

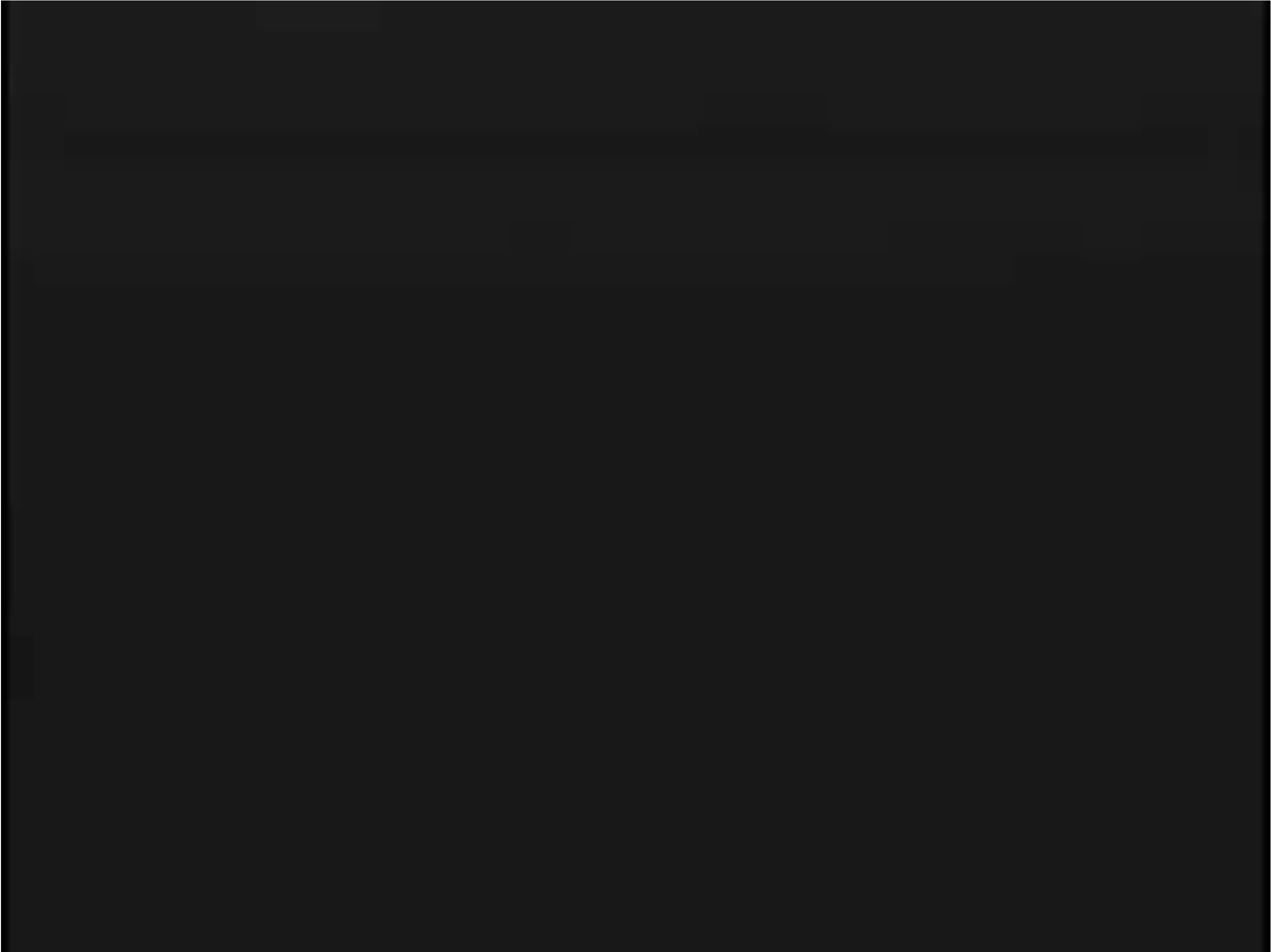
# Thinking Laterally

Expanding the Scope of Paramedic Practice

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**Let's UGA - WAGA**

**THIS FILM IS NOT YET**



**R**

**ATED**

# \$#IT that we carry

- An average of 200lbs
- Phone - sometimes 2
- Radio
- 3 pagers
- Leatherman
- Defib
- BLS stuff

# ALS Drug Box

- Resuscitative medications
- Anti-arrhythmic medication
- Respiratory medications
- Cardiac ischemia/malfunction medications
- Diabetic medications

