الإسعاف National
الوطني Ambulance

Version 4

Emergency Medical Technician - Basic (EMT-B),
Emergency Medical Technician - Intermediate (EMT-I),
Paramedic (EMT-A),
and
Physician Providers

Patient Care Protocols
CGP134

CERTIFIED ISO 9001 · ISQ 14001 ISO 45001

Organization Accredited by Joint Commission International

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Restricted Document وثيقة محظورة

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Protocol Use Notation:

Within the Protocols the use of **GREEN** represents the expectations for the EMT Basic level provider, the use of **BLUE** represents the expectation of the EMT-I level provider, the use of **BROWN** represents the expectations for the Paramedic level provider, and the use of **RED** represents the expectations for the Physician Provider.

INTRODUCTION

The Patient Care Protocols are to be utilized only by providers with EMS level provider privileges at National Ambulance and only by those EMS providers who fulfil NA current training requirements and associated evaluations. National Ambulance educators and/or the Medical Director (MD), or authorized designee, will deliver this training.

The Patient Care Protocols are only to be utilized by NA licensed qualified providers (health care professionals) during patient care events. Providers may NOT utilize these Protocols while off duty or while working for another agency or business.

Whenever these Patient Care Protocols are utilized the clinician that takes responsibility for the patient will also assume responsibility for the patient care report (PCR) in accordance with the National Ambulance Policy for Patient Care Documentation and Patient Care record policy CGP119. These Patient Care Protocols are the National Ambulance approved primary guideline for patient care decision making in reference to medication and procedures performed by the National Ambulance healthcare professional.

The personnel utilizing these Protocols are the health care professionals in accordance within their scope of practice detailed in the NA Fitness to Practice Policy CGP203. The Patient Care Protocols are to be viewed as clinical direction for those providers, who are the hands, eyes, and ears of the Medical Director in regards to the care of patients; a provider should always consider what the Medical Director would want done with the patient they are caring for, in every circumstance.

With the above conditions, I authorize these Patient Care Protocols to be utilized by specified NA health care providers as of October 2015. For these Patient Care Protocols to be utilized by a National Ambulance provider, it requires that the provider have in their APPROVAL OF CLINICAL PRIVILEGES form on which their name and the MD's signature appear.

Medical Director

MEDICAL CONTROL AND CATERGORIZATION OF MEDICATIONS AND PROCEDURES

The Patient Care Protocols contain Tiers 0, 1, 2, and 3 drugs and procedures. This creates a level of practice privilege conferment for the provider, or delegated authority, from the Medical Director (MD), that generally follows the level of competency and experience through from initial authorization and licensing to procedural experience. (Ref. CGP 203 – Fitness to Practice)

Tier '0 - I' Medications in this category may be utilized by Basic Life Support Clinicians and above provided that have received the right DOH credentials as well as NA required privileges.

ADRENALINE 1:1,000	IBUPROFEN
ASPIRIN	METHOXYFLURANE
ENTONOX	OXYGEN
GLUCAGON	PARACETAMOL (PO)
GLUCOGEL	SALBUTAMOL
GTN (SL)	

Tier '0 - II' Medications in this category may only be utilized by Basic Life Support Clinicians who have passed IV/IO Therapy and Cardiac Arrest Course.

ADRENALINE 1:10,000 (0.1mg/1ml)	SODIUM CHLORIDE 0.9%

Tier '1' Medications in this category may be utilized by Intermediate Life Support Clinicians and above provided that have received the right DOH credentials as well as NA required privileges.

AMIODARONE	LIDOCAINE
CHLORPHENIRAMINE	NALOXONE
CLOPIDOGREL	ONDANSETRON
DEXTROSE 10%	PARACETAMOL (IV)

Tier '2 - I' Medications in this category may be utilized by advanced Life Support Clinicians and above provided that have received the right DOH credentials as well as NA required privileges.

ADENOSINE	METOCLOPRAMIDE
ATROPINE	SODIUM LACTATE
DEXAMETHASONE	TRANEXAMIC ACID
FUROSEMIDE	

Tier '2 - II' Medications in this category may be utilized by advanced Life Support Clinicians but also require pre-authorization from DOH licensed physician prior to administration.

HALOPERIDOL	MIDAZOLAM
KETAMINE	MORPHINE

Tier '3' Medications in this category may be administer under direct supervision and presence of a Physician provided that they received the right DOH Credentials as well as NA required privileges.

FENTANYL	PROPOFOL
GTN IV	ROCURONIUM
METOPROLOL	THIOPENTAL

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

<u>Tier '2' Procedures (Paramedic level)</u> may be utilized by the provider, per protocol, but require ACC Team Leader Confirmation on a recorded line.

<u>Any Tier '3' Procedures</u> can be used by physician without restriction but for Paramedic they need to call MD/designee on a recorded line for approval.

<u>Tier '0' Procedures and Diagnostics</u>:

- Oral route for medications
- 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
- Intravenous injection/infusion (EMT-B Extended Scope of Practice ONLY.
- Basic Airway Maneuvers
- Basic Airway Adjuncts
- Automatic External Defibrillator (AED)
- Manual Defibrillator
- Basic Life Support in Cardiac Arrest
- Basic First Aid
- Suctioning
- Foreign body airway obstruction management
- Bag Mask, CPAP / BIPAP Ventilation as per privileged level
- Supra Glotic airway placement
- Cervical spine immobilization
- Immobilization for Musculoskeletal injuries
- Participate in Mass Casualty Incident
- Prepare and assist with on-scene intermediate and ALS skills
- Prepares for labour and supports delivery in uncomplicated situation
- 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
- Use of non-invasive diagnostic devices to take and record vital signs
- Primary Assessment (Medical/Trauma)
- Secondary Assessment (Medical/Trauma)
- Blood glucose monitoring
- Electrocardiograph interpretation of basic rhythms - VF, VT, PEA, Asystole
- Obtain a 12 Lead Electrocardiograph (EMT-B Extended Scope of Service ONLY)
- Point of Care testing (BGL)
- Complete Patient Report Form

<u>Tier '1' Procedures and Diagnostics</u>:

- Subcutaneous injection of medication
- Intraosseous injection/infusion
- Laryngeal Mask Airway placement

- Advanced Life Support in Cardiac Arrest
- SGA airway placement
- Intubation: Oral
- Draw Peripheral blood urine and fluid specimens
- Waveform Capnography
- Prepare and assist with on-scene ALS skills
- Maintain during transport any IV medication infusions or procedures done in a medical facility
- Intranasal medication administration
- Intraosseous injection/infusion
- Intravenous injection/infusion
- Ventilator Management

Tier '2' Procedures and Diagnostics:

- Intubation: Nasal/Oral
- Needle Cricothyrotomy
- Transtracheal jet inflation
- Needle thoracotomy
- Access indwelling catheters and implanted central IV ports for medication administration
- Interpretation of 12 Lead Electrocardiograph
- Cardioversion as per privileged level
- Transcutaneous pacing as per privileged level
- Initiate and orogastric/nasogastric tube
- Prepares for labour and performs complicated emergency delivery
- Access indwelling catheters and implanted central IV ports for medication administration
- Manage patient on Mechanical Ventilator

Tier '3' Procedures:

- Emergency Blood Transfusion
- Surgical Cricothyrotomy
- Chest tube thoracostomy
- Intubation with Rapid Sequence Induction (RSI) if privileged.
- Pericardiocentesis under ultrasound guidance as per privileged level.
- Place Central line under ultrasound guidance as per privileged level.
- Place Urinary catheter
- Emergency Ultrasound examination
- Lab Value interpretation
- Place Central line under ultrasound guidance as per privileged level

GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS

There are thematic issues throughout the Patient Care Protocols; the listing includes but is not limited to those items listed below:

1. The patient history should not be obtained at the expense of the patient; life-threatening problems detected during the primary assessment must be treated first.

2. Cardiac arrest due to trauma is not treated by medical cardiac arrest Protocols – follow Traumatic Cardiac Arrest Protocol.

3. Trauma patients should be transported promptly with airway management as appropriate, control of external hemorrhage, cervical spine immobilization where indicated, tranexamic acid where indicated, permissive hypotension and other indicated procedures attempted en route where possible.

4. Verbally confirm all medications, if able, with your partner, prior to administration.
   The standard method should be a review of the SEVEN "R's":
   - **Right Patient,**
   - **Right Medication,**
   - **Right Dose,**
   - **Right Route,**
   - **Right Time,**
   - **Right Documentation, and**
   - **Right Reason.**

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 and a 12 lead ECG obtained as soon as possible.

6. If the patient's condition does not seem to fit a single Protocol, but several; adapt your care to include all Protocols which apply in a simultaneous manner.

7. The following assessment/care process is to be performed and information is to be obtained on all patients:
   Always assure scene safety for yourself, your fellow rescuers, and your patient.

INITIAL ASSESSMENT:

A = **Airway** with cervical spine control
   i. LEMON law: Look Externally, Examine (3/3/2), Mallampati score, Obstruction, Neck Mobility.
   ii. Trauma ABCS: Airway Injury, Brain Injury, Chest or Cervical Spine Injury, Shock?

B = **Breathing**
C = **Circulation** with control of bleeding
D = **Disability** Determination
E = **Exposure**
A = **Alert** and conscious
V = Responsive to **verbal** stimuli
P = Responsive to **painful** stimuli
U =**Unresponsive**

DETAILED ASSESSMENT:

i. Obtain **vital signs** (minimum 6 items must be there: *respiratory rate, pulse rate, blood pressure, AVPU/GCS, SpO2, and Temp; if available: ECG. Obtain 12 Lead ECG, , EtCO2, BGL,*), 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

iv. Place monitoring equipment, if indicated:
- ECG monitor, with 12 lead (if possible) for CHF, chest pain, syncope patients, and patients with cardiac history with medical complaint.
- Pulse oximeter
- Capnography (EtCO2), as available, for all respiratory, altered mental status, trauma, and advanced airway patients

v. Apply appropriate Protocol based on assessment.
vi. Position patient comfortably as indicated by condition or situation.
vii. Reassure and calm patient. Loosen any restrictive clothing or remove as indicated.
viii. Transport to appropriate hospital via ambulance, rotor, or fixed wing ambulance.
ix. Preplan your care.

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			
Supplemental O2		Yes		No			
Temp	≤ 35		35.1 – 36.0	36.1-38.0	38.1-39.0	≥ 39.1	
Systolic BP	≤ 90	91-100	101-110	111-219			≥ 220
HR	≤ 40		41-50	51-90	91-100	111-130	≥ 131
LOC				A			V, P, or U

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

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,
Example (HR = 100, BP = 100/60), 100/100 = Shock Index of 1.0; consider a clinically significant Shock Index may be present anytime the HR exceeds the Systolic BP.

Shock index is an indicator for an urgent requirements of fluid transfusion which depend on the patient age as mentioned below:

- **Adult** Shock Index ≥ 0.9
- **SIPA** (Shock Index Pediatric Adjusted)
  - SIPA 4- 6 years ≥ 1.2
  - SIPA 6- 12 years ≥ 1.0
  - SIPA ≥12 years ≥ 0.9
- **Under 4 years**: Depend on the physical assessment of the patient
  - Tachycardia > 130 bpm
  - Hypotensive – systolic < 85 mmHg

8. **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

9. Assure that you have performed all procedures and assessments that require a controlled environment prior to placing the patient in a SAR patient package, high angle or HSRS configuration.

10. **AIRWAY CONSIDERATIONS**:
   a. When in doubt, oxygenate the patient to an SpO2 greater than 94 and less than 100%; titrate oxygen and modify delivery method to assure this goal.
   b. Consider the difference between oxygenation and ventilation, use of a NRB Mask at 15L and a NC at 10-15L combined on a patient who is ventilating themselves may resolve oxygenation issues without the risk of hypotension from BVM positive pressure ventilation; target SpO2 of 94-98%.

c. Consider Non-Invasive Ventilatory (NIV) support, such as, continuous positive airway pressure (CPAP) 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 protocols direct a more specific goal.

e. Endotracheal Intubation (or SGA placement is unable to intubate) should be considered when there is airway compromise, respiratory failure, expected clinical course would benefit from mechanical ventilation, GCS is less than or equal to 8, Prolonged BVM ventilation (> 8 mins) has been done, and/or transport while attempting BVM ventilation.

   i. Utilize Intubation Tracheal (privileged clinician) or Intubation with Rapid Sequence Induction (Physician) protocols for intubation procedure.

   ii. A Laryngeal Mask Airway (LMA), an Igel Airway, a SGA Airway (generic), or Laryngeal Tube Airway (LTA) may be utilized in place of an endotracheal tube when the provider feels they will provide an adequate advanced airway, or used until an endotracheal tube can be placed by an appropriately privileged clinician.

   iii. Ventilatory rates should be maintained at every 5-8 seconds unless other direction provided in specific individual protocols

   iv. Do not violate the 1:2 minimum IE ration for ventilation, consider that normally the IE ration should be 1:3 or greater in patient with potential preload impingement and/or air trapping present

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

	Tidal Volume	RR	I:E ratio	PEEP	FiO2
Normal Lungs	8 ml/kg	10-12	1:2	5	1.0
Asthma/COPD	6 ml/kg	6-8	1:4	5	1.0
ARDS	6 ml/kg	10-12	1:2	5-15	1.0
Hypovolemia	8 ml/kg	10-12	1:2	0-5	1.0

g. When the provider encounters failure to intubate/ ventilate situation, the privileged clinician should perform needle cricothyroidomy, the physician should perform surgical cricothyroidomy.

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

11. Unless stated otherwise in protocol, isotonic fluid boluses of 20ml/kg should be delivered as fast as possible within 3-5 minutes preferentially via a large bore IV or IO; large bore in the adult patient being 16, 15, 14, or 12 gauge. Consider switching to Sodium Lactate Compound IV fluid if large boluses of fluid are require to prevent possible acidotic exacerbation.

12. Consider urinary catheter placement for any persistently unconscious patient or patient with urinary retention for excessive periods.

13. If available, the provider may draw blood for laboratory analysis, perform point of care testing, and utilize results to guide care.

14. The provider may utilize ultrasound 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, CPR, or transport to accomplish ultrasound examination.

15. *In Pediatric Patients (newly born to less than 13 yrs.) use the Broselow tape to guide weight identification and energy dosing in pediatric patients.*

16. All Patient Care Protocols in this document assume transport to an appropriate facility or evacuation via aircraft, ground ambulance, or transport for tertiary care; or assume patient is in a tertiary or transitional facility and the provider is providing care in that environment.

    Only physician have the authority to release a patient from scene. Condition of release should be annotated in the PCR.

17. If a patient receives a procedure or medication; is conscious (or regains consciousness); and refuses transport, every effort shall be made to encourage transport of the patient.
    a. *If the patient persists in refusing transport, see the National Ambulance CGP105 Patient Consent and CGP 103 Patient Rights and Responsibility*. For more detail refer to CGP 115 – Policy and Procedure for Patient Transport.

18. ***Medication dosages for medications in this protocol set must be referenced from the current National Ambulance Medication Formulary***.

PATIENT CARE PROTOCOLS

ACTIVATION OF EMERGENCY AEROMEDICAL EVACUATION RESPONSE

Activation of Emergency Aeromedical Evacuation Response is a significant request on the part of the EMS provider, but may be life saving for the patient. Research has shown that aeromedical response is not effective for all patients, as a result, the following are circumstances where the National Ambulance EMS Provider should request emergency aeromedical response through the Ambulance Control Center (ACC).

The EMS provider should also consider whether the patient should be loaded into the ambulance and the aircraft met enroute to the hospital, rather than extending their scene time. Once requested, attempt to update the responding aircraft on the patient's condition and treatment rendered as often as feasible.

Criteria for paramedic supervisor in dispatch center to activate HEMS
Ambulance resource cannot be available for a critical (life-threatening) case for more than 30 minutes
Ambulance resource cannot be available for a urgent case for more than 60 minutes

Criteria for EMS Provider to alert dispatch for HEMS Activation
Trauma
5 or more victims of high speed trauma (e.g. car crash) with victims suffering significant poly trauma (multiple body systems involved e.g. head, pelvis and chest)
Entrapped Patient with unstable vital signs* (derangement of A, B, C, D) – immediate activation
Entrapped Patient with significant poly trauma* – immediate activation
Severe burns (>10% body surface area or respiratory burn) (does not include 1st degree burns)
Polytrauma patient with shock index greater than 1.2 or Early Warning Score greater than 5
Medical
Severe Cardiac Failure or Chronic Obstructive Pulmonary Disease unresponsive to treatment
Life threatening asthma unresponsive to treatment
Pediatric Cardiac Arrest
Two or more seizures in less than 30 minutes
Symptomatic Bradycardia
Hypoglycemic patient unresponsive to treatment with Glucagon and diminished level of consciousness
Severe sepsis or shock

*Entrapped Patient without significant poly trauma and stable vital signs – no activation

This list is not exhaustive and if a life threatening condition is identified that cannot be addressed in an appropriately timely manner scope should be given to activate based on best available information for the paramedic supervisor.
Other key points

- Major Emergency e.g. airplane or train crash should be activated via civil defense so NA should ensure this process would be in place otherwise HEMS is a valuable asset to have available on scene ASAP.

ALTERED MENTAL STATUS (AMS)

Altered Mental Status represent broad spectrum undifferentiated patient.

SPECIFIC INFORMATION NEEDED:

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

SPECIFIC PHYSICAL FINDINGS:

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

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assure Airway, Breathing, and Circulation.**
4. **Assure oxygenation, maintain SpO2 > 94% unless COPD then maintain SpO2 92%, ventilation (ETCO2 monitoring), and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **Use standardized scoring (GCS or AVPU)**
6. **Initiate large bore IV of Isotonic fluid TO KEEP OPEN or saline lock.**
7. **Attach cardiac monitor (obtain 12 lead if possible) and pulse oximeter.**
8. **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**
9. **If history of Opioid overdose and patient has constricted pupils or respiratory depression,**
   - **Adult or pediatric patient: administer Naloxone with continue assessment of the patient.**
   - **If sympathomimetic is used like amphetamine use benzodiazepines experienced clinicians only and IV fluids as needed.**
   - **If Beta-blockers ingested in AMS patient consider giving Glucagon.**
10. **Provide supportive measures, including titration of medications to desired effect.**

CONSIDERATION:

1. ***Consider all deferential diagnosis that can cause AMS: Trauma, Stroke, seizure asthma COPD, Alcohol and liver diseases***
2. ***In the presence of cerebral tumors*** **in the adult patient, the provider may consider** ***Dexamethasone*** **for altered mental status in the cerebral tumor patient.**
3. ***In the presence of known Herpes simplex encephalitis (HSE)*** **in the patient,** ***apply appropriate PPE*****.**
4. ***For patients exhibiting mental health or behavioral pathologies who are exhibiting aggressive or combative behavior which risks harm to themselves or others*****; consider** ***Haloperidol***

AMPUTATIONS

SPECIFIC PHYSICAL FINDINGS:

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

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assure Airway, Breathing, and Circulation.**
4. **Control bleeding – Use tourniquet.**
5. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
6. **Large bore IV of ISOTONIC FLUID solution at appropriate rate to maintain cerebral perfusion or MAP of 65 and more.**
    - **Avoid insert IV line in the affected limb.**
7. **Treat for shock, GO TO SHOCK PROTOCOL.**
8. **Rinse amputated part with normal saline to remove loose debris. DO NOT SCRUB.**
9. **Wrap amputated part in gauze moistened with saline.**
10. **Place wrapped part in plastic bag and seal. Label with NAME, DATE, TIME, and LIMB PART.**
11. **Place sealed bag in container filled with water and keep amputated part cool.**
12. **Follow PAIN MANAGEMENT PROTOCOL for analgesia**
13. ***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 distil 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.)***
14. **Pre-Alert Hospital via ACC**

ALLERGIC REACTIONS & ANAPHYLAXIS

SPECIFIC INFORMATION NEEDED:

1. What was the patient exposed to? (Drug, Food, insect sting, etc…)
2. What time has elapsed?
3. Any loss of consciousness?
4. Was there any emesis, abdominal pain or diarrhea?
5. Prior similar episodes or Family History?
6. Medication taken prior to team arrival?

SPECIFIC PHYSICAL FINDINGS:

1. Vital signs.
2. Level of consciousness.
3. Airway assessment (Dyspnea, Striders, wheeze, cyanosis, respiratory arrest).
4. Circulation (Tachycardia, hypotension, dizziness, collapse, low level of consciousness eventually cardiac arrest).
5. Skin signs (urticarial, edema, present in less than 20% of anaphylaxis patients who progress rapidly to cardiovascular collapse).
6. Early Warning Score and Shock Index.
7. Look at the following criteria to confirm or role out anaphylaxis:
   - Sudden onset and rapid progression of symptoms.
   - Life threatening breathing or circulation problems.
   - Skin and mucosal changes.

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assure Airway, Breathing, and Circulation**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **Attach cardiac monitor, EtCO2, and pulse oximeter if available.**
6. **Remove the trigger (stop drug, remove sting ... etc.**
7. **Large bore cannula and administer IV of Isotonic Fluid (ISOTONIC FLUID) to maintain MAP above 65.**
8. **If blood pressure normal, for relief of symptoms, consider:**
   - **Chlorpheniramine**
9. **If hypotensive (systolic <90 mmHg) and patient has respiratory distress:**
   - **Open IV and infuse fluid bolus 500 – 1000 ml for adults or 20 ml/kg for children if hypotesion present.**
   - **Administer Adrenaline 1:1,000 IM or IV if privileged.**
   - **Consider, as a follow up to adrenaline administration: Chlorpheniramine**
10. **If refractory hypotension:**
    - **Re-administer Adrenaline**
    - **If persistent hypotension occurs follow DISTRIBUTIVE SHOCK PROTOCOL.**

BURNS

CAUSES OF BURN:

- Thermal.
- Electrical.
- Chemical.
- Radiation.

SPECIFIC INFORMATION NEEDED:

1. Time elapsed since burn?
2. Duration of contact/exposure? Long exposure Predict possible airway complications.
3. Was patient in a closed space with steam or smoke? For how long?
4. Any loss of consciousness?
5. Was there an accompanying explosion or toxic fumes?
6. Was there any trauma sustained during the escape from the fire (risk of fall and injuries)
7. Was there an accompanying explosion or toxic fumes?
8. Prior cardiac or pulmonary disease?
9. Tetanus status.

