Resuscitation and Stabilization Treatment Guidelines

Supervising Physician Treatment Guidelines for all clinical staff with practice privileges as an Advanced Practice Paramedic or Resuscitation Officer for use during official _____ patient care activities.

Version 1.3
2023

Document currently under review by the Global Emergency Medical Registry (GEMR) Medical Directors Committee.
Preliminary recommendations 2025.

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INTRODUCTION AND AUTHORIZATION

The Resuscitation and Stabilization Treatment Guidelines are to be utilized only by Advanced Practice Paramedic (APP) or Resuscitation Officer (RO) with clinical privileges at _____ and only by those APP/RO 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/RO's may NOT utilize these Guidelines 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 APPs/ROs 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/RO's as of _____202_.

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 Guidelines 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 initial authorization and licensing to procedural experience.

***Tier '0' Medications** may be utilized at the discretion of the provider, according to guidelines, during patient care activities.*

***Tier '1' Medications** may be utilized at the discretion of the provider, according to guidelines, during patient care activities.*

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

***Any Tier '3' Medications** require Online Medical Control (OLMC) contact.*

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

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

***Any Tier '3' Procedures** require Online medical Control (OLMC) contact.*

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
CEFTRIAXONE
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
ESMOLOL
FENTANYL
FLUMAZENIL
NTG IV
HALOPERIDOL
HEPARIN
INSULIN
KETAMINE
MAGNESIUM
MANNITOL
METOPROLOL
MIDAZOLAM
MORPHINE
NOREPHINEPHRINE
POTASSIUM
PROMETHAZINE
PROPOFOL
ROCURONIUM
SODIUM BICARBONATE
SODIUM THIOSULFATE (for cyanide poising)
SUCCINYLCHOLINE

Tier '3' Medications:

HYDRALAZINE
PHENYTOIN

OTHER MEDICATION*: Prepare and initiate or administer any medications or blood products under specific written guidelines 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
- Pericardiocentesis under ultrasound guidance
- Place Central line under ultrasound guidance
- Perform Ultrasound Assessment using RUSH, BLUE, CAUSE, OB, or FOCUS exams

Tier '3' Procedures:

- Escharotomy

GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES

There are thematic issues throughout the ***Resuscitation and Stabilization Patient Care Guidelines***; the list 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 guidelines – follow Traumatic Cardiac Arrest guideline.
3. **Traumatic Brian Injury patients** should be facilitated promptly for neurosurgical intervention with airway management as appropriate, mannitol, 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 guideline, but several, **adapt your care to include all guidelines 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. Glascow Coma Scale
        vii. Integrated Ultrasound assessment with goal directed intervention
    c. Secondary survey:
        i. Obtain vital signs (<u>minimum</u>: *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
            - 12 lead for CHF, chest pain, syncope, and patients with cardiac history and medical complaints.

ii. Pulse oximeter.
iii. Capnography for all respiratory, altered mental status, trauma, and advanced airway patients.
iv. Non-Invasive Blood Pressure (NIBP) for Mean Arterial Pressure (MAP).

e. Apply appropriate guideline based on assessment.
f. Position patient comfortably as indicated by condition or situation.
g. Reassure and calm patient.
h. Loosen any restrictive clothing or remove as indicated.
i. 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 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 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**:
    a. When in doubt, oxygenate the patient to an SpO2 greater than 92% and less than 100%; titrate oxygen and modify delivery method to assure this goal.
    b. Consider the difference between oxygenation and ventilation, use of an NRB Mask at open rate and a NC at 10-15L combined (APOX) on a patient who is ventilating themselves may resolve oxygenation issues without the risk of hypotension from BVM positive pressure ventilation; target SpO2 of 92-98%.
    c. 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.
    d. When ventilating the patient, EtCO2 should be targeted at 35-45 mmHg unless individual guidelines direct a more specific goal.
    e. 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 with an unprotected airway, prolonged BVM ventilation (> 8 mins), and/or transport would happen while attempting BVM ventilation.
        i. Utilize Intubation Tracheal or Intubation with Rapid Sequence Induction guidelines for intubation procedure.
        ii. An Igel Airway or a SGA Airway (generic) may be utilized in place of an endotracheal tube when the provider feels they will provide an adequate advanced airway for a temporary interval or used until an endotracheal tube can be placed by an appropriately privileged and trained provider.
        iii. Ventilatory rates should be maintained at every 6 seconds unless other direction provided in specific individual guidelines.
        iv. Do not violate the 1:2 minimum IE ration 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 physiological goals from individual guidelines determining ventilator settings with initial settings as delineated:

	Tidal Volume	RR	I:E ratio (min)	PEEP	FiO2
Normal Lungs	8 ml/kg	10-12	1:3	5-10	1.0
Asthma/COPD	4-6 ml/kg	6-8	1:5	5-10	1.0
ARDS	4-6 ml/kg	10-12	1:3	5-15	1.0
Hypovolemia	8 ml/kg	10-12	1:3	0	1.0
Pneumonia	4-6 ml/kg	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 guideline, balanced **fluid boluses of 10-20ml/kg** should be delivered within 3-7 minutes preferentially via a large bore IV or IO above the level of the diaphragm

a. Large bore in the adult patient being 16, 15, 14, or 12 gauge.
b. Use Balanced IV fluid with a SID 24-50 if large boluses of fluid are required to prevent possible acidotic exacerbation.
c. Use ultrasound to assure proper fluid resuscitation through IVC compression/collapse and cardiac diastole monitoring.

13. Consider **urinary catheter** placement for any persistently unconscious patient or patient with urinary retention for excessive periods.
14. The provider may draw **blood for laboratory analysis**, **perform point of care testing, obtain laboratory testing, and/or utilize results to guide care**.
15. 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.
16. In **Pediatric Patients** (newly born to 9 yrs.) use the **Handtevy System** to guide weight identification and energy dosing in pediatric patients.

Utilizing/Directing other healthcare personnel and orders for other healthcare personnel:

As the leader during patient care events, until the arrival of a licensed physician recognized by the APP/RO physician medical director, the APP or RO may utilize and direct other licensed or certified healthcare personnel as the leader of a team approach to the care of the patient. The APP or RO may delegate aspects of the patient care guidelines to healthcare personnel present and trained to carry out the tasks assigned.

When directing other personnel, the APP/RO must denote in their patient care documentation when delegation was utilized. When requesting nursing to carry out care for the patient, the APP/RO must place those requests in the form of an order in the patient care record.

DRUG QUICK REFERENCE GUIDE

Drug	Dose	Guideline
Adenosine	6 mg, IV rapid bolus (first dose) 12 mg, IV rapid bolus (second dose)	Unstable Narrow Complex Tachycardia without reversible cause.
Acetaminophen	1 gm IV bolus (15mg/kg Peds), reduce dose by 50% with decreased liver function	Febrile. Post Arrest.
Acyclovir	10 mg/kg IV bolus, may redoes every 8hr (Ideal Body Weight)	Herpes Simplex Encephalitis. Meningoencephalitis.
Albuterol (Ventolin)	2.5 mg/3 mL Nebulized prn; OR, 2-4 doses from metered dose inhaler (MDI) through Spacer/Mask or ventilator circuit. 20 mg continuous nebulization. Administer 12mL (10mg) of albuterol sulfate inhalation solution, 0.083% (2.5mg/3mL) in nebulizer.	Asthma, COPD, Pneumonia Hyperkalemia Trauma - Crush Injury
Amiodarone	300 mg, IV bolus (first dose) 150 mg, IV bolus (second dose) 150 mg, IV over 10 min x 2	V-Fib/V-Tach Wide Complex Tach with instability
Amyl Nitrate	1 ampule, Inhaled	Inhalation of Toxic Fumes - Cyanide
Aspirin	160-325 mg, PO chewed	Acute Coronary Syndrome
Atropine	0.5 - 1 mg, IV bolus 0.5 - 0.1 mg, IV bolus max 3 mg 1 - 2 mg, IV bolus every 5 min (Peds 0.02 mg/kg)	Bradycardia Calcium Channel Blocker OD Poisoning, Overdose, & Toxins for Organophosphate, Sarin, VX.
Calcium Chloride	1gram, IV over 2 minutes 250 - 500 mg, IV over 2 minutes	Blood Administration. Poisoning, Overdose, & Toxins for Calcium Channel Blocker OD, Hyperkalemia, Unknown toxin ingestion with bradycardia and widened QRS. Trauma – Crush Injury. Eclampsia (Mag Antidote)
Ceftriaxone	1-2gm IV bolus Adult (Pediatric 100mg/kg IV bolus up to maximum adult dose)	Distributive Shock – Sepsis. Infectious Bacterial Agent. Wound Care.
Clopidogrel	300 mg loading dose PO	Acute Coronary Syndromes
Dexamethasone	4 mg IV bolus or IM, may dose every 6 hr. 6mg/day if COVID suspected	Altered Mental Status – Cerebral Tumors. Febrile States.
Dextrose	25 gm, IV bolus (Peds D25 0.5 - 1 gm/kg x 2 every 5 min)	Altered Mental Status, Cerebral Vascular Accident. Diabetic Emergencies. Poisoning, Overdose, & Toxins. Seizure.
Diltiazem	0.25 mg/kg (usually 20 mg) IV Slow (first dose) 0.35 mg (usually 30-35 mg) IV Slow (second dose) Post loading dose: 10 mg/hr Infusion	A-Fib/A-Flutter
Diphenhydramine	50 mg, IV bolus or IM	Allergic Reaction & Anaphylaxis

	25 - 50 mg, IV bolus or IM 50mg Rapid IV bolus	Dystonic Reaction Sedation
Dobutamine	0.5-1 mcg/kg/min IV continuous infusion initially, then 2-20 mcg/kg/min infusion; not to exceed 40 mcg/kg/min.	Shock - Cardiogenic
Dopamine	5 - 20 mcg/kg/min, Infusion	Cardiac Arrhythmia - Bradycardia. Shock – Cardiogenic or Distributive
Epinephrine (Adrenaline) Infusion	2 - 10 mcg/kg/min Infusion	Arrhythmia - Bradycardia. Shock - Distributive or Obstructive.
Epinephrine (Adrenaline) 1:10,000	0.3 – 0.5mg IV 1 mg IV/IO every 6 min (Peds 0.01 mg/kg, IV or IO) 1 mg IV/IO every 6 min (Peds 0.01 mg/kg, IV or IO)	Allergic Reaction & Anaphylaxis. Cardiac Arrest PEA/Asystole. Cardiac Arrest V-Fib/V-Tach Pulseless.
Epinephrine (Adrenaline) 1:1000	0.3 ml, SQ or IM (Peds 0.01 ml/kg, SQ), repeat if severe respiratory distress. 0.3 ml, SQ or IM (Peds 0.01 ml/kg, SQ), repeat if severe respiratory distress at 0.1 mg/kg, IV or IO (second dose) 5 mg via nebulizer	Allergic Reaction & Anaphylaxis. Asthma/COPD. Croup/Epiglottis/Anaphylaxis.
Fentanyl	1-2 mcg/kg IV bolus PRN; or, 1-2 mcg/kg/hr. by continuous IV infusion	Pain Management.
Flumazenil (Romazicon)	0.2 mg (2 ml) IV over 15 seconds	Orthopedic Trauma – Dislocation reduction reversal of benzodiazepine sedation post reduction.
Furosemide	20 - 60 mg IV bolus	Childbirth and Obstetrical/Gynecological Emergencies – Eclampsia. Respiratory Conditions - Pulmonary Edema.
Glucagon	5 mg IV bolus (adult only) 5 mg IV rapid bolus (adult only) 1 mg IM Adult (0.5 mg IM if less than 8 years old)	Poisoning, Overdose, & Toxins – Beta blocker or Calcium Channel Blocker. Cardiac Arrest – PEA (Beta Blocker). 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	Acute Coronary Syndrome
Hydrocortisone	100 mg IV bolus followed by an infusion of 10 mg/hour for seven days	Shock – Distributive or Adrenal Crisis
Hypertonic 3% Saline	3% HTS via IV bolus 1.4 to 2.5 mL/kg, may repeat as required for reoccurrence of herniation signs.	Traumatic Brain Injury
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	Hyperglycemia

	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	 Poisoning, Overdose, & Toxins
Ipratropium Bromide	0.5 mg via nebulizer	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. 2 mg/kg IV push over 1 minute with a 2 mg/kg per hour drip for continued sedation or ventilation.	Pain Management Intubation with Rapid Sequence Induction. Sedation
Lorazepam (Ativan)	2-4 mg IV bolus (Peds 0.05 mg/kg x 2 prn) 2 mg IV bolus over 2 minutes, may repeat once (Peds 0.05 mg/kg x 2 prn)	Seizure. Cerebral Vascular Accident. Childbirth and Obstetrical/Gynecological Emergencies – Eclampsia. Poisoning, Overdose, & Toxins for Cocaine or MDMA
Magnesium Sulfate	4 gm IV bolus, may repeat every 2 minutes to a total of 12 grams 2 gm IV bolus 2 gm IV bolus 1-2 gm IV over 2-3 minutes	Childbirth and Obstetrical/Gynecological Emergencies – Eclampsia/Pre-Eclampsia. Cardiac Arrest - Fib/V-Tach (if Torsades or Hypomagnesemia present) PEA from Respiratory or Hypomagnesium Causation. Respiratory Conditions – Asthma.
Mannitol	0.7 gm/kg, IV push, as needed with increased ICP	Traumatic Brain Injury
Metoprolol	5mg IV every 5 min up to 3 times	Acute Coronary Syndrome. Arrhythmia - Tachycardia.
Naloxone	2 mg IV bolus or IN 2-20 mg IV bolus, IN, or IM	Altered Mental Status Poisoning, Overdose, & Toxins for opioids
Nitroglycerine IV Infusion	5 mcg/minute to start; then increase by 5 mcg/minute every 3-5 minutes, up to 20 mcg/min. After reaching 20 mcg/minute, increase by 10 mcg/minute every 5 minutes until effect is achieved. Do not exceed 50 mcg/minute total.	Acute Coronary Syndrome
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	5-20 mcg/min IV infusion, titrate to a MAP of 65 mmHg; use ultrasound IVC/Focus monitoring to assure adequate volume is present to myocardium Initial: 8-12 mcg/min IV infusion; titrate to effect. Maintenance: 2-4 mcg/min IV infusion, then titrate to MAP of 65 mmHg; use ultrasound IVC/Focus monitoring to assure adequate volume is present to myocardium.	Shock – Distributive Shock - Cardiogenic Post Cardiac Arrest
Ondansetron	4 mg, IV, IM, or ODT; repeat as needed to 12mg	Nausea/Vomiting

	total in 8 hours.	
Oxytocin	10-20 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 bolus Maintenance: 0.1-0.2 mg/kg IV repeat PRN, or, Continuous infusion: 0.01-0.012 mg/kg/min IV	Intubation with RSI Post Intubation and Ventilator Maintenance Dosing
Sodium Bicarbonate	1 mEq/kg IV bolus when HCO3 level is less than 21 mEq/L; may repeat as necessary to bring above 21 mEq/L, but not to exceed 28 mEq/L of HCO3. 1 mEq/kg, IV push and 50 mEq in 500ml Crystalloid IV infusion over 30 minutes	Cardiac Arrest – PEA for Acidosis Poisoning, Overdose, & Toxins for sodium channel blockers.
Sodium Thiosulfate	12.5 gm, IV (Peds 250 mg/kg, IV)	Inhalation of Toxic Fumes
Succinylcholine	2 mg/kg, IV push	Intubation with RSI
Thiamine	100mg IV bolus	Altered Mental Status. Seizure.
Tranexamic Acid	1 gram bolus in 100 mL of normal saline over 10 minutes. May repeat a 1 gram dose over the next 8 hours, but do not exceed 2 grams.	Childbirth and Obstetrical/Gynecological Emergencies. Shock – Hypovolemic (Hemorrhagic). Trauma – Polytrauma.
Vecuronium	Loading: 0.08-0.1 mg/kg IVP over 60 seconds, or, 0.04-0.06 mg/kg IVP if following succinylcholine. Maintenance: 0.01-0.015 mg/kg IVP 20-45min post initial PRN.	Intubation with RSI Post Intubation and Ventilator Maintenance Dosing

ALTERED MENTAL STATUS

SPECIFIC INFORMATION NEEDED:

1. Any loss of consciousness?
2. What down time has elapsed?
3. Alcohol and/or drugs used by the patient?
4. Was patient in this location the entire time?
5. History of diabetes?
6. Behavioral or mental health pathologies?
7. Trauma history?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs and Level of consciousness?
2. Diagnostic devices in place?
3. ASSOCIATED trauma?
4. Lab values?
5. Consider Ultrasound.
6. Mental Status Exam?
7. 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 GUIDELINES.
3. Initiate large bore IV of Balanced fluid TO KEEP OPEN or saline lock.
4. Perform blood draw for laboratory analysis and perform result interpretation.
5. Attach cardiac monitor, NIBP, EtCO2, and pulse oximeter.
6. Obtain 12 Lead ECG.
7. 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

8. If history of drug abuse and patient has constricted pupils or respiratory depression,
   - Adult or pediatric patient: administer Naloxone.
9. Provide supportive measures, including titration of medications to desired effect.
10. Access physician consult for further care.

