

**THERE'S NOTHING "BASIC" ABOUT IT!**

**PHARMACOLOGY  
FOR THE  
EMERGENCY MEDICAL  
TECHNICIAN**

*Presented by*

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**WHAT IF I TOLD  
YOU**

**THERE IS NO "BASIC" LIFE  
SUPPORT**



**<sup>1</sup>BA·SIC**  
***ADJECTIVE \ 'BĀ-SIK ALSO -***  
***ZIK\***

- Rudimentary
- Fundamental
- Non-invasive

# WHAT'S SO "BASIC" ABOUT....

- Sending electricity through people's bodies?
- Sticking people with big needles?
- Shooting meds up somebody's nose?
- Giving drugs that can bottom out blood pressure?





# HERE, EAT THIS





# NOT QUITE.....



- **“I will not eat your unnatural and possibly dangerous blue consumables unless I am provided with complete information as to it’s contents and actions. To do so, despite your assurances, would be illogical.”**

**I REALLY DONT KNOW MUCH ABOUT ALL THESE  
MEDICATIONS**



**LET ME CALL A BUDDY WHO'S  
AN EXPERT**



# PHARMACOLOGY

1. The branch of medicine concerned with the uses, effects, and modes of action of drugs.
2. A subject that is often given too little attention in EMT classes and which many EMTs are minimally concerned with.



# **WHAT YOU NEED TO KNOW ABOUT EVERY DRUG YOU GIVE**

- **Generic and trade names (ALL of them!)**
- **How the drug is classified**
- **What the drug is for (indications)**
- **How does it work in the body (mechanism of action)**
- **How quickly it works (onset of action)**
- **How long it lasts (duration of action)**

# **WHAT YOU NEED TO KNOW ABOUT EVERY DRUG YOU GIVE**

- **What routes can it be given by (whether or not you can do all of them)**
- **What's the correct dose**
- **What are potential side effects**
- **When should you NOT give the drug? (contraindications)**



## **AND BEFORE YOU GIVE THE DRUG...**

- **Make sure you did a COMPLETE history and physical exam appropriate to your situation**
- **Make sure you found ALL the patient's current medications including OTC's**
- **Make sure you have the right presumptive diagnosis, NOT just the patient's chief complaint or symptoms!**

***Remember: giving medications is a clinical  
DECISION!***

**ONE DOES NOT SIMPLY GIVE  
DRUGS**

**BECAUSE A PROTOCOL SAYS  
SO**



# ASPIRIN



- **Names: Acetylsalicylic Acid**
- **Found in many OTC products**
- **Class: Analgesic, anti-inflammatory, antipyretic, inhibits platelet aggregation (NOT a “clot buster”!)**
- **EMS Indication: Chest Pain suggestive of MI**

# ASPIRIN

- **Onset of Action: Peak within 1 hour**
- **Duration of Action: Several days**
- **Routes: Oral**
- **Dose: 162-325 mg, must be chewed for rapid absorption**
- **Side effects: Gastrointestinal bleeding**
- **Contraindications: Known allergy, history of bleeding disorders. Do NOT use enteric coated versions.**





# ALBUTEROL

- **Names: Proventil, Ventolin, others**
- **Class: Bronchodilator, sympathomimetic**
- **EMS Indication: Exacerbation of Asthma or COPD {paramedics} due to bronchospasm**
- **Mechanism: Stimulates beta-2 receptors producing bronchodilation**
- **Onset of Action: 5 to 15 minutes**
- **Duration of Action: 3-4 hours**



# ALBUTEROL



- **Route: Inhalation/nebulization**
- **Dose: Unit dose of 1 vial 0.083% solution (3cc's) given at a flow rate that will deliver the drug over 5-15 mins. ( 6 lpm O2)**
- **Side Effects: tachycardia, nausea, anxiety, cough, dizziness, hypertension**
- **Contraindications: Hypersensitivity to the drug, tachydysrhythmias, respiratory failure, use with caution in patients with cardiac disease**



# EPINEPHRINE

- **Names: Adrenalin, Epi-Pen, Auvi-Q**
- **Class: Sympathomimetic**
- **EMS Indications: Anaphylaxis, Asthma (medical control)**
- **Mechanism: Vasoconstriction, bronchodilation,, increased heart rate, increased force of contraction**
- **Onset of action: Rapid, within minutes**
- **Duration of Action: Short acting; has a half life of 2 minutes**



# EPINEPHRINE

Place injector against patient's thigh  
midway between waist and knee.  
Push and hold for 10 seconds.