SPECIFIC PHYSICAL FINDINGS:

1. **Vital signs:** (SpO2, PEtCO2, Temperature, BP, and ECG q 10 minutes).
2. **Extent of burns:** detailed description of areas burned and body surface involved (rule of 9's)
3. **How to decide Depth of burns:**
   - 3.1. First Degree (Superficial):
     - 3.1.1. Damage of the epidermis only.
     - 3.1.2. Red and Dry.
     - 3.1.3. Blanch with pressure.
     - 3.1.4. Very painful.
   - 3.2. Second Degree (Partial Thickness):
     - 3.2.1. Damage to epidermis and dermis.
     - 3.2.2. Blisters and edema.
     - 3.2.3. Painful.
   - 3.3. Third Degree (Full Thickness):
     - 3.3.1. Loss of all layers of skin.
     - 3.3.2. May appear dark or waxy-white.
     - 3.3.3. Painless.
     - 3.3.4. No blanching.
4. **Evidence of respiratory burns:**
   - 4.1. Soot or erythema of mouth
   - 4.2. Singed nasal hairs or eyebrows.
   - 4.3. Cough or hoarseness

4.4. Respiratory distress
4.5. Carbonaceous sputum
4.6. History of confinement in the burning environment.
4.7. 4.7 Explosion with burns to head and turso.
4.8. 4.8 Facial or neck burn

5. Associated trauma.
6. Early Warning Score and Shock Index?

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assure scene safety first.**
4. **Assure patient safety**
5. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
   - **5.1. If airway burns are suspected, endotracheal intubation early, to maintain SpO2 above 98% and EtCO2 between 30-40 mmHg.**
   - **5.2. If wheezing present, consider nebulized Salbutamol**
6. **Remove clothing which is smoldering or which is non-adherent to the patient.**
7. **Remove rings, bracelets, and other constricting items.**
8. **COOL THE BURN maximum for 20 minutes**
9. **Apply dressings to the burned area, use moist dressing when possible.**
   - **9.1. Clean burn with water or saline solution; use no creams or salves on burn.**
   - **9.2. NOTE: be cautious of hypothermia when cooling a burned patient, temperature drop below normal must be prevented.**
10. **IF BURN IS GREATER THAN 10% OR IF THERE IS SIGNIFICANT PAIN (EMT-B*):**
    - **10.1. Start IV or IO, Large bore, of ISOTONIC FLUID.**
    - **10.2. Fluids per % of burn follow the PARKLAND BURN FORMULA and /Or Shock Index (SI).**
    - **10.3. Monitor vitals every 10 minutes.**
    - **10.4. Document all the fluid given to the patient and handover to the receiving hospital.**
    - **10.5. Assure thermal protection**
    - **10.6. Follow PAIN MANAGEMENT PROTOCOL as indicated.**

SPECIFIC PRECAUTIONS:

1. Leave blisters intact and any adherent debris in the burned area undisturbed. Attempt contact with the regional burn facility for advice and notification of transport.
2. DO NOT use ointments, salves, jells, or similar items on burns.
3. For IV fluid administration follow Parkland Burn Formula:

   Percentage of burn (partial and full) X Weight (Kg) X 4 = total fluids (ml)

   This calculate the total fluids required for the first 24 hours, half to be given over the first 8

hours and half over the next 16 hours.

4. Fluids to be calculated from the time of burn and not the first clinical contact.
5. If the patient is in shock this to be treated early follow shock protocol, burn rarely cause hypovolemic shock so consider another causes of fluid loss.
6. IV/IO can be started in burned areas, if necessary.

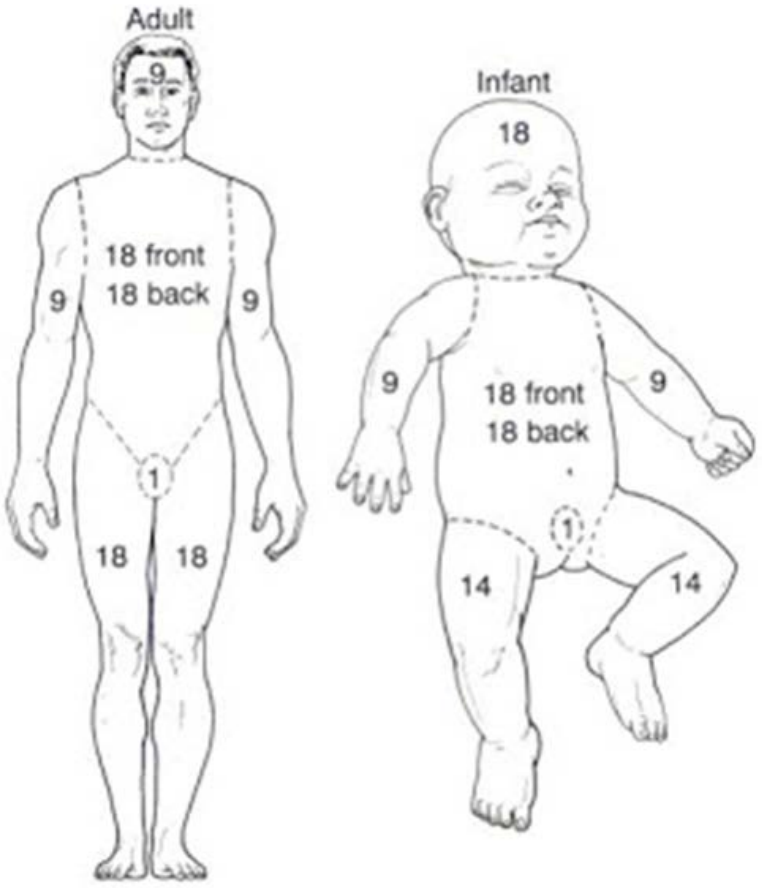
With suspected respiratory burns and progression of symptoms, consider early endotracheal intubation. If airway burn is suspected the patient will develop laryngeal edema very quickly and the simple airway management will not be effective, hence fast transport to hospital is mandatory

BURN CENTER CRITERIA:

If the patient meets any of the following criteria transport to National UAE Burn Centre at Mafraq Hospital, via most appropriate means (i.e.; ground, vessel, air):

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

Rule of Nines:



CARDIAC ARREST & ARRHYTHMIA

GUIDELINES FOR CARE:

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

Points to remember include:

1. Treat the patient, not the monitor.
2. Cardiac arrest due to trauma is not treated with medical causation Protocols.
3. Protocols for cardiac arrest situations presumes that the condition under discussion continually persists, that the patient remains in cardiac arrest, and that CPR is always performed.
4. Adequate chest compressions, defibrillation, airway management, appropriate ventilation, and oxygenation are more important than administration of medications and take precedence over initiating an intravenous line or injecting medications.
5. Increase monitor ECG size to a minimum of 2.5 mm of height to avoid misdiagnosis.
6. After each intravenous medication, give a 20 ml bolus of intravenous fluid and immediately elevate the extremity if possible, this will enhance delivery of the drug to the central circulation.

PULSELESS ELECTRICAL ACTIVITY (PEA) / ASYSTOLE TREATMENT:

1. **Ensure using appropriate PPE.**
2. **Initiate and continue High Quality CPR with BVM ventilation at 30:2 until advanced airway placed, then continuous compressions at 100-120/min and an asynchronous ventilation every 6 seconds**
3. **CPR must be performed for 2 minute intervals prior to interrupting chest compressions for no more than 10 seconds for rhythm check.**
4. **Place Advanced Airway (SGA or ETT) and ventilate every 6 seconds (10 bpm min) with approximately 5-10 ml/kg ideal body weight of ventilatory volume. Could mechanical hyperinflation be causing the PEA?**
    - **If pre-existing, severe, metabolic acidosis (pH 7.0 or less) was documented prior to arrest, *in only that circumstance*, hyperventilation may be utilized at no greater than every 3 seconds.**
    - **Utilize PEtCO2 to guide quality of compressions, ventilations, and cardiac output**
5. **Large bore IV or IO of ISOTONIC FLUID TO KEEP OPEN,**
6. **Administer Adrenaline 1:10,000 every 3-5 minutes IV or IO as appropriate and able.**
7. **Consider possible causes and treat if discovered:**

    7.1. Hypoxia – optimize oxygenation and ventilation.

    7.2. Hypovolemia - If significant volume loss is suspected and ETCO2 greater than 20 with organized rhythm present, begin 20ml/kg Isotonic Fluid bolus and follow shock Protocol.

    7.3. Hypothermia – if severe (less than 30.0C, consider continuing efforts until rewarming performed).

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

7.4.1. Consider Salbutamol nebulizer 5-10 mg over 15 min.

7.4.2. Diuretics: Furosemide 1 mg/kg (40-80 mg) slow IV.

7.4.3. The definite management of severe hyperkalemia is dialysis, transport patient as fast as possible, if any emerging arrhythmia treat according to arrhythmia protocol.

7.5. Hypokalemia – if identified (K< 3.5mmol/L and severe hypokalemia < 2.5 mmol) please ensure fast transport.

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

- Manage with optimization of ventilation and oxygenation; specifically consider transiently increasing ventilatory rate and volume to no more than every 3 seconds.
- Consider the patient to be a potential acidosis patient when KULT are present (ketones, uremia, lactate and toxins) or MUDPILES (methanol, uremia, diabetic ketoacidosis, propylene glycol, isoniazid, lactic acidosis, ethylene glycol, salicylates).
- If acidosis remains after 10 minutes of cardiac arrest, despite ventilatory management above, consider if available at patient location, Sodium bicarbonate (if severe acidosis, less than pH 7.0, or renal failure present).

7.7. Tension Pneumothorax – needle chest decompression immediately, then chest tube thoracotomy.

7.8. Tamponade/Cardiac Effusion – 20ml/kg fluid bolus; then Ultrasound guided pericardiocentesis must be considered.

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

7.10. Thrombosis of Pulmonary Vasculature - if confirmed on POC Ultrasound, transfer patient for emergent thrombolysis.

8. Use Ultrasound if trained in its use to assist with identifying causations, but do NOT interfere with CPR and don't prolong on scene time.

9. Pregnant patients in cardiac arrest require immediate transport and all care enroute to hospital with Compressions performed with Left Uterine Displacement (LUD)to displace uterus from major vessels.

10. Don't withhold or terminate maternal resuscitation.

V - FIB & PULSELESS V - TACH TREATMENT

1. Ensure using appropriate PPE.
2. Initiate and continue CPR/BVM, until defibrillator attached.
3. Confirm ventricular fibrillation (VF) or non-perfusing ventricular tachycardia (VT) on monitor (or with AED).
4. Defibrillate per manufacturer recommendations for VF or VT (Peds: 2-4j/kg, Adult 20j biphasic if using the life-pack 15 and escalate) and continue CPR for 2 minutes
5. Continue CPR and BVM ventilation with 100% O2 at 30:2 ratio until advanced airway placed, then continuous compressions at 100-120/min and an asynchronous ventilation every 6 seconds.
6. CPR must be performed for 2 minute intervals prior to interrupting chest compressions for no more than 10 seconds for rhythm check and Defibrillation per manufacturer recommendations (Peds: 4j/kg subsequent).
7. Place Advanced Airway (SGA or ETT), PEtCO2, and ventilate every 6 seconds (10 bpm min) with approximately 5-10 ml/kg ideal body weight of ventilatory volume.
    - If pre-existing, severe metabolic acidosis (pH 7.0 or less) was documented prior to arrest, *in only that circumstance*, hyperventilation may be utilized at no greater than every 3 seconds.
    - Utilize PEtCO2 to guide quality of compressions, ventilations, and cardiac output
8. Large bore IV or IO of ISOTONIC FLUID TO KEEP OPEN,
9. Reassess rhythm every two minutes for presence of VF or VT and defibrillate with manufacturers recommended dosage (Peds: 4-10j/kg subsequent) if in persistent VF/VT
10. Administer Adrenaline 1:10,000 (10 ml) IV/IO, as appropriate, after 2nd, 4th, 6th, and 8th shock.
11. Administer Amiodarone 300 mg IV/IO after third shock; Administer Amiodarone 150 mg IV/IO after fifth shock.
12. Pregnant patients in cardiac arrest require immediate transport and all care enroute to hospital and Compressions performed with Left Uterine Displacement (LUD).

BRADYCARDIA TREATMENT

Heart Rate less than 60 bpm.

1. Ensure using appropriate PPE.
2. Assure ABCs/Vitals
3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
4. Attach monitor, SpO2, PEtCO2, pulse oximeter and obtain 12 lead ECG if possible.
5. Assess vital signs and consider other causes for bradycardia.
6. Identify and treat possible causes (hypoxia, hypothermia)
7. Start IV or IO of ISOTONIC FLUID TO KEEP OPEN or saline lock.
8. Identify and treat reversible causes (e.g. electrolytes abnormalities)
9. If heart rate < 60 per minute and patient exhibits any of the following signs or symptoms the patient is UNSTABLE:
   - 9.1. Chest pain of a continuous or ongoing nature.
   - 9.2. Altered level of consciousness.
   - 9.3. Hypotension
   - 9.4. Significant signs of Shock.
   - 9.5. Acute onset heart failure.
10. Stable Bradycardia – Observe, 12 Lead ECG, Consult a senior.
11. Unstable Bradycardia - Administer Atropine if TCP is not available (NOTE: Adrenaline for PEDS).
    - 11.1. If Sinus Bradycardia consider use of oxygen and ventilation, then Atropine prior to pacing.
    - 11.2. Atropine may be repeated every 5 minutes to maximum of 3 mg.
12. Unstable Bradycardia - Transcutaneous external cardiac pacing (TCP), if available.
    - 12.1. Begin pacing at 60 bpm and 0 mA and increase in 10 mA doses until capture at manufacturer's recommendation if pacing is not captured at current of 120-130- mA re-site electrodes and repeat the above.
    - 12.2. After electrical capture evaluate patient for mechanical capture.
    - 12.3. Once pacing captured, set the current at 5-10 mA above threshold.
    - 12.4. Consider analgesia and sedation, if patient complain of pain.
13. Unstable Bradycardia - If TCP and Atropine ineffective:
    - 13.1. Adrenaline IV drip

TACHYCARDIA TREATMENT

1. Ensure using appropriate PPE.
2. Assure ABCs/Vitals
3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.
4. Assess vital signs (including SpO2 and EtCO2), attach monitor and obtain 12 lead ECG, and consider other causes of tachycardia.
5. IV or IO of Isotonic Fluid to Keep Open.
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:
        - Observe, Vascular access, O2 is room air SpO2 is less than 95, 12 Lead ECG, Transport for Physician Cardiac Consult
    - 7.2. If the patient is UNSTABLE:
        - Synchronized cardioversion at 100j, 200j, and 300j to maximum 3 attempts (*If time permits, consider sedation), if non-responsive*
        - *Adenosine*
            - If no response within 1 - 2 minutes, a repeat dose should be administered.
            - Do not use Adenosine if history of WPW or pre-excitation signs present on 12 lead ECG
8. Narrow Complex Tachycardia with irregular rate greater than 150 (possible Atrial Fibrillation AVR)
    - 8.1. STABLE with rapid ventricular rate –

- observe, 12 lead ECG, SpO2, PEtCO2, Transport
- Consider rate control of Atrial Fibrillation with AVR with Metoprolol.
- With pre-excitation signs in AF, Avoid AV nodal blocking agents should be avoided as these medications may cause a paradoxical increase in the ventricular response

    - 8.2. UNSTABLE with rapid ventricular rate:
        - *Synchronized Cardioversion* at manufacturer recommendation or 120, 175, then 200 joules (maximum 3 attempts).
        - Peds 0.5 j/kg to1 j/kg first dose, 2 j/kg second dose.
        - *If time permits, consider sedation*
        - If non-responsive to synchronized cardioversion, *consider Esmolol*
9. Wide Complex Tachycardia (HR greater than 150):

9.1. If patient is STABLE:

- **Observe, 12 lead ECG, monitor all vitals every 5 minutes, prepare for possible cardioversion, transport for physician cardiac consult**

9.2. If patient UNSTABLE:

- **Synchronized cardioversion at 100j, 200j, 300j; maximum three attempts**
- ***If time permits, consider sedation*.**
- **If the wide complex is irregular in amplitude – switch to defibrillation mode and deliver defibrillation energy per manufacturer recommendation.**
- **If non-responsive, consider Amiodarone (5mg/kg maximum 150 mg).**

10. If patient at any time becomes pulseless, switch to Cardiac Arrest Protocol.

POST CARDIAC ARREST CARE

1. Assure Return of Spontaneous Circulation (ROSC) with carotid pulse present and rise in PEtCO2 levels.
2. Optimize Ventilation and Oxygenation:
   - 2.1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS with SpO2 at 94-98%.
   - 2.2. Manage ventilation to assure EtCO2 remains 30-40 mmHg.
   - 2.3. Do NOT hyperventilate the patient, except brief periods of ventilations at a maximum of 12-15 bpm to optimize EtCO2 range adherence.
3. Optimize Circulatory Status:
   - 3.1. Obtain 12 lead ECG as soon as possible, transfer for emergency coronary angiography for all patient with STEMI and all electrically unstable patient without STEMI (arrhythmia
   - 3.2. If Patient systolic BP is 90 mmHg or better (greater than MAP of 65): Observe and prepare for interventions if needed.
   - 3.3. If Patient systolic BP is less than 90 mmHg (or less than MAP of 65):
     - Administer IV Fluids (Isotonic Fluid) in 250ml boluses, up to 1-2 liters to maintain patient systolic 90 mmHg or a MAP of 65 mmHg. SBP of more than 100 associated with better recovery. Correction of hypotension is recommended in the immediate post-cardiac arrest period.
     - Treat underlying (i.e. hypoxia, ischemia).
     - If fluids are ineffective, consider Adrenaline infusion
4. Assess patient's level of consciousness:
   - 4.1. If conscious – Observe and prevent hypoxia/hypotension
   - 4.2. If unconscious – initiate hypothermia:
     - Targeted Temperature Management (TTM) between 32°C and 36°C to be maintained constantly for at least 24 hours.
     - The routine prehospital cooling of patients with rapid infusion of cold IV fluids after ROSC is not recommended
     - Place patient on mechanical or Bag/Valve/Advanced Airway ventilation
     - Administer Sedation/Induction Agent
     - Administer Paralytic Agent
     - Avoid hyperthermia, retain patient temperature at or below normal:
       - Remove clothing from patient
       - Consider use of spray bottle misting
       - Use Ice bags at high heat transfer points of body.
     - Place NG/OG tube
     - Use urinary catheter temperature probe, temporal thermometer, and/or rectal thermometer/probe to monitor progress on temperature.
     - Administer initial dose Rocuronium injection if patient begins spontaneous movement after cooling has begun.
5. Review 12 Lead ECG – if positive for STEMI or high suspicion AMI (FOLLOW STEMI PATHWAY IN CHEST PAIN)
   - Direct to cardiac catheterization lab transport

6. **Place urinary catheter if not already accomplished and available**
7. **Perform Glucose test, and if available due to POC laboratory testing availability, other chemistry and troponin panels may be completed.**
8. **Consider Sodium Bicarbonate for persistent acidosis refractory to ventilatory management.**

CHEMICAL RESTRAINT PROCEDURE

INDICATIONS:

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

GUIDELINES:

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

PROCEDURE:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assess the possibility of using physical restraints first.**
4. **Evaluate the personnel needed to safely attempts restraining the patient – Contact police for physical restraint of 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 C-Spine may be a candidate for treatment.
6. **Administer Haloperidol.**
   6.1. Vital signs should be assessed within the first 5 minutes and thereafter as appropriate.
7. **Perform blood draw for laboratory analysis if able.**
8. **Medications can be used for acute agitation.**
   8.1. Midazolam IV/IM can be used when rapid immediate sedation is required, the main adverse effect of Midazolam is respiratory depression, and patient should be monitored appropriately. Other side effect is hypotension
   8.2. Haloperidol is a classical typical antipsychotic where used for acute agitation and violence is IM can treat agitation from various reasons must be used with caution in patient at risk of QT prolongation.

(For full drug information follow the medication formulary).

PRECAUTIONS:

Beware of respiratory compromise and positional asphyxia

Assure actions are commiserate with National Ambulance Policy on Patient Rights, Restraint, and Consent

CHEST PAIN OR PRESUMED 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?

OTHER CARDIAC SYMPTOMS that mandate 12 leads ECG;

- Difficulty of breathing
- Perfuse sweating
- Nausea and vomiting
- Epigastric pain
- Sudden loss of consciousness
- Low pulse rate
- Cardiogenic shock

SPECIFIC PHYSICAL FINDINGS (Assessment):

1. Vital signs.
2. Level of consciousness.
3. Airway assessment.
4. Skin signs.
5. Early Warning Score and Shock Index?

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assure ABCs, position of comfort.**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
   - **4.1. Titrate oxygen therapy, based on monitoring of SpO2 ≥94%.**
5. **Obtain vital signs, Attach cardiac monitor, PEtCO2, and pulse oximeter.**
6. **Obtain 12 lead ECG as soon as possible; determine if STEMI or high suspicion AMI/ACS:**
   - **6.1. Contact Ambulance Control Center (ACC) at 02 596 8698 with an CASMEET report and time STEMI identified**

CASMEET:

- **C**all sign and file number.
- **A**ge of the patient.
- **S**ex of the patient.
- **M**ode of illness.
- **E**xamination (vital signs-GCS).
- **E**stimate Time of Arrival (ETA).
- **T**reatment given.

6.2. Scan 12 lead and send email to **ACC@nationalambulance.ae**

6.3. Await confirmation of receiving hospital from ACC.

7. Administer Aspirin; if patient not allergic to Aspirin.
8. Initiate a large bore IV of ISOTONIC FLUID at a TO KEEP OPEN rate, saline lock, or per SHOCK Protocol.
9. Administer GTN, may be repeated every 5 minutes until:
   9.1. Pain is relieved.
   9.2. Systolic blood pressure falls below 90 mmHg (or MAP of 65 mmHg).
10. Treat Bradycardia or Tachycardia dysrhythmias per Protocols.
11. Consider Entonox or Methoxyflurane for pain
12. Consider Morphine for continued pain.
    12.1. Monitor respirations, PEtCO2, SpO2, and blood pressure closely.
13. Consider anti-emetic for nausea and vomiting.
14. Consider Metoprolol for hemodynamically stable patients with definite or suspected acute MI, to reduce cardiovascular mortality.
    14.1. Second or third dose should not be given if systolic BP is <90 mmHg or HR <40 min.
15. *Administer Clopidogrel for Acute ST segment elevation myocardial infarction (STEMI) in patients: receiving thrombolytic treatment, anticipated thrombolytic treatment, anticipated percutaneous coronary intervention (PCI), or not already taking Clopidogrel.*
16. Consider GTN infusion for ongoing chest pain.

CHEST TRAUMA

INDICATIONS:

1. This Protocol assumes TRAUMA ASSESSMENT PROTOCOL was initiated and will be completed.
2. Possible Complication of Chest Trauma:
   - 2.1. Airway obstruction
   - 2.2. Flail chest
   - 2.3. Open pneumothorax
   - 2.4. Massive hemothorax
   - 2.5. Tension pneumothorax
   - 2.6. Cardiac tamponade
   - 2.7. Myocardial contusion
   - 2.8. Traumatic aortic rupture
3. Other chest injuries including open chest wound, pulmonary contusion, and flail chest.