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 exhibit 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. Control bleeding, tourniquet early if bleeding is not easily controlled.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
3. Large bore IV balanced fluid at appropriate rate to maintain MAP greater than 65 mmHg.
4. Treat for shock, GO TO SHOCK.
5. Rinse amputated part with normal saline to remove loose debris.
6. Do NOT scrub part.
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 (Type and Cross, VGB+CHEM) if able and perform Laboratory Analysis if able.
11. Follow PAIN MANAGEMENT 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.)*
13. Identify whether it is possible to transport patient and amputated limb to surgical center for possible re-attachment. If no reattachment is possible, access surgical consult for further patient acre disposition.

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, which are 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 GUIDELINES.
3. Attach cardiac monitor, NIBP, EtCO2, and pulse oximeter if available.
4. Large bore IV above the level of the diaphragm with Balanced Fluid at to keep open or saline lock.
5. Perform blood draw for laboratory analysis if able.
6. Perform laboratory analysis
7. If blood pressure is normal and no respiratory distress presents, access physician consult for possible discharge and for relief of symptoms, consider:
   - Chlorpheniramine or Loratadine PO
   - Hydrocortisone
8. If hypotensive (MAP less than 65 mmHg) and patient has respiratory distress:
   - Fluid bolus IV 20 ml/kg.
   - Administer Epinephrine 1:1,000
   - Consider epinephrine infusion as a follow up to initial epinephrine, specifically with ingested antigen.
   - Consider Hydrocortisone.
9. If refractory hypotension:
   - Re-administer Epinephrine or Norepinephrine Infusion
   - If persistent hypotension occurs, follow DISTRIBUTIVE SHOCK.
10. Transport to critical care facility or access physician consult.

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:
   - 2.1. 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. Possible cyanide or other toxin?
7. Early Warning Score and Shock Index?
8. Ultrasound assessment?

TREATMENT:

1. Assure patient safety
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
   - 2.1. If airway burns are suspected, endotracheal intubation early, to maintain SpO2 above 94% and EtCO2 between 35-45 mmHg.
   - 2.2. If wheezing present, consider nebulized Albuterol.
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 above the level of the diaphragm.
   - 6.2. Balanced Fluids per % of burn or Shock Guideline.
   - 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 as indicated.

SPECIFIC PRECAUTIONS:

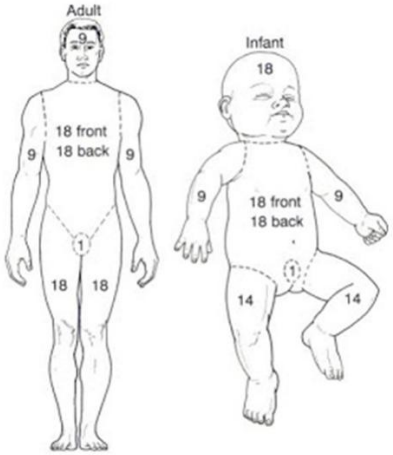
1. Leave blisters intact and any adherent debris in the burned area undisturbed. Attempt to contact the regional burn facility for advice and notification of transport.
2. DO NOT use ointments, salves, jells, or similar items on burns.
3. Follow the Parkland Burn Formula, unless shock symptoms present; “4ml/kg x % burn in first 24 hours".
   3.1. 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, use ultrasound as needed.
5. With suspected respiratory burns and progression of symptoms, consider early endotracheal intubation.
6. If patient is unable to be ventilated due to chest wall eschar, consider escharotomy after Burn Center physician consult.
7. If patient loses pulse in an extremity due to limb eschar, consider escharotomy after Burn Center physician consult.

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):

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

Rule of Nines:



CARDIAC ARREST

GUIDELINES FOR CARE:

Care of cardiac arrest and dysrhythmias is based on standards established by the International Liaison Committee on Resuscitation (ILCOR) of and updated to the most recent science guidelines (ILCOR 2023/2025).

Points to remember include:

1. Cardiac arrest due to trauma is not treated with medical causation guidelines.
2. Guidelines for cardiac arrest situations presume that the condition under discussion continually persists, that the patient remains in cardiac arrest, and that CPR is always performed.
3. In Ventricular Fibrillation and Pulseless Ventricular tachycardia, adequate chest compressions, defibrillation, airway management, appropriate ventilation, oxygenation, and assuring volume status are more important than administration of medications and take precedence over administering medications.
4. Use mechanical compression device when available.
5. Increase monitor ECG size to a minimum of 2.5 mm of height to avoid misdiagnosis.
6. Remove all clothing.

PULSELESS ELECTRICAL ACTIVITY (PEA)/ASYSTOLE TREATMENT:

1. Initiate high quality chest compressions at 110-120/min and an asynchronous ventilation every 6 seconds through an advanced airway with EtCO2 monitoring and Bag/Valve ventilation.
2. CPR must be performed for 2-minute intervals prior to interrupting chest compressions for no more than 10 seconds for rhythm check.
    2.1. If look through technology is available, there is no pause in compressions needed.
3. Place Advanced Airway and ventilate every 6 seconds (10 bpm min) with approximately 6-8 ml/kg predicted body weight of ventilatory volume.
    3.1. Consider whether thoracic distension from over ventilation or breath stacking is causing the PEA?
    3.2. Utilize EtCO2 to guide quality of compressions, ventilations, and cardiac output.
4. Large bore IV or IO of Balanced IV Fluid at to keep open.
    4.1. Draw blood for laboratory analysis and perform analysis if possible.
    4.2. If ultrasound CAUSE or CASA exam reveals poor diastolic refilling or collapsing IVC, consider 20 ml/kg IV Bolus over 3-5 minutes.
5. Administer Epinephrine 1:10,000 IV or IO as soon as able.
    5.1. May repeat as appropriate to do so, every four minutes.
6. Consider possible reversable causes and treat if discovered
    6.1. Use Ultrasound CAUSE Exam to assist with identifying causations, but do NOT interfere with CPR.
    6.2. Treat reversable causes:
        6.2.1. Hypoxia optimize oxygenation and ventilation.
        6.2.2. Hypovolemia if significant non-hemorrhagic volume loss is suspected and EtCO2 greater than 15 mmHg with organized rhythm present, administer 20ml/kg Balanced Fluid bolus over 3-5 minutes and follow shock guideline.

6.2.3. Hypothermia if severe (less than 30^0C, consider continuing efforts until rewarming is performed if EtCO2 over 10mmHg).

6.2.4. Hyperkalemia if identified (greater than 6.5 mmol) consider:

6.2.4.1. Albuterol nebulized into respiratory circuit.

6.2.4.2. Calcium and Sodium bicarbonate (if pH 7.25 or less if in renal failure).

6.2.4.3. Glucose/insulin: short-acting insulin and Dextrose 10%.

6.2.5. Hypokalemia if identified (less than 2 mEq/L) consider Potassium

6.2.6. Hydrogen Ion Dysfunction (Metabolic Acidosis) – consider:

6.2.6.1. Manage with optimization of ventilation and oxygenation; specifically consider transiently increasing ventilatory rate and volume to no more than every 5 seconds.

6.2.6.2. Consider the patient to be a potential acidosis patient when KULT is present (ketones, uremia, lactate and toxins) or MUDPILES (methanol, uremia, diabetic ketoacidosis, propylene glycol, isoniazid, lactic acidosis, ethylene glycol, salicylates).

6.2.6.3. Consider Sodium Bicarbonate for persistent acidosis with widened QRS refractory to ventilatory management and the use of high SID fluids.

6.2.7. Tension Pneumothorax – needle chest decompression immediately, then simple thoracotomy.

6.2.8. Tamponade/Cardiac Effusion – 20ml/kg fluid bolus to improve preload; then Ultrasound guided pericardiocentesis must be considered.

6.2.9. Toxin or Overdose – if specific antidote or guideline is available for specific substance, consider use.

6.2.10. Thrombosis of Pulmonary Vasculature - if confirmed on Ultrasound, consider emergent thrombolysis.

7. Place NG or OC tube to decompress gastric volume.
8. Pregnant patients in cardiac arrest require Compressions performed with Left Uterine Displacement (LUD) and immediate transport for Emergency Cesarean Section from OB/GYN or Surgical provider.
9. Continue Cardiac Arrest Management as long as EtCO2 is maintained above 10 mmHg.
10. Consider transport for indicated specific surgical, pharmacological, or ECMO intervention unavailable at patient site, if patient EtCO2 remains above 15 mmHg after 55 minutes of management time.
11. Consider termination of efforts if EtCO2 persistently below 11 mmHg and unresponsive myocardium per death in the field guideline. – GO TO DEATH IN THE FIELD.

V - FIB & PULSELESS V - TACH TREATMENT:

1. Initiate high quality chest compressions at 110-120/min and attach monitor/defibrillator immediately with initial defibrillation pads placed in the anterior/posterior position.
    A. Place an advanced airway (AA) and provide asynchronous ventilation every 6 seconds through the advanced airway with EtCO2 monitoring and Bag/Valve/AA ventilation, using 6-8 ml/kg IBW for each ventilation and not exceeding 30 cmH2O.
    B. CPR must be performed for two (2) minute intervals prior to interrupting chest compressions for no more than 5 seconds for rhythm check.
    C. If look through (filtered ECG) technology is available, there are no pauses in compressions needed.
    D. Utilize EtCO2 to guide quality of compressions, ventilations, and cardiac output.
2. Confirm ventricular fibrillation (VF) or non-perfusing ventricular tachycardia (pVT) on monitor and defibrillate per manufacturer recommendations for VF or pVT (Peds: 2-4j/kg) and continue CPR for 2 minutes.
    A. Double Sequence Defibrillation (DSD) or Vector Change Defibrillation (VCD) may be performed after the first and second shocks are unsuccessful, when required supplies and equipment are present.
    B. Reassess rhythm every two minutes for presence of VF or pVT and defibrillate with manufacturers recommended dosage (Peds: 4-10j/kg subsequent) if in persistent VF/VT.
3. Establish large bore IV or IO, above the level of the diaphragm, of balanced IV fluid at to keep open
    A. Draw blood for laboratory analysis, perform analysis.
    B. If Ultrasound CAUSE or CASA exam reveals poor diastolic refilling or collapsing IVC, consider 20 ml/kg IV Bolus over 3-5 minutes.
4. Administer Epinephrine 1:10,000, after third shock and may repeat every four (4) minutes as appropriate.
5. Amiodarone or lidocaine may be administered IV/IO as soon as deemed possible.
6. Consider Magnesium Sulfate if Torsades or hypomagnesemia is suspected.
7. Pregnant patients in cardiac arrest require Compressions performed with Left Uterine Displacement (LUD) and immediate transport for Emergency Cesarean Section from OB/GYN or Surgical provider.
8. Place NG or OG tube when feasible to do so after advanced airway placement.
9. Continue cardiac arrest management as long as EtCO2 is maintained above 10 mmHg.
10. Consider transport for Catheterization Lab or ECMO intervention if patient EtCO2 remains above 15 mmHg after 45 minutes of management time and receiving facility will accept patient.
11. Consider termination of efforts after EtCO2 persistently below 10 mmHg and unresponsive myocardium per death in the field guideline – GO TO DEATH IN THE FIELD.

POST CARDIAC ARREST CARE:

1. Assure Return of Spontaneous Circulation (ROSC) with a rise in EtCO2 level, generally above 30 mmHg, and retention of EtCO2 waveform following end of compressions.
   A. If EtCO2 rapidly falls, assume the patient does not have a pulse and resume compressions.
   B. Obtain NIBP measurement to identify MAP.
   C. Consider Rapid Ultrasound in Shock (RUSH) exam to identify potential perfusion issues.
   D. Assess patient's level of consciousness:
      a. If immediately alert with a GCS greater than 12:
         i. Observe and prevent hypoxia/hypotension.
      b. If not Alert with a GCS greater than 12:
         i. Place patient on mechanical or Bag/Valve/Advanced Airway ventilation.
         ii. Administer Ketamine for sedation with BV/ET or mechanical ventilation.
2. Optimize Ventilation and Oxygenation:
   A. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
   B. If not already placed, obtain endotracheal intubation with inline EtCO2 monitoring for patients who are not alert with a GCS of 12 or less.
   C. Target SpO2 is 90-98%.
   D. Target EtCO2 is 35-45 mmHg.
   E. Do NOT hyperventilate the patient in post cardiac arrest.
3. Optimize Circulatory Status:
   A. If Patient MAP is 65 mmHg or better:
      i. Observe and prepare for circulatory support if needed.
   B. If Patient MAP is less than 65 mmHg:
      i. Circulatory support is required.
      ii. If IVC collapses greater than 50% with ventilation on ultrasound, administer Balanced IV Fluids in 20ml/kg boluses administered over 3-5 minutes to maintain a MAP of 65 - 75 mmHg.
      iii. Treat underlying (i.e. hypoxia, ischemia).
      iv. If fluids are ineffective or IVC is less than 30% collapse with ventilation on ultrasound, consider vasopressor infusion of Epinephrine or Norepinephrine.
4. 12 Lead ECG evaluation:
   A. Obtain 12 Lead ECG and interpret.
   B. If normal, plan for a second 12 Lead ECG in 30 minutes.
   C. 12 Lead ECG positive for STEMI or high suspicion AMI:
      a. Transport Direct to cardiac catheterization lab
      b. Initiate Cath Lab Prep:
         i. Remove Clothing, cover with sheet as needed.
         ii. Administer Heparin.
         iii. Mark Pulses.
         iv. Prep Groin (if equipped)
         v. Draw blood samples (VGB+CHEM, High Sensitivity Troponins), analyze if able.

D. If abnormal and showing potential lethal arrhythmia, begin mitigation of the arrhythmia with electrical or pharmacologic intervention.

5. Place NG or OG tube, if not done during cardiac arrest.
6. Avoid hyperthermia, do not allow patient temperature to rise above 37.5^0C; cool as necessary and/or utilize acetaminophen IV to prevent temperature rise above 37.5^0C.
7. Place urinary catheter if not already accomplished and available.
8. Draw blood for laboratory analysis.
   A. Perform Glucose testing.
   B. POC laboratory testing VGB, Electrolytes, pH, cardiac markers, and other chemistry.
9. Consider Sodium Bicarbonate for persistent acidosis with widened QRS refractory to ventilatory management and the use of high SID fluids.

