

SAMPLE

Resuscitation and Stabilization Treatment Guidelines

*Supervising Physician Treatment Guidelines for all clinical staff
with practice privileges as an Advanced Practice Paramedic for
use during official _____ activities.*

*Version 1.3
2024
Courtesy of ATREC Inc*

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INTRODUCTION AND AUTHORIZATION

The Resuscitation and Stabilization Treatment Guidelines are to be utilized only by Advanced Practice Paramedic (APP) with clinical privileges at _____ and only by those APP who fulfil current training requirements and associated evaluations. *Dr.* _____, or authorized designee, will deliver all training and evaluation.

The Resuscitation and Stabilization Treatment Guidelines are only to be utilized by qualified APP's during patient care activities. APP's may NOT utilize these Protocols while off duty or while working for another agency or business.

Whenever these Resuscitation and Stabilization Treatment Guidelines are utilized, the provider will complete a patient care report in accordance with the _____ Policy for Patient Care Documentation.

The Resuscitation and Stabilization Treatment Guidelines are the tertiary source for patient care decision-making during patient care events at _____.

The personnel utilizing the Resuscitation and Stabilization Treatment Guidelines are APP's in accordance within their scope of practice privileges as delineated by licensure level.

The Resuscitation and Stabilization Treatment Guidelines are to be viewed as clinical direction for those providers, who are the delegated care providers with _____.

With the above conditions, I authorize these Resuscitation and Stabilization Treatment Guidelines to be utilized by _____ APP's as of _____ 2024.

For the Resuscitation and Stabilization Treatment Guidelines to be current, the dated signature of the Medical Program Director must appear below.

(Print Name of Medical Director or Supervising Physician Here)

Date

Medical Control and Categorization of Medications and Procedures

The Patient Care Protocols contain Tiers 0, 1, 2, and 3 drugs and procedures. This creates a level of practice privilege conferment for the provider, or delegated authority, from the Head of Emergency, that generally follows the level of competency and experience through from initial authorization and licensing to procedural experience.

Tier '0' Medications may be utilized at the discretion of the provider, per protocol, during patient care activities.

Tier '1' Medications may be utilized at the discretion of the provider, per protocol, during patient care activities.

Tier '2' Medications may be utilized by the provider, per protocol, but requires the provider to confirm dosing and preparation with another healthcare professional or guidelines reference prior to administration.

Any Tier '3' Medications require MPD privileging to the specific provider to perform per protocol via offline, online, or direct medical control.

Tier '0' and '1' Procedures may be utilized at the discretion of the provider, per protocol, during patient care activities, once patient consent has been obtained, per protocol.

Tier '2' Procedures may be utilized by the provider, per protocol, but requires the provider to confirm process with another healthcare professional or guidelines reference prior to use.

Any Tier '3' Procedures require MPD privileging to the specific provider to perform per protocol via offline, online, or direct medical control.

Tier '0' Medications:

ADRENALINE 1:1,000 (1mg/1ml)
ASPIRIN
ENTONOX
GLUCAGON
GLUCOGEL
NTG

IBUPROFEN
IPRATROPIUM BROMIDE
METHOXYFLURANE
OXYGEN
ACETOMINOPEN (PO)
SALBUTAMOL/ALBUTEROL

Tier '1' Medication

ACICLOVIR
ADENOSINE
ADRENALINE 1:10,000 (0.1mg/1ml)
ADRENALINE (infusion)
AMIODARONE
ATROPINE
BALANCED CRYSTALLOID
CALCIUM
CEFTRIAZONE
CHLORPHENIRAMINE
CLOPIDOGREL

DEXAMETHASONE
DEXTROSE 10%
DICLOFENAC
EMLA
FUROSEMIDE
HYDROCORTIZONE
LIDOCAINE
LORATADINE
METOCLOPRAMIDE
NALOXONE
ONDANSETRON

ACETOMINOPEN (IV)
PHENYLEPHRINE
PRASUGREL
PITOCIN/OXYTOCIN

SODIUM CHLORIDE 0.9%
SODIUM LACTATE COMPOUND
SYNTOMETRINE
TRANEXAMIC ACID

Tier '2' Medications:

AMYL NITRATE (for cyanide poisoning)
DOBUTAMINE
DOPAMINE
FENTANYL
FLUMAZENIL
NTG IV
HALOPERIDOL
HEPARIN
INSULIN
KETAMINE
MAGNESIUM

MANNITOL
METOPROLOL
MIDAZOLAM
MORPHINE
NOREPHINEPHRINE
POTASSIUM
PROMETHAZINE
SODIUM BICARBONATE
SODIUM THIOSULFATE (for cyanide poisoning)
SUCCINYLCHOLINE

Tier '3' Medications:

ESMOLOL
HYDRALAZINE
PHENYTOIN
PROPOFOL
ROCURONIUM

OTHER MEDICATION: *Prepare and initiate or administer any medications or blood products under specific written protocols authorized by the Medical Director, or direct written orders from a licensed physician.*

Tier '0' Procedures:

- Oral route for medications
- Basic Airway Maneuvers
- Automatic External Defibrillator (AED)
- Basic Life Support in Cardiac Arrest
- Basic First Aid
- Cervical spine immobilization
- Immobilization for Musculoskeletal injuries
- Place Patients on stretchers and load into ambulance
- Transportation of stable patients with in-hospital interventions
- Drive Ambulances or assist ambulance drivers in transporting patients
- Accompany and assist EMTs on calls
- Remove and replace soiled linens and equipment to maintain sanitary conditions
- Replace supplies and disposable items
- Maintenance and checks of vehicles
- Distribute medications at the direction of Chief Public Health Officer
- Demonstrate general effective communication skills in their role
- Communicate effectively with the public, colleagues and external stakeholders
- Demonstrate effective use of appropriate technology in their role for Information and communication technology
- Demonstrate effective use of appropriate technology in their role for Accessing and utilizing data sources
- Adopt a professional approach to their practice through attitudes, ethical understanding and legal responsibilities
- Adopt a professional approach to their practice through Pre-hospital emergency care operational procedures
- Demonstrate a commitment to continuous professional competency and personal development
- Complete Patient Report Form

Tier '1' Procedures:

- Buccal route administration of medication
- Aerosol route administration of medication
- Sublingual route administration of medication
- Intramuscular injection of medication
- Nebulizer route administration of medication
- Per rectum administration of medication
- Subcutaneous injection of medication
- Use of non-invasive diagnostic devices to take and record vital signs
- Primary Assessment (Medical/Trauma)
- Secondary Assessment (Medical/Trauma)
- Blood glucose monitoring
- ISTAT use and lab value interpretation
- Electrocardiograph interpretation of basic rhythms - VF, VT, PEA, Asystole
- Obtain a 12 Lead Electrocardiograph
- Basic Airway Adjuncts
- Suctioning
- Foreign body airway obstruction management
- Bag Mask Ventilation
- Continuous Positive Airway Pressure (CPAP)
- Laryngeal Mask Airway placement
- SGA airway placement
- Intubation: Oral
- Draw Peripheral blood urine and fluid specimens
- Waveform Capnography
- Interpretation of 12 Lead Electrocardiograph
- Emergency Ultrasound
- Manual defibrillator use
- Mass Casualty Incident
- Prepare and assist with on-scene ALS skills
- Initiate and Orogastric/nasogastric tube
- Prepares for labor and supports delivery in uncomplicated
- Cardioversion
- Transcutaneous pacing
- Prepares for labor and performs complicated emergency delivery

- Maintain during transport any IV medication infusions or procedures done in a medical facility
- Prepare and administer immunizations in the event of an outbreak/epidemic
- Intranasal medication administration
- Needle thoracostomy
- Intraosseous injection/infusion

- Intravenous injection/infusion
- Place Urinary catheter
- Prepare and administer immunizations for seasonal and pandemic influenza
- Prepare and Administer routine/emergency immunizations and TB skin testing
- Ventilator Management

Tier '2' Procedures:

- Chest tube thoracostomy
- Simple thoracostomy
- Intubation: Nasal
- Needle Cricothyrotomy
- Intubation with Rapid Sequence Induction (RSI)
- Surgical Cricothyrotomy
- Transtracheal jet inflation
- Place deep vein canula under ultrasound

- guidance
- Access indwelling catheters and implanted central IV ports for medication administration
- Emergency Blood Transfusion
- Perform Ultrasound Assessment using RUSH, BLUE, CAUSE, OB, or FOCUS exams

Tier '3' Procedures:

- Pericardiocentesis under ultrasound guidance
- Place Central line under ultrasound guidance

GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS

There are thematic issues throughout the *Resuscitation and Stabilization Patient Care Guidelines*; the listing includes but is not limited to those items listed below:

1. The **patient history should not be obtained at the expense of the patient**; life-threatening problems detected during the primary assessment must be treated first.
2. **Cardiac arrest due to trauma** is not treated by medical cardiac arrest Protocols – follow Traumatic Cardiac Arrest Protocol.
3. **Traumatic Brain Injury patients** should be facilitated promptly for neurosurgical intervention with advanced airway management as appropriate, mannitol or hypertonic saline, cervical spine immobilization where indicated, and other indicated procedures performed promptly.
4. **Verbally confirm all medications**, if able, with another person, prior to administration.
 - a. The standard method should be a review of the Five “R’s”: Right Patient, Right Medication, Right Dose, Right Route, and Right Time?
5. **Any patient with a cardiac history**, irregular pulse, syncope, unstable blood pressure in a medical case, dyspnea, or chest pain should be placed on a cardiac monitor, a 12 lead ECG obtained as soon as possible, and ultrasound exam performed.
6. If the patient's condition does not seem to fit a single Protocol, but several; **adapt your care to include all Protocols which apply in a simultaneous manner**.
7. The following **assessment/care process** is to be performed and information is to be obtained on all patients:
 - a. Always assure scene stability for yourself, your fellow rescuers, and your patient.
 - b. Primary survey:
 - i. A = Airway with cervical spine control
 - LEMON law: Look Externally, Examine (3/3/2), Mallampati score, Obstruction, Neck Mobility.
 - Trauma ABCS: Airway Injury, Brain Injury, Chest or Cervical Spine Injury, Shock?
 - ii. B = Breathing
 - iii. C = Circulation with control of bleeding
 - iv. D = Disability Determination
 - v. E = Exposure
 - vi. A = Alert and conscious
 - vii. V = Responsive to verbal stimuli
 - viii. P = Responsive to painful stimuli
 - ix. U = Unresponsive
 - x. Integrated Ultrasound assessment with goal directed intervention
 - c. Secondary survey:
 - i. Obtain vital signs (minimum: respiratory rate, pulse rate, blood pressure; if available: ECG, 12 Lead ECG, SpO₂, EtCO₂, BGL, FHT, temperature), Shock Index (if appropriate), and Early Warning Score (if appropriate)
 - ii. Perform objective head-to-toe assessment
 - iii. Obtain history:
 - Sex, age, and approximate weight
 - Chief complaint
 - Precipitating factors
 - Significant past medical history
 - Allergies
 - Current medications
 - d. Place monitoring equipment, if indicated:
 - i. ECG monitor, with 12 lead (if possible) for CHF, chest pain, syncope patients, and patients with cardiac history with medical complaint.
 - ii. Pulse oximeter
 - iii. Capnography, as available, for all respiratory, altered mental status, trauma, and advanced airway patients
 - e. Apply appropriate Protocol based on assessment.
 - f. Position patient comfortably as indicated by condition or situation.
 - g. Reassure and calm patient. Loosen any restrictive clothing or remove as indicated.

h. Preplan your care.

8. **Early Warning Score for Patient Assessment** (Courtesy Cleveland Clinic):

Physiological Perimeters	3	2	1	0	1	2	3
RR	≤ 8		9-11	12-20		21-24	≥ 25
SpO2	≤ 91	92-93	94-95	≥ 96			
Sup O2		Yes		No			
Temp	≤ 35		35.1 – 36.0	36.1-38.0	38.1-39.0	≥ 39.1	
SBP	≤ 90	91-100	101-110	111-219			
HR	≤ 40		41-50	51-90	91-100	111-130	≥ 220
LOC				A			V, P, or U

The Early Warning Score (EWS) is a simple physiological scoring system suitable for bedside application. An early warning score (EWS) is a guide used by medical staff and emergency medical services to quickly determine the degree of illness of a patient. It is based on data derived from physiological readings and an observation. The resulting observations are compared to a normal range to generate a single composite score, **a score of six (6) or more is statistically linked to increased likelihood of death or admission to an intensive care unit.**

9. **The Shock Index:**

Shock Index = HR/SBP

Isolated vital signs have been shown unreliable in the assessment of shock. In contrast, the Shock Index (SI), defined by the ratio of heart rate to systolic blood pressure, **a shock index of 1.0 or greater, has been shown to better risk-stratify patients for increased transfusion requirements and early mortality.** Example (HR = 100, BP = 100/60), 100/100 = Shock Index of 1.0; consider a clinically significant Shock Index may be present anytime the HR exceeds the Systolic BP.

10. **Glasgow Coma Score:**

The Glasgow Coma Scale or GCS is a neurological scale that gives a reliable, objective way of recording the conscious state of a person for initial as well as subsequent assessment. A patient is assessed against the criteria of the scale, and the resulting points give a patient score between 3 (indicating deep unconsciousness) and 15 (responsive consciousness).

Score	Eye Opening	Best Verbal Response	Best Motor Response
6			Obeys Commands
5		Oriented	Localizes Pain
4	Spontaneous	Confused	Withdraws from Pain
3	To Speech	Inappropriate Words	Flexor response to pain (Decorticate posture)
2	To Pain	Incomprehensible sounds	Extensor response to pain (Decerebrate posture)
1	No Eye Opening	No Verbal Response	No Response to Pain

11. **AIRWAY CONSIDERATIONS:**

- When in doubt, oxygenate the patient to an SpO2 greater than 92% and less than 99%; titrate oxygen and modify delivery method to assure this goal.
- Consider the difference between oxygenation and ventilation, use of an NRB Mask at 15L and a NC at 10-15L combined on a patient who is ventilating themselves may resolve oxygenation issues without the risk of hypotension from BVM positive pressure ventilation; target SpO2 of 94-98%.
- Consider Non-Invasive Ventilatory (NIV) support, such as, continuous positive airway pressure (CPAP), BiPAP, or High Flow Nasal Cannula (HFNC) systems for respiratory and ventilatory support, as well as, functioning where appropriate as a pre-advanced airway interventional bridge.
- When ventilating the patient, EtCO2 should be targeted at 35-45 mmHg unless individual protocols direct a more specific goal.
- Endotracheal Intubation should be considered when there is airway compromise, respiratory failure,

expected clinical course would benefit from mechanical ventilation, GCS is less than or equal to 8, Prolonged BVM ventilation (> 8 mins) has been done, and/or transport while attempting BVM ventilation.

- i. Utilize Intubation Tracheal or Intubation with Rapid Sequence Induction protocols for intubation procedure.
- ii. A Laryngeal Mask Airway (LMA), an Igel Airway, a SGA Airway (generic), or Laryngeal Tube Airway (LTA) may be utilized in place of an endotracheal tube when the provider feels they will provide an adequate advanced airway, or used until an endotracheal tube can be placed by an appropriately privileged and trained provider.
- iii. Ventilatory rates should be maintained at every 5-8 seconds unless other direction provided in specific individual protocols
- iv. Do not violate the 1:2 minimum IE ratio for ventilation, consider that normally the IE ration should be 1:3 or greater in patients with potential preload impingement and/or air trapping present

f. **Utilize ventilator, as available, for ventilation of advanced airway patients** with physiologic goals from individual protocols determining ventilator settings with initial settings as delineated:

	<u>Tidal Volume</u>	<u>RR</u>	<u>I:E ratio (min)</u>	<u>PEEP</u>	<u>FiO₂</u>
Normal Lungs	6-8 ml/kg IBW	10-12	1:2	5	1.0
Asthma/COPD	4-6 ml/kg IBW	6-8	1:5	5	1.0
ARDS	4-6 ml/kg IBW	10-12	1:3	5-15	1.0
Hypovolemia	6-8 ml/kg IBW	10-12	1:2	0-5	1.0
Pneumonia	4-6 ml/kg IBW	12-16	1:3	5-18	1.0

g. When the provider encounters a cannot intubate/cannot ventilate situation, the Provider should perform Surgical Cricothyrotomy.

h. Be prepared to suction the airway at any time.

- 12. Unless stated otherwise in protocol, balanced **fluid boluses of 20ml/kg** should be delivered as fast as possible within 3-5 minutes preferentially via a large bore IV or IO; large bore in the adult patient being 16, 15, 14, or 12 gauge. **Use Balanced IV fluid** if large boluses of fluid are required to prevent possible acidotic exacerbation; Normal Saline is not to be used for fluid resuscitation.
 - a. Use ultrasound to assure proper fluid resuscitation through IVC monitoring
- 13. Use **10-15ml/kg Whole Blood**, type O, immediately for patients in hemorrhagic shock with a MAP less than 60 mmHg.
- 14. Consider early **oral gastric tube** for patients with airway management or cardiac arrest present.
- 15. Consider **urinary catheter** placement for any persistently unconscious patient or patient with urinary retention for excessive periods.
- 16. The provider may draw **blood for laboratory analysis, perform point of care testing, obtain laboratory testing, and/or utilize results to guide care.**

17. The provider will utilize **integrated ultrasound exam in the assessment process** as an adjunct to assist with the assessment process and procedures (i.e.; pericardiocentesis, central line placement, and peripheral line placement), but may NOT interfere with clinical judgment or CPR to accomplish ultrasound examination.
18. In **Pediatric Patients** (newly born to less than 10 yrs.) use the **Handtevy System (reference to right)** to guide weight identification and energy dosing in pediatric patients.

The Handtevy™ Pediatric Code

Weight	Medication	Dose
10 kg	Epi 1:1,000 IM	0.1 mL
	Epi 1:10,000 IV	1 mL
	Amiodarone	1 mL
	Bicarb 8.4%	10 mL
	D ₂₅ W	20 mL
	Normal Saline	200 mL
	Lorazepam	0.5 mL
15 kg	Epi 1:1,000 IM	0.15 mL
	Epi 1:10,000 IV	1.5 mL
	Amiodarone	1.5 mL
	Bicarb 8.4%	15 mL
	D ₂₅ W	30 mL
	Normal Saline	300 mL
	Lorazepam	0.75 mL
20 kg	Epi 1:1,000 IM	0.2 mL
	Epi 1:10,000 IV	2 mL
	Amiodarone	2 mL
	Bicarb 8.4%	20 mL
	D ₂₅ W	40 mL
	Normal Saline	400 mL
	Lorazepam	1 mL
25 kg	Epi 1:1,000 IM	0.25 mL
	Epi 1:10,000 IV	2.5 mL
	Amiodarone	2.5 mL
	Bicarb 8.4%	25 mL
	D ₂₅ W	50 mL
	Normal Saline	500 mL
	Lorazepam	1.25 mL
30 kg	Epi 1:1,000 IM	0.3 mL
	Epi 1:10,000 IV	3 mL
	Amiodarone	3 mL
	Bicarb 8.4%	30 mL
	D ₂₅ W	30 mL
	Normal Saline	600 mL
	Lorazepam	1.5 mL

***NOTE:** The Diazepam IV dose is HALF (1/2) the volume of the listed Diazepam IM / IN dose.
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- Epi 1:1,000 IM 1 mg/mL
- Epi 1:10,000 IV 1 mg/10 mL
- Amiodarone 150 mg/3 mL
- Bicarb 8.4% 50 mEq/50 mL
- D₂₅W 0.25 g/mL
- Normal Saline Bolus 0.9%
- Lorazepam 2mg/mL
- Diazepam 10 mg/2 mL
- ETT U=Uncuffed C=Cuffed

