Model of the Clinical Practice of Emergency Medicine 2009

- Appendix 1
  - Procedures and skills integral to the practice of EM
- Appendix 2
  - Other components and core competencies of the practice of EM

Procedures

Airway (1)

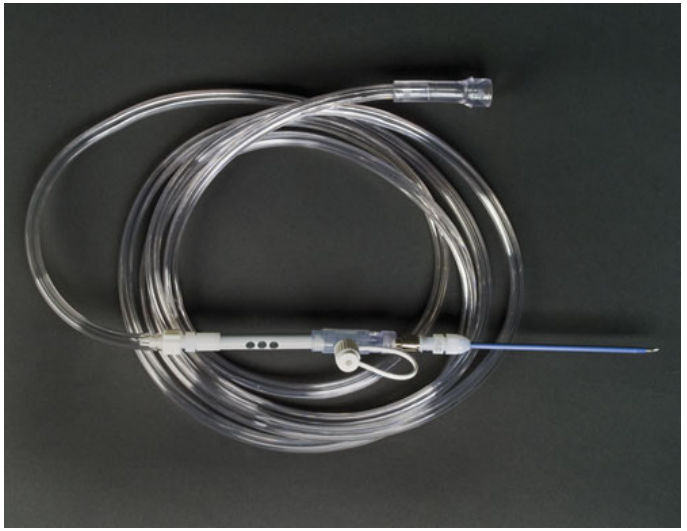
Cricothyroidotomy

- Absolute contraindications?
- Relative contraindications
  - Age < 10 (leads to subglottic stenosis)
  - Bleeding diathesis
  - Poor landmarks
- Complications
  - Hemorrhage, aspiration, misplaced tube, hypoxemia, neurovascular injury, mediastinal emphysema

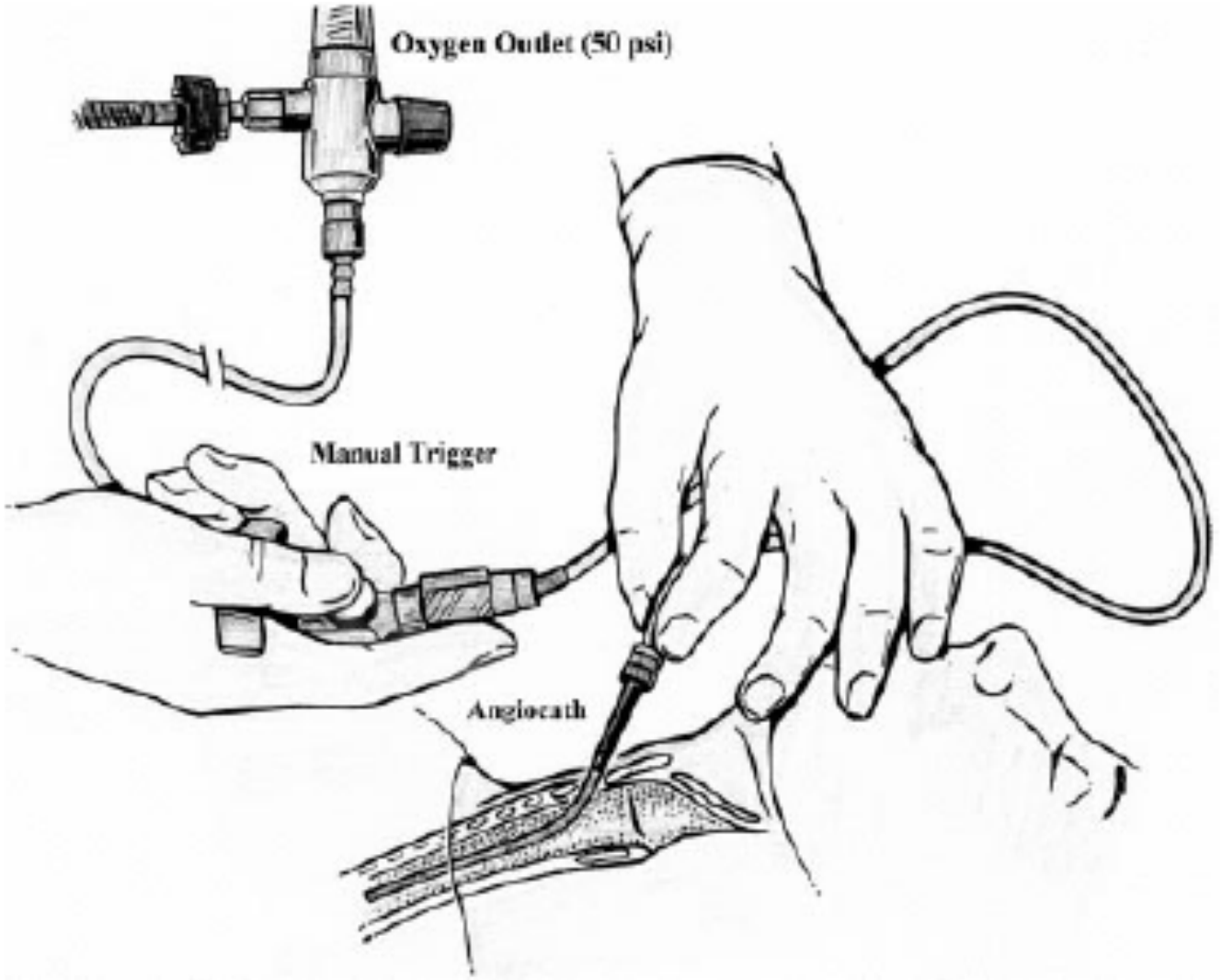
Needle cricothyroidotomy is the emergency surgical airway of choice for age < 10

Airway (2)

- Transtracheal jet ventilation (PTJV)
  - Temporizing device
  - Provides temporary oxygenation/ventilation
  - Limitation: Hypercapnea
  - 4:1 expiratory/inspiratory ratio
  - 2.8-3.0 mm I.D./ 6 F kink resistant catheter
  - 50 psi
  - Max: 30 minutes
  - Facilitates ETT placement due to glottic opening



Airway (3)



Airway (3)

Confirmation of endotracheal intubation

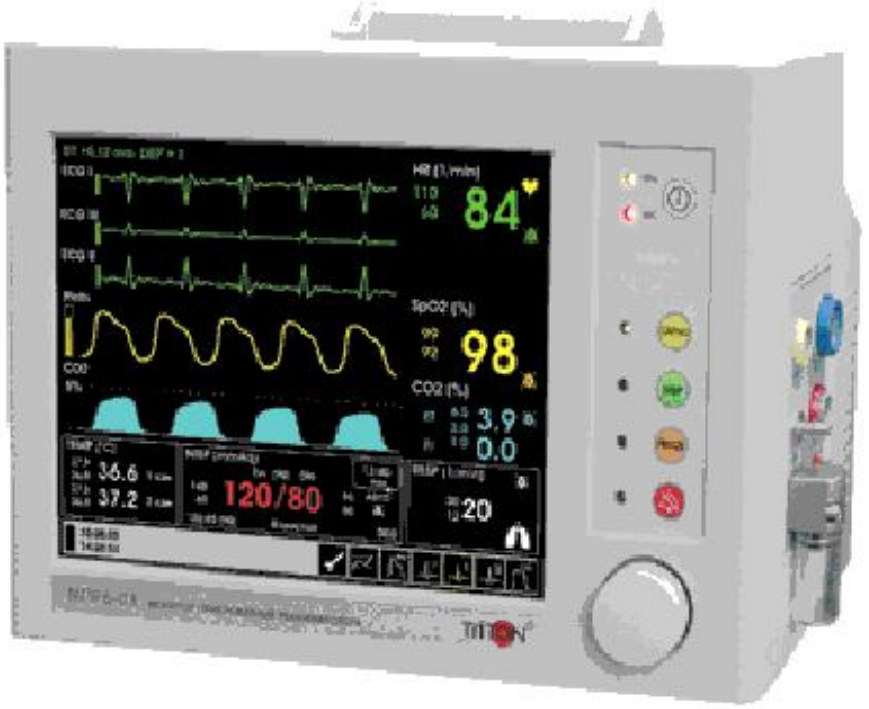
- Visualization
- Auscultation
- Capnometry
  - Reliable if pulse is present
  - False negative in cardiac arrest
- Esophageal detector devices
  - Bulb does not re-expand in esophageal intubation
  - False negatives: pregnancy, obesity, COPD
  - False positives: uncommon
- Chest x-ray: used to rule out right main stem intubation

Airway(4)

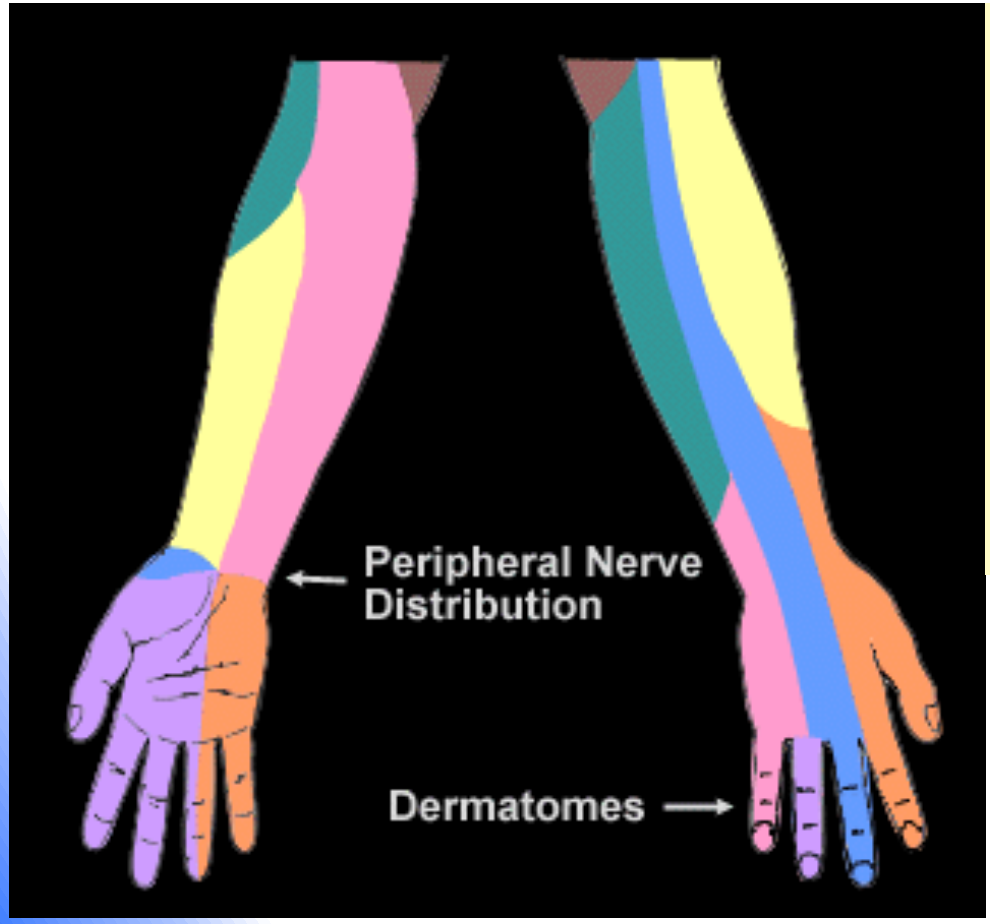
- CAPNOGRAPHY: A VALUABLE TOOL FOR AIRWAY MANAGEMENT, Nagler, J., et al, Emerg Med Clin North Am, 26(4): 881, November 2008.

