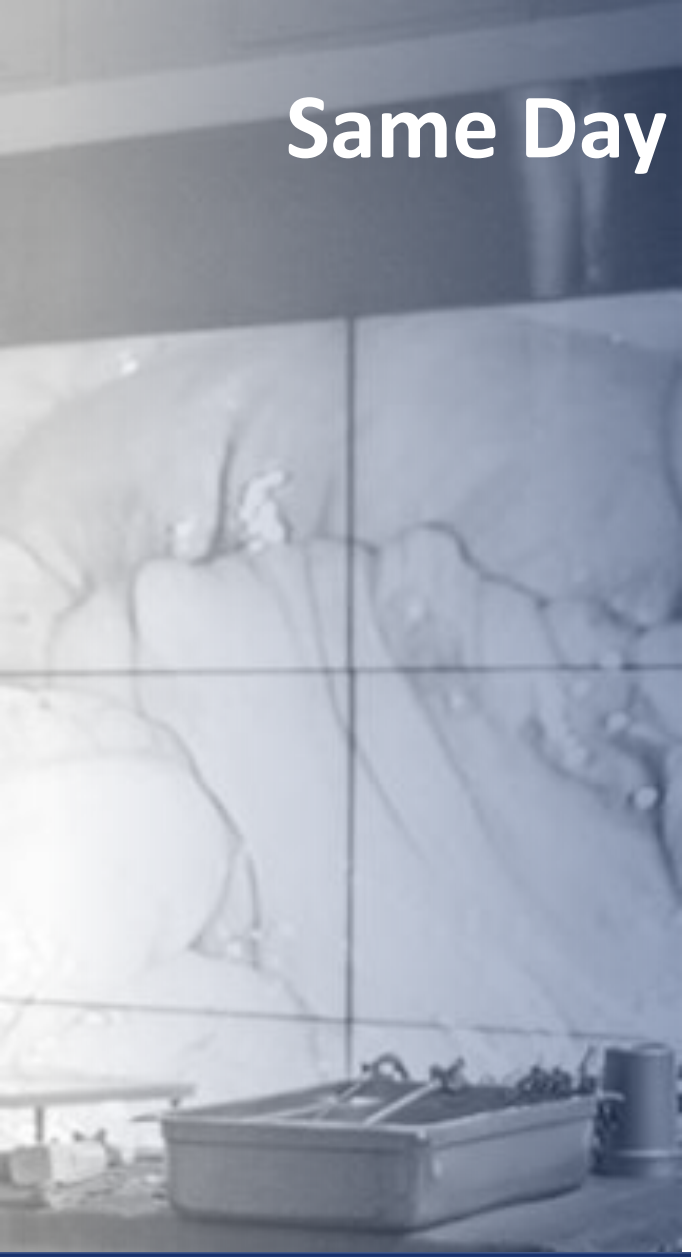
- Encapsulates ND NMB to facilitate immediate reversal vs. Neostigmine
- Sugammadex faster in reversal for bariatric patients vs. Neostigmine
- Associated with shorter time of PACU discharge
- Known to be associated with reduced post-op pain, PONV, bradycardia, oxygen requirements, early recovery

Same Day Discharge Outcomes: Post Surgery Rx.

In-Hospital Pharmacotherapy	Same Day Discharge		≥POD1 Discharge		
	# of Patients that Received Rx	Rx. Dosing	# of Patients that Received Rx.	Rx. Dosing	p-value
Total Dose of POD0 Hydromorphone (mg, represented as IV equivalent))	20 (100.0%)	1.94 (0.9–3.8)	16 (100.0%)	2.39 (0.4–5)	0.184
IV Intraoperative HM (mg)	19 (95.0%)	0.69 (0–1.8)	12 (75.0%)	0.53 (0–1.4)	0.314
IV PACU HM (mg)	12 (60.0%)	0.49 (0–2)	14 (87.5%)	0.58 (0–1.2)	0.576
IV Ward HM (mg)	10 (50.0%)	0.47 (0–2)	13 (81.3%)	1.16 (0–4)	**0.022**
Oral Ward HM (mg; represented as IV equivalent)	8 (40.0%)	0.29 (0–1.2)	3 (18.8%)	0.08 (0–1)	0.061
Subcutaneous Ward HM (mg; represented as IV equivalent)	0	0	1 (6.3%)	0.05 (0–0.8)	0.270
Total Dose of POD0 Ondansetron (mg)	20 (100.0%)	7.8 (4–12)	16 (100.0%)	11.6 (6–12)	**<0.001**
Intraoperative (mg)	18 (90.0%)	3.6 (0–4)	16 (100.0%)	4 (4–4)	0.203
PACU (mg)	0 (0.0%)	0	1 (6.3%)	0.13 (0–2)	0.251
Ward (mg)	20 (100.0%)	4.2 (4–8)	15 (93.8%)	7.5 (0–8)	**<0.001**
Total Dose of POD0 Dexamethasone (mg)	4 (20.0%)	2 (0–16)	9 (56.3%)	2 (0–8)	1.000
Intraoperative (mg)	4 (20.0%)	1.6 (0–8)	5 (31.3%)	2 (0–8)	0.718
PACU (mg)	1 (5.0%)	0.4 (0–8)	0 (0.0%)	0	0.379
Total Dose of POD0 Haloperidol (mg)	12 (60.0%)	0.46 (0–1)	11 (68.8%)	0.66 (0–1.5)	0.231
Intraoperative (mg)	7 (35.0%)	0.26 (0–1)	9 (56.3%)	0.38 (0–1)	0.377
PACU (mg)	3 (15.0%)	0.2 (0–1)	5 (31.3%)	0.28 (0–1)	0.564
Total Dose of Ward POD0 Metronidazole (mg)	4 (20.0%)	12.5 (0–100)	6 (37.5%)	17.2 (0–50)	0.592
Total POD0 IV fluids administered (mL)	20 (100.0%)	1826 (1000–2988)	16 (100.0%)	2135 (889–3366)	0.093
Intraoperative (mL)	18 (90.0%)	880 (400–2000)	15 (93.8%)	910 (60–2300)	0.610
PACU (mL)	19 (95.0%)	372 (4–1532)	13 (81.3%)	223 (13–1193)	0.316
Ward (mL)	18 (90.0%)	603 (276–1166)	16 (100.0%)	1044 (711–1723)	**<0.001**
Total Blood Loss (mL)	-	23.8 (0–200)	-	29.7 (0–150)	0.716
Net Intraoperative Volume (mL)	-	774 (-50–2000)	-	880 (0–2300)	0.551