3.1. TENSION PNEUMOTHORAX OR HEMO/PNEUMOTHORAX:

- 3.1.1. Consistent history, (i.e. chest trauma, COPD, patient on positive pressure ventilation)
- 3.1.2. Shock symptoms, with low or rapidly decreasing BP.
- 3.1.3. Progressive respiratory distress.
- 3.1.4. Tracheal shift away from affected side.
- 3.1.5. Distended neck veins.
- 3.1.6. Asymmetrical movement on inspiration.
- 3.1.7. Hyper expanded chest on effected side.
- 3.1.8. Diminished breath sound on the affected side , hyperresonance percussion on affected side.
- 3.1.9. Increased resistance to positive pressure ventilation, especially if intubated.
- 3.1.10. Consider Ultrasound lung exam confirmation if available.

3.2. SIMPLE PNEUMOTHORAX OR HEMOTHORAX:

- 3.2.1. Non-tension pneumothorax or hemothorax is relatively common, is not immediately life threatening, and should not be decompressed.
- 3.2.2. Monitor for progression from simple to tension pneumothorax or hemo/pneumothorax, especially in flight with rapid elevation change.
- 3.2.3. Respiratory distress, mild to severe.
- 3.2.4. Chest pain
- 3.2.5. Decreased or absent breath sounds on affected side.
- 3.2.6. Subcutaneous emphysema.
- 3.2.7. Consider Ultrasound Lung exam confirmation if available.

3.3. Cardiac Tamponade:

- 3.3.1. Consider potential cardiac tamponade
- 3.3.2. Follow Pericardiocentesis Protocol.

TREATMENT:

1. Obtain consent if possible.
2. Ensure using appropriate PPE
3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
4. Do Not utilize Entonox
5. Initiate a large bore IV of ISOTONIC FLUID at a TO KEEP OPEN rate, maintain MAP of 65 mm Hg or as per SHOCK Protocol
6. No Continuous Positive Airway Pressure (CPAP) in the presence of chest trauma and avoid Positive Pressure Ventilation (PPV) if possible until any tension pneumothorax is resolved.
7. Consider intubation for severe, restrictive chest wall injury or severe respiratory distress.
   - 7.1. Initiate intubation with rapid sequence induction as needed to secure airway.
   - 7.2. Perform surgical cricothyroidomy for patient unable to be intubated or ventilated.
   - 7.3. If you are not privileged for the above mentioned procedure, the patient must be transported rapidly to hospital for appropriate management.
8. Maintain spinal immobilization, control external bleeding, and expose chest.
9. If signs of tension pneumothorax are noted along with hypotension and/or decreased oxygen saturation, then proceed to CHEST DECOMPRESSION PROTOCOL. If prolonged transport or return of tension signs after two chest decompressions, proceed to CHEST TUBE INSERTION PROTOCOL.
10. Patients who exceed 1400ml in first hour or 200ml/hr over 5 hours from chest tube should be considered in need of immediate surgical intervention; outflow of lessor amounts, the patient should be considered urgent but stable.
11. If evidence of a penetrating or sucking chest wound, apply dressing and tape three out of four sides.
12. Remove immediately if patient develops tension pneumothorax.
13. If Flail segment, manually stabilize flail segment and apply bulky dressing to support flail segment.
14. Administer adequate pain relief to avoid respiratory depression.
15. Utilize permissive hypotension to manage patient circulatory status.

CHILD BIRTH & OBSTETRIC EMERGENCIES

OBTAIN CONSENT PRIOR TO ANY PROGRESSION OF ASSESSMENT OR CARE UNDER THIS PROTOCOL!
OBTAIN PERMISSION OF HUSBAND AND MAINTAIN MODESTY

SPECIFIC INFORMATION NEEDED:

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

SPECIFIC PHYSICAL FINDINGS:

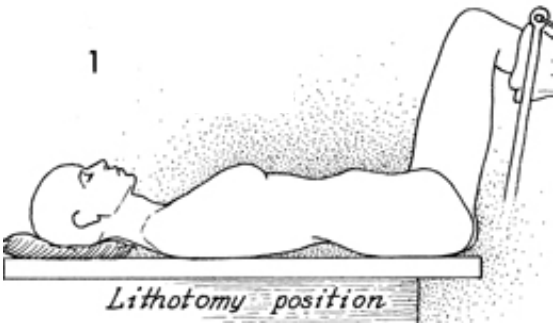
1. Vital signs.
2. Level of consciousness.
3. Crowning and effacement.
4. Airway assessment (LEMON).
5. Early Warning Score and Shock Index?
6. Ultrasound exam if available.

CHILD BIRTH EMERGENCIES TREATMENT:

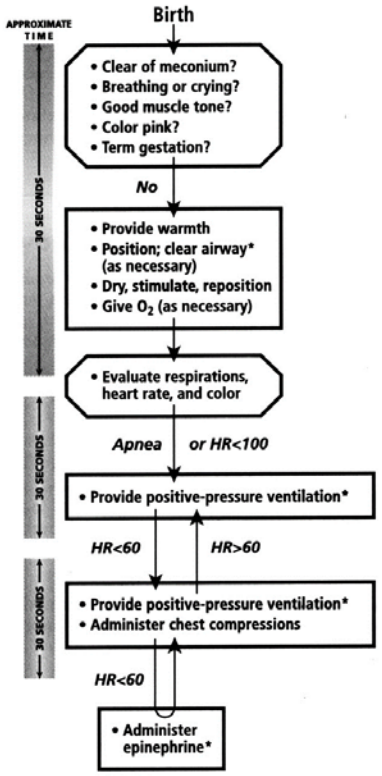
1. **Appropriate PPE is important for dealing with maternity patients.**
2. **Consider double gloves, mask, goggles, apron..etc.**
3. **Assure ABCs.**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **Obtain Fetal Heart Tones (FHT) if possible - consider fetus in distress is FHT outside of 130-170bpm.**
6. **Obtain large bore vascular access.**
7. **Perineal examination:**
   - 7.1. **Vaginal bleeding or leakage of fluid.**
   - 7.2. **Presence of meconium.**
   - 7.3. **Crowning during a contraction.**
   - 7.4. **Presenting part, head, face, foot, arm, cord.**
8. **Vaginal Examination:**
   - 8.1. **Note cervical dilation**

8.2. Identify presenting part(s)
8.3. Identify intra-vaginal lacerations
8.4. Identify cord prolapse and rectify.

9. If active labor, and no vaginal bleeding or crowning:
   9.1. Check for fetal heart tones.
   9.2. Titrate O2 to maintain SpO2 94-98%
10. If vaginal bleeding with no signs of shock (systolic >90 mmhg):
   10.1. Transport with patient in left lateral recumbent position
   10.2. Titrate O2 to maintain SpO2 94-98%
   10.3. **IV ISOTONIC FLUID at 125 ml/hour.**
   10.4. Cardiac monitor, SpO2, EtCO2
11. If heavy vaginal bleeding with signs of shock (systolic <90 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 PROTOCOLS
   11.3. Cardiac monitor, SpO2, EtCO2
   11.4. **IV ISOTONIC FLUID 20ml/kg IV Bolus and follow SHOCK PROTOCOL.**
12. If imminent delivery:
   12.1. Place mother in lithotomy position.
   12.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS Drape mother.
   12.3. Prepare for neonatal resuscitation.
   12.4. Assist delivery.
   12.5. Suction baby's mouth, then nose with bulb suction; if meconium stained fluid, ET intubate and suction baby's airway until clear before stimulating first breath.
   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.
   12.9. **Infuse mother's IV of Isotonic Fluid with 500cc fluid bolus, then at 125 ml/hour.**



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. Cover the prolapsed cord with moist dressing.

13.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS

13.3. IV Isotonic Fluid and run at 125 ml/hour.

13.4. Place gloved index and middle fingers into the vagina and push the infant up to relieve pressure on the cord; remove cord from infant if able.

13.5. Check cord for pulse.

13.6. If no pulse for thirty seconds following maneuver, and greater than 10 minutes to hospital, place mother into lithotomy position and attempt delivery of baby.

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

14.1. Place patient in left lateral recumbent position.

14.2. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS

14.3. IV Isotonic Fluid enroute and run at 125 ml/hour.

14.4. If infant in footling breech and compressing cord, place reverse pressure on infant to recover pulse in cord, if ineffective, consider manually assisted deliver if more than 5 minutes from hospital.

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

15.1. Protect infant from fall and temperature loss.

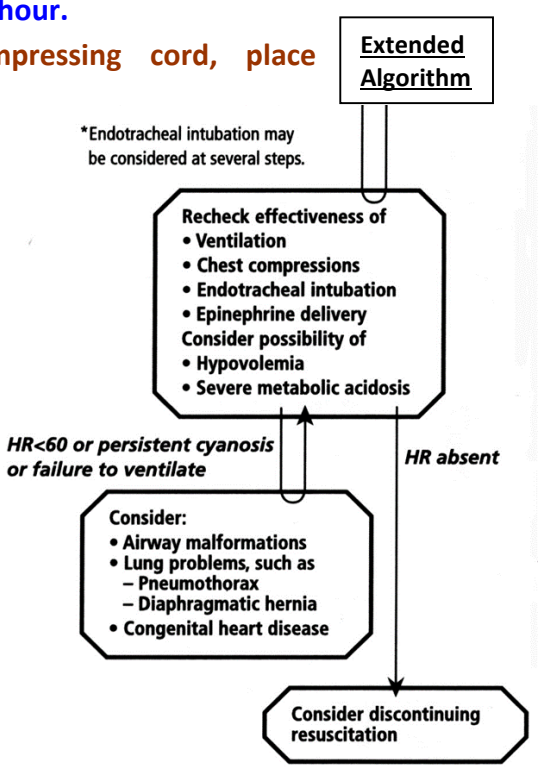
15.2. Check infant's vital signs – if poor, utilize neonatal resuscitation algorithm (at right); if meconium present, suction upper airway; If infant not vigorous, intubate and suction trachea.

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.

15.6. Massage uterus gently following delivery.



15.7. Do not pull on cord or attempt to deliver placenta.

15.8. Start IV Isotonic Fluid and run at 125 ml/hour.

15.9. Watch for external bleeding, begin fundal massage after placenta delivers for bleeding.

16. If significant post-partum hemorrhage (estimated at greater than 1000 ml):

16.1. 20ml/kg IV fluid boluses and utilize permissive hypotension

16.2. SHOCK PROTOCOL if not resolved

16.3. Contact MD for BiManual Massage

PRE-ECLASPSIA AND ECLAMPSIA

Usually develops after 20th week of gestation and or in the postpartum period, it can produce severe hypertension and diffuse organ failure.

PRE-ECLAMPSIA:

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

ECLAMPSIA: can manifest as is seizures and/or unexplained coma in a pregnant woman or during postpartum period.

SPECIFIC INFORMATION NEEDED:

1. How long have symptoms been present?
2. What week is the pregnancy?
3. If delivered, time elapsed since labor?
4. What has your physician/Healthcare provider done thus far?
5. History of previous medical conditions (diabetes, essential hypertension, multiple pregnancy, renal disease, heart disease, young or advance age)?

SPECIFIC PHYSICAL FINDINGS:

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

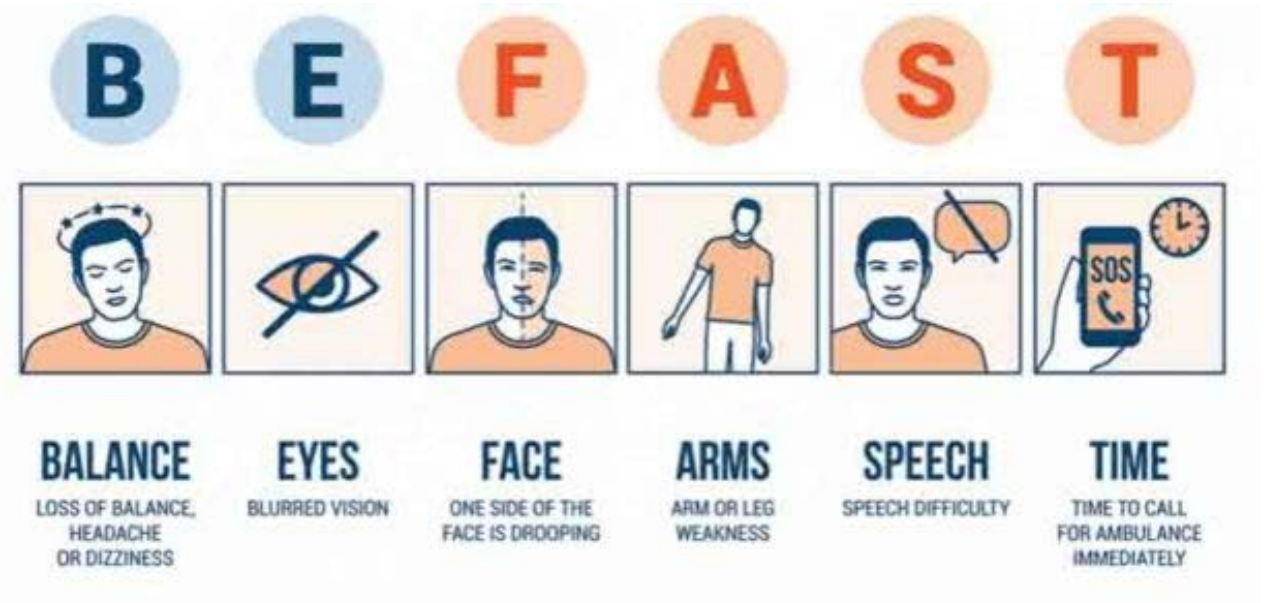
TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assure ABCs.**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.**
5. **Seizures – Go To Seizure Protocol.**
6. **Monitor ECG, vital signs, fetal heart tones, level of consciousness, patellar reflexes, respiratory rate, and oxygenation status every 5 minutes.**
7. **Keep the patient in left lateral recumbent position.**
8. **Monitor urinary output, if possible.**
9. **Evaluate for pulmonary oedema. if present:**
    - **9.1. Consider CPAP**
    - **9.2. Consider GTN**

CEREBRAL VASCULAR ACCIDENT

SPECIFIC INFORMATION NEEDED:

1. How long have symptoms been present?
2. Any pain present?
3. Nature of illness?
4. Cincinnati Stroke Scale or **BE-FAST** Scale;
   - 4.1. **B**alance- any sudden loss of balance or coordination.
   - 4.2. **E**yes- is there any sudden blurred or double vision
   - 4.3. **F**acial Droop (smile/show teeth) = Normal (*equal movement*) or Abnormal *(unequal movement*)?
   - 4.4. **A**rm Drift = Normal (*equal or no movement in both arms*) or Abnormal (*movement or drifting of one arm*)?
   - 4.5. Abnormal **S**peech ("You can't teach old dogs new tricks") = Normal (*correct words/no slurring*) or Abnormal (*incorrect words, slurred speech, no speech*)?
   - 4.6. **T**ime: Time to call for the ambulance
5. If symptoms < 4.5 hours with no history, no symptoms of intracranial bleed, no history of head trauma, no recent surgery, and/or no recent Coumadin use; then consider facilitating transport for thrombolytic therapy.
6. Pre-Alert receiving facility



SPECIFIC PHYSICAL FINDINGS:

1. Vital signs/Early Warning Score?
2. Stroke scale (FAST)?
3. Level of consciousness
4. Airway assessment
5. Skin signs.

TREATMENT:

1. **Obtain consent if possible**
2. **Ensure using appropriate PPE**
3. **Assure ABCs.**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **Initiate IV ISOTONIC FLUID TO KEEP OPEN.**
6. **Attach cardiac monitor and pulse oximeter.**
7. **Elevate head of bed to 15 degrees, if possible.**
8. **Determine serum glucose level with Glucometer.**
   - **8.1. If glucose < 72 mg/dl (4 mmol/l) – DIABETIC EMERGENCIES PROTOCOL**
   - **8.2. Titrate to response to restore normal GCS**
   - **8.3. If no response after 2nd dose rapidly transport to hospital and pre-alert.**
   - **8.4. Consider differential diagnosis.**
9. **Place in recovery position (unless spinal injury suspected) or position of patient comfort.**
10. **Transport, notify ACC, and repeat vital signs frequently.**
11. **Treat seizures per Seizure Protocol.**

DEATH IN THE FIELD PROTOCOL

MAY WITHHOLD RESUSCITATION OF PATIENT IF:

1. Clinician should consider withholding resuscitation in the presence of conditions unequivocally associated with death and ACC team leader should be informed. Conditions as following:
   1.1. Massive cranial and cerebral destruction.
   1.2. Hemi-corporectomy of similar massive injury.
   1.3. Decomposition/Putrefaction.
   1.4. Incineration.
   1.5. Hypostasis with established Rigor Mortis.
   1.6. Submersion >1.5 Hours.
2. The patient is a pulseless, apneic victim of a multiple casualty incident where resources of the EMS 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 and *should not be transported* if:
   3.1. The patient is a victim of blunt trauma or penetrating trauma to the head and has no vital signs in the field (pulseless, apneic, PEtCO2 less than 10 mmHg).
   3.2. In instances prior to transport where the patient declines to the point that no vital signs (i.e. pulse/respiration) are present, the patient should receive resuscitative efforts for at least twenty minutes prior to any declaration of death in the field and that should be done by physician on scene or on a recorded line with the medical director or his delegate.
   3.3. In special circumstances, when there is difficulty to transport the patient with continue CPR to the ambulance and there is no physician available in the scene, EMT should contact ACC team leader who will contact Medical Director (MD)/delegate through a recorded call to get approval to cease /discontinue CPR.
4. In deceased cases, two ECG strips of 10 seconds each should be printed in two leads and attached to the PCR.

NOTE: If pregnancy, poisoning/overdose, drowning, hypothermia, or persistent Ventricular Fibrillation present – transport patient with care enroute and DON"T INTERRUPT RESUSCITATION.

DEATH IN THE FIELD:

1. **Ensure using appropriate PPE.**
2. **Patient has unequivocal signs of death present.**
   2.1. 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.
   2.2. Do NOT begin resuscitation

3. In case of Cardiac Arrest, initiate PR and follow Cardiac Arrest protocol,
   3.1. Continue CPR and transport patient immediately to the hospital. In some circumstances, when there is difficulty to transport the patient with continue CPR to the ambulance and there is no physician available in the scene, contact ACC team leader who will contact Medical Director (MD)/delegate through a recorded call to get approval to cease /discontinue CPR.
   3.2. If 20 minutes or more have passed since patient arrested, and the patient is in asystole STOP RESUSCITATION
4. If patient in Asystole with PEtCO2 less than 10 mmHg and no cardiac movement on Ultrasound (if available) at 20 minutes – STOP RESUSCITATION

Note: If ETCO2 is greater than 20 and ultrasound exam (if available) reveals cardiac movement, the provider may consider initiating the Shock Protocols in addition to the Cardiac Arrest Protocols.

Note: Contact ACC for Death in the Field prior to ending resuscitative efforts that have been started.

DIABETIC EMERGENCIES – HYPOGLYCEMIA / HYPERGLYCEMIA

SPECIFIC INFORMATION NEEDED:

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

SPECIFIC PHYSICAL FINDINGS:

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

TREATMENT - HYPOGLYCEMIA:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **Assure ABCs.**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **Attach cardiac monitor, PEtCO2, and SpO2.**
6. **Determine serum glucose level with Glucometer.**
    - 6.1. **Adult Patient: If glucose < 72 mg/dl (4 mmol/l) Administer Dextrose 10%.**
    - 6.2. **Pediatric Patient: If glucose <72 mg/dl (4 mmol/l), administer Dextrose 10%**
    - 6.3. **If patient able to manage their own oral secretions – oral glucose may be utilized**
    - 6.4. **If Dextrose 10% not available, give Glucagon IM.**
    - 6.5. **Initiate IV/IO with isotonic fluid.**
7. **Repeat glucose determination in 5 minutes and continue Dextrose if results unchanged**
8. **Provide supportive measures.**

TREATMENT – HYPERGLYCEMIA:

1. **Ensure using appropriate PPE**
2. **Assure ABCs.**
3. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
    - 3.1. **Consider hyperventilation at 20 bpm for suspected acidosis**
4. **Initiate IV ISOTONIC FLUID To Keep Open.**
5. **Attach cardiac monitor, EtCO2, and pulse oximeter.**
6. **Determine serum glucose level with Glucometer.**
    - 6.1. **If glucose > 80 mg/dl (4.4 mmol/l) and < 250 mg/dl (14 mmol/l), transport.**
    - 6.2. **If glucose > 250 mg/dl (14 mmol/l), go to #7.**
7. **If glucose > 250 mg/dl (14 mmol/l), and patient exhibiting altered mental status, Kussmaul respirations, dry skin with poor turgor, and/or ketotic breath:**
    - 7.1. **Administer ISOTONIC FLUID bolus of 20 ml/kg IVP.**

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?
5. Any history of air travel after diving?

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.

CLINICAL PRESENTATION:

1. Skin manifestations (diffuse rash, mottled skin, tingling)
2. Chocks (nitrogen bubbles in the lung cause pain, shortness of breath, cough and suffocations feeling which might result in hypoxia).
3. Neurological manifestations (visual disturbance in term of blind spot and flickering) , persistent headache, paralysis, loss of orientation, inability to hear or speak

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE**
3. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
   3.1. Utilize oxygenation methodology to assure 98% or greater SpO2
4. **Place the patient in a supine head-down left lateral decubitus position.**

5. **Attach monitor, EtCO2 and SpO2.**
6. **Start a large bore IV of Isotonic Fluid. If Shock present, follow SHOCK PROTOCOL.**
7. **Protect against hypothermia and hyperthermia.**
8. **Ultrasound examination of lungs (if available)**
9. **Monitor closely for complications (pneumothorax, shock, seizures) and treat per specific Protocols.**
10. **Contact Diver's Alert Network (DAN) for advice (see below), if feasible, for treatment advice.**
11. **Assess vital signs, including temperature, every 10 minutes.**
12. **Facilitate transport to a hyperbaric facility, if possible.**
    - 12.1. **Provide hyperbaric personnel with a detailed history of the dive (depth and duration, timing and onset of symptoms, complications, and any treatment rendered).**
    - 12.2. **Pre-alert via ACC**
13. **Transport at cabin altitude of 500 feet or as low as possible due to flight and terrain restrictions.**
14. **For pain, use PAIN MANAGEMENT PROTOCOLS.**

UAE Decompression Chambers:

1. Umm Al Nar Abu Dhabi, Decompression Center, phone: 971 (0)2 558 9999
2. Aqua Diving Hyperbaric Chamber - Sharjah +971 6 5285323
3. UAE Coast Guard Operations Center, phone 971 (0)2 655 5555

Contacting the Diver's Alert Network – Medical Advice Lines:

1. Middle East Diving Emergencies:
   DAN Europe: Regions of coverage include geographical Europe, the countries of the Mediterranean Basin, the countries on the shores of the Red Sea, the Middle East including the Persian Gulf, the countries on the shores of the Indian Ocean north of the equator and west of India and Sri Lanka, as well as the related overseas territories, districts and protectorates.
   Diving Emergencies: +39-06-4211-8685

FEBRILE CONDITIONS & SEPSIS

SPECIFIC INFORMATION NEEDED:

TAKE STANDARD PRECAUTION PRIOR ASSESSING PATIENT WITH FEBRILE CONDITIONS, IF ASSESSMENT REVILES COMMUNICABLE DISEASE TAKE MORE SPECIFIC PRECAUTIONS.