# Reality

- Introduction of new medications is rare and resisted
- Space constraints will cause a practice drift rather than expansion
- The only way to expand is to use what we have

# The ALS Drug Box

The Route to Paramedics Owning Their Speciality



# Epinephrine

- Actions
- Uses
- Cardiac arrests
  - Dose in adults/children -
- Anaphylaxis
  - Dose in adults/children -

# Another Use

- Useful in respiratory distress, as a pressor and in allergic reactions with extended transport times
  - Nebulized epi
    - Croup
  - Asthma
  - Pressor

# Croup



# Croup

Voice Box

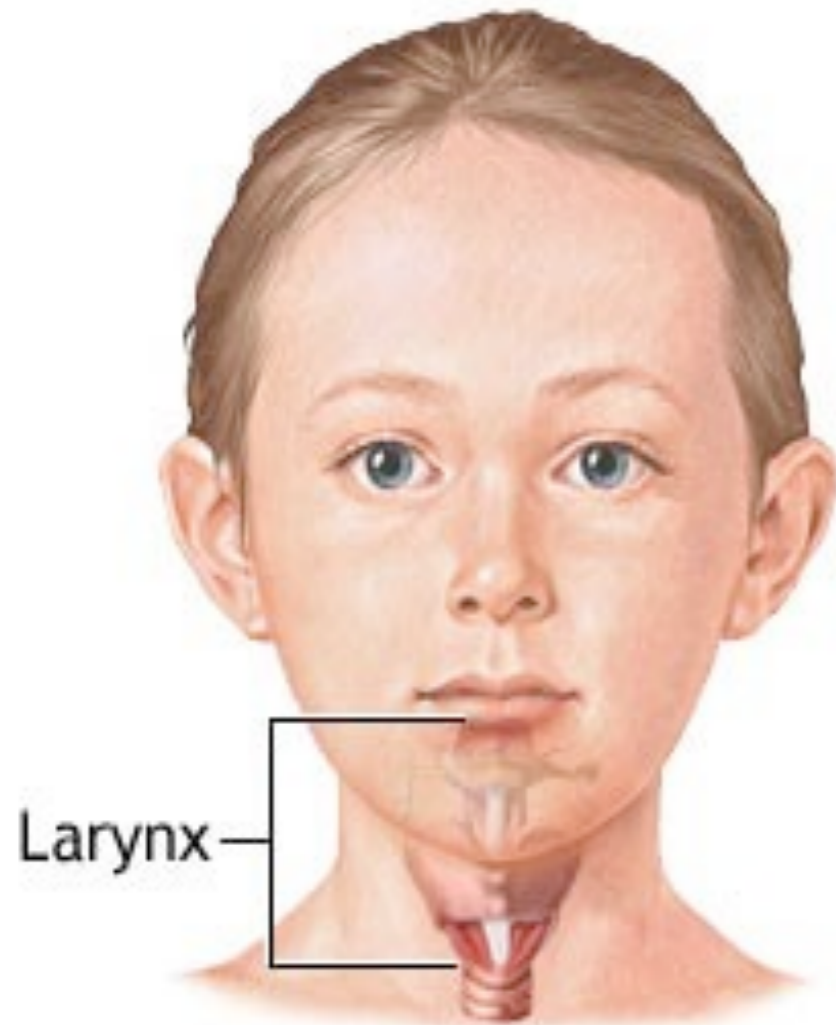


Front view



Vocal  
cords

Top view



Larynx



ADAM.

# Croup Score (Westley)

- LOC - Normal (0), disoriented (5)
- Cyanosis - None (0), with agitation (4), at rest (5)
- Stridor - None (0), with agitation (1), at rest (2)
- Air entry - Normal (0), decreased (1), severe (2)
- Retractions - None (0), mild (1), mod (2), severe (3)

# Westley Score

- Mild  $<2$
- Moderate 3-7
- Severe  $>7$

# Treatment of Croup

- Humidified Oxygen
- (Cold environment)
- Epinephrine nebs
- Steroids

# Epi Neb

- You can use 1:1000 L-epinephrine at 0.5ml/kg up to 5mls
- Can also be used in other airway swelling problems
- Not a curative treatment but “delaying” progression



# Epi Neb

- Asthma
- Anaphylaxis
- COPD
  
- Similar inhalational form found OTC

# Steroids?

- Steroids have now been introduced into some NYS protocols for EMS

# Magnesium

- Action – Smooth Muscle Relaxer
- Uses
  - Anti-eclamptic
  - Tocolytic
  - Asthma/COPD
  - Anti-arrhythmic and overdose management
  - Anti-hypothermic