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CARDIAC ARRHYTHMIA

BRADYCARDIA TREATMENT:

1. Initiate focused assessment.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
3. Attach monitor, SpO2, EtCO2, pulse oximeter and obtain 12 lead ECG.
4. If possible, obtain FOCUS Ultrasound assessment.
5. Assess vital signs and consider other causes for bradycardia.
6. Start IV or IO of balanced IV fluid at to keep open or saline lock.
   6.1. Draw blood for laboratory analysis if appropriate and perform analysis
7. If heart rate < 60 per minute and patient exhibits any of the following signs or symptoms the patient is UNSTABLE:
   7.1. Chest pain of a continuous or ongoing nature.
   7.2. Altered level of consciousness.
   7.3. Hypotension
   7.4. Significant signs of Shock.
   7.5. Acute onset heart failure.
8. If Stable Bradycardia:
   8.1. Transport for cardiac evaluation.
   8.2. Obtain second 12 lead ECG during transport.
   8.3. Monitor for any decompensation.
9. If Unstable Bradycardia
   9.1. Administer Atropine for adults with vagally mediated bradycardia.
      9.1.1. Atropine may be repeated every 5 minutes.
      9.1.2. For pediatric patients, epinephrine is the medication for bradycardia.
   9.2. For non-vagally mediated bradycardia, consider Transcutaneous Cardiac Pacing (TCP) or a vasopressor drip to obtain adequate perfusion.
      9.2.1. Begin TCP at 60 bpm and 0 mA (or manufacturers recommendation), then increase in 10 mA doses until capture.
      9.2.2. After TCP electrical capture evaluate patient for mechanical capture.
      9.2.3. Consider sedation with TCP.
      9.2.4. If vasopressor is chosen option, or if TCP fails, an Epinephrine or Norepinephrine infusion may be utilized to restore adequate perfusion.

TACHYCARDIA TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Assess vital signs (including ECG, NIBP, SpO2, and EtCO2), attach monitor and obtain 12 lead ECG.
3. Consider other causes of tachycardia.
4. Obtain large bore IV or IO access above the level of the diaphragm and balanced IV Fluid to keep open.
5. Draw blood for laboratory analysis as appropriate and perform analysis if available.
6. If patient exhibits any of the following signs or symptoms, consider patient 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 heart failure.

7. Narrow Complex tachycardia with regular rate greater than 150 (possible SVT)
   7.1. If patient is STABLE:
      7.1.1. Observe, Vascular access, O2 if room air SpO2 is less than 94%, 12 Lead ECG, consider Metoprolol for rate control, Transport for Cardiac Consult.
   7.2. If the patient is UNSTABLE:
      7.2.1. Synchronized cardioversion at 100j, 200j, and 300j to maximum four (4) attempts.
      7.2.2. *If time permits, consider sedation*.
      7.2.3. *If non-responsive* to cardioversion, consider request for direct to cardiac catheterization lab.

8. Narrow Complex Tachycardia with irregularly irregular rate greater than 150 (possible Atrial Fibrillation AVR)
   8.1. STABLE with rapid ventricular rate:
      8.1.1. Observe, 12 lead ECG, NIBP, SpO2, EtCO2, Transport for cardiac consult.
      8.1.2. Consider rate control of Atrial Fibrillation with AVR with Metoprolol.
      8.1.3. With pre-excitation signs in AF, AV nodal blocking agents should be avoided as these medications may cause a paradoxical increase in the ventricular response.
   8.2. UNSTABLE with rapid ventricular rate:
      8.2.1. *Synchronized Cardioversion* at manufacturer recommendation or 100, 200, 300, then max joules; maximum four (4) attempts, then transport for possible cardiac catheterization lab.
      8.2.2. Pediatric dose 1 j/kg first dose, 2 j/kg second dose, then 4j/kg; maximum four (4) attempts then transport for cardiac consultation.
      8.2.3. *If time permits, consider sedation*
      8.2.4. If non-responsive to synchronized cardioversion, consider Metoprolol or Esmolol.

9. Wide Complex Tachycardia (HR greater than 150):
   9.1. If patient is STABLE:
      9.1.1. Observe, 12 lead ECG, monitor all vitals every 5 minutes, prepare for possible cardioversion, transport for cardiac consult
   9.2. If patient UNSTABLE:
      9.2.1. Synchronized cardioversion at 100j, 200j, 300j; maximum four (4) attempts
      9.2.2. *If time permits, consider sedation*.
      9.2.3. If the wide complex is irregular in amplitude, switch to defibrillation mode and deliver defibrillation energy per manufacturer recommendation.
      9.2.4. If non-responsive, consider Amiodarone.
      9.2.5. Transport for cardiac consult/cardiac catheterization lab.

10. If patient becomes pulseless at any time, switch to CARDIAC ARREST.

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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 reactions, self-harm, or harm to others.

PROCEDURE:

1. Verbally control patient is possible; verbally state to the patient he/she will be restrained if behavior continues.
2. Contact Law Enforcement for assistance and personnel safety.
3. Assess the possibility of using physical restraints first.
4. Evaluate the personnel needed to safely attempt restraining the patient.
5. Assess the need for pharmacologic intervention carefully.
   5.1. The violently combative patient stands a lesser chance of injury when treated.
   5.2. 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.
6. Administer Haloperidol
   6.1. Vital signs should be assessed within the first 10 minutes and thereafter as appropriate.
7. Consider Ketamine for continued combative behavior
8. Perform blood draw for laboratory analysis and analyze if possible.
9. Access physician consult, access mental health consult, and prepare patient for transfer to appropriate facility.

PRECAUTIONS:

1. Beware of respiratory compromise and positional asphyxia
2. Assure actions are commiserate with Patient Rights, Restraint, and Consent Policies, Regulations, Laws.

CHEST PAIN/ACUTE CORONARY 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?

SPECIFIC PHYSICAL FINDINGS:

1. ECG/12 Lead ECG, NIBP, SpO2, EtCO2.
2. Level of consciousness.
3. Airway assessment.
4. Labs.
5. Early Warning Score and Shock Index?
6. Ultrasound RUSH and FOCUS Exam

TREATMENT:

1. Position of comfort
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    2.1. Titrate oxygen therapy, based on monitoring of SpO2 ≥94%.
3. Administer Aspirin.
4. 12 Lead ECG positive for STEMI or high suspicion AMI:
    4.1. Transport Direct to cardiac catheterization lab
    4.2. Initiate Cath Lab Prep:
        4.2.1. Remove Clothing, cover with sheet as needed.
        4.2.2. Administer Heparin.
        4.2.3. Mark Pulses.
        4.2.4. Prep Groin (if equipped)
        4.2.5. Draw blood samples (VGB+CHEM, High Sensitivity Troponins), analyze if able.
    4.3. If abnormal and showing potential lethal arrhythmia, begin mitigation of the arrhythmia with electrical or pharmacologic intervention.
5. Initiate a large bore IV above the level of the diaphragm of Balanced IV fluid at a to keep open rate, saline lock, or per SHOCK Guideline if hypotensive.
6. Perform blood draw for laboratory analysis and perform analysis if available.
7. Treat Bradycardia or Tachycardia arrhythmia per Guidelines.
8. Consider Ketamine or Fentanyl for pain.
9. Monitor respirations, EtCO2, SpO2, and blood pressure closely.
10. Consider Ondansetron for nausea and vomiting.
11. Consider Nitroglycerin infusion for ongoing chest pain with MAP above 65 mmHg.
12. Package for transport to appropriate facility or access physician consult for low acuity patient disposition.

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CHEST TRAUMA

INDICATIONS:

1. This Guideline assumes chest trauma is present and is of highest priority currently.
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. Ultrasound BLUE Protocol for confirmation
    - 2.3. CARDIAC TAMPONADE:
        - 2.3.1. Consider potential cardiac tamponade.
        - 2.3.2. Ultrasound RUSH or FOCUS exam to confirm.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Do Not Utilize Nitrous Oxide.
3. Do Not Utilize 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 cricothyrotomy for patient unable to be intubated or ventilated.
5. Control external bleeding.
6. If signs of tension pneumothorax are noted along with hypotension and/or decreased oxygen saturation, then proceed to SIMPLE THORACOTOMY. If prolonged transport or return of tension signs, proceed to CHEST TUBE INSERTION.
7. Patients who exceed 1400ml of blood loss in first hour or 200ml/hr of blood loss over 5

hours from chest tube should be considered in need of immediate surgical intervention.
    7.1. Outflow of lessor amounts, the patient should be considered urgent but stable.
8. If evidence of a penetrating or sucking chest wound, apply approved chest seal system or dressing with tape on three out of four sides.
    8.1. Remove immediately if patient develops tension pneumothorax.
9. If Flail segment, manually stabilize flail segment and apply bulky dressing to support flail segment.
10. Utilize SHOCK to manage patient circulatory status.
11. If Cardiac Tamponade:
    11.1. Initiate 20 ml/kg IV fluid bolus over 3-5 minutes to attempt to force preload through myocardium under tamponade pressure.
    11.2. If patient deteriorates further, proceed to PERICARDIOCENTESIS.
12. Transport patient to appropriate facility and access physician consult for further care.

CHILDBIRTH AND OBSTRETRICAL/ GYNECOLOGICAL EMERGENCIES

OBTAIN CONSENT PRIOR TO ANY PROGRESSION OF ASSESSMENT OR CARE IF POSSIBLE

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? How often does the pain occur?
4. How often are the contractions? What Time did contractions start?
5. History of problems with pregnancy vaginal bleeding, prior cesarean sections, high blood pressure, premature labor, and premature rupture of membranes.
6. 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 OB exam finding?

CHILD BIRTH EMERGENCIES TREATMENT:

1. Position of comfort.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
3. Obtain Fetal Heart Tones (FHT) if possible:
   - 3.1. Consider fetus in distress is FHT outside of 130-170bpm.
4. Obtain large bore vascular access above the level of the diaphragm with balanced IV fluid at TKO rate.
5. Perform blood draw for laboratory analysis if able and analysis.
6. Perineal examination:
   - 6.1. Vaginal bleeding or leakage of fluid.
   - 6.2. Presence of meconium.
   - 6.3. Crowning during a contraction.
   - 6.4. Presenting part, head, face, foot, arm, cord.
7. Vaginal Examination:
   - 7.1. Note cervical dilation.
   - 7.2. Identify presenting part(s).
   - 7.3. Identify intra-vaginal lacerations.
   - 7.4. Identify cord prolapse and rectify.
8. Early Obstetrical Physician Consult, if possible.
9. <u>If active labor, and no vaginal bleeding, crowning, or fetal distress</u>:
   - 9.1. Titrate O2 to maintain SpO2 94-98%

9.2. Transport

10. If vaginal bleeding during pregnancy with no signs of shock (MAP greater than 65 mmHg):
    10.1. Transport with patient in left lateral recumbent position
    10.2. Titrate O2 to maintain SpO2 greater than 95%.
    10.3. IV balanced fluid at 250 ml/hour.
    10.4. Cardiac monitor, NIBP, SpO2, EtCO2.
    10.5. Transport.
11. If heavy vaginal bleeding in pregnancy with signs of shock (MAP less than 65 mmHg):
    11.1. Transport with patient in left lateral recumbent position.
    11.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    11.3. Cardiac monitor, NIBP, SpO2, EtCO2.
    11.4. Administer blood and follow SHOCK.
    11.5. Transport for emergent obstetrical consultation.
12. If imminent delivery with no fetal distress:
    12.1. Place mother in lithotomy position.
    12.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    12.3. Drape mother, prepare OB equipment and neonatal resuscitation equipment.
    12.4. Assist delivery.
    12.5. Suction baby's mouth, then nose with bulb suction; if heavy meconium staining/material and poor respiratory response, endotracheally intubate and suction baby's airway until clear before stimulating first breath.
    12.6. Warm, dry, and stimulate infant.
    12.7. Clamp cord in two places, six inches from infant, and cut cord between clamps.
    12.8. Wrap infant in sterile drape or dry blanket with beanie on head and place entire wrapped baby in warming bag.
    12.9. Check infant's vital signs and APGAR, if poor:
        12.9.1. If infant not vigorous, oxygenate with 100% O2 via infant Bag/Valve/Mask.
        12.9.2. If infant ventilatory status is inadequate, endotracheal intubation and ventilate via ET/BV/EtCO2 with 100% O2 at 20 breaths per minute.
        12.9.3. If infant heart rate is less than 60/min, initiate compressions at 120/min with advanced airway asynchronous ventilation at 20 breaths per minute.
        12.9.4. If no improvement with oxygen, ventilation, and compressions, administer Epinephrine.
        12.9.5. If meconium present, suction upper airway, intubate and suction trachea.
    12.10. Infuse mother's IV with 500cc fluid bolus, then at 125 ml/hour; monitor for any potential hemorrhage.
    12.11. Transport.
13. If prolapsed cord:
    13.1. Place mother in knee/chest position and place cord back into vaginal vault with gloved hand in one attempt.
    13.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    13.3. IV Balanced Fluid and run at 250 ml/hour.

13.4. Check cord for pulse.
    13.4.1. If no pulse in cord, place gloved fingers into the vagina and push the infant up to relieve pressure on the cord; remove cord from infant if able and reassess.
    13.4.2. If no pulse for thirty seconds following maneuver, and greater than 5 minutes to hospital, place mother into lithotomy position and attempt delivery of baby.
13.5. Transport for emergent obstetrical consult,

14. If abnormal fetal presentation or decreased fetal heart tones:
    14.1. Place patient in left lateral recumbent position.
    14.2. Transport for emergent obstetrical intervention.
    14.3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    14.4. IV Balanced Fluid enroute and run at 250 ml/hour.
    14.5. If infant in footling breech and compressing cord, place reverse pressure on infant to recover pulse in cord, if ineffective, consider manually assisted delivery if more than 5 minutes from hospital.
15. If delivery completed before arrival:
    15.1. Protect from temperature loss with drying, dry blanket, hat, and warming bag.
    15.2. Check infant's vital signs (SpO2, Temp, EtCO2, ECG, NIBP) and APGAR, if poor:
        15.2.1. If infant not vigorous, oxygenate with 100% O2 via infant Bag/Valve/Mask and apply ECG, SpO2, EtCO2.
        15.2.2. If infant ventilatory status is inadequate, endotracheal intubation and ventilate via ET/BV/EtCO2 with 100% O2 at 20 breaths per minute.
        15.2.3. If infant heart rate is less than 60/min, initiate compressions at 120/min with advanced airway asynchronous ventilation at 20 breaths per minute.
        15.2.4. If no improvement with oxygen, ventilation, and compressions, administer Epinephrine.
        15.2.5. If meconium present, suction upper airway, intubate and suction trachea.
    15.3. Clamp cord in two places, six inches from infant, and cut cord between clamps.
    15.4. Suction, warm, dry, and stimulate infant.
    15.5. Give infant to mother if infant is stable and without respiratory or circulatory concerns.
    15.6. Massage uterus gently following delivery.
    15.7. Do not pull cord or attempt to deliver placenta.
    15.8. Balanced IV Fluid and run at 250 ml/hour.
    15.9. Watch for external bleeding, begin fundal massage after placenta delivers for bleeding.
    15.10. Transport.
16. If significant post-partum hemorrhage (estimated at greater than 1000 ml):
    16.1. 20ml/kg IV fluid bolus over 3-5 minutes and utilize permissive hypotension
    16.2. Administer Pitocin in IV fluid bolus.
    16.3. Administer Blood and follow SHOCK GUIDELINES.
    16.4. Administer TXA.
    16.5. Consider Bi-Manual Massage for continued significant hemorrhage.
    16.6. Transport for emergent obstetrical intervention.

