Christopher B. Colwell, M.D.  
Denver Paramedic Division  
Denver Fire Department  

The Nose Knows: Intra-nasal Medication Options are Growing!
Intranasal Medications
History

- Treatment for allergies
- Earliest studies from the 1920s
- Outpatient/home management
  - 1970s
- Emergency medicine
  - 1990s
- Prehospital
  - 2000s
Nasal Administration

- Rich vascular plexus
- Avoids first-pass metabolism
- Comparable to IV
  - Better than SC, IM, or rectal
    - Sirsi et al, Neurology 2011
    - McMullan et al, Acad Emerg Med 2010
    - Coda et al, Anest Analog 2003
  - Olfactory mucosa directly to the brain and CSF
- Easy
- Convenient
Nasal Administration

- **Safe**
  - Less chance of blood exposure
- **Effective**
  - Holdgate et al, Acad Emerg Med 2010
- **No respiratory depression**
  - Sufentanil
- **Adults and kids!**
- **Painless?**
What Goes Up the Nose?

- Medications
- Drugs
- Foreign bodies
- Alcohol
Characteristics

- Lipophilic molecules
  - Small
- Physiologic pH
- Volume
  - 0.25 to 0.3 mls ideal
    - Some use up to 1 ml and more
- Surface area
  - Larger the better
    - Use both nostrils
Medications

- Naloxone
- Midazolam
  - Seizures or sedation
  - Dose: 0.2-0.4 mg/kg
  - Stings
  - Onset in 5 minutes
- Fentanyl
  - 1.7-2.5 mcg/kg
  - Does not sting
  - Onset in 5 minutes
More Medications

- Glucagon
- Epinephrine
- Atropine
- Ketamine
- Droperidol
- Propranolol
- Verapamil
As Tempting As It May Be....

- No adenosine
- No propofol
- No ondansitron
- No succinylcholine
- No bicarb
- No amiodarone
- No procainamide
Contraindications

- No nose
- Damaged nose
  - Trauma
  - Drug use
Pitfalls

- Failure to give an adequate dose
  - Technique is important
  - Midazolam dose
- Improper technique
30 responses
- 25 using IN
  - 3 soon
- 24 using narcan
- 18 using midazolam
- 11 using fentanyl
- 3 using glucagon
- 1 dilaudid
- 1 influenza vaccine
Conclusions

- Think intranasal
- IV not obsolete.....yet
- Many applications
  - Pain
  - Sedation
  - Seizures
  - Altered mental status
- Publish your experience