

Medication Do's and Don'ts

Hadar Tucker, MCEP 2018

Pretest

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 - A) 400 mg
 - B) 600 mg
 - C) 800 mg
 - D) 1000mg

Pretest

- 2 How long does it take for the analgesia peak of intranasal fentanyl?
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- C) 15 minutes
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Pretest

- 3 Which dose of Toradol works best for pain?
- A) 10 mg
- B) 15 mg
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- 4 Which of the following are side effects of Tramadol?
 - A) Serotonin syndrome
 - B) Seizures
 - C) Increases INR in patients on coumadin
 - D) All of the above

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- 5 4 mg IV Zofran dose is Bio-equivalent to what PO dose?
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- 6 Which of the following would be a good choice for antibiotic treatment of a cutaneous abscess?
 - A) Keflex
 - B) Clindamycin
 - C) Azithromycin
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- 7 2.5 mg nebulized Albuterol is approximately equivalent to:
 - A) 2 puffs thru a spacer
 - B) 5 puffs thru a spacer
 - C) 10 puffs thru a spacer
 - D) Nobody would give albuterol acutely thru a spacer!

Pretest

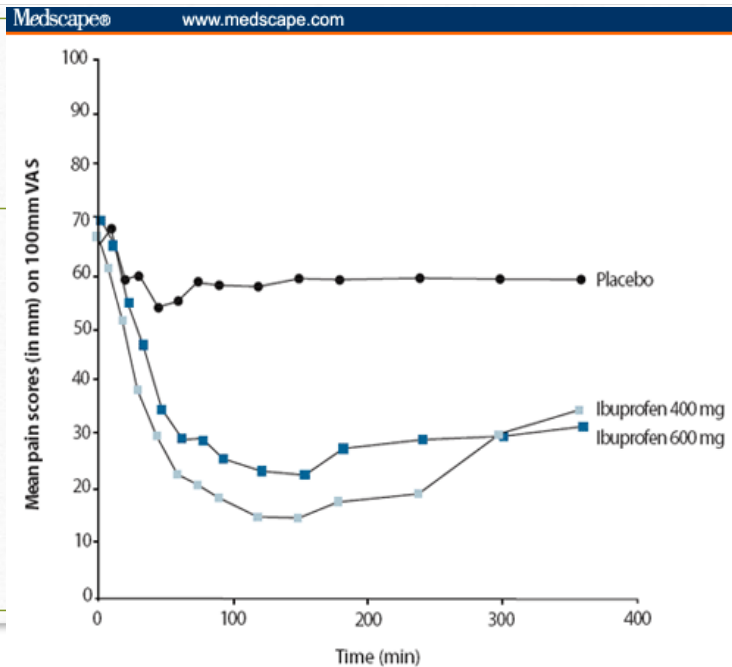
- 8 Which of the following is true re. corticosteroid dosing route:
 - A) IV doses are more effective than oral doses
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 - C) Nebulized doses work the quickest
 - D) Oral dosing works as well as any other route

Pain meds

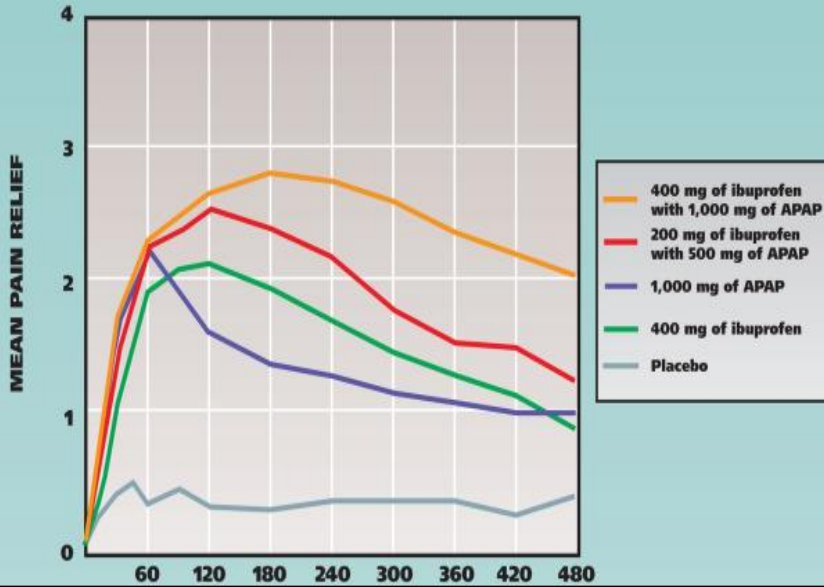
Ibuprofen

- Ceiling effect for analgesia between 400-600
- Ceiling effect for inflammation higher
- Swelling not synonymous with inflammation
- No ceiling effect known for side effects