# Eclampsia

- One or more seizures and or coma in a setting of pre-eclampsia
- Any time from 2nd trimester onwards
- Common cause of maternal death

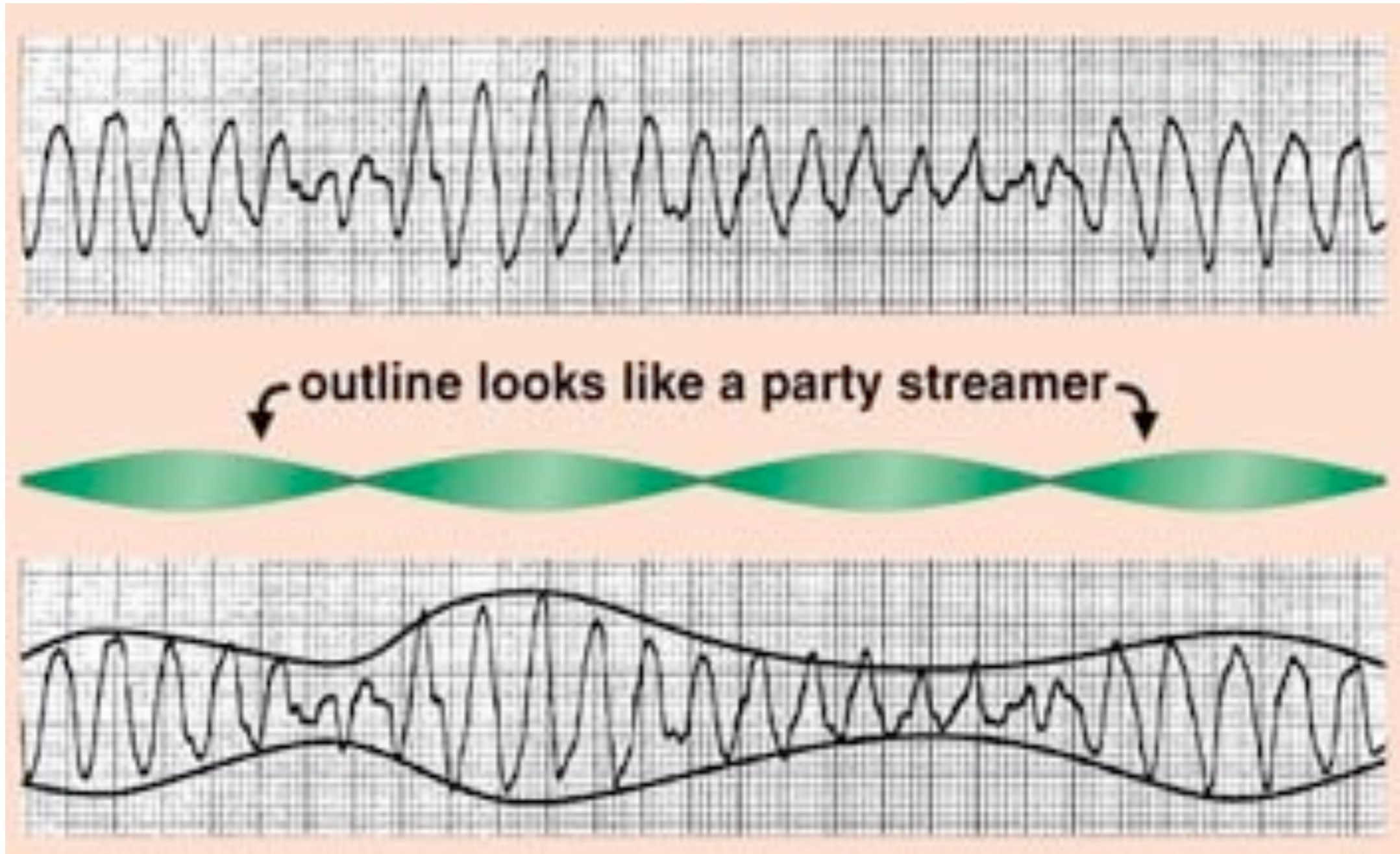
# Eclampsia

- Occurs in 5/10,000 live births
- Increased incidence in
  - Nonwhite
  - Nulliparous
  - Low socioeconomic class
- 50% before term, 33% at term, 17% post-term

# Eclampsia

- Treatment – Deliver the baby
- Seizure management
- Magnesium has been shown to be better than benzodiazepines
- Pre-eclampsia is a “heads up” (5-8% of pregnancies)

# What is this?



# Magnesium

- Cardiac – Torsades
- Asthma/COPD
- Anti-arrhythmic
- Anti-hypothermic
  
- A whole load of controversy



# Magnesium

- Safe, cheap, easy to dose.
- Dose is 1-2g IVP

# Magnesium

- Now used in EMS in SVT/Atrial Rhythms
- Used in overdoses that cause wide QRS
- High dose use in hypothermia management

# Magnesium

- In COPD and Asthma
  - It works the best in the worst patients

# Sodium Bicarbonate

- Actions?
- Uses?

