

# DE-MSING EMS: WHY I'D GET RID OF MORPHINE SULFATE

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# PREHOSPITAL PAIN MANAGEMENT

- Morphine
- Fentanyl
- Hydromorphone
- Ketamine
- Ketorolac
- Tylenol
- Ibuprofen
- Lidocaine
- Whiskey
- Marijuana



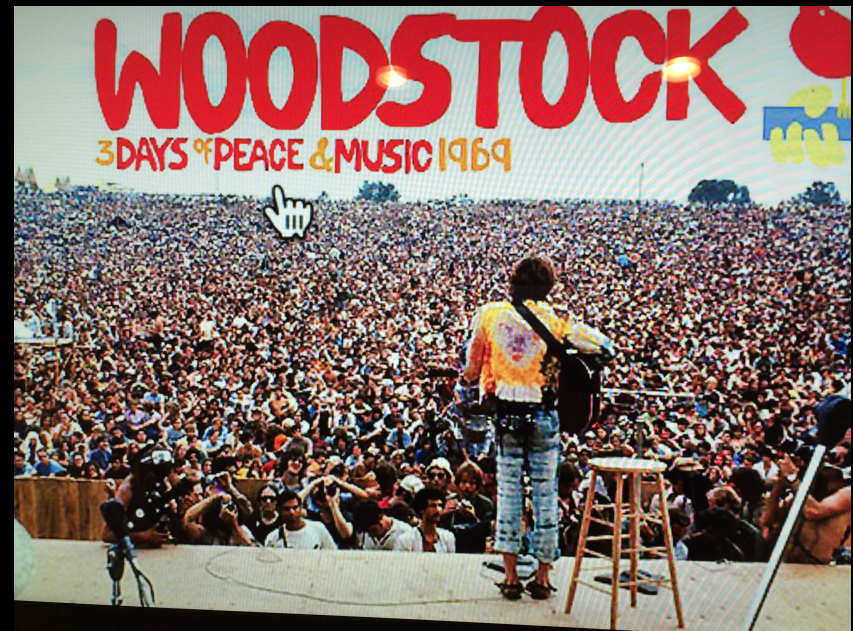
# MONA

- ✓ Morphine
- ✓ Oxygen
- ✓ Nitroglycerin
- ✓ Aspirin



# MORPHINE IN HEART FAILURE

- Rationale
  - 1960s
    - Vasodilatory properties
      - Decreased venous tone
      - Increased venous pooling
        - Decreased cardiac filling pressures
    - Anxiolytic effects
      - Reducing sympathetic nervous system activity
        - Lowering preload and afterload



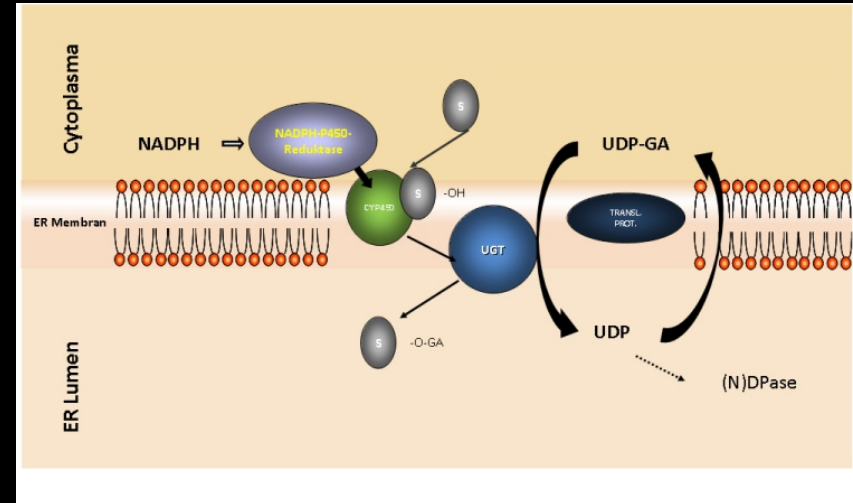
# MORPHINE IN CHEST PAIN

- Rationale
  - Reduction of
    - Sympathetic stress
    - Catecholamine release



