Putting it all Together:
Low Frequency with High Fidelity Skills

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Conflict of Interest Disclosure

- Financial Disclosure
  - Darryl Conway-
    - Instructor- Sports Medicine Concepts
    - Xenith, LLC- Scientific Advisory Board
- Statements, opinions and recommendations contained in this program are ours unless indicated.
- The views may not be the same as the views of our company's, clients, or our colleagues.
- Participants must use discretion and clinical reasoning when using the information contained in this presentation.

Learning Objectives

- At the conclusion of this program, participants will be able to:
  - identify and discuss the most current evidence for the use of advanced airway, wound care and newer CPR techniques in the prehospital setting.
  - Identity and discuss the application procedures for the use of advanced airway, wound care and CPR techniques and agents in the prehospital setting.
  - Identify the role, characteristics, indications, contraindications and precautions for managing the entire scene by implementing these techniques and agents in the prehospital setting.
  - demonstrate the proper sequence and implementation of critical decision-making skills and the current evidence.

“You are not studying or practicing to pass the exam …

You are studying / practicing for the day when you are the only thing between the patient and the grave”


EMSA
EMSA
“In times of stress, you will always fall to the level of your training, not rise to the level of your expectations”

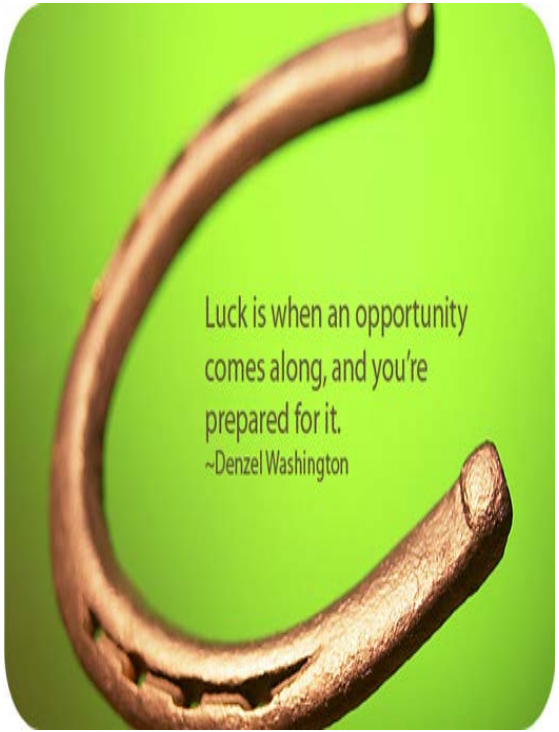
Your mental fitness after the event may depend on your mental preparation before it occurs!

“If it is predictable …

It is manageable!”

What do we know?

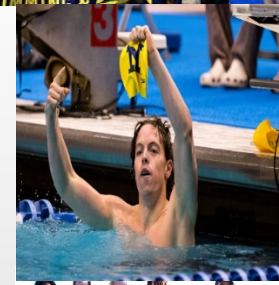
- **Emergency Management & preparation is a component of who we are as ATCs!**
- **Both Lucky? & *Unlucky?***
- **Over manage / Be Intentional about practice**









“Athletic teams excel because they practice! It is not conceivable that personnel responsible for emergency management cannot practice and expect to excel at the time of an emergency”