1. Evaluate for possible exposure to meningitis
2. Evaluate for potential sepsis
3. Evaluate for possible hemorrhagic fever, malaria, or dengue exposure and risk
4. Any history of recent travel.

SPECIFIC PHYSICAL FINDINGS:

1. **History of present condition and potential exposure risks**
2. **Vital signs, including temperature.**
3. **Level of consciousness.**
4. **Airway assessment (LEMON and Trauma ABCS).**
5. **Neurological exam.**
6. **Pediatric shock assessment in pediatric patients less than 33kg: increased respiratory rate, increased respiratory effort, central vs. distal pulse quality, capillary refill, BP less than 70 + (2 x age in years)**
7. **Shock Index Present (Heart rate greater than systolic BP? Calculate cardiac rate divided by the systolic blood pressure)?**
8. **ISTAT Values: Lactate level 4 mmol/L or greater – GO TO DISTRIBUTIVE SHOCK PROTOCOL**
9. **Consider Passive Leg Raise with PEtCO2 or ultrasound Inferior Vena Cava evaluation if available.**

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE.**
3. **COMMON TREATMENT MODALITIES:**
   - **3.1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
   - **3.2. Consider airway management and ventilation with 100% oxygen for:**
     - **3.2.1. Markedly decreased LOC.**
     - **3.2.2. Inability to maintain a patient airway.**
     - **3.2.3. Inability to maintain SpO2 above 95% despite use of all oxygen delivery or NIV ventilation devices.**
     - **3.2.4. EtCO2 >50 mmHg, or GCS < 9**
     - **3.2.5. Reduction in work of breathing and increased cardiac output available for pressure support.**
   - **3.3. Monitor ECG, BP, pulse, respirations, and temperature**

3.4. Establish Large Bore IV/IO with isotonic fluid.

3.5. Fever reduction with Paracetamol (PO or IV)

3.5.1. Intravenous if possible.

3.6. Dehydration therapy

3.6.1. 20 ml/kg Isotonic Fluid boluses for patient with less than 90 mmHg systolic or less than MAP of 65; repeat as required until patient improvement and MAP of 65-70 (or systolic of 90 mmHg or better) reached.

3.6.2. IV or IO ISOTONIC FLUID maintenance fluid at 125-165ml per hour

3.6.3. May use IVC status on Ultrasound (if available) or Passive Leg Raise. PEtCO2 5mmHg increase findings to assist with fluid resuscitation goals and direction.

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

3.7. Pain control – follow pain management Protocols

4. SPECIFIC TREATMENTS:

4.1. MENINGOCOCCEMIA /MENINGITIS

4.1.1. 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.

4.2. SEPSIS

4.2.1. 20 ml/kg Isotonic Fluid boluses for patient with MAP of 65 or less (or systolic of less than 90 in adults); repeat as required until patient improvement and MAP of 65-70 (or systolic of 90 mmHg or better) reached.

4.2.2. Early use of vasopressors is acceptable following initial hydration (minimum 60 ml/kg total dose) and maintenance fluids, begin with up to three boluses of 20 ml/kg Isotonic Fluid. Maintain goal MAP of 65

4.2.2.1. Consider Adrenaline IV drip

4.2.3. Septic Shock – SHOCK PROTOCOL

4.3. MILD FEBRILE CONDITIONS

4.3.1. Oral hydration is acceptable

4.3.2. Mandatory rest

4.3.3. Antipyretics when required.

HEAD TRAUMA

SPECIFIC INFORMATION NEEDED:

1. History:
   1.1. Generalized mechanism of injury, such as Motor vehicle collision, or fall from height, will require complete examination.
   1.2. Focused Trauma such as hit on the head by baseball will require focus exam.
2. Mental status changes.
3. Protective devices worn: helmet, shield.
4. Past medical history
5. Cervical Spine Injury: All patients with head or facial trauma and altered level of consciousness should be assumed to have cervical spine injury and receive restriction of cervical spine movement.
6. Obvious other injuries.

SPECIFIC PHYSICAL FINDINGS:

1. **EVALUATE:** airway (LEMON and Trauma ABCS), breathing, and gross injuries to trunk and extremities.
2. **MENTAL STATUS EXAM:** use descriptive terms and Glasgow Coma Scale and indicate any obvious paralysis.
3. **EXTERNAL EVIDENCE OF HEAD TRAUMA** (Lacerations, depressed or open skull fractures, bleeding from ear or nose, clear fluid from the nose, battle's sign behind the ears, Raccoon eyes).

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE**
3. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
4. **If GCS less than 9, advanced airway placement and ventilate.**
   4.1. **The goal is normal ventilation, not hyperventilation.**
   4.2. **Maintain SPO2 about 95% don't let the SPO2 to drop below 90%.**
   4.3. **PEtCO2 required, maintain CO2 between 35-40 mmHg initially.**
5. **PROTECT patient from the environment and protect spine.**
6. **Use direct pressure to control bleeding wounds on head.**
7. **Establish Large Bore IV/IO with isotonic fluid.**
8. **Monitor vital signs, mental status, and note any changes. Document all changes in GCS.**
9. **IF PATIENT'S BP RISES ABOVE 140 SYSTOLIC, AND PATIENT EXAM REVEALS PUPIL DILATION AND/OR SIGNS OF POSTURING, OR THE PATIENT HAS A SUDDEN AND DRAMATIC CHANGE IN CONSCIOUSNESS (i.e., patient becomes unconscious, obtunded):**
   9.1. **Perform endotracheal intubation (or place advanced airway) if not already done,**

with in line immobilization. Don't attempt intubation if the patient can maintain their airway and are maintaining their oxygen saturation.

9.2. Be ready for logroll as head injured patient are prone to vomiting and to suction especially if the patient is not intubated.

9.3. Administer IV fluids per SHOCK PROTOCOL; patient must remain hydrated during treatment and transport. Fluid resuscitation should be done when needed and to avoid hypotension all the time.

9.4. Consider hyperventilation at 20 bpm to PEtCO2 of 30 – 35 mmHg if decompensation continues.

9.4.1. Beware hyperventilation may decrease cardiac output, decrease cerebral perfusion, and increase hypoxia.

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

9.4.3. In agitated combative patient, agitation can increase their ICP, consider sedation, careful use of benzodiazepines can decrease their agitation without dropping their blood pressure.

9.4.4. Every patient with altered mental state must have BGL check.

9.5. Transport by the most rapid means available for neurosurgical intervention with continuous ongoing exam and treatment of all emerging problems whenever possible.

SPECIFIC PRECAUTIONS:

1. Patients should be aggressively fluid resuscitated; any episodes of hypotension in the head injured patient are deleterious.
2. Restlessness and/or agitation can be due to hypoxemia and/or hypoglycemia.
3. In a patient with signs of head injury, but no trauma present consider High Altitude Cerebral Edema if the patient is above 8000 feet.

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 ISOTONIC 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. Lung examination.

TREATMENT:

1. **Obtain consent if possible.**
2. **Ensure using appropriate PPE**
3. **Remove patient to a cool environment as soon as possible.**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **OBTAIN CONSENT!**
    - **5.1. Remove clothing from patient and begin cooling measures that maximize evaporation/convection with positive airflow across patient.**
    - **5.2. A spray bottle with cool water is one of the best cooling measures.**
    - **5.3. Avoid shivering during the cooling process.**
    - ***5.4. Evaporative cooling alone is not an effective measure***

6. **IV or IO, follow SHOCK PROTOCOL, if indicated.**
    - 6.1. **Heat exhaustion: *Aggressive fluid resuscitation MAY BE REQUIRED, patient may need up to 3-4 liters in the first hour*, followed by up 6 liters in 24 hours.**
    - 6.2. **Heat stroke:**
        - 6.2.1. ***May not be fluid DEPLETED in classic presentation*, use fluid with caution as pulmonary edema may develop.**
        - ***6.2.2. 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, IVC normalizes, urinary output reaches 1-2 ml/kg/hr, and/or patient normalizes.***
7. **If seizure activity noted, follow SEIZURE PROTOCOLS.**
8. **Monitor vital signs every 5-10 minutes.**
9. **Continue cooling throughout transport - Avoid wet blankets or other covering that obstructs air flow.**
10. **Special care should be taken to avoid seizures in aircraft transport.**

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:
   - 3.1. Apnea: Assess airway, breathing and if any chest rise for 1 minute.
   - 3.2. Pulse: Palpate carotid pulse for 1 minute.
   - 3.3. ECG: Attach ECG and interpret rhythm.
   - 3.4. LOC: Determine Level of Consciousness (LOC) by verbal and motor responses.
4. Which "Category of Hypothermia" does patient go into – Mild 34-36^{0}C/Moderate 30-33.9^{0}C/Severe less than 30^{0}C, profound hypothermia 20^{o}C.

SPECIFIC PHYSICAL FINDINGS:

1. Vital Signs including temperature. If pulse or/and breathing absent – Follow "Cardiac Arrest Protocol". If feasible rewarm concurrently.
2. Mental status-APVU or Glasgow Coma Scale.
3. Skin color and texture.
4. Physical exam and Neurologic findings (loss of consciousness, loss of papillary reflexes, loss of tendon reflexes).

TREATMENT:

1. **Obtain consent if possible**
2. **Ensure using appropriate PPE**
3. **Remove patient from cold environment.**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **OBTAIN CONSENT if applicable.**
   - **5.1. Remove wet clothing from patient and begin warming measures that maximize conduction of warmth to patient.**
   - ***5.2. Increase ambulance temperature***
   - ***5.3. Blankets and hot packs to arm pits and groin***
6. **IV or IO, follow SHOCK PROTOCOL, if indicated.**
   - **6.1. Mild Hypothermia: warm liquids and oral glucose as necessary**
   - **6.2. Moderate Hypothermia: Warm IV fluids (if available) and oxygen over 30 minutes**
   - **6.3. Severe Hypothermia: Warm IV fluids (if available) and oxygen over 30 minutes**
7. **If seizure activity noted, follow SEIZURE PROTOCOLS.**
8. **Monitor vital signs every 5minutes.**
9. **Continue warming throughout transport - Avoid wet blankets or other covering that obstructs air flow.**
10. **Do not administer atropine if temp less than 34.0C**

11. **Limit defibrillation to three shocks and withhold medications until greater than 30.0C, increase medication intervals by factor of x 2 until above 34.0C**
12. **When temperature is 28 degrees and less patient is at high risk of Ventricular Fibrillation if the heart is irritated with rough movement, please move gently.**
13. **Lowest recorded adult core temperature with full neurological recovery is 13.7 degrees and for infant is 15 degrees.**
14. **Don't stop resuscitation in patient of cardiac arrest due to hypothermia, continue cardiac arrest protocol with rewarming until arrival at hospital.**

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. **Obtain consent if possible.**
2. **Ensure using appropriate PPE**
3. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
4. **Monitor vital signs, ECG, SpO2, PEtCO2**
5. **Initiate IV ISOTONIC FLUID TO KEEP OPEN,**
6. **Salbutamol by nebulizer for wheezing.**

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. Consider possible diversion to hyperbaric chamber**
2. ***Chlorine gas or dust:***
   - **2.1. Humidified 100% O_2.**
   - **2.2. Treat severe pulmonary edema or bronchospasm per RESPIRATORY CONDITIONS PROTOCOLS**
3. ***Cyanide Inhalation:***
   - **3.1. Hyperventilate with 100% O_2, assist ventilations, and plan for advanced airway placement with RSI when GCS = 8 or less.**
   - **3.2. Cyanide Antidote:**
     - ***3.2.1. Amyl Nitrite (if available at patient location or in CBRN kit).***
       - ***3.2.1.1. Break ampule, allow inhalations 30 seconds each minute***
       - ***3.2.1.2. Place in gauze inside NRB mask (or BV, if assisting respirations)***
     - ***3.2.2. Sodium Thiosulfate (if available at patient location or in CBRN Kit)***
       - ***3.2.2.1. Adult: 50ml 25% solution IV (12.5 g)***
       - ***3.2.2.2. Pediatric: 250mg/kg IV.***
       - ***3.2.2.3. Stop Amyl Nitrite prior to administration of Sodium Thiosulfate.***
4. ***Hydrogen Sulfide:***
   - **4.1. Respiratory depression will occur at specific H2S levels, prepare to assist ventilation.**
   - **4.2. Plan for advanced airway placement with RSI when SpO2 levels above 95% cannot be sustained.**
   - **4.3. Seizure will occur at specific H2S levels, treat seizures per SEIZURE PROTOCOLS.**

MUSCULOSKELETAL INJURIES

Musculoskeletal injuries have the potential to distract team members from more urgent resuscitation priorities, first, recognize and treat life-threatening injuries.

PHYSICAL FINDINGS:

1. Open fracture with active bleeding
2. Localized pain and/or tenderness.
3. Swelling and/or discoloration.
4. Angulation, deep lacerations, exposed bone.
5. Crepitus
6. Loss of function and/or limitation of motion.
7. Guarding and/or rigidity in closed spaces.
8. Quality of distal pulses, sensation, and capillary refill.

MANAGEMENT:

1. **Obtain consent if possible.**
2. **Scene safety**
3. **Use appropriate PPE.**
4. **Control life-threatening bleeding (direct pressure, tourniquet, hemostatic agent)**
5. **ABCDE**
6. **Immobilize cervical spine when indicated.**
7. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.**
8. **IV or IO, large bore, Isotonic Fluid per SHOCK PROTOCOL.**
9. **Primary trauma survey: Preform quick head to toe trauma assessment including GCS.**
10. **Dramatic limb-threatening injuries must not distract from ABCDE management.**
11. **Assess Upper and lower limb, in presence of any fracture:**
    - **11.1 Fluid resuscitation should be guided by the patient's hemodynamic status.**
    - **11.2 Treat pain according to pain management protocol**
    - **11.3 Examine for any open fracture and control bleeding with direct pressure**
    - **11.4 Remove any debris and use normal saline to irrigate the wound if possible.**
    - **11.5 Assess the PMS and document any abnormality especially pulsation**
    - **11.6 Cover the wound with moist sterile dressing.**
    - **11.7 Apply appropriate Immobilization.**
    - **11.8 A traction splint may be applied to all femur fractures (if not contraindicated); additionally, any foot wear should be removed prior to splinting.**
    - **11.9 Splint the fracture in an anatomical position this may reduce bleeding and pain through reduce motion.**
    - **11.10 Elevate fractured limb after splinting if possible, apply cold packs or ice if injuries and time permit.**

11.11 Document pulses and sensation pre and post movement as well as after any intervention.

11.12 Consider early transfer especially in the presence of femur fracture and anticipate for any pulmonary complications (Embolus)

11.13 In the presence of any CRUSH INJURY a traumatic rhabdomyolysis may occur which can lead to acute kidney injury, aggressive fluid therapy is required to protect the kidneys.

11.14 Tetanus status should be documented in the PCR.

NOTE:

CRUSH INJURY:

It is an injury by an object that causes compression of the body. This form of injury is common following a natural disaster or after some form of trauma from a deliberate attack. Other causes include industrial accidents, road traffic collisions, building collapse, accidents involving heavy plant or disaster relief. Common concerns after an injury of this type are rhabdomyolysis and crush syndrome.

RHABDOMYOLYSIS:

A condition in which skeletal muscle is broken down, releasing muscle enzymes and electrolytes from inside the muscle cells. Symptoms may include muscle pains, weakness, vomiting, and confusion. There may be tea-colored urine or an irregular heartbeat. Some of the muscle breakdown products, such as the protein myoglobin, are harmful to the kidneys and may lead to kidney failure

FRACTURE IMMOBILIZATION:

The goal of initial fracture immobilization is to realign the injured extremity in as close to anatomic position as possible and prevent excessive motion at the fracture site.

1. **This is accomplished by applying inline traction to realign the extremity and maintaining traction with an immobilization device.**
2. **Proper application of a splint helps control blood loss, reduces pain, and prevents further neurovascular compromise and soft-tissue injury.**
3. **If an open fracture is present, apply traction if applicable and proper dressing with compression to control possible bleeding.**
4. **Clinician may attempt reduction of joint dislocations preferably under sedation and analgesics use if a closed reduction successfully relocates the joint, immobilize it in the anatomic position with prefabricated splints, pillows, or plaster to maintain the extremity in its reduced position. If reduction is unsuccessful, splint the joint in the position in which it was found. Apply splints as soon as possible, because they can control hemorrhage and**

pain. However, resuscitation efforts must take priority over splint application. Assess the neurovascular status of the extremity before and after manipulation and splinting.

COMPARTMENT SYNDROME

Develops when the pressure within the limb compartment exceeds that of arterial pressure resulting in reduced or absent blood flow. The muscle becomes ischemic and edematous, further increasing compartment pressures. Ultimately, ischemia can lead to muscle necrosis.

CAUSES:

1. Crush injuries due to entrapment or 'self-crushing' (unconscious patient lying on a hard surface)
2. Restrictive plasters, dressings, or splint
3. Circumferential burns
4. Fractures, particularly of the tibia, resulting in hematoma and edema
5. Severe burns causing muscle edema
6. Prolonged exercise resulting in muscle edema
7. The commonest sites for compartment syndrome are the lower leg, forearm, hands and feet.

CLINICAL FEATURES:

The six P's of compartment syndrome

1. Pain out of proportion to the injury and on passive stretch.
2. Paresthesia
3. Pallor
4. Paralysis
5. Pulseless
6. Poikilothermic (limb became colder than the surrounding areas)

MANAGEMENT OF COMPARTMENT SYNDROME:

1. **High index of suspicion.**
2. **Remove/manage any restrictive dressings, casts, or splints.**
3. **For analgesia follow pain management protocol**
4. **Urgent transfer.**

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. PSM (Pulse, Sensation, Movement)

TREATMENT OF ORTHOPEDIC INJURIES:

1. **Obtain consent if possible.**
2. **Use appropriate PPE**
3. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
4. **Immobilize cervical spine (If there is any suspected injury or trauma to the head, neck and spinal column). Follow SPINAL PROTOCOL.**
5. **Examine for additional injuries, evaluate and treat injuries with higher priority than fractures and dislocations.**
6. **For suspected pelvic, femur, other large bone fractures, major dislocations, and fractures with open wounds, establish IV, follow SHOCK PROTOCOLS.**
7. **Apply sterile dressing to any wounds and secure in place.**
8. **Splint as appropriate, axial traction as needed to facilitate splinting.**
   - 8.1. **A traction splint must be applied to all femur fractures; additionally, any foot wear should be removed prior to splinting.**
   - 8.2. **A pelvic binder should be applied to all unresponsive trauma patients and patients with pelvic pain**
   - 8.3. **Elevate fractures where possible, apply cold packs or ice if injuries and time permit.**
   - 8.4. **Document pulses and sensation pre and post movement**
9. **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.**
   - 9.1. **If an extremity must be repositioned for packaging and/or evacuation - do so.**
10. **Follow PAIN MANAGEMENT PROTOCOLS.**
11. **Monitor vital signs, sensation, distal circulation, and motor function. If no circulation can be established in an extremity, consider the fastest means of transport available.**

SPECIFIC PRECAUTIONS AND NOTES:

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

PELVIC WRAP

INDICATIONS:

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

PROCEDURE:

1. **Obtain consent if possible.**
2. **Use appropriate PPE.**
3. **Apply approved pelvic wrap device. If patient is not yet packaged, consider advanced placement of the device on backboard.**
4. **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.**
5. **If using a standard patient sheet:**
   - 5.1. **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.**
   - 5.2. **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.**
   - 5.3. **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.**
6. **Re-check the position of the wrap.**
   - 6.1. **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.**
7. **If the pelvis is unstable on initial exam, do not repeat the exam.**

DISLOCATIONS:

GENERAL PRINCIPLES OF MANAGEMENT:

1. Dislocations are often associated with fractures that may not be evident on physical examination. For this reason, radiographs should be obtained for joint dislocations both prior to and following reductions. E*xceptions to this may be made when vascular compromise is present and when there may be significant delay in obtaining a radiograph.*
2. Joint dislocations are described in terms of where the distal articulating surface is relative to the proximal articulating surface. For example, in an anterior shoulder dislocation, the humeral head (distal articulating surface) takes a position anterior to the glenoid fossa (the proximal articulating surface).
3. Inability to relocate a dislocated joint does not necessarily mean that an improper technique

has been used. Some dislocations are irreducible by a closed technique, most commonly because of the interposition of soft tissue. Persistent attempts at relocation when soft tissue is interposed may lead to further trauma of the joint and surrounding tissue. *After one or two unsuccessful attempts at relocation, package and transport the patient.*

4. A properly reduced joint dislocation not only relieves pain but also relieves stress on the surrounding soft tissues. The corollary to this statement is that the sooner a joint is reduced, the sooner the stress on the neurovascular bundles is relieved.
5. The neurovascular and circulatory status of the affected extremity should be checked immediately. Any compromise of these structures indicates that prompt action should be taken. The neurovascular status must also be reassessed serially and documented after reduction.
6. **Three keys to successful reduction are:**
   (1) Knowledge of the anatomy and reduction maneuver,
   (2) Use of proper analgesia,
   (3) Proceeding in a slow and gentle manner.
7. Attempt to ascertain the mechanism of injury. Such information provides clues to the type of injury and alerts the physician to the possibility of additional associated injuries.
8. Following reduction, the joint must be properly splinted. *An acute joint dislocation is not a minor injury.* Because there is always concomitant muscle, ligament, or other soft tissue disruption with any dislocation, disability is often the end result. Because soft tissue swelling and muscle spasm may initially obscure joint instability or disability, follow-up is mandatory.

PAIN MANAGEMENT

PURPOSE OF PROTOCOLS:

The purpose of the Pain Management Protocol is to give providers guidance in providing analgesic to patients in pain with both orthopedic and soft tissue/muscle injury.
Generally, pain management may be used for patients who have isolated injuries and have no head or traumatic abdominal injury. Pain relief is more than just reduction in pain level; it also provides for relaxation of muscle spasm around injuries, eases the discomfort of evacuation, and provides premedication for anticipated rough evacuations.