DRUG QUICK REFERENCE GUIDE

Drug	Dose	Protocol
Adenosine	6 mg, IV Rapid (first dose) 12 mg, IV Rapid (second dose)	Unstable Narrow Complex Tachycardia without reversible cause
Acetaminophen	1 gm PO or IV (15mg/kg Peds), reduce dose by 50% with decreased liver function	Febrile, Post Arrest, Sedation for surgical procedure
Acyclovir	10-15 mg/kg IV q8hr (Ideal Body Weight)	Herpes Simplex Encephalitis, Meningoencephalitis
Albuterol	2.5 mg/3 cc, Nebulized prn; OR, 2-4 doses from metered dose inhaler (MDI) through Spacer/Mask or ventilator circuit. 20 mg continuous nebulization	Asthma, COPD, Pneumonia Hyperkalemia
Amiodarone	300 mg, IV (first dose) 150 mg, IV (second dose)	V-Fib/V-Tach
	150 mg, IV over 10 min x 2	Wide Complex Tach with instability
Amyl Nitrate	1 ampule, Inhaled	Inhalation of Toxic Fumes - Cyanide
Aspirin	160-325 mg, PO chewed	ACS
Atropine	0.5 - 1 mg, IV	Bradycardia
	0.5 - 0.1 mg, IV max 3 mg	Calcium Channel Blocker OD
	1 - 2 mg, IV every 5 min (Peds 0.02 mg/kg)	Organophosphate OD, Sarin, VX
Benadryl (Diphenhydramine)	50 mg, IV or IM	Allergic Reaction & Anaphylaxis
	25 - 50 mg, IV or IM	Dystonic Reaction
Calcium Chloride	1gram, IV slow	Calcium Channel Blocker OD, Hyperkalemia, Unknown toxin ingestion with bradycardia and widened QRS
	250 - 500 mg, IV slow	Eclampsia (Mag Antidote)
Ceftriaxone (Rocephin)	1-2gm IV Adult 100mg/kg IV for Pediatric (up to maximum adult dose)	Distributive Shock – Sepsis Infectious Bacterial Agent
Cefazolin	1 gm, IV over 30 min or IM, every 6 hr	Wound Care
Dexamethasone	4 mg IV or IM every 6 hr 6mg/day if COVID suspected	Altered Mental Status – Cerebral Tumors, Febrile States
Dextrose	25 gm, IV (Peds D25 0.5 - 1 gm/kg x 2 every 5 min)	Altered Mental Status, Cerebral Vascular Accident, Diabetic Emergencies, Poisoning and Overdose, Seizure
Diltiazem	0.25 mg/kg (usually 20 mg), IV Slow (first dose) 0.35 mg (usually 30-35 mg), IV Slow (second dose) 10 mg/hr, Infusion	A-Fib/A-Flutter
Dopamine	5 - 20 mcg/kg/min, Infusion	Bradycardia, Cardiogenic Shock, Distributive Shock,
Epinephrine Infusion	2 - 10 mcg/kg/min, Infusion	Bradycardia
	2 - 10 mcg/kg/min, Infusion	Distributive or Obstructive Shock
Epinephrine 1:10,000	0.3 – 0.5mg, IV	Allergic Reaction & Anaphylaxis
	1 mg IV/IO every 6 min (Peds 0.01 mg/kg, IV or IO)	PEA, Asystole
	1 mg IV/IO every 6 min (Peds 0.01 mg/kg, IV or IO)	V-Fib/V-Tach Pulseless
Epinephrine 1:1000	0.3 ml, SQ or IM (Peds 0.01 ml/kg, SQ), repeat if severe respiratory distress	Allergic Reaction & Anaphylaxis
	0.3 ml, SQ or IM (Peds 0.01 ml/kg, SQ), repeat if severe respiratory distress	Asthma/COPD
	0.1 mg/kg, ET & IV or IO (second dose)	Cardiac Arrest, PEA (Pediatric)
	5 mg, Med Neb	Croup/Epiglottitis/Anaphylaxis
Fentanyl	1-2 mcg/kg IV bolus or 25-100 mcg/dose PRN; or, 1-2 mcg/kg/hr by continuous IV infusion or 25-200	Pain Management

	mcg/hr	
Flumazenil (Romazicon)	0.2 mg (2 ml) IV over 15 seconds	Dislocation, reversal of sedation
Furosemide	20 - 60 mg, IV	Eclampsia, Altitude Conditions, Pulmonary Edema
Glucagon	5 mg, IV (adult only)	Calcium Channel Blocker OD
	1 mg, IM	Diabetic Emergencies
Haloperidol	2-5 mg IV or IM every 4hr PRN (may require every 1hr in acute agitation); do not exceed 20 mg/day	Altered Mental Status, Chemical Restraint
Heparin	5000 units IV	ACS
Hydrocortisone	50 mg IV every six hours, or 100 mg IV bolus followed by an infusion of 10 mg/hour for seven days	Shock
Insulin	Initial bolus of regular insulin of 0.1 U/kg followed by continuous insulin infusion at 0.07 U/kg/h. If plasma glucose does not fall by at least 10% in the first hour of insulin infusion rate, 0.1 U/kg bolus of insulin can be given once more while continuing insulin infusion. When plasma glucose reaches 200–250 mg/dL, the insulin rate can be decreased by 50% or to the rate of 0.02–0.05 U/kg/h. For Beta Blocker Overdose: 1 U/kg of an insulin bolus followed by continuous infusion of 1-10 U/kg/h	Hyperglycemia, Toxins
Ipratropium Bromide	0.5 mg, Med Neb	Asthma/COPD
Ketamine	0.5-1 mg/kg IV or IM; then in aliquots of 0.5 mg/kg over 3 minutes every 20-60 minutes PRN or via continuous equivalent drip or driver.	Pain Management, Sedation
	2 mg/kg IV push over 1 minute with a 2 mg/kg per hour drip for continued sedation or ventilation.	Intubation with RSI, Ventilator Management, Sedation
Lorazepam (Ativan)	5 mg, IV	Cerebral Vascular Accident (Sz)
	2 mg/min, IV or IM (Peds 0.05 mg/kg x 2 prn)	Eclampsia (Sz)
	2 mg/min, IV or IM	Cocaine, Ecstasy OD
	2 mg/min, IV or IM (Peds 0.05 mg/kg x 2 prn)	Hyperthermia (Sz)
	2 mg/min, IV or IM (Peds 0.05 mg/kg x 2 prn)	Seizure
	2 mg/min, IV or IM (Peds 0.05 mg/kg x 2 prn)	RSI
Magnesium Sulfate	4 gm, IV push, may repeat every 2 minutes to a total of 12 grams	Eclampsia/seizure
	2 gm in 100cc, IV infusion over 10 minutes	Pre-Eclampsia
	2 gm in 100cc, IV slow	V-Fib/V-Tach (if Torsades or hypomagnesemia present) or PEA from Respiratory causation.
Magnesium Sulfate	1-2 gm IV over 3 minutes	Respiratory - Asthma
Mannitol	0.7 gm/kg, IV push, as needed with increased ICP	Head Injury
Metoprolol	2.5-5 mg IV bolus over 2 min, up to 3 doses	Arrhythmia (Rate Control)
Midazolam (Versed)	2-4 mg, IV	Cardioversion
	2 - 10 mg, IV or IM in aliquots of 2 mg	MDMA, Cocaine, GHB
	2-10 mg, IV in aliquots of 2 mg	Pain Management
	5 mg, IV; then every 30 minutes in aliquots of 2-5 mg IV	Post Intubation Ventilator Management

Naloxone	2 mg, IV or IM	Altered Mental Status
	2-20 mg, IV, IM or ET	Poisoning & Overdose
Nitroglycerine IV Infusion	0.25 mcg/kg/min IV infusion	Chest Pain, CHF Pulmonary Edema
Nitroglycerine Spray/Tablet	0.4 mg, SL x 3 every 5 min	Chest Pain
	0.4 mg, SL x 3 every 5 min	Pulmonary Edema
Norepinephrine	2-4 mcg/min IV; Start: 8-12 mcg/min IV, then titrate to effect; use ultrasound IVC/Focus monitoring. <i>Patients w/ septic shock may require higher doses</i>	Shock (Non-hypovolemic) Post Cardiac Arrest
Ondansetron (Zofran)	4 mg, IV, IM, or ODT; repeat as needed to 12mg total in 8 hours.	Nausea/Vomiting
Pitocin	20 units in 1000 ml Crystalloid Infusion over 3-7 minutes	Postpartum Hemorrhage
Propofol	Induction: >55 years or debilitated or ASA III/IV: 20 mg IVP q10sec until onset (2-2.5 mg/kg max); do not use rapid bolus because as it will increase likelihood of undesirable cardiorespiratory depression Continued Sedation: Variable rate infusion method: 0.025-0.075 mg/kg/min IV during first 10-15 min sedation maintenance; subsequently decrease infusion rates over time to 25 to 50 mcg/kg/min and adjust clinical response; allow approximately 2 min for onset of peak drug effect to titrate to clinical response	Pain Management, Sedation
Potassium	2.5-3.5 mEq/L: 10 mEq/hr maximum infusion rate; 40 mEq/L maximum concentration; not to exceed 200 mEq dose/24hr <2.5 mEq/L or symptomatic hypokalemia: 40 mEq/hr maximum infusion rate in presence of continuous ECG monitoring and frequent lab monitoring; patients may require up to 400 mEq/24hr.	Hyperglycemia Hypokalemia
Rocuronium	0.6-1.2 mg/kg IV push	Intubation with RSI
	0.1-0.2 mg/kg IV repeat PRN, OR, 0.01-0.012 mg/kg/min IV Infusion	Post Intubation and Ventilator Maintenance Dosing
Sodium Bicarbonate	1 mEq/kg, IV may repeat as necessary to bring into normal level of Bicarb	Cardiac Arrest - Acidosis with pH less than 7.25
	1 mEq/kg, IV push and 50 mEq in 500ml Crystalloid IV infusion over 30 minutes	Tricyclic OD with QRS widening
Sodium Thiosulfate	12.5 gm, IV (Peds 250 mg/kg, IV)	Inhalation of Toxic Fumes
Solu-Medrol	125 mg, IV	Asthma, COPD, Sepsis
Succinylcholine	2 mg/kg, IV push	Intubation with RSI
Thiamine	100mg IV or IM	Altered Mental Status, Diabetic Emergencies, Seizure
Vecuronium	0.1 mg/kg, IV push	Extended Paralysis

ALTERED MENTAL STATUS

SPECIFIC INFORMATION NEEDED:

1. What down time has elapsed?
2. What, if any, alcohol and/or drugs was the patient using?
3. Was patient in this location the entire time?
4. Any loss of consciousness?
5. History of diabetes?
6. Prior substance abuse issues?
7. Behavioral or mental health pathologies?
8. Trauma history?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness
3. Diagnostic devices in place?
4. ASSOCIATED trauma.
5. Lab values?
6. Consider Ultrasound?
7. Mental Status Exam?
8. Early Warning Score and Shock Index?

TREATMENT:

1. Assure Airway, Breathing, and Circulation.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Initiate large bore IV of Balanced fluid TO KEEP OPEN or saline lock; PER SHOCK if Hypotensive.
4. Perform blood draw for laboratory analysis and perform result interpretation.
5. Attach cardiac monitor (obtain 12 lead if possible) and pulse oximeter.
6. Determine serum glucose level with Glucometer.
 - a. Adult Patient: If glucose < 72 mg/dl (4 mmol/l) - GO TO DIABETIC EMERGENCIES
 - b. Pediatric Patient: If glucose <72 mg/dl (4 mmol/l) - GO TO DIABETIC EMERGENCIES
7. If history of drug abuse and patient has constricted pupils or respiratory depression,
 - Adult or pediatric patient: administer Naloxone.
8. Provide supportive measures, including titration of medications to desired effect.

CONSIDERATION:

1. *In the presence of cerebral tumors in the adult patient, the provider may consider Dexamethasone for altered mental status in the cerebral tumor patient.*
2. *In the presence of possible Herpes simplex encephalitis (HSE) in the patient, consider Acyclovir.*
3. *For patients exhibiting mental health or behavioral pathologies who are exhibiting aggressive or combative behavior which risks harm to themselves or others; consider Haloperidol*

AMPUTATIONS

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness.
3. Limb condition and Limb Pulses
4. Associated trauma.
5. Early Warning Score and Shock Index.

TREATMENT:

1. Assure Airway, Breathing, and Circulation.
2. Control bleeding – Use tourniquet.
3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
4. **Large bore IV of BALANCED FLUID solution at appropriate rate to maintain systolic \geq 80 mmHg systolic.**
 - 4.1.1. **If injury is an isolated amputation, patient may be fluid resuscitated to within normal systolic range if all bleeding has been controlled.**
5. Treat for shock, GO TO SHOCK PROTOCOL.
6. Rinse amputated part with normal saline to remove loose debris. DO NOT SCRUB.
7. Wrap amputated part in gauze moistened with saline.
8. Place wrapped part in plastic bag and seal. Label with NAME, DATE, TIME, and LIMB PART.
9. Place sealed bag in container filled with water and several ice cubes.
10. Perform blood draw for laboratory analysis if able, Perform Laboratory Analysis if able
11. Follow PAIN MANAGEMENT PROTOCOL for analgesia
12. *If partial amputation, place in anatomical position to facilitate the best vascular status and wrap in bulky dressings. If the vascularity to the distal part is compromised, wrap the distal part and apply ice. (Consider placing the pulse oximeter probe on a finger or toe of the affected extremity to monitor the vascular status of the injured extremity.)*

ALLERGIC REACTIONS & ANAPHYLAXIS

SPECIFIC INFORMATION NEEDED:

1. What was the patient exposed to? (Food, insect sting, etc...)
2. What time has elapsed?
3. Any loss of consciousness?
4. Was there any emesis?
5. Prior similar episodes or Family History?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness.
3. Airway assessment.
4. Skin signs (present in less than 20% of anaphylaxis patients who progress rapidly to cardiovascular collapse).
5. Early Warning Score and Shock Index.

TREATMENT:

1. Assure Airway, Breathing, and Circulation
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Attach cardiac monitor, EtCO₂, and pulse oximeter if available.
4. Large bore IV of Balanced Fluid (BALANCED FLUID) at to keep open (TO KEEP OPEN) or saline lock.
5. Perform blood draw for laboratory analysis if able.
6. Perform laboratory analysis
7. If blood pressure normal, for relief of symptoms, consider:
 - Chlorpheniramine or Loratadine
 - Hydrocortisone
8. If hypotensive (systolic <90 mmHg) and patient has respiratory distress:
 - Open IV and infuse fluid bolus of 20 ml/kg.
 - Administer Epinephrine 1:1,000
 - Consider, as a follow up to epinephrine infusion, consider Hydrocortisone
9. If refractory hypotension:
 - Re-administer Epinephrine or Norepinephrine Infusion
 - If persistent hypotension occurs follow DISTRIBUTIVE SHOCK PROTOCOL.

BURNS

SPECIFIC INFORMATION NEEDED:

1. Time elapsed since burn?
2. Was patient in a closed space with steam or smoke? For how long?
3. Any loss of consciousness?
4. Was there an accompanying explosion or toxic fumes?
5. Prior cardiac or pulmonary disease?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs (SpO₂, EtCO₂, Temperature, BP, and ECG q 10 minutes).
2. Extent of burns: detailed description of areas burned and body surface involved (rule of 9's)
3. Depth of burns:
 - 3.1. Superficial - erythema only
 - 3.2. Significant - blistering or charred areas
4. Evidence of respiratory burns:
 - 4.1. Soot or erythema of mouth
 - 4.2. Singed nasal hairs
 - 4.3. Cough or hoarseness
 - 4.4. Respiratory distress
 - 4.5. Carbonaceous sputum
5. Associated trauma.
6. Early Warning Score and Shock Index?

TREATMENT:

1. Assure patient safety
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
 - 2.1. If airway burns are suspected, endotracheal intubation early, to maintain SpO₂ above 98% and EtCO₂ between 30-40 mmHg.
 - 2.2. If wheezing present, consider nebulized Salbutamol
3. Remove clothing which is smoldering or which is non-adherent to the patient.
4. Remove rings, bracelets, and other constricting items.
5. COOL THE BURN: apply dressings to the burned area, use moist dressing when possible.
 - 5.1. Clean burn with water or saline solution; use no creams or salves on burn.
 - 5.2. NOTE: be cautious of hypothermia when cooling a burned patient, temperature drop below normal must be prevented.
6. IF BURN IS GREATER THAN 10% OR IF THERE IS SIGNIFICANT PAIN:
 - 6.1. Start IV or IO, Large bore, of BALANCED FLUID.
 - 6.2. Fluids per % of burn or Shock Protocols.
 - 6.3. Perform blood draw for laboratory analysis if able.
 - 6.4. Monitor vitals every 10 minutes.
 - 6.5. Assure thermal protection
 - 6.6. Follow PAIN MANAGEMENT PROTOCOL as indicated.

SPECIFIC PRECAUTIONS:

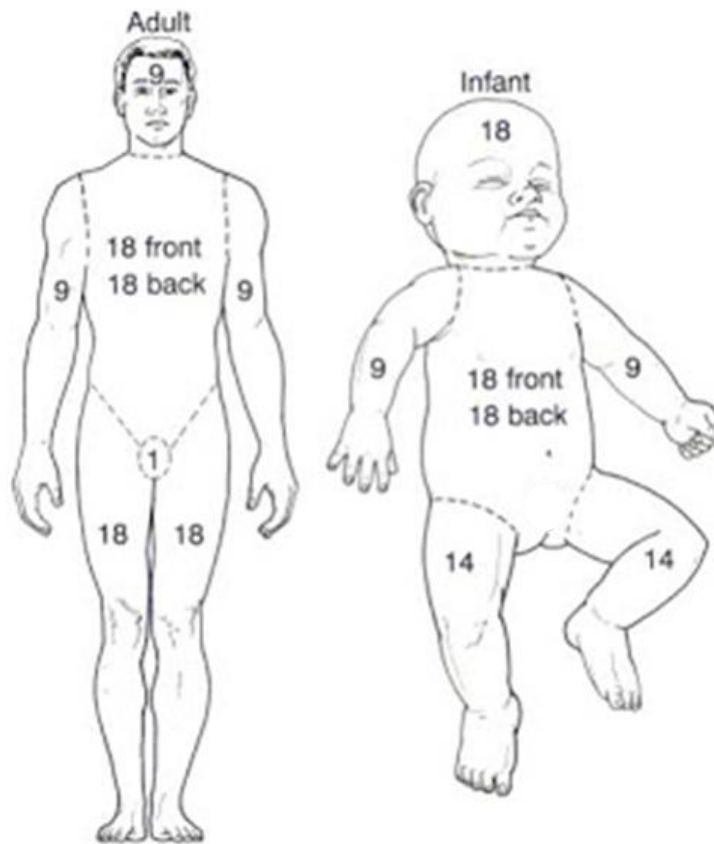
1. Leave blisters intact and any adherent debris in the burned area undisturbed. Attempt contact with the regional burn facility for advice and notification of transport.
2. DO NOT use ointments, salves, jells, or similar items on burns.
3. Follow the Parkland Burn Formula, unless shock symptoms present; "4ml/kg x % burn in first 24 hours" - Give half of the amount in first eight hours and the remaining over the following 16 hours.
4. IV/IO can be started in burned areas, if necessary.
5. With suspected respiratory burns and progression of symptoms, consider early endotracheal intubation.

BURN CENTER CRITERIA:

If the patient meets any of the following criteria transport to Burn Center, via most appropriate means (i.e.; ground, vessel, air):

- Burns exceed 20% of patient's body surface.
- Suspected full thickness burns, exceeding 10% of patients body surface.
- Full or partial thickness burns to hands, feet, head, face, or genitalia.
- Burns associated with respiratory distress or respiratory system.
- Electrical burns.
- Burns associated with other serious medical problems or trauma.

Rule of Nines:



CARDIAC ARREST and ARRHYTHMIA

GUIDELINES FOR CARE:

Care of cardiac arrest and dysrhythmias is based on standards established by the American Heart Association committee on emergency cardiac care and updated to the most recent science guidelines (October 2015).

Points to remember include:

1. Treat the patient, not the monitor.
2. Cardiac arrest due to trauma is not treated with medical causation Protocols.
3. Protocols for cardiac arrest situations presumes that the condition under discussion continually persists, that the patient remains in cardiac arrest, and that CPR is always performed.
4. Adequate chest compressions, defibrillation, airway management, appropriate ventilation, and oxygenation are more important than administration of medications and take precedence over initiating an intravenous line or injecting medications.
5. Use mechanical compression device when available.
6. Increase monitor ECG size to a minimum of 2.5 mm of height to avoid misdiagnosis.
7. Remove all clothing.
8. Use ultrasound to perform CAUSE or CASA exam, identify and treat any derangements.

PULSELESS ELECTRICAL ACTIVITY (PEA)/ASYSTOLE TREATMENT:

1. Initiate and continue High Quality CPR with BVM ventilation at 30:2 until advanced airway placed, then continuous compressions at 110-120/min and an asynchronous ventilation every 6 seconds
2. *CPR must be performed for 2-minute intervals prior to interrupting chest compressions for no more than 10 seconds for rhythm check if look through technology is unavailable.*
3. Place Advanced Airway (SGA or ETT) and ventilate every 6 seconds (10 bpm min) with approximately 6-8 ml/kg predicted body weight of ventilatory volume. *Could mechanical hyperinflation be causing the PEA?*
 - If pre-existing, severe, metabolic acidosis (pH 7.0 or less) was documented prior to arrest, *in only that circumstance*, hyperventilation may be utilized at no greater than every 5 seconds.
 - Utilize EtCO₂ to guide quality of compressions, ventilations, and cardiac output
4. Large bore IV or IO of BALANCED FLUID TO KEEP OPEN, draw blood for laboratory analysis, perform analysis.
5. Administer Epinephrine 1:10,000 every 4 minutes IV or IO as appropriate and able, up to three doeses.
6. Consider possible causes and treat if discovered (*Use Ultrasound CAUSE Exam* to assist with identifying causations, but do NOT interfere with CPR):
 - 6.1. Hypoxia – optimize oxygenation and ventilation.
 - 6.2. Hypovolemia - If significant volume loss is suspected and ET_{CO}₂ greater than 20 with organized rhythm present, begin 20ml/kg Balanced Fluid bolus and follow Shock Protocol.
 - 6.3. Hypothermia – if severe (less than 30°C, consider continuing efforts until rewarming performed if EtCO₂ over 10mmHg).
 - 6.4. Hyperkalemia – if identified (greater than 6.5 mmol) consider:
 - 6.4.1. Sodium bicarbonate (if pH 7.25 or less or renal failure)
 - 6.4.2. Albuterol nebulized into respiratory circuit
 - 6.4.3. Glucose/insulin: short-acting insulin and Dextrose 10%
 - 6.5. Hypokalemia – if identified (less than 2.5 mmol) consider Potassium
 - 6.6. Hydrogen Ion Dysfunction (Metabolic Acidosis) – consider:
 - Manage with optimization of ventilation and oxygenation; specifically consider transiently increasing ventilatory rate and volume to no more than every 5 seconds.
 - Consider the patient to be a potential acidosis patient when KULT are present (*ketones, uremia, lactate and toxins*) or MUDPILES (*methanol, uremia, diabetic ketoacidosis, propylene glycol, isoniazid, lactic acidosis, ethylene glycol, salicylates*).
 - If acidosis remains after 5 minutes of cardiac arrest, despite ventilatory management above, consider Sodium bicarbonate (if less than pH 7.25, or renal failure present).

