Enhanced Recovery After Surgery

In The Ambulatory Surgical Center

JoAnne Higgins, MS, CRNA
United Anesthesia Services, PC

Patient Checklist

Day of Surgery:

- Take your medications as instructed by your surgical team.
- If you have diabetes, hold your oral diabetes medication and take ½ your insulin dose.
- If you have any questions regarding your medications, please contact your surgeon's office.
- You may take pain medications as instructed before surgery.
- Use Bactoshield CHG 4% Body Wash prior to coming to the hospital.
- Bring your CPAP machine to hospital (if you use one)
- ***Drink a 20 oz. non-red Gatorade or Powerade. This drink must be finished 1 hour before your arrival to the hospital.***
- ***May sip clear liquids up to 1 hour before your arrival to the hospital.***
- ***Bring your pack of gum to the hospital, if provided by your surgeon's office.***

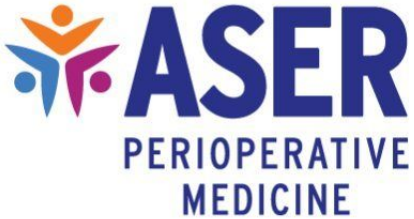
What????!!!

What about ASPIRATION???

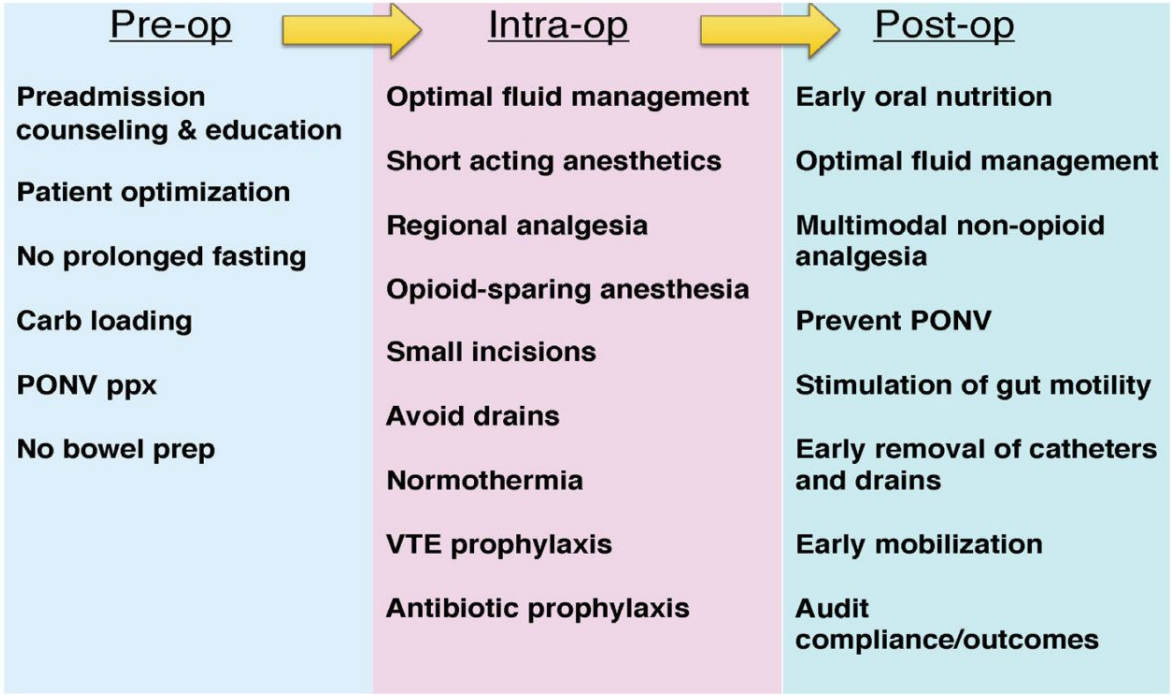
Enhanced Recovery After Surgery (ERAS)

- multimodal
- evidence-based
- applied to the conventional perioperative techniques
- reduce postoperative complications
- achieve early recovery
- require a dedicated and organized team effort
- enable early discharge


ERAS® Society


ASER
PERIOPERATIVE
MEDICINE

Enhanced Recovery After Surgery (ERAS)

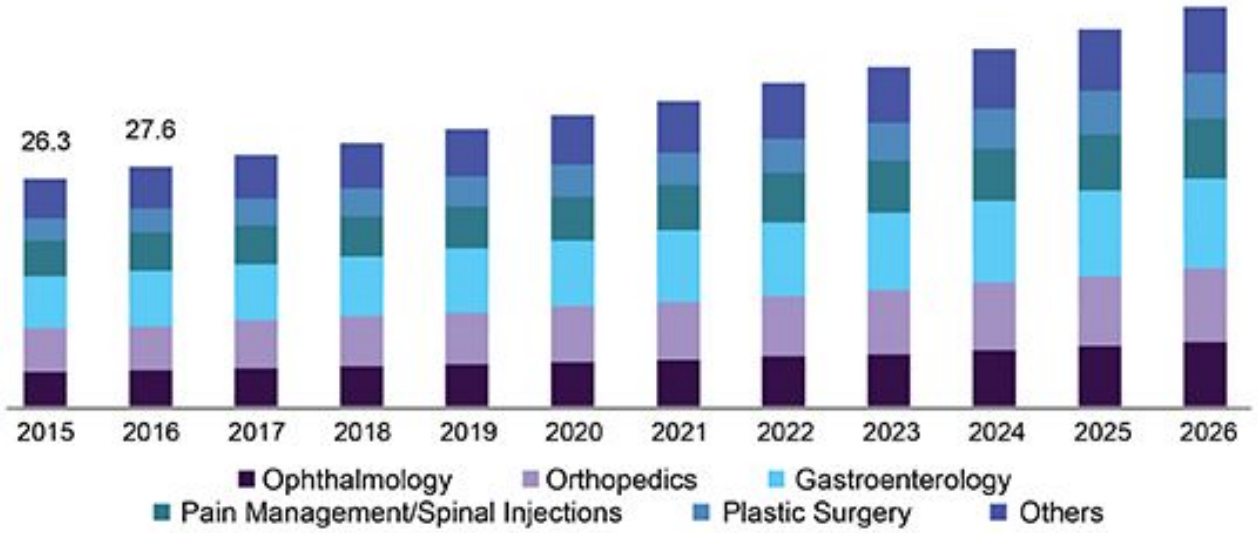


Elements of Enhanced Recovery After Surgery

Source: Jeanette Amery, MSN, RN, AGACNP-BC. Used with permission.


