THE UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER AT DALLAS





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**DISCLOSURE: Consultant Baxter International Inc.** 

### **Goals of Sedation/Analgesia for NORA**

- Improve patient acceptance and cooperation
  - Anxiolysis, sedation, amnesia
- Minimize pain and discomfort
  - Uncomfortable procedures, deep structure traction
  - Need for multiple local anesthetic injections
- Facilitate proceduralist
  - Prevent patient movement
- Expedite discharge
  - Rapid recovery clearheaded

### **Sedation/Analgesia Technique**

- Sedative-hypnotics: midazolam, propofol
- Analgesia
  - Opioids
  - Analgesic adjuncts: ketamine, dexmedetomidine
  - Non-opioid analgesics: acetaminophen, NSAIDs
- Non-pharmacological: reassurance, music, virtual reality
  - Systematic review of 74 RCTs, music reduced postoperative pain and anxiety and increased patient satisfaction [Hale J, et al: Lancet 2015; 386: 1659-71]



Lin Y-C, Wan L, Jamison RN: Anesth Analg 2017;125:2081-93



### **Sedation/Analgesia Complications**

- Patient dysphoria/movement
- Airway obstruction/respiratory depression/hypoxemia
- Cardiovascular: hypotension/dysrhythmias
- Regurgitation and aspiration
- Delayed discharge



## **Pain Control**



### **Patient Education**

- Set realistic goals and expectations
  - "Plan to reduce pain intensity to an acceptable level"
- Use simple non-opioids as primary analgesics
  - Combination of acetaminophen and NSAIDs
  - No difference in analgesic efficacy between non-selective NSAIDs and COX-2 specific inhibitors, at equipotent doses
  - COX-2 inhibitors lack of platelet inhibition, do not influence perioperative blood loss
  - Oral and IV formulations have similar analgesia
- Non-pharmacological approach

### Systematic Review and Meta—Analysis of the Association Between Non—Steroidal Anti—Inflammatory Drugs and Operative Bleeding in the Perioperative Period

Bongiovanni T, et al: Am Coll Surg 2021; 232: 765-90

- 74 studies between 1987 and 2019 with 151,031 patients included
- Wide of surgical procedures: ENT, breast, abdomen, plastics, etc.
- Clinically significant bleeding = documented hematoma, need for a reoperation due to bleeding, and the need for a blood transfusion
- NSAIDs are unlikely to be the cause of postoperative bleeding complications
- Results are consistent across NSAID type and surgical procedures

### **NSAIDs: Unfounded Concerns**

- Renal complications: Short duration of use does not appear to influence AKI in patients with normal renal function
- Cardiac complications: No conclusive evidence for increased risk of cardiovascular events after CABG surgery
  - Despite the block-boxed warning against NSAID use after CABG, certain NSAIIDs such as naproxen may be relatively safe
- GI complications: not increased with short duration (~7 days)
- Bone reunion after fractures: lack good evidence

### Dexamethasone

- Reduces pain and opioid requirements
- Excellent antiemetic
- Improves functionality
- No safety concerns
  - Delayed wound healing, infection
  - Hyperglycemia

