EARLY IMPACT BLS
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WHAT MAKES A DIFFERENCE IN EMS?
BECAUSE WE WANT TO SPEND TIME DOING THOSE THINGS AND NOT WASTE TIME ON DOING THE THINGS THAT WASTE TIME.

THE MEDICATIONS BLS USE
- THE MEDICATIONS THAT BLS USE
- MANAGEMENT OF TRAUMA - HEMOSTASIS/PELVIC COMPRESSION/TRACTION
- ALS PROVIDERS
- LIGHTS/SIRENS/GOLDEN HOUR/EMD CODES/FIRST RESPONSE

MEDICATION LIST
- OXYGEN
- ALBUTEROL
- EPI-PEN
- ASPIRIN

OXYGEN
- Does oxygen hurt the patient?
OXYGEN

- Discovered by a Scotsman - John Scott Haldane.
- Responsible for the first gas mask and first space suit.

FIRST - DO NO HARM

OXYGEN

- YOU CAN’T PUT OXYGEN ON A COPD PATIENT OR THEY WILL STOP BREATHING!
- YOU HAVE TO PUT OXYGEN ON EVERYONE BECAUSE IT ALWAYS HELPS AND NEVER HURTS!
- GIVE SOME OXYGEN TO SOME PATIENTS AND NONE TO OTHERS!

COPD ISSUE

- Significant hypoxia for 4-6 minutes will cause cardiac arrest.
- The actual level of hypoxia is unclear but levels above 50mmHg appear to be sufficient. (Mnemonic 30 to 60, 60 to 90).

COPD

- COPD patients live at lower oxygen levels
- Evidence is to keep the paO2>50 (Sat > 88%)
- The concern is that the COPD patient retains CO2 and becomes less responsive. This happens over a long time frame and is not a concern for EMS.
**COPD**

- There is some evidence that immediate high dose oxygen can cause a rapid rise in CO2 - however this is not a concern for EMS = hypoxia/COPD = oxygen good.

**HIGH DOSE OXYGEN**

- One other group - Neonates
- Again - not an EMS concern

**OXYGEN**

- Benefit from routine oxygen is mixed
  - In myocardial infarction studies
    - Maroko - Reduction in infarct size in non-hypoxic animals with LAD lesions
    - Madias - Showed improvement in ECG in humans with MI
    - Rawles - Failed to show benefit in MI patients

**PRE-OXYGENATION**

- Desaturations during intubation are linked to worse outcomes in EMS
  - 100% pre-oxygenation will stop ALS killing patients!

**SUMMARY FOR OXYGEN**

- Risk is minimal in EMS but there are some long term concerns for patient management
- Saturation probes have allowed a better management scheme to be developed
- Plan - Standard of care but consider nasal canula versus 100% NRB

**NASAL CANULA VS 100% NRB**

- 100% for
  - Extreme SOB, preoxygenation prior to intubation
- Nasal canula for
  - Less sick, trying to keep the saturation above 90%
EPI-PENS

- For use in anaphylaxis
- NOT for allergic reactions!

ANAPHYLAXIS

- Severe allergic reaction
- Systemic symptoms

ANAPHYLAXIS

- Skin - Itch, hives, rash
- Mucous membranes - Swelling
- Breathing - Bronchospasm and wheezing
- Vital signs - “SHOCK”. Dropping blood pressure.

ANAPHYLAXIS

- Caused by a massive release of histamine and other chemicals causing an extreme allergic response in a system that is primed to respond
- 1% of patients will die from it (1500 deaths/year in the USA)

ANAPHYLAXIS

- Can be triggered by multiple triggers and via multiple routes
- Common triggers are bee stings, drug (PCN) and peanuts
ANAPHYLAXIS

- BLS treatment is simple - Decon, epipen, oxygen, rapid transport
- EPI-PEN
  - 2 types (child and adult)
  - Intramuscular injection
  - Onset in 5-15 minutes
  - Duration - Theoretically 1-4 hours

EPI-PEN

- Teaching should always be that “this is just a holding measure until we can get you to hospital”
- Why?

EPI-PEN

- The effect of the epipen may be overcome by the ongoing reaction - multiple doses may be needed and other medications will have to be given

EPI

- Used in cardiac arrest, anaphylaxis, croup and other emergency situations (has been used in asthma)
- Cannot be given orally
- Absorbed in muscle, sub-cutaneously, intravenously and over membranes

EPI

- What you will see when you give it
  - Tachycardia/elevated blood pressure
  - Anxiety
  - Tachypnea
  - Dilate pupils
  - “Fight part of the fight or flight response”

When they get to hospital
- May get further epi
- Anti-histamines
- Steroids
- Supportive management
THE PATIENT WILL BE DEAD IN THE NEXT 3-5 MINUTES
SO TREAT IT

ALBUTEROL

- “and Albuterol”
- Used in the treatment of bronchospasm (wheezing)
- Indicated in the treatment of asthma and allergy

ALBUTEROL

- Similar to epinephrine
  - Epi - Acts on alpha and beta receptors
  - Albuterol - Acts on beta 2 receptors

ALBUTEROL

- Typically given via nebulizer - getting it directly to the receptors that it wants to influence
- Dose 2.5mg (Can go 15mg/hr)
- The dose is somewhat unimportant because most of it goes into the air

ALBUTEROL

- Set the flow to allow misting and provide oxygenation to the patient
- Indicated in asthmatics with wheezing and shortness of breath
- It works - Its safe - Just do it

ALBUTEROL

- Set up the nebulizer and then switch on the oxygen (unless you want to taste it)
ASPIRIN

- Included in NYS BLS protocols
- Indicated in patients with chest pain of presumed cardiac origin
- Dose is 2-4 x 81mg (Baby aspirin)
- Cheap - But represents the biggest bang for the EMS buck!