New Britain
SURGERY CENTER

U.S. ambulatory surgery center market size, by application, 2015 - 2026 (USD Billion)



Source: www.grandviewresearch.com

Pre- op

Preadmission counseling & education

Patient optimization

No prolonged fasting

Carb loading

PONV ppx

Pre-Admission Counseling and Education

It is the recommendation of the AANA that all patients should receive preoperative counseling by in-person class or Multimedia content. The content should include:

- Fulfill all prescriptions (e.g., bowel prep, antibiotics)
- Meeting with ERAS Coordinator, Surgeon and Anesthesia, and provide contact information for questions
- Obtain/review H&P as per center policy
- Complete an Optimization/Risk Stratification through the H&P to identify optimization needs such as deep breathing exercises, smoking cessation 4 weeks prior to surgery, alcohol abstinence 4 weeks prior to surgery and addressing anemia – FIVe therapy (Folate, Iron, Vitamin B12 and Vitamin C, and/or erythropoietin)
- Telephone interview: interview consisting of anesthesia interview and reviewing ER packet, Enhanced recovery education and patient/caregiver expectations

Enhanced Recovery At A Glance
Audit Compliance
Visit us at AANA.com
The AANA thanks Joshua Newman, MSN, CRNA, Kara Douglas, MS, BSN, CRNA, Desiree Chappel, MS

Pre-Admission Counseling and Education (cont'd)

- Fasting guidelines and CHO beverage information
- Incentive spirometer demo
- Prescriptions for such as Emend and Scopolamine patch if high risk
- PONV Risk Assessment
- Nutritional optimization – Consider PONS score for nutritional screening
- Prehabilitation – Consider frailty assessment score
- For diabetics, consider endocrinology consult
- For chronic pain patients, consider O-NET screening
- Recommend setting expectations early and educating patient
- Consider showering with Chlorohex day before

Enhanced Recovery At A Glance
Audit Compliance
Visit us at AANA.com
The AANA thanks Joshua Newman, MSN, CRNA, Kara Douglas, MS, BSN, CRNA, Desiree Chappel, MS

Patient Optimization

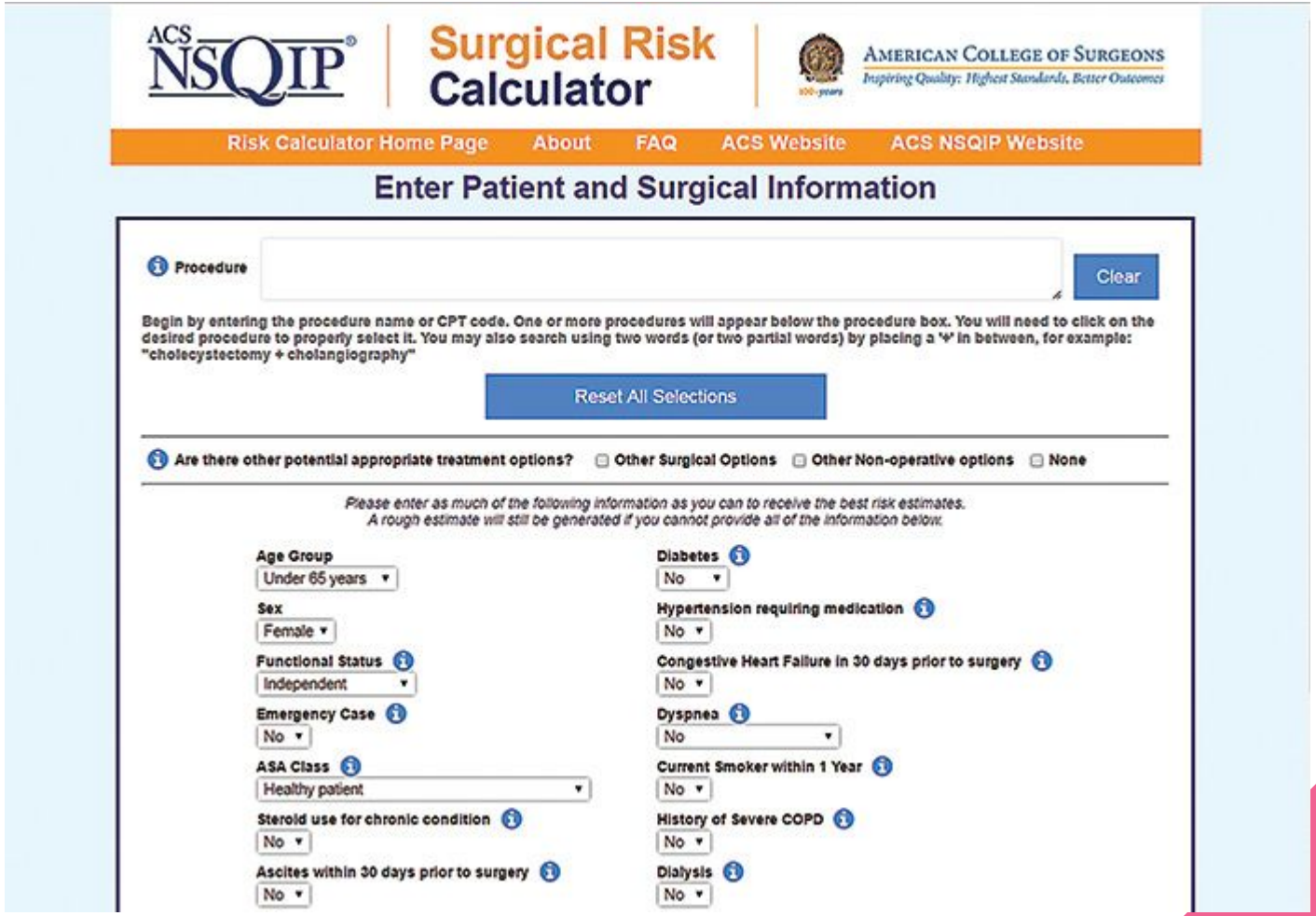
- Patient BMI
- History and Physical
- Decide on which labs by the history and physical
- Cardiac Evaluation
- OSA Evaluation

Screening tool for OSA: STOP-Bang

S	Does the patient **snore** loudly (louder than talking or loud enough to be heard through closed doors)?	Y/N
T	Does the patient often feel **tired**, fatigued, or sleepy during the day?	Y/N
O	Has anyone **observed** the patient stop breathing during their sleep?	Y/N
P	Does the patient have, or is the patient being treated for, high blood **pressure**?	Y/N
B	Does the patient have a **BMI** of more than 35?	Y/N
a	**Age.** Is the patient older than 50?	Y/N
n	Is the patient's **neck** circumference greater than 40cm?	Y/N
g	**Gender.** Is the patient male?	Y/N

Scoring: **Y ≥ 3 = high risk** of OSA
Y < 3 = low risk of OSA

Developed by Chung F, Yegneswaran B, Liao P, Chung SA, Vairavanathan S, Islam S, Khajehdehi A, Shapiro C: *STOP Questionnaire A Tool to Screen Patients for Obstructive Sleep Apnea*, 2008.