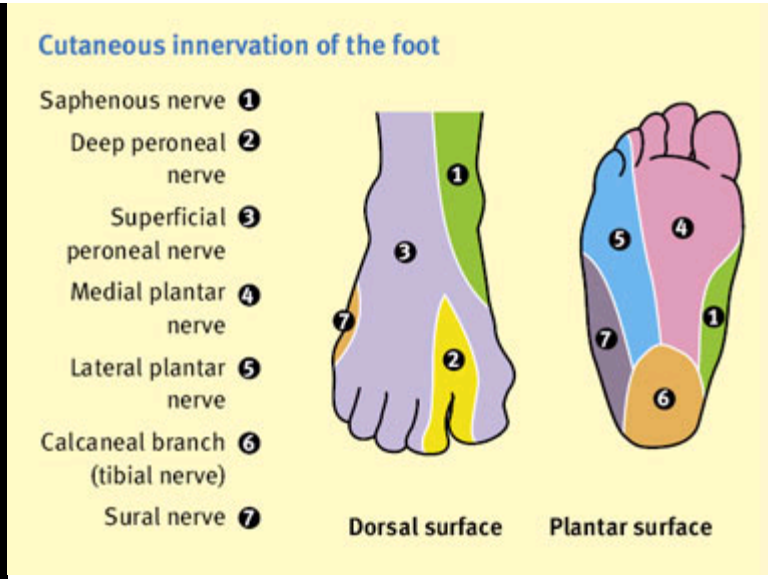
Indications

- Procedural sedation
- BiPAP
- DKA
- Mech Ventilated Pts



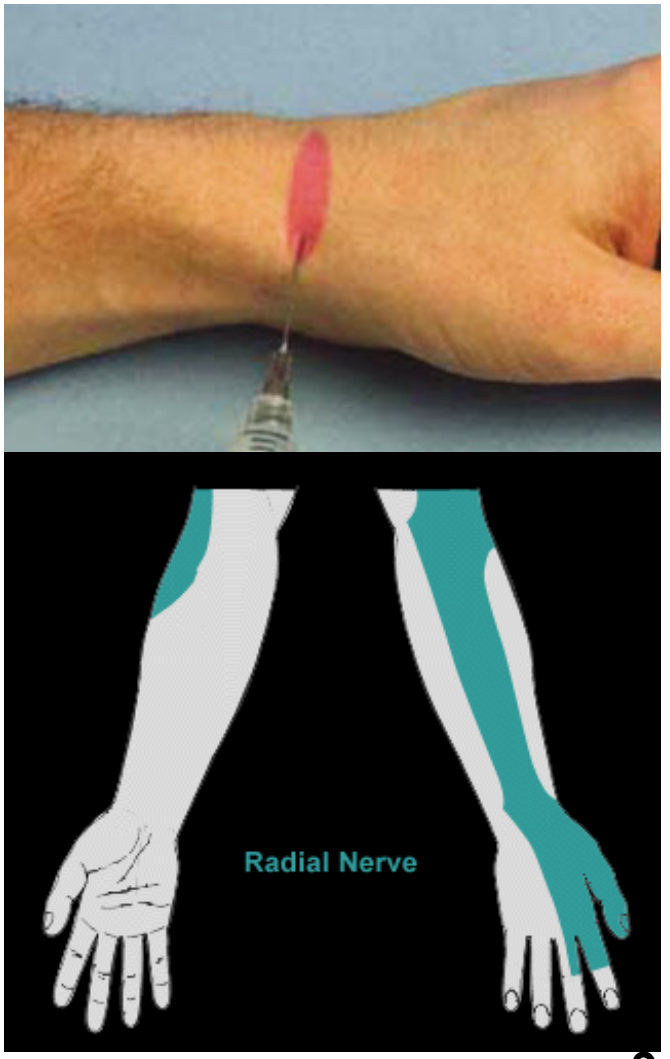
Regional Nerve Blocks

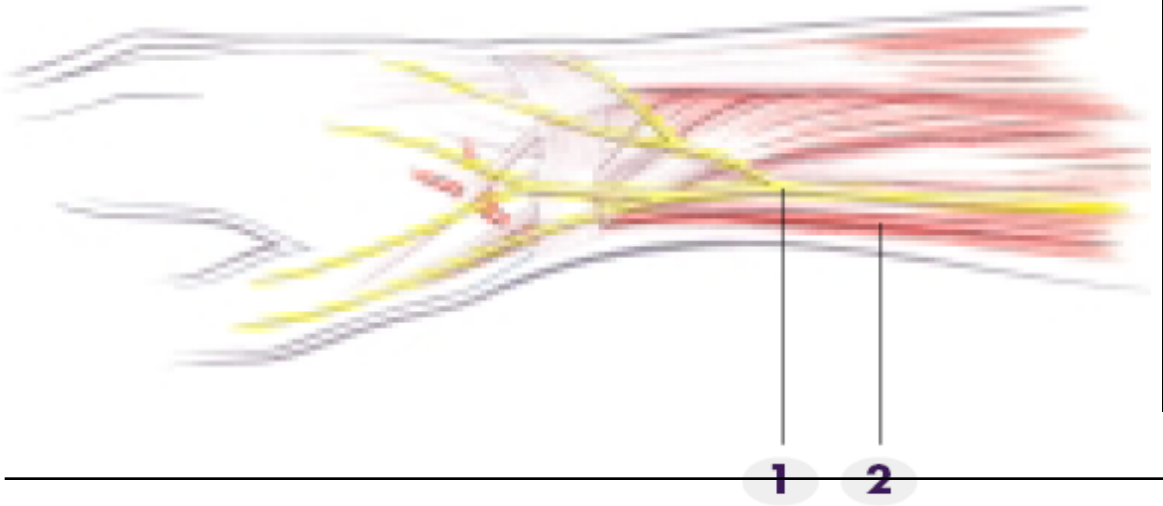




Radial Nerve Block

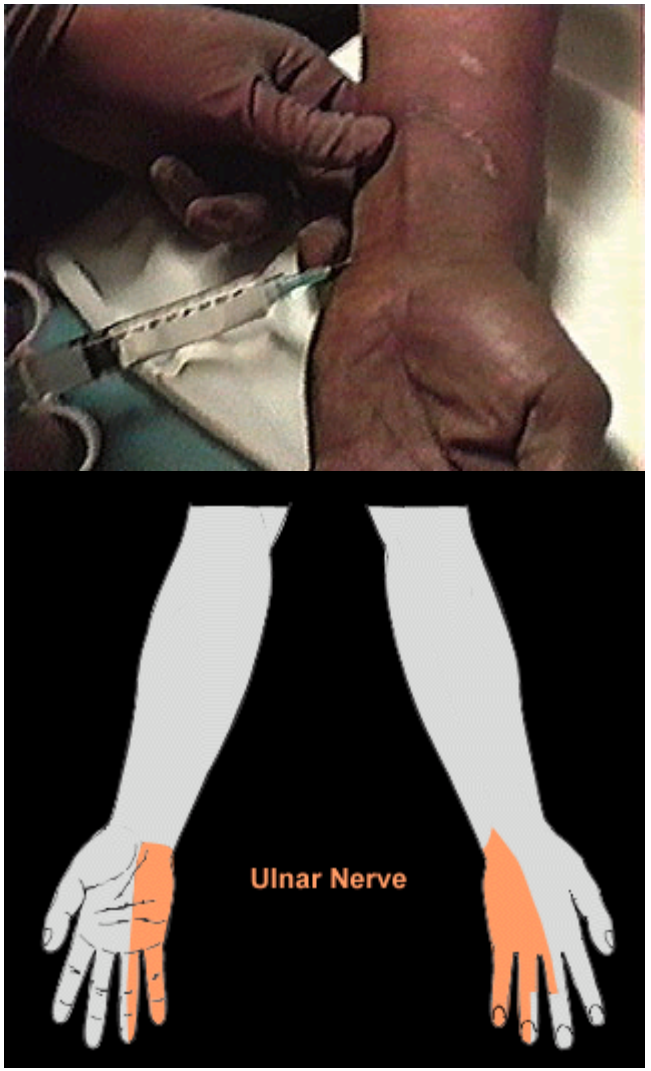
- Supination
- 3-5 cm proximal to the joint
- 10cc lidocaine or bupivicaine





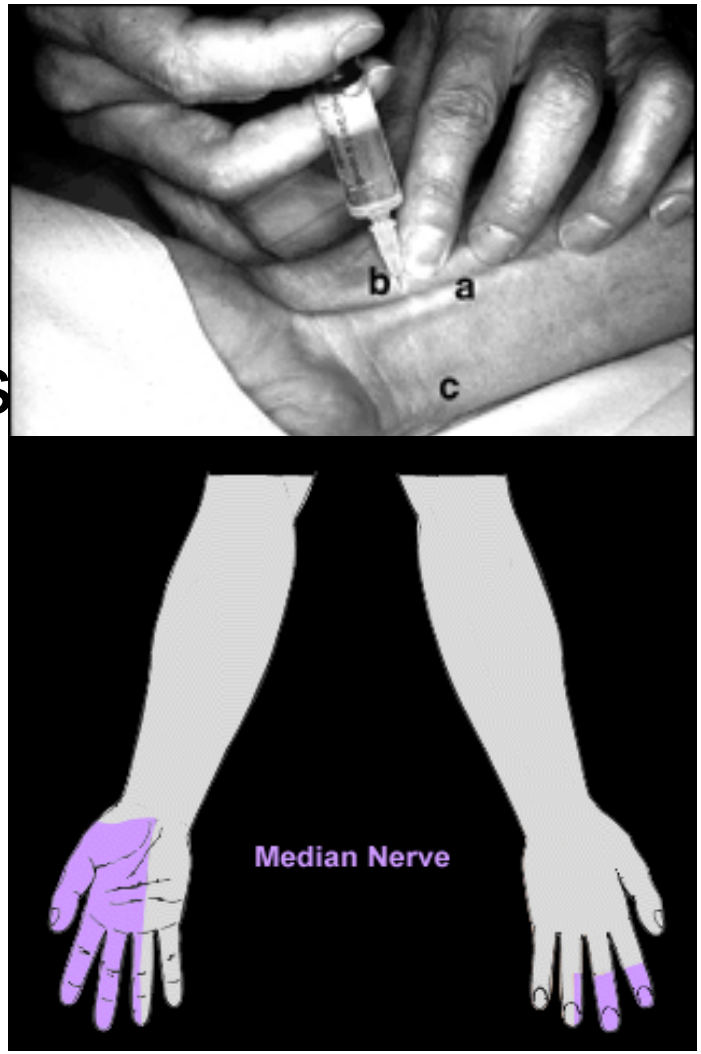
Ulnar Nerve Block

- Supination
- 3 finger widths from distal crease
- Inject between the flexor carpi ulnaris and the ulnar artery. Paresthesias, withdraw slightly and inject
- 3-5 cc lidocaine or bupivicaine



Median Nerve Block

- Inject between the flexor carpi radialis and the palmaris longus
- 3-5cc lidocaine or bupivicaine



Ankle Blocks (1)

- Superficial peroneal nerve
  - Inject SQ between the lateral maleolus and the anterior border of the tibia
- Posterior tibial nerve
  - Medial aspect of the calcaneal tendon anterior toward the posterior tibia. The nerve is just posterior to the tibial artery.
  - If paresthesias, inject 3-5 cc
  - If not, contact the tibia and inject 5-7 cc

Ankle Blocks (2)

Fig 4

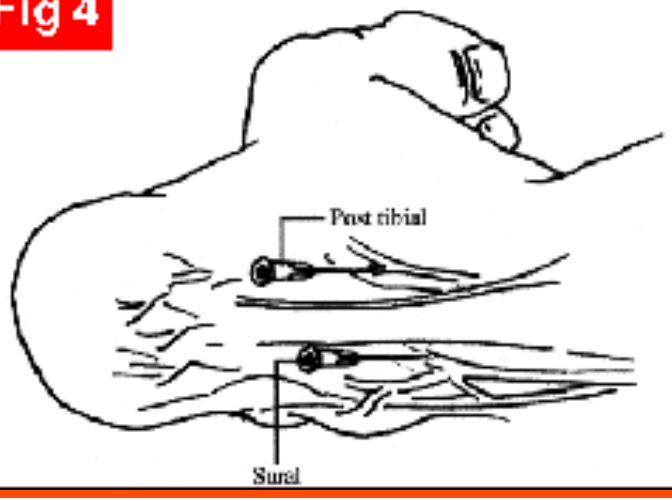
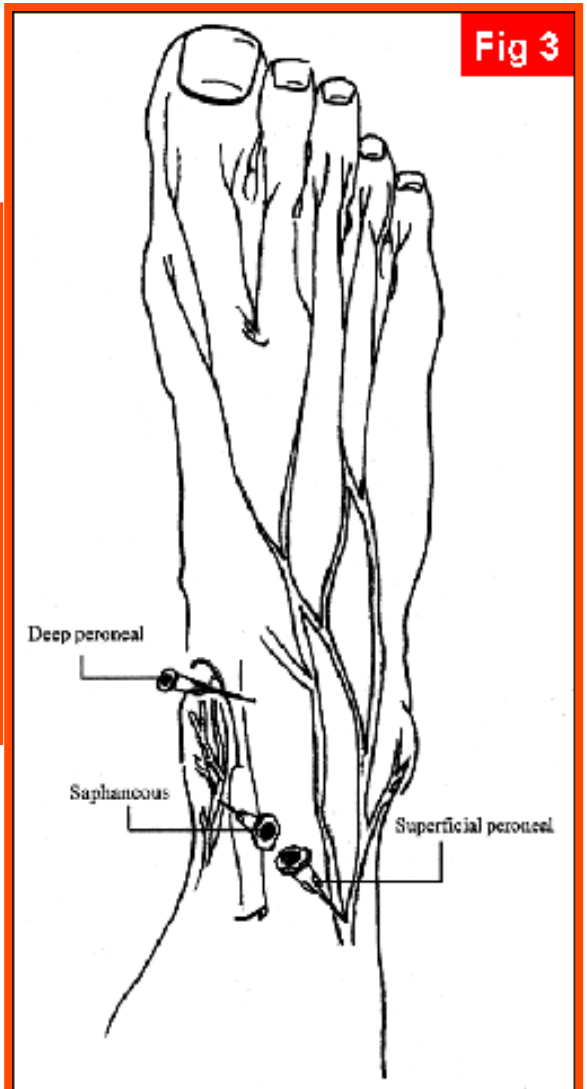


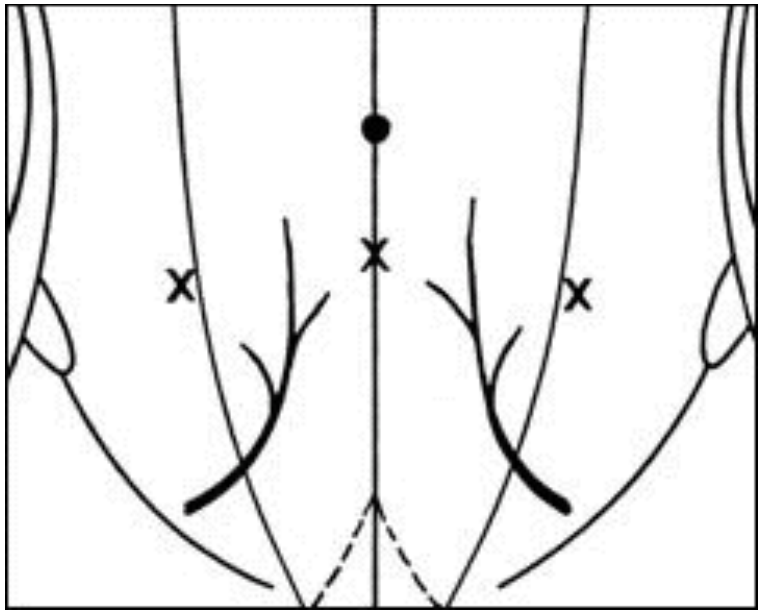
Fig 3



Paracentesis

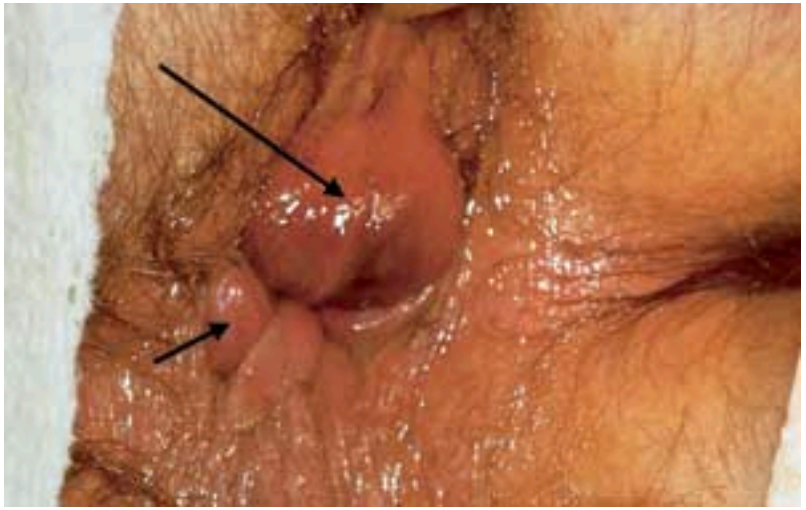
- Contraindications
  - Acute abdomen (absolute)
  - Platelet less than 20K
  - INR greater than 2.0
  - Pregnancy
  - Distended bladder
  - Distended bowel
  - Cellulitis
  - Adhesions

Thomsen TW, Shaffer RW, et al. Paracentesis. N Engl J Med. Nov 2006;355(19):e21.