# HIGHLY VARIABLE

- Metabolism
  - Enzyme UGT2B7
    - UDP-Glucuronosyltransferase-2B7
    - 2 active metabolites
  - Genetic polymorphisms in UGT
    - Darbari et al
      - Amer J Hematol 2008
  - Fentanyl/hydromorphone
    - CYP3A4





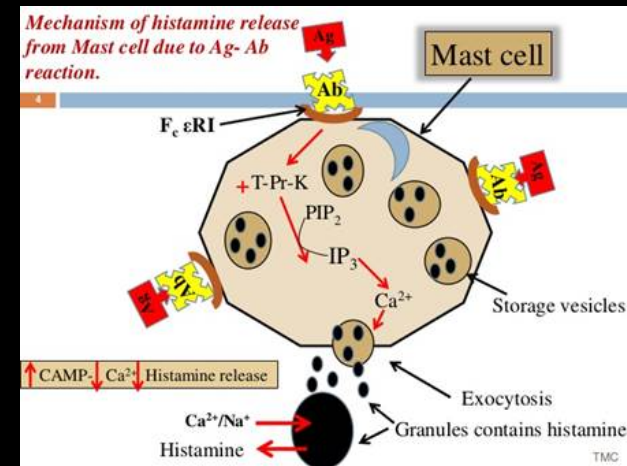
# MORPHINE HARM

- Nausea/vomiting
  - 1/5 to 1/3
    - Smith et al
      - Eur J Pharmacol, 2014
- Hypotension
  - Weldon et al
    - Prehosp Emerg Care 2016



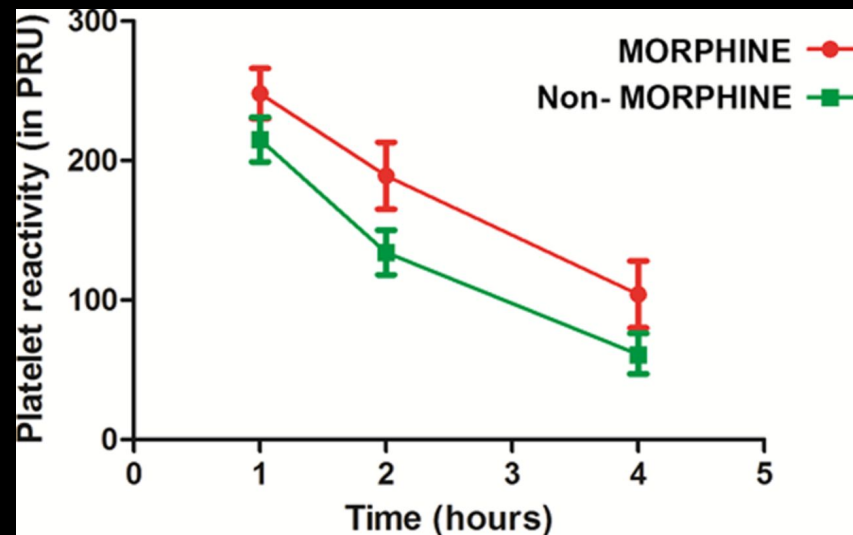
# MORPHINE HARM

- Histamine release
  - Barke et al
    - Life Sci, 1993
  - Shapiro et al
    - Crit Care Med 1995