Ibuprofen 400 vs. 600 mg



Adding Acetaminophen to Ibuprofen works better



Intranasal fentanyl

- Dose 1-2 mcg/kg
 - 70 % bioavailable
- Volume < 1 ml per nostril for IN meds
 - 50 mcg/ML
 - Allows maximum of 100 mcg fentanyl

Intranasal Versed

- Dose 0.2 – 0.5 mg/kg
- Requires the higher 5 mg/ml concentration for most kids due to volume restriction of < 1 ml / nostril
 - Allows maximum dose 10 mg
 - 50 kg kid x 0.2 mg/kg > 10 mg
- Sedation in 5-10 minutes

Intranasal fentanyl

- Plasma peak 13 minutes
- Analgesia peak 15.5 minutes
 - *Pharmacokinetics and Pharmacodynamics of IN fentanyl in patients with pain after oral surgery*, Annals of Pharmacotherapy, 2008

Three reasons not to use Toradol

- **Multiple studies show that Toradol is no better than Ibuprofen for pain**
 - For example, Intramuscular Ketorolac vs Oral Ibuprofen in Emergency Department Patients with Acute Pain Martha L. Neighbor, MD, Kathleen A. Puntillo, RN, DNSc. Acad. Emerg. Med. Feb., 1998
- **More GI toxicity than Ibuprofen**
- **COST (\$10 / dose vs 10 cents/dose)**

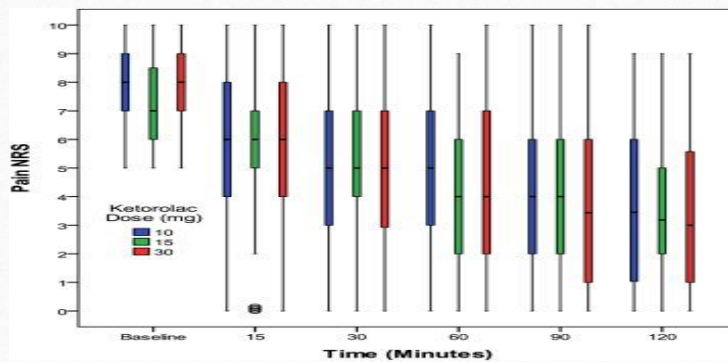
Ketorolac (Toradol): more is not better

- **Recent study in Annals Emergency medicine heating up the blogosphere re. Toradol dosing**
 - S. Motov et. al., Annals of Emerg. Medicine, Aug 2017 (SAEM 2016)

*Comparison of
Intravenous
Ketorolac at Three
Single-Dose
Regimens for
Treating Acute
Pain in the
Emergency
Department: A
Randomized
Controlled Trial*

- 312 patients approached > 240 enrolled
 - 80 patients each dose group
 - No difference pain scores 10 vs 15 vs 30 mg IV

Comparison of Intravenous Ketorolac at Three Single-Dose Regimens for Treating Acute Pain



Toradol dosing

- **Turns out some early studies also showed that more Toradol was not better**
 - Double-blind parallel comparison of multiple doses of ketorolac, ketoprofen and placebo administered orally to patients with postoperative dental pain, M.V.Olmedo et al, *Pain*, 90, **2001**
 - A double blind study with placebo control of Intramuscular Ketoralac Tromethamine in the treatment of cancer pain, Maurice Staquet, *Clinical Pharmacology*, Nov. **1989**

Tramadol (Ultram)

- **Not FDA approved Pediatrics (2017)**
- **Three reasons not to prescribe Tramadol**
 - empharmd.blogspot.com/2015/05/three-reasons-not-to-prescribe-tramadol
 - Mathew Delaney, MD, FACEP, FAAEM

