Whipple Care Pathway

PREOPERATIVE

Patient Education/Prehabilitation

Do not delay surgery > 4 weeks in order to achieve the below:
-Surgery goal/expectation setting
-Tobacco cessation
-Nutrition assessment and counseling
-Functional status and exercise guidance
-Cardiopulmonary testing[1] as indicated
-Social work evaluation/screening if available (examples: PROMIS 10, PHQ-2, PHQ-9, SF-12)
-Education: home medications, incentive spirometer, pain management
-Consider weight loss counseling for BMI > 35 in elective non-cancer cases.[1]
-Prehabilitation program when available

Preoperative Planning

-Anticipate discharge needs/care coordination
-Consult for patients on anti-coagulation to establish plan for peri-op anticoagulation[1]
-Schedule post-hospital visit. For cancer patients, coordinate with oncology[1]
-Imaging: CT with contrast or MRI with contrast within 60 days before surgery
-Tumor board/multidisciplinary discussion for cancer patients

Labs

-COMP
-Pre-albumin
-CBC with differential
-INR
-PTT
-Type and Screen
-HbA1c for all patients
-Tumor markers as appropriate

Glycemic Control

-If HbA1C ≥ 6.5%: Consult to endocrinology or primary care for management for glycemic control
-If HbA1C ≥ 8% or glucose >250 mg/dL: Consult to endocrinology or primary care for management for glycemic control AND consider alternative surgery date if appropriate

IMMEDIATE PREOP

Shower

-Shower with soap or antiseptic agent on at least the night before surgery
-Provide product and clear instruction

Carbohydrate Loading

-Consider carb loading in all[1] patients
Examples: white grape juice, apple juice, clearfast, maltodextrin, Gatorade, Impact

Reduced Fasting

-Clear liquids up until 2 hours prior to surgery

Glycemic Control

-Check baseline glucose level on all patients in pre-op if not done in preop appointment

Prevention of PONV

-Screen all patients for PONV risk
-Administer antiemetic regimen based risk assessment score: Dexamethasone 4-8mg IV after induction, Ondansetron 4mg IV at end of surgery; diphenhydramine
-Risk Assessment Example:
4 Primary Risk Factors: Female; Non-smoker; History or motion sickness; previous PONV; Expected administration of postoperative opioids.
Score 1 for each applicable risk factor
0-1 risk factors: Ondansetron 4mg 15min prior to end of case
2 risk factors: Choose one or two agents listed below
3 risk factors: Choose one or two agents listed below
4 risk factors: Apply Scopolamine patch at least 2 hours before induction, Administer Dexamethasone 4-8mg IV after induction, Ondansetron 4mg IV at end of surgery; diphenhydramine

Multimodal Analgesia

-Administer ≥ 2 non-opioid analgesia strategies

Examples:
-epidural for those at risk for narcotic dependency[1]
-Regional (TAP/QL block)
-Acetaminophen
-Gabapentin
-Celebrex
-Review pain management plan before anesthesia induction

Appropriate IV Prophylactic Antibiotics

-Administer 15 to 60 minutes before incision
-MSQC Recommendation:
Cefazolin 2 g IV; 3 g if ≥ 120 kg + Metronidazole 500 mg
OR Cefoxitin 2 g
OR Ceftriaxone/Flagyl or Cipro/Flagyl
-PCN allergy: Conduct thorough review of reported reaction to evaluate if alternative regimen necessary. Consider allergy testing to confirm.
-See ASHP guidelines in MSQC resources for other acceptable antibiotic regimens and beta-lactam alternatives

INTRAOP

VTE Prophylaxis

-Within 2 hours before surgery:
-Heparin 5000 units OR Lovenox 40
-Place SCD's

Alcohol-based Skin Preparation

-Use alcohol-based prep unless contraindicated

Normothermia

-Maintain core body temperature of 96.8°F (36°C)
-Apply forced air warming
-Consider use of fluid warmer if duration of surgery is >4 hours, or expected blood loss is >500 ml, or expected fluid infusion is >3 liters[1]

Lung Protective Ventilation

-For patients with normal pulmonary function undergoing general anesthesia with endotracheal intubation, administer increased Fio2 during surgery and after extubation in the immediate postoperative period.
-To optimize tissue oxygen delivery, maintain perioperative normothermia and adequate volume replacement

Glycemic Control

-DM: Check glucose every 1-2 hours
-NDM: Consider at discretion of preop glucose/HbA1c
-Goal <180 mg/dL
-Treat with subcutaneous rapid acting insulin or IV insulin infusion

Euvolemia

-Avoid excess fluid administration. Discuss restrictive fluid strategy/goal-directed fluid therapy with anesthesia (< 10 ml/kg/hr) 2
-Use balanced chloride-restricted crystalloid solution
-Minimize blood transfusion. Intraoperative transfusion only after discussion between anesthetic and surgical staff. If agreed, and unless there is major hemorrhage, transfuse 1 unit and assess. Target hemoglobin > 7 g/dL1