Excision of Thrombosed Hemorrhoids

- 48-72 hours within onset of symptoms
- Local infiltration of lidocaine
- Elliptical incision/ excision of clot and overlying skin
- > 72 hours, conservative medical therapy



Nail Trephination

- Trephination as good as nail bed exploration
- Needle or cautery

Wound Care

Karounis et al. COSMETIC OUTCOMES WITH ABSORBABLE VS. NONABSORBABLE SUTURES

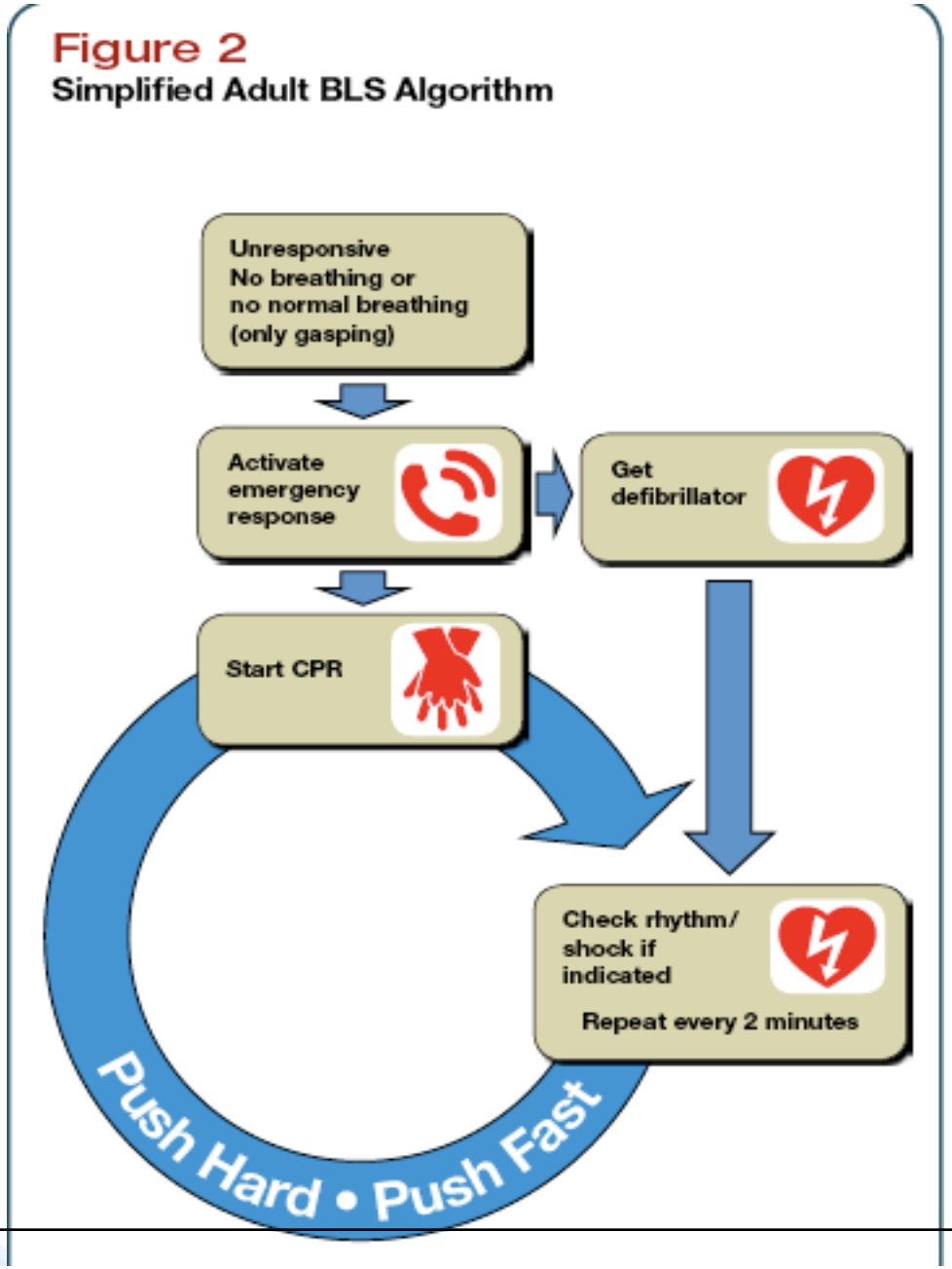
ACAD EMERG MED. July 2004, Vol. 11, No. 7

- Absorbable plain gut suture
  - No need for suture removal
  - No difference in cosmetic result

New AHA Guidelines

- BLS
- ACLS
- PALS

BLS



Summary

- The simplified universal adult BLS algorithm has been created (Figure 2).
- Refinements have been made to recommendations for immediate recognition and activation of the emergency response system based on signs of unresponsiveness, as well as initiation of CPR if the victim is unresponsive with no breathing or no normal breathing (ie, victim is only gasping).
- "Look, listen, and feel for breathing" has been removed from the algorithm.
- Continued emphasis has been placed on high-quality CPR (with chest compressions of adequate rate and depth, allowing complete chest recoil after each compression, minimizing interruptions in compressions, and avoiding excessive ventilation).
- There has been a change in the recommended sequence for the lone rescuer to initiate chest compressions before giving rescue breaths (C-A-B rather than A-B-C). The lone rescuer should begin CPR with 30 compressions rather than 2 ventilations to reduce delay to first compression.
- Compression rate should be at least 100/min (rather than "approximately" 100/min).
- Compression depth for adults has been changed from the range of 1½ to 2 inches to at least 2 inches (5 cm).

Summary of Key BLS Components for Adults, Children, and Infants

	Recommendations		
Component	**Adults**	**Children**	**Infants**
Recognition	Unresponsive (for all ages)		
	No breathing or no normal breathing (ie, only gasping)	No breathing or only gasping	
	No pulse palpated within 10 seconds for all ages (HCP only)		
CPR sequence	C-A-B		
Compression rate	At least 100/min		
Compression depth	At least 2 inches (5 cm)	At least ⅓ AP diameter About 2 inches (5 cm)	At least ⅓ AP diameter About 1½ inches (4 cm)
Chest wall recoil	Allow complete recoil between compressions HCPs rotate compressors every 2 minutes		
Compression interruptions	Minimize interruptions in chest compressions Attempt to limit interruptions to <10 seconds		
Airway	Head tilt–chin lift (HCP suspected trauma: jaw thrust)		
Compression-to-ventilation ratio (until advanced airway placed)	30:2 1 or 2 rescuers	30:2 Single rescuer 15:2 2 HCP rescuers	
Ventilations: when rescuer untrained or trained and not proficient	Compressions only		
Ventilations with advanced airway (HCP)	1 breath every 6-8 seconds (8-10 breaths/min) Asynchronous with chest compressions About 1 second per breath Visible chest rise		
Defibrillation	Attach and use AED as soon as available. Minimize interruptions in chest compressions before and after shock; resume CPR beginning with compressions immediately after each shock.		

Abbreviations: AED, automated external defibrillator; AP, anterior-posterior; CPR, cardiopulmonary resuscitation; HCP, healthcare provider.
*Excluding the newly born, in whom the etiology of an arrest is nearly always asphyxial.

ACLS

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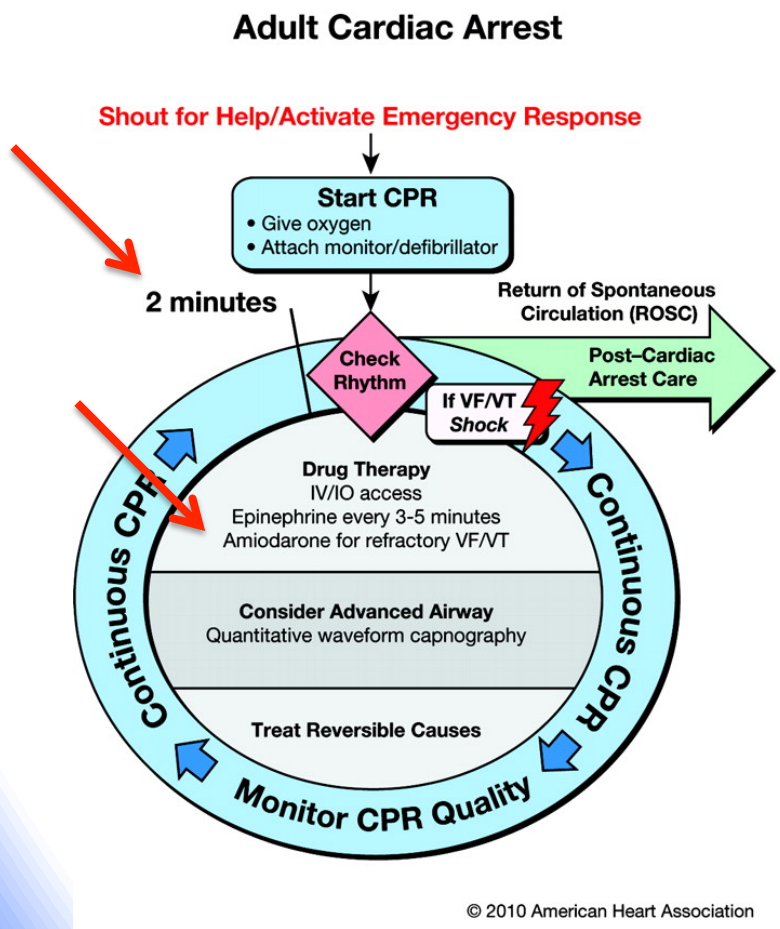
ACLS Cardiac Arrest Circular Algorithm



CPR Quality
- Push hard (≥2 inches [5 cm]) and fast (≥100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
  - If P_{ETCO_2} <10 mm Hg, attempt to improve CPR quality
- Intra-arterial pressure
  - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in P_{ETCO_2} (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Shock Energy
- **Biphasic:** Manufacturer recommendation (120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Drug Therapy
- **Epinephrine IV/IO Dose:** 1 mg every 3-5 minutes
- **Vasopressin IV/IO Dose:** 40 units can replace first or second dose of epinephrine
- **Amiodarone IV/IO Dose:** First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Supraglottic advanced airway or endotracheal intubation
- Waveform capnography to confirm and monitor ET tube placement
- 8-10 breaths per minute with continuous chest compressions

Reversible Causes
- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

Neumar, R. W. et al. Circulation 2010;122:S729-S767

Circulation

American Heart Association
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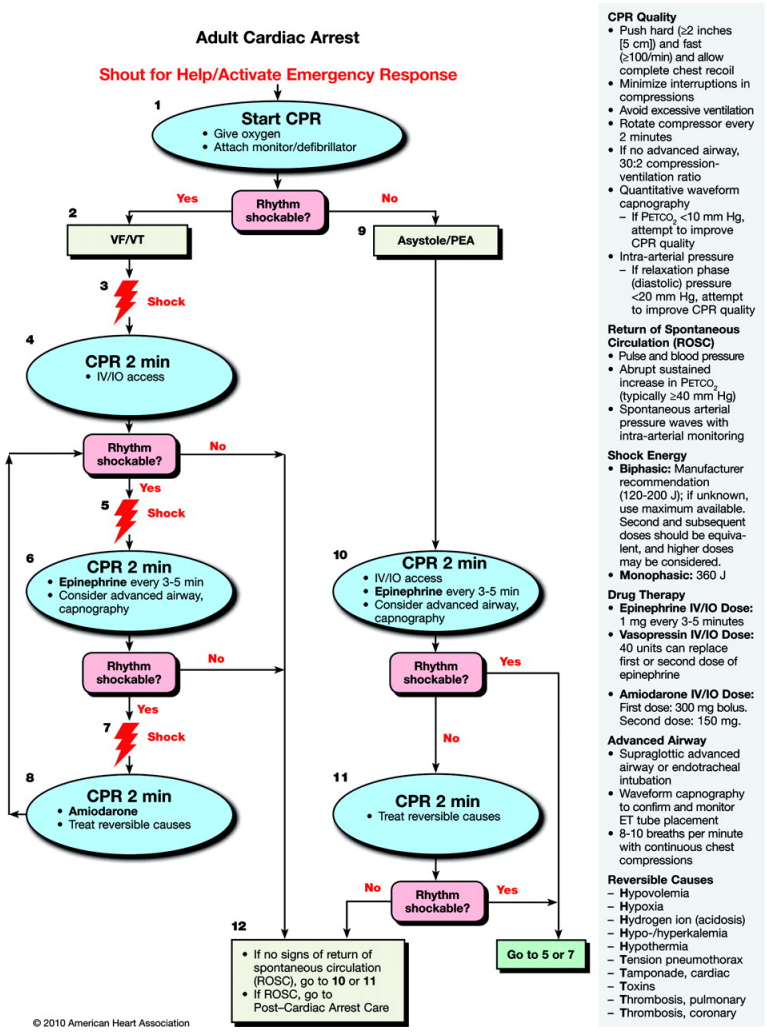
ACLS Cardiac Arrest Algorithm