- **Routes: Intramuscular in the thigh (IV for paramedics)**
- **Dose: 1 auto injector (0.3mg of a 1:1000 solution) for adults**
- **Side effects: tachycardia, hypertension, anxiety, tremors, dizziness, increase in myocardial oxygen demand**
- **Contraindications: None in anaphylaxis. Can cause side effects typical of sympathomimetics, but they are outweighed by the benefit in reversing anaphylaxis.**



# NITROGLYCERIN

- **Names: NitroDur, Nitrostat, NitroBid, others**
- **Class: Vasodilator, Anti-Anginal, Nitrate**
- **EMS Indication: Ischemic Chest Pain**
- **Mechanism: Relaxes smooth muscle**
- **Onset of Action: 1 to 3 minutes**
- **Duration of Action: 25-30 minutes**



# NITROGLYCERIN



- **Routes:** Sublingual tablet or spray for EMT use, patch, topical ointment, IV
- **Dose:** 1/150 gr or 0.4mg tablet or spray, but comes in several doses and patients may have different doses than protocol
- **Side effects:** Hypotension, headache, flushing, reflex tachycardia, burning sensation under the tongue
- **Contraindications:** Hypotension, use of erectile dysfunction medications within 72 hours.



# ED DRUGS? THEY DON'T WANNA TELL YA! {SO IT DEPENDS ON HOW YA ASK!!}

Ask your doctor if medical advice from a television commercial is right for you.



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# OXYGEN

Oxygen is Good! All the time!!

(uhhhh...maybe NOT!)





# **SOME QUESTIONS ABOUT O<sub>2</sub>** **(THAT MAKE EMS PEOPLE UNCOMFORTABLE)**

- **Can there be too much of a good thing?**
- **Could too much O<sub>2</sub> harm patients?**
- **Are we giving high con O<sub>2</sub> to everyone just because we always have?**



# **CURRENT THINKING ON OXYGEN**

- **Oxygen remains an important and vital treatment for those who need it**
- **“Who needs it” should be evaluated by pulse oximetry and titrated to maintain SpO<sub>2</sub> above 94%**
- **Patients at high risk for hypoxia benefit most ie: airway compromise**
- **High concentrations of oxygen given to those with SpO<sub>2</sub> above 94% may lead to the production of free radicals which can cause cell damage**



# ARE WE CLEAR?

- **Hyperoxia can cause potential problems, but**
- **Prolonged hypoxia kills**
- **Never withhold oxygen, but use critical thinking when giving!**