- 6.7. Tension Pneumothorax – needle chest decompression immediately, then simple thoracotomy.
- 6.8. Tamponade/Cardiac Effusion – 20ml/kg fluid bolus; then Ultrasound guided pericardiocentesis must be considered
- 6.9. Toxin or Overdose – if specific antidote is available for specific substance, consider use.
- 6.10. Thrombosis of Pulmonary Vasculature - if confirmed on POC Ultrasound, consider emergent thrombolysis.
7. Place NG or OC tube, when possible, to decompress gastric.
8. Pregnant patients in cardiac arrest require Compressions performed with Left Uterine Displacement (LUD) and immediate Emergency Cesarean Section from OB/GYN or Surgical provider.
9. Consider placing patient on gurney, in a head/back elevated position (30 degrees), following a minimum of four minutes of compressions and mechanical CPR device providing compressions.
10. *Consider termination of efforts* if EtCO₂ persistently below 11 mmHg and unresponsive myocardium per death in the field Protocol. – GO TO DEATH IN THE FIELD PROTOCOL

V - FIB & PULSELESS V - TACH TREATMENT:

1. Initiate and continue Compressions and ventilation, until defibrillator attached.
2. Confirm ventricular fibrillation (VF) or non-perfusing ventricular tachycardia (VT) on monitor (or with AED).
3. Defibrillate per manufacturer recommendations for VF or VT (Peds: 2-4j/kg) and continue CPR for 2 minutes
4. Continue CPR and BVM ventilation with 100% O₂ at 30:2 ratio until advanced airway placed, then continuous compressions at 100-120/min and an asynchronous ventilation every 6 seconds.
5. *CPR must be performed for 2-minute intervals prior to interrupting chest compressions for no more than 5 seconds for rhythm check and Defibrillation per manufacturer recommendations (Peds: 4j/kg subsequent).*
 - Vector Change (VC) or Double Sequence Defibrillation (DSD) may be performed after first shock completed, when equipment is present to perform DSD or VC.
6. Place Advanced Airway (SGA or ETT), EtCO₂, and ventilate every 6 seconds (10 bpm min) with approximately 6-8 ml/kg predicted body weight of ventilatory volume.
 - If pre-existing, severe metabolic acidosis (pH 7.0 or less) was documented, *in only that circumstance*, hyperventilation may be utilized at no greater than every 5 seconds ventilation.
 - Utilize EtCO₂ to guide quality of compressions, ventilations, and cardiac output
7. Large bore IV or IO of BALANCED FLUID TO KEEP OPEN, draw blood for laboratory analysis, perform analysis.
8. *Reassess rhythm every two minutes for presence of VF or VT and defibrillate with manufacturers recommended dosage (Peds: 4-10j/kg subsequent) if in persistent VF/VT*
9. Ultrasound CAUSE Exam, identify and treat derangements as indicated.
10. Consider Epinephrine if PEA was original rhythm.
11. Consider Amiodarone or lidocaine IV/IO after second shock; repeat after IV/IO after fifth shock.
12. Consider Magnesium Sulfate; only if Torsades or hypomagnesemia suspected.
13. Pregnant patients in cardiac arrest require Compressions performed with Left Uterine Displacement (LUD) and immediate Emergency Cesarean Section from OB/GYN or Surgical provider.
14. Consider placing patient on gurney, in a head/back elevated position (30 degrees), following a minimum of four minutes of compressions and mechanical CPR device providing compressions.
15. Place NG or OG tube.
16. Consider termination of efforts after EtCO₂ persistently below 10 mmHg and unresponsive myocardium per death in the field Protocol – GO TO DEATH IN THE FIELD PROTOCOL

BRADYCARDIA TREATMENT:

1. Assure ABCs/Vitals
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Attach monitor, SpO₂, EtCO₂, pulse oximeter and obtain 12 lead ECG if possible and FOCUS Ultrasound.
4. Assess vital signs and consider other causes for bradycardia.
5. Start IV or IO of BALANCED FLUID TO KEEP OPEN or saline lock, draw blood for laboratory analysis if appropriate, perform analysis

6. If heart rate < 60 per minute and patient exhibits any of the following signs or symptoms the patient is UNSTABLE:
 - 6.1. Chest pain of a continuous or ongoing nature.
 - 6.2. Altered level of consciousness.
 - 6.3. Hypotension
 - 6.4. Significant signs of Shock.
 - 6.5. Acute onset heart failure.
7. Stable Bradycardia – Observe, 12 Lead ECG, Physician Cardiac Consult.
8. Unstable Bradycardia - Administer Atropine if TCP is not available (*NOTE: Epinephrine for PEDS*).
 - 8.1. If Sinus Bradycardia consider use of oxygen and ventilation, then Atropine prior to pacing.
 - 8.2. Atropine may be repeated every 5 minutes.
9. Unstable Bradycardia - Transcutaneous external cardiac pacing (TCP).
 - 9.1. Begin pacing at 60 bpm and 0 mA and increase in 10 mA doses until capture at manufacturers recommendation.
 - 9.2. After electrical capture evaluate patient for mechanical capture.
 - 9.3. Consider sedation.
10. Unstable Bradycardia - If TCP and Atropine ineffective:
 - 10.1. Epinephrine or Norepinephrine infusion

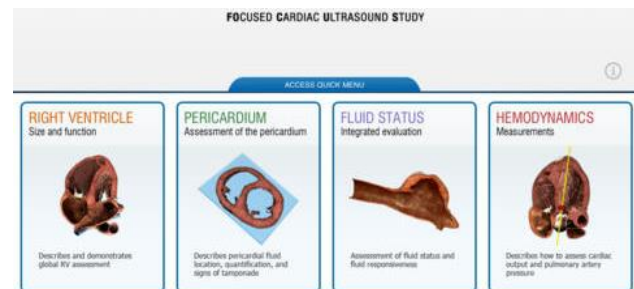
TACHYCARDIA TREATMENT:

1. Assure ABCs/Vitals
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.
3. Assess vital signs (including SpO2 and EtCO2), attach monitor and obtain 12 lead ECG, and consider other causes of tachycardia.
4. IV or IO of Balanced Fluid To Keep Open, draw blood for laboratory analysis is appropriate, Perform Laboratory Analysis.
5. If patient exhibits any of the following signs or symptoms, consider patient UNSTABLE:
 - 5.1. Chest pain of a continuous or ongoing nature.
 - 5.2. Altered level of consciousness.
 - 5.3. Hypotension
 - 5.4. Significant signs of shock
 - 5.5. Acute heart failure.
6. Narrow Complex tachycardia with regular rate greater than 150 (possible SVT)
 - 6.1. If patient is STABLE:
 - Observe, Vascular access, O2 if room air SpO2 is less than 95, 12 Lead ECG, Obtain Cardiac Consult
 - 6.2. If the patient is UNSTABLE:
 - Synchronized cardioversion at 100j, 200j, and 300j to maximum 3 attempts (*If time permits, consider sedation*), *if non-responsive*
 - Adenosine
 - If no response within 1 - 2 minutes, a repeat dose should be administered.
 - Do not use Adenosine if history of WPW or pre-excitation signs present on 12 lead ECG
7. Narrow Complex Tachycardia with irregular rate greater than 150 (possible Atrial Fibrillation AVR)
 - STABLE with rapid ventricular rate – observe, 12 lead ECG, SpO2, EtCO2, Transport
 - Consider rate control of Atrial Fibrillation with AVR with Metoprolol.
 - With pre-excitation signs in AF, Avoid AV nodal blocking agents should be avoided as these medications may cause a paradoxical increase in the ventricular response
 - Obtain Cardiac Consult
 - UNSTABLE with rapid ventricular rate:
 - Synchronized Cardioversion at manufacturer recommendation or 100, 200, 300, then max joules (maximum 4 attempts, then cardiac cath lab care required).
 - Peds 1 j/kg first dose, 2 j/kg second dose, then 4j/kg third and final dose.

- *If time permits, consider sedation*
 - If non-responsive to synchronized cardioversion, consider Esmolol
8. Wide Complex Tachycardia (HR greater than 150):
 - 8.1. If patient is STABLE:
 - Observe, 12 lead ECG, monitor all vitals every 5 minutes, prepare for possible cardioversion, obtain cardiac consult
 - 8.2. If patient UNSTABLE:
 - Synchronized cardioversion at 100j, 200j, 300j; maximum three attempts
 - *If time permits, consider sedation.*
 - If the wide complex is irregular in amplitude – switch to defibrillation mode and deliver defibrillation energy per manufacturer recommendation.
 - If non-responsive, consider Amiodarone.
 9. If patient at any time becomes pulseless, switch to Cardiac Arrest Protocol.

POST CARDIAC ARREST CARE:

1. Assure Return of Spontaneous Circulation (ROSC) with carotid pulse present and rise in EtCO₂ levels and ultrasound RUSH exam
2. Optimize Ventilation and Oxygenation:
 - Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS with SpO₂ at 92-98%.
 - Manage ventilation to assure EtCO₂ remains 30-40 mmHg.
 - Do NOT hyperventilate the patient.
3. Optimize Circulatory Status:
 - Obtain 12 lead ECG as soon as possible and FOCUS Ultrasound Exam
 - If Patient MAP of 65 or better: Observe and prepare for interventions if needed.
 - If Patient less than MAP of 65:
 - If IVC collapsing greater than 50% with ventilation, administer IV Fluids (Balanced Fluid) in 20ml/kg boluses to maintain a MAP of 65 mmHg.
 - Treat underlying (i.e. hypoxia, ischemia).
 - If fluids are ineffective or IVC is less than 30% collapse with ventilation, consider Epinephrine infusion
4. Assess patient's level of consciousness:
 - If conscious – Observe and prevent hypoxia/hypotension
 - If unconscious:
5. Place patient on mechanical or Bag/Valve/Advanced Airway ventilation
 - Administer Sedation/Induction Agent for mechanical ventilation
 - Administer Paralytic Agent if needed for excessive patient movement.
6. Place NG or OG tube
7. Avoid hyperthermia, retain patient temperature at 37.5°C or less:
 - Remove clothing from patient
 - Consider acetaminophen
 - Consider use of cooled fluids at 4°C for IV Bolus at 20ml/kg if IVC collapsing.
 - Consider use of cooled fluids at 4°C through NG or OG tube, place 500ml into stomach for 10 minutes, suction and repeat.
 - Use Ice bags at high heat transfer points of body.
 - Use urinary catheter temperature probe, temporal thermometer, and/or rectal thermometer/probe to monitor progress on temperature.
8. Review 12 Lead ECG – if positive for STEMI or high suspicion AMI:
 - Transport Direct to cardiac catheterization lab



- Perform Cath Lab Prep:
 - Remove Clothing, cover with sheet as needed.
 - Administer Heparin.
 - Mark Pulses.
 - Prep Groin (if equipped)
 - Draw bloods
- 9. Place urinary catheter if not already accomplished and available
- 10. Draw blood for laboratory analysis,
 - Perform Glucose test.
 - POC laboratory testing VGB, Electrolytes, pH, cardiac markers, and other chemistry.
- 11. Consider Sodium Bicarbonate for persistent acidosis refractory to ventilatory management.

CHEMICAL RESTRAINT PROCEDURE

INDICATIONS:

1. Chemical restraint should be utilized only if the patient is a potential danger to self and/or others.
2. It is not to be used on Conscious and Alert patients specifically refusing treatment.

GUIDELINES:

1. Pharmacologic agents may be used to provide a safe method of restraining the violently combative patient who presents a danger to themselves or others and to prevent the violently combative patient from further injury while secured by physical restraint.
2. These patients may include, but are not limited to the following:
 - 2.1. Alcohol and/or drug-intoxicated patients.
 - 2.2. Restless, combative head injured patients.
 - 2.3. Acute psychotic reaction, self-harm, or harm to others.

PROCEDURE:

1. Verbally control patient is possible, and verbally state to the patient he/she will be restrained if behavior continues.
2. Assess the possibility of using physical restraints first.
3. Evaluate the personnel needed to safely attempt restraining the patient – Contact Law Enforcement as Needed.
4. Assess the need for pharmacologic intervention carefully.
 - 4.1. The violently combative patient stands a lesser chance of injury when treated.
 - 4.2. A patient who is physically restrained and aggressively fighting his/her restraints, or compromising his/her airway or spine may be a candidate for treatment.
5. Administer Haloperidol
 - 5.1. Vital signs should be assessed within the first 5 minutes and thereafter as appropriate.
6. Consider Lorazepam for continued combative behavior
7. Perform blood draw for laboratory analysis.

PRECAUTIONS:

Beware of respiratory compromise and positional asphyxia

Assure actions are commiserate with Patient Rights, Restraint, and Consent

CHEST PAIN

or Presumed Acute Cardiac Syndrome (ACS)

SPECIFIC INFORMATION NEEDED:

1. Where is the *Pain*?
2. What is the *Quality* of the pain?
3. Does the pain *radiate* anywhere?
4. What is the *Severity* of the pain?
5. What *Time* did the pain start?
6. What was the patient doing when the pain occurred?
7. Prior similar episodes?
8. FOCUS Exam with Ultrasound.

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness.
3. Airway assessment.
4. Labs.
5. Early Warning Score and Shock Index?
6. Ultrasound RUSH and FOCUS Exam



TREATMENT:

1. Assure ABCs, position of comfort
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
 - Titrate oxygen therapy, based on monitoring of SpO₂ ≥94%.
3. Obtain vital signs, Attach cardiac monitor, EtCO₂, and pulse oximeter.
4. Obtain 12 lead ECG as soon as possible; determine if STEMI or high suspicion AMI/ACS:
5. Administer Aspirin; if patient not allergic to Aspirin.
6. Initiate a large bore IV of BALANCED FLUID at a TO KEEP OPEN rate, saline lock, or per SHOCK Protocol.
7. Perform blood draw for laboratory analysis if able and perform analysis.
8. Treat Bradycardia or Tachycardia dysrhythmias per Protocols.
9. Consider Methoxyflurane for pain
10. Consider Ketamine for continued pain.
 - 10.1. Monitor respirations, EtCO₂, SpO₂, and blood pressure closely.
11. Consider anti-emetic for nausea and vomiting.
12. Consider Metoprolol for hemodynamically stable patients with definite or suspected acute MI, to reduce cardiovascular mortality.
 - 12.1. Second or third dose should not be given if systolic BP is <90 mmHg or HR <40 min.
13. Consider IV Nitroglycerin infusion for ongoing chest pain with MAP above 65 mmHg.
14. Administer unfractionated Heparin for patients with STEMI.

CHEST TRAUMA

INDICATIONS:

1. This Protocol assumes TRAUMA ASSESSMENT PROTOCOL was initiated and will be completed.
2. Other chest injuries including open chest wound, pulmonary contusion, and flail chest.
 - 2.1. TENSION PNEUMOTHORAX OR HEMO/PNEUMOTHORAX:
 - 2.1.1. Consistent history, (i.e. chest trauma, COPD, patient on positive pressure ventilation)
 - 2.1.2. Shock symptoms, with low or rapidly decreasing BP.
 - 2.1.3. Progressive respiratory distress.
 - 2.1.4. Tracheal shift away from affected side.
 - 2.1.5. Distended neck veins.
 - 2.1.6. Asymmetrical movement on inspiration.
 - 2.1.7. Hyper expanded chest on effected side.
 - 2.1.8. Drum like percussion on affected side.
 - 2.1.9. Increased resistance to positive pressure ventilation, especially if intubated.
 - 2.1.10. Consider Ultrasound lung exam confirmation
 - 2.2. SIMPLE PNEUMOTHORAX OR HEMOTHORAX:
 - 2.2.1. Non-tension pneumothorax or hemothorax is relatively common, is not immediately life threatening, and should not be decompressed.
 - 2.2.2. Monitor for progression from simple to tension pneumothorax or hemo/pneumothorax, especially in flight with rapid elevation change.
 - 2.2.3. Respiratory distress, mild to severe.
 - 2.2.4. Chest pain
 - 2.2.5. Decreased or absent breath sounds on affected side.
 - 2.2.6. Subcutaneous emphysema.
 - 2.2.7. Consider Ultrasound Lung exam confirmation
 - 2.3. Cardiac Tamponade:
 - 2.3.1. Consider potential cardiac tamponade
 - 2.3.2. Follow Pericardiocentesis Protocol

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
2. Do Not utilize Entonox
3. No Continuous Positive Airway Pressure (CPAP) in the presence of chest trauma and avoid Positive Pressure Ventilation (PPV) if possible until any tension pneumothorax is resolved.
4. Consider intubation for severe, restrictive chest wall injury or severe respiratory distress.
 - 4.1. Initiate intubation with rapid sequence induction as needed to secure airway.
 - 4.2. Perform surgical cricothyroidomy for patient unable to be intubated or ventilated.
5. Maintain spinal immobilization, control external bleeding, and expose chest.
6. If signs of tension pneumothorax are noted along with hypotension and/or decreased oxygen saturation, then proceed to CHEST DECOMPRESSION PROTOCOL. If prolonged transport or return of tension signs after two chest decompressions, proceed to CHEST TUBE INSERTION PROTOCOL.
7. Patients who exceed 1400ml in first hour or 200ml/hr over 5 hours from chest tube should be considered in need of immediate surgical intervention; outflow of lessor amounts, the patient should be considered urgent but stable.
8. If evidence of a penetrating or sucking chest wound, apply dressing and tape three out of four sides.
9. Remove immediately if patient develops tension pneumothorax.
10. If Flail segment, manually stabilize flail segment and apply bulky dressing to support flail segment.
11. Utilize permissive hypotension to manage patient circulatory status.

CHILD BIRTH AND OBSTRETRICAL EMERGENCIES

OBTAIN CONSENT PRIOR TO ANY PROGRESSION OF ASSESSMENT OR CARE UNDER THIS PROTOCOL!

SPECIFIC INFORMATION NEEDED:

1. Last menstrual period and due date if known.
2. How many pregnancies and live births has the patient had?
3. What is the Quality of the pain?
4. How often does the pain occur?
5. How often are the contractions?
6. What Time did this start?
7. History of problems with pregnancy vaginal bleeding, prior cesarean sections, high blood pressure, premature labor, premature rupture of membranes.
8. Current complaints; onset of labor, timing of contractions, rupture of membranes, or urge to push.

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness.
3. Level of fundus.
4. Crowning and effacement.
5. Airway assessment (LEMON).
6. Early Warning Score and Shock Index?
7. Ultrasound exam.

CHILD BIRTH EMERGENCIES TREATMENT:

1. Assure ABCs.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Obtain Fetal Heart Tones (FHT) if possible - consider fetus in distress is FHT outside of 130-170bpm.
4. Obtain large bore vascular access and perform blood draw for laboratory analysis if able and analysis.
5. Perineal examination:
 - 5.1. Vaginal bleeding or leakage of fluid.
 - 5.2. Presence of meconium.
 - 5.3. Crowning during a contraction.
 - 5.4. Presenting part, head, face, foot, arm, cord.
6. Vaginal Examination:
 - 6.1. Note cervical dilation
 - 6.2. Identify presenting part(s)
 - 6.3. Identify intra-vaginal lacerations
 - 6.4. Identify cord prolapse and rectify.
7. If active labor, and no vaginal bleeding or crowning:
 - 7.1. Check for fetal heart tones.
 - 7.2. Titrate O₂ to maintain SpO₂ 94-98%
8. If vaginal bleeding with no signs of shock (systolic >90 mmHg):
 - 8.1. Transport with patient in left lateral recumbent position
 - 8.2. Titrate O₂ to maintain SpO₂ 94-98%
 - 8.3. IV BALANCED FLUID at 125 ml/hour.
 - 8.4. Cardiac monitor, SpO₂, EtCO₂
9. If heavy vaginal bleeding with signs of shock (systolic <90 mmHg):
 - 9.1. Transport with patient in left lateral recumbent position.
 - 9.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR

PATIENT CARE PROTOCOLS

9.3. Cardiac monitor, SpO₂, EtCO₂

9.4. IV BALANCED FLUID 20ml/kg IV Bolus and follow SHOCK PROTOCOL.

10. If imminent delivery:

- 10.1. Place mother in lithotomy position.
- 10.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS Drape mother.
- 10.3. Prepare for neonatal resuscitation.
- 10.4. Assist delivery.
- 10.5. Suction baby's mouth, then nose with bulb suction; if meconium stained fluid, ET intubate and suction baby's airway until clear before stimulating first breath.
- 10.6. Warm, dry, and stimulate infant.
- 10.7. Clamp cord in two places, six inches from infant, and cut cord between clamps.
- 10.8. Wrap infant in sterile drape or dry blanket.
- 10.9. Infuse mother's IV of Balanced Fluid with 500cc fluid bolus, then at 125 ml/hour.

11. If prolapsed cord:

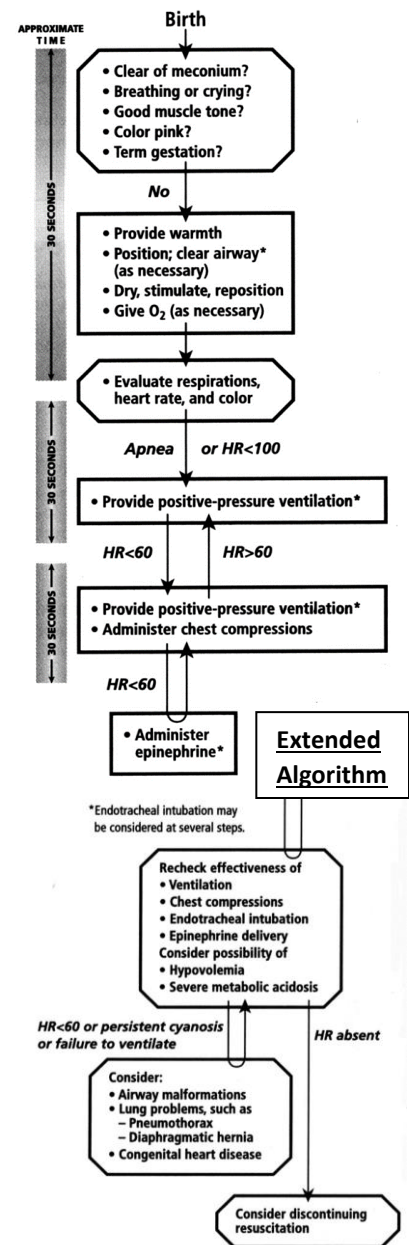
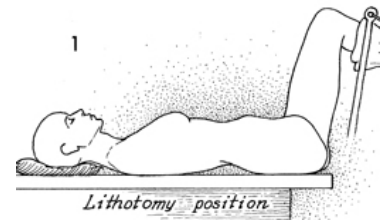
- 11.1. Place mother in knee/chest position and place cord back into vaginal vault with gloved hand in one attempt.
- 11.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
- 11.3. IV Balanced Fluid and run at 125 ml/hour.
- 11.4. Place gloved index and middle fingers into the vagina and push the infant up to relieve pressure on the cord; remove cord from infant if able.
- 11.5. Check cord for pulse.
- 11.6. If no pulse for thirty seconds following maneuver, and greater than 10 minutes to hospital, place mother into lithotomy position and attempt delivery of baby.

12. If abnormal fetal presentation or decreased fetal heart tones:

- 12.1. Place patient in left lateral recumbent position.
- 12.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
- 12.3. IV Balanced Fluid enroute and run at 125 ml/hour.
- 12.4. If infant in footling breech and compressing cord, place reverse pressure on infant to recover pulse in cord, if ineffective, consider manually assisted deliver if more than 5 minutes from hospital.

13. If delivery completed before arrival, or in-field:

- 13.1. Protect infant from fall and temperature loss.
- 13.2. Check infant's vital signs – if poor, utilize neonatal resuscitation algorithm (at right); if meconium present, suction upper airway; If infant not vigorous, intubate and suction trachea.
- 13.3. Clamp cord in two places, six inches from infant, and cut cord between clamps.
- 13.4. Suction, warm, dry, and stimulate infant.
- 13.5. Give infant to mother.
- 13.6. Massage uterus gently following delivery.
- 13.7. Do not pull on cord or attempt to deliver placenta.