Neumar, R. W. et al. Circulation 2010;122:S729-S767

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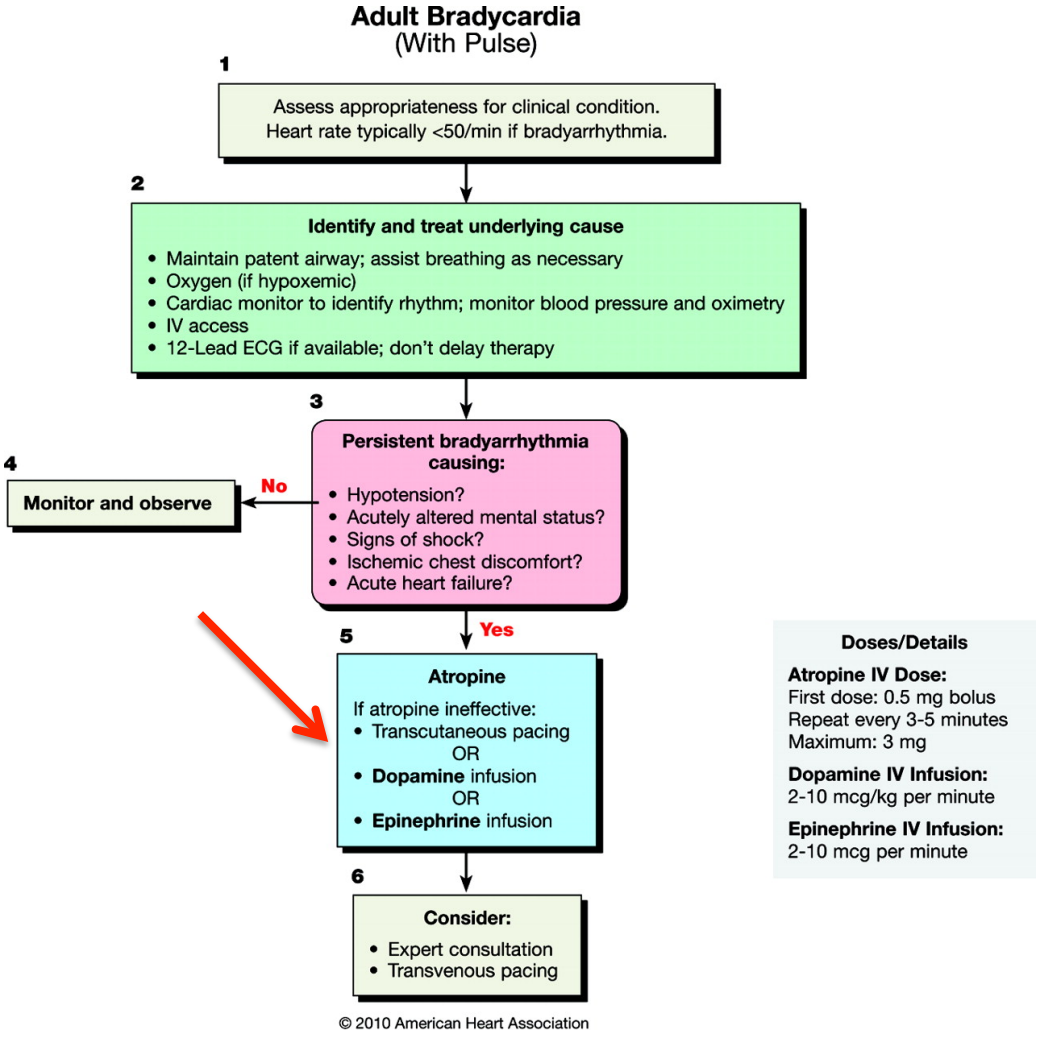
Bradycardia Algorithm



Neumar, R. W. et al. Circulation 2010;122:S729-S767

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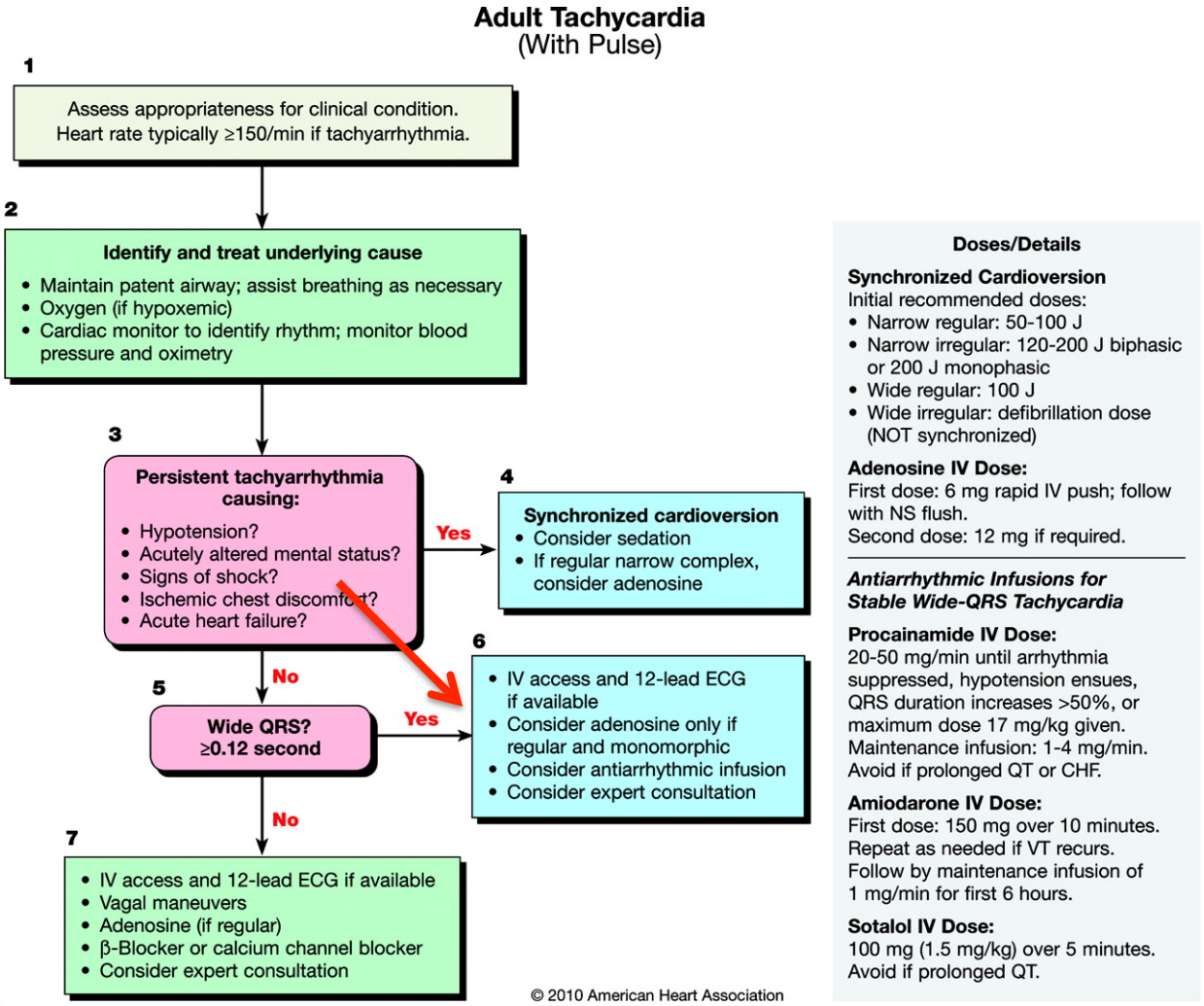
Tachycardia Algorithm



Neumar, R. W. et al. Circulation 2010;122:S729-S767

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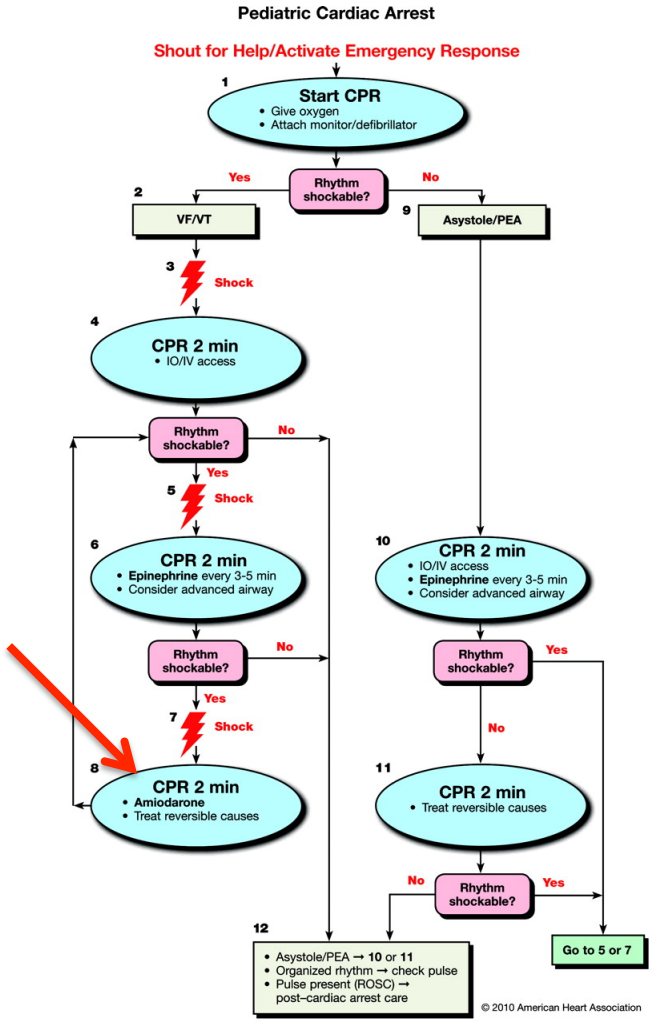
Summary

- Quantitative waveform capnography is recommended for confirmation and monitoring of endotracheal tube placement and CPR quality.
- The traditional cardiac arrest algorithm was simplified and an alternative conceptual design was created to emphasize the importance of high-quality CPR.
- There is an increased emphasis on physiologic monitoring to optimize CPR quality and detect ROSC.
- Atropine is no longer recommended for routine use in the management of pulseless electrical activity (PEA)/asystole.

- Chronotropic drug infusions are recommended as an alternative to pacing in symptomatic and unstable bradycardia.
- Adenosine is recommended as safe and potentially effective for both treatment and diagnosis in the initial management of undifferentiated regular monomorphic wide-complex tachycardia.
- Systematic post–cardiac arrest care after ROSC should continue in a critical care unit with expert multidisciplinary management and assessment of the neurologic and physiologic status of the patient. This often includes the use of therapeutic hypothermia.

PALS

PALS Pulseless Arrest Algorithm



Doses/Details

CPR Quality
- Push hard (≥1/3 of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 15:2 compression-ventilation ratio. If advanced airway, 8-10 breaths per minute with continuous chest compressions

Shock Energy for Defibrillation
First shock 2 J/kg, second shock 4 J/kg, subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose.

