ANESTHESIA DOGMA DISCUSSION AND PHARMACEUTICAL REVIEW

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OBJECTIVES

- Review clinical scenarios for when to use paralytics and infusion therapy
- Review basic pharmaceutical properties of several common anesthesia medications
- Propose strategies to use critical thinking to improve patient safety versus old dogmas of anesthesia

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- Everyday we make decisions that impact the lives of our patients, our surgeons, our OR team, our recovery team, and ourselves.
- We have been trained to take these factors into account when we are creating the plan of care for our patients.
- We make these decisions everyday, sometimes without even realizing the impact that they have.
- Sometimes we need to acknowledge all the little things that impact our decisions.

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To paralyze or not to paralyze, that is the question!

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Case Examples

- Patient 1: 66 yo Male, 5'9", 350 lbs (159kg), Ankle Fracture scheduled for 90 min. Hx of OSA, DM, HTN, GERD, 8 hrs NPO, Thigh tourniquet requested by surgeon
- BMI 51
- LMA?
- ETT?
- Block & MAC?

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Case Examples

- Patient 2: 52 yo Male, 5'6", 186lbs (84.5kg), Ankle fracture scheduled for 90 min. Hx of HTN, Asthma, "slow waking from Anesthesia", Kidney transplant, 8hrs NPO, Thigh tourniquet requested
- BMI 30
- LMA?
- ETT?
- Block & MAC?

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Case Examples

- Patient 3: 36 yo Female, 5’4”, 234lbs (106.4kg), Hysteroscopy scheduled for 20 min, no medical history, surgeon doesn’t like Paracervical blocks
- BMI 40
- LMA?
- ETT?

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Case Examples

- Patient 4: 44 yo Female, 5’0”, 251lbs (114kg), Hysteroscopy scheduled for 20 min. Hx of HTN, GERD, OSA
- BMI 49
- LMA?
- ETT?

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Paralytics, what's your flavor?

- Rocuronium
- Cisatracurium
- Succinylcholine

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Where's the best place to source pharmaceutical references?

A. My anesthesia clipboard with quick reference cheat sheet
B. Google
C. "THAT'S WHAT MY PROGRAM DIRECTOR TAUGHT ME DRILL SERGEANT!!!"
D. That annoying paper that comes in the box with the medication
E. PDR
   - Physician's desk reference
   - The example used when defining the word "Tome"
   - This is actually a composition of package inserts
   - Can be outdated because it is most often used to look impressive in Zoom backgrounds

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Rocuronium (Zemuron)

So, what do you actually give, and how long do you wait before you intubate?

1. 50mg or less, 60 seconds
2. 50mg, 45 seconds
3. 0.6mg/kg, and wait 3 minutes
4. 1.2mg/kg, and wait 1 minute

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Rocuronium

Manufacturer recommends:

- Actual body weight dosing @ 0.6mg/kg for intubation
- 80% blockade is reached at 1 minute
- Maximum blockade in less than 3 minutes

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Rocuronium

"I'll give the RSI dose!"

Manufacturer recommends:

- Rapid Sequence Intubation dosing "0.6-1.2 mg/kg will provide excellent or good intubating conditions in most patients in less than 2 minutes"

Package insert bullet 2.2

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Rocuronium

- Do not mix with Ancef
  - Increase duration of action with certain antibiotics and inhalation anesthetics
- Patients older than 65 yrs, increased time to block with all doses
  - 2.3 minutes @ 0.6 mg/kg (vs 1 minute for same dose patients ages 18-64)

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Cisatracurium

- Manufacturer recommends:
  - Dosing of 0.15-0.2 mg/kg up to 0.4 mg/kg
  - Not RSI recommended
    - Onset is 2.5 minutes to achieve a 90% block

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Cisatracurium

- Geriatric patients and renal patients, add 1 minute to onset time prior to intubation
  - Now at 3.5 minutes until intubation conditions

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Cisatracurium (Nimbex)

- Repeat dosing not recommended until 50 minutes after administration of intubating dose
  - Maintenance dosing is recommended at 0.03 mg/kg
- Not compatible with Propofol at the Y-site
  - Planning a TIVA?
    - Start a second line!

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Succinylcholine (Anectine or Quelicin)

- Manufacturer recommended intubation dose
  - 0.6 mg/kg
  - Less than 60 seconds to onset
  - 4-6 minutes until eliminated

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Succinylcholine

- Contraindicated in patients with a history of MH……
  - Hyperkalemia risk is greatest at 7-10 days after:
    - Major burns
    - Multiple Traumas
    - Denervation of Skeletal Muscle
    - Upper Motor Neuron injuries
- Do not give to patients with Digitalis Toxicity
- Increased Intraocular pressure
- Increased Bradycardia

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Succinylcholine

- Increased effective paralysis with use of :
  - Oxytocin
  - Lidocaine
  - Desflurane
  - Magnesium

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Sugammadex (Bridion)

What's a discussion on NDMR if we don't talk reversals?