- 13.8. Start IV Balanced Fluid and run at 125 ml/hour.
- 13.9. Watch for external bleeding, begin fundal massage after placenta delivers for bleeding.
- 14. If significant post-partum hemorrhage (estimated at greater than 1000 ml):
 - 14.1. 20ml/kg IV fluid boluses and utilize permissive hypotension
 - 14.2. Consider Pitocin.
 - 14.3. SHOCK PROTOCOL if not resolved
 - 14.4. Consider Bi-Manual Massage for continued significant hemorrhage

ECLAMPSIA

Pre-Eclampsia:

In addition to swelling, protein in the urine, and hypertension, preeclampsia symptoms can include: Rapid weight gain caused by a significant increase in bodily fluid, Abdominal pain, Severe headaches, Change in reflexes, Reduced urine or no urine output, Dizziness, Excessive vomiting and nausea, and/or Vision changes.

Eclampsia: Eclampsia is seizures in a pregnant woman, not related to an existing brain condition.

SPECIFIC INFORMATION NEEDED:

1. How long have symptoms been present?
2. What week is the pregnancy?
3. What has your physician/Healthcare provider done thus far?
4. History of previous medical conditions?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs, including Fetal Heart Tones if possible.
2. Level of consciousness.
3. Airway assessment.
4. Neurological exam.

TREATMENT:

1. Assure ABCs.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. IV of Balanced Fluid at 125 ml/hr, draw bloods for laboratory analysis if available, perform laboratory analyses
4. Seizures – Go To Seizure Protocol
5. Monitor ECG, vital signs, fetal heart tones, level of consciousness, patellar reflexes, respiratory rate, and oxygenation status every 5 minutes.
6. Keep the patient in left lateral recumbent position.
7. Monitor urinary output, if possible.
8. Evaluate for pulmonary edema. if present:
 - Consider CPAP
 - Consider Nitroglycerine
9. Magnesium Sulfate:
 - Remember, Magnesium Sulfate can cause respiratory depression with cardiovascular collapse.
 - Measure and document deep tendon reflex (DTR) and/or Patellar Reflexes.
 - If patellar reflexes are absent, shut off the infusion immediately.
 - Retain infusion if patient is postictal when assessed

CEREBRAL VASCULAR ACCIDENT

SPECIFIC INFORMATION NEEDED:

1. How long have symptoms been present?
2. Any pain presents?
3. Nature of illness?
4. Cincinnati Stroke Scale or FAST Scale;
 - 4.1. Facial Droop (smile/show teeth) = Normal (*equal movement*) or Abnormal (*unequal movement*)?
 - 4.2. Arm Drift = Normal (*equal or no movement in both arms*) or Abnormal (*movement or drifting of one arm*)?
 - 4.3. Abnormal Speech (“You can’t teach old dogs new tricks”) = Normal (*correct words/no slurring*) or Abnormal (*incorrect words, slurred speech, no speech*)?
5. If symptoms < 4.5 hours with no history, no symptoms of intracranial bleed, no history of head trauma, no recent surgery, and/or no recent Coumadin use; then consider facilitating transport for thrombolytic therapy.

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs/Early Warning Score
2. Stroke scale
3. Level of consciousness
4. Airway assessment
5. Skin signs.
6. Labs
7. Ultrasound clot scan



TREATMENT:

1. Assure ABCs.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Initiate IV BALANCED FLUID TO KEEP OPEN, draw bloods for laboratory analysis, and perform laboratory analysis.
4. Attach cardiac monitor and pulse oximeter.
5. Elevate head of bed to 15-30 degrees.
6. Determine serum glucose level with Glucometer.
 - If glucose < 72 mg/dl (4 mmol/l) – DIABETIC EMERGENCIES PROTOCOL
 - Titrate to response to restore normal GCS
 - Consider differential diagnosis.
7. Place in recovery position (unless spinal injury suspected) or position of patient comfort.
8. Obtain CT scan and specialist interpretation within 20 and 40 minutes.
9. Repeat vital signs frequently.
10. Treat seizures per Seizure Protocol.
11. Consult for Cath Lab Admission for Intervention.

DEATH DURING RESUSCITATION PROTOCOL

MAY WITHHOLD RESUSCITATION OF PATIENT IF:

1. There are unequivocal signs of death, e.g., rigor mortis, decomposition, decapitation, dependent lividity, evisceration of heart or brain, or incineration.
2. The patient is a pulseless, apneic victim of a multiple casualty incident where resources of the system are required for stabilization of other patients.
3. In addition to the conditions listed under withholding resuscitative efforts, a victim of trauma should be determined dead if:
 - 3.1. The patient is a victim of blunt trauma or penetrating trauma to the head and has no vital signs in the field (pulseless, apneic, EtCO₂ less than 10 mmHg).
 - 3.2. In instances where the patient declines to the point that no vital signs (i.e. pulse/respiration) are present, the patient should receive resuscitative efforts for at least ten minutes prior to any declaration of death in the field
4. Recognizable QRS of at least sixty (60) per minute should be considered compatible with life in trauma patients.

DEATH During Resuscitation:

1. Patient has obvious signs of death present
 - 1.1. decomposition, rigor mortis, lividity, incineration, decapitation, injuries incompatible with life, unwitnessed traumatic cardiac arrest, evisceration of heart or brain, major cranial insult with absence of vital signs, and/or cardiac arrest during a mass casualty event.
 - 1.2. Do NOT begin resuscitation
2. Cardiac arrest care has been initiated
 - 2.1. 15 minutes or more have passed since patient arrested, bystander/RRT CPR was not initiated, and EtCO₂ is less than 10mmHg – STOP resuscitation
 - 2.2. NOTE: If pregnancy, poisoning, overdose, or drowning are present – Treat and consider Transport of patient
3. If patient in continued cardiac arrest with EtCO₂ less than 10 mmHg after 20 minutes of monitored cardiac arrest management – Stop Resuscitation

Note: If ETCO₂ is greater than 15 and ultrasound exam reveals cardiac movement, the provider may consider initiating the Shock Protocols in addition to the Cardiac Arrest Protocols.
If patient is in VF at one hour of management and an EtCO₂ greater than 15 mmHg, consider cath lab transfer.
If patient is at one hour of management with an EtCO₂ greater than 15 mmHg, consider ECMO if available.

DIABETIC EMERGENCIES – HYPOGLYCEMIA/HYPERGLYCEMIA

SPECIFIC INFORMATION NEEDED:

1. How long have symptoms been present?
2. History of previous medical conditions?
3. Nature of present illness?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness.
3. Airway assessment.
4. Skin signs.

TREATMENT - HYPOGLYCEMIA:

1. Assure ABCs.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Initiate Large Bore IV/IO with balanced fluid.
4. Attach cardiac monitor, EtCO₂, and SpO₂.
5. Determine serum glucose level with Glucometer.
 - Adult Patient: If glucose < 72 mg/dl (4 mmol/l) Administer Dextrose 10%.
 - Pediatric Patient: If glucose < 72 mg/dl (4 mmol/l), Administer Dextrose 10%
 - If patient able to manage their own oral secretions – oral glucose may be utilized
 - If unable to establish IV, give Glucagon
6. Repeat glucose determination in 5 minutes and continue Dextrose if results unchanged
7. Provide supportive measures.

TREATMENT – HYPERGLYCEMIA:

1. Assure ABCs.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
 - Consider hyperventilation at 20 bpm and 6-8 ml/kg predicted body weight for suspected acidosis
3. Initiate IV BALANCED FLUID To Keep Open, if able, draw blood for laboratory analyses, and perform laboratory analyses.
4. Attach cardiac monitor, EtCO₂, and pulse oximeter.
5. Determine serum glucose level with Glucometer.
 - if glucose > 80 mg/dl (4.4 mmol/l) and < 250 mg/dl (14 mmol/l), transport.
 - if glucose > 250 mg/dl (14 mmol/l), go to #6.
6. If glucose > 250 mg/dl (14 mmol/l), and patient exhibiting altered mental status, acidosis, Kussmaul respirations, dry skin with poor turgor, and/or ketotic breath:
 - Administer BALANCED FLUID bolus of 20 ml/kg IVP.
 - Consider Insulin for patients non-responsive to IVF with glucose > 450 mg/dl (25 mmol/l)
 - Consider Potassium if < 2.5 mEq/L or symptomatic hypokalemia:
 - Remove Potassium once 4 mEq/L reached

DIVING EMERGENCIES – DECOMPRESSION SICKNESS

SPECIFIC INFORMATION NEEDED:

1. How long have symptoms been present?
2. What depth was patient diving at and dive timeline?
3. What rate of ascent was used?
4. History of previous medical conditions?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness.
3. Airway assessment (LEMON/Trauma ABCS).
4. DAN Diver Neurological Assessment For Treatment and Hyperbaric Referral
 - 4.1. Orientation
 - 4.1.1. Does the diver know his/her own name and age?
 - 4.1.2. Does the diver know the present location?
 - 4.1.3. Does the diver know what time, day, year it is?
 - 4.1.4. Note: Even though a diver appears alert, the answers to these questions may reveal confusion. Do not omit them.
 - 4.2. Eyes
 - 4.2.1. Have the diver count the number of fingers you display, using two or three different numbers.
 - 4.2.2. Check each eye separately and then together.
 - 4.2.3. Have the diver identify a distant object.
 - 4.2.4. Tell the diver to hold head still, or you gently hold it still, while placing your other hand about 18 inches/0.5 meters in front of the face. Ask the diver to follow your hand. Now move your hand up and down, then side to side. The diver's eyes should follow your hand and should not jerk to one side and return.
 - 4.2.5. Check that the pupils are equal in size.
 - 4.3. Face
 - 4.3.1. Ask the diver to purse the lips. Look carefully to see that both sides of the face have the same expression.
 - 4.3.2. Ask the diver to grit the teeth. Feel the jaw muscles to confirm that they are contracted equally.
 - 4.3.3. Instruct the diver to close the eyes while you lightly touch your fingertips across the forehead and face to be sure sensation is present and the same everywhere.
 - 4.4. Hearing
 - 4.4.1. Hearing can be evaluated by holding your hand about 2 feet/0.6 meters from the diver's ear and rubbing your thumb and finger together.
 - 4.4.2. Check both ears moving your hand closer until the diver hears it.
 - 4.4.3. Check several times and compare with your own hearing.
 - 4.4.4. Note: If the surroundings are noisy, the test is difficult to evaluate. Ask bystanders to be quiet and to turn off unneeded machinery.
 - 4.5. Swallowing Reflex
 - 4.5.1. Instruct the diver to swallow while you watch the "Adam's apple" to be sure it moves up and down.
 - 4.6. Tongue
 - 4.6.1. Instruct the diver to stick out the tongue. It should come out straight in the middle of the mouth without deviating to either side.
 - 4.7. Muscle Strength
 - 4.7.1. Instruct the diver to shrug shoulders while you bear down on them to observe for equal muscle strength.
 - 4.7.2. Check diver's arms by bringing the elbows up level with the shoulders, hands level with the arms and touching the chest. Instruct the diver to resist while you pull the arms away, push

them back, up and down. The strength should be approximately equal in both arms in each direction.

4.7.3. Check leg strength by having the diver lie flat and raise and lower the legs while you resist the movement.

4.8. Sensory Perception

4.8.1. Check on both sides by touching lightly as was done on the face. Start at the top of the body and compare sides while moving downwards to cover the entire body.

4.8.2. Note: The diver's eyes should be closed during this procedure. The diver should confirm the sensation in each area before you move to another area.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
 - Utilize oxygenation methodology to assure 98% SpO₂
2. Place the patient in a supine head-down left lateral decubitus position.
3. Attach monitor, EtCO₂ and SpO₂.
4. Start a large bore IV of Balanced Fluid. If Shock present, follow SHOCK PROTOCOL.
5. Protect against hypothermia and hyperthermia.
6. Ultrasound examination of lungs and heart
7. Monitor closely for complications (pneumothorax, shock, seizures) and treat per specific Protocols.
8. Contact Diver's Alert Network (DAN) for treatment advice.
9. Assess vital signs, including temperature, every 10 minutes.
10. Facilitate transport to a hyperbaric facility, if possible.
 - Provide hyperbaric personnel with a detailed history of the dive (depth and duration, timing and onset of symptoms, complications, and any treatment rendered).
 - Pre-alert chamber staff
11. Transport at cabin altitude of 500 feet or as low as possible due to flight and terrain restrictions.
12. For pain, use PAIN MANAGEMENT PROTOCOLS.

FEBRILE CONDITIONS AND SEPSIS

SPECIFIC INFORMATION NEEDED:

1. Evaluate for possible exposure to meningitis
2. Evaluate for potential sepsis
3. Evaluate for possible hemorrhagic fever, malaria, or dengue exposure and risk
4. Take full PPE precautions

SPECIFIC PHYSICAL FINDINGS:

1. History of present condition and potential exposure risks
2. Vital signs, including temperature.
3. Level of consciousness.
4. Airway assessment (LEMON and Trauma ABCS).
5. Neurological exam.
6. Pediatric shock assessment in pediatric patients less than 33kg: increased respiratory rate, increased respiratory effort, central vs. distal pulse quality, capillary refill, BP less than $70 + (2 \times \text{age in years})$
7. Shock Index Present (Heart rate greater than systolic BP? Calculate cardiac rate divided by the systolic blood pressure)?
8. ISTAT/Lab Values: Lactate level 4 mmol/L or greater – GO TO DISTRIBUTIVE SHOCK PROTOCOL
9. Ultrasound Inferior Vena Cava and FOCUS evaluation for determination of fluids or vasoactive agent suitability.

TREATMENT:

1. Common Treatment Modalities:
 - 1.1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
 - 1.2. Monitor ECG, BP, pulse, respirations, EtCO₂, and temperature
 - 1.3. Establish Large Bore IV/IO with balanced fluid, draw bloods for laboratory analysis, perform laboratory analysis
 - 1.4. Consider advanced airway and ventilation with 100% oxygen for:
 - o markedly decreased LOC
 - o inability to maintain a patient airway
 - o Inability to maintain SpO₂ above 95% despite use of all oxygen delivery or NIV ventilation devices
 - o EtCO₂ >50 mmHg, or GCS < 9
 - o Reduction in work of breathing and increased cardiac output available for pressure support.
 - 1.5. Fever reduction with Acetaminophen (IV)
 - 1.5.1. Intravenous if possible.
 - 1.6. Dehydration therapy
 - o 20 ml/kg *Balanced Fluid boluses for patient with MAP less than 65; repeat as required until patient improvement and MAP of 65-70 reached.*
 - o IV or IO BALANCED FLUID maintenance fluid at 125-165ml per hour
 - o May use IVC status on Ultrasound findings to assist with fluid resuscitation goals and direction.
 - o Urinary catheter insertion for urinary output (goal: 1-2ml/kg/hr)
 - 1.7. Pain control – follow pain management Protocols
2. Specific Treatments:
 - 2.1. Meningococemia /Meningitis
 - 2.1.1. Headache, with possible increase in pain on neck movement; if headache has increased over time, do not wait for lumbar puncture prior to antibiotic therapy.
 - 2.1.2. Obtain Blood for laboratory analysis and culture if possible
 - 2.1.3. Administer Ceftriaxone
 - 2.1.4. Administer steroid
 - 2.2. Sepsis
 - 2.2.1. 20 ml/kg *Balanced Fluid boluses for patient with MAP of 65 or less (or systolic of less than 90*

- in adults); repeat as required until patient improvement and MAP of 65-70 reached.
- 2.2.2. Early use of vasopressors is acceptable following initial hydration (minimum 40 ml/kg total dose) and maintenance fluids, begin with up to three boluses of 20 ml/kg Balanced Fluid. Maintain goal MAP of 65
 - Consider Epinephrine infusion
- 2.2.3. Obtain Blood for laboratory analysis and culture if possible
- 2.2.4. Administer Ceftriaxone
- 2.2.5. Administer steroid
- 2.2.6. Septic Shock – SHOCK PROTOCOL
- 2.3. Mild Febrile Conditions
 - 2.3.1. Oral hydration is acceptable
 - 2.3.2. Mandatory rest

HEAD TRAUMA/TRAUMATIC BRAIN INJURY

SPECIFIC INFORMATION NEEDED:

1. History: mechanism of injury, mental status changes.
2. Protective devices worn: helmet, shield.
3. Past medical history and/or Cervical Spine Injury?

SPECIFIC PHYSICAL FINDINGS:

1. EVALUATE: airway (LEMON and Trauma ABCS), breathing, and gross injuries to trunk and extremities.
2. Mental Status Exam: use descriptive terms and Glasgow Coma Scale.
3. External evidence of head trauma.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
2. If GCS 10 or less, advanced airway placement and ventilate.
 - The goal is normal ventilation, not hyperventilation.
 - EtCO₂ required, maintain EtCO₂ between 35-40 mmHg during ventilation initially.
3. PROTECT patient from the environment and protect spine.
4. Use direct pressure to control bleeding wounds on head.
5. Establish Large Bore IV/IO with balanced fluid, draw bloods for laboratory analysis, perform laboratory analysis
6. Monitor vital signs, mental status, and note any changes. Document all changes in GCS.
7. IF PATIENT'S BP RISES ABOVE 140 SYSTOLIC, AND PATIENT EXAM REVEALS PUPIL DILATION AND/OR SIGNS OF POSTURING, OR THE PATIENT HAS A SUDDEN AND DRAMATIC CHANGE IN CONSCIOUSNESS (i.e., patient becomes unconscious, obtunded):
 - Perform endotracheal intubation (or place advanced airway) if not already done, with in line immobilization.
 - Consider Mannitol or Hypertonic Saline with signs of herniation or rapidly increasing ICP present; repeat as required up to twice for reoccurrence of herniation signs.
 - If treatment or transport will exceed one hour after mannitol administration, consider placement of urinary catheter to decrease potential for bladder injury.
 - Administer IV fluids per SHOCK PROTOCOL; patient must remain hydrated during treatment and transport.
 - If use of mannitol and Hypertonic Saline is not successful, consider hyperventilation at 20 bpm to EtCO₂ of 30mmHg if decompensation continues.
 - Beware hyperventilation may decrease cardiac output, decrease cerebral perfusion, and increase hypoxia.
 - Excessive pressure of ventilation may also increase intracranial pressure
 - Transport by the most rapid means available for neurosurgical intervention.

SPECIFIC PRECAUTIONS:

1. Patients should be aggressively fluid resuscitated and oxygenated; any episodes of hypotension or hypoxia in the TBI patient are deleterious.
2. Restlessness and/or agitation can be due to hypoxemia and/or hypoglycemia.
3. Mannitol should not be given to a patient in shock with MAP less than 60.
4. Mannitol Precautions:
 - Anuria (due to severe renal disease), mannitol may lead to fluid overload.
 - Severe Dehydration: mannitol may lead to over diuresis of patients.
 - Intracranial Bleeding: mannitol may increase bleeding.
 - Pulmonary Edema: mannitol may lead to exacerbation.
 - Bladder injury: mannitol may lead to bladder injury if urinary catheterization is not accomplished with distended bladder.

HYPERTHERMIA

TYPES OF HEAT ILLNESS:

1. **Heat Stroke:** The signs of heat stroke include elevated body temperature and altered mental status, manifesting in a classic or exertional presentation. The patient may or may not be sweating. These patients may or may not be volume depleted. Give fluids cautiously (evaluate with US or PLR if available) due to potential for pulmonary edema. Heat stroke is a medical emergency with a 30% mortality rate.
2. **Heat Exhaustion:** Presents as volume depletion with normal mental status and normal body temperature (or near normal). These patients are markedly fluid short and may require as much as 3-4 liters of BALANCED FLUID over the first 4 hours. Upon resolution, these patients should avoid heat and exercise for 24-36 hours.
3. **Heat Cramps:** Are a benign condition caused by electrolyte imbalance. Allow the person to rest in a cool environment and drink oral fluids with electrolytes (not plain water). After rest and rehydration, these patients can usually return to moderate activity.

SPECIFIC INFORMATION NEEDED:

1. Sudden collapse or gradual onset?
2. Exercise induced?
3. Previous history of hyperthermia?
4. Recent food/fluid intake?
5. Ambient temperature?

SPECIFIC PHYSICAL FINDINGS:

1. Vital Signs including temperature, if possible.
2. Mental status-APVU or Glasgow Coma Scale.
3. Skin color and presence or absence of sweating.
4. Ultrasound BLUE protocol examination.

TREATMENT:

1. Remove patient to a cool environment as soon as possible.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Cooling (*OBTAIN CONSENT!*):
 - Remove clothing from patient and begin cooling measures that maximize evaporation/convection with positive airflow across patient.
 - A spray bottle with cool water is one of the best cooling measures.
 - Avoid shivering during the cooling process.
 - *Evaporative cooling alone is not an effective measure*
4. IV or IO, follow SHOCK PROTOCOL, if indicated. Draw blood for laboratory analysis, perform laboratory analyses
 - Heat exhaustion:
 - *Aggressive fluid resuscitation MAY BE REQUIRED, patient may need up to 3-4 liters in the first hour, followed by up to 6-10 liters in 24 hours.*
 - Heat stroke:
 - *May not be fluid DEPLETED in classic presentation, use fluid with caution as pulmonary edema may develop; Complete Ultrasound BLUE Protocol*
 - *May be severely fluid DEPLETED in exertional presentation, aggressive fluid resuscitation (20ml/kg per bolus) is warranted, slow resuscitation when signs of fluid loss abate, ultrasound IVC normalizes, urinary output reaches 1-2 ml/kg/hr, and/or patient normalizes.*
5. If seizure activity noted, follow SEIZURE PROTOCOLS.
6. Monitor vital signs every 5-10 minutes.
7. Continue cooling - Avoid wet blankets or other covering that obstructs air flow.
8. Special care should be taken to avoid seizures.

HYPOTHERMIA

SPECIFIC INFORMATION NEEDED:

1. Length of exposure.
2. Hypothermia patients are categorized by the lowest physical variable, which they display.
3. Following are the physical variables of hypothermia:
 - Apnea: Put metal or glass shined object under nostrils for 1 minute.
 - Pulse: Palpate carotid pulse for 1 minute.
 - ECG: Attach ECG and interpret rhythm.
 - LOC: Determine Level of Consciousness (LOC) by verbal and motor responses.
 - Ultrasound FOCUS exam to identify viability of circulatory status.
4. Which "Category of Hypothermia" does patient go into – Mild 34-36⁰C/Moderate 30-33.9⁰C/Severe less than 30⁰C.