Drug Therapy
- **Epinephrine IO/IV Dose:** 0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- **Amiodarone IO/IV Dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place give 1 breath every 6-8 seconds (8-10 breaths per minute)

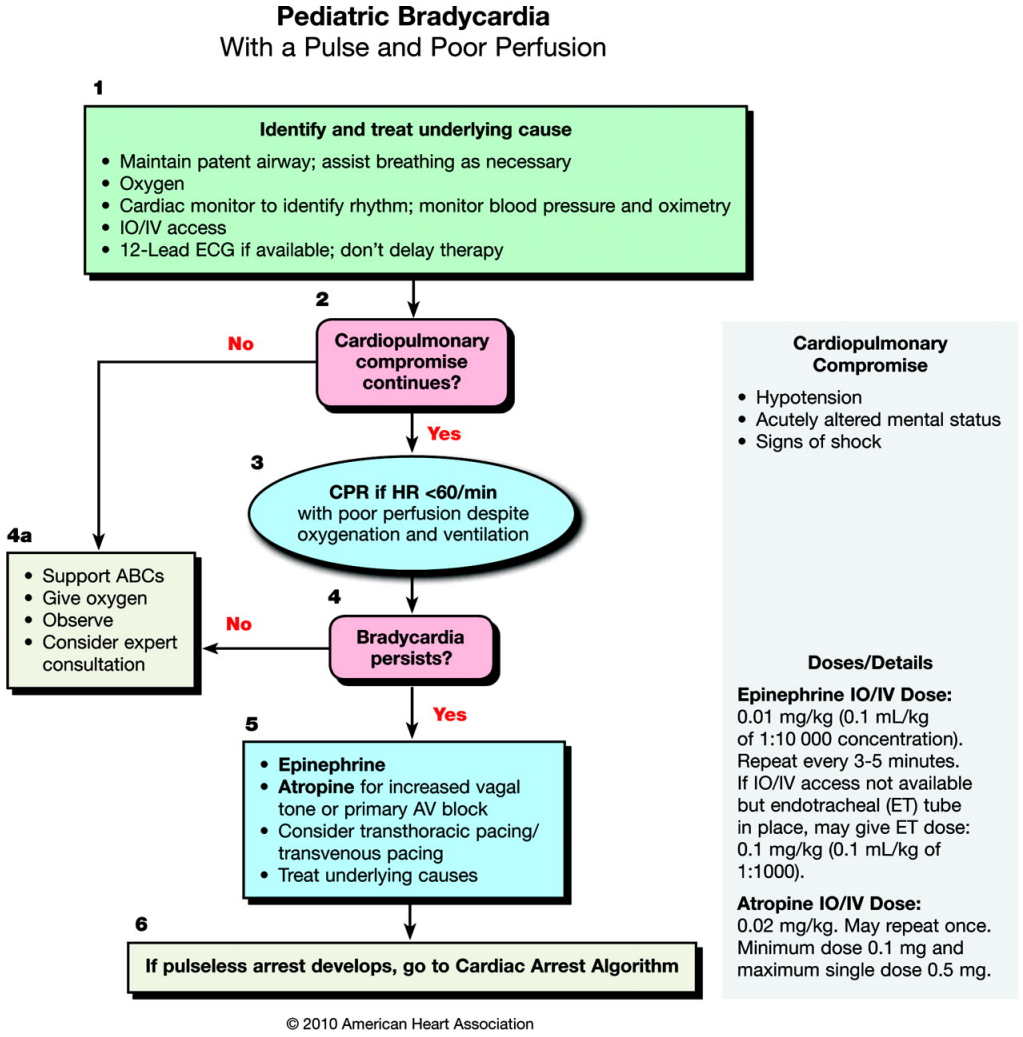
Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

Kleinman, M. E. et al. Circulation 2010;122:S876-S908

Circulation

PALS Bradycardia Algorithm



Kleinman, M. E. et al. Circulation 2010;122:S876-S908

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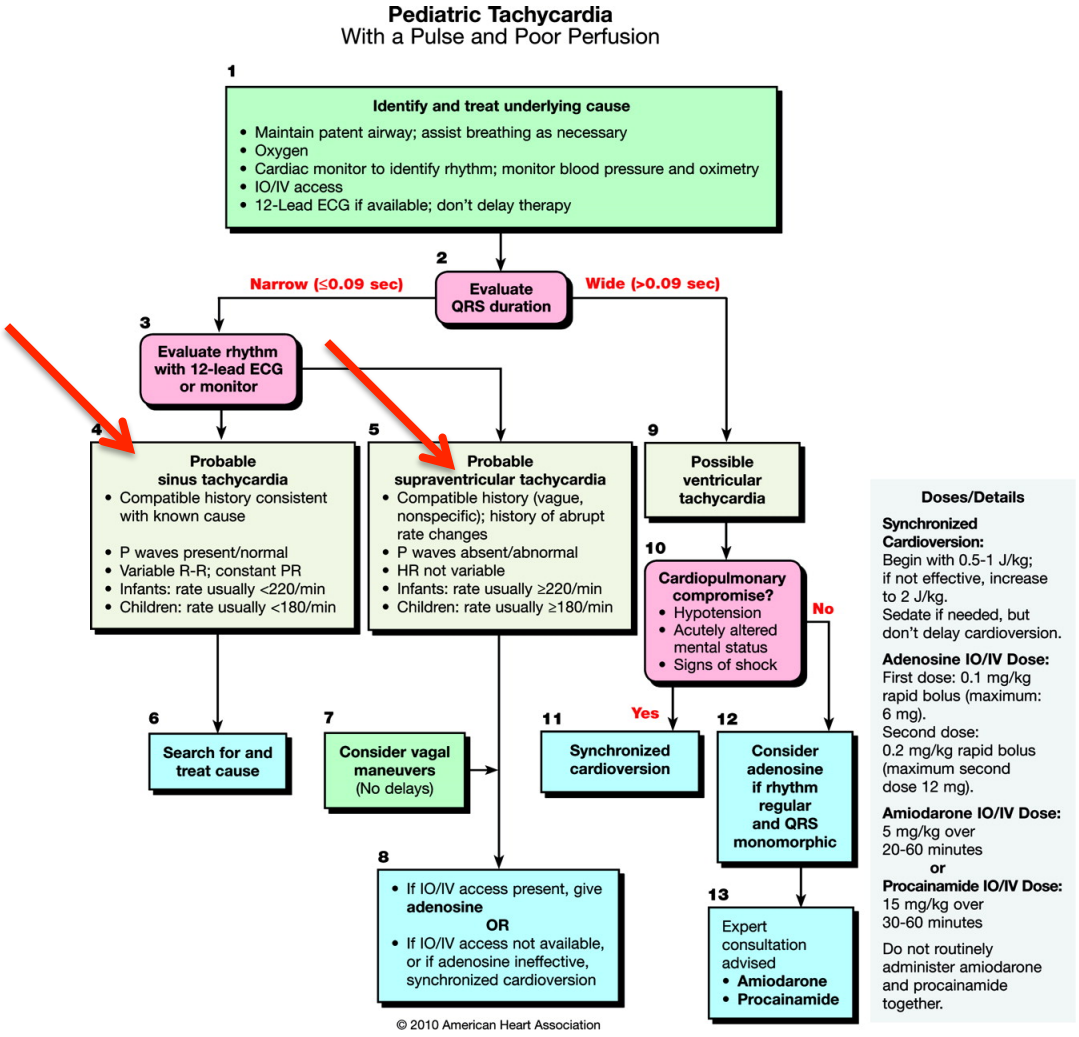
PALS Tachycardia Algorithm



Kleinman, M. E. et al. Circulation 2010;122:S876-S908

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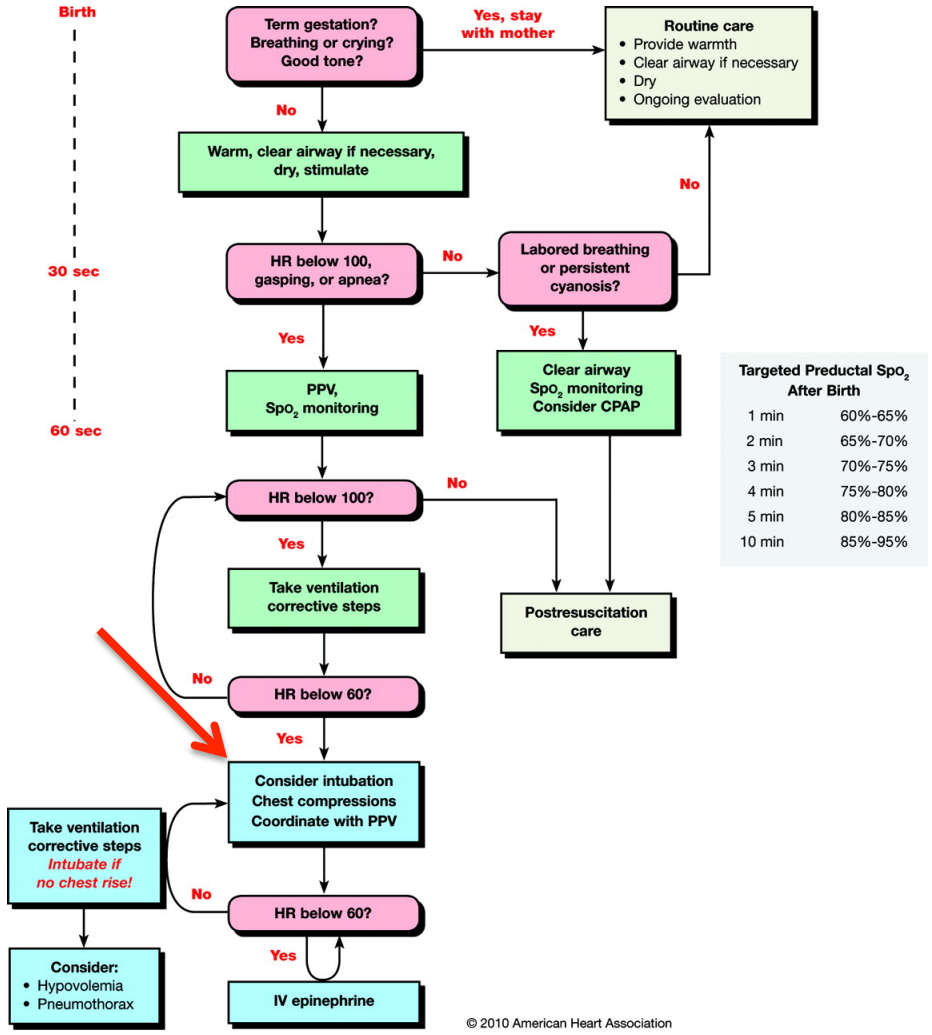
Newborn Resuscitation Algorithm



Kattwinkel, J. et al. Circulation 2010;122:S909-S919

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Summary

- Many key issues in the review of the PALS literature resulted in refinement of existing recommendations rather than new recommendations; new information is provided for resuscitation of infants and children with selected congenital heart defects and pulmonary hypertension.
- Monitoring capnography/capnometry is again recommended to confirm proper endotracheal tube position and may be useful during CPR to assess and optimize the quality of chest compressions.
- The PALS cardiac arrest algorithm was simplified to emphasize organization of care around 2-minute periods of uninterrupted CPR.
- The initial defibrillation energy dose of 2 to 4 J/kg of either monophasic or biphasic waveform is reasonable; for ease of teaching, a dose of 2 J/kg may be used (this dose is the same as in the 2005 recommendation). For second and subsequent doses, give at least 4 J/kg. Doses higher than 4 J/kg (not to exceed 10 J/kg or the adult dose) may also be safe and effective, especially if delivered with a biphasic defibrillator.
- On the basis of increasing evidence of potential harm from high oxygen exposure, a new recommendation has been added to titrate inspired oxygen (when appropriate equipment is available), once spontaneous circulation has been restored, to maintain an arterial oxyhemoglobin saturation ≥94% but <100% to limit the risk of hyperoxemia.
- New sections have been added on resuscitation of infants and children with congenital heart defects, including single ventricle, palliated single ventricle, and pulmonary hypertension.
- Several recommendations for medications have been revised. These include not administering calcium except in very specific circumstances and limiting the use of etomidate in septic shock.
- Indications for postresuscitation therapeutic hypothermia have been clarified somewhat.
- New diagnostic considerations have been developed for sudden cardiac death of unknown etiology.
- Providers are advised to seek expert consultation, if possible, when administering amiodarone or procainamide to hemodynamically stable patients with arrhythmias.
- The definition of wide-complex tachycardia has been changed from >0.08 second to >0.09 second.

Rosenberg M. Comparison of Broselow tape measurements versus physician estimations of pediatric weights

The American Journal of Emergency Medicine; April, 2010

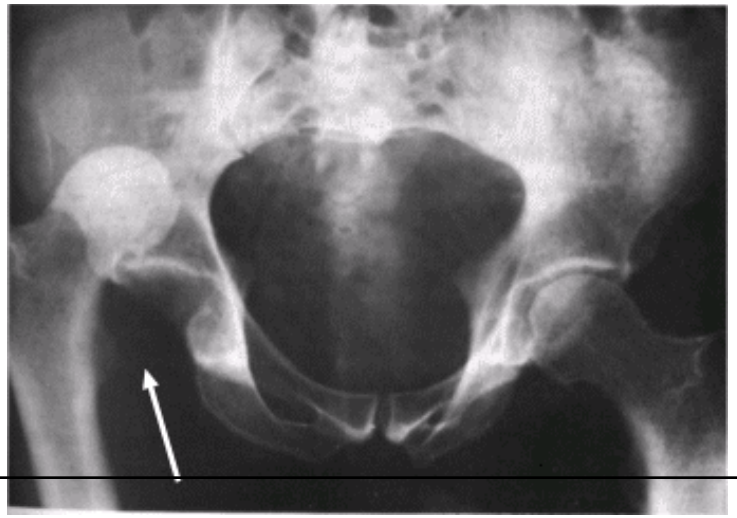
- 372 Patients
- Mean age: 45.7 months
- Obesity
  - Physician 26.4%
  - Broselow 16.0%

Joint Reductions

- Posterior elbow dislocations
  - Procedural sedation
  - Supine: slight flexion/ supination with opposing traction on the humerus and forearm
  - Prone: flexed to 90^{o} hand toward ground traction on forearm with pressure on olecranon

Joint Reductions (2)

- Posterior hip dislocations
  - Procedural sedation
  - Hip flexed, bed lowered, Shoulder in the popliteal fossa with arm under injured leg and hand on uninjured leg, pelvis stabilized, traction at 90º, internal rotation