Ron Courson, ATC, PT, NREMT-I, CSCS

University of Georgia

- **"There is no such thing as always and NEVER!"**

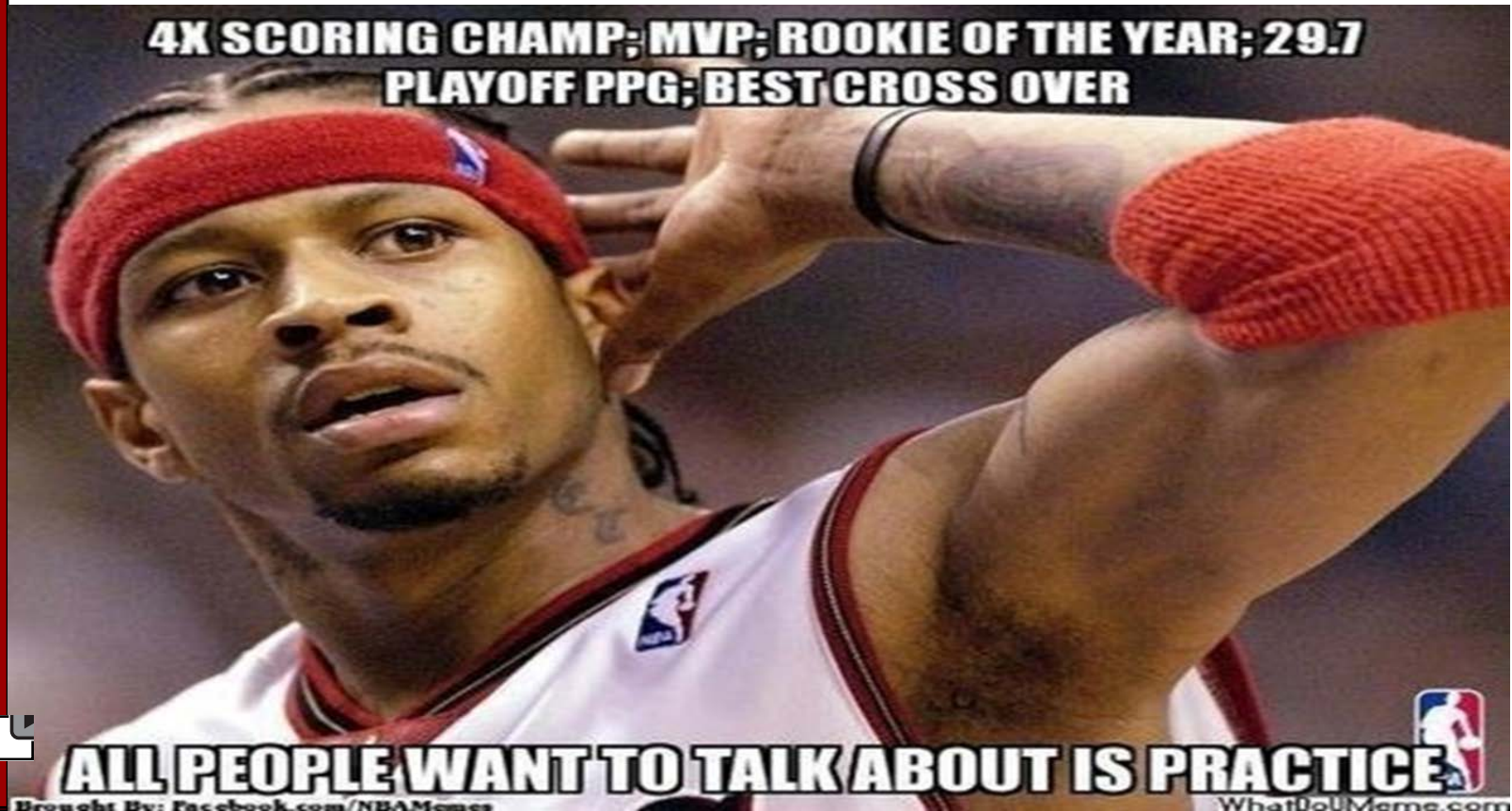
  Dr. James Andrews, MD

- **Black & White vs. Gray**
  - **Every emergency situation & every patient is different**
  - **Individual circumstances must dictate appropriate actions**

Pit Crew Concepts

- Systems based approach
- Each person has a specific pre-assigned duty
- Each person is strategically placed to maximize effectiveness
- Each duty is coordinated for efficiency
- As personnel integrate into the system → add interventions

Highly Functioning Pit Crew Team



Leadership
Followship
Relationships

- **Not mutually exclusive-** *can be leader one moment & follower next*
- ***If appropriate relationships are built,*** *can go from one to other* **seamlessly & w/o conflict**

“Pit Crew Concepts”

A

B

C

Effective Teams

Assign team roles in an EAP, or before the beginning of an event;

- Reduces unnecessary discussion during initial assessment
- Creates clear communication and standards

Train together

- We train like we fight, and we fight like we train (make training and practice a team-based evolution)

Communicate

- Effective teamwork requires communication. Appropriate feedback and closed loop communication is key. Must be clear, concise and professional.
- Effective communication inhibits misunderstanding and increases collaboration

“Bridging the Gap”

- **What personnel are involved in your management of emergency situations?**
  - **Immediate Response**
  - **Before EMS arrives**
  - **Unstable Patient?**
  - **After EMS Arrives?**
  - **Visiting Team?**

- **Is a coach, strength coach, student, etc. who has trained with ATCs & the various equipment & techniques suited for involvement at various times?**

Practice vs Games

- Practices-
  - Less ATCs
  - Usually no physician or EMS
  - More SAs participating
  - College- 162 (91%)
- Games-
  - May have physician(s) and/or more ATCs
  - May have standby EMS
  - Higher visibility
  - Less SAs participating simultaneously
  - College- 13 – 16 (9%)

Pre-Event "Time Out"

- Who is running the "code" ("team leader")?
- Who is responsible for the airway?
- When do we move / transport off of the field in a CPR situation?
- Are we removing equipment? When? How?
- How are we moving to and/or off of a rigid immobilization device?
- What facility are we transporting to?
- Do we have a roster with player weights for EMS / medications?
- Visiting team considerations?

Primary Assessment

- Scene Control
- Nature of Injury / Illness
- Additional Resources needed
- Communication

Primary Assessment

- **Equipment does not matter!**

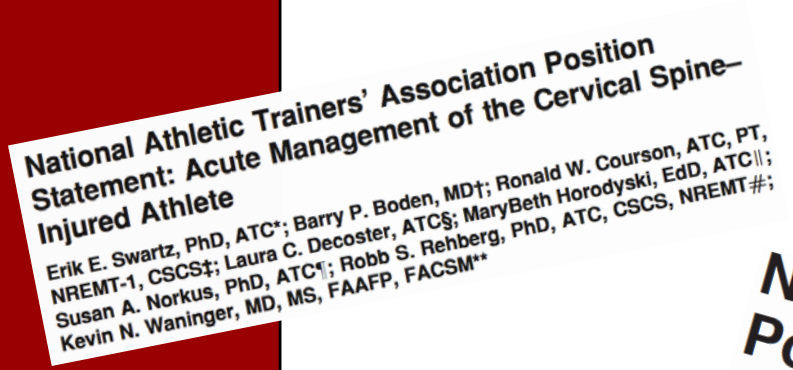
- ***Exposure & access to vital life functions must be established or easily achieved <u>in a reasonable & acceptable manner</u>***

- **C**irculation-
  - Hemorrhage
  - Cardiac
- **A**irway
- **B**reathi

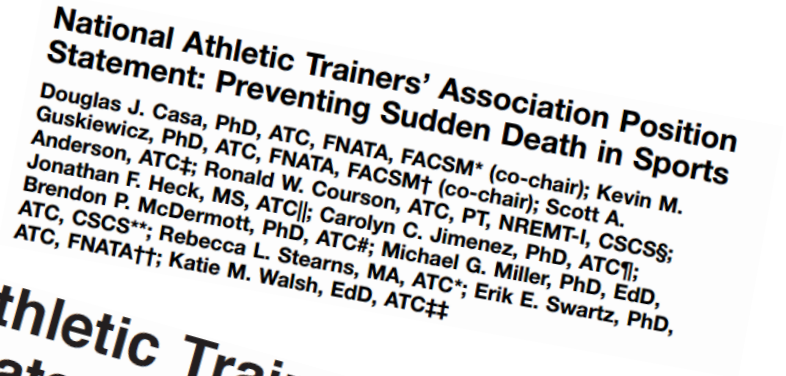
Practices are determined by local Medical Oversight…

Remember that all changes in medical practice are determined by your State Practice Act, Supervising Physician, employer and specific practice protocols and guidelines.