PAIN ASSESSMENT:

1. Do you screen for pain initially?
2. Pain score is documented?
3. What is the management given after the assessment?
4. How often do you reassess for pain?
5. Is the pain reassessed after medications given and after each intervention (splinting)?
6. A minimum of 2 pain scores must be recorded.
7. If non-pharmacological intervention done (psychological reassurance, dressings, splinting) reassess pain every 5 min
8. All patient with pain should be offered pain medication regardless of pain score. If pain medication refused this should be documented.

PAIN SCORING RE-ASSESSMENT TIMES FOR PHARMACOLOGICAL INTERVENTIONS

Drug	Route	Time to Onset	Time to maximum effect	Pain Reassessment time
Entonox	IN	3 - 5 mins	5 - 10 mins	Every 3 - 5 mins
Penthrox	IN	2 - 5 mins	5 - 10 mins	Every 3 - 5 mins
Paracetamol	IV	<15 mins	30 - 60 mins	Every 15 mins
Paracetamol	PO	30 - 60 mins	1 - 3 hours	Every 20 - 30 mins
Ibuprofen	PO	30 - 60 mins	2 hours	Every 20 - 30 mins
Morphine	IV/IO	5 - 10 mins	10 - 20 mins	Every 5 mins
Fentanyl	IV/IO	immediate	3 - 15 mins	Every 1 - 5 mins
Ketamine	IV	30 seconds	5 mins	Every 1 - 5 mins
Ketamine	IM	5 - 10 mins	10 - 20 mins	Every 5 mins

PAIN SCORING RE-ASSESSMENT TIMES FOR NON-PHARMACOLOGICAL INTERVENTIONS

Intervention	Pain Reassessment time
Psychological e.g. distraction	Every 5 mins
Dressings	Every 5 mins
Splintage	Every 5 mins

FOR ADULT USE THE MNEMONIC SOCRATES:

- **S**-Site
- **O**-Onset
- **C**-Character
- **R**-Radiate
- **A**-Associated symptoms
- **T**-Time/duration
- **E**-Exacerbating or reliving factors
- **S**-severity.

FOR PEDIATRIC USE WONG AND BAKER AND THE MNEMONIC FLACC:

- **F**-face, facial expressions
- **L**-Legs, position and movement
- **A**-activity, body activity and position
- **C**-cry, continues or absent
- **C**-concealability, nervousness and if distractible.

TREATMENT:

1. **Obtain consent if possible.**
2. **Use appropriate PPE.**
3. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS; rule out any possible injury to head and/or abdomen, and rule out any serious illness or injury.**
4. **MANAGE ANY LIFE OR LIMB THREATENING ILLNESS OR INJURY PRIOR TO PROVIDING PAIN MANAGEMENT.**
5. **Establish Large Bore IV/IO with isotonic fluid,**
6. **Maintain Systolic BP above 90 mmHg and respiratory rate above 12/min.**
7. **SpO2 and PEtCO2 are required for any sedation process.**
8. **Pain score must be documented and patient must be reassessing pre and post treatment.**
9. **ANALGESIC OPTIONS:**
    a. **Paracetamol PO**
    b. **Ibuprofen PO**
    c. **Entonox**
        i. **ADULT: Self-administered via facemask or mouthpiece after suitable instruction**
        ii. **PEDIATRIC: As long as they are capable of understanding instruction and self-administering**

    Note: Entonox is a combination of nitrous oxide 50% and oxygen 50%. It is stored in medical cylinders that have a blue body and white shoulders.

    d. **Methoxyflurane (Penthrox):**

i. The 'whistle' device. Have patients inhale until pain is relieved, or until they can't hold the 'whistle' administration device on their own.
ii. Pediatric: must be able to hold device

e. Paracetamol IV
f. Ketamine
g. Morphine Sulfate
i. In the patient with clear lungs, normal saline 150-300cc may be administered after each dose to prevent hypotension.
h. Fentanyl

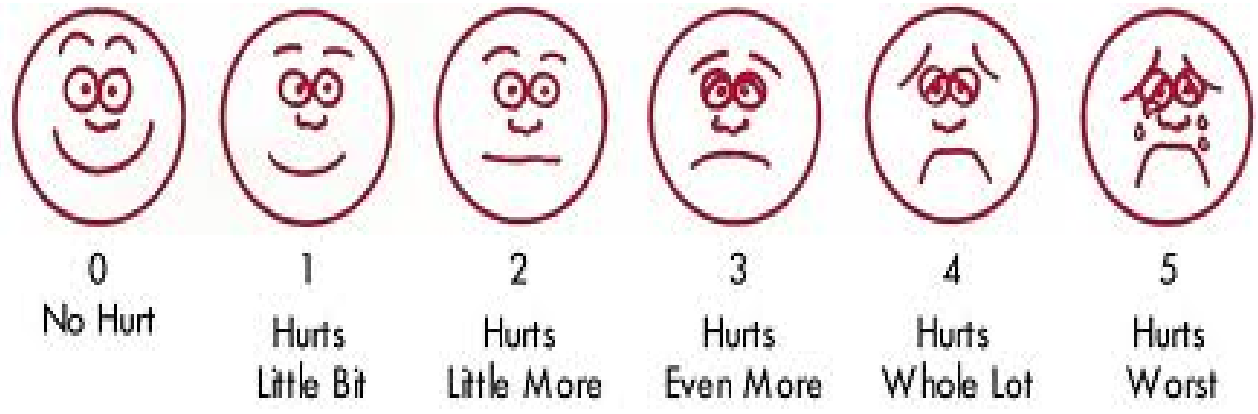
10. In Adult patients with anxiety, patients with significant muscle spasm, and patients with allergic history to sulfates:
a. Sedative Agents may be used for relaxation.
b. Sedatives do not treat pain directly, but will help relieve muscle spasm and produce sedation.
11. Be prepared to support respirations and place an advanced airway.
12. Hypotension secondary to analgesia will usually respond to fluid administration.
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 Morphine until the analgesia wears off.

SPECIFIC PRECAUTIONS AND CONSIDERATIONS:

1. Naloxone has a shorter half-life than Morphine - watch for recurrent sedation.
2. Beware of the patient who has been in severe pain and the pain is suddenly relieved, for example, reduction of a dislocation, respiratory depression may occur.
3. The child's condition and the resultant score will determine the amount of analgesia required.

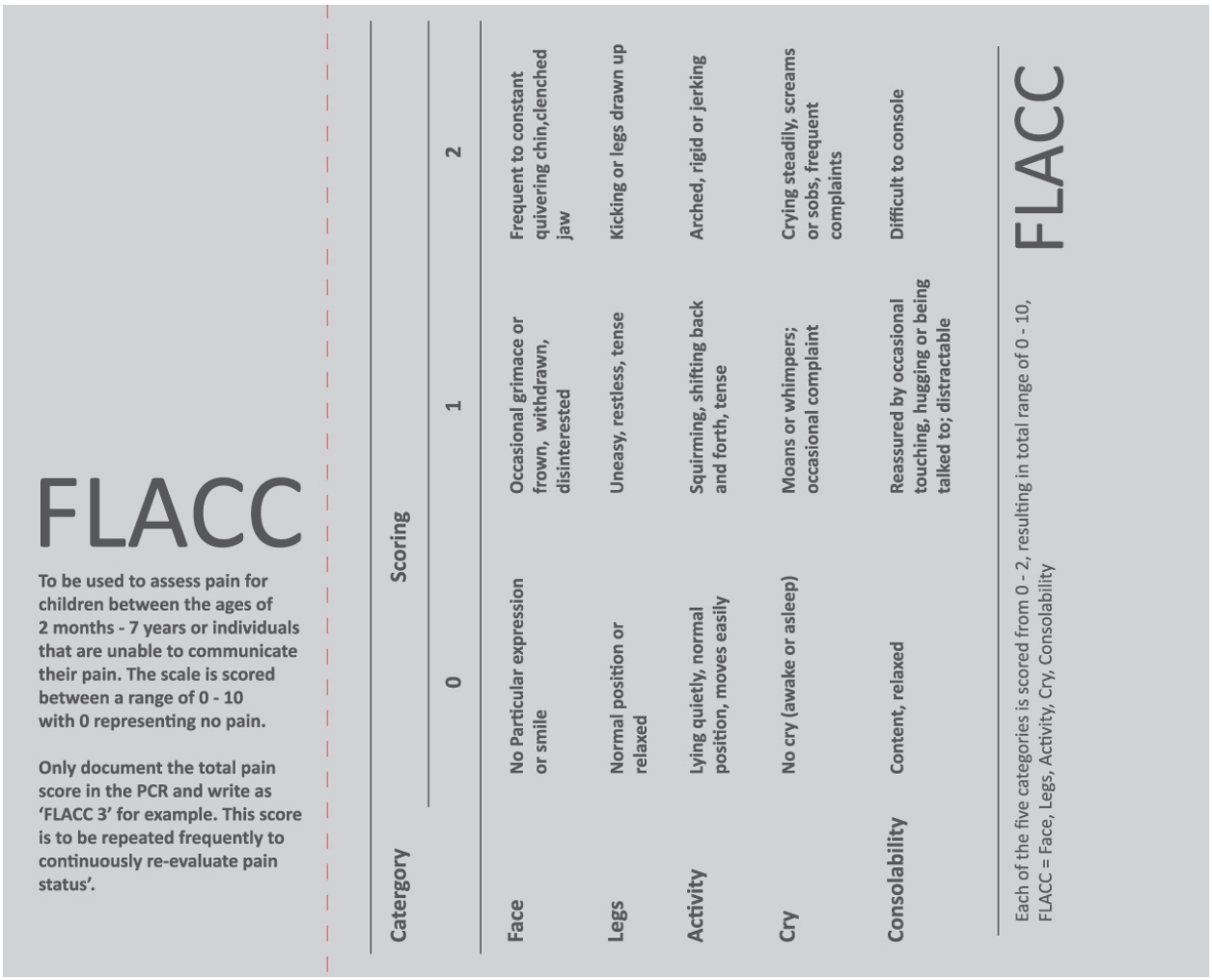
WONG AND BAKER:

The patient is shown the faces and is asked to point to the face that describes how he/she is feeling.



THE FLACC SCALE: (Face, Legs, Activity, Cry, Consolability scale)

It is a measurement tool to assess pain in children who are unable to communicate their pain or up to 7 years of age**.**



FLACC

To be used to assess pain for children between the ages of 2 months - 7 years or individuals that are unable to communicate their pain. The scale is scored between a range of 0 - 10 with 0 representing no pain.

Only document the total pain score in the PCR and write as 'FLACC 3' for example. This score is to be repeated frequently to continuously re-evaluate pain status'.

Catergory	Scoring		
	0	1	2
Face	No Particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin,clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to; distractable	Difficult to console

Each of the five categories is scored from 0 - 2, resulting in total range of 0 - 10, FLACC = Face, Legs, Activity, Cry, Consolability

PATIENT PACKAGING

PURPOSE OF PROTOCOLS:

The purpose of this Protocol is to give providers a guideline for *PACKAGING PATIENTS FOR EVACUATION*.

Patients who are secured into a litter (Fast stretcher) can become hypothermic or be placed in positions where their circulation is impaired. Repeated assessment is required every 15-20 minutes.

PACKAGING CONSIDERATIONS:

1. **Patients who are immobilized can have significant heat loss even in warm weather while strapped into the litter (Fast stretcher) due to immobility and injury.**
2. **The patient must be protected from the environment at all stages of the treatment and evacuation. This can be as simple as a tarp over the patient, or constructing a shelter and using multiple warming techniques.**
3. **Provide protection from the sun.**
4. **All medical care items should be packaged within the litter, with the exception of the Bag/Valve, if the patient is being ventilated. IV lines should be in pressure infusers, with flow regulating device in line. Oxygen bottles should be in the litter and if the patient is being ventilated, plan on endotracheal tube placement prior to placing the patient in the litter.**
5. **Patients who are at risk for losing body temperature should be packaged in spinal precautions, if necessary, then placed in a sleeping bag, on an insulating pad, in the litter, with a tarp or other waterproof material over the patient.**
6. **Consider preheating the sleeping bag with several chemical heat packs. Then place 3-10 chemical heat packs into the sleeping bag with the patient.**
7. **Use blanket to cover the patient and avoid any hypothermia.**
8. **Place any extra insulating materials available around patient.**
9. **Stop the litter every 15-20 minutes to monitor patient's condition and rest the litter team.**
10. **Consider Patient Restraint early for the safety of the patient, crew and aircraft.**
11. **Document in the patient record that the patient is securely and safety packaged for transport.**

PEDATRIC CONSIDERATIONS:

Do not utilize KEDs for immobilization of pediatric patients.

Use a long back board with blanket rolls as lateral space fillers.

POISONING & OVERDOSES

SPECIFIC INFORMATION NEEDED:

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

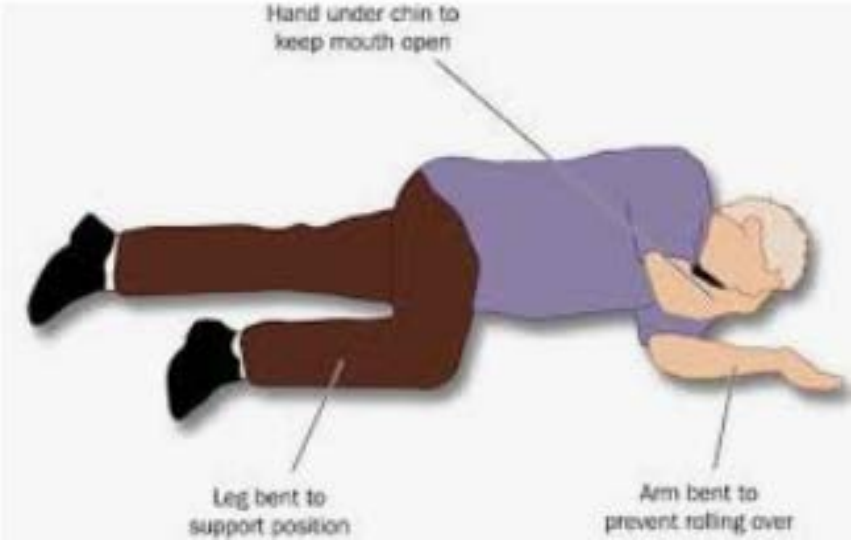
Consider symptomatic treatment depending on the type medication consumed
For further support contact ACC team leader who can communicate with the "Poison & Drug Information Center – UAE 800424" (available for limited times only 8 am – 4 pm working days)" to get more information if needed.

SPECIFIC PHYSICAL FINDINGS:

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

TREATMENT:

1. **Obtain consent if possible.**
2. **Use appropriate PPE.**
3. **Assure ABCDE/Vital Signs**
4. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS**
5. **Initiate IV ISOTONIC FLUID TO KEEP OPEN, consider the SHOCK PROTOCOL when it is needed**
6. **Attach cardiac monitor, $PEtCO_2$, and SpO2.**
7. **Determine serum glucose level with Glucometer; if glucose < 72 mg/dl (4 mmol/l), follow Hypoglycemia Protocol.**
8. **If inadequate air exchange, initiate and maintain mechanical ventilation with 100% oxygen.**
9. **Patient who are not intubated should be nursed in the recovery position to minimize the risk of aspiration should vomiting occur.**



Recovery Position

10. Treat any dysrhythmias per appropriate Protocol.
11. Consider Ondansetron for nausea, vomiting, or prophylaxis
12. **IF APNEIC:**
    - 12.1. Initiate and maintain mechanical ventilation with 100% oxygen.
    - 12.2. Endotracheal intubation (or other advanced airway device).
        - 12.2.1. If Opiate or Narcotic Overdose administer Naloxone prior to intubation.
    - 12.3. Treat any cardiac arrhythmias per appropriate CARDIAC ARREST AND ARRHYTHMIA PROTOCOL.
13. **IF THE PATIENT IS SEIZING**
    - 13.1. Treat with benzodiazepines. Hypoxia and hypoglycemia should be excluded as potential causes. If blood pressure <90 mmHg, and/or if respirations < 8 per minute, and/or possible narcotic overdose.
    - 13.2. Administer 100% oxygen via method to sustain SpO2 above 95%.
    - 13.3. Assist ventilations as needed, place advanced airway once BVM is required.
    - *13.4. Administer Naloxone.*
    - 13.5. Administer 20ml/kg Isotonic Fluid bolus
    - 13.6. Check carefully for any other injuries, particularly to the head.
14. **IF INHALED POISON:**
    - 14.1. Assure personal safety.
    - 14.2. Remove patient to fresh air.
    - 14.3. Administer 100% oxygen via method to sustain an SpO2 above 95%
    - 14.4. See **INHALATION OF TOXIC FUMES PROTOCOL**.
15. **IF SKIN OR EYE CONTAMINATION:**
    - 15.1. Assure personal safety.
    - 15.2. Remove contaminated clothes.
    - 15.3. Irrigate with water or normal saline if to the eye or small part of the body.

16. **IF CHOLINERGIC POISONING** (Organo-Phosphate Insecticides, Sarin Gas, VX Gas)
    - ***16.1. Atropine as required until muscarinic symptoms reverse***
    - **16.2. Suction as needed.**
    - **16.3. If seizing go to SEIZURE PROTOCOL.**
17. **IF ANTIDEPRESSANT OD (TRICYCLICS):**
    - **17.1. Hyperventilate if assisting ventilations.**
    - **17.2. Treat hypotension with 20ml/kg fluid bolus to physiologic effect**
    - **17.3. If tachycardia >110, dysrhythmia or widening QRS, proper observation of the patient every 5 minutes, if seizures consider sedation.**
18. **CALCIUM CHANNEL BLOCKER & BETA BLOCKER OD:**
    - **18.1. Atropine as needed for bradycardia.**
    - ***18.2. Glucagon (adults only).***
    - ***18.3. Fluid challenge 200-300 ml Isotonic Fluid.***
    - **18.4. Pace as needed.**
        - **18.4.1. If hypotension is persistent treat per SHOCK PROTOCOL.**
19. **COCAINE, METHAMPHETAMINE, GHB, MDMA:**
    - **19.1. GHB (GAMMA HYDROXYBUTRATE):**
        - **19.1.1. Be prepared for respiratory depression and/or arrest – early airway management.**
        - **19.1.2. Be prepared for cardiac arrhythmias, including bradycardia, treat is symptomatic.**
    - **19.2. MDMA (ECSTASY, E):**
        - **19.2.1. Restraint may be required due to extreme behaviors, inform ACC team leader and ask for police help if needed.**
        - **19.2.2. Be prepared to intervene with aggressive cooling for hyperthermia**
        - **19.2.3. Begin emergent cooling if temp is 102^0 F (39^0C) or greater.**
        - **19.2.4. Be prepared for seizures – treat aggressively**
        - **19.2.5. Consider urinary catheter placement for monitoring and potential rhabdomyolysis.**
    - **19.3. COCAINE/METHAMPHETAMINE:**
        - **19.3.1. 100% O_2 via methodology to maintain SpO2 above 95%**
        - **19.3.2. Consider Midazolam**
        - **19.3.3. If chest pain – GO TO CHEST PAIN PROTOCOL**
20. **ENVENOMATION:**
    - Signs of bite: (some or all signs might be found).
    - Severe local redness, swelling, bruising and pain.
    - Some bleeding specially if snake.
    - Paresthesia.
    - Metallic taste in the mouth.
    - Feel of anxiety or impending doom.
    - Nausea, vomiting and abdominal pain.

- Sweating

20.1. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS

20.2. IV or IO, large bore, Isotonic Fluid per SHOCK PROTOCOL,

20.2.1. If IV/IO fluids ineffective after 60 ml/kg total dose, consider adrenaline drip.

20.3. Cardiovascular support per SHOCK PROTOCOL.

20.4. If Anaphylactic – ANAPHYLASIS PROTOCOL

20.5. Cardiac monitor, SpO2, PEtCO2, and obtain 12 lead as possible.

20.6. Immobilize the patient.

20.7. Keep extremity below heart.

20.8. Remove all jewelry.

20.9. Identify snake, scorpion, or marine animal if possible; remember that even a dead animal may reflexively bite.

20.10. Define an area above envenomation and measure extremity circumference every 15 minutes.

20.11. Midazolam, once patient is intubated and placed on ventilatory support

20.12. Australian pressure immobilization technique.

20.12.1. This technique has been shown to be helpful in delaying systemic absorption of elapid venoms, but its use in cobra bites remains controversial.

20.12.2. An elastic compress (i.e., Ace wrap, clothing, crepe bandage) is wrapped rapidly around a bitten extremity, beginning below the bite site, if possible, and progressing proximally to encompass the entire limb.