ACS NSQIP
Surgical Risk Calculator
American College of Surgeons
Inspiring Quality: Highest Standards, Better Outcomes
Risk Calculator Home Page
About
FAQ
ACS Website
ACS NSQIP Website
Enter Patient and Surgical Information
Procedure
Clear
Begin by entering the procedure name or CPT code. One or more procedures will appear below the procedure box. You will need to click on the desired procedure to properly select it. You may also search using two words (or two partial words) by placing a '+' in between, for example: "cholecystectomy + cholangiography"
Reset All Selections
Are there other potential appropriate treatment options?
Other Surgical Options
Other Non-operative options
None
Please enter as much of the following information as you can to receive the best risk estimates.
A rough estimate will still be generated if you cannot provide all of the information below.
Age Group
Under 65 years
Sex
Female
Functional Status
Independent
Emergency Case
No
ASA Class
Healthy patient
Steroid use for chronic condition
No
Ascites within 30 days prior to surgery
No
Diabetes
No
Hypertension requiring medication
No
Congestive Heart Failure in 30 days prior to surgery
No
Dyspnea
No
Current Smoker within 1 Year
No
History of Severe COPD
No
Dialysis
No

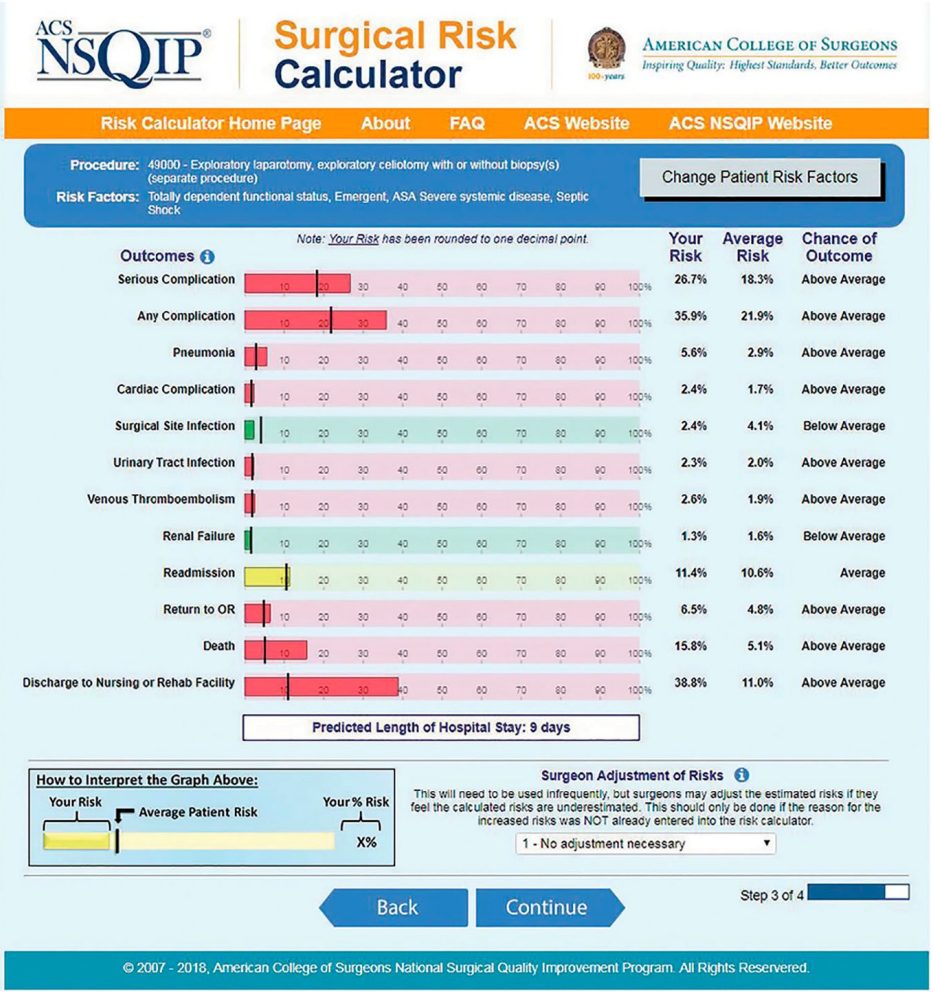


Fig. 2 ACS NSQIP Surgical Risk Calculator with patient-adjusted outcomes for procedure

web color only

"While it is desirable that there should be no solid matter in the stomach when chloroform is administered, it will be found very salutary to give a cup of tea or beef-tea two hours previously".

Joseph Lister, 1883

Moving Beyond "NPO at Midnight"

Healthy Patient of Any Age
(i.e., not diabetic, obese, pregnant, ileus/SBO, difficult airway)

Undergoing Elective Procedure
(i.e., not emergent)

General or Regional Anesthesia
(i.e., not merely local anesthesia)

Hours Pre-Op	Allowable Food or Beverage
>8	**Heavy foods** (fried/fatty) and meats
6	**Light meal** (e.g., toast + clear liquid) **Cow's milk** (in moderation) **Infant formula**
4	**Breast milk**
2	Non-alcoholic **clear liquids** (e.g., water, fruit juice without pulp, nutritional drinks, clear tea, black coffee)
0-2	**NPO**