# Sodium Bicarbonate

- Bicarbonate donator
  - Severe acidosis
  - “Pressor actions”
- Sodium donator
  - Tricyclic overdose
  - Low sodium seizures

# Sodium Bicarbonate

- Theory (2008)
  - Low pH is bad
  - Bicarb increases pH
  - Improves cardiac health
  - Risk outweighs benefit
- Only benefit was shown in 1 study of VFib dogs. Not shown in humans.

# Theory of Paradoxical Acidosis

# TCA Use

- Commonly used from 1950s-1990s
- Now making a return
- Chronic pain, panic, OCD, enuresis
- Still an awesome antidepressant
- Absorption 2-6 hrs
- May delay gastric emptying



# TCA OD

- Clinically
  - Hypotension
  - Arrhythmias
  - Anticholinergic
  - Confusion
  - Seizures

# Cardiac Effects

- Increase in PR interval
- Widening of the QRS
- Sinus tachy is the first sign (Vagolytic)
- Refractory Hypotension
  - Decreased contractility
  - Peripheral vasodilation

# Bicarbonate

- Change blood pH to allow more protein binding of TCA
- Sodium donator

# Magnesium

- Used to shorten the QRS

# Benzodiazepines

- TCA lower GABA
- Seizures are really bad sign
- Use BZD, but NOT phenytoin....why?

# Glucagon

- Action
- Uses

# Other Uses

- Food impaction
- Anaphylaxis
- Beta-blocker overdose

# Beta-Blockers

- Uses – Drop BP, angina, heart failure, migraines and tremor
- Beta 1 – Heart
- Beta 2 – Smooth muscle
- Beta 3 – Adipose tissue



# The Beta-Blocker Problem

- Where does epi act?
- How?
- So what is the problem?

# Beta Blocker OD

- How is it managed?
  - Fluids
  - Atropine
  - Glucagon
  - Calcium
- Will epi work?

# Anaphylaxis

- How do we manage anaphylaxis?
- And in a beta-blocker patient?

# Glucagon

- Using glucagon to bypass the beta blocker mechanism

# Vasopressin

- Uses
- Dose

# Vasopressin

- “That drug that you can use instead of epi.....but is a PITA to draw up.....so I just use epi”

# Vasopressin

- Acts at vasopressin receptors
- Similar action to Epi
- Animals in cardiac arrest with higher doses of endogenous vasopressin had higher rates of survival

# In Hospital vs EMS

- What are the differences between in-hospital cardiac arrest and EMS cardiac arrest?



# Is the key acidosis?

- Vasopressin found to be more effective in cardiac arrest where the presenting rhythm is asystole.
- Vasopressin is used in sepsis as a pressor.

# New Uses

- Uses as the acidotic pressor
- Used in penetrating trauma to the abdomen

# Vasopressin

- New actions
  - Acts as a pressor despite the acidity of the tissue
  - Diverts blood away from the abdomen and to the central circulation