20.12.3. The compress is as tight as one used for a ligamentous sprain immobilization.

20.12.4. Then, the extremity is splinted and kept at or below heart level.

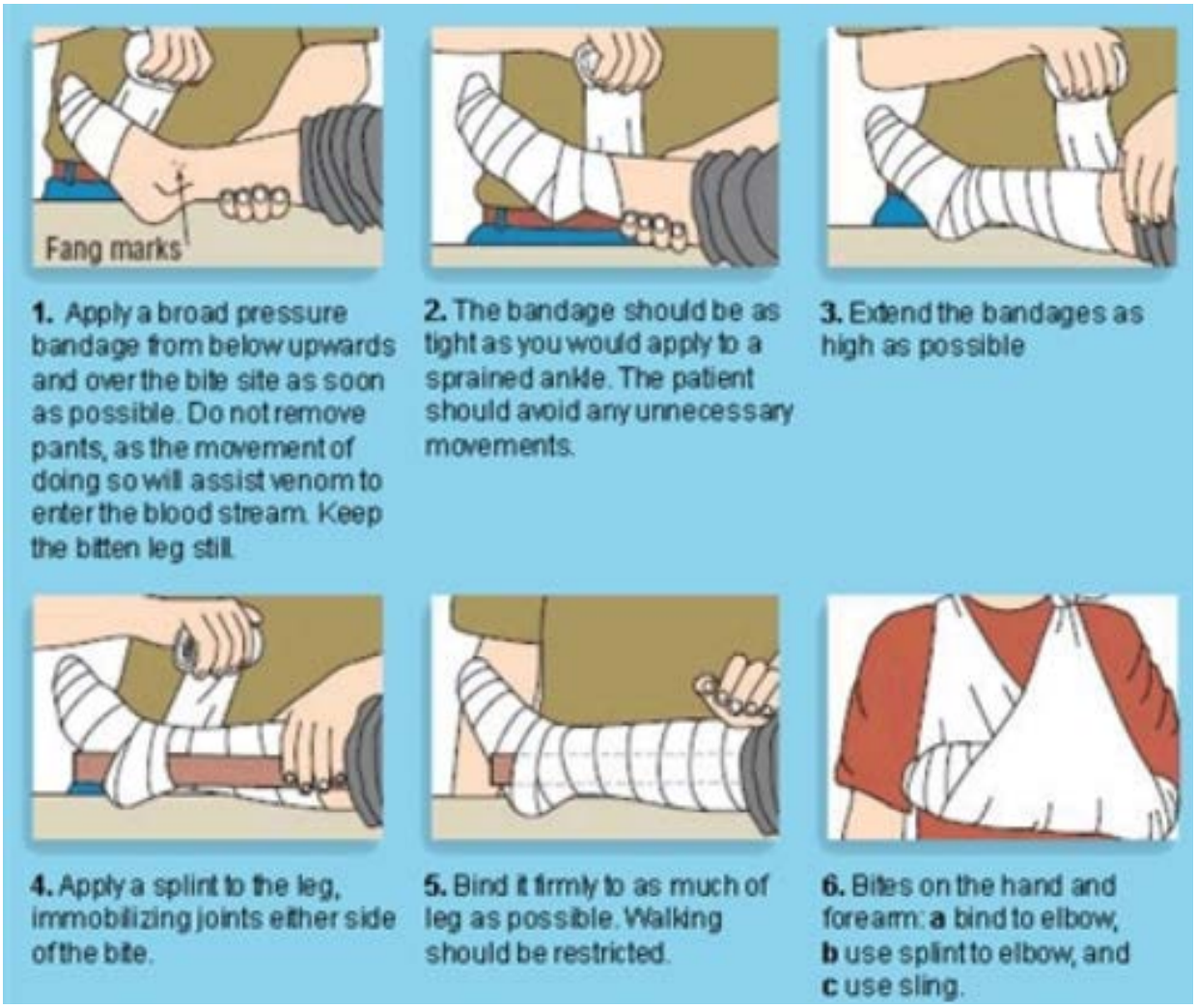
20.13. Incisions are not helpful, nor are the use of a mechanical suction device.

20.14. Avoid cooling measures and ice application. They have been associated with increased necrotic complications.

20.15. If venom is spit into the eyes, immediately and copiously irrigate them with any bland fluid, such as water, saline solution, or milk.

20.16. Antivenom is the only proven therapy for significant snakebites. Some are monovalent, but most are polyvalent against venoms of all the important snakes of a nation or region. However, the quality varies, and no international standards of purity or effectiveness exist.

20.17. All bites and envenomation cases should be considered emergent transport.



Pressure Immobilization Technique (PHTLS)

RESPIRATORY CONDITIONS

PURPOSE OF PROTOCOLS:

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

RESPIRATORY DISTRESS:

HISTORY:

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

PHYSICAL FINDINGS:

1. Vital signs, including level of consciousness.
2. Airway Assessment (LEMON law)
3. Skin color, rashes, and hives.
4. Stridor, wheezing or rhonchi.
5. Distended neck veins.
6. Breath sounds.
7. Peripheral edema.
8. Signs of trauma.
9. Ultrasound lung exam (if available)
10. ISTAT Values and interpretation (if available)

TREATMENT:

1. **Obtain consent if possible.**
2. **Use appropriate PPE.**
3. **Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.**
4. **Use pulse oximeter and $EtCO_2$, if available.**
5. **IV or IO, large bore, Isotonic Fluid per SHOCK PROTOCOL**
6. **Monitor cardiac rhythm, and obtain 12 lead ECG when possible.**
7. **TREAT UNDERLYING CAUSE, AS FOLLOWS:**
   - **7.1. UPPER AIRWAY (CROUP, EPIGLOTTIS, ANAPHYLAXIS, FOREIGN BODY).**
     - **7.1.1. Consider need for early advanced airway intervention and possible**

obstructed airway intervention.

7.1.2. Treat anaphylaxis per ANAPHYLAXIS PROTOCOL, if appropriate.

7.1.3. If audible strider at rest, Adrenaline via neb

7.1.4. If Adrenaline is given the patient must be watched closely for 3-4 hours because rebound distress can occur

7.1.5. Consider Dexamethasone for croup following Adrenaline

7.2. PULMONARY EDEMA, (NOT SECONDARY TO HAPE):

7.2.1. Sit patient upright, if possible.

7.2.2. Use CPAP for first line ventilatory support.

7.2.3. If BP less than 100 mm/Hg: Treat possible cardiogenic shock (See SHOCK PROTOCOL).

7.2.4. If BP greater than 100 mm/Hg: GTN SL.

7.3. ASTHMA/COPD:

7.3.1. Use of CPAP for ventilatory support in the patient with a respiratory rate, if unable to maintain SpO2 greater than 92% and PEtCO2 within normal range despite utilization of oxygen delivery systems.

7.3.2. Nebulized Salbutamol & Ipratropium; may repeat as needed until respiratory distress resolves.

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

7.3.4. If asthma patient is deteriorating and less than 60 years old and non-responsive to other treatments, give Adrenaline.

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

7.3.4.2. In life threatening anaphylaxis, the benefit of adrenaline will outweigh the risk.

7.4. TENSION PNEUMOTHORAX AND/OR HEMOTHORAX:

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

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

7.4.3. Needles may be placed within 0.5cm of previous site.

7.4.4. See CHEST TUBE THORACOSTOMY PROTOCOL.

7.5. UNABLE TO ADEQUATELY VENTILATE & OXYGENATE PATIENT:

7.5.1. Unprotected airway with decreasing level of consciousness.

7.5.2. See INTUBATION TRACHEAL

7.5.3. See ENDOTRACHEAL INTUBATION WITH PARALYTICS PROTOCOL.

SEIZURES

INITIAL INTERVENTION:

1. Obtain consent if possible.
2. Use appropriate PPE
3. Ensure patient safety to prevent injury
4. Primary Survey/Vitals
5. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS
   - 5.1. Any witness seizure should be supported with 100% O2.
   - 5.2. Do Not force teeth apart
   - 5.3. Nasopharyngeal airways useful and well tolerated
6. Cardiac Monitor, PEtCO2, SpO2, 12 leads ECG when possible.
7. Consider possible alternative seizure causations

TREATMENT: "If seizure has persisted more than 5 minutes or if repetitive"

1. Manage ABCDE
2. Administer High flow oxygen
3. Insert IV line, if difficult obtain IO access.
4. Check blood Glucose and treat accordingly.
5. Midazolam is the first line of treatment,

5.1. In adult patient,

3.1.1 IV/IO dose is 0.05 mg/kg. Repeat Midazolam every 3 – 5 minutes up to maximum cumulative dose 10 mg.

OR

3.1.2 IM dose is 0.1 mg/kg. Repeat Midazolam 0.05 mg/kg every 10 -15 minutes up to maximum cumulative dose 15 mg.

5.2. In pediatric patient,

5.2.1. IV/IO dose is 0.05 mg/kg. Repeat Midazolam every 3 – 5 minutes up to maximum cumulative dose 5 mg.

OR

5.2.2. IM dose is 0.2 mg/kg. Repeat Midazolam 0.1 mg/kg once only after 10 -15 minutes. Cumulative dose should not exceed 10 mg.

6. If seizure persists, ISTAT for blood chemistry, consider potential hyponatremia
   - 6.1. Isotonic Fluid containing sodium, administered in 20ml/kg bolus
7. Continue airway management and assessment as benzodiazepines carry risk of respiratory depression and hypotension.
8. In patient with known epilepsy, consider medication doses given by family before ambulance arrival.

OTHER CONSIDERATIONS:

1. **BE PREPARED TO MANAGE RESPIRATORY DEPRESSION**
2. 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.
3. Seizure activity without end, although minor in nature, should be treated under this Protocol; in addition, seizure patients with limited motor seizure history or focal seizure history may have continuous activity.
4. Causes of status epilepticus can include: Epilepsy, Fever/Infection, Med Change, Metabolic, Cerebrovascular Disease, (Ethanol) ETOH/Drugs
5. Consider non-convulsive/minimally convulsive status in unexplained coma and hx of seizures
6. Seizures that self-terminate in a known epileptic may not require treatment or transport.
7. Only 25% of status epilepticus have epilepsy
8. Seizures may be a sign of cerebral hypoxia from cardiac arrest.
9. Seizures may be caused by dysrhythmias.
10. Seizures may be caused by head trauma or central neurologic injury
11. Febrile seizures in children are usually brief in nature, but in some instances can become status seizures.

SHOCK PROTOCOL

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

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

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, which result in inadequate perfusion.

   1.1. Obtain consent if possible.

   1.2. Use appropriate PPE.

   1.3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS. Avoid hyperventilation, generally ventilate at every 6 seconds with approximately 5-10ml/kg of ideal body weight volume without PEEP; with pre-existing metabolic acidosis documented, ventilatory rates may be increased to manage that pre-existing issue.

   1.4. STOP hemorrhage, apply direct pressure to any external bleeding, in trauma patient if no clear source of external bleeding, consider internal bleeding and transport quickly.

   1.5. See ENDOTRACHEAL INTUBATION WITH PARALYTICS PROTOCOL.

   1.6. Start large bore IV or IO,

   1.7. Check for BGL and serum lactate.

   1.8. Establish second vascular access as time permits

   1.9. If Hemorrhage is NOT suspected, administer 20ml/kg boluses of isotonic fluid until patient vital signs normalize, urine output is 1-2 ml/kg/hr, or shock index is 0.8 or less.

   1.10. ***IF HEMORRHAGE IS SUSPECTED***, manage patient using permissive hypotension concepts:

   - **If patient systolic pressure is at or greater than 90 mmHg (or a MAP of 45-50),**
     - **Establish vascular access,**
     - **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 90 mmHg (or a MAP of 45),**
  - **Begin cautious fluid resuscitation with ISOTONIC FLUID in 500ml boluses (20ml/kg for pediatric patients),**
  - **Observing vitals continuously to prevent pressure rise to a MAP of 50 at which time fluids should be TO KEEP OPEN,**

    Note: however, Potential benefits from stabilizing the patient before transportation should be balanced against risks associated with increased delays in reaching hospital.
  - **Provider may utilize PEtCO2 PLR or ultrasound of IVC (if available) to assist with fluid resuscitation, a flat IVC being indicative of additional fluid required and FAST/RUSH to identify potential volume loss.**

2. <u>DISTRIBUTIVE SHOCK (SEPTIC):</u>

Result from excessive vasodilation and impaired distribution of blood which leads to hypo-perfusion. The main example is septic shock. Common causes:

- anaphylaxis,
- Burns (can cause both hypovolemic and distributive)
- Early sepsis,
- Reaction to toxins
- Heavy metals poisoning
- Neurogenic shock.

2.1. Obtain consent if possible.

2.2. Use appropriate PPE.

2.3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS; Vitals, and consider etiology of the event.

2.4. Start large bore IV or IO,

2.5. Establish second vascular access as time permits

2.6. <u>For anaphylaxis</u> – GO TO ANAPHYLAXIS PROTOCOL.

2.7. <u>IN SUSPECTED SEPTIC SHOCK PATIENTS</u>:

2.5.1. If patient systolic pressure is at or greater than 90 mmHg (or a MAP of 65-70),

- **Establish vascular access,**
- **Obtain vitals every 5 minutes,**
- **Consider additional assessment (with diagnostic tools as available) and**
- **Be prepared to intervene should patient be further identified as requiring fluid resuscitation.**
- **Provider may utilize PEtCO2 PLR or ultrasound of IVC (if available) to assist with fluid resuscitation; an IVC reading indicative of fluid loss, provider should begin fluid resuscitation.**
- **If provider has access to point of care testing (ISTAT) 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 20mins.

2.5.2. FLUID RESUSCITATION: If patient systolic pressure is less than 90 mmHg (or a MAP of 65), begin fluid resuscitation with ISOTONIC FLUID at 20ml/kg bolus, observing vitals continuously to prevent pressure. This may be repeated as necessary for patients non-responsive to fluid administration to reach a MAP of 65-70 mmHg.

2.5.3. Continued hypotensive states following fluid:

2.5.3.1. If a patient does not respond to a total of 3000ml of Isotonic Fluid, consider Adrenaline infusion titrated to a MAP of 65 or Systolic of 90 mmHg.

2.5.3.2. Consider early use of adrenaline IV infusion following initial hydration (60-80 ml/kg total dose) and maintenance fluids

3. **OBSTRUCTIVE SHOCK:**

Mechanical obstruction to blood flow, to or from the heart including cardiac tamponade, tension pneumothorax, dissecting aneurysm, and massive pulmonary embolism.

3.1. Obtain consent if possible.

3.2. Use appropriate PPE.

3.3. ABCs, assure airway, assure oxygenation.

3.4. TENSION PNEUMOTHORAX: *needle chest decompression immediately*, FOLLOW CHEST TRAUMA PROTOCOL

3.5. TAMPONADE/CARDIAC EFFUSION: 20ml/kg fluid bolus; perform pericardiocentesis with ultrasound guidance when confirmed on Ultrasound.

3.5.1. CT/CE Patients are very preload dependent - IV fluids usually help BP

3.5.2. Beware intubation complications (PPV → preload and Cardiac Output fall → cardiac arrest), be prepared for possible arrest. Avoid hyperventilation and PEEP, generally ventilate at every 5-6 seconds with approximately 5-10ml/kg ideal body weight of volume

3.6. PULMONARY EMBOLISM: transport for emergent tertiary care if identified on ultrasound.

3.6.1. Patients are often hypoxic

3.6.2. PEtCO2 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.

3.6.3. Patients are very preload sensitive - IV fluids often don't help and may cause decompensation.

3.6.3.1. Right Ventricle (RV) overload causes septum to bulge into Left Ventricle (LV) → Decreased LV filling → Decreased Stroke volume (SV), cardiac output (CO), and BP

3.6.3.2. IVF may worsen this process

3.6.3.3. Consider adrenaline infusion immediately

3.6.4. Start large bore IV or IO,

3.6.5. Establish second vascular access as time permits

3.6.6. Manage patient using permissive hypotension concepts:

3.6.6.1. If patient systolic pressure is at or greater than 80 mmHg (or a MAP of 45-50), establish vascular access, obtain vitals every 5 minutes, consider additional assessment (with diagnostic tools as available) and be prepared to intervene.

3.6.6.2. If patient systolic pressure is less than 80 mmHg (or a MAP of 45), begin cautious fluid resuscitation with ISOTONIC FLUID in 500ml boluses (20ml/kg for pediatric patients), observing vitals continuously to prevent pressure rise above 80 mmHg systolic or a MAP of 50.

3.6.6.3. May utilize PEtCO2 Passive Leg Raise, ultrasound IVC exam (if available), and Shock Index to assist with fluid resuscitation.

4. <u>CARDIOGENIC SHOCK:</u>

Decreased cardiac output and evidence of tissue hypoxia in the presence of adequate intravascular volume.

Signs and symptoms:

- Hypotension
- Absence of hypovolemia
- Signs of poor tissue perfusion (Cyanosis, Oliguria, Cool extremities, altered mental state).

4.1. Obtain consent if possible.

4.2. Use appropriate PPE.

4.3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.

4.4. Initiate IV ISOTONIC FLUID to Keep Vein Open (KVO),

4.4.1. If hypotensive, consider 250 ml fluid boluses every 5 minutes until a MAP of 65 is reached.

4.4.2. If systolic BP <90 mmHg - Consider Adrenaline infusion.

4.5. Attach cardiac monitor, EtCO2, and pulse oximeter.

4.6. Perform 12 lead ECG if feasible.

4.7. Treat dysrhythmias per the appropriate Protocol.

4.8. If signs of severe hypoventilation occur:

4.8.1. Assist ventilations with BVM with 100% oxygen.

4.8.2. Consider advanced airway placement.

4.8.3. Intubated patients with severe pulmonary congestion may require PEEP to maintain oxygenation status.

4.8.4. 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 and primarily applicable to penetrating trauma patient that increases systemic blood pressure without reaching normotension (mean normal blood pressures). The goal blood pressure for these patients is a mean arterial pressure of 45-50mmHg or a systolic blood pressure less than or equal to 90. This goes along with certain clinical criteria. Following traumatic injury some patients experience hypotension that is usually due to hemorrhage but can be due to other causes as well (blood leaking around an abdominal aortic aneurysms). In the past, physicians were very aggressive with fluid resuscitation to normalize values. Current studies have found benefit to allowing specific patients to experience some degree of hypotension in certain settings. This concept does not exclude therapy by means of fluid, inotropes or vasopressors; the only restriction is to avoid completely normalizing blood pressure in a context where blood loss may be enhanced. When a person starts to hemorrhage the body starts a coagulation process that eventually stops the bleed; issues with fluid resuscitation without control of bleeding is thought to be secondary to dislodgement of the thrombus that is helping to control further bleeding. Thrombus dislodgement was found to occur at a systolic pressure greater than 80mm Hg. In addition, fluid resuscitation dilutes coagulation factors that form and stabilize a clot, hence making it harder for the body to use its natural mechanisms to stop the bleeding. These factors are aggravated by hypothermia, exemplified by fluids being administered without warming.

ADRENAL CRISIS:

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

SPINAL INJURY PROTOCOL:

HISTORY:

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

SPECIFIC PHYSICAL FINDINGS:

A. ASSESSMENT OF SPINAL INJURY:

1. **Obtain consent if possible.**
2. **Use appropriate PPE**
3. **ABCDE**
4. **Assess vital signs**
5. **Assess for any other trauma**
6. **Examine for any of those findings:**
   - **6.1. Any Significant Distracting Injuries.**
   - **6.2. If the patient is under influence of a drug or alcohol.**
   - **6.3. If the patient is confused or uncooperative.**
   - **6.4. Has low GCS.**
   - **6.5. Has any spinal pain or tenderness?**
   - **6.6. Has extremity weakness. (Motor assessment).**
   - **6.7. Has altered or absent sensation on limbs.**
   - **6.8. Any penetrating trauma to head neck or torso with positive neurological deficit.**
   - **6.9. Any history of previous spinal surgery.**
7. **Carry out full in-line spinal immobilization if any of the factors above are present or if this assessment cannot be done.**

ALWAYS USE CLINICAL JUDGMENT, IF IN DOUBT, IMMOBILIZE.

B. ASSESSMENT FOR CERVICAL SPINE INJURY:

1. **Use the Canadian C-Spine rules to assess whether the patient at high, low or no risk for C-Spine injury**
2. **Carry out full in-line spinal immobilization if:**
   - **2.1. High risk factor for cervical injury is indicated by Canadian rule.**
   - **2.2. A low-risk factor for cervical spine injury is identified by the Canadian C-spine rule and the person is unable to actively rotate their neck 45 degrees left and right**
3. **Ultrasound Lung, RUSH (Rapid Ultrasound for Shock and Hypotension), FAST (Focus Assessment with Sonography Trauma) examination to identify other potential trauma/bleeding if available.**

TREATMENT:

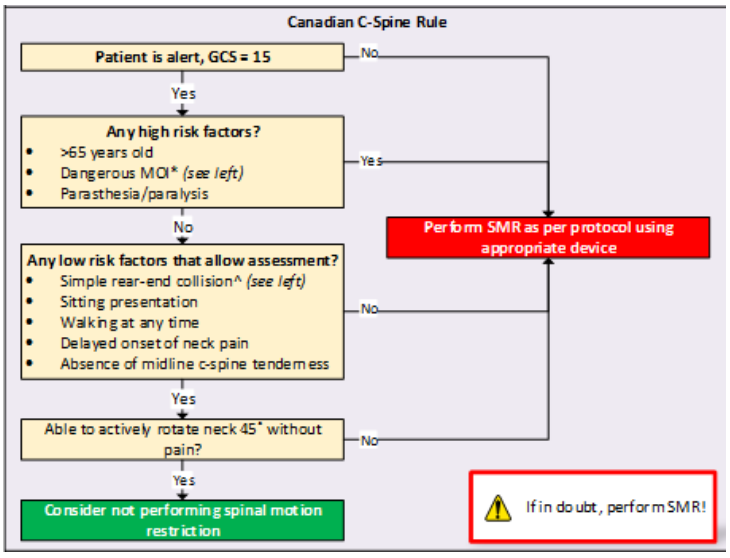
1. Obtain consent if possible.
2. Use appropriate PPE.
3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.
4. Protect the patient cervical spine with in-line spinal immobilization during any airway intervention.
5. Immobilize cervical spine with rigid extrication collar and maintain with manual in-line support, then immobilize patient to long spine board and utilize a tape/head support combination to secure head. Alternatively, if the patient is in a setting which is not conducive to use of a long board, the patient may be immobilized with a combination of rigid cervical collar, spinal immobilization device (i.e. KED, OSS, etc...), and then place patient in a litter and strap into place.
6. Establish large bore IV or IO line, if patient is hypotensive and without other injury, follow SHOCK PROTOCOL for distributive shock.
7. 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.
   7.1. Continue fluids at 500-1000 ml/hour, if no signs of pulmonary edema.
8. If with patient greater than 2 hours, measure and record all urine output.

SPECIFIC PRECAUTIONS AND CONSIDERATIONS:

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

Canadian Spine Algorithm:

Dangerous mechanisms:
- fall from ≥3 ft or 5 stairs
- an axial load to the head
- a motor vehicle accident
  - at high speed (>100 km/hr)
  - rollover
  - ejection
- a collision involving a motorized recreational vehicle
- a bicycle collision



TRAUMA ASSESSMENT

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

Emphasis at scene should be to perform rapid primary survey. ***After gaining access to the patient, scene time should not exceed 10 minutes, except for extended extrication times, transport by ambulance to landing zone (LZ) or procedures***. Plan to obtain vascular access and lower priority treatments once enroute to the hospital. Do not delay transport.