PREECLAMPSIA/ECLAMPSIA

1. Preeclampsia:
   A. In addition to swelling, protein in the urine, and hypertension.
   B. 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.
2. Eclampsia:
   A. 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.
5. Ultrasound OB exam finding.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Large bore IV, above the level of the diaphragm, of Balanced Fluid at 125 ml/hr.
3. Draw blood for laboratory analysis if available, perform laboratory analyses
4. Monitor vital signs, fetal heart tones, level of consciousness, patellar reflexes, respiratory rate, and oxygenation status every 5 minutes.
5. Keep the patient in left lateral recumbent position.
6. Consult or Transport for emergent obstetrical intervention as soon as possible.
7. Monitor urinary output, if possible.
8. Evaluate for pulmonary edema. if present:
   8.1. Consider CPAP
   8.2. Consider Nitroglycerine if MAP above 70 mmHg.
9. If Seizures occur:
   9.1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
   9.2. Administer Lorazepam rapid IV push, repeat up to three (3) doses as necessary.
   9.3. Administer Magnesium Sulfate IP push, repeat once as necessary.
   9.4. Continued status seizure:
      9.4.1. Endotracheal intubation with pharmacological assistance.
      9.4.2. Ventilate at 6-8 ml/kg IBW with ET/BV/EtCO2 or ET/EtCO2 with mechanical ventilator.

9.4.3. Manage circulation with SHOCK Guidelines.
9.4.4. Sedate with Ketamine.
9.4.5. Transport for emergent obstetrical consultation.

10. Magnesium Sulfate:
    10.1. Remember, Magnesium Sulfate can cause respiratory depression with cardiovascular collapse.
    10.2. Measure and document deep tendon reflex (DTR) and/or Patellar Reflexes.
    10.3. If patellar reflexes are absent, shut off the infusion immediately.
    10.4. Retain infusion if patient is postictal when assessed

GYNECOLOGICAL EMERGENCIES:

SPECIFIC INFORMATION NEEDED:

1. Last menstrual period and due date if known.
2. How many pregnancies and live births has the patient had?
3. Is there pain?
4. What is the Quality of the pain?
5. How often does the pain occur?
6. What Time did this start?
7. History of OB/GYN conditions?
8. Current complaints?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness?
3. Vaginal Bleeding?
4. Possible Pregnancy?
5. Airway assessment (LEMON)?
6. Early Warning Score and Shock Index?
7. Ultrasound RUSH and OB exam finding?

GYNECOLOGICAL EMERGENCIES TREATMENT:

1. Position of comfort.
2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
3. Obtain large bore vascular access above the level of the diaphragm with balanced IV fluid at TKO rate.
4. Perform blood draw for laboratory analysis if able and analysis.
5. Perineal examination:
    5.1. Vaginal bleeding?
    5.2. Presence of infectious discharge or material?
6. Early OB/GYN Physician Consult, if possible.
7. <u>If signs of infection are present without sepsis and MAP above 65 mmHg</u>:
    7.1. Maintain SpO2 greater than 95%.
    7.2. IV balanced fluid at 250 ml/hour.
    7.3. Cardiac monitor, NIBP, SpO2, EtCO2.
    7.4. Access or Transport for OB/GYN care.
8. <u>If signs of infection are present with possible sepsis and MAP less than 65 mmHg</u>:
    8.1. Maintain SpO2 greater than 95%.
    8.2. Consider Ceftriaxone.
    8.3. FOLLOW SHOCK Guideline.
    8.4. Cardiac monitor, NIBP, SpO2, EtCO2.
    8.5. Access or Transport for emergent OB/GYN evaluation and intervention.
9. <u>If vaginal bleeding with no signs of shock (MAP greater than 65 mmHg)</u>:
    9.1. Transport.
    9.2. Maintain SpO2 greater than 95%.

9.3. IV balanced fluid at 250 ml/hour.
9.4. Cardiac monitor, NIBP, SpO2, EtCO2.
9.5. Access OB/GYN consult.

10. If heavy vaginal bleeding with signs of shock (MAP less than 65 mmHg):
    10.1. Transport with patient in left lateral recumbent position.
    10.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    10.3. Cardiac monitor, NIBP, SpO2, EtCO2.
    10.4. Administer blood and follow SHOCK Guidelines.
    10.5. Transport for emergent OB/GYN consultation.
11. If severe hemorrhage (estimated at greater than 1500 ml):
    11.1. 20ml/kg IV fluid bolus over 3-5 minutes and utilize permissive hypotension
    11.2. Administer Blood and follow SHOCK Guidelines.
    11.3. Administer TXA.
    11.4. If vaginal wounds are present, control hemorrhage, follow WOUNDS Guidelines.
    11.5. Transport for emergent OB/GYN intervention.

SEXUAL ASSAULT:
(As recommended by the National Association of EMS Physicians)

1. Trauma-Informed Care:
    1.1. EMS clinicians should recognize that sexual assault is a traumatic event, and we recommend a trauma-informed care approach.
    1.2. Some recommended actions include, but are not limited to, asking questions that validate a survivor's experience, asking permission before doing an exam to acknowledge a patient's choice, and allowing a support person during the physical exam.
2. Physical Injuries after sexual assault:
    2.1. EMS clinicians should assess for serious traumatic injuries associated with sexual assault including strangulation.
    2.2. Follow appropriate guidelines for etiologies identified for treatment.
3. Collaboration with Sexual Assault Forensic Examiner Organizations:
    3.1. EMS clinicians should understand general forensic guidelines and state-specific regulations relevant to prehospital care.
    3.2. Indications for forensic exams vary by state, thus partnerships between EMS and sexual assault forensic examiner organizations can facilitate access to forensic examiners who can provide clear guidance on available forensic resources.
4. Transport to Sexual Assault Forensic Examiner-resourced facilities:
    4.1. EMS systems should identify local facilities that are resourced to care for sexual assault survivors or systems designed to provide these resources to the survivor and preferentially transport stable survivors to these destinations for medical and forensic evaluation.
    4.2. If there is concern for a life-threatening injury, patients should be transported to a trauma center for evaluation.
5. Documentation:
    5.1. In addition to awareness of local regulations, EMS clinicians should be complete, accurate, and culturally competent in their documentation.
    5.2. EMS providers should minimize bias in their documentation.
6. Evidence Preservation:
    6.1. EMS clinicians should be aware of best practices for evidence preservation and be trained in evidence collection in the prehospital setting, including avoiding showering, eating, changing clothes before the forensic exam, and maintaining chain of custody.
    6.2. EMS clinicians should be sensitive to environment and facilitate privacy for patient.
7. Consider other special populations:
    7.1. EMS clinicians should be aware of high-risk special populations for sexual assault with unique medical, cultural and/or regulatory considerations.
    7.2. Special populations include, but are not limited to, pediatric, elderly, transgender, gender diverse, LGBTQ (lesbian, gay, bisexual, transgender, queer), pregnant, and male survivors.

References:

1. Cao, Dazhe MD, et al. Part 10: Adult and Pediatric Special Circumstances of Resuscitation: 2025 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.

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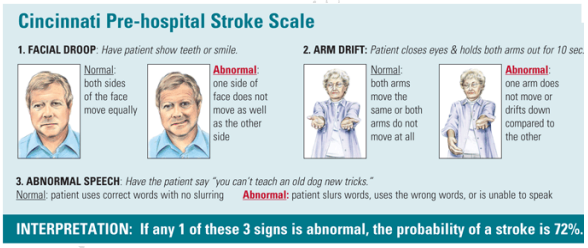
CEREBRAL VASCULAR ACCIDENT

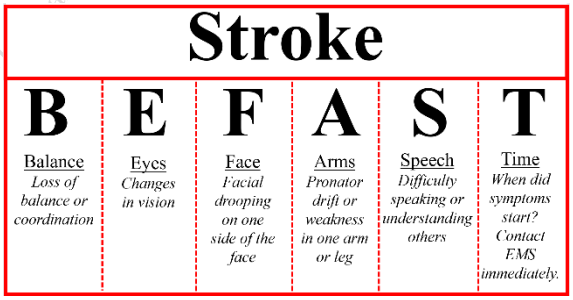
SPECIFIC INFORMATION NEEDED:

1. How long have symptoms been present?
2. Any pain presents?
3. Nature of illness?
4. Cincinnati Stroke Scale or BEFAST 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 intra-arterial retrieval or thrombolytic therapy.



SPECIFIC PHYSICAL FINDINGS:

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



TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Obtain large bore IV access, above the level of the diaphragm, draw bloods for laboratory analysis, and perform laboratory analysis if able.
3. Assure ECG, NIBP, SpO2, EtCO2 monitoring and obtain 12 lead ECG.
4. Elevate head of bed to 30-45 degrees.
5. Determine serum glucose level with Glucometer.
   - 5.1. If glucose < 72 mg/dl (4 mmol/l) – HYPOGLYCEMIS/HYPERGLYCEMIA Guideline.
   - 5.2. Titrate to response to restore normal GCS.
   - 5.3. Consider differential diagnosis.
6. Treat seizures per SEIZURE Guideline.
7. Obtain (or Transport) for CT scan within 20 minutes and specialist interpretation within 40 minutes.
8. Physician Consult for Neuro Cath Lab Admission for intervention or thrombolytic use.

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DEATH IN THE FIELD/DEATH DURING RESUSCITATION

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 on arrival of EMS personnel (pulseless, apneic, EtCO2 less than 10 mmHg).

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 are present on initial assessment.
    1.2. Do NOT begin resuscitation with the above present.
2. Cardiac arrest care has been initiated:
    2.1. STOP Resuscitation if 15 minutes or more have passed since patient arrested, bystander and/or initial responder CPR was NOT initiated, and EtCO2 is less than 10mmHg.
    2.2. NOTE: If pregnancy, poisoning, overdose, or drowning are present – Treat and consider Transport of patient
3. Stop Resuscitation if the patient has EtCO2 less than 10 mmHg for the past 20 minutes of monitored cardiac arrest management and there is no myocardial activity detected on ultrasound.

Continue Resuscitation Considerations:

1. If ETCO2 is greater than 15 mmHg and ultrasound exam reveals cardiac movement, the provider may consider initiating the Shock Guidelines in addition to the Cardiac Arrest Guidelines.
2. If patient remains in Ventricular Fibrillation after 45 minutes of management and an EtCO2 greater than 15 mmHg, consider transport and consider request for catheterization lab access or ECMO access.
3. If patient is at one hour of management with an EtCO2 greater than 15 mmHg, consider transport for ECMO if available.
4. If trauma patient appears in cardiac arrest, but there is a recognizable QRS of at least sixty (60) per minute, follow TRAUMA ARREST.
5. In instances where the trauma patient declines to the point that no vital signs (i.e. pulse/respiration) are present, follow TRAUMA ARREST.

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/Early Warning Score.
2. Level of consciousness.
3. Blood Glucose Level.

TREATMENT - HYPOGLYCEMIA:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Initiate Large Bore IV/IO with balanced fluid; draw blood for laboratory analysis and perform is able.
3. Assure ECG, EtCO2, NIBP, and SpO2 monitoring continuously.
4. 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
5. Repeat glucose determination in 5 minutes and continue Dextrose if results unchanged.
6. Provide supportive measures.

TREATMENT – HYPERGLYCEMIA:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
   - For suspected acidosis with widened QRS complex and GCS less than 12, consider hyperventilation with 20 bpm and 6-8 ml/kg via ET/BV/EtCO2 after intubation assisted by pharmacologic agents.
2. Obtain large bore IV access with saline lock or balanced IV fluid; if able, draw blood for laboratory analyses, and perform laboratory analyses.
3. Assure ECG, NIBP, SpO2, and EtCO2 monitoring continuously.
4. Determine serum glucose level with Glucometer.
   - if glucose > 80 mg/dl (4.4 mmol/l) and < 250 mg/dl (14 mmol/l).
   - if glucose > 250 mg/dl (14 mmol/l), go to #5.
5. 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 IV fluid bolus of 20 ml/kg over 3-5 minutes.
   - 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 GUIDELINES.
   a. Utilize oxygenation methodology to assure 98%-100% SpO2
2. Place the patient in a supine head-down left lateral decubitus position.
3. Assure ECG, NIBP, EtCO2 and SpO2 monitoring continuously.
4. Obtain large bore IV access above the level of the diaphragm with saline lock or balanced fluid; if Shock present, follow SHOCK Guidelines.
5. Protect against hypothermia and hyperthermia.
6. Perform BLUE and RUSH Ultrasound exams.
7. Monitor closely for complications (pneumothorax, shock, seizures) and treat per specific Guidelines.
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.
    a. Provide hyperbaric personnel with a detailed history of the dive (depth and duration, timing and onset of symptoms, complications, and any treatment rendered).
    b. 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.

References:

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FEBRILE CONDITIONS AND SEPSIS

SPECIFIC INFORMATION NEEDED:

1. Evaluate 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. 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 x age in years).
7. Shock Index (SI) Present (Heart Rate dived by Systolic Pressure = SI)?
8. Lab Values: Lactate level 4 mmol/L or greater – GO TO DISTRIBUTIVE SHOCK.
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 GUIDELINES.
    - 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:
        - 1.4.1. Markedly decreased LOC.
        - 1.4.2. Inability to maintain a patent airway.
        - 1.4.3. Inability to maintain SpO2 above 95% despite use of all oxygen delivery or NIV ventilation devices.
        - 1.4.4. EtCO2 >50 mmHg, or GCS < 9
        - 1.4.5. 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
        - 1.6.1. 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.
            - 1.6.1.1. Pediatric MAP (50th percentile at 50th height percentile) = 1.5 x age in years + 55.
        - 1.6.2. IV or IO BALANCED FLUID maintenance fluid at 125-165ml per hour
        - 1.6.3. May use IVC status on Ultrasound findings to assist with fluid

resuscitation goals and direction.

1.6.4. Urinary catheter insertion for urinary output (goal: 1-2ml/kg/hr)

1.7. Pain control – follow pain management guidelines

1.8. Physician Consult and consider early transport to pediatric intensive care facility.

2. Specific Treatments:

2.1. Meningococcemia /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 less than 65 mmHg in adults (Pediatric MAP at 50th percentile at 50th height percentile = 1.5 x age in years + 55); repeat as required until patient improvement and MAP of 65-70 (or appropriate pediatric MAP) 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.

2.2.2.1. Maintain goal MAP of 65 (Pediatric MAP at 50th percentile at 50th height percentile = 1.5 x age in years + 55).

2.2.2.2. 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.

2.3. Mild Febrile Conditions

2.3.1. Oral hydration is acceptable

2.3.2. Mandatory rest

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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 RUSH and 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 GUIDELINES.
3. Cooling (Obtain Consent if possible):
    - 3.1. Remove clothing from patient and begin cooling measures that maximize evaporation/convection with positive airflow across patient.
    - 3.2. A spray bottle with cool water is one of the best cooling measures.
    - 3.3. Avoid shivering during the cooling process.
    - 3.4. Evaporative cooling alone is not an effective measure
4. IV or IO, follow SHOCK, if indicated. Draw blood for laboratory analysis, perform laboratory analyses
    - 4.1. Heat exhaustion:
        - 4.1.1. 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.
    - 4.2. Heat stroke:
        - 4.2.1. May NOT be fluid DEPLETED in classic presentation, use fluid with caution

as pulmonary edema may develop.

4.2.2. Complete Ultrasound RUSH and BLUE Protocol.

4.2.3. 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.
6. Monitor vital signs every 5-10 minutes.
7. Continue cooling
   7.1. Avoid wet blankets or other covering that obstructs air flow.
8. Special care should be taken to avoid seizures.
9. Access physician consult for further care and patient disposition.

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:
   a. Apnea: Utilize EtCO2 and/or put metal or glass shined object under nostrils for 1 minute.
   b. Pulse: Palpate carotid pulse for 1 minute.
   c. ECG: Attach ECG and interpret rhythm.
   d. LOC: Determine Level of Consciousness (LOC) by verbal and motor responses.
   e. Ultrasound FOCUS exam to identify viability of circulatory status.
4. Which "Category of Hypothermia" does patient go into: Mild 34-36^{0}C, Moderate 30-33.9^{0}C, or Severe less than 30^{0}C.