- ?Overmedicated or ≥POD1 pts have higher pain/nausea?
- ? Contributes to ileus, urinary retention?



Same Day Discharge: 30 Day Outcomes

30-day Outcomes	Same Day Discharge	≥ POD1 Discharge	p-value
N	20	16	-
30-day Emergency Department Visits	1 (5.0%)	1 (6.25%)	0.873
30-day Readmissions	0 (0%)	1 (6.25%)	0.264
30-day Complications	0 (0%)	0 (0%)	1.000

- **POD 0 GROUP**
  - Patient A – discharged POD0, experienced left sided pain on POD3, negative x-rays in ED, **no pathology found and subsequently discharged** from SJHC ED
- **POD ≥1 GROUP**
  - Patient B – discharged POD1 after experiencing abdominal fullness and upper GI discomfort, presented to ED POD2, **CT abdomen negative and discharge from SJHC ED**
  - Patient C - discharged POD1 after experiencing anxiety related to same day discharge, presented to ED POD3, admitted with **normal CT and discharged by General Surgery the following morning**

- All after-hours visits
- No outside hospital presentations

Same Day Discharge Outcomes: Reasons for ≥POD1 D/C

Reasons for Extended Hospitalization	≥ POD1 Discharge
N	16
Abnormal Vitals[a]	1 (6.3%)
Residual post-operative pain	5 (31.3%)
Nausea	1 (6.3%)
Urinary Retention	3 (18.8%)
Abnormal Blood Work[b]	1 (6.3%)
Intraoperative event[c]	1 (6.3%)
Patient Anxiety/Apprehension	2 (12.5%)
Inadequate PO Intake	2 (12.5%)

a - patient described post-operative palpitations, PACs and sinus arrhythmia with variable rate not no concerning features, followed by Internal Medicine. Troponins negative. Discharged on POD2

b- patient developed non-specific rash in PACU, blood work drawn demonstrated leukocytosis, septic work-up negative and patient discharged the following day

c - intraoperative splenic injury requiring Surgicel(C) – surgeon requested patient be monitored overnight

Note: some patients are represented multiple times as they experienced more than one issue contributing to their ≥POD1 discharge

Extracting Insights & Key Learnings

Perioperative

Surgical

Administrative

Perioperative, Surgical and Administrative Strategies

Perioperative

- Consent appt – patient expectation management CENTRAL to success
- Alignment among all caregivers, anesthesia, surgeons, nurses, trainees
  - Multiple education lunch&learns to ensure understanding of eligibility + care pathways

- Stringent patient selection proved effective
- Pre-operative multi-modal analgesia
- Pre-operative anti-nausea pre-medication (applied for Aprepitant on formulary)

Perioperative, Surgical and Administrative Strategies

Surgical

- Group bariatrics practice – attempts made at unification of standardized intra-operative
- Variability persists with comfort with SDD, TXA, post operative analgesics (NSAIDs)
- Variability persists with anesthesia during OR – narcotics, anti-nauseants, Sugammadex
- Opioid conscious analgesia proved effective, minimized adding new medications,, but change in drug delivery and use of multi-modals has decreased overall dose+freq. of administrations

Perioperative, Surgical and Administrative Strategies

Administrative

- Strong initial opposition encountered from ACS surgeons, until clear pathways for readmission established
- Regular educational lunch&learns for nursing and trainees has proved successful to reinforce program eligibility, D/C criteria
- Ward/Bed issues – due to resource limitations, day ward lost in time, resulting in patients coming to primary nor ambulatory ward, cost benefit somewhat lost when bariatric beds have been already earmarked for patients that may require overnight stay – need a dedicated ambulatory suite
- Program is resource intensive wrt post-operative follow-up, dependent on fellows/nurse practitioners

Same Day: Onwards & Upwards

Summary

- Introduction of a same day program for Bariatric surgery at SJHC has proved feasible through
  - ***Stringent patient selection***
  - ***Multi-modal pharmacotherapeutics***
  - ***Close follow-up***
  - ***Supportive measures in case of complications***
- Our current SDD patient volumes are too small to assess safety and burden on ACS/ED
- Aprepitant, TXA and Sugammadex have proven to be key Rx. interventions

- Careful consideration of perioperative, surgical and administrative factors is required to ensure safety, quality assurance and program success

Thank you

Perioperative, Surgical and Administrative Strategies

Perioperative	Surgical	Administrative
Patient Education	Intra-Op Standardization	Staff Education
Premedication	Opioid Conscious Analgesia	QI Studies & Analyses
Multi-modal Analgesia		Patient Care Protocols