NATA Position Statements


National Athletic Trainers' Association Position Statement: Acute Management of the Cervical Spine–Injured Athlete

Erik E. Swartz, PhD, ATC*; Barry P. Boden, MD†; Ronald W. Courson, ATC, PT, NREMT-1, CSCS‡; Laura C. Decoster, ATC§; MaryBeth Horodyski, EdD, ATC‖; Susan A. Norkus, PhD, ATC¶; Robb S. Rehberg, PhD, ATC, CSCS, NREMT#; Kevin N. Waninger, MD, MS, FAAFP, FACSM**


National Athletic Trainers' Association Position Statement: Preventing Sudden Death in Sports

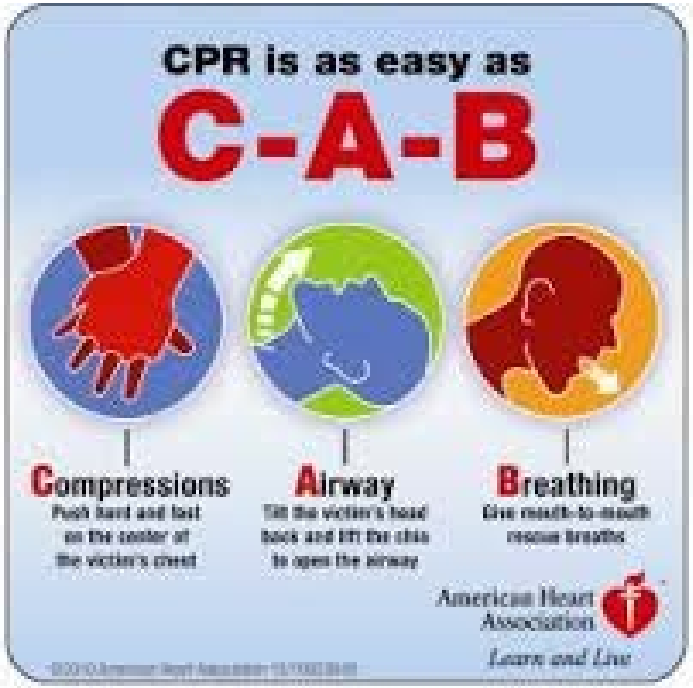
Douglas J. Casa, PhD, ATC, FNATA, FACSM* (co-chair); Kevin M. Guskiewicz, PhD, ATC, FNATA, FACSM† (co-chair); Scott A. Anderson, ATC‡; Ronald W. Courson, ATC, PT, NREMT-I, CSCS§; Jonathan F. Heck, MS, ATC‖; Carolyn C. Jimenez, PhD, ATC¶; Brendon P. McDermott, PhD, ATC#; Michael G. Miller, PhD, EdD, ATC, CSCS**; Rebecca L. Stearns, MA, ATC*; Erik E. Swartz, PhD, ATC, FNATA††; Katie M. Walsh, EdD, ATC‡‡


National Athletic Trainers' Association Position Statement: Exertional Heat Illnesses

Helen M. Binkley*; Joseph Beckett†; Douglas J. Casa‡; Douglas M. Kleiner§; Paul E. Plummer‖

Basic Life Support

CAB remains the focus (perfusion)



Keys to Successful CPR

- Emphasis on maximizing compressions
- Ensuring chest compressions of adequate rate
- Ensuring chest compressions of adequate depth
- Allowing full chest recoil between compressions
- Minimizing interruptions in chest compressions
- Avoiding excessive ventilation

Keys to Successful CPR

- Chest Compression Depth
- Chest Recoil
- Minimizing Interruptions in Chest Compressions
- Controlled Ventilations
- Early Defibrillation

Teamwork helps achieve goals of High Quality "High Performance" CPR

Goals include:

- Quality compressions (2-2.4 inches)
- Quality rate (100-120)
- Avoiding excessive ventilation
- Maximizing chest compression fraction (60-80%)
- Minimizing all pauses, especially the longest

Keys to Successful CPR

- In adult cardiac arrest, it is reasonable to perform chest compressions at a rate of 100/min to 120/min (note the new upper limit)
- During manual CPR, perform chest compressions to a depth of at least 2 inches or 5 cm for an average adult, while avoiding excessive chest compression depths (greater than 2.4 inches or 6 cm)
- Greater emphasis on minimizing pre and post shock pauses in compressions

CPR Techniques & Devices

- "The use of mechanical piston devices may be considered in specific settings where the delivery of high-quality manual compressions may be challenging or dangerous for the provider (eg, limited rescuers available, prolonged CPR, during hypothermic cardiac arrest, in a moving ambulance, in the angiography suite, during preparation for extracorporeal CPR [ECPR]), provided that rescuers strictly limit interruptions in CPR during deployment and removal of the devices." (Class IIb, LOE C-EO)

Circulation. 2015;132:S436-S443, originally published October 14, 2015

Chest Compression Depth

The 2015 ILCOR systematic review examined if chest compression depth different from 2 inches (5 cm) ***influences physiologic or clinical outcomes?***

During manual CPR, rescuers should perform chest compressions to a depth of at least 2 inches or 5 cm for an average adult, while avoiding excessive chest compression depths (greater than 2.4 inches or 6 cm) (Class I, LOE C-LD).

Circulation. 2015;132:S414-S435

Chest Recoil

The 2015 ILCOR guidelines addressed whether **full chest wall recoil** compared with **incomplete recoil** *influenced physiologic or clinical outcomes?*

Why is this important?

Incomplete recoil increases intrathoracic pressure and impedes venous return, coronary perfusion pressure, and myocardial blood flow and potentially influences resuscitation outcomes.

Zuercher M, et al. Leaning during chest compressions impairs cardiac output and left ventricular myocardial blood flow in piglet cardiac arrest. *Crit Care Med*. 2010;38:1141–1146.

Niles DE, et a;. Prevalence and hemodynamic effects of leaning during CPR. *Resuscitation*. 2011;82 suppl 2:S23–S26.

Part 5: Adult Basic Life Support and Cardiopulmonary Resuscitation Quality

(*Circulation*. 2015;132[suppl 2]:S414–S435. DOI: 10.1161/CIR.0000000000000259.

Minimizing Interruptions in Chest compressions

The 2015 ILCOR guidelines addressed whether shorter compared with longer interruptions in chest compressions *influenced physiologic or clinical outcomes?*

Interruptions in chest compressions can be intended as part of required care (ie, rhythm analysis and ventilation) or unintended (ie, rescuer distraction) The need to be limited in length and frequency

Part 5: Adult Basic Life Support and Cardiopulmonary Resuscitation Quality

(*Circulation*. 2015;132[suppl 2]:S414–S435. DOI: 10.1161/CIR.0000000000000259.