### Safety of Perioperative Glucocorticoids in Elective Noncardiac Surgery Dexamethasone versus standard treatment for postoperative A Systematic Review and Meta-analysis nausea and vomiting in gastrointestinal surgery: randomised Andrew J. Toner, F.R.C.A., Whunthan Ganeshanathan, F.R.C.A., Matthew T. C controlled trial (DREAMS Trial) Kwok M. Ho, Ph.D., Tomas B. Corcoran, M.D. (Res.) DREAMS Trial Collaborators and West Midlands Research Collaborative This article has been selected for the Avest-esculory CME Program. and disclosure and ordering information can be found in the CME sec BMJ 2017: 357: i1455 of this issue. Dexamethasone dexamethasone ABSTRACT Experienced vomiting Received antiemetics on demand Background: Glucocorticoids are increasingly used perioperatively, principally to prevent naus $\overline{}$ 77 cerns focus on the potential for hyperglycemia and increased infection. The authors hypothesize 80 pose to such adverse outcomes in a dose-dependent fashion after elective noncardiac surgery. Methods: The authors conducted a systematic literature search of the major medical databases P(0.001 2016. Randomized glucocorticoid trials in adults specifically reporting on a safety outcome were with Peto odds ratio method or the quality effects model. Subanalyses were performed accord 60 P<0.001 equivalent of low (less than 8 mg), medium (8 to 16 mg), and high (more than 16 mg). The prin infection and peak perioperative glucose concentrations were subject to meta-regression. P=0.65 Results: Fifty-six trials from 18 countries were identified, predominantly assessing dexamethasone. ( 40 P=0.14on any wound infection (odds ratio, 0.8: 95% CI, 0.6 to 1.2) but did result in a clinically unimpe P=0.003 erative glucose concentration (weighted mean difference, 20.0 mg/dl; Cl, 11.4 to 28.6; P < 0.001 a P=0.87 Glucocorticoids reduced peak postoperative C-reactive protein concentrations (weighted mean diff to -12.5; P < 0.001), but other adverse outcomes and length of stay were unchanged. No dose-effe 20 Conclusions: The evidence at present does not highlight any safety concerns with respect to the use of and subsequent infection, hyperglycemia, or other adverse outcomes. Nevertheless, collated trials lac power to detect clinically important differences in complications such as wound infection. (ANESTHE Δ 0-24 hours 25-72 hours 73-120 hours postoperative postoperative postoperative

### Ketamine

- Reduces propofol and opioid requirements
- Adverse effects: hallucinations, nightmares
  - Avidan MS, et al: Lancet 2017; 390: 267-75;
  - Vlisides PE et al: Br J Anaesth 2018; 121: 249-59
- Contraindications: poorly controlled CV disease, hepatic dysfunction, high intracranial and intraocular pressures, active psychosis, pregnancy

### **Dexmedetomidine: Not as Safe as You Think**

- Dexmedetomidine has been promoted as having no respiratory effects
  - Similar upper airway collapsibility as propofol, regardless of level of sedation
  - Can cause upper airway obstruction
    - Lodenius A, et al, Anesthesiology 2019; 131: 962-73
- Low-dose dexmedetomidine with propofol

delayed discharge readiness after colonoscopy

- Edokpolo LU, et al: Anesthesiology 2019; 131: 279-86
- Dexmedetomidine increase hypotension
  - Hemodynamics monitoring after treatment cessation (i.e., PACU and beyond)
    - Demiri M, et al: Br J Anaesth 2019;123:795-807



### **Regional Analgesic Techniques**

- Provides excellent dynamic pain relief, important component of optimal multimodal analgesic therapy
- Pre-operative or rescue-after procedure
  - Surgical site local anesthetic infiltration
  - Peripheral nerve blocks
  - Interfascial plane blocks: superficial/deep torso surgery
  - Neuraxial blocks: role limited in the ERP era

Surgical site infiltration: A neuroanatomical

proach Joshi GP, Machi A: Best Pract Res Anaestheisiol 2019; 33: 317-24

Surgical Site Infiltration for Abdominal Surgery: A Novel Neuroanatomical-based Approach



### **Post-Procedure Analgesia**

- Acetaminophen 1 gm, po, q 6 h
- NSAIDs
  - Ibuprofen 400-600 mg, q 6-8 h
  - Meloxicam 15 mg, po, daily
  - Celecoxib 200 mg, po, q 12 h
- Opioids
  - Oxycodone IR 5-10 mg, po, q 6 h, PRN
  - Tramadol 50 mg, po, q 6 h, PRN

### Summary

- Optimal peri-procedure pain relief critical
- Educate patients regarding and analgesic options, set realistic expectations
- Emphasize use of non-opioids: acetaminophen and NSAIDs/COX-2 inhibitors, dexamethasone, local/regional analgesia techniques
- Consider non-pharmacologic approaches
- Limit the use of sedative-hypnotics, analgesic adjuncts, opioids





# **Questions?**