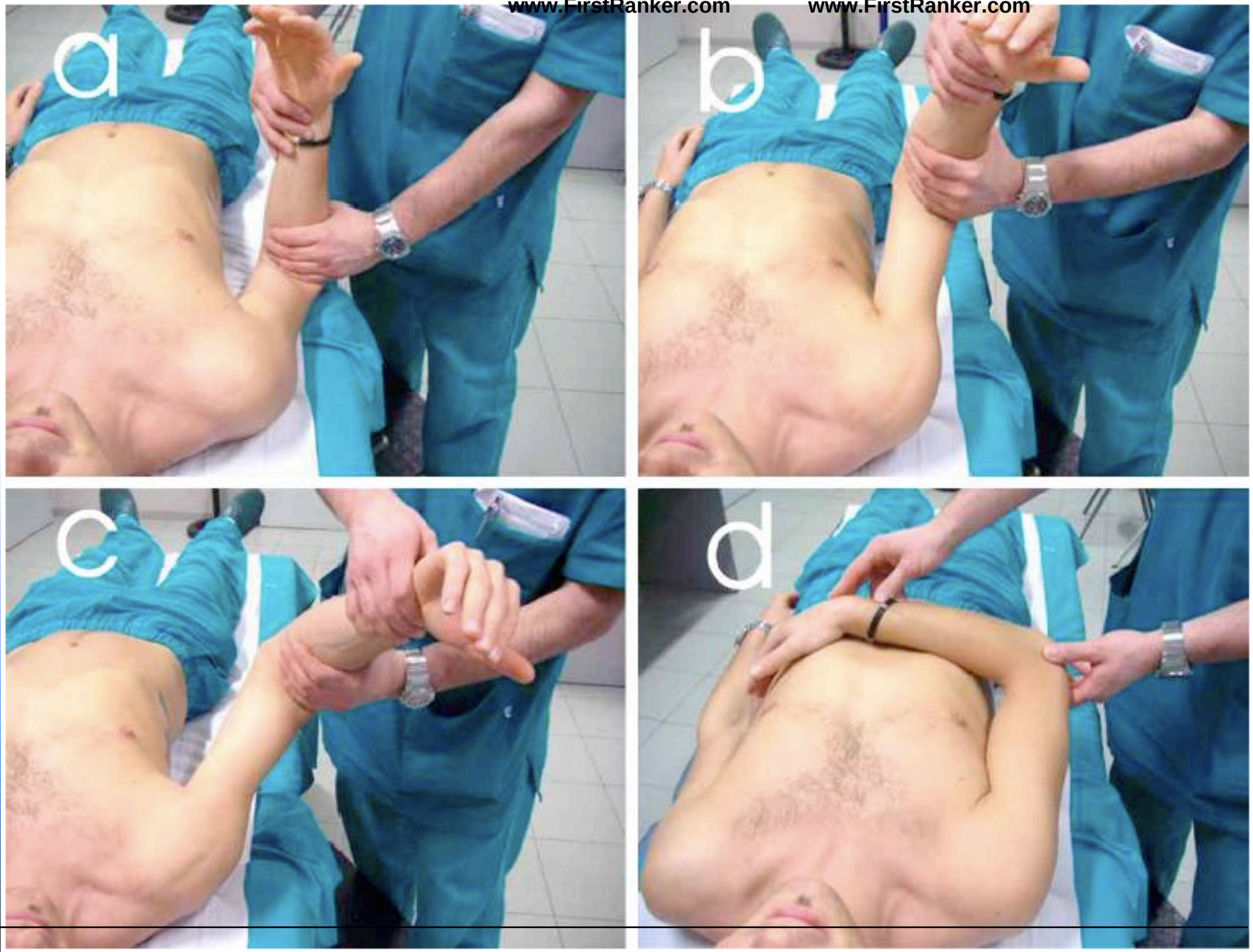


Joint Reductions (3)

- Shoulder dislocations
- Scapular manipulation
  - Prone or sitting
  - Scapula rotated externally
- Traction-counter traction
- Stimson technique

Cunningham Technique

- Kocher maneuver (leverage)
  - Higher complication rate
  - Axillary nerve injury
  - Capsular damage
  - Humeral shaft fracture
- External rotation



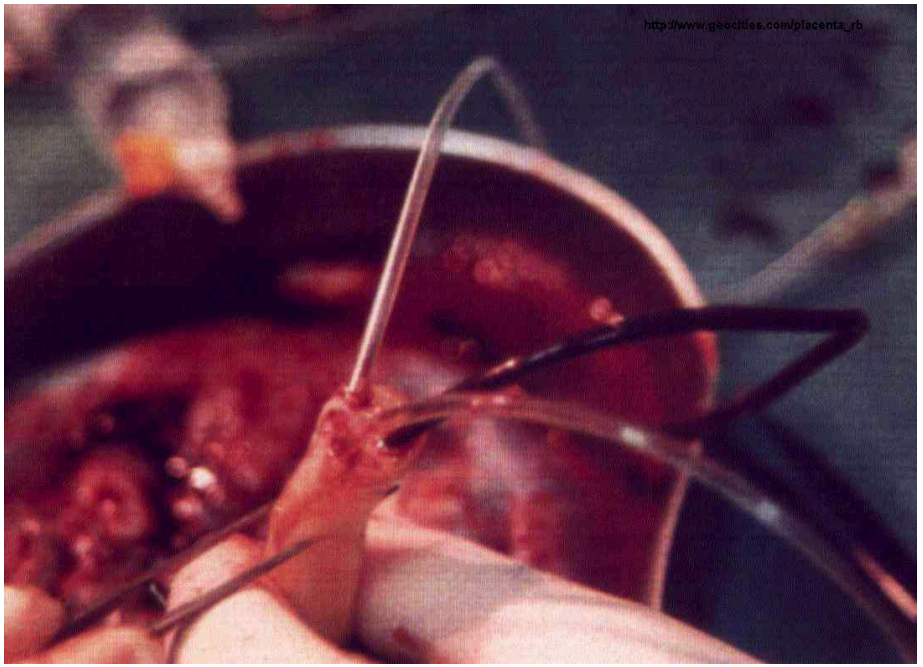
Central Venous Access

- Complications
  - Pneumothorax (subclavian > IJ approach)
  - Hemothorax, venous thrombosis, arterial or neurologic injury, arteriovenous fistula, infection, air embolism, great vessel injury
  - Femoral anatomy, lateral to medial: N-A-V-L
- Trauma considerations
  - Place line on side of trauma/pneumothorax
  - Place line on side opposite potential vascular injury

Contraindication: coagulopathy

Umbilical Line Insertion

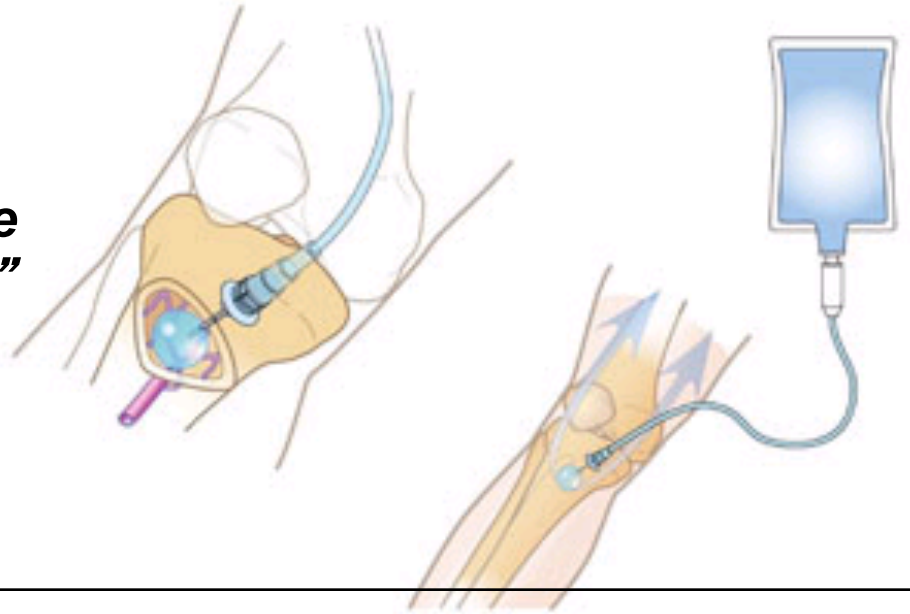
- Hemostasis with umbilical tape or suture
- Two arteries and one vein
- 5 F catheter: Term
- 3.5 F catheter: Pre-term
- Advance 1-2 cm beyond the point of blood return
- 4-5 cm: Term



Intraosseous Access

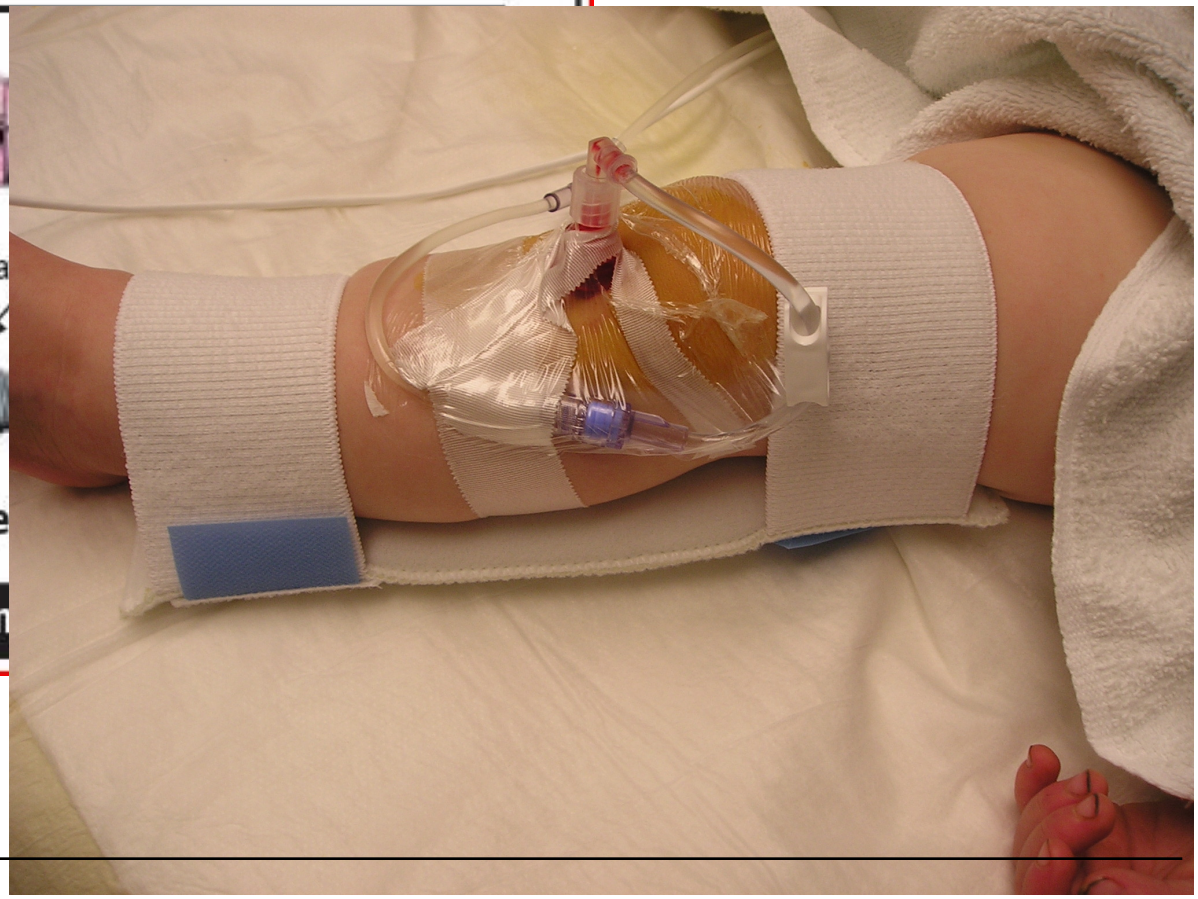
- Rapid temporary vascular access
- Anterior tibia is preferred pediatric site
- Prox humerus, distal tibia, medial malleolus and preferred adult sites
- Complications: infection, subcutaneous infiltration, hematator osteomyelitis

"When venous access cannot be quickly and reliably established"



EZ-IO® sterile needle set attaches to the Power Driver for patient insertion.