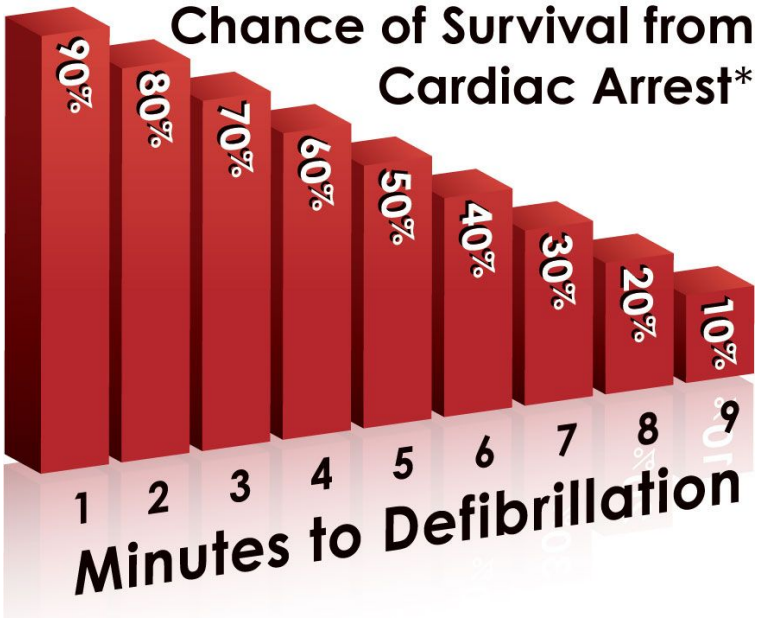
Controlled Ventilations

- Only enough for chest rise (300 – 400 ml)
- Pausing only 2-3 seconds to ventilate during 30:2
- Asynchronous ventilations every 6 seconds once advanced airway is in place or every 10th compression

"For HCPs, the 2015 Guidelines Update allows flexibility for activation of the emergency response and subsequent management in order to better match the provider's clinical setting."

Defibrillation

- Shocking on a 2-minute cycle
- Pre-charging the monitor at 1:45
- Minimize perishock pause to less than 5 seconds
- Change out rescuer on chest compressions during perishock pause



Airway Management

- "The jaw-thrust maneuver is recommended over the head-tilt technique, which produces unnecessary motion at the head and in the cervical spine."
- "Advanced airway management techniques (e.g., laryngoscope, endotracheal tube) are recommended when appropriately trained and certified rescuers are present."
- "If rescue breathing becomes necessary, the individual with the most training and experience should establish an airway and commence rescue breathing using the safest technique(s)."
- "During airway management, rescuers should cause as little motion as possible."

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So… wrap up so far…

- Teamwork helps achieve goals of High Quality "High Performance" CPR
- Goals include:
  - Quality compressions (2-2.4 inches)
  - Quality rate (100-120)
  - Avoiding excessive ventilation
  - Maximizing chest compression fraction (60-80%)
  - Minimizing all pauses, especially the longest

High Performance CPR

High Performance CPR typically consists of expertly performed BLS with strict attention to:

- Minimally interrupted chest compressions
- Controlled ventilations
- Defibrillation

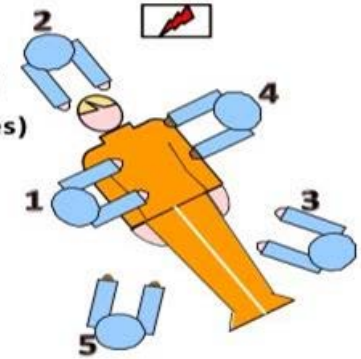
Team Approach to Resuscitation

How do we achieve quality CPR?

TEAMWORK!!!

Efficient "Pit Crew" CPR Teamwork

1: Compressions (swap every 1 min w/#4)
2: Defib/AED & Mask Seal (help keep times)
3: CPR Card & Timekeeper
4: Squeeze bag (swap every 1 min w/#1)
5: IV/IO access ASAP & prepare drugs
(6: Document in laptop ePCR)