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

HISTORY:

1. Obtain details surrounding incident.
   1.1. Time of incident.
   1.2. Nature of incident.
   1.3. Mechanism of injury (Fall, Auto Crash, Motorcycle crash, burn)
   1.4. Loss of Consciousness.
   1.5. Apparent Injuries.
2. Receive report of patient condition and interventions prior to crew arrival.
3. Obtain information concerning past medical history, allergies, medications and last meal.
4. Obtain copies of record, x-ray and laboratory studies if patient transfer situation.
5. Avoid the most common three major causes of death in trauma patient:
   5.1. Massive acute blood loss.
   5.2. Severe injury to vital organs especially the brain from hypoxia, hypoglycemia and hypotension.
   5.3. Acute ventilatory failure due to airway obstruction

PRIMARY SURVEY/INTERVENTION:

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

1. **Provide appropriate airway management while maintaining cervical spine stabilization as indicated:**
   1.1. Evaluate patency, remove gross blood and objects from mouth, position for clear airway.
   1.2. Assess the patient for potential airway problems prior to transport, use LEMON law (3/3/2) for assessment.
   1.3. Assure oxygenation, ventilation, and airway management as appropriate per GENERAL GUIDELINES FOR PATIENT CARE PROTOCOLS.
2. **Breathing:**

2.1. Expose neck/chest.
2.2. Rate/depth of respirations.
2.3. Inspect/palpate for signs of tension pneumothorax, open pneumothorax or flail chest.
2.4. Auscultate lung fields and percuss for any internal bleeding.
2.5. Alleviate tension pneumothorax (See CHEST DECOMPRESSION PROTOCOL).
3.6 Seal open pneumothorax with Asherman seal, Russel seal, or occlusive dressing taped on three sides
3.6.1 Ultrasound exam of lungs (if available)

3. **Circulation with control of hemorrhage:**
   - 3.1. Assess for shock even if compensated.
   - 3.2. Assess for pulses.
   - 3.3. Evaluate perfusion/capillary refill.
   - 3.4. Apply direct pressure to bleeders.
     - 3.4.1. Bleeding control - hemorrhage controlled
     - 3.4.2. Bleeding NOT controlled – Injury site suitable for a tourniquet?
       - 3.4.2.1. If Yes – Apply tourniquet
       - 3.4.2.2. If No - Apply hemostatic agent or dressing with direct pressure
   - 3.5. Apply appropriate splinting of skeletal injuries.
   - 3.6. Maintain normal body temperature (Avoid hypothermia).
   - 3.7. Initiate two large-bore IV's or IO with ISOTONIC FLUID during transport.
   - 3.8. Do not delay transport to initiate IVs.
   - 3.9. Administer TXA
4. Neurological exam with GCS, AVPU, Pupil size and reaction, Seizure activity or any sensory or motor loss.

SECONDARY SURVEY:

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

Detailed assessment is a systematic head-to-toe physical examination that identify all injuries.

The patient airway, respiratory, and circulatory status must be reassessed frequently because the patient who initially present without life-threatening injuries may subsequently develop them

1. **HEAD:**
   - 1.1. Assess for signs of trauma, including scalp lacerations/bleeding and skull deformities.
   - 1.2. Assess for rhino/otorrhea.
   - 1.3. Assess pupillary size and reactivity.
2. **MAXILLOFACIAL:**
   - 2.1. Reassess adequacy of airway.
   - 2.2. Assess for instability of facial bones.
   - 2.3. Assess for nasal, eye, and oral injuries.
     - 2.3.1. **Definitive Care:**
       - 2.3.1.1. Protect and maintain airway.

2.3.1.2. Control nasal bleeding by packing with gauze if necessary.

3. **NECK:**

3.1. Assess for wounds, swelling, deformity, subcutaneous emphysema, tracheal deviation, and jugular venous distention.

3.2. Assess quality of carotid pulses.

3.2.1. **Definitive Care:**

3.2.1.1. Apply cervical collar and cervical immobilization device for any blunt trauma ≤ 24 hours from time of injury.

3.2.1.2. Control bleeding by direct pressure.

3.2.1.3. Protect airway.

4. **CHEST:**

4.1. Assess/palpate chest wall for wounds, deformities, and symmetrical excursion.

4.2. Auscultate breath sounds.

4.3. Auscultate heart tones with regard to rate and quality.

4.3.1. **Definitive Care:**

4.3.1.1. Assist ventilation per Airway Protocol.

4.3.1.2. If evidence of injury follow CHEST TRAUMA PROTOCOL

5. **ABDOMEN**

5.1.Assess abdomen for contusions, wounds or eviscerated organs.

5.2.Gently palpate abdomen to assess tenderness or rigidity.

5.2.1. **Definitive Care:**

5.2.1.1. Cover open wounds with dry sterile dressing.

5.2.1.2. Cover any eviscerated organs with sterile moist dressing.

6. **GU/PELVIC:**

6.1.Assess for swelling, discoloration, bleeding or blood at urethral meatus.

6.2.Do not manipulate pelvis, MOI should suggest potential fracture.

6.2.1. **Definitive Care:**

6.2.1.1. Control bleeding, by direct pressure.

6.2.1.2. Consider Urinary catheter for interfacility trauma transports

6.2.1.3. If blood present at urethral meatus - DO NOT INSERT URINARY CATHETER.

7. **EXTREMITIES:**

7.1.Assess for bleeding, contusions, deformities, or swelling in all extremities.

7.2.Assess neurovascular status of all extremities by noting presence of pulses, skin color and gross motor and sensory function.

7.2.1. **Definitive Care:**

7.2.1.1. Control bleeding by direct pressure and cover all open wounds with dry sterile dressings.

7.2.1.2. Treat all injuries per ORTHOPEDIC INJURIES PROTOCOL

8. **NEUROLOGIC:**

8.1. Assess mental status and note Glasgow Coma Scale.

8.2. Assess gross motor and sensory function.

8.2.1. Definitive Care:

8.2.1.1. Treat per HEAD INJURY PROTOCOL.

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

9. ULTRASOUND (if Availablre):

9.1. Ultrasound exam of Lungs, Chest, Abdomen

9.2. Modify fluid resuscitation based on findings as necessary.

9.3. Follow pain management protocol if any pain.

ADDITIONAL TREATMENT CONSIDERATIONS:

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

ADULT TRAUMA SCORE:

Table-1: Revised Trauma Score.

Glasgow Coma Scale (GCS)	Systolic Blood Pressure (SBP)	Respiratory Rate (RR)	Coded Value
13-15	>89	10-29	4
9-12	76-89	>29	3
6-8	50-75	6-9	2
4-5	1-49	1-5	1
3	0	0	0

Pediatric Trauma Score:

Component	Score		
	+2	+1	-1
Weight	>20 kg	10 - 20 kg	< 10 kg
Airway	Normal	Oral or nasal airway	Intubated or tracheostomy
Systolic BP	>90 mm Hg	50 - 90 mm Hg	<50 mm Hg
Level of Consciousness	Awake	Obtunded or any loss of consciousness	Comatose
Open Wounds	None	Minor	Major or penetrating
Fractures	None	Minor	Open or multiple
Total Score			
	9 - 12 Minor Trauma **6 - 8 Potentially life threatening** **0 - 5 Life threatening** **< 0 Usually fatal**		

TRAUMATIC CARDIAC ARREST

TREATMENT:

1. Confirm Cardiac Arrest - Begin Chest Compressions at 100-120/min
2. *If medical arrest probable* – follow CARDIAC ARREST PROTOCOL.
3. *Loss of vital signs greater than 20 minutes – consider ending resuscitative efforts.*
4. Establish Endotracheal Tube (or insert supraglottic airway device if unable to ET intubate) and ventilate patient with oxygen at 5 – 10 ml/kg IBW and q 5 – 8 seconds ventilation with 100% Oxygen and PEEP at 0 cmH20
   - 4.1. Establish PEtCO2 on airway and evaluate levels.
   - 4.2. Consider ending resuscitative efforts if PEtCO2 is less than 10mmHg with high quality compressions and proper ventilations.
5. ECG Monitoring, if ventricular fibrillation present, defibrillate once every 2 minutes of CPR.
6. Establish Vascular Access (x 2 if able), preferably above the level of the diaphragm, at least one large bore IV/IO (16-14g)
7. Hemorrhage Control:
   - 7.1. Direct Pressure for bleeding wounds and compression dressings.
   - 7.2. Hemostatic agent use on wounds.
   - 7.3. Isotonic 20ml/kg IV Fluid
   - 7.4. Continue infusion of blood product at 10ml/kg boluses, if begun at transferring facility and ordered by transferring physician.
   - 7.5. Tranexamic Acid into first fluid bolus when administered.
8. Ultrasound for immediate FAST, RUSH, and Lung Exams (if available)
   - 8.1. If no cardiac movement on US after 10 minutes and PEtCO2 less than 10mmHg – end resuscitative efforts if possible.
   - 8.2. If preload or right ventricle compression identified – fluid resuscitation and identify whether hemothorax or pneumothorax is cause, if yes, resolve.
9. *PEtCO2 less than 10mmHg – GO TO Death in the Field Protocol.*
10. *If Pneumothorax identified* – NEEDLE CHEST DECOMPRESSION, if ineffective CHEST TUBE THORACOTOMY
11. If *Tension Hemothorax or Hemothorax resulting in ventricular compassion – Isotonic Fluid at 20 ml/kg with CHEST TUBE THORACOTOMY*
12. If *Cardiac Tamponade* present - 20 ml/kg Isotonic Fluid Bolus and perform PERICARDIOCENTESIS with Ultrasound guidance
13. Consider Adrenaline after 10 minutes of resuscitative effort.
14. If PEtCO2 above 20 mmHg and cardiac movement on ultrasound (if available) at 15 minutes' post event – ACTIVATE DIRECT TO OPERATING ROOM PROCESS for Clam Shell Thoracotomy from surgical team
15. PEtCO2 less than 10mmHg at 20 minutes and no cardiac movement on ultrasound (if available) – GO TO Death in the Field Protocol

VOMITING / NAUSEA

Could be a symptom of acute myocardial infarction especially STEMI, obtain 12 leads ECG.

TREATMENT:

1. **Obtain consent if possible.**
2. **Use appropriate PPE.**
3. **Assure airway, breathing, circulation, and protection from environment.**
4. **Attend to other illness or injury first.**
5. **Establish IV, follow SHOCK PROTOCOL, if necessary.**
6. **Ondansetron IV or dissolvable strip.**
7. **All immobilized patients who will be involved in high angle extrication, short haul or helicopter hoist should receive Ondansetron prior to extrication.**

EMT-B Extended scope IV/OI and Cardiac Care Northern Emirates

Shock Index Reference:

Shock index = Heart Rate / systolic blood pressure. The shock index is calculated automatically on e PCR and can be seen at bottom of Observations once Pulse and Blood pressure are inputted. Adult shock index ≥ 0.9

Shock Index pediatric adjusted (SIPA)
4 – 6 Years ≥ 1.2

6 – 12 Years ≥ 1

> 12 Years ≥ 0.9

For Pediatric < 4 years old IV Fluid Resuscitation depends on the physical assessment (warning signs) Warning Signs (with associated injury or illness)

Tachycardia, Delayed capillary refill, Weak peripheral pulses, Altered mental status, Cold extremity, Fever (septic shock)

MEWS Reference:

Green = 0–2 Score | Yellow = 3 Score | Orange = 4–5 Score | Red = greater than 6 Score

Modified Early Warning System (MEWS)	3	2	1	0	1	2	3
Respiratory rate per minute		Less than 8	8	9–17	18–20	21–29	greater than or = to 30
Heart rate per minute		Less than 40	40–50	51–100	101–110	111–129	greater than or = to 130
Systolic blood pressure	Less than or = to 70	71–80	81–100	101–159	160–199	200–220	greater than 220
Conscious level (AVPU)	Unrespon-sive	Responds to pain	Responds to voice	Alert	Agitation or confusion	New on set of agitation or confusion	
Temperature		Less than 95.0°F (35.0°C)	95.0–96.8° F (35.05–36° C)	96.9–100.4°F (36.05–38° C)	100.5–101.3° F (38.05–38.5° C)	greater than or = to 101.4°F (38.55°C)	

Source: Kathy D.Duncan RN; Christine McMullan MPA; Barbara M. Mills DNP, PNP, RN, ACNPC, ANPC, CCRN, PCCN – Nursing February 2012

REASON:

Creating the EMT – B Extended scope of practice to include IV Fluid Resuscitation in case of shock (hypovolemic, Cardiogenic and septic shock) depending on the shock index for Adult and pediatric age ≥ 4 years old as mentioned in the shock index guide. Meets accreditation requirements and upgrades the Pre- Hospital Care provided to the Communities of Northern Emirates

FLUID RESCUSITATION:

Pediatric or Adult Fluid resuscitation is 20ml / kg Bolus over 5 – 20 min to maintain blood pressure and tissue perfusion. Vital signs must be rechecked and assessed after every 250ml or at 5min intervals as per CGP 134. Epinephrine 1:10 000 for Cardiac Arrest only. Fluid resuscitation / Cardiac Arrest IV/IO access

- Shock management
- Hemorrhage control
- Severe Dehydration
- Heat Exhaustion

MEWS & SHOCK INDEX (SI):

The Scoring System is accurate for Medical Patients but random Blood Sugar Levels may need to be considered. Treat the patient not the numbers.

The Trauma Patient will be highlighted in the Shock Index if there is potential concern. The Shock Index (SI) and MEWS was modified to capture Pediatric Pulse and BP Readings for accuracy. Treat the patient not the numbers.

The Medic will always be able to Override and Manually Change the MEWS /SI Score if they feel that needs to reflect differently.

REQUIREMENTS TO ACHIEVE COMPETENCY:

- EMT – B Licensed HAAD and current
- Completion of the IV / IO and Cardiac Arrest Care program
- LMS Learning Package all complete
- Face to Face Education Component complete and passed
- Hospital IV training complete and passed
- Pre-Hospital practice under Supervision complete

All of the above must be complete and your Area Manager must inform Education Manager you have completed before you can practice autonomously.

APPENDIX 'A' PROCEDURAL PROTOCOLS

CHEST DECOMPRESSION (NEEDLE THORACOSTOMY)

INDICATIONS:

Signs of tension pneumothorax must be present before decompression is performed. If advanced airway management is required and a tension pneumothorax are present, pneumothorax management should be priority.

TENSION PNEUMOTHORAX – SIGNS & SYMPTOMS:

1. Consistent history, (i.e. chest trauma, COPD, patient on positive pressure ventilation)
2. Absent breathe sound on affected side.
3. Shock symptoms, with low or rapidly decreasing BP.
4. Progressive respiratory distress (tachypnea, cyanosis).
5. Tracheal shift away from affected side.
6. Distended neck veins.
7. Inadequate chest expansion.
8. Hyper expanded chest on effected side.
9. Hyper-resonant percussion on affected side.
10. Increased resistance to positive pressure ventilation, especially if intubated. Decompensated shock (systolic BP < 90 mmHg)

PROCEDURE:

1. **Obtain consent when possible,**
2. **High flow oxygen.**
3. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to SpO2, air entry.**
4. **Patient must be in supine or sitting up position.**
5. **Confirm the affected side, note it might be bilateral.**
6. **Aseptic condition when possible, Disinfect the selected procedure site with approved disinfectant.**
7. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
8. **On affected side, locate the mid-clavicular line 2nd intercostal space and insert a large gauge over-the-needle catheter (10 – 14Ga.) with syringe attached, over the superior margin of the third rib and then slide over it.**
9. **If the air is under tension, the barrel will pull easily.**
10. **Remove the syringe, remove needle (Needle should be safely dispose in the sharp box) and then advance the cannula.**
11. **Decompression of the chest should follow.**
12. **Secure inserted cannula to the patient's chest.**

COMPLICATION:

1. Failure
2. Local hematoma
3. Pneumothorax
4. Organ injury

MANAGEMENT OF COMPLICATIONS:

1. Continuous monitoring
2. Early recognition
3. Treat symptomatically,
4. Request support,
5. Rapid transport to the hospital

CHEST TUBE THORACOSTOMY

INDICATIONS:

1. Evidence of Air/Fluid in the pleural space accompanied by signs of poor perfusion.
2. Failure of needle Decompression attempts.
3. Aeromedical Transport patient with pneumothorax.

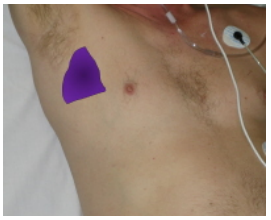
SIGNS OF TENSION PNEUMOTHORAX:

1. Consistent history, (i.e. chest trauma, COPD, patient on positive pressure ventilation)
2. Absent breathe sound on affected side.
3. Shock symptoms, with low or rapidly decreasing BP.
4. Progressive respiratory distress (tachypnea, cyanosis).
5. Tracheal shift away from affected side.
6. Distended neck veins.
7. Inadequate chest expansion.
8. Hyper expanded chest on effected side.
9. Hyper-resonant percussion on affected side.
10. Increased resistance to positive pressure ventilation, especially if intubated. Decompensated shock (systolic BP < 90 mmHg)

CONSIDER:

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

PROCEDURE:



1. **Obtain consent when possible.**
2. **Determine the affected side.**
3. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to SpO2, air entry.**
4. **Determine insertion site (fifth intercostal space anterior to mid-axillary line)**
5. **Position patient supine with head 30 degree up, with arm abducted and elbow flexed under the head (if possible).**
6. **Aseptic condition when possible, Disinfect the selected procedure site with approved disinfectant agent.**
7. **Check and prepare all equipment prior to the procedure while maintaining sterility**

8. **Locally anesthetize the skin and rib periosteum if available due to patient level of consciousness, ensure needle travels over the top of the 6th rib to avoid neurovascular injury.**
9. **Keep within the "Safe Triangle" as shown in the diagram**
10. **Make 2-3 cm incision over rib**
11. **Dissect using blunt technique through subcutaneous tissues**
12. **Puncture parietal pleura over the top of the rib with curved clamp**
13. **Insert gloved finger into incision to palpate lung and ensure proper placement**
14. **Place chest tube toward the lung apex and attach to drain system**
15. **If available suture in place or use dressing to cover incision, assuring dressing does not interfere with outflow**

COMPLICATIONS:

1. Pain.
2. Damage to local structure.
3. Lung injury
4. Bleeding
5. Vascular structure injury.
6. Infection

MANAGEMENT OF COMPLICATIONS:

1. Continuous monitoring
2. Early recognition
3. Treat symptomatically,
4. Request support,
5. Rapid transport to the hospital
6. Maintain sterile technique
7. Pain management.

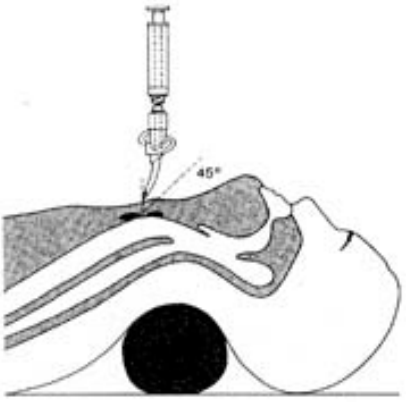
CRICOTHYROTOMY

NEEDLE CRICOTHYROTOMY

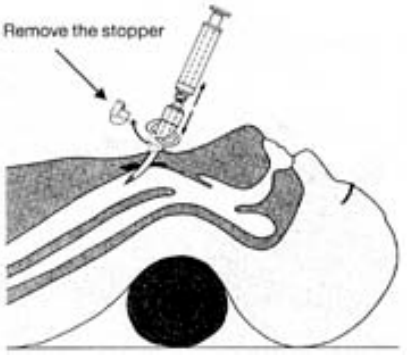
INDICATIONS:

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

PROCEDURE (QUICKTRACH®):



1. **Consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to SpO2, air entry.**
3. **Aseptic condition when possible, Disinfect the selected procedure site with approved disinfectant.**
4. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
5. **Place the patient in a supine position. Assure stable positioning of the neck region (place a pillow or piece of clothing under the patient's shoulders) and hyperextend the neck.**
6. **Secure the larynx laterally between the thumb and forefinger. Find the cricothyroid ligament (in the midline between the thyroid cartilage and the cricoid cartilage). This is the puncture site.**
7. **Firmly hold the device and puncture the cricothyroid ligament at a 90-degree angle. Note: Because of the sharp tip and conical shape of the needle, an incision of the skin with a scalpel is not necessary. The opening of the trachea is achieved by dilating through the skin. This reduces the risk of bleeding as only the smallest necessary opening is made.**
8. **After puncturing the cricothyroid ligament, check the entry of the needle into the trachea by aspirating air through the syringe. If air is present, the needle is within the trachea*. Now, change the angle of insertion to 60 degrees and advance the device forward into the trachea to the level of the stopper. The stopper reduces the risk of inserting the needle too deeply and causing damage to the rear wall of the trachea.**
9. **Remove the stopper. After the stopper is removed, be careful not to advance the device further with the needle still attached.**



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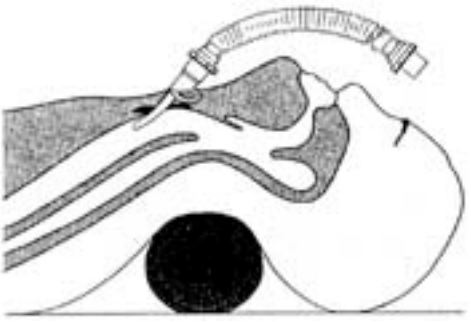


Should no aspiration of air be possible in Step 4 because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle further until entrance into the trachea is made. Once this is verified, continue as in Step 6.

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

COMPLICATIONS:

1. Technique failure
2. kinking of cannula
3. Cannula obstruction or dislodgment
4. Injury to local structure (Trachea, esophageal, nerve, vessels injury.
5. Surgical emphysema.

MANAGEMENT OF COMPLICATIONS:

1. Continuous monitoring.
2. Early recognition.
3. Treat symptomatically.
4. Request support.
5. Rapid transport to the hospital.

SURGICAL CRICOTHYROIDOTOMY

INDICATIONS

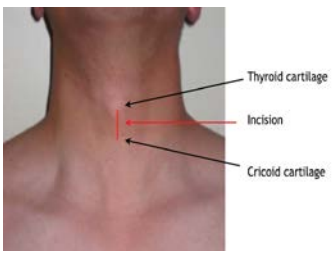
- Patient in need of airway management and provider is unable to ventilate patient.
- Inability to succeed at endotracheal intubation and patient cannot be ventilated.

CONTRAINDICATIONS

- Ability to secure an airway with less invasive means.
- Inability to locate landmarks.
- Transection of trachea distal to cricothyroid membrane.
- Age <12 yrs.