# Vasopressin

- Take 40 units - add to 1000cc
- Run at 1cc/min

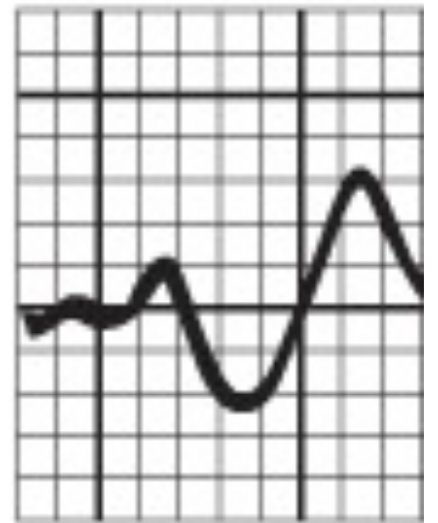
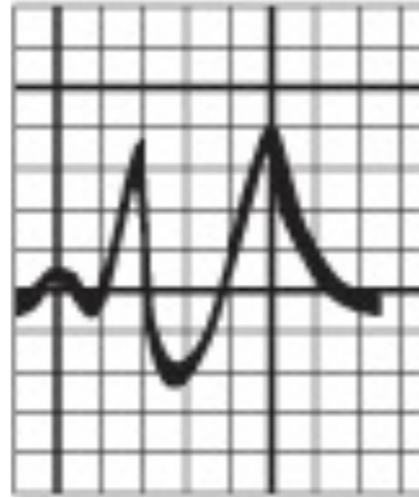
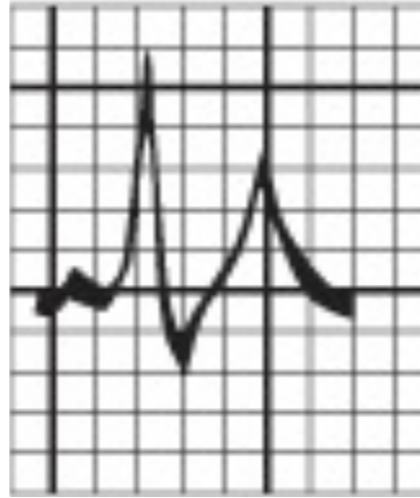
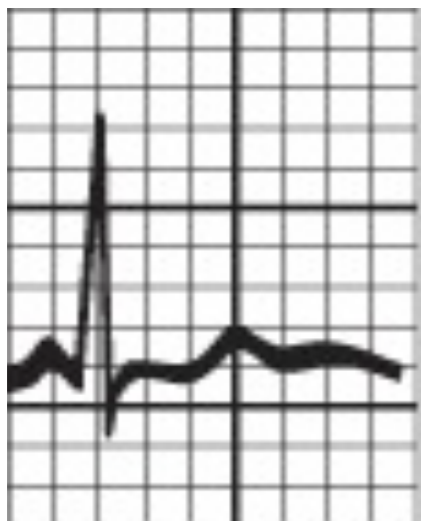
# More to the Vasopressin Story?

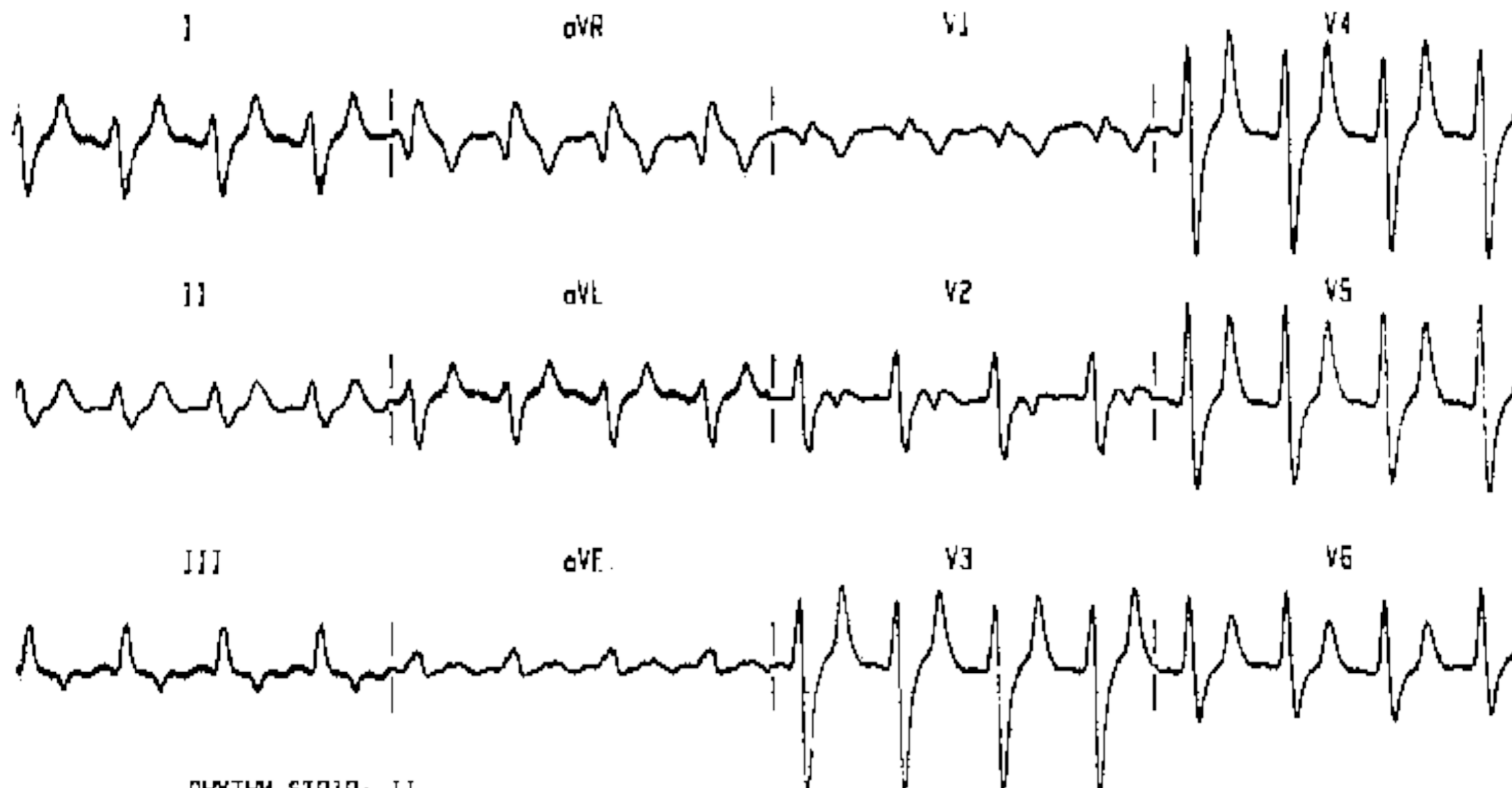
- Given the acidosis is one of the major factors that stops epi working.....
- High dose rapid bicarb is now returning