Mechanical Devices

Airway Management

Basic Adjuncts

- BVMs

- NPA's

- OPA's

Supraglottic Airways

King Tube and I-Gel or LMA

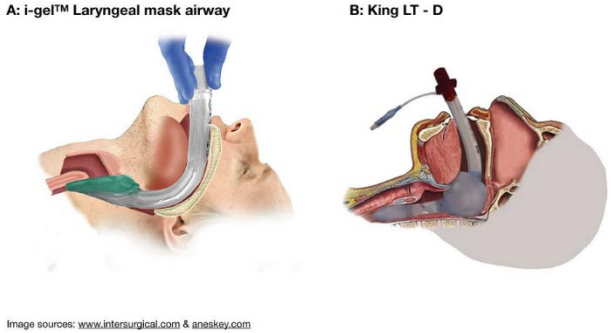
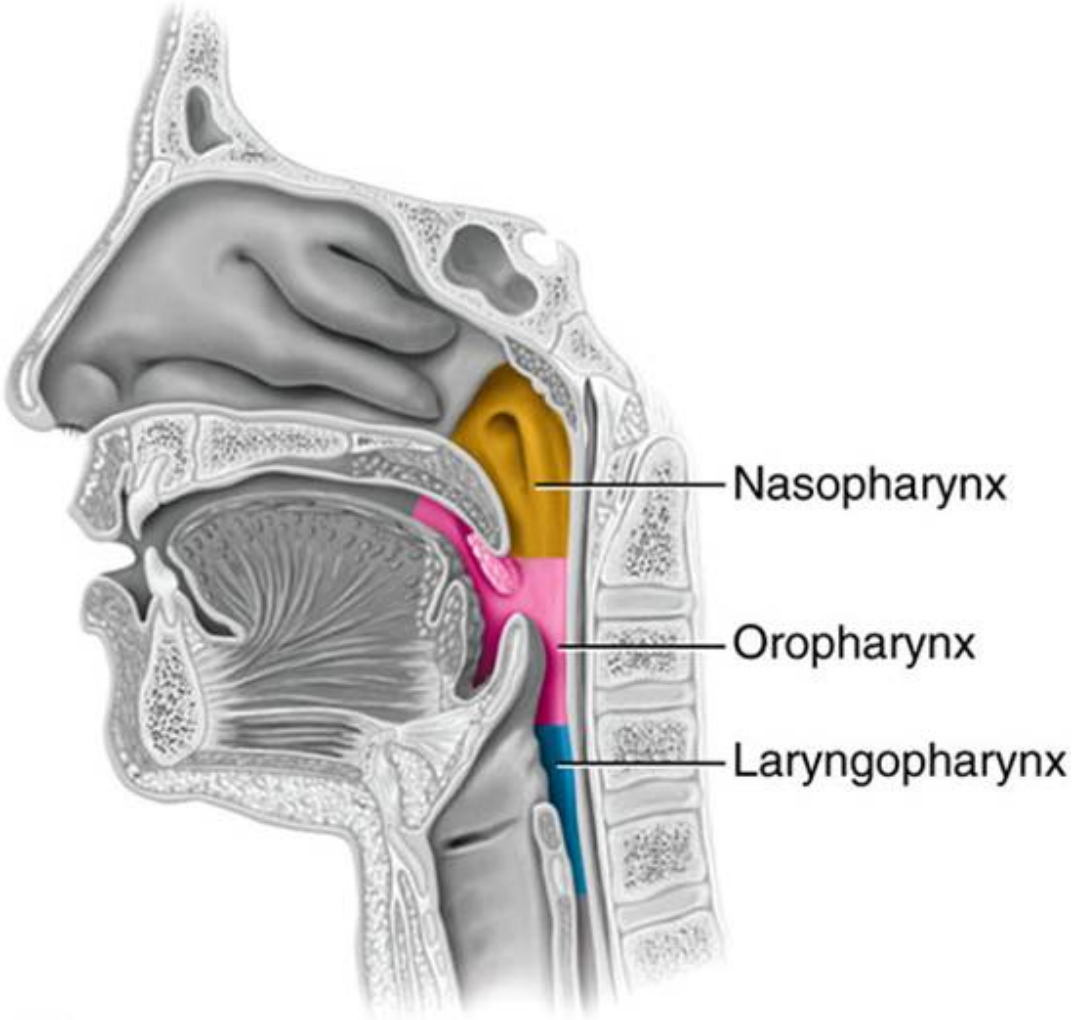


Image sources: www.intersurgical.com & aneskey.com

Differentiate the types of airway adjuncts (oropharyngeal airways [OPA], nasopharyngeal airways [NPA] and supraglottic airways [King LT-D or Combitube]) and their use in maintaining a patent airway in adult respiratory and/or cardiac arrest. (AC-9)

Upper Airway



Adult vs. Pediatric

- Pediatric airway smaller and more flexible than adult
- Pediatric vocal cords more anterior & closer to base of tongue
- Narrowest part of pediatric airway is cricoid cartilage, glottic opening is narrowest in adults
- Tongue is larger in pediatrics compared to adults

Bag Valve Mask Ventilations

- The most important airway skill
- Always the first response to inadequate oxygenation and ventilation
- " Anybody (*almost*) can be oxygenated and ventilated with a bag and a mask "
- Delays the collapse and the urgency to intubate

- Requires practice to master

- This can be a 2 or 3 person skill
  - Use 2 people when ever possible

Bag Valve Mask Ventilations

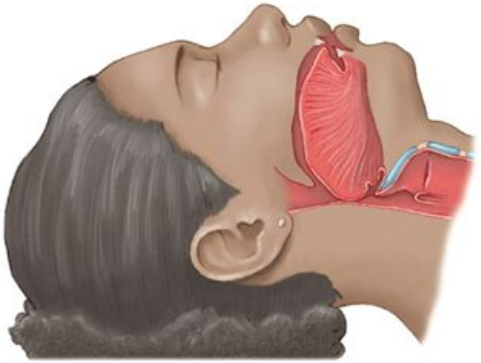
- One hand to
  - maintain face seal
  - position head
  - maintain patency
- Other hand ventilates
- (Tip: Pull Chin Into Mask, Don't Push Mask down onto Face)

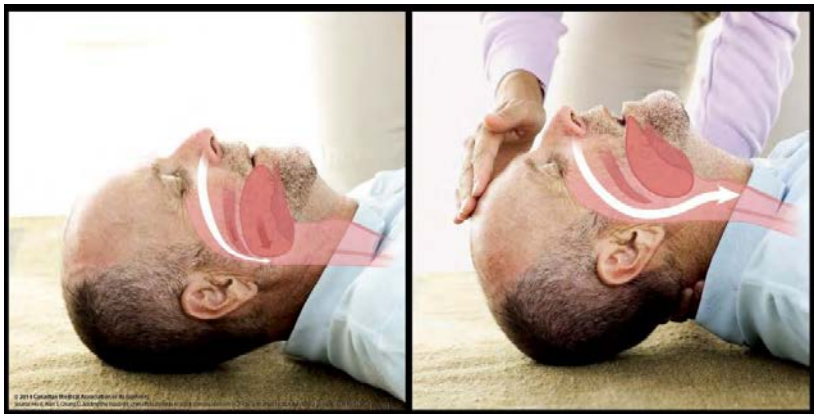
BVM Success

- Use 2 People
  - 1 Mask, 1 Squeeze
- Enough Air to See Chest rise
- 1+ Seconds to deliver the air