SPECIFIC PHYSICAL FINDINGS:

1. Vital Signs including temperature.
2. Mental status-APVU or Glasgow Coma Scale.
3. Labs
4. Physical exam and Neurologic findings

TREATMENT:

1. Remove patient from cold environment.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. OBTAIN CONSENT!
 - Remove wet clothing from patient and begin warming measures that maximize conduction of warmth to patient.
 - *Increase ambient temperature*
 - *Blankets and hot packs to arm pits and groin*
4. IV or IO, follow SHOCK PROTOCOL, if indicated. Draw blood for laboratory analysis, perform laboratory analyses
 - Mild Hypothermia: warm liquids and oral glucose as necessary
 - Moderate Hypothermia: Warm IV fluids and oxygen (40⁰C) over 30 minutes
 - Severe Hypothermia: Warm IV fluids and oxygen (40⁰C) over 30 minutes
5. Fluid management should be guided by IVC status and laboratory values
6. If seizure activity noted, follow SEIZURE PROTOCOLS.
7. Monitor vital signs every 5-10 minutes.
8. Continue warming - Avoid wet blankets or other covering that obstructs air flow.
9. Manage airway
10. Do not administer atropine if temp less than 34⁰C
11. Limit defibrillation to three shocks and withhold medications until greater than 30⁰C, increase medication intervals by factor of x 2 until above 34⁰C
12. No active rewarming beyond 32⁰C

INHALATION OF TOXIC FUMES

CAUTION:

1. Protect yourself from exposure.
2. Patient should be removed from area of toxic substance by personnel equipped with proper safety gear.

INITIAL INTERVENTION/DRUG THERAPY:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
2. Monitor vital signs, ECG, SpO₂, EtCO₂
3. Initiate IV BALANCED FLUID TO KEEP OPEN, draw blood for laboratory analysis, perform laboratory analyses
4. Albuterol by nebulizer for wheezing.

SPECIFIC THERAPIES:

1. ***Carbon monoxide:***
 - Hyperoxygenate patient with 100% O₂.
 - Advanced airway placement if patient GCS less than 9
 - Ventilate at 12 bpm with 8 ml/kg predicted body weight
2. ***Chlorine gas or dust:***
 - Humidified 100% O₂.
 - Treat severe pulmonary edema or bronchospasm per RESPIRATORY CONDITIONS PROTOCOLS
3. ***Cyanide Inhalation:***
 - Hyperventilate with 100% O₂, assist ventilations, and plan for advanced airway placement with RSI when GCS = 8 or less.
 - Cyanide Antidote:
 - *Amyl Nitrite (if available at patient location or in CBRN kit).*
 - *Break ampule, allow inhalations 30 seconds each minute*
 - *Place in gauze inside NRB mask (or BV, if assisting respirations)*
 - *Sodium Thiosulfate (if available at patient location or in CBRN Kit)*
 - *Adult: 50ml 25% solution IV (12.5 g)*
 - *Pediatric: 250mg/kg IV.*
 - *Stop Amyl Nitrite prior to administration of Sodium Thiosulfate.*
4. ***Hydrogen Sulfide:***
 - Respiratory depression will occur at specific H₂S levels, prepare to assist ventilation.
 - Plan for advanced airway placement with RSI when SpO₂ levels above 95% cannot be sustained.
 - Seizure will occur at specific H₂S levels, treat seizures per SEIZURE PROTOCOLS.
5. ***Weaponized Agents – Sarin/VX:***
 - Go to Organophosphate Protocol.
 - Take extreme care to avoid personal contamination, even small amounts may lead to death.

ORTHOPEDIC INJURIES

SPECIFIC INFORMATION NEEDED:

1. History of Trauma, mechanism of injury.

SPECIFIC PHYSICAL FINDINGS:

1. Localized pain and/or tenderness.
2. Swelling and/or discoloration.
3. Angulation, deep lacerations, exposed bone.
4. Crepitus
5. Loss of function and/or limitation of motion.
6. Guarding and/or rigidity in closed spaces.
7. Quality of distal pulses, sensation, and capillary refill.
8. CSM (Circulation, Sensation, Movement)

TREATMENT OF ORTHOPEDIC INJURIES:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
2. Immobilize cervical spine if appropriate.
3. Examine for additional injuries, evaluate and treat injuries with higher priority than fractures and dislocations.
4. For suspected pelvic, femur, other large bone fractures, major dislocations, and fractures with open wounds, establish IV, follow SHOCK PROTOCOLS.
5. Apply sterile dressing to any wounds and secure in place.
6. Splint as appropriate, axial traction as needed to facilitate splinting.
 - A traction splint may be applied to all femur fractures if time permits; additionally, any foot wear should be removed prior to splinting.
 - A pelvic binder should be applied to all unresponsive trauma patients and patients with pelvic pain
 - Elevate fractures where possible, apply cold packs or ice if injuries and time permit.
 - Document pulses and sensation pre and post movement
7. If no circulation is present in an extremity, attempt to regain in a pulse by repositioning the limb; if repositioning is not effective, consider reduction of injury or light traction.
 - If an extremity must be repositioned for packaging and/or evacuation - do so.
8. Follow PAIN MANAGEMENT PROTOCOLS.
9. Monitor vital signs, sensation, distal circulation, and motor function. If no circulation can be established in an extremity, obtain Orthopedic consult and consider relocation of limb.

SPECIFIC PRECAUTIONS AND NOTES:

1. Fractures do not necessarily lead to loss of function; for instance, impacted fractures may cause extreme pain, but little or no loss of function.
2. Extremity injuries benefit from appropriate care, but are of low priority in multiply injured patients.
3. Hip dislocations are an orthopedic emergency, transport for orthopedic consult.
4. Severely angulated extremity fractures may need alignment and splinting to evacuate the patient, package the patient, and/or transport the patient, if necessary - do it.
 - Reassess and document the distal circulation and sensation after each movement.
 - Document pulses pre and post movement
5. Ligament injuries are a serious injury and deserve the same treatment as any fracture or dislocation. There is a high incidence of torn ACL knee ligaments in the knee injury that was initially very painful, then got better or "feels fine now"; be careful that knee injury is treated as if a tear or rupture has occurred.

PELVIC WRAP

INDICATIONS:

1. This Protocol assumes the TRAUMA ASSESSMENT PROTOCOLS was initiated and will be completed.
2. To be applied in all blunt trauma patients with either severe pelvic pain or pelvic instability.
3. The pelvic wrap is not indicated for suspected isolated hip fractures, i.e., ground level falls.

PROCEDURE:

1. Apply approved pelvic wrap device. If patient is not yet packaged consider advanced placement of the device on backboard.
2. Before tightening the wrap around the pelvis, ensure all the objects are removed from the patient's pockets so that the pressure of the pelvic wrap doesn't press on items causing additional pain.
3. If using a standard patient sheet:
 - Fold the sheet smoothly several times lengthwise (do not roll it) until it is about 9 inches or 25cm wide, and apply underneath the pelvis, centered on the greater trochanters of the femurs.
 - Tighten the sheet around the pelvis, adjusting the tension to try to return the pelvis to the normal anatomic position based on the initial assessment of instability.
 - Secure the sheet with a knot or cross the sheet in the middle, twist it, and secure it laterally with a clamp. The sheet should feel tightly wrapped around the pelvis allowing for two fingers to be inserted between sheet and pelvis.
4. Re-check the position of the wrap.
 - You should still be able to feel the anterior superior iliac spines after placement. If not, the sheet may be too high on the pelvis and must be repositioned.
5. If the pelvis is unstable on initial exam, do not repeat the exam.

DISLOCATIONS:

GENERAL PRINCIPLES OF MANAGEMENT:

1. Dislocations are often associated with fractures that may not be evident on physical examination. For this reason, radiographs should be obtained for joint dislocations both prior to and following reductions. *Exceptions to this may be made when vascular compromise is present and when there may be significant delay in obtaining a radiograph.*
2. Joint dislocations are described in terms of where the distal articulating surface is relative to the proximal articulating surface. For example, in an anterior shoulder dislocation, the humeral head (distal articulating surface) takes a position anterior to the glenoid fossa (the proximal articulating surface).
3. Inability to relocate a dislocated joint does not necessarily mean that an improper technique has been used. Some dislocations are irreducible by a closed technique, most commonly because of the interposition of soft tissue. Persistent attempts at relocation when soft tissue is interposed may lead to further trauma of the joint and surrounding tissue. *After one or two unsuccessful attempts at relocation, package and transport the patient.*
4. A properly reduced joint dislocation not only relieves pain but also relieves stress on the surrounding soft tissues. The corollary to this statement is that the sooner a joint is reduced, the sooner the stress on the neurovascular bundles is relieved.
5. The neurovascular and circulatory status of the affected extremity should be checked immediately. Any compromise of these structures indicates that prompt action should be taken. The neurovascular status must also be reassessed serially and documented after reduction.
6. Three keys to successful reduction are (1) knowledge of the anatomy and reduction maneuver, (2) use of proper analgesia, (3) proceeding in a slow and gentle manner.
7. Attempt to ascertain the mechanism of injury. Such information provides clues to the type of injury and alerts the physician to the possibility of additional associated injuries.
8. Following reduction, the joint must be properly splinted. *An acute joint dislocation is not a minor injury.* Because there is always concomitant muscle, ligament, or other soft tissue disruption with any dislocation, disability is often the end result. Because soft tissue swelling and muscle spasm may initially obscure joint instability or disability, follow-up is mandatory.

PAIN MANAGEMENT

PURPOSE OF PROTOCOLS:

The purpose of the Pain Management Protocol is to give providers guidance in providing analgesic to patients in pain with both orthopedic and soft tissue/muscle injury.

Generally, pain management may be used for patients who have isolated injuries and have no potential traumatic brain injury.

Pain relief is more than just reduction in pain level; it also provides for relaxation of muscle spasm around injuries, eases the discomfort of evacuation, and provides premedication for anticipated rough evacuations.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS; rule out any possible injury to head and/or abdomen, and rule out any serious illness or injury.
2. MANAGE ANY LIFE OR LIMB THREATENING ILLNESS OR INJURY PRIOR TO PROVIDING PAIN MANAGEMENT.
3. **Establish Large Bore IV/IO with balanced fluid, draw bloods for laboratory analysis, perform laboratory analysis**
4. Maintain MAP above 65 and respiratory rate above 10/min.
5. SpO₂ and EtCO₂ are required for any sedation process.
6. Pain score must be noted and patient must be reassessed pre and post treatment.
7. Analgesic Options:
 - a. Acetaminophen IV (or PO if EMT administering)
 - b. Entonox
 - i. Adult: Self-administered via facemask or mouthpiece after suitable instruction
 - ii. Pediatric: As long as they are capable of understanding instruction and self-administering
 - iii. Entonox is a combination of nitrous oxide 50% and oxygen 50%. It is stored in medical cylinders that have a blue body and white shoulders
 - c. Methoxyflurane (Penthrox):
 - i. The 'whistle' device. Have patients inhale until pain is relieved, or until they can't hold the 'whistle' administration device on their own.
 - ii. Pediatric: must be able to hold device
 - d. Ketamine
 - e. Fentanyl
 - f. Propofol
8. Consider use of regional nerve block under ultrasound guidance for limb injuries.
9. Be prepared to support respirations and place an advanced airway.
10. Hypotension secondary to analgesia will usually respond to IV fluid administration of 20 ml/kg, titrated to effect.
11. Have Naloxone immediately available PRIOR to administration of opioid analgesic.
 - a. Naloxone may be used to reverse respiratory depression.
 - b. However, once you give Naloxone you will be unable to provide further analgesia with opioids until the analgesia wears off.

SPECIFIC PRECAUTIONS AND CONSIDERATIONS:

1. Naloxone has a shorter half-life than Opioids - watch for recurrent sedation.
2. Beware of the patient who has been in severe pain and the pain is suddenly relieved, for example, reduction of a dislocation, respiratory depression may occur.

POISONING AND OVERDOSES

SPECIFIC INFORMATION NEEDED:

1. History of incident.
2. Nature of substance patient has taken in or been exposed to.
3. Type and amount of poison.
4. How poisoned, ingested, inhaled, injected, surface contamination?
5. Time poisoned.
6. Has patient vomited? If so, when?
7. History of drug or alcohol usage.
8. Pre-existing medical problems.
9. Pediatric Patient - Single Dose Can Kill List (for pediatric patients less than 25kg, toxicity onset 1-8hrs):

Alcohols

Ethylene glycol
Isopropanol
Methanol

Antidepressants

Tricyclic
antidepressants
Monoamine oxidase
inhibitors

Antihypertensive

Clonidine
Diltiazem
Verapamil

Antimalarial

Chloroquine
Quinine
Benzocaine

Caustics

Ammonia
fluoride/bifluoride
Boric acid
Disk batteries
Hydrofluoric acid
Selenious acid

Herbals

Camphor
Eucalyptus oil
Oil of wintergreen
(methyl salicylate)
Pennyroyal oil

Hydrocarbons

Imidazolines
Naphazoline

Oxymetazoline
Tetrahydrozoline
Xylometazoline

Insecticides,

Rodenticides,

Herbicides

Carbamates
Diquat
Lindane
Nicotine
Organophosphates
Paraquat

Opioids

Diphenoxylate
Methadone
Morphine
Oxycodone
Propoxyphene
Sulfonylureas
Acetohexamide
Chlorpropamide
Glimepiride
Glipizide
Glyburide
Tolazamide
Tolbutamid

SPECIFIC PHYSICAL FINDINGS:

1. Mental status.
2. Mental health issues.
3. Airway (LEMON) and Respiratory assessment.
4. For Bradycardia in poisoning, remember “PACED” (Propranolol, Anticholinesterase, Calcium Channel Blocker, Ethanol, Digoxin)
5. Physical Exam

TREATMENT:

1. Assure ABCs/Vitals
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
3. Initiate IV BALANCED FLUID TO KEEP OPEN, draw bloods for laboratory analysis, perform laboratory analysis
4. Attach cardiac monitor, EtCO₂, and SpO₂.
5. Determine serum glucose level with Glucometer; if glucose < 72 mg/dl (4 mmol/l), administer Dextrose
6. If inadequate air exchange, initiate and maintain mechanical ventilation with 100% oxygen.
7. Treat any dysrhythmias per appropriate Protocol.
8. Consider Ondansetron for nausea, vomiting, or prophylaxis
9. If apneic:
 - Initiate and maintain mechanical ventilation with 100% oxygen.
 - Endotracheal intubation (or another advanced airway device).
 - If Opiate or Narcotic Overdose administer Naloxone prior to intubation.
 - Treat any cardiac arrhythmias per appropriate CARDIAC ARREST AND ARRHYTHMIA PROTOCOL.
10. If seizing:
 - Go to SEIZURE PROTOCOL.
11. If blood pressure <90 mmHg, and/or if respirations <8 per minute, and/or possible narcotic overdose:
 - Administer 100% oxygen via method to sustain SpO₂ above 95%.
 - Assist ventilations as needed, place advanced airway once BVM is required.
 - Administer Naloxone.
 - Administer 20ml/kg Balanced Fluid bolus
 - If possible Benzodiazepine overdose – administer Flumazenil
12. If inhaled poison:
 - Assure personal safety.
 - Remove patient to fresh air.
 - Administer 100% oxygen via method to sustain an SpO₂ above 95%
 - See INHALATION OF TOXIC FUMES PROTOCOL.
13. If skin or eye contamination:
 - Assure personal safety.
 - Remove contaminated clothes.
 - Irrigate with water or normal saline.
14. If Cholinergic Poisoning (Organo-Phosphate Insecticides, Sarin Gas, VX Gas)
 - Atropine as required until muscarinic symptoms reverse
 - Manage Airway, Suction as needed.
 - If seizing go to SEIZURE PROTOCOL.
15. If antidepressant OD (tricyclics):

- Hyperventilate if assisting ventilations.
 - Treat hypotension with 20ml/kg fluid bolus to physiologic effect
 - If tachycardia >110, dysrhythmia or widening QRS, or if seizures:
 - *Sodium Bicarbonate*
 - *Magnesium Sulfate*
16. Hyperkalemia – if identified (greater than 6.5 mmol) consider:
- Albuterol continuous nebulization
 - Glucose/insulin: short-acting insulin and Dextrose 10%
 - Calcium chloride
 - Sodium bicarbonate (if severe acidosis, pH less than 7.1, or renal failure)
17. Calcium Channel Blocker & Beta Blocker OD:
- If Bradycardia, GO TO BRADYCARDIA
 - Calcium Gluconate IV, if known Calcium Channel Blocker OD.
 - Glucagon (adults only).
 - Fluid challenge Balanced Fluid.
 - Pace as needed.
 - If hypotension is persistent treat per SHOCK PROTOCOL.
18. Cocaine, Methamphetamine, GHB, MDMA:
- GHB
 - Be prepared for respiratory depression and/or arrest – early airway management.
 - Be prepared for cardiac arrhythmias, including bradycardia (TCP if symptomatic).
 - MDMA (Ecstasy, E)
 - Restraint may be required due to extreme behaviors
 - Be prepared to intervene with aggressive cooling for hyperthermia
 - Begin emergent cooling if temp is 102° F (39°C) or greater.
 - Be prepared for seizures – treat aggressively
 - Consider urinary catheter placement for monitoring and potential rhabdomyolysis
 - Cocaine/Methamphetamine:
 - 100% O₂ via methodology to maintain SpO₂ above 95%
 - Consider Midazolam or Lorazepam
 - If chest pain – GO TO CHEST PAIN PROTOCOL
19. Beta Blocker
- Epinephrine Infusion
 - Glucagon
 - Gastric decontamination
 - Benzodiazepines (in patients with seizures)
 - Insulin Infusion with D10 to maintain BGL
 - Cardiac pacing/cardiopulmonary resuscitation
 - Extracorporeal membrane oxygenation (ECMO)
20. Envenomation:
- *Assure Safety, beware that the keeping of venomous exotic snakes has increased dramatically in certain socio-economic groups, back away and exit any location with an unrestrained potentially venomous snake present.*
 - Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
 - IV or IO, large bore, Balanced Fluid per SHOCK PROTOCOL, draw bloods for laboratory, and perform laboratory analysis.
 - If IV/IO fluids ineffective after 60 ml/kg total dose, consider epinephrine infusion
 - Cardiovascular support per SHOCK PROTOCOL.

- If Anaphylactic – ANAPHYLASIS PROTOCOL
- Cardiac monitor, SpO₂, EtCO₂, and obtain 12 lead ECG as possible.
- Labs
- Immobilize the patient.
- Keep extremity below heart.
- Remove all jewelry.
- Identify snake, scorpion, or marine animal if possible; remember that even a dead animal may reflexively bite – DO NOT HANDLE THE ANIMAL.
- Define an area above envenomation and measure extremity circumference every 15 minutes.
- Ketamine and Succinylcholine, for intubation and ventilatory support
- Australian pressure immobilization technique.
 - This technique has been shown to be helpful in delaying systemic absorption of elapid venoms, but its use in cobra bites remains controversial.
 - An elastic compress (i.e., Ace wrap, clothing, crepe bandage) is wrapped rapidly around a bitten extremity, beginning below the bite site, if possible, and progressing proximally to encompass the entire limb.
 - The compress is as tight as one used for a ligamentous sprain immobilization.
 - Then, the extremity is splinted and kept at or below heart level.
- Incisions are not helpful, nor are the use of a mechanical suction device.
- Avoid cooling measures and ice application. They have been associated with increased necrotic complications.
- If venom is spit into the eyes, immediately and copiously irrigate them with any bland fluid, such as water, saline solution, or milk for 15-20 minutes.
- Antivenom is the only proven therapy for significant snakebites. Some are monovalent, but most are polyvalent against venoms of all the important snakes of a nation or region. However, the quality varies, and no international standards of purity or effectiveness exist.
- For pain – consider Ketamine.

RESPIRATORY CONDITIONS

PURPOSE OF PROTOCOLS:

In many situations, providers must manage patients with respiratory conditions for extended time periods. The following Protocol is designed to assist with the longer term care issues related to the respiratory patient.

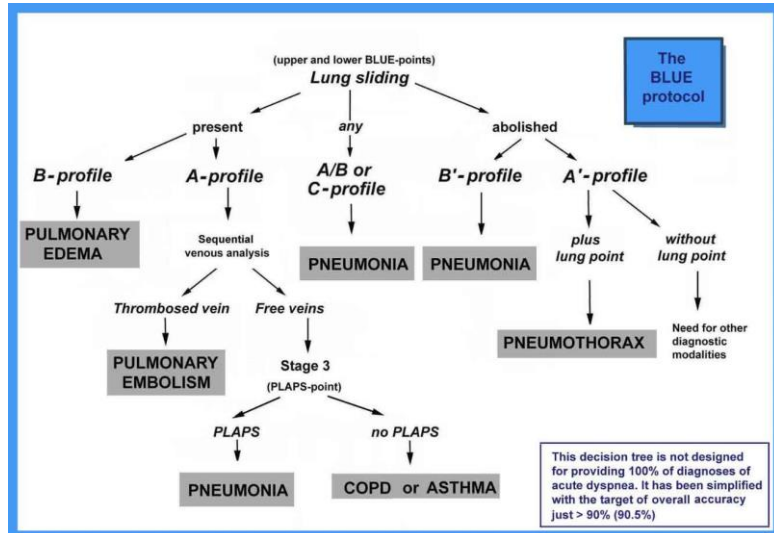
RESPIRATORY DISTRESS:

HISTORY:

1. Fever, chills, speed of onset.
2. Cough with sputum production, including recent changes.
3. Recent illness and past medical history:
 - Asthma, CHF, and/or COPD.
 - Pneumonia.
 - Medications/allergies.
 - Chest pain.
 - Parenthesis.