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 GUIDELINES.
3. Temperature Management (Obtain Consent if possible):
   3.1. Remove wet clothing from patient and begin warming measures that maximize conduction of warmth to patient.
   3.2. Increase ambient temperature
   3.3. Blankets and hot packs to arm pits and groin
4. Draw blood for laboratory analysis, perform laboratory analyses if able.
5. Obtain large bore IV access above the level of the diaphragm, follow SHOCK.
   5.1. Mild Hypothermia: warm liquids and oral glucose as necessary.
   5.2. Moderate Hypothermia: Warm IV fluids and oxygen (40^{0}C) over 30 minutes.
   5.3. Severe Hypothermia: Warm IV fluids and oxygen (40^{0}C) over 30 minutes.
6. Fluid management should be guided by IVC status and laboratory values.
7. If seizure activity noted, follow SEIZURE.
8. Monitor vital signs every 5-10 minutes.
9. Continue warming - Avoid wet blankets or other covering that obstructs air flow.
10. Do not administer atropine if temp is less than 34^{0}C.
11. Limit defibrillation to three shocks and withhold medications until greater than 30^{0}C, increase medication intervals by factor of x 2 until above 34^{0}C.
12. No active rewarming beyond 32^{0}C.
13. Access physician consult if further care required and/or patient disposition.

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 GUIDELINES.
2. Assure ECG, SpO2, EtCO2, NIBP monitoring continuously.
3. Obtain large bore IV access above the level of the diaphragm with saline lock or balanced IV fluid.
4. Draw blood for laboratory analysis, perform laboratory analyses
5. Albuterol by nebulizer for wheezing.
6. Access physician consult if further care is required.

SPECIFIC THERAPIES:

1. Carbon monoxide:
   - 1.1. Hyper oxygenate patient with 100% O_2.
   - 1.2. Advanced airway placement if patient GCS less than 9.
   - 1.3. Ventilate at 10 bpm with 8 ml/kg ideal body weight and 100% O2.
2. Chlorine gas or dust:
   - 2.1. Humidified 100% O_2.
   - 2.2. Treat severe pulmonary edema or bronchospasm per RESPIRATORY CONDITIONS.
3. Cyanide Inhalation:
   - 3.1. Hyperventilate with 100% O_2, assist ventilations, and plan for advanced airway placement with pharmacologic agents when GCS is 9 or less.
   - 3.2. 20ml/kg IV fluid bolus over 3-5 minutes.
   - 3.3. Cyanide Antidote:
     - 3.3.1. Administer Hydroxocobalamin.
     - 3.3.2. Flush IV line with a minimum of 100 ml of IV fluid.
     - 3.3.3. Administer Sodium Thiosulfate.
4. Hydrogen Sulfide (H2S):
   - 4.1. Respiratory depression will occur at specific H2S levels, prepare to assist ventilation.
   - 4.2. Plan for advanced airway placement with pharmacologic agents when SpO2 levels above 95% cannot be sustained.
   - 4.3. Seizure will occur at specific H2S levels, treat seizures per SEIZURE.
5. Weaponized Agents – Sarin/VX:
   - 5.1. Go to Organophosphate.
   - 5.2. 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)
9. Ultrasound assessment, including RUSH.
10. Obtain imaging as recommended.

TREATMENT OF ORTHOPEDIC INJURIES:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
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.
5. Apply sterile dressing to any wounds and secure in place.
6. Splint as appropriate, axial traction as needed to facilitate splinting.
7. A traction splint may be applied to all femur fractures if time permits; additionally, any footwear should be removed prior to splinting.
8. A pelvic binder should be applied to all unresponsive trauma patients and patients with pelvic pain.
9. Elevate fractures where possible, apply cold packs or ice if injuries and time permit.
10. Document pulses and sensation pre and post movement.
11. 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.
12. If an extremity must be repositioned for packaging and/or evacuation - do so.
13. For pain follow PAIN MANAGEMENT.
14. Monitor vital signs, sensation, distal circulation, and motor function. If no circulation can be established in an extremity, obtain Orthopedic consultation and consider relocation of limb.
15. Physician consult for reduction recommendations, further care required, or for patient disposition.

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, reduce or transport for orthopedic consultation.
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.
   a. Reassess and document the distal circulation and sensation after each movement.
   b. 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.

<u>PELVIC WRAP</u>

INDICATIONS:

1. This Guideline assumes the treatment was NOT initiated by BLS.
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:
   3.1. 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.
   3.2. 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.
   3.3. 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.
   4.1. 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.

<u>DISLOCATIONS:</u>

<u>GENERAL PRINCIPLES OF MANAGEMENT:</u>

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.
   1.1. 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.
    2.1. 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.
    3.1. Some dislocations are irreducible by a closed technique, most commonly because of the interposition of soft tissue.
    3.2. Persistent attempts at relocation when soft tissue is interposed may lead to further trauma of the joint and surrounding tissue.
    3.3. 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.
    4.1. 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.
    5.1. Any compromise of these structures indicates that prompt action should be taken.
    5.2. The neurovascular status must also be reassessed serially and documented after reduction.
6. Three keys to successful reduction are:
    6.1. Knowledge of the anatomy and reduction maneuver,
    6.2. Use of proper analgesia, and,
    6.3. Proceeding in a slow and gentle manner.
7. Attempt to ascertain the mechanism of injury.
    7.1. 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.
    8.1. An acute joint dislocation is not a minor injury.
    8.2. Because there is always concomitant muscle, ligament, or other soft tissue disruption with any dislocation, disability is often the end result.
    8.3. Because soft tissue swelling and muscle spasm may initially obscure joint instability or disability, follow-up is mandatory.

PAIN MANAGEMENT

PURPOSE OF GUIDELINE:

1. The purpose of the Pain Management Guideline is to give providers guidance in providing analgesic to patients in pain with orthopedic injury, soft tissue/muscle injury, flank pain, abdominal pain, and/or renal colic pain.
2. 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.
3. Beware of the patient who has been in severe pain and the pain is suddenly relieved, for example, reduction of a dislocation, respiratory depression can occur.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Rule out any possible traumatic brain injury.
3. Manage life threatening illness or injury prior to pain management.
4. Obtain large bore IV access above the level of the diaphragm with a saline lock or balanced fluid.
5. Draw bloods for laboratory analysis, perform laboratory analysis, if able.
6. Maintain MAP above 65 and respiratory rate above 10/min during any pain management.
7. Continuous SpO_2 and $EtCO_2$ monitoring are required for any sedation process.
8. Pain score must be noted, and patient must be reassessed pre and post treatment.
9. Analgesic Options:
    a. Acetaminophen
        i. When used as a multimodal approach, it may lower total doses of other analgesics to achieve pain control.
    b. Nitrous Oxide.
        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. Nitrous Oxide is a combination of nitrous oxide 50% and oxygen 50%.
        iv. It is stored in medical cylinders that have a blue body and white shoulders
    c. Ketamine.
    d. Fentanyl.
    e. Propofol.
10. Consider use of regional nerve block under ultrasound guidance for limb injuries.
11. Be prepared to support respirations and place an advanced airway.
12. Hypotension secondary to analgesia will usually respond to IV fluid administration of 20 ml/kg, titrated to effect.
13. 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.
    c. Naloxone has a shorter half-life than Opioids - watch for recurrent sedation.

POISONING, OVERDOSE, & TOXINS

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.

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
Carfentanyl
Diphenoxylate
Fentanyl
Methadone
Morphine
Oxycodone
Propoxyphene

Sulfonylureas
Acetohexamide
Chlorpropamide
Glimepiride
Glipizide
Glyburide
Tolazamide
Tolbutamid

SPECIFIC PHYSICAL FINDINGS:

1. Mental status.
2. Mental health issues, Possible Suicide, Possible Drug Abuse?
3. Airway (LEMON) and Respiratory assessment.
4. Consider "PACED" (Propranolol, Anticholinesterase, Calcium Channel Blocker, Ethanol, Digoxin) for toxin patients exhibiting bradycardia.
5. Physical Exam and vitals (SpO2, EtCO2, ECG, NIBP, Temperature).

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. If inadequate air exchange, initiate and maintain mechanical ventilation with 100% oxygen.
3. Obtain large bore IV access above the level of the diaphragm with saline lock or balanced fluid.
4. Draw bloods for laboratory analysis, perform laboratory analysis if able.
5. Assure ECG, EtCO2, NIBP, and SpO2 monitor continuously.
6. Determine serum glucose level with Glucometer; if glucose < 72 mg/dl (4 mmol/l), administer Dextrose.
7. Treat any dysrhythmias per appropriate Guideline.
8. Consider Ondansetron for nausea, vomiting, or prophylaxis
9. Physician consult for further care, patient referral, or patient disposition.
10. 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 ARRHYTHMIA.
11. If seizing:
    - Go to SEIZURE.
12. 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 and unable to maintain oxygenation, administer Flumazenil.
13. 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.
14. If skin or eye contamination:
    - Assure personal safety.
    - Remove contaminated clothes.

- Irrigate with water or normal saline.

15. If Cholinergic Poisoning (Organo-Phosphate Insecticides, Sarin Gas, VX Gas)
    - Atropine as required until muscarinic symptoms reverse.
    - Manage Airway, Advanced Airway with decreasing GCS, Suction as needed.
    - If seizing, go to SEIZURE.
16. 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*
17. 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).
18. Calcium Channel Blocker & Beta Blocker OD:
    - If Bradycardia, GO TO BRADYCARDIA.
    - Calcium Chloride, if known Calcium Channel Blocker OD.
    - Glucagon (adults only).
    - 10-20ml/kg fluid challenge balanced fluid.
    - Transcutaneous or Intravenous Pacing as needed.
    - If hypotension is persistent treat per SHOCK.
19. Cocaine, Methamphetamine, GHB, MDMA:
    - GHB
        - Be prepared for respiratory depression and/or arrest – early advanced airway and ventilation 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 102^0 F (39^0C) or greater.
        - Be prepared for seizures – treat aggressively.
        - Consider urinary catheter placement for monitoring and potential rhabdomyolysis.
    - Cocaine/Methamphetamine:
        - 100% O_2 and airway management via methodology to maintain SpO2 above 95%.
        - Consider Midazolam or Lorazepam to mitigate increased metabolic and cardiac activity.
        - If chest pain – GO TO CHEST PAIN/ACUTE CORONARY SYNDROMES.
20. Beta Blocker
    - Epinephrine Infusion.
    - Glucagon.
    - Gastric decontamination.
    - Benzodiazepines (in patients with seizures).

- Insulin boluses, Dextrose if needed to maintain BGL.
- Cardiac pacing/cardiopulmonary resuscitation.
- Extracorporeal membrane oxygenation (ECMO) if unable to maintain cardiac function.

21. Envenomation:
    - Assure Safety, beware that the keeping of venomous exotic snakes, insects, and marine life has increased dramatically in certain socio-economic groups.
        - Back away and exit any location with an unrestrained potentially venomous animal present until safety can be assured.
    - Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    - Obtain large bore IV above the level of the diaphragm with saline lock or balanced fluid.
    - Draw bloods for laboratory and perform laboratory analysis if able.
    - 20ml/kg fluid bolus over 3-5 minutes for MAP less than 65 mmHg.
        - If fluids are ineffective after 40 ml/kg total dose, consider epinephrine infusion
    - Cardiovascular support per SHOCK.
    - If Anaphylactic – ANAPHYLASIS.
    - Assure ECG, NIBP, SpO2, EtCO2 monitor continuously and obtain 12 lead ECG.
    - If injection point is in an extremity, keep extremity below heart.
    - Remove all jewelry.
    - Define an area above envenomation and measure extremity circumference every 15 minutes.
    - Australian pressure immobilization technique for elapid venoms.
        - This technique has been shown to be helpful in delaying systemic absorption of elapid venoms.
        - An elastic compress (i.e., Ace wrap, crepe bandage, etc....) 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 ligamentous sprain immobilization.
        - Then, the extremity is splinted and kept at or below heart level.
    - 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.
        - Transport to antivenom available facility if possible.
    - Ketamine for pain and ventilatory sedation support.
    - Identify snake, scorpion, or marine animal if possible; remember that even a dead animal may reflexively bite – DO NOT HANDLE THE ANIMAL.
    - Incisions are not helpful, nor are the use of mechanical suction devices.
    - Avoid cooling measures and ice application, they have been associated with increased necrotic complications.

RESPIRATORY CONDITIONS

PURPOSE OF GUIDELINE:
In many situations, providers must manage patients with respiratory conditions for extended time periods prior to referral or transfer or the patient. The following Guideline 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 (ECG, NIBP, EtCO2, SpO2, Temperature) and EWS.
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 RUSH exam and BLUE Protocol.
10. Lab values and interpretation

TREATMENT:
1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Use pulse oximeter and $EtCO_2$, if available.
3. IV or IO, large bore, Balanced Fluid per SHOCK, draw bloods for laboratory, and perform laboratory analysis.
4. Assure ECG, NIBP, EtCO2, SpO2 monitor continuously and obtain 12 lead ECG when possible.
5. Treat underlying cause, as follows:
   5.1. Upper Airway (croup, epiglottis, anaphylaxis, foreign body).
      5.1.1. Consider need for early advanced airway intervention and possible obstructed airway intervention.
      5.1.2. Treat anaphylaxis per ANAPHYLAXIS, if appropriate.
      5.1.3. If audible strider at rest, Epinephrine via nebulizer.
      5.1.4. If Epinephrine is given the patient must be watched closely for 3-4 hours as

rebound distress can occur.

5.1.5. Consider Dexamethasone for croup following Epinephrine.

5.2. Pulmonary Edema from Congestive Heart Failure, (not secondary to HAPE):

5.2.1. Sit patient upright, if possible.

5.2.2. Use CPAP or BiPAP for first line ventilatory support.

5.2.3. If MAP is less than 70 mm/Hg:

5.2.3.1. Treat possible cardiogenic shock (See SHOCK).

5.2.4. If MAP is greater than 70 mm/Hg:

5.2.4.1. Initial NTG SL, then NTG IV.

5.3. Asthma/COPD:

5.3.1. Use CPAP or BiPAP 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.

5.3.2. Albuterol & Ipratropium; may repeat as needed until respiratory distress resolves.

5.3.3. Magnesium for the asthma patient, nonresponsive to Albuterol.

5.3.4. 20ml/kg IV fluid bolus for preload impingement secondary to mechanical ventilation and/or air stacking.

5.3.5. If asthma patient is deteriorating and non-responsive to other treatments, give Epinephrine.

5.3.5.1. Give adrenaline with caution to anyone with cardiac disease or hypertension.

5.3.5.2. In life threatening anaphylaxis, the benefit of adrenaline will outweigh the risks.

5.3.6. Consider Hydrocortisone

5.3.7. If patient non-responsive to interventions, endotracheal intubation with pharmaceuticals and ventilate with an I:E ration 1:5 to start and 4-6 ml/kg IBW volume.

5.4. Tension Pneumothorax and/or Hemothorax:

5.4.1. Initial needle decompression at second intercostal space and mid-clavicular line.

5.4.2. Further decompression may be necessary due to catheter plug, swelling, or valve failure; place further needles lateral to initial decompression site.

5.4.3. If two needle decompressions are ineffective, proceed to SIMPLE THORACOTOMY and CHEST TUBE THORACOSTOMY.

5.5. Unable to adequately ventilate and/or oxygenate patient:

5.5.1. Unprotected airway with decreasing level of oxygenation, start NIV.

5.5.2. Consider potential base cause (i.e., pneumonia, sepsis, bronchospasm, etc.).

5.5.3. Consider Antibiotic Therapy.

5.5.4. If patient ventilatory effort becomes ineffective - See ENDOTRACHEAL INTUBATION WITH PARALYTICS.

5.5.5. Continued ventilator or oxygenation difficulties:

5.5.5.1. Consider alternative ventilator strategy.

5.5.5.2. Consider rate, volume, I:E ratio, PEEP settings.

5.5.5.3. Consider positioning (i.e., prone position ventilation).

5.5.5.4. Consider Dexamethasone if COVID suspected.

5.5.5.5. Support circulatory system and consider heart rate may be elevated significantly with hypoxia over a long period, consider the tachycardia is likely hypoxia based.
5.5.5.6. Consider fluid bolus for preload impingement secondary to mechanical ventilation and/or air stacking.