Benefits of Clear Liquids up to 2 hours Pre-Op

- ✓LESS patient thirst and hunger
- ✓LOWER risk of aspiration

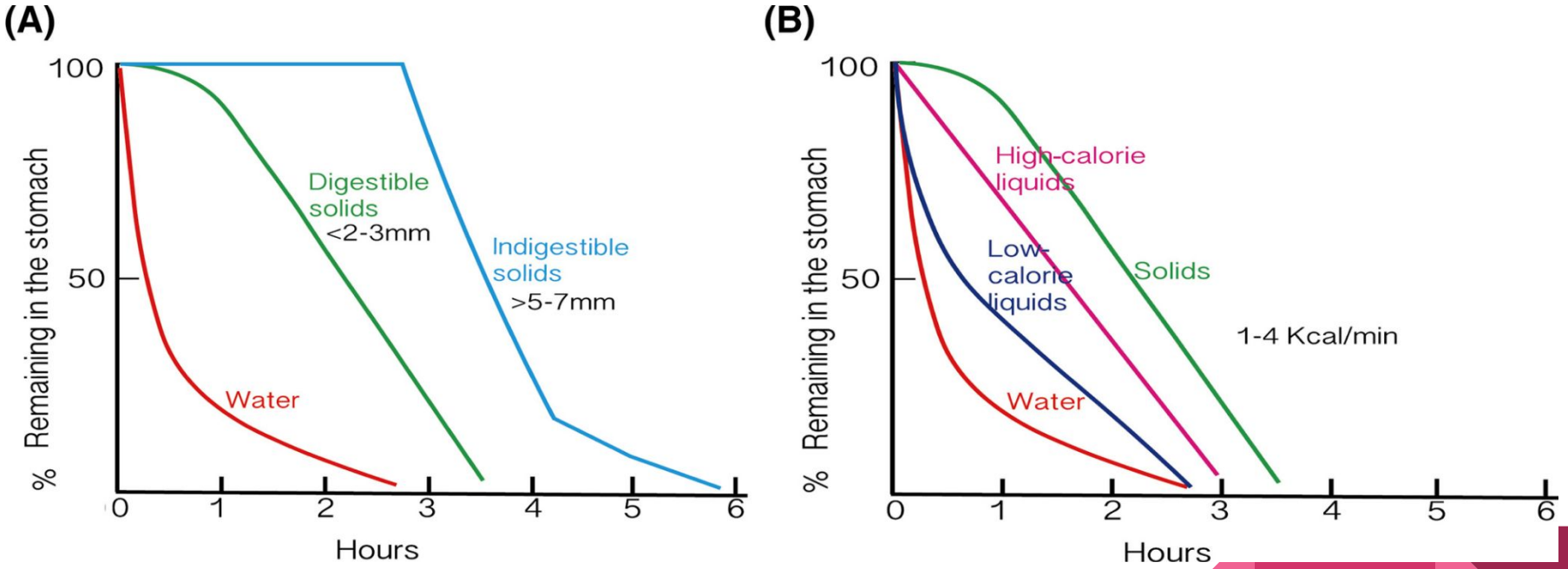
Source: American Society of Anesthesiologists. Practice Guidelines for Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration: Application to Healthy Patients Undergoing Elective Procedures. Anesthesiology. 2017; 126:376-393.

@jbrafel

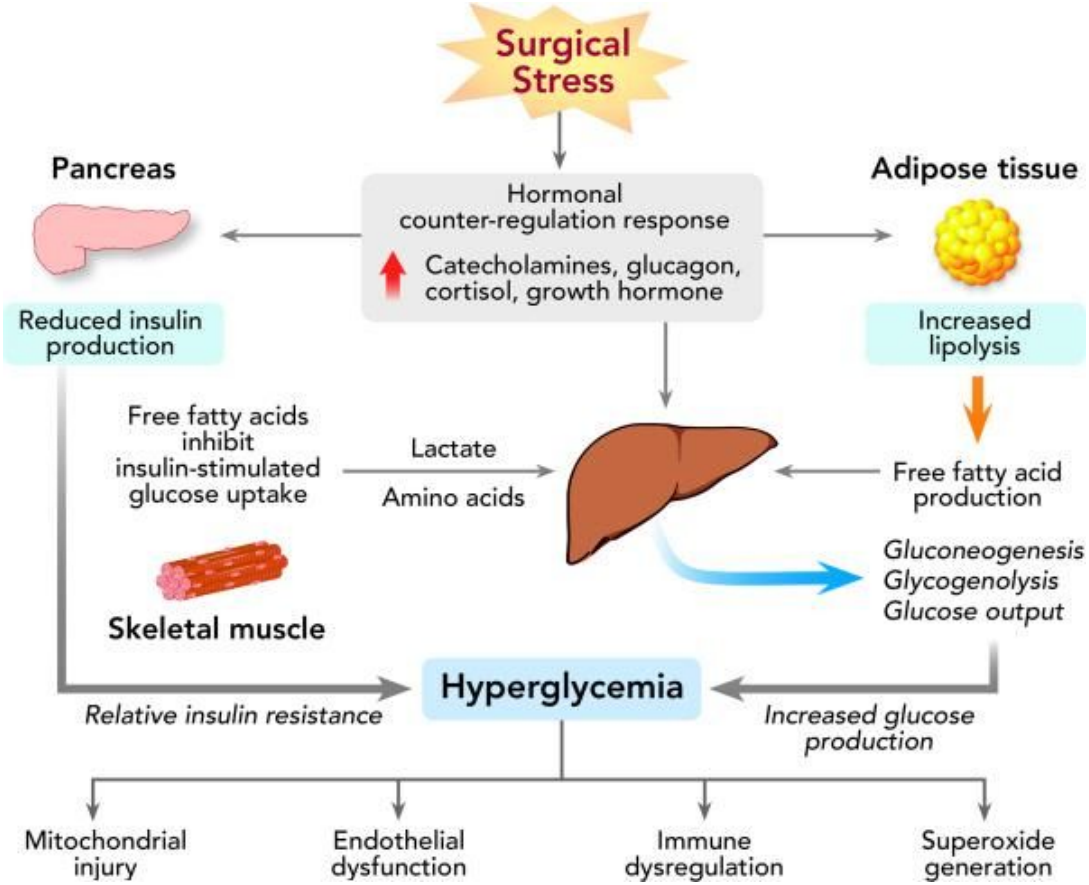
2023 American Society of Anesthesiologists Practice Guidelines for Preoperative Fasting

- Reaffirms the previous recommendations for clear liquids until 2 hour preoperatively. Simple or complex carbohydrate–containing clear liquids appear to reduce hunger compared with non-caloric clear liquids.
- The addition of protein to preoperative carbohydrate-containing clear liquids did not seem to either benefit or harm healthy patients.
- It is further suggested not to delay surgery in healthy adults after confirming the removal of chewing gum.
- Fasting duration is often substantially longer than recommended and prolonged fasting has well described adverse consequences. Therefore, to avoid prolonged fasting in children, efforts should be made to allow clear liquids in healthy children as close to 2 hour before procedures as possible.