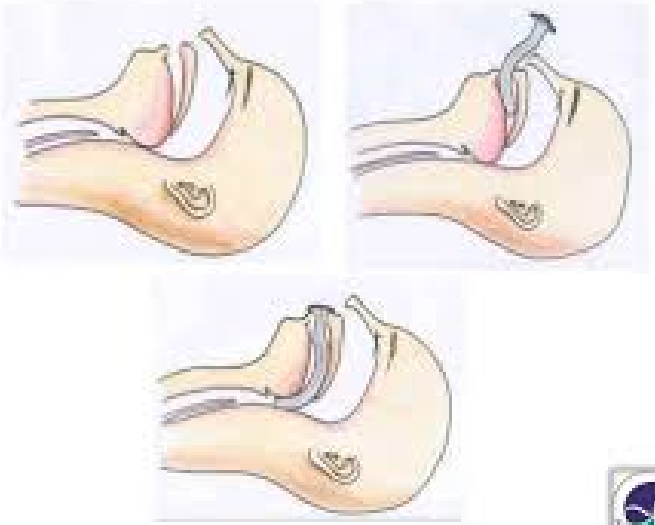
Airway Adjuncts - BLS

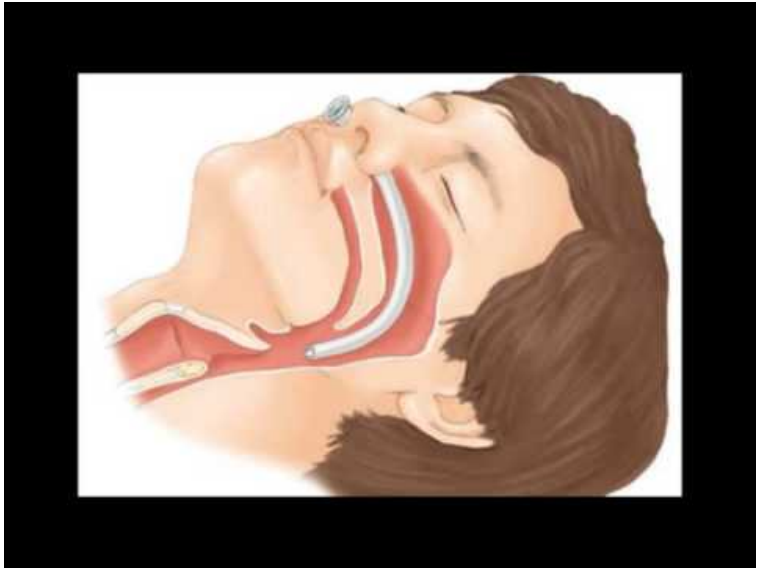
The Tongue as an Airway Obstruction





Placement

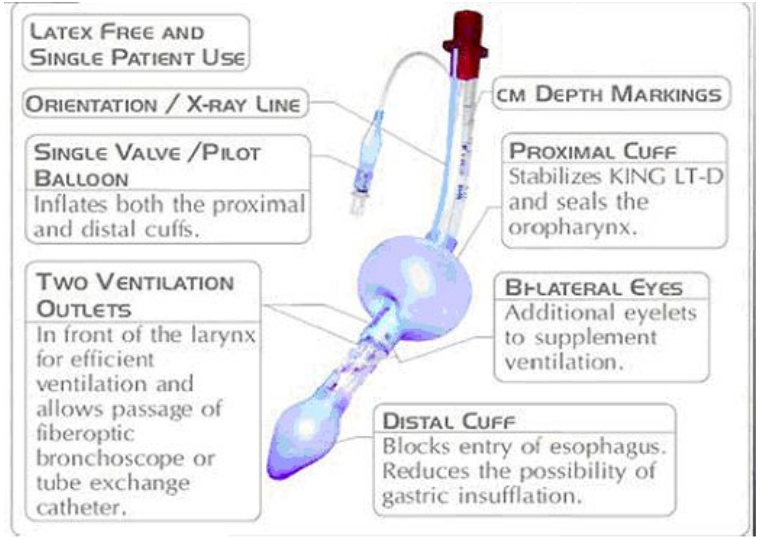




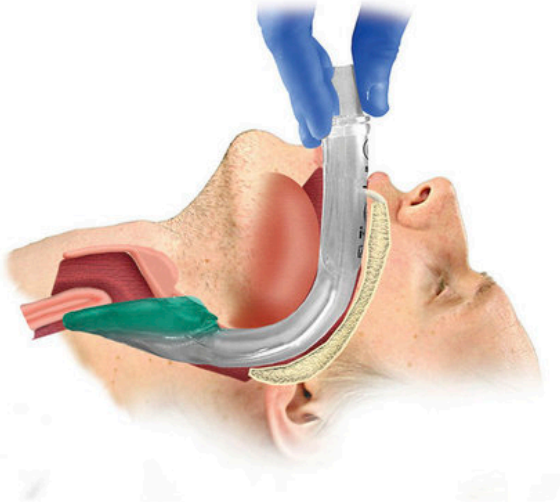
Why Progress beyond NPA/OPA

- This is on a continuum
- Can you mask ventilate?
  - Does an NPA Help? Do they accept OPA?
- Athlete presentation
  - Are they getting better or worse
- Do I need to move the patient?
- Where is the equipment?
- How comfortable are you with the skill?