PEDATRIC CONSIDERATIONS:

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

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SEDATION

The intent of this guideline is to provide guidance and process for the two most common sedation circumstances in the emergency medical environment, sedation for mechanical ventilation and procedural sedation. Wherever possible monotherapeutic agents are favored for sedation administered by non-anesthesiology professionals primarily due to predictability, simplicity in titration, and enhanced safety margins compared to using multiple drugs concurrently.

Procedural sedation involves administering sedative, anxiolytic, and/or analgesic medications to facilitate the safe completion of procedures that a fully conscious patient cannot tolerate. The appropriate sedation level depends on the anticipated degree of pain, anxiety, and the need for the patient to remain still. The most severe complication is respiratory failure due to hypoventilation or airway obstruction, often resulting from deeper sedation than intended. A trained healthcare provider should conduct a comprehensive medical evaluation before the procedure, including an assessment of airway anatomy and a history of airway anomalies. This evaluation also guides the selection of medications to minimize risk during procedural sedation.

Sedation for mechanical ventilation involves administering sedative, anxiolytic, and/or analgesic medications to facilitate the physiologic state and compliance required for effective mechanical ventilation in a critically ill patient.

<u>Sedation for Mechanical Ventilation in the Intubated Patient</u>:

1. Assure ECG, NIBP, SpO2, EtCO2, and temperature monitoring is continuous and recorded every 5 minutes while patient is under sedation.
   - 1.1. Set monitor to repeat vitals every 5 minutes at a minimum, and if possible activate communication to patient care record for population of the vitals from monitor.
   - 1.2. If the monitor utilized, does not have a temperature feature, obtain a manual temperature every ten minutes and record in patient pare record.
2. Assure endotracheal tube is secured and ventilator settings are appropriate for the patient.
3. Sedation with Ketamine.
   - 3.1. Ketamine provides sedation, amnesia, and analgesia with a lower risk of respiratory depression. This agent is administered intravenously over one minute in unresponsive patients and over three minutes in responsive patients.
   - 3.2. In the responsive patient, it is good practice to turn bright lights in the patient's eyes to dim during induction, as well as repeatedly ask the patient during induction the question: "Tell me about the best day you ever had".
     - 3.2.1. Ketamine has a significant role in therapeutic approaches like Ketamine-Assisted Psychotherapy (KAP) and Ketamine Meditation; as a result, during induction with Ketamine, one should guide the patient's consciousness toward a pleasant experience, rather than risk being self-guided to a more unpleasant experience.
   - 3.3. Patients with a history of ketamine hypersensitivity resulting in anaphylaxis should not be administered ketamine; caution should be used in pregnant patients and patients with uncontrolled hypertensive crisis.
   - 3.4. If unable to utilize Ketamine, due to potential for adverse physiological complication,

Propofol may be utilized. Caution is indicated, as Propofol does not provide analgesia and is associated with significant adverse effects, including bradycardia, hypotension, and hypertriglyceridemia.

4. If the patient cannot be managed with sedation utilizing ketamine, document neurologic findings, ventilator non-compliance, and status prior the addition of a long term paralytic.
   4.1. Assure patient is adequately oxygenated, quantitative waveform capnography reading appropriately, suction has been utilized to clear tube, and the endotracheal tube is in place and has not become dislodged or plugged.
5. Administer Rocuronium, to maintain paralysis, if patient is fighting ventilation and ventilation compliance cannot be achieved.
   5.1. Refrain from administration until necessary due to EtCO2 waveform indicating patient ventilatory effort or signs of gross motor movement not managed with sedation.
6. Rocuronium Considerations:
   6.1. Duration of action is 30-90 minutes; it may have longer duration in hyperperfused patient.
   6.2. Prolonged excretion should be anticipated in renal or hepatic failure patients.
   6.3. As with any paralytic, Rocuronium has no effect on consciousness or pain; patients should be sedated, and pain control management should be utilized.
7. Notify receiving physician/receiving facility of long-acting paralytic use.

<u>Procedural Sedation for other than intubation</u>:

1. If endotracheal intubation – Go to INTUBATION WITH RAPID SEQUENCE INDUCTION.
2. Identify and document the reason for procedural sedation.
3. Assure ECG, NIBP, SpO2, EtCO2, and temperature monitoring is continuous and recorded every 5 minutes while patient is under sedation.
   3.1 Set monitor to repeat vitals every 5 minutes at a minimum, and if possible activate communication to patient care record for population of the vitals from monitor.
   3.2 If the monitor utilized, does not have a temperature feature, obtain a manual temperature every ten minutes and record in patient pare record.
4. Assure advanced airway, ventilation, and oxygen delivery equipment is present and immediately available.
5. Assure a large bore IV access has been obtained, above the level of the diaphragm, and a balanced solution is set at to keep open rate initially.
   5.1 If there is a predicted MAP decrease with sedation, consider improving patient preload prior to sedation with IV fluid bolus of 10ml/kg.
   5.2 If the patient experiences hypotension during sedation, IV Fluid bolus of 10ml/kg over 3-5 minutes; if hypotension persists – Go to SHOCK.
6. Select sedation agent
   6.1 Ketamine is the preferred agent.
      6.1.1 Identify whether the procedure will require disassociation or sedation.
      6.1.2 Ketamine provides sedation, amnesia, and analgesia with a lower risk of respiratory depression. This agent is administered intravenously over one minute in unresponsive patients and over three minutes in responsive patients.

6.1.3 In the responsive patient, it is good practice to turn bright lights in the patient's eyes to dim during induction, as well as repeatedly ask the patient during induction the question: "Tell me about the best day you ever had".

6.1.3.1 Ketamine has a significant role in therapeutic approaches like Ketamine-Assisted Psychotherapy (KAP) and Ketamine Meditation, as a result, during induction with Ketamine.

6.1.3.2 One should guide the patient's consciousness toward a pleasant experience, rather than risk being self-guided to a more unpleasant experience.

6.2 Propofol may be utilized.

6.2.1 Propofol should be considered a backup to Ketamine and used when it is not possible to utilize Ketamine.

6.2.2 Propofol does not provide analgesia, thus an analgesic agent may be required.

6.2.3 Caution is indicated, as Propofol is associated with significant adverse effects, including bradycardia, hypotension, and hypertriglyceridemia.

7. Prepare sedation agent and begin induction.
8. In the prehospital environment, "bringing the patient out of sedation" may not be required, rather allowing the patient to continue during transport or turnover, in a sedated state is acceptable and may be advantageous to the patient.

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SEIZURES

INITIAL INTERVENTION:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
   - Do Not force teeth apart.
   - Nasopharyngeal airways are useful and well tolerated.
2. Consider possible alternative seizure causations.

TREATMENT:

1. If seizure has persisted, more than 5 minutes, or if repetitive:
   - 1.1. Obtain large bore IV access above the level of the diaphragm with saline lock or balanced fluid.
   - 1.2. Draw blood for laboratory analysis (including electrolytes), perform laboratory analyses if able and determine serum glucose level.
   - 1.3. Assure ECG, NIBP, EtCO2, SpO2 monitor continuously, and obtain 12 lead ECG.
   - 1.4. Administer Dextrose, if hypoglycemic, HYPOGLYCEMIA/HYPERGLYCEMIA.
   - 1.5. Midazolam or Lorazepam for seizure control.
   - 1.6. If seizure persists, obtain blood chemistry
     - 1.6.1. If acute onset Hyponatremia, administer Hypertonic Saline to raise acute onset Hyponatremia patient above seizure threshold (approximately Na 110).
2. If seizure persists despite maximum therapy and/or history of status epilepticus:
   - 2.1. Levetiracetam
   - 2.2. Phenytoin

OTHER CONSIDERATIONS:

1. Physician consult for further care and advise on transport to neurological intensive care facility.
2. Be prepared to manage respiratory insufficiency.
3. 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.
4. Seizure activity without end, although minor in nature, should be treated under this Guideline; in addition, seizure patients with limited motor seizure history or focal seizure history may have continuous activity.
5. Causes of status epilepticus can include: Fever/Infection, Med Change, Metabolic, Cerebrovascular Disease, ETOH/Drugs.
6. Consider non-convulsive/minimally convulsive status in unexplained coma and history of seizures.
7. Seizures that self-terminate in a known epileptic may not require treatment or transport.
8. Only 25% of status epilepticus have epilepsy.
9. Seizures may be a sign of cerebral hypoxia from cardiac arrest.
10. Seizures may be caused by dysrhythmias.
11. Seizures may be caused by head trauma or central neurologic injury.
12. 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. Indications may include, but are not limited to the following:

1. Mean arterial pressure less than 65 mmHg.
2. EtCO2 trending downward to less than 25 mmHg with decreasing MAP.
3. Shock Index (cardiac rate divided by the systolic blood pressure = greater than 1 assume shock present)
4. Early Warning Score (greater than 6 is a patient at risk of death and/or intensive care admission) which includes hypotension.

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.
    - 1.1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    - 1.2. Avoid hyperventilation, generally ventilate at every 6 seconds with approximately 6-8 ml/kg of predicted body weight volume without PEEP.
    - 1.3. With pre-existing metabolic acidosis documented, ventilatory rates may be increased to manage that pre-existing ventilatory compensation issue.
    - 1.4. STOP hemorrhage if present.
    - 1.5. Obtain large bore IV above the level of the diaphragm with saline lock or balanced fluid; establish second IV access as time permits.
    - 1.6. Draw bloods for laboratory analysis and type/cross and perform laboratory analysis if able.
    - 1.7. Ultrasound assessment (RUSH exam).
    - 1.8. If Hemorrhage is NOT suspected:
        - 1.8.1. Administer 20ml/kg boluses of balanced fluid until patient vital signs normalize, IVC is without greater than 50% collapse, urine output is 1-2 ml/kg/hr and/or shock index is 0.8 or less.
    - 1.9. If Hemorrhage IS suspected:
        - 1.9.1. 10 ml/kg bolus Whole Blood (or Packed Red Blood Cells).
            - 1.9.1.1. Repeat as necessary to hemoglobin greater than 10 g/dL and/or MAP 50 mmHg.
            - 1.9.1.2. Calcium Chloride administered after two units of blood.
        - 1.9.2. Manage patient using permissive hypotension concepts:
            - 1.9.2.1. If patient systolic pressure is at or greater than MAP of 50 mmHg, obtain vitals every 5 minutes, consider additional assessment (with diagnostic tools as available) and be prepared to intervene.
            - 1.9.2.2. If patient systolic pressure is less than a MAP of 50 mmHg, begin cautious fluid resuscitation with balanced fluid in 20ml/kg boluses, observing vitals continuously to prevent pressure rise above MAP of 50 mmHg, once reached fluids should be to keep open until MAP less than 50 mmHg.
        - 1.9.3. Use ultrasound RUSH exam to assist with fluid resuscitation, a flat IVC being indicative of additional fluid required and RUSH exam to identify potential

volume loss or free fluid in thorax.

1.9.4. 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 GUIDELINES; Vitals and consider etiology of the event.
   - Obtain large boar IV above the level of the diaphragm with saline lock or balanced fluid.
   - Draw blood for laboratory analysis and type/cross, perform laboratory analysis, if able.
   - Establish second vascular access as time permits.
   - Ultrasound assessment (RUSH).
   - For anaphylaxis – GO TO ANAPHYLAXIS.
   - In Suspected Septic Shock Patients:
     - If patient is at or greater than MAP of 65 mmHg, 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.
       - Utilize EtCO2 PLR or ultrasound of IVC to assist with fluid resuscitation; an IVC collapsing greater than 50% is indicative of fluid loss and indicates fluid resuscitation should begin.
       - 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 is less than a MAP of 65 mmHg, 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 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 40 ml/kg fluid, administer vasopressor agent infusion titrated to a MAP of 70 mmHg.
       - Consider early use of IV presser agent infusion following initial hydration 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. Assure airway and assure oxygenation.
   b. Tension Pneumothorax – *needle chest decompression immediately*, follow CHEST

TRAUMA.

c. Tamponade/Cardiac Effusion - 20ml/kg fluid bolus; follow PERICARDIOCENTESIS.
   i. CT/CE Patients are very preload dependent - IV fluids usually help improve MAP.
   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 5-10ml/kg ideal body weight of volume.
   iii. Transport and consult for possible direct to operating room disposition.
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 do not 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 blood for laboratory analysis and type/cross, perform laboratory analysis, if able.
   v. Establish second vascular access as time permits.
   vi. Ultrasound assessment (RUSH, FOCUS, BLUE).
   vii. Transport and/or consider Consult for Thrombolytic Therapy
   viii. 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 GUIDELINES.
   b. Initiate IV BALANCED FLUID To Keep Open, draw blood for laboratory analysis, perform laboratory analysis, if able.
      i. If hypotensive, consider 250 ml fluid boluses every 5 minutes until a MAP of 65 mmHg is reached (Assess IVC and FOCUS after each bolus for potential fluid overload, avoid plethoric IVC and/or dilated myocardium).
      ii. If MAP less than 65 mmHg - Consider Dopamine or Norepinephrine infusion.
      iii. If MAP less than 60 mmHg and FOCUS exam shows decreased contractility – Dobutamine.

c. Assure ECG, NIBP, SpO2, and EtCO2 monitored continuously.
d. Obtain 12 Lead ECG.
e. Treat dysrhythmias with appropriate guidelines.
f. Ultrasound assessment (FOCUS).
g. If signs of severe hypoventilation occur:
    i. CPAP or BiPAP and consider advanced airway placement.
    ii. Intubated patients with severe pulmonary congestion require PEEP to maintain oxygenation status, assure PEEP does not reduce MAP.
    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, which increases systemic blood pressure without reaching normotension (normal mean blood pressures). The goal blood pressure for these patients is a mean arterial pressure of 45-50 mmHg. 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 extremely aggressive with fluid resuscitation to normalize values. Current studies have found benefits 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 MAP pressure of greater than 50 mmHg. 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:

Suddenly, 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. Addison patients who report they are in crisis should be believed.
Treatment: Hydrocortisone IVP, Shock Guideline, and consultation.

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.
7. Obtain imaging as recommended.