Three
reasons
not to
prescribe
Tramadol

- 1- It may not work
 - No better than Acetaminophen in blinded studies

Three
reasons
not to
prescribe
Tramadol

- 2- It may hurt our patients
 - Erratic metabolism
 - Seizures
 - Hypoglycemia
 - Serotonin syndrome
 - Drug interactions

Tramadol major drug interactions

- 444 major drug interactions per drugs.com

Tramadol major drug interactions

- Short list:
 - Most antidepressants (MAOI, SSRI, Tricyclics)
 - Antifungals
 - Antibiotics (macrolides, linezolid)
 - Coumadin
 - Seizure meds
 - Tryptans
 - Other opiate pain meds

Three
reasons
not to
prescribe
Tramadol

3- It isn't a "safe" opioid

Acetaminophen
dosing

- All Acetaminophen liquid now 160 mg / 5 ml
 - @16 mg/kg = 5 ml for 10 kg kid
- Ibuprofen liquid 100 mg/5 ml
 - @10 mg/kg = 5 ml for 10 kg kid

Acetaminophen

- Rectal dose should be 30-40 mg/kg to get levels 10-20 ug/ml
 - Many studies, for example: *Twenty-four-Hour Pharmacokinetics of Rectal Acetaminophen in Children : An Old Drug with New Recommendations*, P. Birmingham et. Al, *Anesthesiology*. 1997
- Some sources (e.g., Epocrates) still list 10-20 mg/kg rectally
 - Don't bother

Ondansetron (Zofran)

- 4 mg IV = 6 mg PO
 - Consider 8 mg PO dose in larger patients
- 8-15 kg (and > 6 months old) 0.15 mg/kg or 2 mg PO
 - 0.1 mg/kg IV
- Prolonged QT
- Serotonin syndrome

Antibiotics for cutaneous abscess

- Presume MRSA
- Bactrim
- Doxycycline > 8 yrs old
- Linezolid (Zyvox)
 - Off patent, also covers strep pneumonia
 - MAOI

Antibiotics for cutaneous abscess

- *NOT* Clindamycin
 - Resistance to MRSA > 40%
- *NOT* Keflex
 - Still Listed in some sources (e.g., Medscape)

**Bonus !
Antibiotics
that work
as well by
mouth as
by IV route**

- Clindamycin
- Fluoroquinolones
- Metronidazole
- Doxycycline, Minocycline (group 2 tetracyclines)
- Trimethoprim-Sulfa
- Linezolid

**Albuterol
HFA vs.
Nebulizer**

- **4-8 puffs thru spacer is equivalent to 2.5 mg nebulized for acute asthma exacerbations**
 - Idris AH, McDermott MF, Raucci JC et al. Emergency department treatment of severe asthma. Metered-dose inhaler plus holding chamber is equivalent in effectiveness to nebulizer. *Chest.* **1993**;
 - Replacement of nebulizer therapy by an albuterol inhaler and valved holding chamber, Leslie Hendeles et. Al, *Am J Health-Syst Pharm*—Vol 62 May 15, **2005**
 - Review with 17 reference studies

Succinylcholine

- Distributed in extracellular fluid, and younger children have more extracellular fluid
- 2 mg/kg in children < 2 yrs old
 - I still pre-treat with atropine
- 1.5 mg/kg 2-10
- 1 mg/kg teenagers and adults

Corticosteroid Route

IV might be $\frac{1}{2}$ - 1 hour faster onset

IM, oral, IN, S.C. essentially identical

All routes have same duration

Almost never reason to give IM steroids in the ED

IM
Haloperidol
for sedation
of
dangerous
agitated
patients

- **IM Haldol**
 - **Peak action in agitated patients 30 – 45 minutes**
 - Package insert, Mcneil pharmaceutical
 - **Duration of sedation not listed, $\frac{1}{2}$ life 21 hours**
 - **Multiple side effects**

IM
Haloperidol
for sedation
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- **Other options:**
 - **IM ketamine (avoid in schizophrenics)**
 - **IM Benzodiazepines (avoid in respiratory depressed)**
 - **IM Droperidol (avoid in USA)**

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