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Dangerous Medication Mistakes

- Medication errors are common. One academic medical center evaluated error rates during medical resuscitations and found that 1 out of 2 doses was administered in error. (Gokham R, et al. Resuscitation 2012;83(4):482-7.)

- Treating Hyperkalemia with Insulin
  - Incidence of hypoglycemia
    - A 10 unit dose of IV regular insulin has an onset of action of about 5-10 minutes, peaks at 25-30 minutes, and lasts 2-3 hours. IV dextrose lasts about an hour.
    - **The overall incidence of hypoglycemia appears to be ~10%, but could be higher.** (Allon, et al. Kidney Int 1990;38:869-72) (Apel J, et al. Clin Kidney J 2014;0:1-3) (Schafers S, et al. J Hosp Med 2012;7:239-42)
  - Risk factors for developing hypoglycemia (Apel J, et al. Clin Kidney J 2014;0:1-3)
    - No prior diagnosis of diabetes
    - No use of diabetes medication prior to admission
    - A lower pretreatment glucose level
    - Renal dysfunction (Dickerson RN, et al. Nutrition 2011;27:766-72).
  - Strategies for avoiding hypoglycemia
    - http://www.aliem.com/hyperkalemia-management-preventing-hypoglycemia-from-insulin/. It is loosely based on the Rush University protocol (Apel 2014).

- Opioids are a frequent cause of litigation in ED cases, particularly hydromorphone
  - Hydromorphone 1 mg IV = Morphine 7 mg IV
    - Morphine 10 mg seems high, yet hydromorphone 2 mg raises little concern.
    - Starting morphine at 0.1 mg/kg (normal kidney function and age < 65 years)
    - A good strategy is start low, go slow
  - Naloxone
    - Doses ≥ 0.4 mg will result in withdrawal in patients chronically taking opioids.
    - Instead, start with 0.04 mg and administer 0.04-0.08 mg increments (Kim HK et al. *J Med Toxicol.* 2015 Aug 20. [Epub ahead of print])
    - Here's how to prepare it: http://www.aliem.com/trick-trade-naloxone-dilution/

- Epinephrine is one of the most problematic medications in the ED with regard to errors
  - Cardiac arrest concentration: **1:10,000** = 1 gm/10,000 mL = 1,000 mg/10,000 mL = **0.1 mg/mL**
  - Pretty-much-everything-else concentration: **1:1,000** = 1 gm/1,000 mL = 1,000 mg/1,000 mL = **1 mg/mL**
  - **The epinephrine ratio labeling is going away in May 2016 (at least in the U.S.)!**
    - http://empharmd.blogspot.com/2016/01/no-more-epinephrine-ratios.html?q=epinephrine
  - Here are a few ways to reduce errors:
    - Limit the number of epinephrine sizes/concentrations in your ED
    - Consider stocking epinephrine auto injectors for anaphylaxis/asthma

- Syringe labeling in the ED
  - The two critical pieces of information that must be on every syringe are: **drug name** and **concentration** (Kothari D, et al. *Br J Anaesth* 2013;110(6):1056-8.)
  - Further reading: http://www.aliem.com/art-of-syringe-labeling-in-the-ed/