Gastric Emptying

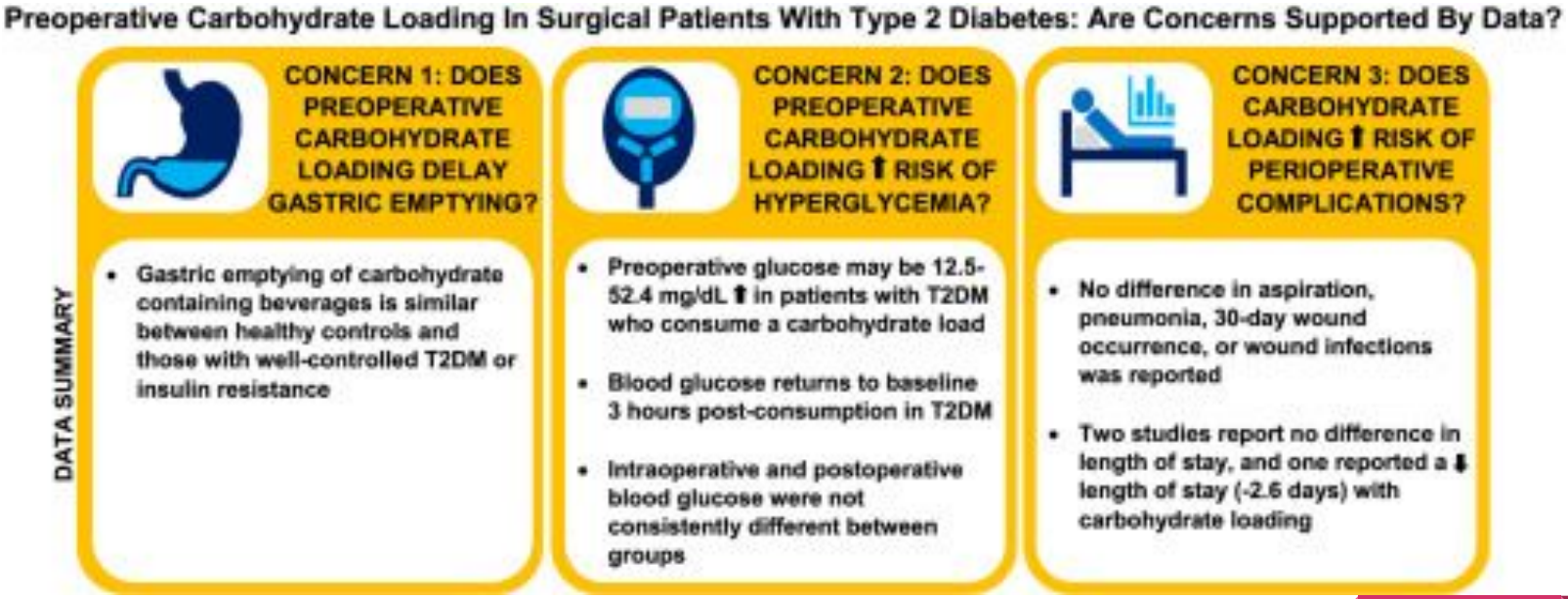


Advances in the physiology of gastric emptying, Raj K. Goyal, Yanmei Guo, Hiroshi Mashimo
10 February 2019



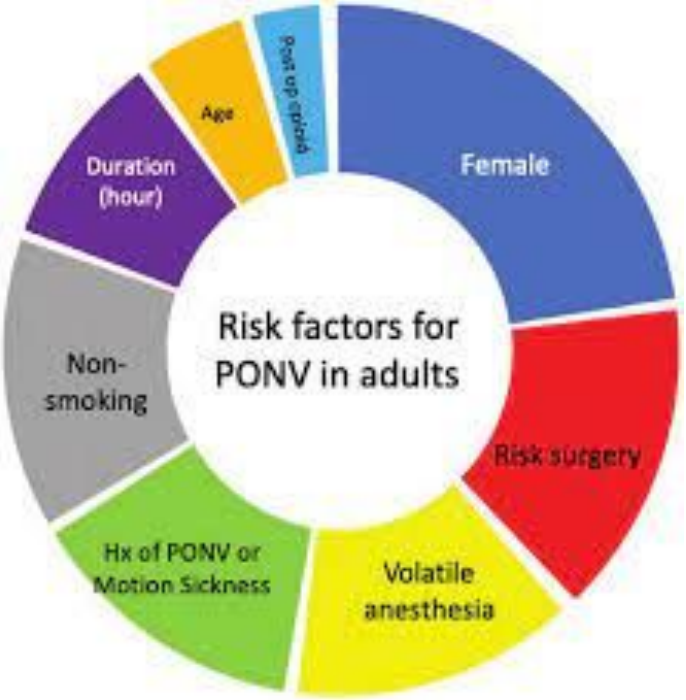
Surgical induced insulin resistance: Prediction and prevention, paper written in April 2019, Negar Karimian, MD, MSc, Doctor of Philosophy, Division of Experimental Surgery, Department of Surgery, McGill University, Montreal, Quebec, Canada

Carb Loading



Preoperative carbohydrate loading in surgical patients with type 2 diabetes: Are concerns supported by data?, Katie N. Robinson, Bridget A. Cassady, Refaat A. Hegazi, Paul E. Wischmeyer September 02, 2021, Clinical Nutrition ESPN.

PONV Risk Assessment



https://www.ashp.org/-/media/assets/policy-guidelines/docs/endorsed-documents/endorsed-documents-fourth-consensus-guidelines-postop-nausea-vomiting.pdf

APFEL Score

"Risk points"	1	2	3	4
Risk estimation (%)	20 (%)	40 (%)	60 (%)	80 (%)

Risk factors (each one "Risk-poin"t)

1 point female gender
1 point no smoking
1 point postoperative use of opioides
1 point previous PONV or motion-sickness in patients' history.

Assessing the applicability of scoring systems for predicting postoperative nausea and vomiting
J. Bosch, C. Kalkman, +4 authors K. Moons Anaesthesia 2005

PONV Prophylaxis

Drugs	Dose	Evidence	Timing	Evidence
Aprepitant	40 mg per os	A2[113,115]	At induction	A2[113]
Casopitant	150 mg per os	A3[117,118]	At induction	
Dexamethasone	4–5 mg IV	A1[121]	At induction	A1[326]
Dimenhydrinate	1 mg/kg IV	A1[152–154]		
Dolasetron	12.5 mg IV	A2[84,85]	End of surgery; timing may not affect efficacy	A2[85]
Droperidol[a]	0.625–1.25 mg IV	A1[138,139]	End of surgery	A1[140]
Ephedrine	0.5 mg/kg IM	A2[223,224]		
Granisetron	0.35–3 mg IV	A1[91–93]	End of surgery	A1[108–110]
Haloperidol	0.5–<2 mg IM/IV	A1[146]		
Methylprednisolone	40 mg IV	A2[137]		
Ondansetron	4 mg IV, 8 mg ODT	A1[74,75]	End of surgery	A1[107]
Palonosetron	0.075 mg IV	A2[105,106]	At induction	A2[105,106]
Perphenazine	5 mg IV	A1[162]		
Promethazine	6.25 - 12.5 mg IV	A2[222,295]		
Ramosetron	0.3 mg IV	A2[102]	End of surgery	A2[102]
Rolapitant	70–200 mg per os	A3[119]	At induction	
Scopolamine	Transdermal patch	A1[157,158]	Prior evening or 2 h before surgery	A1[157]
Tropisetron	2 mg IV	A1[97]	End of surgery	Expert opinion

These recommendations are evidence-based, and not all the drugs have an FDA indication for PONV. Drugs are listed alphabetically.