Airway Adjuncts- Supraglottic



A: i-gel™ Laryngeal mask airway



B: King LT - D

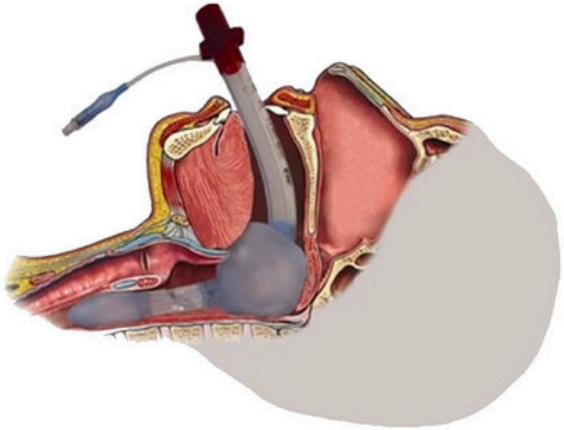


Image sources: www.intersurgical.com & aneskey.com

Pulse Oximetry

- Measures saturation of RBCs with O_2
- Normal saturation = 97%+

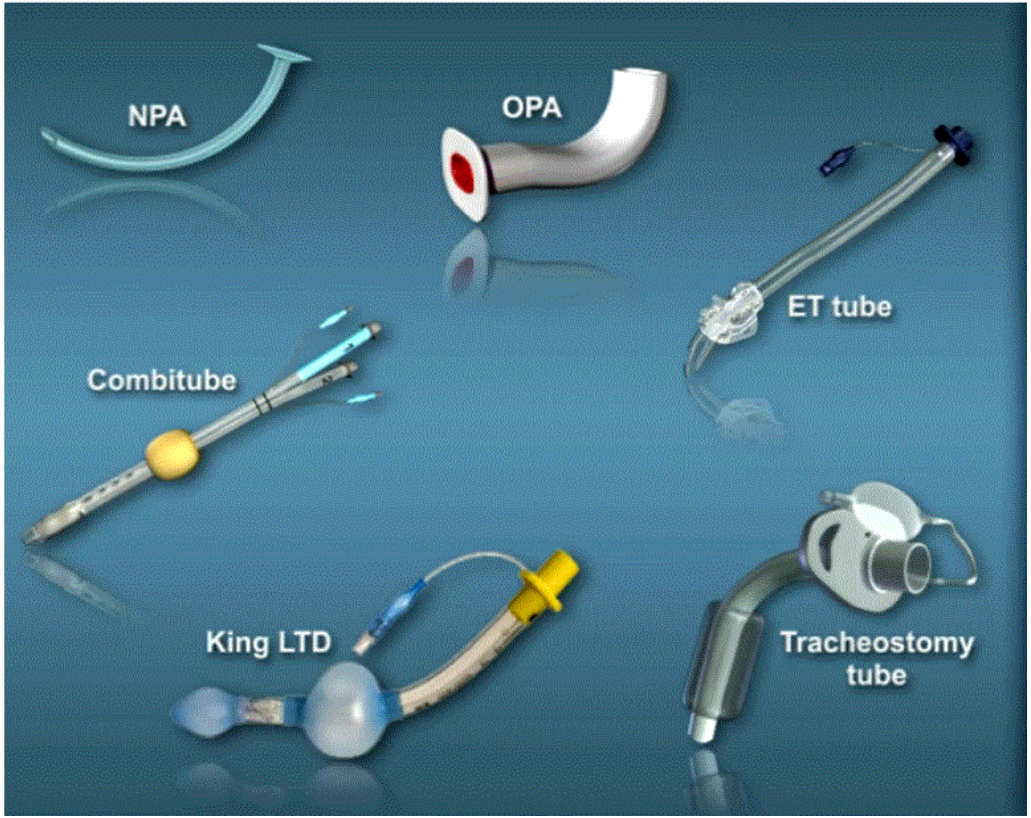
Capnography

- Measures concentration of carbon dioxide in the expired air.
- How much CO2 you breath out
- Measures Oxygenation
- Normal should be 35-45
- Will keep at 35 if signs of herniation or serious head injury
- Best Indicator of Oxygenation and Metabolism

Hyperventilation Risks

- DO NOT HYPERVENTILATE, ESPECIALLY WITH A HEAD INJURY
- Hyperventilation will cause vasoconstriction and allows more blood into the cranial vault worsening the injury.
- ONLY if they show signs of Herniation

We have Options……



Bleeding and Wound Care

"As the profession of athletic training continuously evolves and ATs practice in various settings, these healthcare providers must have the ability to maintain a high level of preparation and proficiency in all aspects of immediate and emergency care. This ability is critical to minimizing risk to the injured participant." – BOC, 2015

Everything has advantages and disadvantages

Each option can be implemented in a variety of situations

There is no "Gold Standard"

Stopping blood loss in a severe hemorrhage is really the Gold Standard

Wound Care:
When Direct Pressure Isn't Enough

- Everything has advantages and disadvantages
- Each option can be implemented in a variety of situations
- There is no "Gold Standard"
- Stopping blood loss in a severe hemorrhage is really the Gold Standard
- Evaluation and Recognition is Key
- Basic bandaging of soft tissue injuries is often overlooked by first responders.
- These basic concepts are critical to the casualty's survival.

Understanding Shock

In 1862

- Samuel Gross described shock as the "rude unhinging" of the machinery of life.

- Inadequate Tissue perfusion with oxygenated blood

- Failure of adequate tissue oxygen delivery and utilization during shock can lead to organ dysfunction and death.

Shock Management

Compensated shock	Decompensated shock	Irreversible shock
• Pulse rate increases • Respirations increase • Weak pulse • Cool, clammy skin • Anxious, restless, combative • Thirsty, weak	• Very weak or absent pulses • Severe drop in blood pressure • Altered mental status or unconsciousness • Slow breathing to apnea	• Cell death • Organ system failure • Washout • Hemorrhaging all over • Patient dies
Stage I and II hemorrhages 500-1250ml blood loss 5-25% blood volume lost	**Stage III and IV hemorrhages** 1250-1750+ ml blood loss 25-35%+ blood volume lost	**Stage IV hemorrhage** 1750+ ml blood loss 35%+ blood volume lost
THIS IS WHERE YOU NEED TO WORK YOUR MAGIC. Stop the bleeding. Oxygenation. Give fluids. Keep the patient warm. Get them to definitive care.	WORK VERY FAST. You MAY be able to get the patient back, but you need to work very fast. Praying helps.	STICK A FORK IN HIM. HE'S DONE.