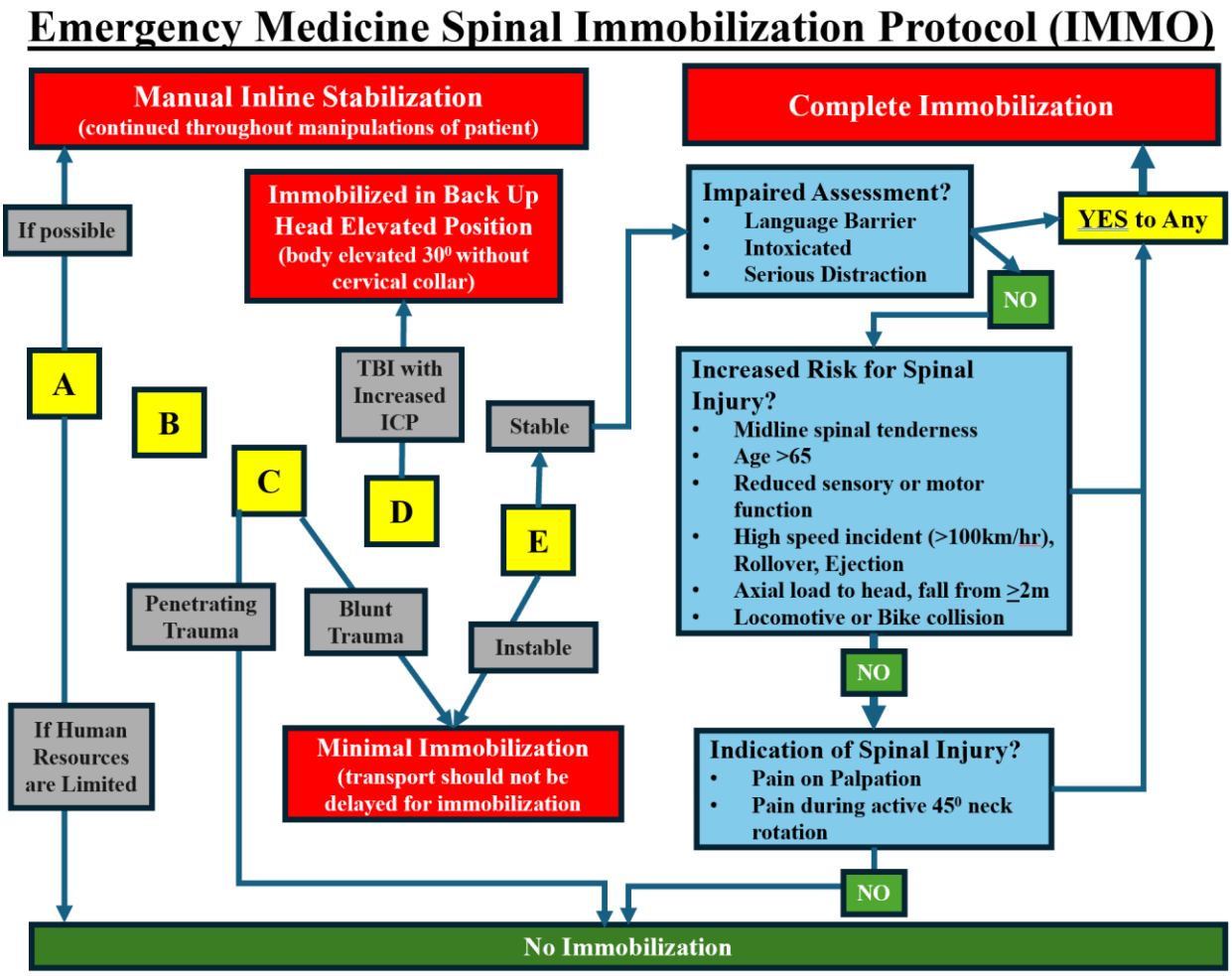
TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
2. Utilize the Emergency Medicine Spinal Immobilization Protocol (IMMO) to identify patients requiring spinal immobilization.
    2.1. If necessary, 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.
3. Establish large bore IV or IO line, if patient is hypotensive and without other injuries, follow SHOCK for distributive shock.
4. Draw blood for laboratory analysis, perform laboratory analysis.
5. 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.
    5.1. Continue fluids at 500-1000 ml/hour, if no signs of pulmonary edema.
6. If with patient greater than 2 hours, measure and record all urine output.
7. Physician consult for further care, transfer, or patient disposition.

SPECIFIC PRECAUTIONS AND CONSIDERATIONS:

1. Vomiting should be expected in head injury patients; therefore, if immobilization is required, 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.

Emergency Medicine Spinal Immobilization Protocol (IMMO):



TRANSPORT

Patient transport modality is a complex issue. The basic question of “how much time makes a difference?” is not an easy answer, it depends on the patient condition, distance, and the ability to stabilize the patient prehospitally. Through the decades, EMS practice has frequently been based upon the concept of a so-called "Golden Hour." However, recent studies have shown that there is little evidence to either support or refute the concept of a "Golden Hour.". Intuitively, some emergencies may benefit from rapid response and transport; however, most probably will not. With this in mind, we must weigh the benefits of lights and siren response (about 3 minutes faster), which appear minimal; with the potential risks (accidents, poor ability to perform interventions, etc.…), which appear to be significant.

The following questions can help you decide on emergent transport for the patient:

1. Is your patient going to die?
    1.1. What is the level of time-sensitivity for the patient? A question frequently worded as “With the patient die in the next hour?”. This question is asking for a judgment on whether the patient requires a specific, time-sensitive intervention that cannot be provided in the prehospital setting.
    1.2. Is the patient in need of cardiac catheterization and rapid access to the cath lab? On the other side of the issue, a patient with an Early Warning Score of less than 5, is unlikely to die today.
2. Is the patient stable or will the patient be stable in the next few minutes?
    2.1. Along the same lines of time-sensitivity is patient stability. This question represents the balance of the first question and focuses on the patient’s presentation rather than the anticipated hospital treatment.
    2.2. What is the patient’s Early Warning Score? Does the patient have a high score and are currently unstable? Or was the patient a high score and now has a score after care of 5 or less?
    2.3. Clearly the patient with an uncontrolled critical injury, that has not responded to treatment, may benefit from rapid transport.
3. Where are you going?
    3.1. Destination decision has a lot to do with transport mode as well. Transporting to hospitals in the center of an urban area may require RLS transport more frequently due to increased traffic, whereas an outlying hospital in a suburban or rural area, or one right off a highway, may be better suited to non-emergent transport.
4. Is your decision safe?
    4.1. Safety, of you, your partner, your patient and the public, should be the highest priority when deciding emergent or nonemergent transport mode.

4.2. The data is clear that drivers will make atypical decisions when they suddenly see flashing lights behind them; these unpredictable behaviors increase the possibility of a collision when transporting in emergent mode.
4.3. When presented with a no stable patient, nonemergent transport should be chosen.

5. What is the potential benefit?
5.1. It was often thought, and unfortunately still taught, that utilizing red lights and siren expedites transport to the hospital. The reality of multiple studies provides the conclusion that emergent transport to the hospital saves a minimal amount of time in most cases.
5.2. While emergent transport results in negligible time savings for many transports there are cases when it can prove beneficial. As an example, red lights and siren can assist in moving through a crowded intersection during the morning or afternoon commute, in addition, an ambulance may be able to more effectively get through traffic backing up from an accident when in emergent mode.

References:

1. Bledsoe, Bryan DO. EMS Myth #4: Lights and sirens save a significant amount of travel time and lives. EMS World, December 2003. https://www.hmpgloballearningnetwork.com/site/emsworld/article/10325079/ems-myth-4-lights-and-sirens-save-significant-amount-travel-time-and-lives
2. Ho J, Lindquist M. Time saved with the use of emergency warning lights and siren while responding to requests for emergency medical aid in a rural environment. Prehosp Emerg Care. 2001 Apr-Jun;5(2):159-62. doi: 10.1080/10903120190940056. PMID: 11339726.
3. Lickiss, Patrick. 5 questions to guide EMS transport decisions. EMS1, March 24, 2017. https://www.ems1.com/patient-assessment/articles/5-questions-to-guide-ems-transport-decisions-G7ZAGZSAyAflkr4O/

TRAUMA – POLYTRAUMA

This guideline is to serve as the basis of evaluation and management of polytrauma patients. The other trauma related guidelines address specific injuries or events; if necessary, combine guidelines for the polytrauma patient.

Emphasis at scene should be to perform rapid primary survey and begin interventions with the goal of no more than 15 minutes until transport is initiated. For inter-facility trauma patient transfer, the emphasis should still be minimizing time at the referral facility, as these patients may have a time-dependent injury.

INFORMATION/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 SBAR for patient if not first on scene.
3. Obtain information concerning past medical history, allergies, medications and last meal, if possible.
4. Obtain copies of record, imaging, and laboratory studies if patient transfer situations.
5. If ordering labs, include type and cross if possible.
6. Obtain imaging as recommended.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    1.1 Protect patient from the environment and prevent hypothermia.
        2. Stop hemorrhage/bleeding.
    2.1 Direct pressure.
    2.2 Hemostatic agents, wound injected hemostatic agents, and/or wound packing.
    2.3 Immobilization.
    2.4 Use extremity tourniquet early with significant bleeding uncontrolled with direct pressure on the extremity wound.
    2.5 Use junctional tourniquet with significant bleeding that is not controlled in or near a junctional site.
3. Facilitate early packaging and transport to trauma facility with interventions enroute, unless airway management, patient access, or patient extrication is required.
4. If Chest Trauma is present, go to CHEST TRAUMA.
5. Obtain large bore IV access (x2 if possible), above the level of the diaphragm with saline lock or balanced fluid.
6. Draw blood for laboratory analysis, and if able, perform laboratory analysis.
7. If shock symptoms are present – go to SHOCK.
    7.1 Consider early blood administration with signs of hemorrhagic shock and/or ultrasound findings positive for potential hemorrhage.
8. Ultrasound RUSH Protocol to identify potential life-threatening injury.

9. If traumatic brain injury present – go to TRAUMATIC BRAIN INJURY.
10. If spinal injury possible – go to SPINAL INJURY.
11. If significant wounds are present – go to WOUND CARE.
12. Orthopedic extremity injuries are typically not life threatening, assure hemorrhage is controlled, place into anatomical position for transport, protect fractures from displacement and immobilize as able.
13. If the patient has a sudden loss of pulse – go to TRAUMATIC CARDIAC ARREST.

ADDITIONAL TREATMENT CONSIDERATIONS:

1. Continually reassess patient for changes or new findings.
2. Record vital signs (ECG, NIBP, SpO2, EtCO2) at least every 5 minutes if patient is unstable and every 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 medications – follow PAIN MANAGEMENT.
6. Transport per trauma system rules or physician consult for further care and patient transfer request.

TRAUMA – CRUSH INJURY

This guideline is meant to provide personnel who encounter crush syndrome in prehospital and austere environments with evidence-based guidance for how to manage the various aspects of crush injury care and monitoring.

Recommendations follow a "minimum," "better," "best" format that provides alternate or improvised methods when optimal hospital options are unavailable. Crush syndrome is a life and limb-threatening condition that can occur because of entrapment of the extremities accompanied by extensive damage of a large muscle mass. It can develop following as little as 1 hour of entrapment. Effective medical care is required to reduce the risk of kidney damage, cardiac arrhythmia, and death.

Crush syndrome is a reperfusion injury that leads to traumatic rhabdomyolysis. Reperfusion results in the release of muscle cell components, including myoglobin and potassium that can be lethal. Myoglobin release results in rhabdomyolysis, with risk of kidney damage. Kidney damage leads to hyperkalemia and eventually cardiac arrhythmias. Calcium is taken up by injured muscle cells and this can cause hypocalcemia, contributing to cardiac arrhythmias. The risks are increased with large areas of tissue crushed (one or both lower extremities) and the length of time the casualty is pinned prior to extrication.

Emphasis at scene should be to perform rapid primary survey and begin interventions with the goal of no more than 15 minutes until transport is initiated. For inter-facility trauma patient transfer, the emphasis should still be minimizing time at the referral facility, as these patients may have a time-dependent injury.

INFORMATION/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 SBAR for patient if not first on scene.
3. Obtain information concerning past medical history, allergies, medications and last meal, if possible.
4. Obtain copies of record, imaging, and laboratory studies if patient transfer situations.
5. If ordering labs, include type and cross if possible.
6. Ultrasound assessment and obtain imaging as recommended.

TREATMENT:

1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE GUIDELINES.
    1.1 Protect patient from the environment and prevent hypothermia.
2. Stop hemorrhage/bleeding.
    2.1 Direct pressure.
    2.2 Hemostatic agents, wound injected hemostatic agents, and/or wound packing.

2.3 Immobilization.
2.4 Use extremity tourniquet early with significant bleeding uncontrolled with direct pressure on the extremity wound.
2.5 Use junctional tourniquet with significant bleeding that is not controlled in or near a junctional site.

3. Facilitate early packaging and transport to trauma facility with interventions enroute, unless airway management, patient access, or patient extrication is required.
4. If Chest Trauma is present, go to CHEST TRAUMA.
5. Obtain large bore IV access (x2 if possible), above the level of the diaphragm with saline lock or balanced fluid.
6. Draw blood for laboratory analysis, and if able, perform laboratory analysis.
7. Correct hypovolemia to prevent myoglobin injury to the kidneys and dilute toxic concentrations of potassium to reduce risk of kidney damage and lethal arrhythmias.
   7.1 2 Liter initial IV bolus of crystalloid.
   7.2 Then, rate of 1L/h, adjust to urine output goal of >100–200mL/hr.
   7.3 Monitor for fluid overload.
8. If shock symptoms are present – go to SHOCK.
   5.1 Consider early blood administration with signs of hemorrhagic shock and/or ultrasound findings positive for potential hemorrhage.
   5.2 The principles of hypotensive resuscitation according to TCCC DO NOT apply in the setting of extremity crush injury requiring extrication.
9. Ultrasound RUSH Protocol to identify potential life-threatening injury and BLUE protocol to identify any possible fluid overload.
10. Place urinary catheter and monitor urine output.
    10.1 If unable to obtain urinary catheter, capture urine in premade or improvised graduated cylinder (i.e., urinal, emesis bag, etc....).
    10.2 Urinary output goal (UOP) of 100–200mL/hr; the fluid rate should be adjusted to maintain this level of UOP.
11. If potassium level is >5.5mEq/L or there are cardiac arrhythmias:
    1.1 Administer calcium chloride IV over 2–3 minutes; onset of effect is immediate, and duration of effect is 30–60 minutes.
    1.2 Give 10 units of regular insulin followed immediately by 50mL of D50; onset of effect is 20 minutes, and duration of action is 4–6 hours.
    1.3 Administer 12mL (10mg) of albuterol sulfate inhalation solution, 0.083% (2.5mg/3mL) via nebulizer, onset of effect is 30 minutes, and duration of action is 2 hours.
12. Tourniquets: Consider tourniquet placement for crush injury before extrication if the length of entrapment exceeds 2 hours and crush injury protocol cannot be initiated immediately
    12.1 Apply two tourniquets side by side and proximal to the injury immediately before extrication
13. Consider Ketamine for disassociation for the patient during the extrication and treatment process.
14. If traumatic brain injury present – go to TRAUMATIC BRAIN INJURY.
15. If spinal injury possible – go to SPINAL INJURY.
16. If significant wounds are present – go to WOUND CARE.

17. Orthopedic extremity injuries are typically not life threatening, assure hemorrhage is controlled, place into anatomical position for transport, protect fractures from displacement and immobilize as able.
18. If the patient has a sudden loss of pulse – go to TRAUMATIC CARDIAC ARREST.

ADDITIONAL TREATMENT CONSIDERATIONS:

1. Transport per trauma system rules or physician consult for further care, transfer, and patient disposition.
2. Continually reassess patient for changes or new findings.
3. Record vital signs (ECG, NIBP, SpO2, EtCO2) at least every 5 minutes if patient is unstable and every 15 minutes if patient is stable.
4. Monitor and document response to all interventions.
5. Perform and document serial neurologic, cardiac, respiratory, and abdominal exams.
6. All trauma patients with significant pain who are not hypotensive may have pain medications – follow PAIN MANAGEMENT.

Reference:

1. Thomas Walters, PhD, MAJ Douglas Powell, MC, USA, SFC Andrew Penny, SO-ATP, USA, Maj Ian Stewart, MC, USAF, LTC (P) Kevin Chung, MC, USA, COL Sean Keenan, MC, USA. Col Stacy Shackelford, MC, USAF. Joint Trauma System Clinical Practice Guideline (JTS CPG) – Crush Syndrome, Publication Date: 28 December 2016.