[a]See FDA Black box warning.

https://www.ashp.org/-/media/assets/policy-guidelines/docs/endorsed-documents/endorsed-documents-fourth-consensus-guidelines-postop-nausea-vomiting.pdf

Intra - op

Optimal fluid management

Short acting anesthetics

Regional analgesia

Opioid-sparing anesthesia

Small incisions

Avoid drains

Normothermia

VTE prophylaxis

Antibiotic prophylaxis

Perioperative fluid management for major elective surgery

Narrative review

Fluid overload is deleterious

Aim for zero-balance fluid therapy

Hypovolaemia is deleterious

Goal-directed therapy in high-risk patients

Balanced crystalloids are the **first choice** of fluids to be used in the operating theatre.
Additional research on the **optimal type** of fluid for use during major surgery is needed.

BJS

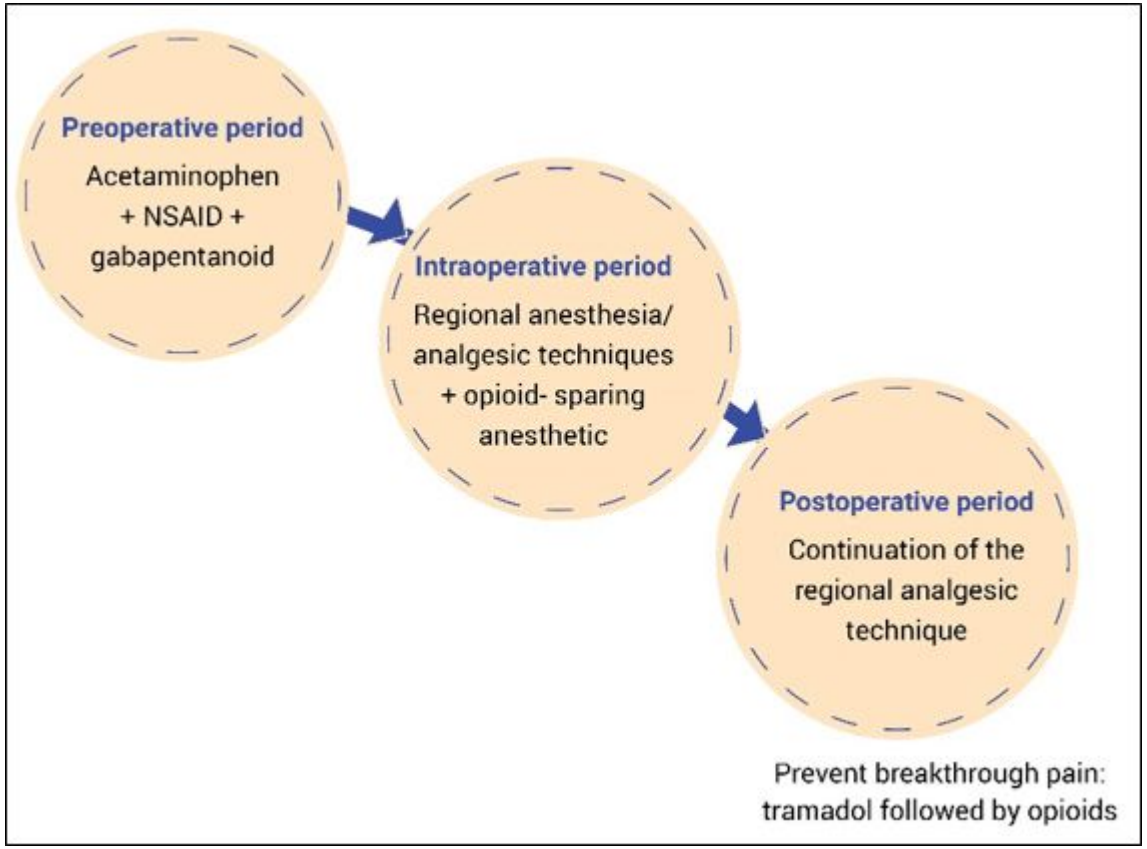
Heming et al. *BJS* 2020

@BJSurgery

Rapid Awakening

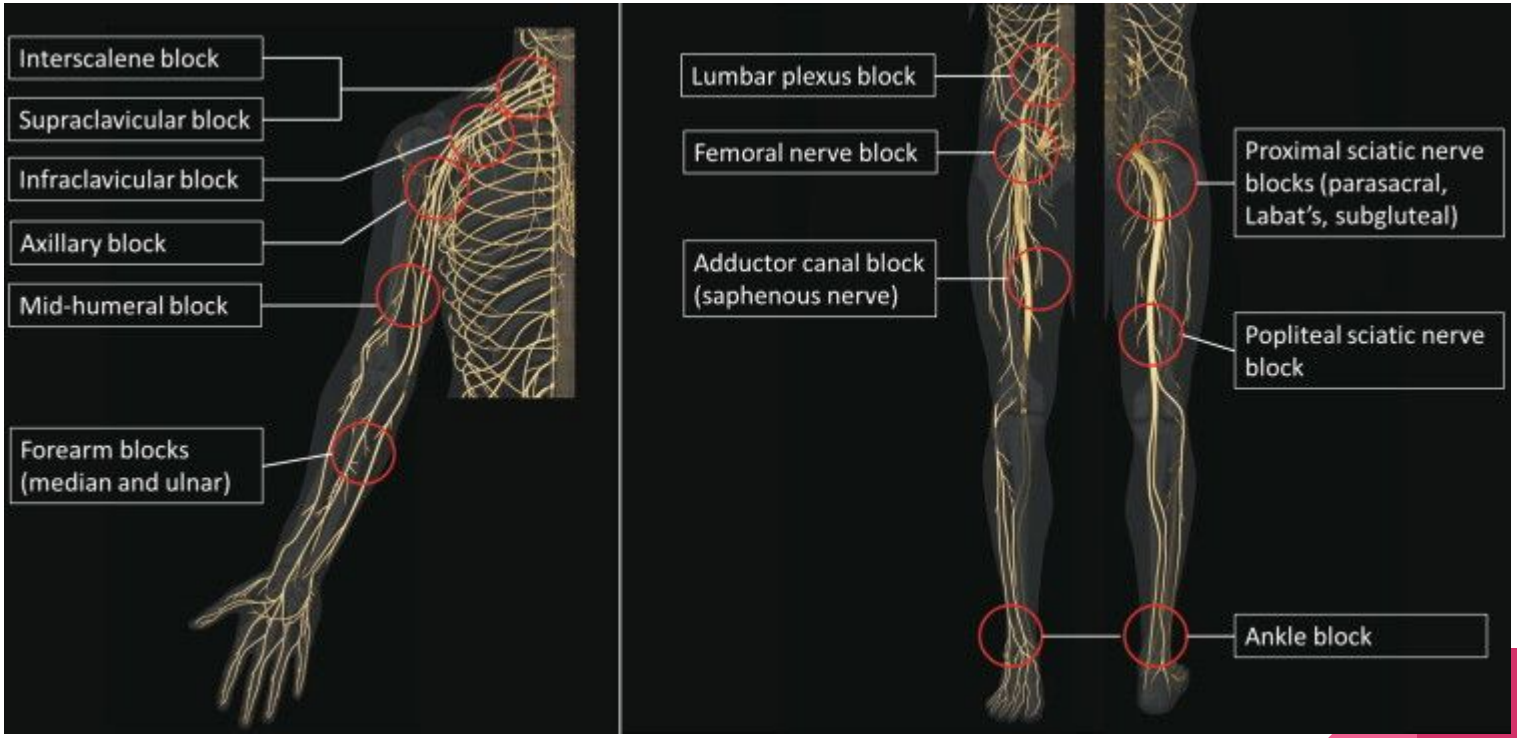
- Patient education
- Avoid hunger - CHO loading
- No sedative medication needed
- Short acting IV drugs
- Pre-op regional anesthesia
- Pre-emptive analgesia