PHYSICAL FINDINGS:

1. Vital signs, including level of consciousness.
2. Airway Assessment (LEMON law)
3. Skin color, rashes, and hives.
4. Stridor, wheezing or rhonchi.
5. Distended neck veins.
6. Breath sounds.
7. Peripheral edema.
8. Signs of trauma.
9. Ultrasound lung exam/Blue Protocol (see to right)
10. Lab values and interpretation



TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
2. Use pulse oximeter and EtCO₂, if available.
3. IV or IO, large bore, Balanced Fluid per SHOCK PROTOCOL, draw bloods for laboratory, and perform laboratory analysis.
4. Monitor cardiac rhythm, and obtain 12 lead ECG when possible.
5. Treat underlying cause, as follows:
 - 5.1. Upper Airway (croup, epiglottitis, anaphylaxis, foreign body).
 - Consider need for early advanced airway intervention and possible obstructed airway intervention.
 - Treat anaphylaxis per ANAPHYLAXIS PROTOCOL, if appropriate.
 - *If audible strider at rest, Epinephrine via neb*
 - If Epinephrine is given the patient must be watched closely for 3-4 hours as rebound distress can occur
 - Consider Dexamethasone for croup following Epinephrine

- 5.2. Pulmonary Edema from Congestive Heart Failure, (not secondary to HAPE):
- Sit patient upright, if possible.
 - Use CPAP or BiPAP for first line ventilatory support.
 - If BP less than 100 mm/Hg:
 - Treat possible cardiogenic shock (See SHOCK PROTOCOL).
 - If BP greater than 100 mm/Hg:
 - NTG SL, then NTG IV.
- 5.3. Asthma/COPD:
- Use of CPAP for ventilatory support in the patient with a respiratory rate, if unable to maintain SpO₂ greater than 92% and EtCO₂ within normal range despite utilization of oxygen delivery systems.
 - Albuterol & Ipratropium; may repeat as needed until respiratory distress resolves.
 - Consider Magnesium IV for the asthma patient, nonresponsive to Albuterol.
 - Consider 20ml/kg IV fluid bolus for preload impingement secondary to mechanical ventilation and/or air stacking (Focus and IVC Ultrasound Exam)
 - If asthma patient is deteriorating and non-responsive to other treatments, give Epinephrine.
 - Give adrenaline with caution to anyone with cardiac disease or hypertension.
 - In life threatening anaphylaxis, the benefit of adrenaline will outweigh the risk.
 - Consider Hydrocortisone
- 5.4. Tension Pneumothorax and/or Hemothorax:
- Initial needle decompression at second intercostal space and mid-clavicular line.
 - Further decompressions may be necessary due to catheter plug, swelling, or valve failure; place further needles lateral to initial decompression site.
 - Needles may be placed within 0.5cm of previous site.
 - See CHEST TUBE THORACOSTOMY PROTOCOL.
- 5.5. Unable to adequately ventilate and/or oxygenate patient:
- Unprotected airway with decreasing level of oxygenation, start NIV.
 - Consider prone position for patient unresponsive to NIV.
 - Consider potential base cause (i.e.; pneumonia, sepsis, bronchospasm, etc.)
 - Consider Antibiotic Therapy
 - If patient ventilatory effort becomes ineffective - See ENDOTRACHEAL INTUBATION WITH PARALYTICS PROTOCOL.
 - Continued ventilator or oxygenation difficulties
 - Consider alternative ventilator strategy.
 - Consider rate, volume, I:E ratio, PEEP settings.
 - Consider positioning (i.e.; prone ventilation).
 - Consider Dexamethasone if COVID suspected
 - Support circulatory system and consider heart rate may be elevated significantly with hypoxia over a long period, consider the tachycardia is likely hypoxia based.

PEDATRIC CONSIDERATIONS:

1. *Pediatric fluid resuscitation is done with repeated doses of 20ml/kg BALANCED FLUID, until improvement.*

SEDATION

INITIAL INTERVENTION:

1. Sedation for surgical procedure, mechanical ventilation, and/or post arrest.
2. Complete Pre-Anesthesia Checklist and Planning Tool.
3. Vitals and labs as required.
4. Ultrasound BLUE, RUSH, FOCUS, OB clearance is necessary.
5. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
6. Consult, as required, Anesthesiologist for short term case plan in the facility setting.

TREATMENT:

1. Pre-oxygenate patient
2. Place large bore IV access above the level of the diaphragm
3. I.V. Balanced fluid TO KEEP OPEN, draw blood for laboratory analysis as required and perform laboratory analyses as required.
4. Fluid bolus as required for pressure support or pre-anesthesia to prevent pressure issues due to medications or procedure being completed.
5. Administer acetaminophen
6. Determine serum glucose level and labs as needed
7. Cardiac Monitor, EtCO₂, SpO₂, 12 lead ECG when possible.
8. Administer chosen sedation agent: ketamine or propyl with any accompanying benzodiazepine or opioid.
9. Establish SGA or ETT with ventilator for general anesthesia (ASA Level 5); prepare and ready SGA or ETT for moderate (ASA Level 3) or deep sedation (ASA Level 4) case.
10. Monitor patient throughout sedation procedure, if surgical procedure case, assure vitals (ECG, SpO₂, EtCO₂, Temperature, and BP) are recorded every five (5) minutes during the sedation process
11. If short term sedation for surgical procedure, recover patient to a documented Aldrete score of 8 or better prior to discharge.

OTHER CONSIDERATIONS:

1. BE PREPARED TO MANAGE RESPIRATORY DEPRESSION AND ARREST
2. Maintain patient 35-45 mmHg EtCO₂, MAP greater than 70 mmHg, and 94-98% SpO₂ during sedation.
3. If patient exhibits hypoxia, MAP below 65 mmHg, EtCO₂ lower than 30 mmHg or above 50 mmHg during a surgical procedure that is not required for saving the patient from immediate death, stop or pause procedure to stabilize patient.
4. Short periods of hypotension or respiratory depression which are brief in nature, may be managed intraprocedure.

SEIZURES

INITIAL INTERVENTION:

7. Primary Survey/Vitals
8. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
 - Do Not force teeth apart
 - Nasopharyngeal airways useful and well tolerated
9. Consider possible alternative seizure causations

TREATMENT:

12. If seizure has persisted more than 5 minutes or if repetitive:
13. I.V. Balanced fluid TO KEEP OPEN, draw blood for laboratory analysis, perform laboratory analyses
14. Determine serum glucose level and labs
15. Cardiac Monitor, EtCO₂, SpO₂, 12 lead ECG when possible.
16. Administer Dextrose, if hypoglycemic, PER DIABETIC EMERGENCIES PROTOCOL
17. Midazolam or Lorazepam
18. If seizure persists, obtain blood chemistry
 - If potential hyponatremia;
 - Hypertonic Saline, administered in 20ml/kg bolus
19. If seizure persists despite maximum therapy and/or history of status epilepticus:
 - Phenytoin

OTHER CONSIDERATIONS:

5. BE PREPARED TO MANAGE RESPIRATORY DEPRESSION
6. Status epilepticus definition: > 5 minutes seizure or recurrent seizures without return to consciousness; be aggressive with patient care, it is associated with a high mortality rate.
7. Seizure activity without end, although minor in nature, should be treated under this Protocol; in addition, seizure patients with limited motor seizure history or focal seizure history may have continuous activity.
8. Causes of status epilepticus can include: Fever/Infection, Med Change, Metabolic, Cerebrovascular Disease, ETOH/Drugs
9. Consider non-convulsive/minimally convulsive status in unexplained coma and hx of seizures
10. Seizures that self-terminate in a known epileptic may not require treatment or transport.
11. Only 25% of status epilepticus have epilepsy
12. Seizures may be a sign of cerebral hypoxia from cardiac arrest.
13. Seizures may be caused by dysrhythmias.
14. Seizures may be caused by head trauma or central neurologic injury
15. Febrile seizures in children are usually brief in nature, but in some instances, can become status seizures.

SHOCK

SHOCK SYNDROME:

Shock syndrome is inadequate organ perfusion. Signs and symptoms may include, but are not limited to the following:

1. Pulse over 120 with a Systolic Blood Pressure less than 90 or mean arterial pressure less than 60.
2. Cold and clammy skin (may be absent with septic shock).
3. Mental status: confused, restless, apathy.
4. SHOCK INDEX (cardiac rate divided by the systolic blood pressure = greater than 0.9 – assume shock present)
5. EARLY WARNING SCORE (greater than 4 is a patient at risk of death and/or intensive care admission)
6. Perform Ultrasound RUSH Protocol and treat derangements as identified.

CLASSIFICATION and TREATMENT:

1. **HYPOVOLEMIC SHOCK:** Loss of circulating blood volume due to hemorrhage or loss of fluid from vomiting, diarrhea, burns, dehydration, heat exhaustion, heat stroke
 - Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS. Avoid hyperventilation, generally ventilate at every 6 seconds with approximately 5-10ml/kg of ideal body weight volume without PEEP; with pre-existing metabolic acidosis documented, ventilatory rates may be increased to manage that pre-existing issue.
 - STOP hemorrhage if present.
 - See ENDOTRACHEAL INTUBATION WITH PARALYTICS PROTOCOL.
 - Start large bore IV or IO, draw bloods for laboratory analysis and type/cross, and perform laboratory analysis.
 - Establish second vascular access as time permits
 - *If Hemorrhage is NOT suspected*, administer 20ml/kg boluses of balanced fluid until patient vital signs normalize, IVC is without collapse, urine output is 1-2 ml/kg/hr, and/or shock index is 0.8 or less.
 - *If Hemorrhage IS suspected*, manage patient using permissive hypotension concepts:
 - If patient systolic pressure is at or greater than MAP of 50, establish vascular access, obtain blood samples, perform laboratory analysis, obtain vitals every 5 minutes, consider additional assessment (with diagnostic tools as available) and be prepared to intervene.
 - If patient systolic pressure is less than a MAP of 50, begin cautious fluid resuscitation with BALANCED FLUID in 20ml/kg boluses, observing vitals continuously to prevent pressure rise to a MAP of 50 at which time fluids should be TO KEEP OPEN until MAP less than 50.
 - Utilize BLOOD (Packed Red Blood Cells (PRC) or Whole Blood) at 10-15 ml/kg initial bolus
 - Use ultrasound for RUSH and IVC collapse to assist with fluid resuscitation, a flat IVC being indicative of additional fluid required and POCUS RUSH exam to identify potential volume loss.
 - Administer Tranexamic Acid (TXA)
2. **DISTRIBUTIVE SHOCK (Septic):** Abnormal vascular tone including anaphylaxis, early sepsis, and neurogenic shock.
 - Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS; Vitals, and consider etiology of the event.
 - Start large bore IV or IO, draw bloods for laboratory analysis and type/cross, perform laboratory analysis
 - Establish second vascular access as time permits

- For anaphylaxis – GO TO ANAPHYLAXIS PROTOCOL.
 - In Suspected Septic Shock Patients:
 - If patient systolic pressure is at or greater than 90 mmHg (or a MAP of 65-70), establish vascular access, obtain blood samples, obtain vitals every 5 minutes, consider additional assessment (with diagnostic tools as available) and be prepared to intervene should patient be further identified as requiring fluid resuscitation.
 - Provider should utilize EtCO₂ PLR or ultrasound of IVC to assist with fluid resuscitation; an IVC reading indicative of fluid loss, provider should begin fluid resuscitation.
 - If provider has access to lab testing and identifies a high lactate level in patients with suspected sepsis or septic shock (confirming the tourniquet wasn't on for more than 2 minutes when the blood sample was drawn); Lactate is a marker for cellular hypoxia, a level above 4.0 mmol/L is associated with 27% mortality and requires fluid resuscitation. Consider a serial lactate measure every 20-30 mins.
 - Fluid Resuscitation: If patient systolic pressure is less than a MAP of 65, begin fluid resuscitation with BALANCED FLUID at 20ml/kg bolus, observing vitals continuously to prevent pressure. This may be repeated as necessary for patients non-responsive to fluid administration to reach a MAP of 65-70 mmHg.
 - Ceftriaxone within 30 minutes of arrival.
 - Hydrocortisone following second fluid bolus.
 - Continued hypotensive states following fluid:
 - If a patient does not respond to a total of 3000ml of Balanced Fluid, consider presser agent infusion titrated to a MAP of 65-70.
 - Consider early use of IV presser agent infusion following initial hydration (40-60 ml/kg total dose) and maintenance fluids
3. **OBSTRUCTIVE SHOCK:** Mechanical obstruction to blood flow, to or from the heart including cardiac tamponade, tension pneumothorax, dissecting aneurysm, and massive pulmonary embolism.
- a. ABCs, assure airway, assure oxygenation
 - b. Tension Pneumothorax – *needle chest decompression immediately*, FOLLOW CHEST TRAUMA PROTOCOL
 - c. Tamponade/Cardiac Effusion - 20ml/kg fluid bolus; perform pericardiocentesis with ultrasound guidance when confirmed on Ultrasound.
 - i. CT/CE Patients are very preload dependent - IV fluids usually helps BP
 - ii. Beware intubation complications (PPV → preload and Cardiac Output fall → cardiac arrest), be prepared for possible arrest. Avoid hyperventilation and PEEP, generally ventilate at every 5-6 seconds with approximately 5-10ml/kg ideal body weight of volume
 - d. Pulmonary Embolism – transport for emergent tertiary care if identified on ultrasound.
 - i. Patients are often hypoxic
 - ii. EtCO₂ will decrease (Pulmonary embolus will cause an increase in dead space, decreasing the alveoli available to offload carbon dioxide), advanced airway and PPV may be beneficial.
 - iii. Patients are very preload sensitive - IV fluids often don't help and may cause decompensation.
 - Right Ventricle (RV) overload causes septum to bulge into Left Ventricle (LV) → Decreased LV filling → Decreased Stroke volume (SV), cardiac output (CO), and BP
 - IVF may worsen this process
 - Consider adrenaline infusion immediately
 - iv. Start large bore IV or IO, draw bloods for laboratory analysis and type/cross, perform laboratory analysis

- v. Establish second vascular access as time permits
 - vi. Consider Consult for Thrombolytic Therapy
 - vii. Manage patient using permissive hypotension concepts:
 - If patient systolic pressure is at or greater than a MAP of 50, establish vascular access, obtain blood samples, obtain vitals every 5 minutes, consider additional assessment (with diagnostic tools as available) and be prepared to intervene.
 - If patient systolic pressure is less than a MAP of 45, begin cautious fluid resuscitation with BALANCED FLUID in 20ml/kg boluses, observing vitals continuously to prevent pressure rise above a MAP of 50.
 - May utilize Ultrasound exam and Shock Index to assist with fluid resuscitation.
4. **CARDIOGENIC SHOCK:** Heart pump failure to circulate the blood volume through the system.
- a. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.
 - b. Initiate IV BALANCED FLUID To Keep Open, draw blood for laboratory analysis, perform laboratory analyses
 - i. If hypotensive, consider 250 ml fluid boluses every 5 minutes until a MAP of 65 is reached (Assess IVC and FOCUS after each bolus for potential fluid overload)
 - ii. If systolic BP <90 mmHg - Consider Dopamine or Norepinephrine infusion.
 - c. Attach cardiac monitor, EtCO₂, and pulse oximeter.
 - d. Perform 12 lead ECG if feasible.
 - e. Treat dysrhythmias per the appropriate Protocol.
 - f. If signs of severe hypoventilation occur:
 - i. Assist ventilations and consider advanced airway placement.
 - ii. Intubated patients with severe pulmonary congestion require PEEP to maintain oxygenation status.
 - iii. Monitor Input and Output (I&O) closely.

PEDATRIC CONSIDERATIONS:

1. Pediatric patients may have vascular access attempted via Intraosseous Needle (IO) for administration of fluids and medications; in the presence of altered mental status, respiratory failure, shock, and cardiac arrest
2. Pediatric fluid resuscitation in sepsis is done with repeated doses of 20ml/kg, until improvement.
3. Blood pressure is an unreliable sign of circulatory status in pediatric patients; utilize the rapid cardiopulmonary assessment to evaluate end organ perfusion.

PERMISSIVE HYPOTENSION:

Permissive hypotension or hypotensive resuscitation is the use of restrictive fluid therapy, specifically in the trauma patient, that increases systemic blood pressure without reaching normotension (normal mean blood pressures). The goal blood pressure for these patients is a mean arterial pressure of 45-50mmHg. This goes along with certain clinical criteria. Following traumatic injury some patients experience hypotension that is usually due to hemorrhage but can be due to other causes as well (blood leaking around an abdominal aortic aneurysms). In the past, physicians were very aggressive with fluid resuscitation to normalize values. Current studies have found benefit to allowing specific patients to experience some degree of hypotension in certain settings. This concept does not exclude therapy by means of fluid, inotropes or vasopressors; the only restriction is to avoid completely normalizing blood pressure in a context where blood loss may be enhanced. When a person starts to hemorrhage the body starts a coagulation process that eventually stops the bleed; issues with fluid resuscitation without control of bleeding is thought to be secondary to dislodgement of the thrombus that is helping to control further bleeding. Thrombus dislodgement was found to occur at a systolic pressure greater than 80mm Hg. In

addition, fluid resuscitation dilutes coagulation factors that form and stabilize a clot, hence making it harder for the body to use its natural mechanisms to stop the bleeding. These factors are aggravated by hypothermia, exemplified by fluids being administered without warming.

Adrenal Crisis:

Sudden, severe worsening of adrenal insufficiency symptoms is called adrenal crisis. If the person has Addison's disease, this worsening can also be called an Addisonian crisis. In most cases, symptoms of adrenal insufficiency become serious enough that people seek medical treatment before an adrenal crisis occurs. However, sometimes symptoms appear for the first time during an adrenal crisis. Symptoms of adrenal crisis include: sudden, severe pain in the lower back, abdomen or legs, severe vomiting and diarrhea, dehydration, hypotension, loss of consciousness

Treatment: IV hydrocortisone, Shock Protocol, and consult

SPINAL INJURY

HISTORY:

1. Mechanism of injury.
2. Past medical history.

SPECIFIC PHYSICAL FINDINGS:

1. Level of consciousness/Glasgow Coma Scale.
2. Vital signs.
3. Other trauma.
4. Paralysis, weakness, numbness, and/or tingling.
5. Point tenderness, deformity, and/or guarding along spinal column.
6. Ultrasound Lung, RUSH, FAST examination to identify other potential trauma/bleeding.

TREATMENT:

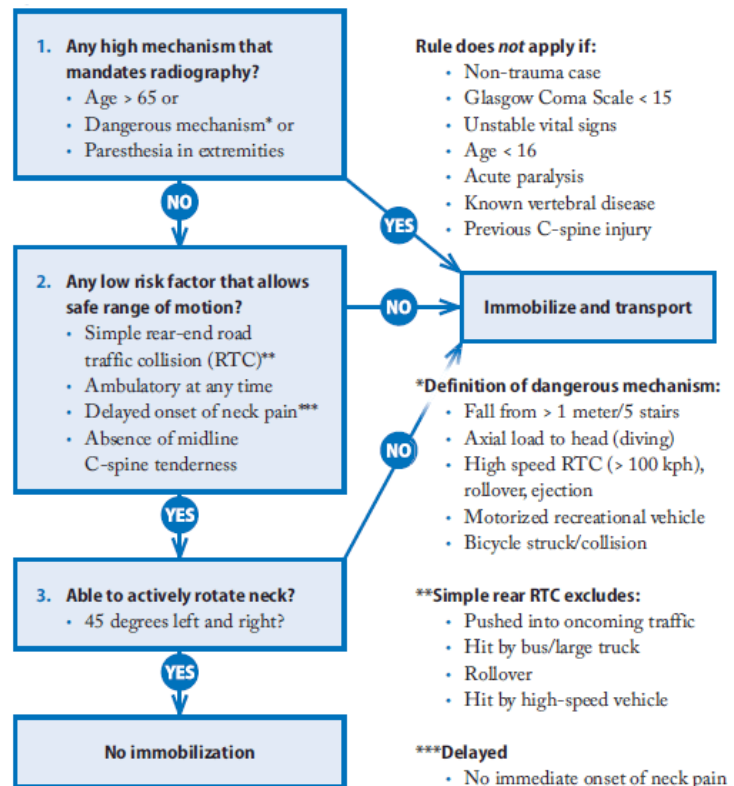
1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.
2. Immobilize cervical spine with rigid extrication collar and maintain with manual in-line support, then immobilize patient to long spine board and utilize a tape/head support combination to secure head. Alternatively, if the patient is in a setting which is not conducive to use of a long board, the patient may be immobilized with a combination of rigid cervical collar, spinal immobilization device (i.e. KED, OSS, etc...), and then place patient in a litter and strap into place.
3. Establish large bore IV or IO line, if patient is hypotensive and without other injury, follow SHOCK PROTOCOL for distributive shock. Draw bloods for laboratory analysis, perform laboratory analysis
4. In a patient with paralysis of the lower extremities, where spinal shock is suspected, and there is no other explanation for continued hypotension, after 40ml/kg of fluid, begin adrenaline infusion to maintain systolic blood pressure above 90 mmHg.
 - 4.1. Continue fluids at 500-1000 ml/hour, if no signs of pulmonary edema.
5. If with patient greater than 2 hours, measure and record all urine output.

SPECIFIC PRECAUTIONS AND CONSIDERATIONS:

1. Vomiting should be expected in head injury patients; therefore, the patient must be securely immobilized to long board for the purposes of rolling the board during emesis.
 - 1.1. Consider Ondansetron. Avoid chin straps and tape.
2. All geriatric patients should have a high suspicion of possible spinal injury.

Canadian Spine Algorithm:

Use to determine spinal immobilization requirements (See at right)



TRAUMA ASSESSMENT

This Protocol is to serve as the basis of evaluation and management of all trauma patients. The other trauma Protocols in this section assume that this Protocol was initiated. After following another trauma Protocol, return to this Protocol for continued evaluation/management.

Emphasis at scene should be to perform rapid primary survey.

For inter-facility trauma transfer, the emphasis should still be minimizing time at the referral facility, as these patients may have a time-dependent injury.

HISTORY:

1. Obtain details surrounding incident.
 - 1.1. Time of incident.
 - 1.2. Nature of incident.
 - 1.3. Loss of Consciousness.
 - 1.4. Apparent Injuries.
2. Receive report of patient condition and interventions prior to crew arrival.
3. Obtain information concerning past medical history, allergies, medications and last meal.
4. Obtain copies of record, x-ray and laboratory studies if patient transfer situation.

PRIMARY SURVEY/INTERVENTION:

(OBTAIN TRAUMA SCORE, SHOCK INDEX, AND EARLY WARNING SCORE)

1. Airway (includes cervical spine control):
 - 1.1. Evaluate patency, remove gross blood and objects from mouth, position for clear airway.
 - 1.2. Assess the patient for potential airway problems prior to transport, use LEMON law (3/3/2) for assessment.
 - 1.3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.
2. Breathing:
 - 2.1. Expose neck/chest.
 - 2.2. Rate/depth of respirations.
 - 2.3. Inspect/palpate for signs of tension pneumothorax.
 - 2.4. Auscultate lung fields.
 - 2.5. Alleviate tension pneumothorax (See CHEST DECOMPRESSION PROTOCOL).
 - 2.6 Seal open pneumothorax with Asherman seal, Russel seal, or occlusive dressing taped on three sides
 - 2.6.1 Ultrasound exam of lungs
3. Circulation with control of hemorrhage:
 - 3.1. Assess for pulses.
 - 3.2. Evaluate perfusion/capillary refill.
 - 3.3. Apply direct pressure to bleeders.
 - 3.3.1. Bleeding control - hemorrhage controlled
 - 3.3.2. Bleeding NOT controlled – Injury site suitable for a tourniquet?
 - 3.3.2.1. If Yes – Apply tourniquet
 - 3.3.2.2. If No - Apply hemostatic agent or dressing with direct pressure
 - 3.4. Initiate two large-bore IV's or IO with BALANCED FLUID, add Packed Red Cells (PRC) if initial bolus does not resolve hypotension.
 - 3.5. Do not delay transport.
 - 3.6. Administer TXA

- 3.7. Blood draw for laboratory analysis and perform laboratory values interpretation.
4. Neurological exam with GCS, AVPU.