# The Trauma Story

- Pressors generally not used in trauma because it was felt it was a volume issue.
- Last year - everyone was talking low volume resuscitation.
- This year - maybe suggesting vasopressin in certain circumstances.

# Final Medication Story



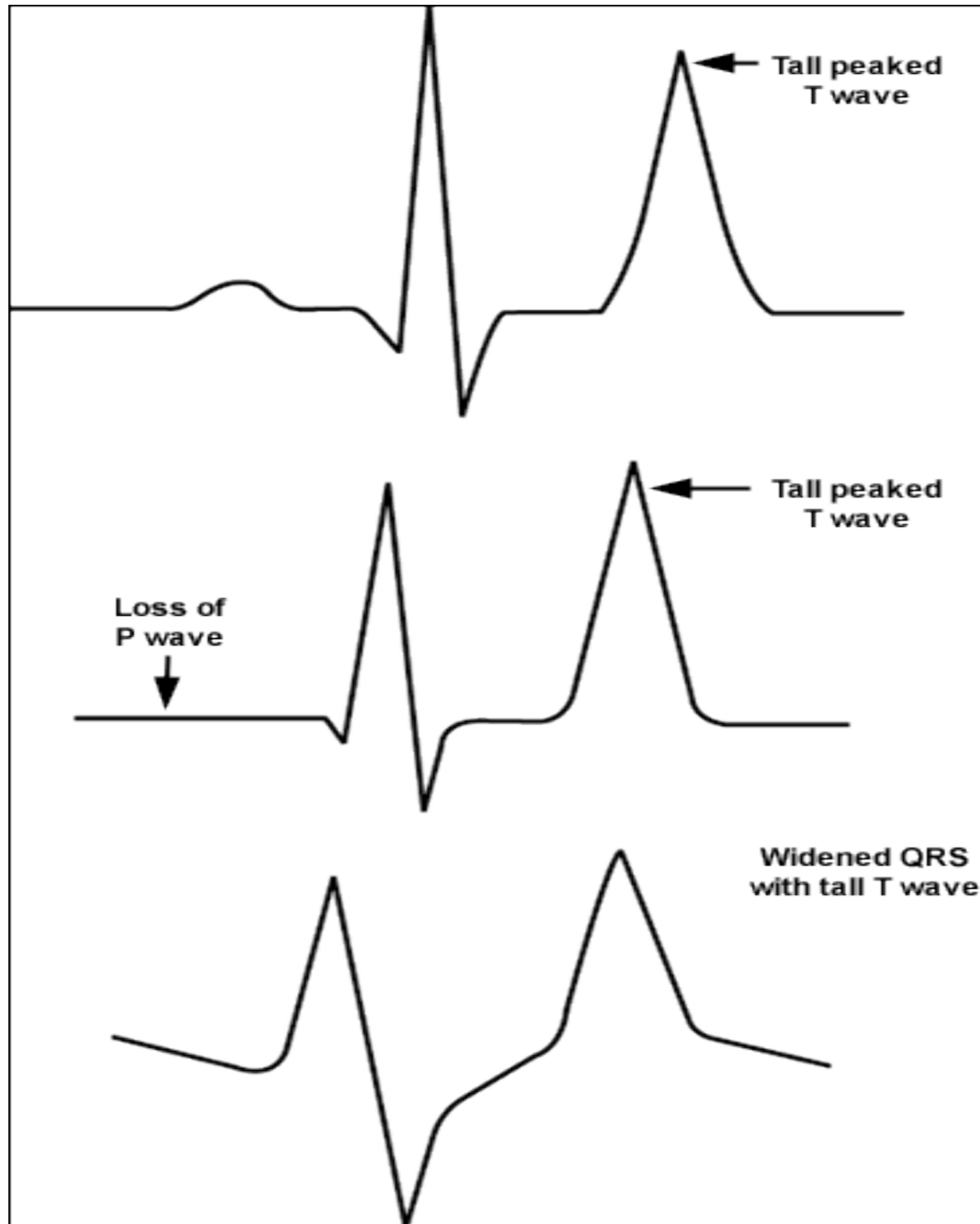