Multimodal Analgesia



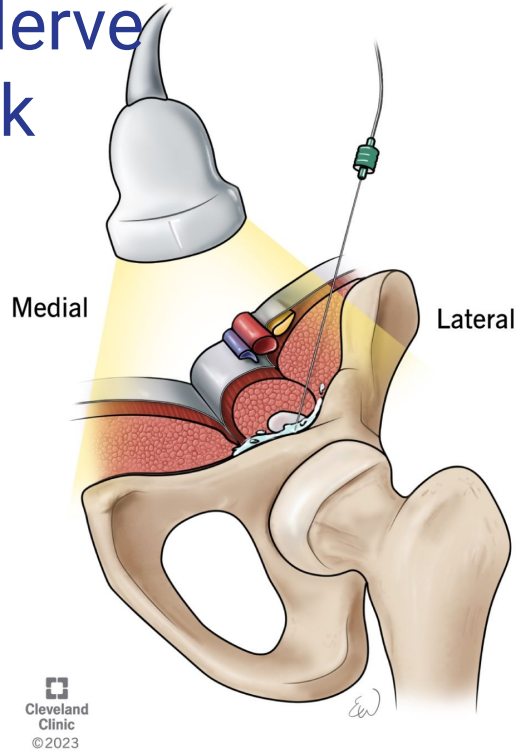
*Enhanced recovery after surgery (ERAS) for the anaesthesiologis*t, November 2020, Indian Journal of Clinical Anaesthesia 7(4):553-562

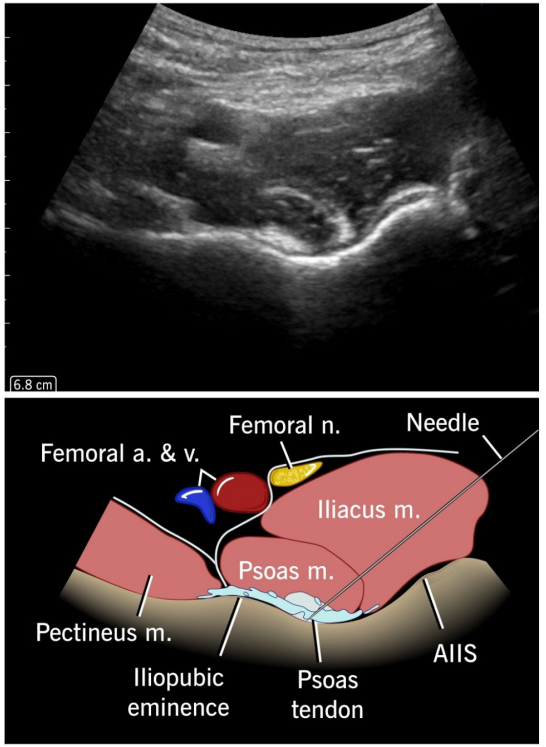
Peripheral Nerve Blocks



Anesthesia of the Peripheral Nerves, Richelle Kruisselbrink, Ki Jinn Chin, Nerves and Nerve Injuries, Vol 1: History, Embryology, Anatomy, Imaging, and Diagnostics, 2015, Pages 251-270