- For Rocuronium and Vecuronium reversal
  - With 1-2 Post Tetanic (0/4 TOF)
    - 4 mg/kg
  - If >/= 2/4 TOF
    - 2 mg/kg
- For Rocuronium only
  - If needing to reverse a 1.2 mg/kg RSI Roc dose, and AFTER approximately 3 minutes
    - 16 mg/kg

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Slido

Propofol use for Endoscopy sedation:

Intermittent Bolus

Or

"Set it and Forget it!" Ronco Style with a syringe pump

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Propofol (Diprivan)

- Initiation and Maintenance of MAC sedation in Adults:
- Dosing is recommended according to the Physical Status & age of patient
- Initial infusion of 0.5 mg/kg at a rate of 100-150 mcg/kg/min for 3-5 minutes
- *{70kg pt is 35mg, at a rate of 60mL/ hr for 3.5 minutes…….}*

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Propofol (Diprivan)

- In elderly, debilitated, or ASA-PS 3 or 4 patients, Rapid bolus should not be used for MAC sedation.
  - The dosage of propofol should be reduced to approximately 80% of the usual dose (0.4mg/kg)
- Maintenance of sedation, a variable rate infusion method is preferable over intermittent bolus dose method
- Maintenance rates of 25-75 mcg/kg/min for first 10-15 minutes, then decrease over time to 25-50 mcg/kg/min
- If intermittent blousing is used, increments of 10-20 mg can be titrated
- May need increased doses for more stimulating (intra-abdominal) procedures

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Propofol (Diprivan)

- General Anesthesia Continuous infusion
  - 150-200 mcg/kg/min for first 10-15 minutes, then decrease 30-50% in first half hour
  - Generally, 50-100 mcg/kg/min for maintenance

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Propofol (Diprivan)

Since we are talking about it, might as well review Induction dosing:

- ASA-PS 1-2 & 17-65 years old:
  - 2-2.5 mg/kg
- ASA-PS 3-4 & >65 years old:
  - 1-1.5 mg/kg
- Peds 3-16 years old:
  - 2.5-3.5 mg/kg

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Propofol (Diprivan)

Since we are talking about it, might as well review an old Dogma:

Can you mix lidocaine in your propofol syringe to decrease the burning sensation on administration?

According to the Package Insert:

- ”Can mix in lidocaine to a concentration of 20mg per 200mg of Propofol immediately before administration”

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Dogma Discussion:

- Who mixes Lidocaine into their Propofol syringe routinely?
- Has anyone been curious to try the other side?
- What about with Propofol infusion vs bolusing?

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Ondansetron (Zofran)

- 5HT3 Receptor antagonist
- For treatment of nausea and vomiting associated with emetogenic cancer chemotherapy and as prevention of postoperative nausea and/or vomiting
- Mechanism of action not fully characterized

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Ondansetron (Zofran)

- Not a dopamine-receptor antagonist
- Serotonin receptors of the 5-HT3 type are present both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone of the area postrema
  - It is not certain whether ondansetron's antiemetic action… is mediated centrally, peripherally, or in both sites

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Ondansetron (Zofran)

PONV treatment:

- 4mg IV over 2-5 minutes (not less than 30 seconds) immediately before the induction of general balanced anesthesia for adults
  - 0.1 mg/kg for pediatric patients <40 kg

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Ondansetron (Zofran)

PONV Treatment:

- Adult surgical patients who received general balanced anesthesia and no prophylactic antiemetics & had N/V within 2 hrs post-op, single 4mg IV dose was significantly effective
- Repeat dosing: Patients who do not achieve adequate control of PONV following a single, prophylactic, pre-induction, IV dose of ondansetron 4mg, administration of a second IV dose of ondansetron 4mg postoperatively does not provide additional control of N/V.

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Ondansetron (Zofran)

- Routine prophylaxis is not recommended for patients in whom there is little expectation that nausea and/or vomiting will occur postoperatively
  - If PONV must be avoided, then Zofran is indicated even if risk is low

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Ondansetron (Zofran)

- Headache is #1 adverse event
- Use caution in patients with long QT syndrome
- Serotonin syndrome has been reported with 5HT3 receptor antagonists

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Ondansetron (Zofran)

Serotonin Syndrome signs and symptoms:

- Agitation
- Hallucinations
- Coma
- Delirium
- Tachycardia
- Dizziness
- Flushing
- Muscle tremor or rigidity
- Nausea, Vomiting, and Diarrhea

- Treatment with Benzodiazepines, O2, IV fluids, discontinue medication causing SS

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Dogma Discussion:

- Who is administering over 2-5 minutes prior to induction?
- Anyone else anecdotally notice HA incidence goes up with speed of administration?
- Anyone giving Zofran prior to placing spinal for C-section?

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Dexamethasone (Decadron)

Adrenocortical steroid for treatment of PONV 4– 8mg IV

What do we all want to avoid?

- ”Burning or tingling especially in the perineal area (after IV injection)…”

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Dexamethasone (Decadron)

Perineal pruritus:

- Mechanism behind this reaction is currently unknown
  - Postulated that may be caused by the phosphate ester of the dexamethasone sodium phosphate; this is why it is not seen with methylprednisolone injections
- More common in females than males
- Mitigated by dilution and slow IV administration

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Dexamethasone (Decadron)

- Not listed as treatment for PONV, only chemotherapy induced Nausea and/or Vomiting
  - Most often used in combination with 5HT3 Antagonists
- It has been studied as a PONV therapy, most effective if given before the induction of anesthesia

Wang, J. et al(Anesth Analg 2000,91:136-9) *The Effect of Timing of Dexamethasone Administration…*

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Dogma Discussion:

- Is it worth the time to dilute and give it slowly prior to induction?
- If we don't know how it works, and the pruritis only lasts 60-90 seconds, isn't it just fine to give it undiluted once patient is asleep?

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Questions?

Thank you for your time, attention, and participation!

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