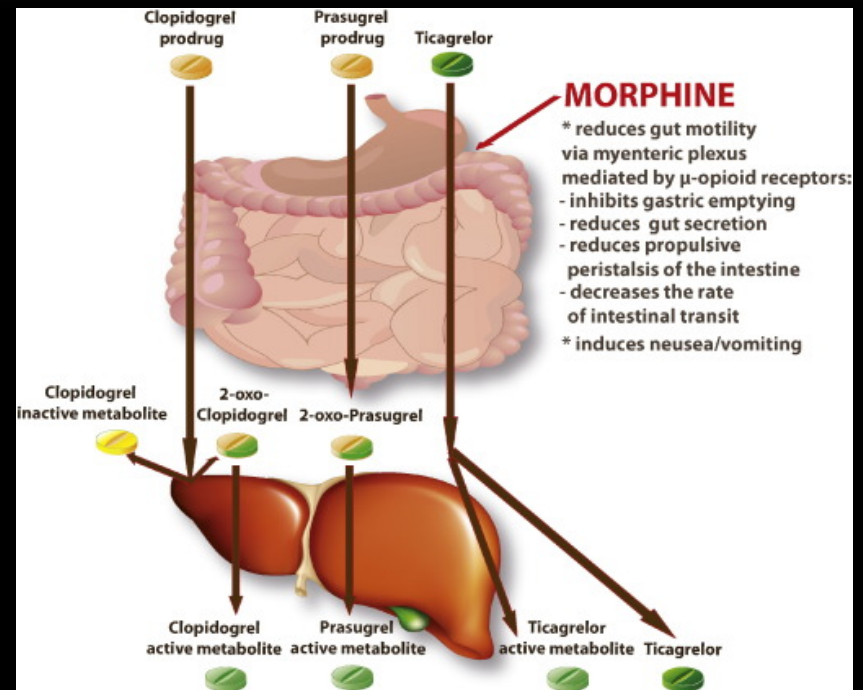
# MORPHINE HARM

- Attenuated platelet inhibition
  - Clopidogrel
  - Prasugrel
  - Ticagrelor
    - Kubica et al (IMPRESSION)
      - Eur Heart J, 2016
    - Montalescot et al (ATLANTIC)
      - N Engl J Med, 2014



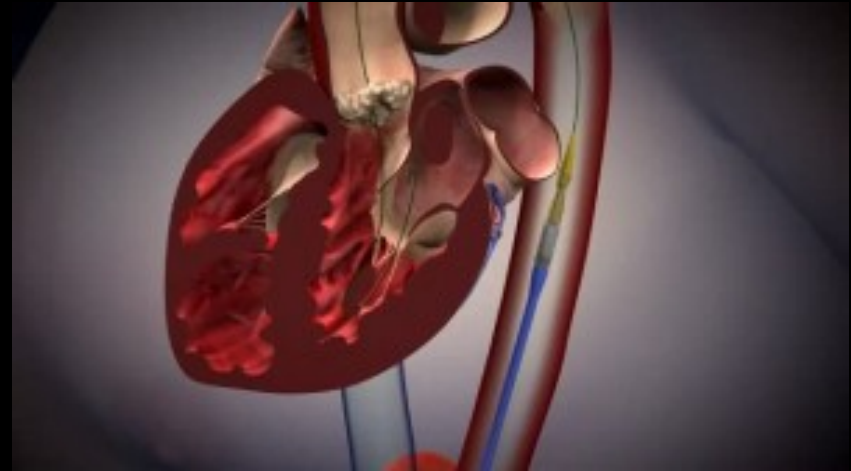
# MORPHINE HARM

- Morphine may impair the absorption of anti-platelet and other oral drugs by inhibiting normal gastric activity
- 5-fold increased likelihood of high platelet reactivity
  - Parodi, et al
    - Circ Cardio Interv, 2015



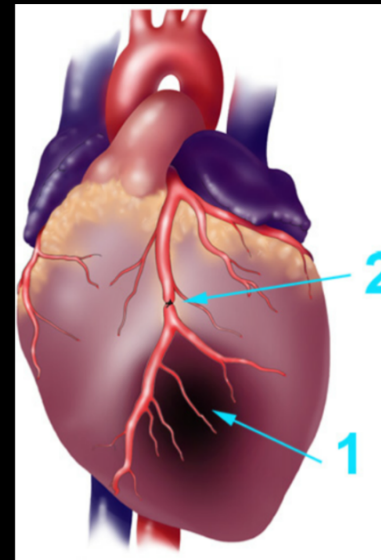
# MORPHINE HARM

- Depressed myocardium
  - Riggs et al
    - Circ Shock, 2016
- Respiratory depression
  - Radke et al
    - Clin Rev Allergy Immunol, 2014