RHYTHM STRIP: II  
 25 mm/sec; 1 cm/mV

LGC 00000-0000

~ 40 07





# How Do You Treat?

- Negate it
- Dilute it
- Push it into cells (move it)
- Remove it

# What do you have?

- Calcium Chloride
- Bicarbonate
- Albuterol
- Normal Saline

# Innovation and Change?

- Not just restricted to the realm of medications

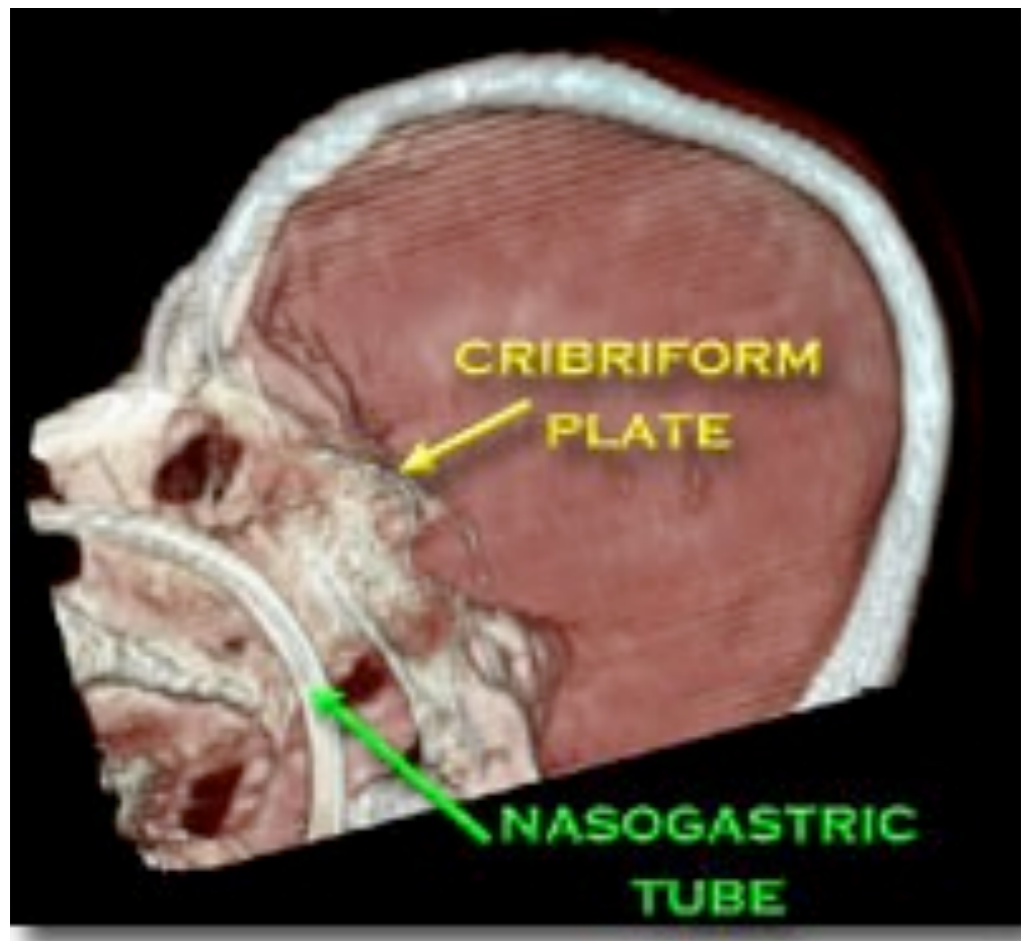
# NASCAR

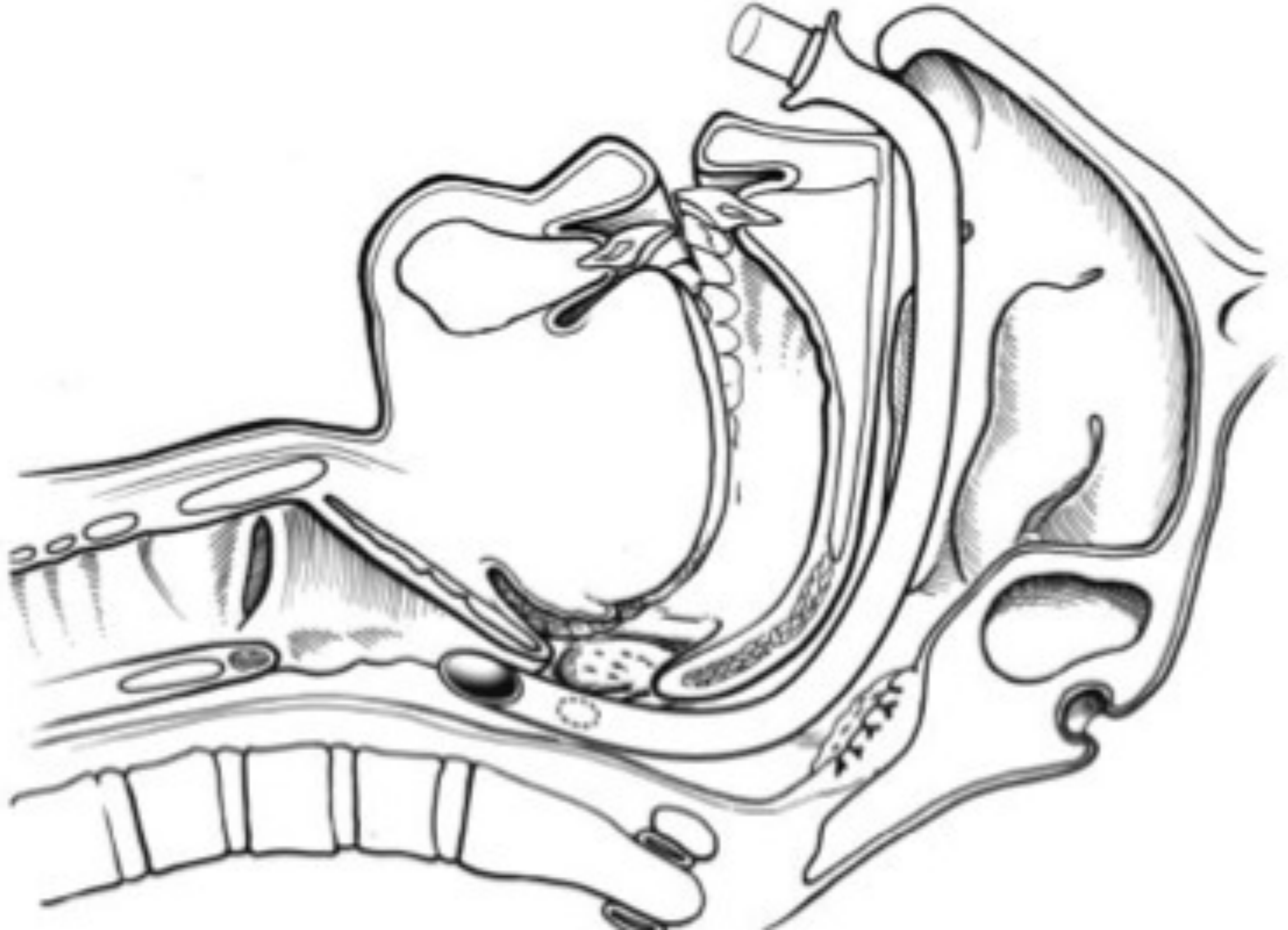


# Possibility?



# But....







# Nascar Airway

- Also known as a Trumpet Airway Device

# Now - TAD+Endotrol





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