EZ-IO Power Driver an

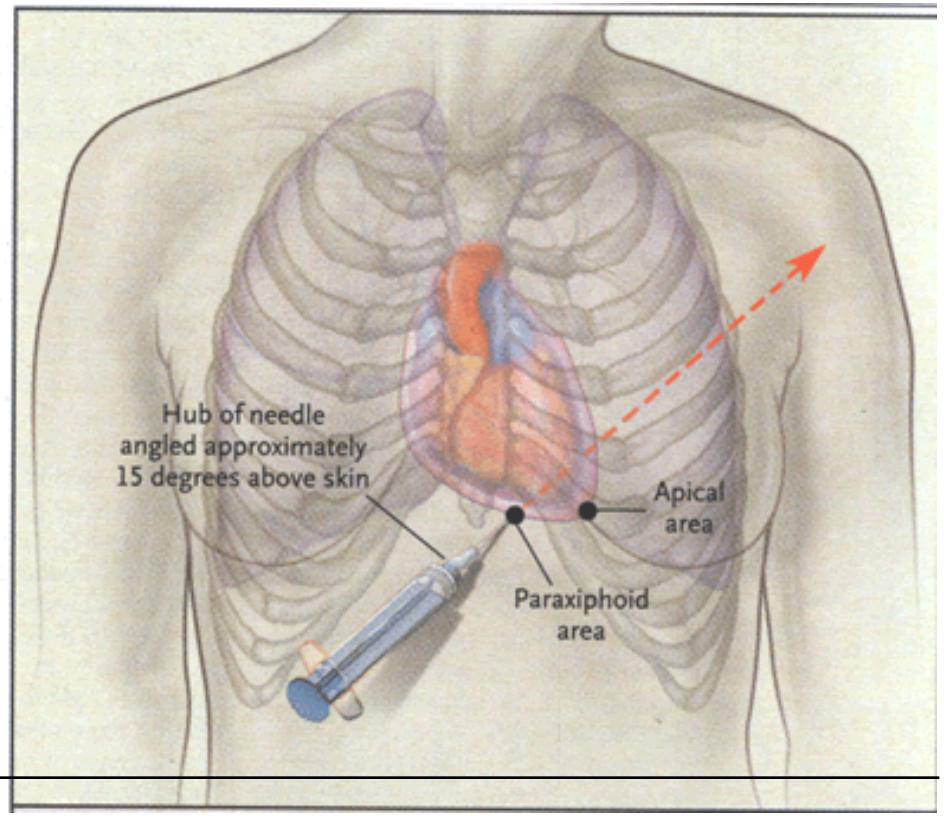


Chest Tube Thoracostomy

- Complications
  - Infection
  - Great vessel
  - Intercostal neurovascular injury
  - Persistent pneumothorax
  - Subcutaneous emphysema
  - Re-expansion pulmonary edema (rare)
  - Intra-abdominal placement (intrathoracic abdomen: 4th intercostal space anteriorly to the 7th intercostal space posteriorly to the inferior costal margins)

Pericardiocentesis

- Pericardial effusion: diagnostic and therapeutic
- Ultrasound guidance is recommended
- EKG-guided: unipolar EKG electrode attached to exploring needle
- Complications
  - Cardiac laceration,
  - ventricular fibrillation
  - Pneumothorax
- Non-clotting blood is
- diagnostic



ED Thoracotomy (1)

- Indication: penetrating thoracic injuries
  - Arrest imminent despite airway control and fluids
  - Loss of vital signs
  - Better for preventing arrest rather than treating arrest
  - Pericardial tamponade (pericardiocentesis is temporizing)
  - CPR < 15 min, particularly with electrical activity
- Poor prognostic signs
  - Non-intubated field arrest >5 min
  - Intubated field arrest >10 min
  - Initial rhythm agonal or asystole

ED Thoracotomy (2)

- Goals of procedure
  - Evacuation of pericardial tamponade (left phrenic nerve can be injured when opening pericardium)
  - Control hemorrhage
  - Open cardiac massage
  - Cross clamp aorta
- Not routinely indicated in blunt trauma, penetrating abdominal trauma

ED Ultrasound

Procedural Sedation

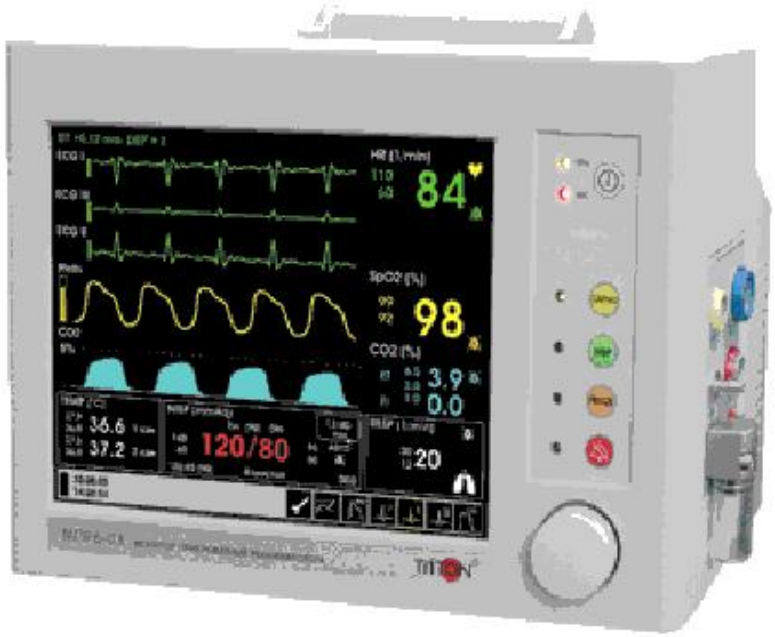
- Preparation is the key
- Is the patient an appropriate candidate?
- NPO guidelines (controversial and not mandatory)
- Informed consent
- Know the adverse effects
- Continuous monitoring
- Safe discharge
- Not every patient can or should undergo PSA in the ED

ASA Classifications

- ASA I A normally healthy patient
- ASA II A patient with mild systemic disease
- ASA III A patient with severe systemic disease and functional limitations
- ASA IV A patient with severe systemic disease that is a constant threat to life
- ASA V A moribund patient who is not expected to survive without the procedure
- Classes III and IV may require consultation with an anesthesiologist

Equipment (minimum)

- High flow O_2 source
- Suction
- Vascular access
- Airway management equipment
- Monitor pulse ox, blood pressure, capnography



NPO Guidelines

- No oral liquids within 2 hours for children <2 years; 3 hours if >2 years
- Prefer no milk or solids within 8 hours
- In the emergency department setting
  - Delay sedation if possible
  - Use lightest sedation possible
  - Have airway equipment at bedside

Medications (1)

Opioids: analgesia and sedation

Opioids + Benzos = Opioids given first

- Morphine
  - Poor lipid solubility (slow blood-brain penetration)
  - Histamine release (hypotension, bronchospasm)
  - Liver metabolites 4 times more potent and longer lasting

Medications (2)

- Fentanyl
  - Low complication rate for PSA in ED
  - Chest wall rigidity (seen with large doses and rapid administration, not relieved by naloxone, may need to paralyze and intubate)
  - Highly lipid soluble, penetrates blood-brain barrier rapidly, accumulates in adipose tissue
  - Does not release histamine (no hypotension or bronchospasm)

Medications (3)

Anxiolytics (sedation, amnesia, anxiolysis)

- Methohexital (Brevital)
  - Twice as potent as thiopental
  - Ultra-rapid onset (30 sec.) / duration = 10 minutes
  - Causes unconsciousness
  - A direct myocardial depressant and vasodilator
  - Avoid in hemodynamically compromised patients
  - Can cause hypoventilation / apnea

Medications (4)

Anxiolytics (sedation, amnesia, anxiolysis)

- Midazolam
  - High lipid solubility, rapid CNS effect
  - Combination with EtOH or opioids causes increased sedation, respiratory and cardiac depression
  - Administer in small doses
  - Chronic alcohol user may require higher doses
  - Broselow issues with overweight children

Medications (5)

- Propofol
  - Supplied as an emulsion
  - Injection causes burning sensation
  - No egg allergy (egg protein)
  - No preservatives, therefore increased risk of bacterial contamination
  - Sedation is rapid, amnesia unreliable
  - Significant cardiovascular depression
  - Antiemetic properties
  - Dedicated IV line
  - Less likely to cause resp depression v. Etomidate

Medications (6)

- Etomidate: sedation and hypnosis (induction)
  - Metabolized by liver
  - No decreased blood pressure, no decreased RR
  - Side effects: N/V, myoclonus, adrenal suppression

Medications (7)

- Ketamine: dissociative anesthetic
  - Emergence reactions more common over 16 years old
  - Benzos may decrease emergence reaction
  - Increased ICP
  - Respiratory and cardiovascular depression rare
  - Bronchorrhea (pre-medicate with glycopyrolate or atropine)
  - Laryngospasm rare

Medications (8)

- Reversal Agents
  - Naloxone (Narcan)
    - Duration 1-2 hours
    - May need repeat dosing
    - Duration action the same as Fentanyl
  - Flumazenil (Romazicon)
    - Watch for re-sedation
    - Complications: seizures, withdrawal in chronic benzo users
    - Duration of action same as Versed
    - Contraindicated for empiric OD Tx

	Morphine	Fentanyl	Brevital	Propofol	Etomidate	Ketamine
Histamine release	X					
Chest rigidity		X				
Bronchorrhea						X
Hypotension	X		X	X		
Adrenal suppression					X	
↓Resp	X	X	X	X	X	
Emergence reaction						X
Myoclonus					X	
Bronchodilator						X
Antiemetic				X		

EM Administration

ED Design

- New ED design
  - Allow for 25% increase in current patient load by the time new ED completed and 25% increase over the next 5 years (total increase 50%)
- One treatment area for every 2000 visits or 5-7 spaces per ED physician on duty
- Each treatment area at least 9' X 9'
- Parking: 12-14 spaces per 20,000 visits
- Pediatric EDs have greater equipment needs
- EDs with >100 visits/day must have a major trauma room and an eye room

Patient Satisfaction

- Most common complaints
  - Physician and nursing issues
  - Operational inefficiency
  - Lack of comfort
  - Not being informed
  - Improper billing
- Most common physician complaints
  - Misdiagnosis of presenting problem
  - Unprofessionalism
- Less common complaints
  - Inadequate treatment, incomplete explanation
  - Department cleanliness
- Communication is critical

EMS

Standards / Training (1)

- National highway safety act of 1966 / EMS system act of 1973
  - Defined goals for improving EMS on a national scale
  - Federal funding for EMS operations, training and research
- National highway traffic safety administration (NHTSA)
  - Federal EMS oversight

Standards / Training (2)

- Certification criteria vary from state to state
  - National standards inconsistently adopted
  - EMT scope and practice may vary regionally
- State EMS laws and regulations define
  - Ambulance service capabilities
  - Training requirements
  - Physician leadership requirements
- State health department is lead agency

Standards / Training (3)

- Dept. of Transportation (DOT) EMS training curricula
  1. U.S. DOT first responder: 20 hours. First aid, CPR, AED, EMT-A (no longer exists)
  2. EMT-B: 110 hours. Ambulance operations, BLS training, CPR
  3. EMT-I: 300 hours. EMT-B + IVs + airways (Combitube, LMA) + limited drugs (dextrose, naloxone)
  4. EMT-P: 1100 hours. EMT-B + EMT-I + advanced airways, ACLS, medications

Medical Control (1)

- Paramedics act under a physician's license
- Standing orders allow paramedics to function when online medical contact is not available
- The ultimate responsibility for quality assurance lies with the local EMS medical director
- EMS system is regulated by state law
- Federal regulations specify ambulance standards

Medical Control (2)

- Immediate (online, direct)
  - Orders to EMTs in the field (radio contact)
  - Direct field observation (ride along)
    - Best method for assessing quality of care
    - Most complete data gathering, prompt feedback
- Prospective (offline, indirect)
  - Development of policies and procedures
  - Standing order approval
  - Training, testing and education
- Retrospective (offline, indirect)
  - Review of run sheets
  - QA EMS training based on deficiencies

Refusal of Care

- Online medical direction should be requested
- High liability area
- Implied consent if patient is impaired
- Documentation is key to legal protection
- Non-transports do not = AMA

Disaster Medicine: General (1)

- Disaster: “When the destructive effects of natural or man-made forces overwhelm the ability of a given area or community to meet the demand for healthcare”
  - External: occurs outside hospital (plane crash)
  - Internal: occurs within hospital (fire, power failure)
  - Both can occur together

Disaster Medicine: General (2)

- Phases of disaster management
  - Planning & Preparedness
  - Mitigation
  - Response
  - Recovery
  - Evaluation
- Important factors for response success
  - Established EMS system
  - Correct assessment of extent of disaster
  - Mobilization of resources

Disaster Medicine: General (3)

- No one agency in charge of nation's trauma and emergency care systems
- Federal emergency management agency (FEMA)
  - 2,600 FTEs
  - Partnerships: 27 federal agencies, State and local EMAs and Red Cross
  - Federal response plan (response to all disasters and emergencies)
  - Helps state and local organizations prepare, respond and recover
- Federal emergency aid
  - Requested by Governor
  - Authorized by President

Disaster Medicine: General (4)

- National disaster medical system (NDMS)
  - Section of the Dept. of Homeland Security
  - Supplemental medical response in case of catastrophic disaster
  - Domestic disasters
  - Natural Disasters, Technological Disasters, Major Transportation Accidents , Acts of Terrorism including Weapons of Mass Destruction Events
  - DMATs (disaster medical assistance teams): medical volunteers responding to NDMS

Disaster Medicine: General (5)

- Communication is the first problem in disasters (telephone lines)
- Lack of back-up resources is the most common problem

Disaster Medicine: Operation (1)

- Hospital / ED Plan
  - JC disaster plan and participate in two drills per year
  - Key functions: activation, capacity assessment, command center, communications, supplies, designated areas, training, drills
  - Media
    - Designated administrator should be assigned
    - Restricted to designated non-care area

Disaster Medicine: Operation (2)

- Incident command system
  - Standardized EMS command and control for an organized response
  - Management of multi-agency / multi-jurisdictional response

Disaster Medicine: Operation (3)

- Disaster triage tags
  - Red = life-threatening injury
  - Yellow = serious but stable
  - Green = non-serious injury
  - Black = dead or moribund

Medicolegal Aspects of EM

Emergency Medical Treatment and Active Labor Act (EMTALA) (1)

- Purpose: to prevent denial of emergency care, or transfer of patients, based solely on the patient's ability to pay (anti-dumping law)
- Medical Screening Exam (MSE): all patients presenting to the emergency department must receive a MSE regardless of their ability to pay

Emergency Medical Treatment and Active Labor Act (EMTALA) (2)

- "Campus means the physical area immediately adjacent to the provider's main buildings, other areas and structures that are not strictly contiguous to the main buildings but are located within 250 yards of the main buildings, and any other areas determined on an individual case basis, by the CMS regional office, to be part of the provider's campus."