SECONDARY SURVEY:

The following secondary survey is to be performed as time, patient condition, and flight duration permits.

1. HEAD:
 - 1.1. Assess for signs of trauma, including scalp lacerations/bleeding and skull deformities.
 - 1.2. Assess for rhino/otorrhea.
 - 1.3. Assess pupillary size and reactivity.
2. MAXILLOFACIAL:
 - 2.1. Reassess adequacy of airway.
 - 2.2. Assess for instability of facial bones.
 - 2.3. Assess for nasal, eye, and oral injuries.
 - 2.3.1. Definitive Care:
 - 2.3.1.1. Protect and maintain airway.
 - 2.3.1.2. Control nasal bleeding by packing with gauze if necessary.
3. NECK:
 - 3.1. Assess for wounds, swelling, deformity, subcutaneous emphysema, tracheal deviation, and jugular venous distention.
 - 3.2. Assess quality of carotid pulses.
 - 3.2.1. Definitive Care:
 - 3.2.1.1. Apply cervical collar and cervical immobilization device for any blunt trauma \leq 24 hours from time of injury.
 - 3.2.1.2. Control bleeding by direct pressure.
 - 3.2.1.3. Protect airway.
4. CHEST:
 - 4.1. Assess/palpate chest wall for wounds, deformities, and symmetrical excursion.
 - 4.2. Auscultate breath sounds.
 - 4.3. Auscultate heart tones with regard to rate and quality.
 - 4.3.1. Definitive Care:
 - 4.3.1.1. Assist ventilation per Airway Protocol.
 - 4.3.1.2. If evidence of injury follow CHEST TRAUMA PROTOCOL
5. ABDOMEN
 - 5.1. Assess abdomen for contusions, wounds or eviscerated organs.
 - 5.2. Gently palpate abdomen to assess tenderness or rigidity.
 - 5.2.1. Definitive Care:
 - 5.2.1.1. Cover open wounds with dry sterile dressing.
 - 5.2.1.2. Cover any eviscerated organs with sterile moist dressing.
6. GU/PELVIC:
 - 6.1. Assess for swelling, discoloration, bleeding or blood at urethral meatus.
 - 6.2. Do not manipulate pelvis, MOI should suggest potential fracture.
 - 6.2.1. Definitive Care:
 - 6.2.1.1. Control bleeding, by direct pressure.
 - 6.2.1.2. Consider Urinary catheter for interfacility trauma transports
 - 6.2.1.3. If blood present at urethral meatus - DO NOT INSERT URINARY CATHETER.
7. EXTREMITIES:
 - 7.1. Assess for bleeding, contusions, deformities, or swelling in all extremities.
 - 7.2. Assess neurovascular status of all extremities by noting presence of pulses, skin color and gross motor and sensory function.
 - 7.2.1. Definitive Care:
 - 7.2.1.1. Control bleeding by direct pressure and cover all open wounds with dry sterile dressings.

7.2.1.2. Treat all injuries per ORTHOPEDIC INJURIES PROTOCOL

8. NEUROLOGIC:

8.1. Assess mental status and note Glasgow Coma Scale.

8.2. Assess gross motor and sensory function.

8.2.1. Definitive Care:

8.2.1.1. Treat per HEAD INJURY PROTOCOL.

8.2.1.2. Monitor and treat potentially reversible causes of altered level of consciousness (i.e., hypoxia, hypovolemia, and hypoglycemia).

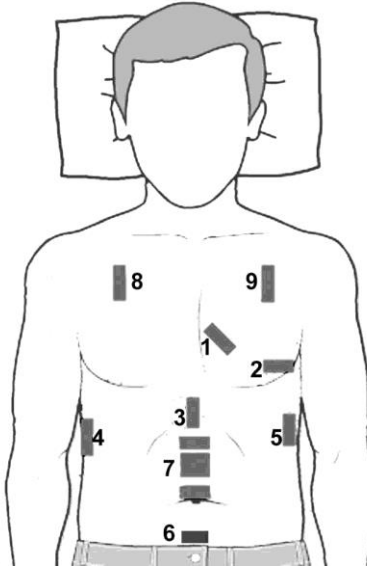
9. ULTRASOUND:

9.1. Ultrasound exam of Lungs, Chest, Abdomen, perform RUSH exam

9.2. Modify fluid resuscitation based on findings as necessary.

ADDITIONAL TREATMENT CONSIDERATIONS:

1. Continually reassess patient for changes or new findings.
2. Record vital signs and pulse oximeter at least every 5 minutes if patient is unstable and every 10-15 minutes if patient is stable.
3. Monitor and document response to all interventions.
4. Perform and document serial neurologic, cardiac, respiratory and abdominal exams.
5. All trauma patients with significant pain who are not hypotensive may have pain medicines titrated. This applies to both scene and trauma transfer patients.



RUSH(ed) Exam Sequencing

1. Parasternal Long Cardiac View
2. Apical Four-Chamber Cardiac View
3. Inferior Vena Cava View
4. Morison's with Hemothorax View
5. Spleno-renal with Hemothorax View
6. Bladder View
7. Aortic Slide Views
8. Pulmonary View
9. Pulmonary View

Use Curvilinear Array for all Views
Add in a search for Ectopic Pregnancy and DVT depending on clinical circumstances

TRAUMATIC CARDIAC ARREST

TREATMENT:

1. Confirm Cardiac Arrest - Begin Chest Compressions at 100-120/min
2. *If medical arrest probable* – follow CARDIAC ARREST PROTOCOL.
3. *Loss of vital signs greater than 20 minutes* – consider ending resuscitative efforts.
4. Establish Endotracheal Tube (or insert supraglottic airway device if unable to ET intubate) and ventilate patient with oxygen at 5 – 10 ml/kg IBW and q 5 – 8 seconds ventilation with 100% Oxygen and PEEP at 0 cmH2O
 - Establish EtCO2 on airway and evaluate levels.
 - Consider ending resuscitative efforts if EtCO2 is less than 10mmHg with high quality compressions and proper ventilations.
5. ECG Monitoring, if ventricular fibrillation present, defibrillate once every 2 minutes of CPR.
6. Establish Vascular Access (x 2 if able), preferably above the level of the diaphragm, at least one large bore IV/IO (16-14g)
7. Hemorrhage Control:
 - Direct Pressure for bleeding wounds and compression dressings; tourniquets for any extremity hemorrhage.
 - Hemostatic agent used on wounds.
 - Balanced IV Fluid 20ml/kg.
 - Whole Blood at 15ml/kg boluses.
 - Tranexamic Acid into first fluid bolus when administered.
8. Ultrasound for immediate RUSH and Lung Exams
 - If no cardiac movement on US after 10 minutes and EtCO2 less than 10mmHg – end resuscitative efforts if possible.
 - If preload or right ventricle compression identified – fluid resuscitation and identify whether hemothorax or pneumothorax is cause, if yes, resolve.
9. *EtCO2 less than 10mmHg* – GO TO Death During Resuscitation.
10. *If Pneumothorax identified* – NEEDLE CHEST DECOMPRESSION, if ineffective CHEST TUBE THORACOTOMY
11. *If Tension Hemothorax or Hemothorax resulting in ventricular compression* – Balanced Fluid at 20 ml/kg with CHEST TUBE THORACOTOMY
12. If *Cardiac Tamponade* present - 20 ml/kg Balanced Fluid Bolus and perform PERICARDIOCENTESIS with Ultrasound guidance
13. Consider Epinephrine after 10 minutes of resuscitative effort.
14. If EtCO2 above 20 mmHg and cardiac movement on ultrasound at 15 minutes post event – ACTIVATE DIRECT TO OPERATING ROOM PROCESS for surgical team
15. EtCO2 less than 10mmHg at 20 minutes and no cardiac movement on ultrasound – GO TO Death During Resuscitation

VOMITING/NAUSEA

TREATMENT:

1. Assure airway, breathing, circulation, and protection from environment.
2. Attend to other illness or injury first.
3. Establish IV, follow SHOCK PROTOCOL, if necessary. Draw blood for laboratory analysis, perform laboratory analyses
4. Ondansetron IV or dissolvable strip.
5. All immobilized patients who will be involved in high angle extrication, air evacuation, short haul or helicopter hoist should receive Ondansetron prior to movement.

Procedural Protocols

CHEST DECOMPRESSION (NEEDLE THORACOSTOMY)

INDICATIONS:

1. Some of the signs of simple pneumothorax as well as some of the signs of tension pneumothorax must be present before decompression is performed. If advanced airway management and tension pneumothorax are present, perform thoracostomy before advanced airway management and positive pressure ventilation.
2. **TENSION PNEUMOTHORAX:**
 - 2.1. Consistent history, (i.e. chest trauma, COPD, patient on positive pressure ventilation)
 - 2.2. Shock symptoms, with low or rapidly decreasing BP.
 - 2.3. Progressive respiratory distress.
 - 2.4. Tracheal shift away from affected side.
 - 2.5. Distended neck veins.
 - 2.6. Asymmetrical movement on inspiration.
 - 2.7. Hyper expanded chest on effected side.
 - 2.8. Drum like percussion on affected side.
 - 2.9. Increased resistance to positive pressure ventilation, especially if intubated.
3. **SIMPLE PNEUMOTHORAX:**
 - 3.1. Non-tension pneumothorax is relatively common, is not immediately life threatening, and should not be decompressed.
 - 3.2. Monitor for progression from simple to tension pneumothorax, especially in flight with rapid elevation change.
 - 3.3. Respiratory distress, mild to severe.
 - 3.4. Chest pain.
 - 3.5. Decreased or absent breath sounds on affected side.
 - 3.6. Subcutaneous emphysema.

PROCEDURE:

1. Expose entire chest.
2. Clean chest vigorously with alcohol, NA approved cleanser, or soap.
3. On affected side, locate the mid-clavicular line and insert a large gauge over-the-needle catheter (10 – 14Ga.) with syringe attached, over the superior margin of the third rib.
4. Touch superior rib, and then slide over it.
5. If the air is under tension, the barrel will pull easily.
6. Remove the syringe, and advance the catheter, then remove needle.
7. Secure to the patient's chest.

CHEST TUBE THORACOSTOMY

INDICATIONS - ACCOMPANIED BY SIGNS OF POOR PERFUSION:

1. Signs of tension pneumothorax:
 - 1.1. Unilateral decreased breath sounds.
 - 1.2. Tracheal deviation.
 - 1.3. Jugular-venous distention.
 - 1.4. Respiratory distress.
2. Consider:
 - 2.1. Blunt trauma patients.
 - 2.2. Penetrating trauma patients,
 - 2.3. Intubated patients who become suddenly unstable or difficult to bag.

CONSIDER:

1. Needle thoracostomy should be performed prior to chest tube procedure.
2. Consultation with the sending Doctor should occur regarding an interfacility patient who has had a pneumothorax documented by chest x-ray and who is being taken to altitude in an unpressurized aircraft or is being ventilated with positive pressure.
3. Consider ending procedure after simple thoracostomy is completed and delay tube placement until later.
4. Balance length of transport with risk and time it takes to perform procedure onsite rather than in transport

PROCEDURE:

1. Needle chest decompression failure present and documented a minimum of twice.
2. Determine insertion site (fifth intercostal space anterior to mid-axillary line)
3. Surgically prepare and drape chest if possible
4. Locally anesthetize the skin and rib periosteum if necessary due to patient level of consciousness
5. Keep within the “Safe Triangle” unless guided elsewhere by ultrasound localization of pleural fluid or for a purely apical secondary pneumothorax which requires an approach via the second inter costal space at mid-clavicular line
6. Make 2-3 cm incision over rib
7. Dissect using blunt technique through subcutaneous tissues
8. Puncture parietal pleura over the top of the rib with curved clamp
9. Insert gloved finger into incision to palpate lung
10. Place chest tube toward same side shoulder and attach to drain system and ultrasound confirmation.
11. Use dressing to cover incision, assuring dressing does not interfere with outflow



CRICOTHYROTOMY

NEEDLE CRICOTHYROTOMY

INDICATIONS:

1. This technique is to be used only when other attempts to establish an airway have been unsuccessful (i.e. you are unable to intubate or ventilate using BVM, or Combi-Tube) and respiratory obstruction exists. Such conditions are most likely to be found with foreign-body obstruction; facial and laryngeal trauma; inhalation, thermal, or caustic injury to the upper airway; angioneurotic edema; upper airway bleeding; epiglottitis and croup.

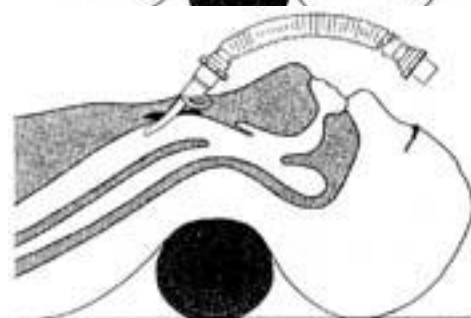
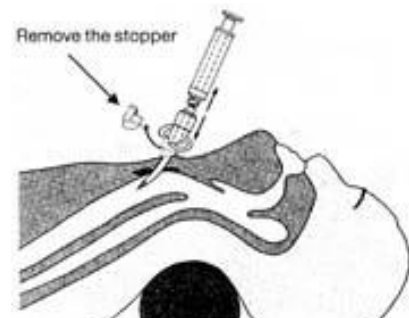
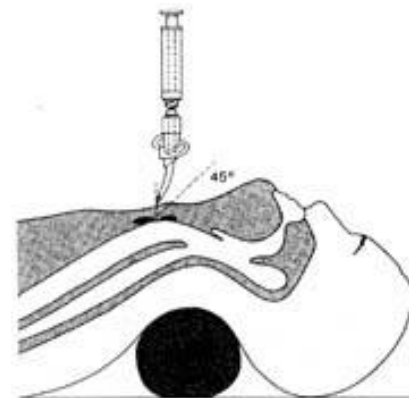
PROCEDURE (QuickTrach®):

1. Place the patient in a supine position. Assure stable positioning of the neck region (place a pillow or piece of clothing under the patient's shoulders) and hyperextend the neck.
2. Secure the larynx laterally between the thumb and forefinger. Find the cricothyroid ligament (in the midline between the thyroid cartilage and the cricoid cartilage). This is the puncture site.
3. Firmly hold the device and puncture the cricothyroid ligament at a 90 degree angle. Note: Because of the sharp tip and conical shape of the needle, an incision of the skin with a scalpel is not necessary. The opening of the trachea is achieved by dilating through the skin. This reduces the risk of bleeding as only the smallest necessary opening is made.
4. After puncturing the cricothyroid ligament, check the entry of the needle into the trachea by aspirating air through the syringe. If air is present, the needle is within the trachea*. Now, change the angle of insertion to 60 degrees and advance the device forward into the trachea to the level of the stopper. The stopper reduces the risk of inserting the needle too deeply and causing damage to the rear wall of the trachea.
5. Remove the stopper. After the stopper is removed, be careful not to advance the device further with the needle still attached.

***Warning**

Should no aspiration of air be possible in Step 4 because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle further until entrance into the trachea is made. Once this is verified, continue as in Step 6.

6. Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe. Next, secure the cannula with the neck tape, apply the connecting tube to the 15mm connection, and connect the other end to the resuscitation bag or ventilation circuit.



SURGICAL CRICOTHYROIDOTOMY

INDICATIONS

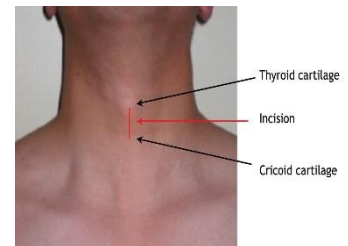
- Patient in need of airway management and provider is unable to ventilate patient.
- Inability to succeed at endotracheal intubation and patient cannot be ventilated.

RELATIVE CONTRAINDICATIONS

- Inability to locate landmarks.
- Transection of trachea distal to cricothyroid membrane.
- Age <10 yrs.

PROCEDURE:

1. Recognizes inadequacy of ventilation, despite attempts to ventilate via BVM and failure to perform advanced airway placement with RSI and patient unresponsive
2. Assembles equipment for procedure (tube, gum boogie/tracheal tube inducer, suction, syringe, way to introduce tube, surgical scissors, method of securing tube, 4x4's)
3. Locates landmark: prominent thyroid cartilage of larynx and cricoid cartilage is 1-3cm below this - the cricothyroid membrane is between.
4. Prep skin with approved cleanser; use sterile drapes if time permits.
5. Palpate and maintain grasp on thyroid cartilage with non-dominant hand.
6. Using a scalpel or scissors, make longitudinal 1-1.5cm incision through skin over cricoid membrane
7. Using a scalpel or scissors, make transverse 1-1.5cm incision through cricothyroid membrane and place Gum Boogie into incision prior to removing scalpel or scissors.
8. Slide ETT over Gum Boogie and into tracheal lumen inferiorly toward carina until balloon has passed through the incised opening.
9. Remove Gum Boogie
10. Place EtCO₂ and Auscultate chest/stomach to confirm placement, inflate cuff, tape securely, and manage per post intubation care.
11. Secure ETT
12. Consider infiltrate area with Lidocaine if patient is awake



GASTRIC DECOMPRESSION THROUGH NASO/OROGASTRIC TUBE INSERTION

INDICATIONS:

1. Inability to adequately ventilate due to gastric distension, patient with advanced airway in place, gastric decompression, and/or use with hypothermia induction.

CONTRAINDICATIONS:

1. Head/face injured trauma patient – Orogastric Tube Insertion only in this patient
2. Anatomic anomalies preventing correct placement

PROCEDURE:

1. Determine correct size and depth of tube
 - 1.1. Size:
 - 1.1.1. Newborn 8.0 fr.
 - 1.1.2. Toddler/Preschool 10 fr.
 - 1.1.3. School age 12 fr.
 - 1.1.4. Adolescents/Adults 14-18 fr.
 - 1.2. Depth:
 - 1.2.1. Nasogastric: Top of nose, over ear to xyphoid process.
 - 1.2.2. Orogastric: lip, around angle of mandible to xiphoid process.
 - 1.3. Consider Nebulized Lidocaine
2. Insert tube:
 - 2.1. Nasogastric:
 - 2.1.1. Pass tube along nasal floor into stomach.
 - 2.1.2. Instill air into tube w/ 20cc syringe and auscultate epigastrium **or confirm with ultrasound.**
 - 2.1.3. Secure tube.
 - 2.2. Orogastric:
 - 2.2.1. Visualize posterior pharynx, pass tube over tongue into stomach; or through 8.5 05 9.0 ETT placed in esophagus.
 - 2.2.2. Instill air into tube w/ 20 cc syringe and auscultate epigastrium **or confirm with ultrasound.**
 - 2.2.3. Secure tube.
3. Precautions/Complications:
 - 3.1. In head trauma patient where gastric decompression would benefit ventilation Gastric tube placement will be through the mouth.
 - 3.2. Complications associated with Gastric tube placement.
 - 3.2.1. Epistaxis.
 - 3.2.2. Intracranial placement.
 - 3.2.3. Complications associated with NG/OG tube placement.
 - 3.2.4. Bronchial placement.
 - 3.2.5. Pharyngeal perforation, esophageal obstruction or rupture.
 - 3.2.6. Bronchial or alveolar perforation.
 - 3.2.7. Pneumothorax.
 - 3.2.8. Gastric or duodenal rupture.

INTUBATION WITH RAPID SEQUENCE INDUCTION

INDICATIONS:

1. Airway compromise or respiratory failure
2. Expected clinical course or GCS less than or equal to 8
3. Prolonged BVM ventilation (> 8 mins) or transport while attempting BVM ventilation

PRE-INTUBATION:

1. Use CHALLENGE RESPONSE RSI CHECKLIST to optimize intubation attempts and patient condition.
2. Airway exam completed (LEMON and Trauma ABCS)
3. 100% O₂ administered via NRB Mask and NC at 15L or continue CPAP/BiPAP in place.
 - Must maximize O₂ by placing a nasal cannula on patient at 15 liters flow in addition to NIV or NRB mask, and retain in place during intubation.
4. If, BVM ventilation of patient, EtCO₂ in place and NC at 15L
5. Optimize patient position
6. Hyperoxygenate patient prior to paralytic use if possible
7. Suction in “ready” position
8. Primary and Secondary IV or IO secured.
9. Cardiac monitor, SpO₂, and EtCO₂ ready.
10. Prepare Equipment on CHALLENGE CHECKLIST
 - ALWAYS Pre-Load Gum Elastic Boogie catheter with endotracheal tube
 - Prepare video laryngoscopy if available for difficult airways
11. Perform Time Out
 - In-line immobilizer brief (if necessary)
 - Monitoring (SpO₂, ECG, EtCO₂) tasks person briefed
 - Drug administer briefed and dosages confirmed

INTUBATION:

1. PERFORM CHALLENGE CHECKLIST WITH ALL COMPONENTS CHECKED
2. Administer Ketamine
3. Administer Succinylcholine
4. Perform endotracheal intubation.
 - If relaxation inadequate in 60-120 seconds, may repeat dosage of Succinylcholine, if this was used initially.
5. If not successful after 30 seconds or desaturation (SpO₂ below 90%) occurs, temporarily halt intubation attempt and hyperoxygenate with BVM and 100% O₂.
6. Reattempt intubation.
 - *If intubation unsuccessful, after two attempts in two minutes* - Place Alternative Airway Device immediately and manage airway with device; DO NOT reattempt intubation.
 - *Cannot intubate and cannot ventilate* - Perform Cricothyrotomy.
7. If bradycardia - Treat hypoxia, as the most likely cause.
8. Upon successful intubation, confirm ET tube placement by capnography and auscultation.
 - Ventilate with Bag-Valve-ET (or ventilator) and 100% O₂, maintain EtCO₂ 35-45mmHg (30-35 mmHg with head injury).
 - Confirm and document tube length at teeth
 - Titrate oxygen via SpO₂ monitoring in post arrest patients to 95-99% SpO₂, maintain ventilations at an EtCO₂ range of 35-40 mmHg.
 - Continuous patient monitoring with EtCO₂, SpO₂, ECG, and NIBP

- Use capnometer in absence of capnogram.