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. Evaluation: 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 GUIDELINES.
2. If GCS less than 9 and patent airway is not present, obtain advanced airway placement and ventilation.
   - 2.1. The goal is normal ventilation, not hyperventilation.
   - 2.2. EtCO2 required, maintain EtCO2 between 35-40 mmHg during ventilation initially.
3. Protect patient from the environment and prevent hypothermia.
4. Prevent any episode of hypoxia or hypotension.
5. Use direct pressure to control bleeding wounds on head.
6. Obtain large bore IV above the level of the diaphragm with saline lock or balanced fluid.
7. Draw bloods for laboratory analysis, and if able, perform laboratory analysis.
8. Monitor vital signs, mental status, and note any changes. Document all changes in GCS.
9. If patient's MAP rises above 100 and patient exam reveals pupil dilation and/or signs of posturing, or patient has sudden and dramatic change in consciousness (i.e., patient becomes unconscious, obtunded):
   - 9.1. Perform endotracheal intubation with pharmacologic agents (or place advanced airway) if not already done.
   - 9.2. Ventilate to maintain EtCO2 35-45 mmHg with 6-8 ml/kg Ideal Body Weight and no more than 30 cmH2O ventilatory pressure.
   - 9.3. 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.
   - 9.4. If treatment or transport will exceed one hour after mannitol administration, consider placement of urinary catheter to decrease potential for bladder injury.
   - 9.5. Administer IV fluids per SHOCK; prevent hypotension during treatment and transport.
   - 9.6. If use of mannitol and/or hypertonic saline is not successful, consider hyperventilation at 20 bpm to EtCO2 of 30mmHg if decompensation continues.
     - 9.6.1. Be aware that hyperventilation may decrease cardiac output, decrease cerebral perfusion, decrease neurologically intact survival, and increase hypoxia.

9.6.2. Excessive pressure of ventilation may also increase intracranial pressure.

9.7. Transport by the most rapid means available for emergent neurosurgical intervention.

SPECIFIC PRECAUTIONS:

1. Obtain imaging and expert review of imaging as soon as possible.
2. Transport per trauma system rules and/or physician consult for further care, transfer, and/or patient disposition.
3. Patients should be aggressively fluid resuscitated and oxygenated; any episodes of hypotension or hypoxia in the TBI patient are deleterious.
4. Restlessness and/or agitation may be due to hypoxemia and/or hypoglycemia.
5. Mannitol should not be given to a patient in shock with MAP less than 60.
6. Mannitol Precautions:
   - 6.1. Anuria (due to severe renal disease), mannitol may lead to fluid overload.
   - 6.2. Severe Dehydration: mannitol may lead to over diuresis of patients.
   - 6.3. Intracranial Bleeding: mannitol may increase bleeding.
   - 6.4. Pulmonary Edema: mannitol may lead to exacerbation.
   - 6.5. Bladder injury: mannitol may lead to bladder injury if urinary catheterization is not accomplished with distended bladder.

References:

1. American College of Surgeons. BEST PRACTICES GUIDELINES - THE MANAGEMENT OF TRAUMATIC BRAIN INJURY. 2024 American College of Surgeons.
2. Susanto M, Riantri I. Optimal Dose and Concentration of Hypertonic Saline in Traumatic Brain Injury: A Systematic Review. Medeni Med J. 2022 Jun 23;37(2):203-211. doi: 10.4274/MMJ.galenos.2022.75725. PMID: 35735001; PMCID: PMC9234368.

TRAUMATIC CARDIAC ARREST

TREATMENT:

1. Confirm Cardiac Arrest - Begin Chest Compressions at 100-120/min.
2. *If medical arrest probable* – follow CARDIAC ARREST.
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 6-8 ml/kg IBW and every 6 seconds ventilation with 100% Oxygen and PEEP at 0 cmH20.
   4.1. Establish EtCO2 on airway and evaluate levels.
   4.2. Consider ending resuscitative efforts if EtCO2 is less than 10mmHg with high quality compressions and proper ventilations.
5. ECG Monitoring, if ventricular fibrillation is present, defibrillate once every 2 minutes of CPR.
6. Establish large bore Vascular Access (x 2 if able), preferably above the level of the diaphragm.
7. Hemorrhage Control:
   7.1. Direct Pressure for bleeding wounds and compression dressings; tourniquets for any extremity hemorrhage.
   7.2. Hemostatic agent used on/in wounds.
   7.3. 'O' Whole Blood or Packed Red Blood Cells at 10ml/kg boluses.
   7.4. Tranexamic Acid in balanced fluid bolus.
8. Ultrasound for immediate RUSH and Lung Exams
   8.1. If no cardiac movement on ultrasound after 10 minutes and EtCO2 less than 10mmHg, end resuscitative efforts.
   8.2. 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 – Blood administration and Simple or Chest Tube Thoracotomy.*
12. If *Cardiac Tamponade* present - 20 ml/kg Balanced Fluid Bolus, administer Blood, and initiate 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 and transport.
15. EtCO2 less than 10mmHg at 20 minutes and no cardiac movement on ultrasound – go to Death During Resuscitation

References:

1. Schober P, Giannakopoulos GF, Bulte CSE, Schwarte LA. Traumatic Cardiac Arrest-A Narrative Review. J Clin Med. 2024 Jan 5;13(2):302. doi: 10.3390/jcm13020302. PMID: 38256436; PMCID: PMC10816125.
2. Lott, Carsten et al. European Resuscitation Council Guidelines 2025 Special Circumstances in Resuscitation. Resuscitation, Volume 215, 110753

VOMITING/NAUSEA

TREATMENT:

1. Assure airway, breathing, circulation, and protection from environment.
2. Address other illnesses or injuries first.
3. Establish large bore IV above the level of the diaphragm, follow SHOCK, if necessary.
   3.1. If patient appears to be dehydrated, consider IV fluid administration.
4. Draw blood for laboratory analysis, perform laboratory analysis, if able.
5. Ultrasound assessment (RUSH).
6. Ondansetron IV.
   6.1. May repeat to a total of 12 mg.
7. All immobilized patients who will be involved in high angle extrication, air evacuation, short haul, or helicopter hoist should receive Ondansetron prior to movement.

WOUND CARE

GENERAL PRINCIPLES:

1. Wounds are rarely life threatening.
    a. Early tourniquet or junctional tourniquet for bleeding uncontrolled with direct pressure.
    b. Apply hemostatic agents to wounds early.
2. Treat all life-threatening injuries first and then treat wounds only if time permits.
3. *Goals of wound Care:*
    a. Stop blood loss.
    b. Preventing infection.
    c. Promote healing and reduce discomfort.
    d. Minimize loss of function.
4. Wound closure in the field with sutures or steri-strips is not recommended because of the risk of infection.
5. BLS may transport patients with minor wounds and who have been treated without difficulty, are comfortable, are Alert/Conscious x 4, and have an EWS of less than 5.
6. Physician consult for further care or patient disposition.

TREATMENT:

1. Shallow wounds: Injury that disrupts the skin but does not extend through the full thickness of the skin.
    1.1. Abrasions and minor, superficial burns:
        1.1.1. If transport time is greater than 2 hours, cleanse wound by washing thoroughly with soap and water.
        1.1.2. Apply non-adherent dressing and bandage.
2. Open wounds: Injury that extends through the full thickness of the skin.
    2.1. Lacerations, avulsions, amputations:
        2.1.1. Stop bleeding:
            2.1.1.1. Direct pressure.
            2.1.1.2. Hemostatic agents and wound packing.
            2.1.1.3. Consider Elevation.
            2.1.1.4. Immobilization.
            2.1.1.5. Use extremity tourniquet early with significant bleeding uncontrolled with direct pressure on the extremity wound.
            2.1.1.6. Use junctional tourniquet with significant bleeding that is not controlled in or near a junctional site.
        2.1.2. If bleeding is easily controlled and transport time is greater than 2 hours clean wound as follows:
            2.1.2.1. Remove foreign material.
            2.1.2.2. Wash skin around wound with soap and clean water.
            2.1.2.3. Consider wound closure if edges approximate adequately and patient has no issues with potential scaring.
        2.1.3. If bleeding is easily controlled, irrigate wound with clean, sterile (if possible) water or BSS (a large syringe works well).
        2.1.4. Cover with dry, sterile dressing.
        2.1.5. Large bore IV access, above the level of the diaphragm, with saline lock or balanced fluid.
        2.1.6. Draw blood for specimens and laboratory analysis, perform analysis if able.
        2.1.7. If significant blood loss or signs of shock present – go to SHOCK.

3. Impaled objects:
    3.1. Impaled objects in the extremities should be stabilized for transport or cut off and stabilized for transport.
    3.2. Removal should only be considered if the patient's impaled object cannot be effectively stabilized for packaging and/or transport and further wait time prior to transport will place patient at risk for mortality.
    3.3. The objective is to cause the least tissue damage.
    3.4. Tourniquet extremity if blood loss cannot be controlled, junctional tourniquet as necessary.
    3.5. Utilize hemostatic agents, wound packing, and/or injected hemostatic agents to control blood loss from wound(s).
    3.6. Large bore IV access, above the level of the diaphragm, with saline lock or balanced fluid.
    3.7. Draw blood for specimens and laboratory analysis, perform analysis if able.
    3.8. If signs of shock present – go to SHOCK.
4. High risk wounds: Wounds with high potential for infection.
    4.1. Bite wounds, very dirty, contaminated wounds; crushing, contused, ragged wounds, compound fractures or wounds into joints, and/or puncture wounds can be considered high risk.
        4.1.1. Stop bleeding.
        4.1.2. Remove foreign material.
        4.1.3. Wash skin around wound with soap and clean water.
        4.1.4. If bleeding is easily controlled, irrigate wound with clean, sterile water or normal saline (a large syringe works well to irrigate).
        4.1.5. Splint any wound over a joint or involving a possible fracture.
        4.1.6. Large bore IV access, above the level of the diaphragm, with saline lock or balanced fluid.
        4.1.7. Draw blood for specimens and laboratory analysis, perform analysis if able.
        4.1.8. Consider Ceftriaxone for possible infection.

<u>Wet environment</u>:
1. If evacuation may require moving the patient through a wet environment (water crossing, boating accidents) consider covering wounds with impermeable dressing.
2. Replace dressing if wound becomes wet, and re-clean wound if it becomes contaminated.

Procedural Guidelines

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/SIMPLE THORACOTOMY

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 in the field.
2. Consultation with the sending Physician should occur regarding an interfacility patient who has had a pneumothorax documented by imaging and who is being taken to altitude in an unpressurized aircraft or vehicle, and/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 and/or consider Ketamine, due to high 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 with scissors or scalpel over ribs.
7. Dissect using blunt technique through subcutaneous tissues.
8. Puncture parietal pleura over the top of the rib with clamp.
9. Insert gloved finger into incision to palpate lung (Simple Thoracotomy is now complete).
10. Place chest tube toward same side shoulder and attach to drain system and ultrasound confirmation.
11. Secure tube with towel clamps and/or extreme tapping in place.
12. Use dressing to cover incision, assuring dressing does not interfere with outflow

CRICOTHYROTOMY

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 Supraglottic Airway) and respiratory obstruction exists.
2. 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.

SURGICAL CRICOTHYROIDOTOMY

INDICATIONS

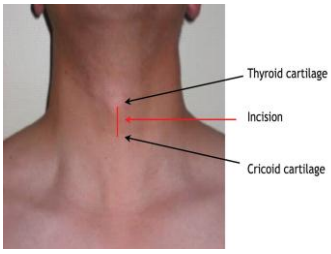
- Patient in need of airway management and provider is unable to ventilate patient.
- Inability to succeed at endotracheal intubation and patient cannot be ventilated.

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 scissors (or scalpel), 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 brain 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% O_2 administered via NRB Mask at open rate and NC at 15L or continue CPAP/BiPAP in place.
    - 3.1. Must maximize O2 by placing a nasal cannula on patient at 15 liters flow in addition to NIV or NRB mask at open rate and retain NC in place during intubation.
4. Optimize patient position.
5. Hyperoxygenate patient prior to paralytic use if possible.
6. Suction in "ready" position.
7. Primary IV or IO secured.
8. Assure ECG, SpO2, NIBP, and EtCO2 monitored continuously.
9. Prepare Equipment on CHALLENGE CHECKLIST
    - 9.1. ALWAYS Pre-Load Gum Elastic Boogie catheter with endotracheal tube.
    - 9.2. Mandatory video laryngoscopy if available.
10. Perform Time Out and briefing with:
    - 10.1. In-line immobilizer (if necessary).
    - 10.2. Monitoring (SpO2, ECG, EtCO2) tasked person.
    - 10.3. Drug administrator and dosages confirmed.

INTUBATION:

1. PERFORM CHALLENGE CHECKLIST WITH ALL COMPONENTS CHECKED
2. Administer Ketamine.
3. Administer Succinylcholine.
4. Perform endotracheal intubation.
    - 4.1. If relaxation is 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 88%) occurs, temporarily halt intubation attempt and hyperoxygenate.
6. Reattempt intubation.
    - 6.1. *If intubation is unsuccessful, after two attempts in two minutes*:
        - 6.1.1. Place Alternative Airway Device immediately and manage airway with device.
        - 6.1.2. DO NOT reattempt intubation.
    - 6.2. *Cannot intubate and cannot ventilate:*
        - 6.2.1. Perform Cricothyrotomy.
7. If bradycardia - Treat hypoxia, as the most likely cause.
8. Upon successful intubation, confirm ET tube placement by capnography and ultrasound (if

available).

8.1. Ventilate with Bag-Valve-ET (or ventilator) and 100% O_2, maintain $EtCO_2$ 35-45mmHg (30-35 mmHg with Traumatic Brain Injury).
8.2. Confirm and document tube length at teeth.
8.3. Titrate oxygen via SpO2 monitoring in post arrest patients to 95-99% SpO2, maintain ventilations at an EtCO2 range of 35-40 mmHg.
8.4. Continuous patient monitoring with EtCO2, SpO2, ECG, and NIBP.
8.5. Use capnometer in absence of capnogram.

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 90-98% and an EtCO2 of 35-45 mmHg (assist pediatric patient respirations at normal ventilation rates per age).
   1.2. For the patient with traumatic brain injury maintain a minimum MAP of 70 mmHg 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 cannot 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.
   2.1. 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:
   5.1. Duration of action 25-50 minutes, may have longer duration in hyperperfused patient.
   5.2. Prolonged excretion should be anticipated in renal or hepatic failure patients.
   5.3. 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% O_2 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% O_2 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 is 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 video laryngoscopy system, use per manufacturer's recommendations.
3. Elevate mandible with video laryngoscopy system, use per manufacturer's recommendations/
4. Introduce Gum Boogie.
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% O_2.
11. Reattempt intubation.
    11.1. *If intubation is 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 cricothyrotomy.

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 (EtC02) 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 EtC02 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% O_2.
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 cricothyrotomy.
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:

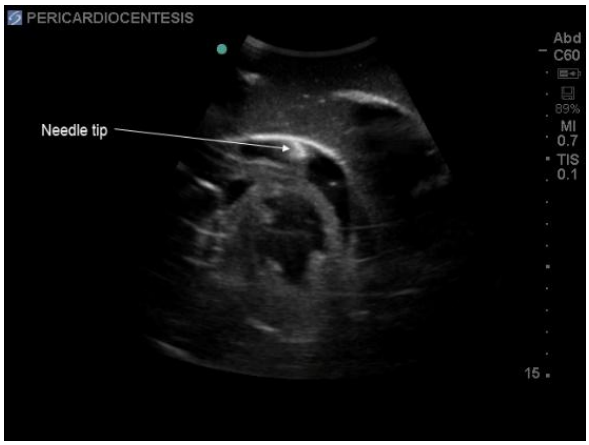
1. Symptomatic Pericardial Tamponade identified on ultrasound exam
2. Pulseless electrical activity (PEA) in the setting of penetrating trauma, refractory to other treatment or identified on ultrasound.
3. Significant instability in patient with known or strongly suspected Pericardial Tamponade.
4. Beck's 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 is 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: (2) 60mL syringes, (1) 16 or 18 gauge needle 5 inches (12 cm in length), (1) 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 is identified.



SYNCHRONIZED CARDIOVERSION

INDICATIONS:

a. 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
    a. 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's 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.

URINARY CATHETER PLACEMENT

<u>CONSENT MUST BE OBTAINED PRIOR TO PROCEDURE</u>

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 Guidelines packet has been checked against the following references for validity and science guidelines:

1. ILCOR – 2023/2025 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://tbiguidelines.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.lsuhsc.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 8th 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