Emergency Medical Treatment and Active Labor Act (EMTALA) (3)

- Scope and extent of MSE based on
  - Chief complaint, emergency condition
  - Hospital resources
  - May include ancillary tests and on-call specialists available to hospital
- Accuracy of diagnosis is less important than adherence to process
- MSE cannot be delayed for financial information
  - Rule out emergent medical condition / active labor
  - Stabilize patient

Emergency Medical Treatment and Active Labor Act (EMTALA) (4)

- Who can do the MSE?
  - "Qualified" medical personnel
  - Determined by hospital
  - Designation must be outlined in hospital bylaws
- Federal transfer law applies to hospitals receiving Medicare payments
- Patients in active labor are considered unstable
- On Call Physician responsibilities

Emergency Medical Treatment and Active Labor Act (EMTALA) (5)

- Patient transfer requirements
  - Good medical reason for transfer (benefits >risks and if higher level of service)
  - Informed consent (risks and benefits)
  - Facility-to-facility communication and agreement to accept transfer
  - Space available
  - Transferring facility determines mode of transportation
- Violations: hospital and physician fines $50,000 and loss of ability to bill Medicare

HIPAA

Health Insurance Portability & Accountability Act of 1996.

"Portability" – COBRA.

"Accountability" – 4 Parts:

Patient Confidentiality.

Transactions & Code Sets.

Security.

Patient Identifiers.

Enforcement and Penalties

- Civil Monetary Penalties
  - Fines range from $100 to $25,000 annually for the same offense.
- Criminal Penalties
  - Fines up to $250,000 and/or 10 years in prison.

HIPAA Privacy Rule

- Established Federal protections for Protected Health Information (PHI) that is maintained or transmitted in ANY form.
- Provides patients with the right to control their medical information and to NOT have it used or divulged to others against their wishes.

Protected Health Information

Health information relating to the past, present or future health conditions of the individual.

This covers all information, maintained electronically, in paper form or communicated verbally.

Information that actually identifies an individual, or that can be used to identify an individual.

Key: Did you learn the patient information through your job? It must be protected

Disclosure of PHI

- HIPAA Authorizations
  - Strict legal requirements for the contents of the form.
  - Must specifically describe the information to be released.
  - Must contain the name of person authorized to make the disclosure and the person to whom the disclosure will be made.
  - Do not honor an authorization form unless it meets the strict HIPAA criteria.

Violence / Abuse

Child Abuse

- Mandatory reporting in all states. Report any suspicion
- Legal immunity
- Consider failure to thrive, emotional and psychological trauma
- Admission is recommended
- Multiple injuries in various stages
- Commonly seen with delays in treatment or frequent visits with vague complaints

Violence / Abuse (2)

Child Abuse

- Fractures suspicious for abuse
  - Greatest in children <5, majority <18 months
  - Long bone, posterior rib (most common child abuse fracture in infants), metaphyseal, bilateral, multiple, various stages of healing
  - Fractures with low specificity for abuse
    - Linear skull
    - Long bone age > 5
    - Clavicle
- Consider CT of the Brain

Patient Rights (1)
Decision-Making Capacity (DMC)

- Determined by clinical circumstances
  - Comprehension of options
  - Awareness of consequences
  - Comprehension of risks and benefits
- A patient with DMC has the right to refuse treatment
- Forcing treatment on a refusing patient with DMC could be charged as assault and battery

N Engl J Med 2007;357:1834-40.

Competence is a legal term requiring a court ruling

Patient Rights (2)

Civil Commitment

- Being psychotic is not, in itself, a reason for commitment
- Must demonstrate danger to self or others, or grave disability
- Strongest predictor: Lack of insight

Informed Consent

- The physician's responsibility
- Includes disclosure of risks and benefits
- Review viable alternatives
- Explain risks of not being treated

Patient Rights (3)
Implied Consent

- Consent is implied in an emergency situation
- Need to document
  - Nature of emergency
  - Treatment for patient's benefit
  - Reason consent could not be obtained

Patient Rights (4)
Minors: Consent

- Parent or legal guardian must consent to treatment if age < 18 (age may vary by state)
- If parent or guardian unavailable
  - Evaluate and treat, especially if delay may result in harm
  - Make repeated attempts to contact parent(s)
  - Document all of the above

Patient Rights (5)
Minors: Consent

- Laws vary by state
- Emancipated minor (may treat without parental consent)
  - Married or pregnant
  - Active military duty
  - Living away from home
  - Condition is a public health hazard

Patient Rights (6)
Minors: Consent

- EMTALA 1st!!
- EMTALA (federal law) pre-empts state law
  - MSE for all patients presenting to the emergency department
  - Must provide stabilizing treatment
  - Not age-specific
- State courts almost always affirm a physician's (reasonable) judgment
- Withholding treatment is more likely to be held negligent

Patient Rights (7)
Advanced Directives

- Applies to acute cardiac or respiratory arrest
- Does not imply presence of terminal illness or refusal of other care
- “When in doubt, resuscitate”

Patient Rights (8)

Patient Restraints

- Team approach, minimum necessary force
- Behaviors dangerous to patient or staff
  - Behavioral
  - Medically necessary
- Close observation required for safety
- Chemical before physical
- Documentation: reason, physician order, re-evaluation

Duty to Third Party

- Named third party
  - If patient identifies someone that they plan to injure, notification of police is recommended
- Unnamed third party
  - Written “do not drive” discharge instructions for sedatives, narcotics, eye patch, seizures
  - Treatment of partners of STD patients

Good Samaritan Laws

- No duty to act
- Protect non-compensated responders
- Do not apply to patients in the ED
- Do not protect if grossly negligent
- Can’t be used to defend a malpractice claim

Mandatory Reporting by Healthcare Providers

- Varies with jurisdiction
- Communicable diseases
  - STDs, hepatitis (reported by lab)
  - Highly contagious (anthrax, measles) reported if suspected
- Violent acts
  - Child abuse, domestic abuse, elder abuse
  - Death

Disclosure of medical error

- Thomas H. Gallagher, M.D., David Studdert, LL.B., Sc.D., M.P.H., and Wendy Levinson, M.D. Disclosing Harmful Medical Errors to Patients. N Engl J Med 2007; 356:2713-2719
  - Inform the patient asap
  - Express regret for the error
  - Advise them of the follow up that will occur
  - Demonstrate a plan of avoidance

Medical Malpractice: Terms (1)

- Duty to treat
  - Established when patient presents to the ED
- Standard of care
  - Actions a reasonable physician with similar training would take under similar circumstances
- Direct cause ("causation")
  - Injury occurred as a direct result of actions by the treating physician
- Proximate cause ("causation")
  - No superseding or intervening forces interrupting the chain of causation.
- Damages
  - Wages, medical expenses, pain and suffering

Medical Malpractice: Terms (2)

- Professional negligence
  - Conduct fails to meet accepted standard of care
- Joint & several liability ("deep pocket" rule)
  - Several physicians held accountable
  - A physician may be only 1% at fault but could pay entire judgment

Medical Malpractice: Overview (3)

- Most common reasons
  - Failure to diagnose
  - Complications from treatment/procedures
  - Delays in definitive management
- Most frequent claims
  - Missed fractures and dislocations
  - Wound care (infection, tendon injury, neurovascular injury, foreign body)
- Expensive claims
  - AMI
  - Meningitis
  - Spinal cord injury

POLICIES & PROCEDURES QUESTIONS

Regarding EMS, which statement is true?

A. Paramedics are licensed practitioners
B. Standing orders allow paramedics to function without any medical control
C. EMS systems are state regulated
D. Certification requirements are consistent from state to state
E. On-line medical control is not suggested for refusals

In a disaster, which problem is usually encountered first?

A. Lack of back up resources
B. Insufficient volunteers
C. Communication problems
D. Water supply contamination
E. Jurisdiction disputes

A roofer working on a hospital owned office building 150 yards from the hospital has fallen and is unconscious and unresponsive. What is the hospital's responsibility in this case?

A. Call 911
B. The hospital has no legal responsibility to this patient
C. The hospital must mobilize an internal response to assist this patient
D. The hospital is obligated to pay for all medical expenses associated with his injuries
E. The hospital must contact his employer and family

With respect to EMTALA and Medical Screening Examinations, which statement is true?

A. The extent of the MSE is based solely on the chief complaint
B. The MSE may be performed after obtaining financial information if the delay is < 30 minutes
C. Stabilization is considered part of the MSE
D. Delays in performing the MSE are acceptable on busy days
E. Patients in early labor, < 5 cm dilated, are considered stable

A 2 m/o child has not been using his right arm after he crawled off the changing table 3 days ago. Radiographs show a spiral mid-shaft humerus fracture. Regarding this patient's condition, which of the following is accurate?

A. All states have mandatory reporting laws, except for West Virginia and Texas.
B. Admission is rarely necessary
C. Multiple injuries with various stages of healing are often present
D. Linear skull fractures are pathognomonic
E. Most occur between 5 and 10 years

Which of the following most accurately describes PTJV?

A. A minimum of 20 psi is required for adequate oxygenation and ventilation
B. An Inspiratory to expiratory (I:E) ratio of 4:1 will ensure adequate ventilation
C. Will always sustain adequate ventilation for greater than 1 hour
D. The primary limitation is hypercapnea
E. IV catheters are the preferred catheter choice for this procedure

Of the following, which patient most likely has medical decision making capacity?

A. A 3 y/o with a thumb laceration

B. A 24 y/o patient with MR who is oriented to person, place and time. She does not fully understand the risks and benefits of the proposed treatment

C. A 79 y/o patient oriented to person only

D. A 28 y/o uncooperative, very intoxicated patient who is oriented to person, place and time who was struck in the head with a brick.

E. A 52 y/o patient with metastatic breast cancer and brain metastases. She is oriented to person, place and time. She understands the risks and benefits of the proposed treatment

Which of the following is a required component of a medical malpractice lawsuit?

A. Breech of a good Samaritan law
B. Probable cause
C. Duty to act
D. Gross negligence
E. Adequate malpractice coverage

A 22 y/o female patient suffers a laceration to the palmar surface of her hand over the mid, 2nd metacarpal. Which nerve block should provide anesthesia for this location?

A. Radial nerve
B. Median nerve
C. Superficial peroneal nerve
D. Ulnar nerve
E. Palmaris longus

A 42 year old emergency physician presents with a 2-day old, thrombosed external hemorrhoid, following 4 days of board review, which is the most appropriate treatment ?

A. Elliptical incision with excision of the overlying tissue and the clot
B. Linear incision with clot expression
C. Clot removal by electrocautery
D. Conservative medical therapy
E. Wait 3 more days until it is good and ready for treatment

Which governmental agency is most likely to assume primary responsibility for overseeing the development of emergency and trauma care in the US?

A. Department of Health and Human Services
B. Department of Homeland Security
C. The Office of the Inspector General
D. The Department of Agriculture
E. The Department of Defense

In procedural sedation, capnography is used to detect which of the following?

A. Hypoxemia
B. Hyperventilation
C. Level of sedation
D. Tidal volume
E. Hypoventilation

A 45 year old female patient with poor vascular access required a central line. A right internal jugular line was placed. Two days later, it was identified that the line was placed in the carotid artery. What is the most appropriate course of action?

A. Remove the line, advising the patient you are just repositioning the line.

B. Blame the resident.

C. Tell the patient that medications are delivered more effectively this way.

D. Show remorse for the error.

E. Look for another job.

A 73 y/o patient presents to the ED with an anterior shoulder dislocation. The patient has a history of COPD, NIDDM and CAD. What is this patient's ASA level?

A. ASA I
B. ASA II
C. ASA III
D. ASA IV
E. ASA V

Which of the following is true, regarding medications for sedation/analgesia?

A. Ketamine precipitates bronchospasm
B. Etomidate may be associated with adrenal suppression
C. Fentanyl is a dissociative anesthetic
D. Propofol induces nausea
E. Midazolam is reversed with naloxone

An 82 y/o patient presents with a sinus bradycardia at 32 bpm. Her BP = 134/82. The patient denies chest pain and shortness of breath and is asking to use the phone to call her son. What is the most appropriate treatment per ACLS?

A. Atropine 0.5 mg IVP
B. Emergent transcutaneous pacing
C. Observation
D. Epinephrine drip 2-10 mcg/min
E. Vasopressin 40 U IVP

Which of the following is an EMTALA requirement for transfers?

A. Facility to facility discussion and agreement of transfer acceptance is necessary
B. Pre-authorization by the insurance company
C. Patients must be transferred by ambulance
D. Benefits should be equal to the risks
E. The transfer should not be delayed for stabilization

A 75 y/o COPD patient arrives via EMS in severe respiratory distress with cyanosis. "The patient is a DNR." However, no paperwork could be located. What is the most appropriate action?

A. Provide the patient with comfort measures only
B. Do not treat the patient until his DNR status is verified
C. Treat the patient with multiple doses of morphine until he is comfortable
D. Intubate the patient and initiate mechanical ventilation
E. Treat the patient with nebulized bronchodilators and oxygen only

Which of the following is true regarding "Good Samaritan" legislation?

A. Covers all acts, including gross negligence
B. Applies to indigent ED patients
C. Can be used in defense of an emergency department malpractice claim
D. Protects uncompensated care providers
E. Discourages bystander assistance

An 8 y/o boy is in an ATV accident. He is awake and alert, mildly tachycardic and has a deformity to the left forearm. His parents cannot be located. What is the most appropriate action?

A. Locate the parents and obtain consent before treating the patient
B. Call child protective services
C. Locate the closest relative who can give consent before providing treatment
D. Perform a medical screening examination and stabilize the patient prior to parental consent
E. Stabilize the patient and then send to the OR for ORIF without parental consent

PPS 20

Policies & Procedures Answer Key

1. C	11. A
2. C	12. E
3. C	13. D
4. C	14. C
5. C	15. B
6. D	16. C
7. E	17. A
8. C	18. D
9. B	19. D
10. A	20. D