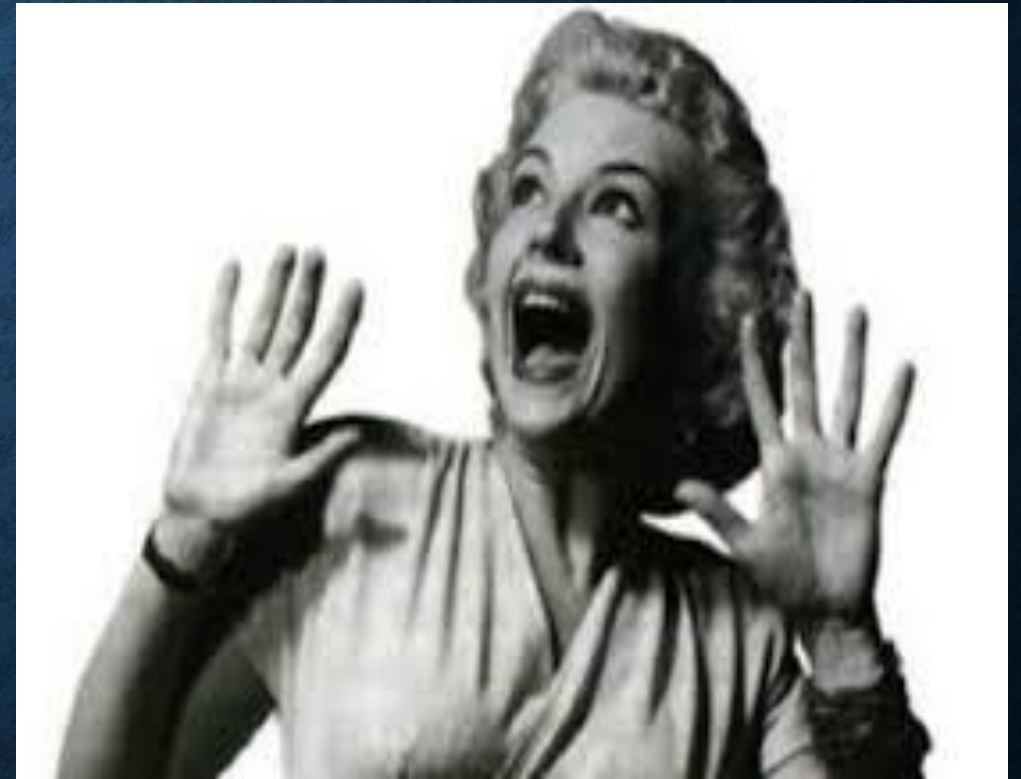
*And Now*

**OUR FEATURE  
PRESENTATION**



# **ATTACK OF THE KILLER NALOXONE**

**An insidious PLOT  
to DESTROY the  
very FABRIC of  
EMS systems !!**



# NALOXONE



- **Forget all the controversy about who should give it and why. Naloxone is now part of the EMT toolkit and has been used safely in EMS for almost 40 years.**



# NALOXONE

## NALOXONE: WHAT IS IT?

Naloxone, sold under the brand name Narcan, is a medication that can reverse an overdose caused by an opioid drug. When administered during an overdose, naloxone blocks the effects of opioids on the brain. It is quick acting and can cause immediate reversal of opioid effects within several minutes. If naloxone is given to a person who is not experiencing an opioid overdose, it is harmless. Naloxone has no potential for abuse.

Source: Ohio Department of Health



# NALOXONE



- **Naloxone is given intranasally by EMT's and can also be given IM or IV by paramedics.**
- **Dose: 0.4mg to 2.0mg; intranasal dose is 2mg**
- **Onset: Within 2 min.**
- **Duration: 30-60 min.**



# NALOXONE



- **Response to Naloxone is usually immediate BUT remember...**
- **The goal is to restore adequate breathing, NOT “raise the patient from the dead”**
- **Possible side effects: Withdrawal symptoms, vomiting, agitation**

# **KNOW YOUR PROTOCOL DRUGS? THAT'S NOT ENOUGH!**



- **Patient meds can interact with or block the actions of EMS drugs**
- **The patient's meds can give important clues about history**



# **KNOW YOUR PROTOCOL DRUGS? THAT'S NOT ENOUGH!**

- **Polypharmacy is a common problem, especially in the elderly**
- **EMT's should know patient meds as well as protocol meds!**
- **Do drug cards on any meds that are new to you! Use available references!**



# IF PHARMACOLOGY IS \$000000 IMPORTANT FOR EMT'S.....

- **Why is so little time devoted to it in EMT classes ?**
- **Why are the blind leading the blind?**
- **Why isn't there a specific medication administration skills station in the PSE?**





# I WANT YOU



- **To know your meds!**
- **To know how they work!**
- **To know “WHY” and not just regurgitate protocol!**
- **To reject the low expectation approach to care!**

Be the change  
you wish to see  
in the world  
Gandhi