# MORPHINE HARM

- ACS
  - Increased infarct size
  - Increased mortality
    - Meine et al (CRUSADE)
      - Am Heart J, 2005



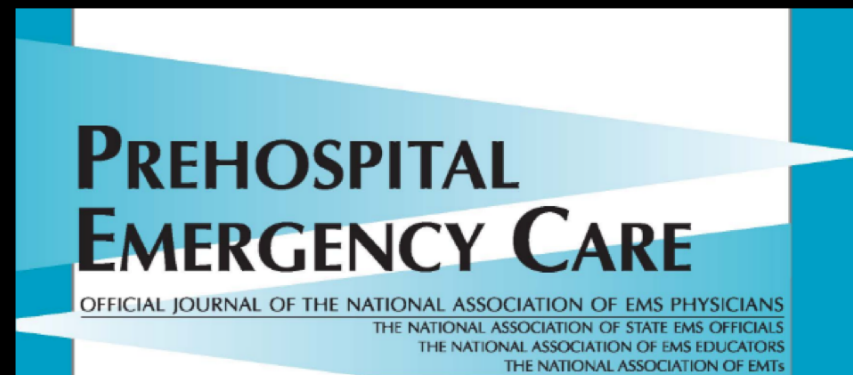
# MORPHINE IN HEART FAILURE

- Morphine increased the 30 day mortality when used in acute heart failure patients in the ED
  - At every time point
    - Miro et al, Chest 2017



# FENTANYL

- Highly lipophilic
  - Crosses blood-brain barrier rapidly
    - Onset is around 30 seconds
    - Off in 20 minutes
- Less side effects
  - Fleischman et al
    - Prehospital Emerg Care, 2010





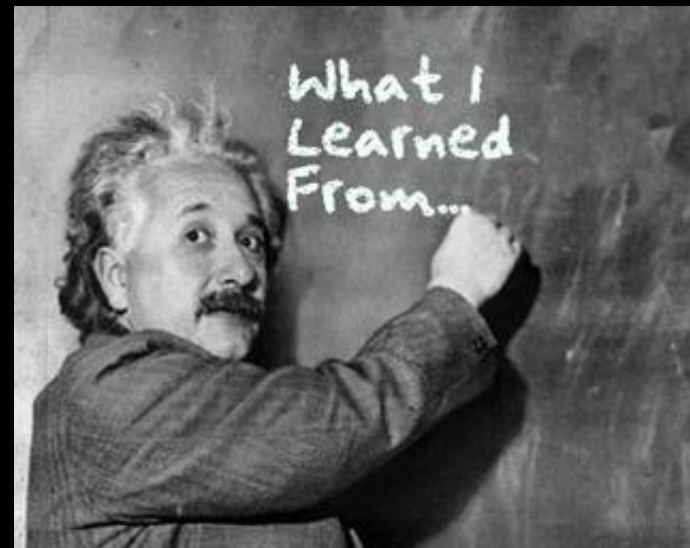
# FENTANYL VERSUS MORPHINE FOR CHEST PAIN

- Fentanyl
  - Comparable to morphine in providing analgesic effect
  - Less nausea and 1/2 emesis
  - Hypotension seen with morphine but not fentanyl
  - Safe and effective alternative to morphine
    - Weldon et al
    - Prehospital Emerg Care 2016



# TAKE HOME

- Morphine is unpredictable at best
- May cause harm
  - CHF
  - MI
    - Attenuating anti-platelet activity
  - NSTEMI



## TAKE HOME

- When you use opiates, switch to fentanyl if you have not already!
- If you need something longer acting, consider hydromorphone



# EMS MUSEUM