POST INTUBATION:

1. Once intubation has been accomplished, normal ventilation rates should be maintained.
 - Administer O₂ via Bag-valve-ET at the breaths per minute to maintain an SpO₂ of 95-99% and an EtCO₂ of 35-45 mmHg (assist pediatric patients respirations at normal ventilation rates per age).
 - For the patient with closed head injury maintain a minimum BP of 90 mmHg systolic and EtCO₂ 30-35 mm/Hg.
2. Connect patient to ventilator, if available, and confirm successful ventilation and oxygenation settings based on patient monitoring devices.
3. Monitor and record vital signs (SpO₂, EtCO₂, ECG, NIBP) every 10 minutes
4. Check and secure lines and tubes
5. Establish medications for infusion, if any, and utilize infusion pump.

POST INTUBATION PARALYTIC PROCEDURE:

1. If using long acting paralytic agent, if the patient is not able to be managed with sedation utilizing ketamine, document neurologic findings and status prior to use.
2. Rocuronium, to maintain paralysis, only if respiratory drive returns or patient is fighting ventilation.
 - Refrain from administration until necessary due to EtCO₂ waveform indicating patient ventilatory effort or signs of gross motor movement.
3. Sedation with Ketamine.
4. Notify receiving physician/receiving facility of long acting paralytic use.
5. Rocuronium Considerations:
 - Duration of action 25-50 minutes.
 - Prolonged excretion should be anticipated in renal or hepatic failure patients.
 - As with any paralytic, Rocuronium has no effect on consciousness or pain; patients should be sedated and pain control management should be utilized.

INTUBATION – SUPRAGLOTTIC AIRWAY

INDICATIONS:

4. Airway compromise or respiratory failure
5. Expected clinical course or GCS less than or equal to 8
6. Prolonged BVM ventilation (> 8 mins) or transport while attempting BVM ventilation

PRE-INTUBATION IN PATIENT WITH PULSE – OPTOMIZATION FOR FIRST ATTEMPT SUCCESS:

1. Airway exam completed (LEMON and Trauma ABCS)
2. 100% O₂ administered via NRB Mask at 15L, CPAP at 15-25L, or BVM if patient apneic.
 - 2.1. Must maximize O₂ by placing a nasal cannula on patient at 15 liters flow in addition to BVM or NRB mask, and retain in place during intubation.
3. If, BVM ventilation of patient, EtCO₂ in place
4. Optimize patient position – ear/shoulder plane, sniffing position
5. Hyperoxygenate patient prior to attempt if possible
6. Suction ready
7. **Primary IV or IO secured.**
8. Cardiac monitor, SpO₂, and EtCO₂ ready.
9. Prepare Equipment:
 - 9.1. ALWAYS Gum Elastic Boogie catheter or Flexible Lighted Stylet system for oral tracheal intubation.
 - 9.2. Prepare video laryngoscopy or flexible intubation scope if available for difficult airways
10. Perform Time Out
 - 10.1. In-line immobilizer brief (if necessary)
 - 10.2. Monitoring (SpO₂, ECG, EtCO₂) tasks person briefed

INTUBATION - iGEL:

1. Select appropriately sized i-Gel airway
2. Check package is intact and no damage to the i-Gel
3. Ensure all equipment is in easy reach
4. Lubricates the back, sides and front of the i-Gel no lower than the bite block
5. Remove any excess lubricant
6. Position head in sniffing position (If appropriate)
7. Hold the i-Gel securely along the bite block
8. Introduce the tip of the i-Gel into the mouth towards the hard pallet
9. Glide the i-Gel along the hard pallet until a definitive resistance is felt
10. Secure the i-Gel in place with support strap
11. Attach ventilation device and EtCO₂ sampling tubule to i-Gel
12. Ventilate the patient successfully (1 breath every 5 to 6 seconds)
13. Place gastric tube through channel in device to facilitate gastric decompression.

POST INTUBATION:

1. Once intubation has been accomplished, normal ventilation rates should be maintained.
 - 1.1. Administer O₂ via Bag-valve-iGEL at the breaths per minute to maintain an SpO₂ of 95-99% and an EtCO₂ of 35-45 mmHg (assist pediatric patients respirations at normal ventilation rates per age).
 - 1.2. For the patient with closed head injury maintain MAP 70-80 mmHg, SpO₂ of 95-100%, and EtCO₂ 35-45 mm/Hg initially.
 - 1.3. For the patient in post cardiac arrest maintain MAP 65-70 mmHg, SpO₂ of 95-99%, and EtCO₂ 35-40 mm/Hg initially.
2. Connect patient to ventilator, if available, and confirm successful ventilation and oxygenation settings based on patient monitoring devices.
3. Monitor and record vital signs (SpO₂, EtCO₂, ECG, NIBP) every 10 minutes
4. Check and secure lines and tubes

INTUBATION - TRACHEAL

INDICATIONS:

1. Airway compromise or respiratory failure
2. Expected clinical course or GCS less than or equal to 8
3. Prolonged BVM ventilation (> 5 mins) or transport while attempting BVM ventilation

PRE-INTUBATION IN PATIENT WITH PULSE – OPTOMIZATION FOR FIRST ATTEMPT SUCCESS:

1. Airway exam completed (LEMON and Trauma ABCS)
2. 100% O₂ administered via NRB Mask at 15L, CPAP at 15-25L, or BVM if patient apneic.
 - 2.1. Must maximize O₂ by placing a nasal cannula on patient at 15 liters flow in addition to BVM or NRB mask, and retain in place during intubation.
3. If, BVM ventilation of patient, EtCO₂ in place
4. Optimize patient position – ear/shoulder plane, sniffing position
5. Hyperoxygenate patient prior to attempt if possible
6. Suction ready
7. **Primary IV or IO secured.**
8. Cardiac monitor, SpO₂, and EtCO₂ ready.
9. Prepare Equipment:
 - 9.1. ALWAYS Gum Elastic Boogie catheter or Flexible Lighted Stylet system for oral tracheal intubation.
 - 9.2. Prepare video laryngoscopy or flexible intubation scope if available for difficult airways
10. Perform Time Out
 - 10.1. In-line immobilizer brief (if necessary)
 - 10.2. Monitoring (SpO₂, ECG, EtCO₂) tasks person briefed

INTUBATION – ORAL TRACHEAL:

1. Position head in “sniffer” position
2. Insert direct laryngoscopy blade while displacing tongue (if using video laryngoscopy system, use per manufacturers recommendations)
3. Elevate mandible with direct laryngoscope (if using video laryngoscopy system, use per manufacturers recommendations)
4. Introduce Gum Boogie or Flexible Lighted Stylet system with ET tube and advance to canulate the trachea (if using video laryngoscopy system, use per manufacturers recommendations).
5. Advanced ET tube to proper depth, assuring tube is not against carina and not beyond proper depth (3 x diameter of ET expressed in centimeters)
6. Inflates cuff to proper pressure and disconnects syringe
7. Directs ventilation of patient
8. Confirms proper placement first with EtCO₂ waveform and then by auscultation bilaterally over each lung and over epigastrium
9. Secures ET tube with commercial device or tape, using caution to prevent too tight a binding effect around patient’s head/neck.
10. If not successful after 30 seconds or desaturation (SpO₂ below 90%) occurs, temporarily halt intubation attempt and hyperoxygenate with BVM and 100% O₂.
11. Reattempt intubation.
 - 11.1. *If intubation unsuccessful, after two attempts in two minutes* - Place Alternative Airway Device immediately and manage airway with device; DO NOT reattempt intubation.
 - 11.2. *Cannot intubate and cannot ventilate* - Perform needle cricothyroidomy.
12. If bradycardia - Treat hypoxia, as the most likely cause.

INTUBATION – NASO TRACHEAL:

Note: DO NOT utilize nasotracheal method if any of the following are present: Cardiac arrest, Apnea, Pediatric patients (age ≤ 10 years or 25kg), Le Fort Fracture with instability on palpation, EtCO₂ and BAAM equipment not available

1. Place NRB mask at 15 liters on patient with hole cut over nare to be used
2. Place nasal trumpet with generous amount of lidocaine gel in both nares prior to attempt, then remove one from nare to be utilized.
3. Using Intranasal Drug Delivery device (MAD Nasal™ or other system) inject 50mg lidocaine into each nare prior to attempt
4. Prepare ET Tube:
 - 4.1. Select an ET tube size at least one half size smaller than estimated for the patient
 - 4.2. Apply gel to the endotracheal tube cuff
 - 4.3. Place EtCO₂ on end of tube during attempt,
 - 4.4. Place Beck Airway Airflow Monitor (BAAM) device on end of EtCO₂ sampling tubule, on ETT
 - 4.5. If using flexible laryngoscope for increased first attempt success, follow manufacturer recommendations
5. Apply two sprays of phenylephrine in each nare to induce local vasoconstriction
6. Insert the well-lubricated tube perpendicular to the coronal plane along the floor of the largest patent nare toward the occiput of the head, bevel side facing inward toward the septum. This positioning will prevent a turbinate from being trapped in the tube and subsequently being sheared off as the tube is advanced.
7. Pass the tube straight back (not angulated upward) with constant, gentle pressure. As the tube is advanced, there is a loss of resistance as the tube passes from the nasopharynx into the oropharynx. Continue advancing the tube.
8. As the ET Tube nears the trachea an audible increase in whistling will be heard from the BAAM device and EtCO₂ readings will remain at or near initial levels, indicating that the tip of the endotracheal tube is near the entrance to the trachea.
 - 8.1. The awake patient should be instructed to deeply inspire to help guide the tube through the vocal cords and into the trachea.
 - 8.2. Correct endotracheal placement may also be assisted by rotating the tube 90 degrees so that the bevel is up and facing the glottis
 - 8.3. Once in the trachea, remove BAAM device immediately and attached Bag Valve
9. Carefully advance the endotracheal tube through larynx into the trachea when device sounds and EtCO₂ are at their peak.
10. Confirms proper placement first with EtCO₂ waveform and then by auscultation bilaterally over each lung and over epigastrium
 - 10.1. Once the tube has been placed, the patient should not be capable of phonation
 - 10.2. End-tidal carbon dioxide (EtCO₂) detection shall be confirmed within 60 seconds of endotracheal tube placement. The capnography adaptor is to be placed at the bag-valve device-endotracheal tube interface for the first ventilation. The normal waveform indicating correct endotracheal placement reflects a rapid upstroke with the beginning of exhalation, the exhalation plateau ending at the point of EtCO₂ measurement, and a rapid down stroke with the beginning of inhalation. Any waveform that does not show rhythmic rise and fall correlating with assisted ventilations indicates incorrect tube placement and the tube must be withdrawn.
11. Inflates cuff to proper pressure and disconnects syringe, and then directs ventilation of patient
12. Secures ET tube with commercial device or tape, using caution to prevent too tight a binding effect around patient's head/neck.
13. If not successful after 30 seconds or desaturation (SpO₂ below 90%) occurs, temporarily halt

- intubation attempt and hyperoxygenate with BVM and 100% O₂.
14. Reattempt intubation.
 - 14.1. *If intubation unsuccessful, after two attempts in two minutes* - Place Alternative Airway Device (if possible) and manage airway with device; DO NOT reattempt intubation.
 - 14.2. *Cannot intubate and cannot ventilate* - Perform needle cricothyroidomy.
 15. If bradycardia - Treat hypoxia, as the most likely cause.

POST INTUBATION:

1. Once intubation has been accomplished, normal ventilation rates should be maintained.
 - 1.1. Administer O₂ via Bag-valve-ET at the breaths per minute to maintain an SpO₂ of 95-99% and an EtCO₂ of 35-45 mmHg (assist pediatric patients respirations at normal ventilation rates per age).
 - 1.2. For the patient with closed head injury maintain MAP 70-80 mmHg, SpO₂ of 95-100%, and EtCO₂ 35-45 mm/Hg initially.
 - 1.3. For the patient in post cardiac arrest maintain MAP 65-70 mmHg, SpO₂ of 95-99%, and EtCO₂ 35-40 mm/Hg initially.
2. Connect patient to ventilator, if available, and confirm successful ventilation and oxygenation settings based on patient monitoring devices.
3. Monitor and record vital signs (SpO₂, EtCO₂, ECG, NIBP) every 10 minutes
4. Check and secure lines and tubes
5. Ketamine for patients with agitation and responsive to pain or voice.

PERICARDIOCENTESIS

INDICATIONS:

1. Symptomatic Pericardial Tamponade identified on ultrasound exam
2. Pulseless electrical activity (PEA) in the setting of penetrating trauma, refractory to other treatment or identified on ultrasound.
3. Significant instability in patient with known or strongly suspected Pericardial Tamponade.
4. Beck's Triad (may not be present if hypo-perfused): Jugular Venous Distention (JVD), hypotension, narrowed pulse pressure, muffled heart tones.

PROCEDURE:

1. Airway assessment (LEMON and Trauma ABCS), ventilatory assessment, circulatory assessment
2. Take measures to sustain SpO₂ above 95%, avoid positive pressure ventilation if possible, until cardiac effusion resolved.
 - 2.1. Positive Pressure Ventilation (PPV) and/or Continuous Positive Airway Pressure (CPAP) will likely result in dramatic decrease in cardiac output from decreased preload.
3. Confirm Cardiac Tamponade with Ultrasound (*i.e.*: Right atrium collapses in systole, Right ventricle collapses in diastole, Vena cava dilated without respiratory variation in size, or myocardium is surrounded by fluid)
4. Obtain and assemble appropriate equipment
 - 4.1. 2, 60mL syringes,
 - 4.2. 16 or 18 gauge needle 5 inches (12 cm in length),
 - 4.3. 3 way stopcock
5. Place 3 way stopcock on needle and syringe on stopcock
6. Cleanse site prior to needle insertion
7. Assures Patient is on ECG, SpO₂, EtCO₂, and Position Ultrasound in sub-xiphoid or subcostal position.
8. Determine insertion site of needle (1-2cm inferior to the left of xiphoid process)
9. Manually locate the xiphoid process and move your finger to the left, to the lower costal margin.
10. Insert the needle at a 45 degree angle, advancing slowly toward the left shoulder, while holding negative pressure on the syringe.
11. Watch the needle enter the largest pocket of fluid via ultrasound and document with images if possible and retain ultrasound in place.
 - 11.1. Watch ECG for ectopy and arrhythmias, if ectopy begins, withdraw from position where noted.
12. Aspirate as much fluid as possible, turn off stopcock replace syringe
13. Reassess patient
14. If no improvement, aspirate a second time until improvement identified.



SYNCHRONIZED CARADIOVERSION

INDICATIONS:

1. Unstable Tachyarrhythmia
 - i. tachycardia patients with rates in excess of 150 bpm from a myocardial cause with one or more of the following additional symptoms: Hypotension, continuous chest pain, altered mental status, signs of shock, or acute onset congestive heart failure

PROCEDURE

1. Attaches the ECG limb leads to obtain an initial rhythm
2. The patient is determined in an unstable condition by signs and symptoms.
3. Sedation considered for all alert patients
4. The therapy pads are placed in the manufacturer recommended position
5. Lead 2 is confirmed or the lead with the greatest QRS amplitude should be selected
6. SYNC is selected by depressing the SYNC button - Confirm that the SYNC LED lights
7. Adjusts ECG size until sense markers appear on the QRS complexes
8. Confirms that the SYNC LED blinks off with each detected QRS complex and the heart rate is displayed
9. Selects the appropriate Biphasic Joules per manufacturer recommendation, or absent recommendation:
 - a. *Narrow and regular rhythm* = 100j, 200j, 300j, maximum setting (four attempts maximum)
 - b. *Narrow and irregular rhythm* = 100j, 200j, 300j, maximum setting (four attempts maximum)
 - c. *Wide and regular rhythm* = 100j, 200j, 300j, maximum setting (four attempts maximum)
 - d. *Wide and irregular rhythm* = DO NOT SYNC – Use manufacturer recommendation for

DEFIBRILLATION

10. Selects CHARGE by depressing the CHARGE button
11. Listen for the tone sound indicating full charge and “Clear” patient.
12. Press and “hold” SHOCK while observing the monitor screen
13. Confirms that the defibrillator discharged on the next sensed QRS complex and shock was delivered
14. Check Pulse and Reassesses the patient post synchronized cardioversion - *If the rhythm is unchanged, select the next energy level and repeat procedure*
15. *If the patient goes into cardiac arrest* ensure that next shock attempt is a defibrillation and not a synchronized cardioversion attempt.
16. If the patient converts evaluate vital signs and response to procedure

TRANSCUTANEOUS PACING

INDICATIONS:

1. Symptomatic Bradycardia, of cardiac origin, non-responsive to Atropine initial dose
2. Bradycardia of cardiac origin, which is unlikely to respond to atropine therapy
 - Second and Third Degree Heart Block

PROCEDURE

1. Attaches the ECG limb leads to obtain an initial rhythm
2. Differentiate between stable and un-stable; patient is unstable if:
 - a. Bradycardia with one of the following: Hypotension, Altered mental status, continuous chest pain, signs of shock, *or* acute onset heart failure
3. The patient is determined in an unstable condition by signs and symptoms.
4. Sedation is considered for all alert patients
5. The Therapy pads are placed in the manufacturer recommended position
6. Lead 2 is confirmed as selection (The lead with the greatest QRS amplitude should be selected) and Select PACE
7. Begin pacing at a heart rate of 60 bpm and “zero” current output
8. Increase current by increments of 10 mAs (*or manufacturers recommendation*) while observing cardiac monitor for evidence of electrical capture, then confirm mechanical capture by checking pulses and BP.
9. If the patient is comfortable at this point, continue pacing. If the patient is uncomfortable at this point, decrease current output by increments of 5 mA to a point just above electrical and mechanical capture.
10. If the patient still complains of pain during pacing despite reduced current output, consider sedation and /or analgesia.
11. If the patient remains unconscious during pacing, assess capture by observing the monitor and evaluating pulse or blood pressure changes.
12. In case of electrical capture and no pulses, follow Cardiac Arrest — PEA protocol.

URINARY CATHETER PLACEMENT

CONSENT MUST BE OBTAINED PRIOR TO PROCEDURE

INDICATIONS:

1. Patient has acute urinary retention or bladder outlet obstruction
2. Need for accurate urine output measurements
3. Patient requires prolonged immobilization

PROCEDURE

1. Select the smallest urinary catheter possible, consistent with good drainage.
2. Wash hands and don clean gloves
3. Open outer wrap and remove components
4. Place under pad beneath patient, plastic or “shiny” side down
5. Use the cleansing wipes to cleanse patient’s peri-urethral area
6. Discard gloves and perform hand hygiene with provided alcohol hand sanitizer gel
7. Don sterile gloves provided with catheter
8. Position drape on patient appropriately
9. Use the syringe with the green plunger to deposit lubricant into tray top compartment for
10. Urinary catheter lubrication
 - a. Remove top tray and place next to bottom tray, keep wrapper in place
 - b. Attach the water-filled syringe to the inflation port (It is not necessary to pre-test the Foley catheter balloon)
 - c. Remove urinary catheter from wrap and lubricate catheter
11. Prepare patient with packet of pre-saturated antiseptic swab sticks
 - a. Female Patient: With a downward stroke cleanse the right labia minora and discard the swab, repeat for left labia minora, and with the last swab stick cleanse the middle area between the labia minora
 - b. Male Patient: Cleanse the penis in a circular motion starting at the urethral meatus and working outward
12. Proceed with catheter insertion until urine is visible in the drainage tube, insert catheter two additional inches (5cm), and inflate catheter balloon using entire 10mL of sterile water provided in the prefilled syringe
 - a. Note: Use of less than 10mL can result in asymmetrically inflated balloon
13. Once inflated, gently pull catheter until the inflated balloon is snug against the bladder neck
14. Discard all materials in accordance with infection control policy and remove contaminated gloves
15. Secure the urinary catheter to the patient using tape or manufacture device
16. Position hanger of bag on gurney at the foot of the bed and use clip to secure drainage tube to sheet, confirm tube is not kinked
17. Indicate time and date of catheter insertion on provided labels and place designated labels on drainage system
18. Document procedure according to patient documentation policy

Resuscitation and Stabilization Treatment Guidelines References

This Protocols packet has been checked against the following references for validity and science guideline:

1. American Heart Association – 2023 Science Guidelines
2. Canadian Evidence Based Practice (PEP) (<https://emspep.cdha.nshealth.ca/>)
3. National Association of EMS Physicians Position Papers of Practice (<http://www.naemsp.org/Pages/Position-Statements.aspx>)
4. ISLA International Conference on Drowning Research Papers (http://www.worldconferenceondrowningprevention2011.org/content_common/pg-drowning-research.seo)
5. American College of Emergency Physicians – ACEP Position Papers (<http://www.acep.org/content.aspx?id=32334>)
6. Brain Trauma Foundation – Traumatic Brain Injury Guidelines (<http://tbguidelines.org/glHome.aspx?gl=1>)
7. Intracranial Hypertension Guideline; Stocchetti N, Maas AIR. Traumatic Intracranial Hypertension. N Engl J Med 2014; 370:2121-30. (<http://web.up.ac.za/sitefiles/file/45/1335/17594/Other/nejmra1208708Traumatic%20Intracranial%20Hypertension.pdf>)
8. Anaesthesia Trauma and Critical Care Manual (<http://www.atacc.co.uk/>)
9. Pediatric Emergency Medicine Practice, EB Medicine Updates, https://www.medschool.lsuhs.edu/emergency_medicine/docs/pills%20that%20kill.pdf
10. Joint Royal Colleges Ambulance Liaison Committee Clinical Practice Guidelines
11. The Pre-Hospital Emergency Care Council (PHECC) Clinical Practice Guidelines
12. Subbe C.P., Kruger M., et Al - "Validation of a modified Early Warning Score in medical admissions." Quarterly Journal of Medicine 2001; 94; 521-6
13. National Early Warning Score Development and Implementation Group (NEWSDIG) (2012). National Early Warning Score (NEWS): standardising the assessment of acute-illness severity in the NHS. London: Royal College of Physicians
14. Basics of Anesthesia 7th Edition by Manuel Pardo MD
15. Emergency Department Resuscitation of the Critically Ill, 2nd Edition: A Crash Course in Critical Care, Michael E. Winters MD