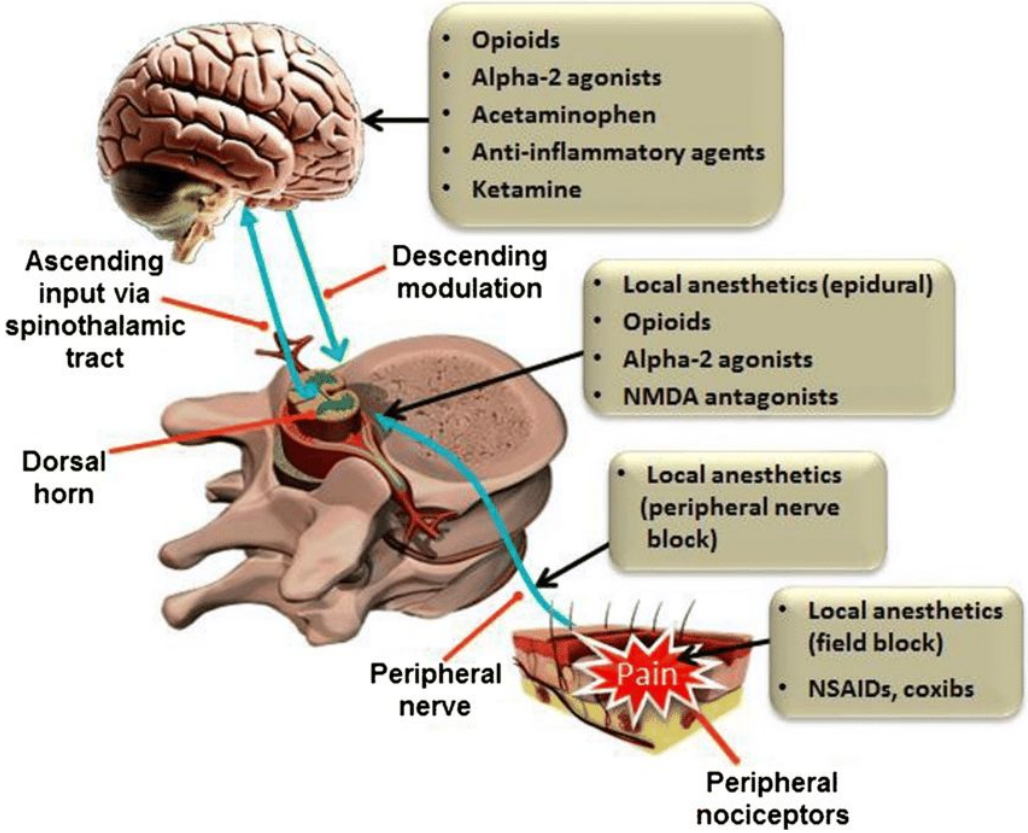
PEricapsular Nerve Group Block





https://www.asra.com/news-publications/asra-newsletter/newsletter-item/asra-news/2023/08/01/how-i-do-it-pericapsular-nerve-group-%28peng%29-block

Multimodal Analgesia



“Cocktail” for Hip Arthroscopies at NBSC

- Gabapentin 200 mg with sip of water in pre-op
- PENG block in pre-op (usually 2 mg midazolam IV given before block)
- Standard induction agents - propofol - lidocaine, 50-100 mcg fentanyl, rocuronium
- Intraoperative PONV prophylaxis - ondansetron, decadron
- Acetaminophen 1 GM IV at the beginning of surgery
- Ativan 0.25 mg and ketorolac 30 mg at the end of surgery

“Cocktail” for Shoulder Surgery at NBSC

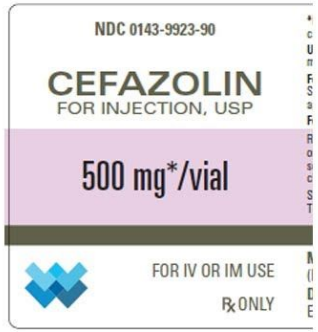
- Interscalene block with Exparel/Bupivacaine in pre-op (usually 2 mg midazolam IV given before block)
- Standard induction agents - propofol - lidocaine
- Intraoperative PONV prophylaxis - ondansetron, decadron
- Ketorolac 30 mg at the end of surgery

Antibiotics

Cefazolin Injection

500mg, 1g, 2 gm, 10mg

Uses, Side Effects, Moa



Normothermia

Post op

Early oral nutrition

Optimal fluid management

Multimodal non-opioid analgesia

Prevent PONV

Stimulation of gut motility

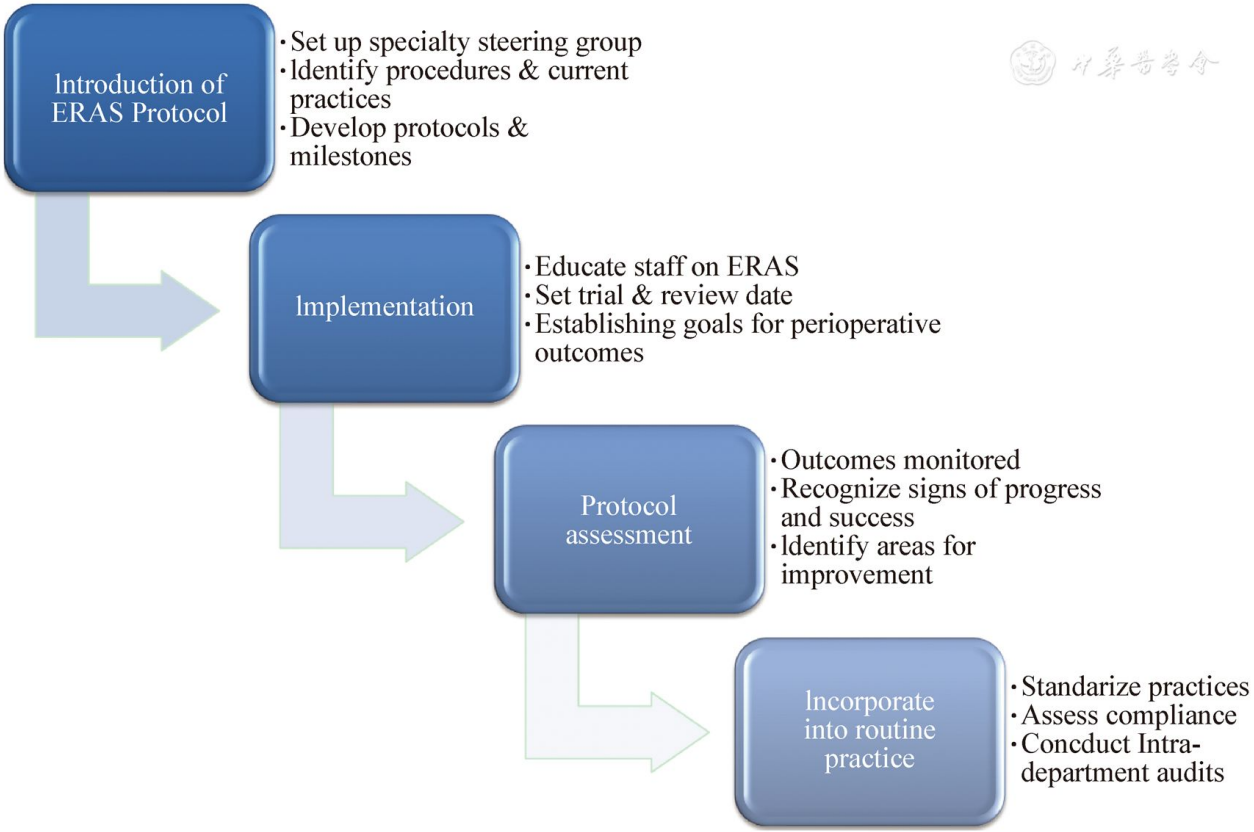
Early removal of catheters and drains

Early mobilization

Audit compliance/outcomes

Barhemsys - Rescue after PONV Prophylaxis

The Bottom Line




RAHMET
OBRIGADO
GRAZIE
HVALA
谢谢
KIITOS
DANKE
TAK
DANK JE
THANK YOU
SHUKRAAN
ευχαριστώ
GRACIAS
BARKA
MERCI
СПАСИБО
ARIGATO
TAKK
TACK