ASPIRIN

- ISIS-2 Study - Mortality benefit if patients get ASA
  - Later study (Friemark) showed patients that received early aspirin in myocardial infarction had a reduced mortality (1.6 vs 3.5 hours, p<0.001, 1200 patients studied)
    - 7 days - 2.5% vs 6% (p=0.01)
    - 30 days - 3.3% vs 7.3% (p=0.008)
    - 1 year - 5% vs 10.6% (p=0.002)

ASPIRIN

- Contra-indications
  - Aspirin allergy
  - Children < 12
  - You can give it if they are on coumadin, plavix or aspirin
  - You should give it even if they say they think that they took one earlier

ASPIRIN

- Studies have shown that people say they have taken aspirin but when you go back and look they have taken tylenol, ibuprofen or other OTC medications

ASPIRIN

- Originally developed in the late 1800s by Bayer
- Became popular during the 1918 pandemic flu
- In the 1980s benefits for cardiovascular health were discovered
- Remains one of the best treatments for migraine (more effective than imitrex)

TRAUMA MANAGEMENT

“Squeeze it, compress it, pull it straight”
DOES BLS MANAGEMENT OF TRAUMA MAKE A DIFFERENCE?

HEMORHAGIC SHOCK

- What is shock?
- What happens when you bleed?

SHOCK

- Reduced tissue perfusion resulting in decreased delivery of oxygen and nutrients that are needed for cellular function
- Hypovolaemic shock is the most common

SHOCK

- The body responds to divert blood to the needed organs
- A decrease in volume causes the body to release:
  - epinephrine
    - Causes an increase in heart rate, peripheral vasoconstriction and a sympathetic squeeze to the central organs
  - Many other things happen
    - Hormones released cause water retention and release of sugar from body stores
AGE

- Children - Smaller blood volume (they are hit harder), under 2 the kidneys do not conserve well, surface area is large causing heat loss
- Old people - Compensatory mechanisms are blunted and often their organs cannot take the decreased perfusion

HOW FAST?

- Cardiac stroke volume is 70-80cc
- Heart rate is 100 = 7 lts per minute
- Body has about 5 lts of blood

BLOOD OVER IV FLUIDS

- IV fluids are aimed at restoring a volume to allow the heart to pump - restores pre-load
- No fluids do the job of blood. Not even blood!

MANAGEMENT

- If it is bleeding - You need to stop it
  - Compression
  - Traction of bones

QUIK CLOT

- Acts by absorbing all water from the blood
- Pour it on to wound and then dress
- Action is to dry out blood leaving the clotting factors
In a 1992 study - the average blood loss from a midshaft femur fracture was 1.276 L. Fracture pattern and velocity of injury did not correlate to blood loss. May be complicated with arterial bleeding also.

The insertion of the muscles predisposes to displacement - which makes more bleeding likely. Traction overcomes the muscle pull and re-opposes the ends of the bones - reducing bleeding and building its own muscular bandage.

The concept of getting a patient to definitive trauma care within one hour.

NO
On average 43.5 seconds faster - No clinical impact.
GOLDEN HOUR

- No
- Oregon 2010 - 3600 major trauma patient - Every minute of transport time had an OR of 1. Same for 10 minute blocks

AEDS

- YES
- Multiple studies now show early defibrillation improves survival with survival rates improved anywhere from 2-20%

EMD CODING

- YES
- Shown to safely triage calls to lower acuity and now being used in refusal of service

ADVANCED LIFE SUPPORT
ALS

- NO (and YES)
- Studies out of Canada are showing that in general stay and play does not work
- Effective strategies have been brought to the BLS level
- Very few ALS interventions that make a difference

SURVIVING SEPSIS
BLS ROLE

SEPSIS

- Surviving sepsis is centered around recognition and proactive management
- BLS need to call ALS or inform the hospital PTA

VITALS

- If they have 2 of the following
  - HR > 90
  - Temp > 38.3°C (100.9°F) or < 36°C (96.8°F)
  - RR > 20
  - Altered mental status
  - Glucose > 120 (if non-diabetic)

HISTORY

- Is the history suggestive of new infection?
  - Pneumonia
  - UTI
  - Abdominal pain / diarrhea
  - Meningitis
  - Cellulitis / septic arthritis / wound infection
  - Indwelling line

SSI - SIGNS AND SYMPTOMS OF INFECTION
SEPSIS

THEN

- Are any of the following present or new to the patient?
  - SBP<90 or MAP<65
  - Sats<90%
  - No urine in >8 hours
  - Prolonged bleeding

IF YES - THEN GOAL
DIRECTED SEPSIS

***SEPSIS ALERT***

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