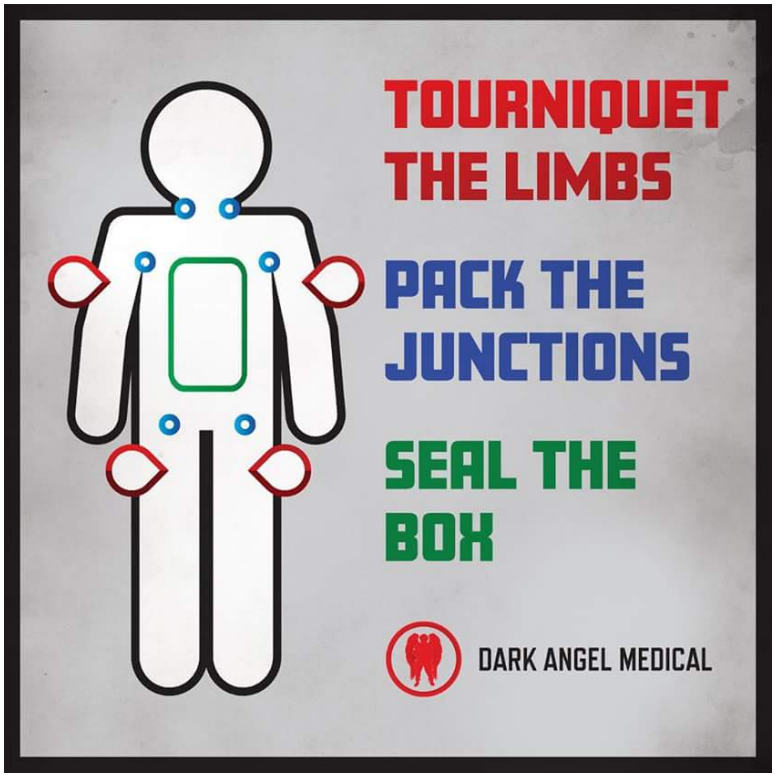
Wound Care

Direct Pressure or
Pressure Bandage

Tourniquet

Wound Packing

Clotting Agents



Direct Pressure/Pressure Dressings

Most venous hemorrhages or simple arterial hemorrhages from the distal third of an extremity are generally well controlled with an absorbent bandage placed direct over the wound

The Closer an artery is to the left ventricle, the great the force exerted on the vessel's wall. The more proximal an arterial is to the heart, the greater amount of force needed to tamponade the vessel and stop hemorrhage

120 lbs of pressure to occlude a proximal to a femoral artery hemorrhage

Proximal Arterial Hemorrhage is life threatening

Tourniquets

Commercial tourniquets

- 2-3 inches above the wound
- Watch for other sites of bleeding
    - above the wound
- Multiple bleeding sites
    - » proximal application

- Should be tight enough to stop bleeding
- The tourniquet should never be placed
    - Joint (knee or elbow)
    - Over an impaled object
- Extremity should be exposed
- Document application time
    - Write on patient!

Tourniquets

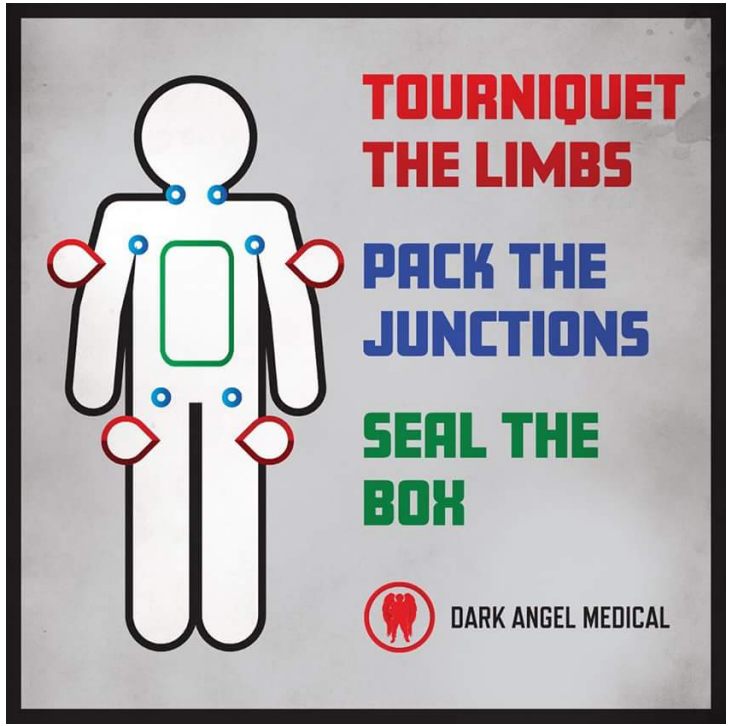
- A prehospital tourniquet should not be removed by EMS personnel without authorization from their EMS Sponsor Hospital/Medical Direction
- If application exceeds six hours, removal should only be done by the physician providing definitive care
- Over clothing and as high and tight as possible when working in a mass casualty.
- Directly on Skin, 2-3 Inches over the wound when your in a controlled environment.
- Take note of tourniquet time.

Tourniquet Mistakes

- Not using one when you should
- Using a tourniquet for minimal bleeding
- Not making it tight enough – the tourniquet must eliminate the distal pulse
- Not using a second tourniquet if needed
- Waiting too long to put the tourniquet on
- Periodically loosening the tourniquet to allow blood flow to the injured extremity
-

Non-Extremity Massive Hemorrhage

- Tourniquets are ineffective in the following areas:
  - Neck
  - Armpit
  - Groin
- Treatment for these areas includes:
  - Direct pressure
  - Pack wound, if applicable
  - Pressure dressing



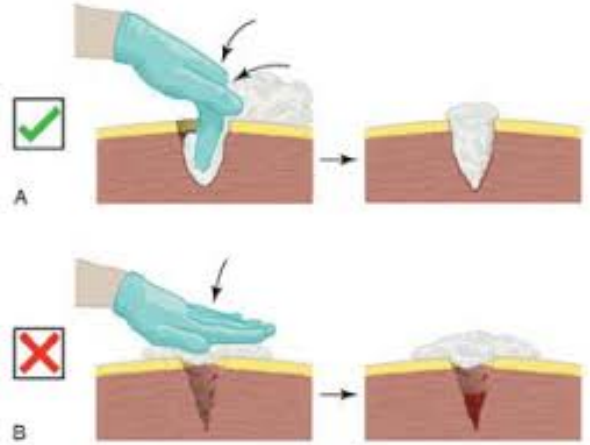
Wound Packing

- When a tourniquet won't work
- Expose the wound
- Locate the bleeder
- Place FOCUSED direct pressure
- Pack the wound

Consider Hemostatic Dressings

Wound Packing

- Pack Combat Gauze tightly into wound and directly onto bleeding source
- More than one gauze may be required to stem blood flow
- Combat Gauze maybe re-packed or adjusted into the wound to ensure proper placement



Wound Packing

- Open clothing around wound
- If possible, remove excess pooled blood from the wound while preserving any clots already formed in the wound
- Locate source of most active bleeding
- Pack the wound
  - Don't release Pressure
  - Swapping fingers or Side by each
    - Pack all voids

Add, Add,
Add and then
Add some more

Questions?

Lets go Practice……

"The more you prepare beforehand, the more relaxed and creative and effective you'll be when it counts." Bill Parcells

Thank you

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