Multimodal Analgesia

-Administer ≥2 non-opioid analgesia strategies
Examples:
-IV Lidocaine
-Wound infiltration with long-acting anesthetic at surgical site
-IV Ofirmev (acetaminophen) if not given preop
-Regional (TAP/QL block) if not done preop
-Ketamine
-Ketorolac at end of case

Redosing of Antibiotics

-Cefazolin: 4 hour interval
-Metronidazole: If operative time >8 hours consider redosing

Drains

-Foley
-For PJ (pancreaticojejunostomy), pull NG by POD 1

POSTOP

Normothermia in PACU

-Maintain temperature >96.8°F (36°C) in PACU
-Utilize forced air warmer PRN

Labs

-COMP
-CBC

Incentive Spirometer

-Use 10x/hour while awake
-Wean supplemental O2 to SPO2 > 92%

Minimize IV Fluids

-Minimize and discontinue fluids early as possible

Early Ambulation

-Ambulation starting on POD 1
-ambulate at least 3 times a day
-HOB at 30 degrees at all times

Early Foley Removal

-Remove Foley on or before POD 2 in all patients without voiding difficulty
-Bladder scan if not voiding spontaneously p 6 hours. Straight cath x 2 for urinary retention > reinsert Foley and follow-up with Urology for male patients[1]

Early Alimentation[1]

-Gum chewing POD 0
-Ice chips/sips < 8oz in 8hrs
-Goal: Regular diet by POD 3

Multimodal Analgesia

-Use narcotic analgesics only if needed
-Administer ≥ 2 non-opioid analgesia strategies

Examples:
-Acetaminophen
-Gabapentin
-Ketorolac
-Ibuprofen
-IV Lidocaine

Glycemic Control

-Goal: <180 mg/dL
NDM patients with normoglycemia before or during surgery:
-Check glucose on morning of POD1 before meal to monitor for stress-induced hyperglycemia
NDM patients with elevated glucose before or during surgery:
-Check glucose for 24-48 hours until at or below target goal
-If elevated, IV insulin while NPO and basal-bolus insulin regimen once resuming oral nutrition. Consult endocrinology or medicine for diabetic management.
DM patients:
-Standard glucose monitoring, Q6h
-IV insulin while NPO and basal-bolus insulin regimen once oral nutrition resumed. Consult endocrinology or medicine for diabetic management.

Medications

-Perioperative PPI scheduled
-Diuretics as indicated
-Home meds- Resume when indicated
-Consider pancreatic enzymes supplements when indicated

VTE Prophylaxis

-Heparin 5000 units subcutaneous TID or Lovenox 40 QD
-Lovenox for 28 days for cancer patients
-SCDs while in bed

Discontinue Prophylactic IV Antibiotics

-Prophylaxis is typically not warranted past surgery end time (possible exception – biliary stents).
-If continued, duration should be no more than 24 hours past surgery end time unless otherwise indicated.

Op Report Dictation:

Be sure to document:
-Pancreatic duct size in mm
-Pancreas texture - hard/soft
-Vascular reconstruction- venous/arterial/both
-Presence of biliary stent
-Neoadjuvant treatment

Patient Education

-Diet, dehydration
-Discharge planning
-Encourage clinic contact vs. ED presentation- provide with clinic phone number

Discharge Criteria

(1) Tolerating diet without nausea or has nutritional plan
(2) Pain controlled with oral meds only

POST-DISCHARGE

Contact Patient within 2 business days

-Make postop phone call to patients within 2 days of discharge

Clinic Visit within 2-6 weeks

-Clinic visit within 2-6 weeks of discharge, consider earlier visit
-Oncology within 12 weeks when indicated
-Utilize telemedicine or postop clinic for early follow up visit

Resources

-Pancreatic ERAS protocol- Cleveland Clinic [1]

-ASHP Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery (2013). https://www.ashp.org/-/media/assets/policy-guidelines/docs/therapeutic-guidelines/therapeutic-guidelines-antimicrobial-prophylaxis-surgery.ashx?la=en&hash=A15B4714417A51A03E5BDCAC150B94EAF899D49B

-Association Between Preoperative Hemoglobin A1c Levels, Postoperative Hyperglycemia, and Readmissions Following Gastrointestinal Surgery (2017). https://jamanetwork.com/journals/jamasurgery/fullarticle/2645761

-Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection (2017). https://jamanetwork.com/journals/jamasurgery/fullarticle/2623725

-Intraoperative Fluid Resuscitation Strategies in Pancreatectomy: Results from 38 Hospitals in Michigan. (2016). https://www.ncbi.nlm.nih.gov/pubmed/27116681 [2]

-Michigan Opioid Prescribing and Engagement Network (2019). https://opioidprescribing.info/

-Perioperative temperature management (2019). https://www.uptodate.com/contents/perioperative-temperature-management

-Postoperative Nausea and Vomiting (2019). https://www.uptodate.com/contents/postoperative-nausea-and-vomiting