PROCEDURE:

1. **Consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to SpO2, air entry.**
3. **Aseptic condition when possible, Disinfect the selected procedure site with alcohol swabs.**
4. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
5. **Recognizes inadequacy of ventilation, despite attempts to ventilate via BVM and failure to perform advanced airway placement with RSI and patient unresponsive**
6. **Assembles equipment for procedure (proper size ET tube, gum boogie/tracheal tube inducer, suction, syringe, way to introduce tube, scalpel, method of securing tube, 4x4's)**



7. **Locates landmark: prominent thyroid cartilage of larynx and cricoid cartilage is 1-3cm below this - the cricothyroid membrane is between.**
8. **Prep skin with NA approved disinfectant; use sterile drapes if time permits.**
9. **Palpate and maintain grasp on thyroid cartilage with non-dominant hand.**
10. **Using a scalpel, make longitudinal 1-1.5cm incision through skin over cricoid membrane**

11. **Using a scalpel, make transverse 1-1.5cm incision through cricothyroid membrane and place Gum Boogie into incision prior to removing scalpel, then remove the scalpel.**
12. **Dilate with gloved little finger and palpate tracheal lumen, ideally identifying the cartilage of the posterior wall of the trachea/ cricoid ring.**

13. **Use forceps to separate thyroid and cricoid cartilage's opening the tracheal lumen around Gum Boogie.**
14. **Slide ETT over Gum Boogie and into tracheal lumen inferiorly toward carina until balloon has passed through the incised opening.**
15. **Secure ETT is held securely while Removing Gum Boogie and ETT connected to BVM.**
16. **Place PEtCO2 and Auscultate chest/stomach to confirm placement, inflate cuff, tape securely, and manage per post intubation care.**
17. **Secure ETT**
18. **Consider infiltrate area with Lidocaine if patient is awake**

COMPLICATIONS:

1. Technique failure
2. Injury to local structure (Trachea, esophageal, nerve, vessels injury.
3. Surgical emphysema.

MANAGEMENT OF COMPLICATIONS:

1. Continuous monitoring.
2. Early recognition.
3. Treat symptomatically.
4. Rapid transport to the hospital.

GASTRIC DECOMPRESSION THROUGH NASOGASTRIC / OROGASTRIC TUBE INSERTION

INDICATIONS:

1. Inability to adequately ventilate due to gastric distension, patient with advanced airway in place, gastric decompression of fluids, air or blood.
2. HEMS and Long distance air transfers

CONTRAINDICATIONS:

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

PROCEDURE:

1. **Consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure**
3. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
4. **Determine correct size and depth of tube**
   - **4.1. Size:**
     1. **Newborn 8.0 fr.**
     2. **Toddler/Preschool 10 fr.**
     3. **School age 12 fr.**
     4. **Adolescents/Adults 14-18 fr.**
   - **4.2. Depth and Measurement:**
     1. **Nasogastric: Top of nose, over ear to xyphoid process.**
     2. **Orogastric: lip, around angle of mandible to xiphoid process.**
   - **4.3. Consider Nebulized Lidocaine, or lignocaine gel if available.**
5. **Insert tube:**
   - **5.1. Nasogastric:**
     1. **Sit the patient upright if possible (conscious patient).**
     2. **Ensure the tube is well lubricated with KY gel.**
     3. **Pass tube along nasal floor into stomach.**
     4. **Advance tube until the measured estimation of entry into the gastrium**
     5. **Push air into tube w/ 20cc syringe and auscultate epigastrium or confirm with ultrasound if available.**
     6. **Secure tube and connect to collection bag.**
   - **5.2. Orogastric:**
     1. **Visualize posterior pharynx, pass tube over tongue into stomach.**
     2. **Advance tube to the measurement estimated to reach the gastrium.**
     3. **Push air into tube w/ 20 cc syringe and auscultate epigastrium or confirm with ultrasound if available.**
     4. **Secure tube.**

6. Precautions/Complications:

6.1. In head trauma patient where gastric decompression would benefit ventilation Gastric tube placement will be through the mouth.

COMPLICATIONS ASSOCIATED WITH GASTRIC TUBE PLACEMENT.

1. Epistaxis.
2. Intracranial placement.
3. Vomiting and aspiration.
4. Bronchial placement (If the patient starts coughing with the sterile water flush).
5. Pharyngeal perforation, esophageal obstruction or rupture.
6. Bronchial or alveolar perforation.
7. Pneumothorax.
8. Gastric or duodenal rupture.
9. Kinking and knotting.

TO PREVENT COMPLICATIONS:

1. Make sure that you are familiar with the process of Oro/Naso gastric tube insertion
2. In an unconscious or obtunded patient, you may use a Magills Forceps with a laryngoscope to visualize the NGT and guide the tube into the esophagus under direct laryngoscopy until the desired measured insertion is achieved.

IN CASE OF COMPLICATION

1. Remove the NGT/OGT Tube
2. Treat symptomatically
3. Seek clinical advice and or support
4. Rapid transport to hospital

RAPID SEQUENCE INTUBATION

Rapid sequence intubation (RSI) is an airway management technique that produces inducing immediate unresponsiveness (induction agent) and muscular relaxation (neuromuscular blocking agent) and is the fastest and most effective means of controlling the emergency airway

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
4. Impending obstruction (e.g. airway burn, penetrating neck trauma.

PRE-INTUBATION:

1. **Consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to SpO2, air entry.**
3. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
4. **Use CHALLENGE RESPONSE RSI CHECKLIST to optimize intubation attempts and patient condition.**
5. **Airway exam completed (LEMON and Trauma ABCS)**
6. **Pre-oxygenation, 100% O2 administered via NRB Mask at 15L, CPAP at 15-25L, or BVM if appropriate.**
    - 6.1. **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.**
7. **If, BVM ventilation of patient, PEtCO2 in place**
8. **Optimize patient position**
9. **Pre-oxygenate patient prior to paralytic use if possible**
10. **Suction in "ready" position**
11. **Primary and Secondary IV or IO secured.**
12. **Cardiac monitor, SpO2, and EtCO2 ready.**
13. **Backup – always have a surgical kit available**
14. **Prepare Equipment on CHALLENGE CHECKLIST**
    - 14.1. **Use of Gum Elastic Boogie has been associated with higher success rate in intubation.**
    - 14.2. **Prepare video laryngoscopy if available for difficult airways**
15. **Perform Time Out**
    - 15.1. **In-line immobilizer brief (if necessary)**
    - 15.2. **Monitoring (SpO2, ECG, PEtCO2) tasks person briefed**
    - 15.3. **Drug administer briefed and dosages confirmed drugs drawn up and ready.**
    - 15.4. **EtCO2 ready.**

INTUBATION:

1. **PERFORM CHALLENGE CHECKLIST WITH ALL COMPONENETS CHECKED**
2. **Administer Induction Agent, ketamine 1.5 2 mg/kg.**
3. **Administer Paralytic Agent, Rocuronium 0.6-1.2 mg/kg, Loading dose, 5-10 mcg/kg/min Maintenance dose.**
4. **Perform endotracheal intubation.**
5. **If not successful after 30 seconds or desaturation (SpO2 below 90%) occurs, temporarily halt intubation attempt and pre-oxygenate with BVM and 100% O_2.**
6. **Reattempt intubation.**
   - 6.1. ***If intubation unsuccessful, after two attempts in two minutes*** **- Place Alternative Airway Device immediately and manage airway with device; DO NOT reattempt intubation.**
   - 6.2. ***Cannot intubate and cannot ventilate*** **- Perform cricothyroidomy.**
7. **If bradycardia - Treat hypoxia, as the most likely cause.**
8. **Upon successful intubation, confirm ET tube placement by capnography and auscultation.**
   - 8.1. **Ventilate with Bag-Valve-ET (or ventilator) and 100% O_2, maintain $EtCO_2$ 35-45mmHg (30-35 mmHg with head 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 PEtCO2, 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 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 a minimum BP of 90 mmHg systolic and EtCO2 30-35 mm/Hg.**
2. **Connect patient to ventilator, if available, and confirm successful ventilation and oxygenation settings based on patient monitoring devices.**
3. **Monitor and record vital signs (SpO2, PEtCO2, 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, 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 Midazolam.

4. Notify receiving physician/receiving facility of long acting paralytic use.

5. Rocuronium Considerations:

5.1. Duration of action 25-50 minutes.

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.

COMPLICATIONS:

1. Technique failure

MANAGEMENT OF COMPLICATIONS:

1. Continuous monitoring.
2. Early recognition.
3. Treat symptomatically.
4. Rapid transport to the hospital.

INTUBATION – SUPRAGLOTTIC AIRWAY

INDICATIONS:

- Airway compromise or respiratory failure
- Expected clinical course or GCS less than or equal to 8
- Prolonged BVM ventilation (> 8 mins) or transport while attempting BVM ventilation
- Useful backup when RSI is attempted and failed
- Excellent option in trauma patients as they can be inserted independent of the patient position.

Contraindication:

- Intact gag reflex
- Recent ingestion of caustic substance
-

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

1. **Consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to SpO2, air entry.**
3. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
4. **Airway exam completed (LEMON and Trauma ABCS)**
5. **100% O2 administered via NRB Mask at 15L, CPAP at 15-25L, or BVM if patient apneic.**
6. **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.**
7. **If, BVM ventilation of patient, PEtCO2 in place**
8. **Optimize patient position – ear/shoulder plane, sniffing position**
9. **Pre-Oxygenate patient prior to attempt if possible**
10. **Suction ready**
11. **Primary IV or IO secured.**
12. **Cardiac monitor, SpO2, and EtCO2 ready.**
13. **Prepare Equipment:**
    - 13.1. **ALWAYS Gum Elastic Boogie catheter or Flexible Lighted Stylet system for oral tracheal intubation.**
    - 13.2. **Prepare video laryngoscopy or flexible intubation scope if available for difficult airways**
14. **Perform Time Out**
    - 14.1. **In-line immobilizer brief (if necessary)**
    - 14.2. **Monitoring (SpO2, ECG, PEtCO2) 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 PEtCO2 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 patient's 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, PEtCO2, ECG, NIBP) every 10 minutes**
4. **Check and secure lines and tubes**

COMPLICATIONS:

1. Technique failure
2. Gagging and vomiting if intact gag
3. Aspiration
4. Damage to esophagus,
5. Blockage
6. Improper placement
7. Inadequate ventilation

MANAGEMENT OF COMPLICATIONS:

8. Remove and ventilate with BVM
9. Request medical support
10. Provide suctioning when needed
11. Always choose appropriate size
12. Continuous monitoring.
13. Early recognition.
14. Treat symptomatically.
15. Rapid transport to the hospital

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 (> 8 mins) or transport while attempting BVM ventilation

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

1. **Consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to SpO2, air entry.**
3. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
4. **Airway exam completed (LEMON and Trauma ABCS)**
5. **100% O_2 administered via NRB Mask at 15L, CPAP at 15-25L, or BVM if patient apneic.**
   - 5.1. **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.**
6. **If, BVM ventilation of patient, PEtCO2 in place**
7. **Optimize patient position – ear/shoulder plane, sniffing position**
8. **Pre-oxygenate using 100% O2 for 3 min using tight-fitting face mask prior to attempt if possible**
9. **Suction ready**
10. **Primary IV or IO secured.**
11. **Cardiac monitor, SpO2, and EtCO2 ready.**
12. **Prepare Equipment:**
13. **Perform Time Out**
    - 13.1. **In-line immobilizer brief (if necessary)**
    - 13.2. **Monitoring (SpO2, ECG, PEtCO2) tasks person briefed**

INTUBATION – ORAL TRACHEAL:

1. **Position head in "sniffer" position**
2. **Insert direct laryngoscopy blade while displacing tongue (if using video laryngoscopy system, use per manufacturers recommendations)**
3. **Elevate mandible with direct laryngoscope (if using video laryngoscopy system, use per manufacturers recommendations)**
4. **Introduce Gum Boogie or Flexible Lighted Stylet system with ET tube and advance to canulate the trachea (if using video laryngoscopy system, use per manufacturers recommendations).**
5. **Advanced ET tube to proper depth, assuring tube is not against carina and not beyond proper depth (3 x diameter of ET expressed in centimeters)**
6. **Inflates cuff to proper pressure and disconnects syringe**
7. **Directs ventilation of patient**

8. Confirms proper placement first with PEtCO2 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 Pre-oxygenate with BVM and 100% O_2.
11. Reattempt intubation.
    - 11.1. *If intubation unsuccessful, after two attempts in two minutes* - Place Alternative Airway Device immediately and manage airway with device; DO NOT reattempt intubation.
    - 11.2. *Cannot intubate and cannot ventilate* - Perform needle cricothyroidomy.
12. If bradycardia - Treat hypoxia, as the most likely cause.

INTUBATION – NASO TRACHEAL:

Note: DO NOT utilize nasotracheal method if any of the following are present: Cardiac arrest, Apnea, Pediatric patients (age ≤10 years or 25kg), Le Fort Fracture (Transracial Fracture) with instability on palpation, PEtCO2 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 PEtCO2 on end of tube during attempt,
    - 4.4. If using flexible laryngoscope for increased first attempt success, follow manufacturer recommendations
5. 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.
6. 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.
7. As the ET Tube nears the trachea PEtCO2 readings will remain at or near initial levels, indicating that the tip of the endotracheal tube is near the entrance to the trachea.
    - 7.1. The awake patient should be instructed to deeply inspire to help guide the tube through the vocal cords and into the trachea.
    - 7.2. Correct endotracheal placement may also be assisted by rotating the tube 90 degrees so that the bevel is up and facing the glottis

7.3. Once in the trachea, attached Bag Valve

8. Carefully advance the endotracheal tube through larynx into the trachea when device sounds and PEtCO2 are at their peak.
9. Confirms proper placement first with PEtCO2 waveform and then by auscultation bilaterally over each lung and over epigastrium
   9.1. Once the tube has been placed, the patient should not be capable of phonation
   9.2. 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.
10. Inflates cuff to proper pressure and disconnects syringe, and then directs ventilation of patient
11. Secures ET tube with commercial device or tape, using caution to prevent too tight a binding effect around patient's head/neck.
12. If not successful after 30 seconds or desaturation (SpO2 below 90%) occurs, temporarily halt intubation attempt and pre-oxygenate with BVM and 100% O_2.
13. Reattempt intubation.
   13.1. *If intubation unsuccessful, after two attempts in two minutes* - Place Alternative Airway Device (if possible) and manage airway with device; DO NOT reattempt intubation.
   13.2. *Cannot intubate and cannot ventilate* - Perform needle cricothyroidomy.
14. 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, PEtCO2, ECG, NIBP) every 10 minutes
4. Check and secure lines and tubes
5. Ketamine for patients with agitation and responsive to pain or voice.

COMPLICATIONS AND MANAGEMENT OF COMPLICATION:

- Gagging and vomiting if intact gag.
- Aspiration, provide suctioning when needed
- Damage to esophagus, always choose appropriate size. Broken teeth (trauma)
- Bleeding
- Misplacement – remove the tube
- Hypoxia – provide proper airway management

SYNCHRONIZED CARDIOVERSION

INDICATIONS:

Unstable Tachyarrhythmia

Tachycardia patients with rates in excess of 150 bpm from a myocardial cause with one or more of the following additional symptoms:

i. Hypotension,
ii. continuous and ongoing chest pain,
iii. altered mental status,
iv. signs of shock,
v. acute onset heart failure

PROCEDURE

1. **Consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to ECG, HR, SPO2, BP.**
3. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
4. **Attaches the ECG limb leads to obtain an initial rhythm**
5. **The patient is determined in an unstable condition by signs and symptoms.**
6. **Sedation considered for all alert patients if the time permits.**
7. **The therapy pads are placed in the manufacturer recommended position**
8. **Lead 2 is confirmed or the lead with the greatest QRS amplitude should be selected**
9. **SYNC is selected by depressing the SYNC button - Confirm that the SYNC LED lights**
10. **Adjusts ECG size until sense markers appear on the QRS complexes**
11. **Selects the appropriate Biphasic Joules per manufacturer recommendation, or absent recommendation:**
    a. ***Narrow and regular rhythm*** **= 50j with increase of 50j per attempt to a maximum of 200j**
    b. ***Narrow and irregular rhythm*** **= 100j with increase of 50j per attempt to a maximum of 200j**
    c. ***When atrial fibrillation is present start with 120 j***
    d. ***Wide and regular rhythm*** **= 100j with increase of 50j per attempt to a maximum of 200j**
    e. ***Wide and irregular rhythm*** **= DO NOT SYNC – Use manufacturer recommendation for DEFIBRILLATION**
12. **Selects CHARGE by depressing the CHARGE button**
13. **Listen for the tone sound indicating full charge and "Clear" patient.**
14. **Press and "hold" SHOCK while observing the monitor screen**
15. **Confirms that the defibrillator discharged on the next sensed QRS complex and shock was delivered**

16. **Check Pulse and Reassesses the patient post synchronized cardioversion - If the rhythm is unchanged, select the next energy level and repeat procedure**
17. **If the patient goes into cardiac arrest, ensure that next shock attempt is a defibrillation and not a synchronized cardioversion attempt.**
18. **If the patient converts to normal rhythm evaluate vital signs and response to procedure**

TRANSCUTANEOUS PACING

INDICATIONS:

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

PROCEDURE

1. **Obtain consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure with special reference to ECG 12 leads, BP, HR and Peripheral Pulse.**
3. **Attaches the ECG limb leads to obtain an initial rhythm**
4. **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**
5. **The patient is determined in an unstable condition by signs and symptoms.**
6. **Sedation and analgesia are to be considered for all alert patients but that should not delay the management.**
7. **The Therapy pads are placed in the manufacturer recommended position**
8. **Lead 2 is confirmed as selection (The lead with the greatest QRS amplitude should be selected) and Select PACE**
9. **Begin pacing at a heart rate of 60 bpm and "zero" current output**
10. **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.**
11. **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.**
12. **If the patient still complains of pain during pacing despite reduced current output, consider sedation and /or analgesia.**
13. **If the patient remains unconscious during pacing, assess capture by observing the monitor and evaluating pulse or blood pressure changes.**
14. **In case of electrical capture and no pulses, follow Cardiac Arrest — PEA protocol.**
15. **If there is no response to pacing and ACLS drugs – MD consult is necessary.**
16. **If pacing is not captured at current of 120-130- mA re-site electrodes and repeat the pacing process.**
17. **If the procedure fail,**
    17.1. Seek senior medical support
    17.2. Treat symptomatically.
    17.3. Rapid transport and pre-alert to the hospital.

URINARY CATHETER PLACEMENT

CONSENT MUST BE OBTAINED PRIOR TO PROCEDURE

INDICATIONS:

1. Patient has acute urinary retention or bladder outlet obstruction
2. Need for accurate urine output measurements
3. Patient requires prolonged immobilization and / OR transport
4. Patient on deep sedation
5. Clinical discretion.

CONTRAINDICATIONS:

In the presence of traumatic injury to lower urinary tract, signs are: Blood at the meatus, perineal hematoma.

EQUIPMENT:

Single use urethral catheterization tray which contain (approved disinfectant, sterile cotton, sterile drape, sterile gloves, urethral catheter, 10 Ml syringe, collection bag).
Sterile anesthetic lubricant (lidocaine gel)

PROCEDURE

1. **Obtain consent when possible.**
2. **Monitor all patient vitals and clinical parameters before, during and after the procedure.**
3. **Aseptic condition when possible, Disinfect the selected procedure site with approved disinfectant.**
4. **Check and prepare all equipment prior to the procedure while maintaining sterility.**
5. **Select the smallest urinary catheter possible, consistent with good drainage.**
6. **Open outer wrap and remove components**
7. **Place patient supine in frog leg position with knees flexed.**
8. **Place under pad beneath patient, plastic or "shiny" side down**
9. **Discard gloves and perform hand hygiene with provided alcohol hand sanitizer gel**
10. **Don sterile gloves provided with catheter**
11. **Position drape on patient appropriately**
12. **12. Lubricate the urinary catheterPrepare 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**

c. **Using a syringe with no needle, instill 5-10 mL of lidocaine gel 2% into the urethra if available.**

d. **Allow 2-3 minutes for anesthetic before proceeding with catheterization.**

13. **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**
14. **If no spontaneous return of urine occurs, try attaching a 60-mL syringe to aspirate urine. If urine return is still not visible, withdraw the catheter and reattempt the procedure (preferably after using ultrasonography if available to verify the presence of urine in the bladder).**
    a. **Note: Use of less than 10mL can result in asymmetrically inflated balloon**
15. **Once inflated, gently pull catheter until the inflated balloon is snug against the bladder neck**
16. **Discard all materials in accordance with infection control policy and remove contaminated gloves**
17. **Secure the urinary catheter to the patient using tape or manufacture device and connect it to the drainage bag allowing for free flow.**
18. **Indicate time and date of catheter insertion on provided labels and place designated labels on drainage system**
19. **Document procedure according to patient documentation policy**

ACUTE COMPLICATIONS:

1. Creation of false passage
2. Urethral perforation
3. Bleeding
4. In case of any complication, remove the catheter

FAST SCANNING – FOCUSED ASSESSMENT WITH SONOGRAPHY IN TRAUMA:

Bedside ultrasound test used in all multiple trauma patients or patient with chest and abdominal injuries to test for blood around the heart or abdominal organs.

FOUR LOCATIONS ARE VIEWED:

- Morrison's Pouch (between the liver and right kidney)
- Splenorenal Angle (between the spleen and left kidney)
- Rectovesical Pouch (men), or Rectouterine Pouch (pouch of Douglas) (women)
- Pericardial sac (a black rim of fluid around the heart suggests a pericardial effusion)

INDICATIONS:

- Blunt abdominal trauma
- Hemodynamically unstable patient when internal bleeding is suspected
- Stable penetrating trauma
- Patient with trauma and low conscious level (intoxicated, head injury, spinal injury)
- Lower rib fractures and pelvic fractures.

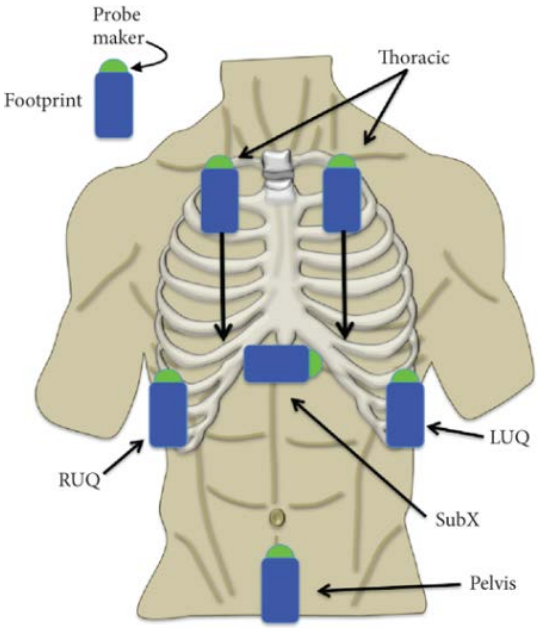
CONTRAINDICATIONS:

- Immediate indication for laparotomy

PROCEDURE:

- **Obtain Consent if possible.**
- **Appropriate use of PPE.**
- **Supine position with both arms under the head if possible.**
- **Expose entire abdomen and look for any bruising**
- **Use pain killers when necessary according to pain management protocol.**
- **Minimize female exposure of sensitive areas**
- **Prepare your ultrasound machine at the right side of the patient**
- **Morrison's pouch (RUQ): start with transducer indicator toward the patient head and at the midaxillary line and look to the kidney liver interspace, examine anteriorly and posteriorly for any free fluids, you can slide the prop superiorly above the lower ribs just above the diaphragm to look for any hemothorax**
- **Pelvic view (Pelvis): apply the indicator longitudinal and toward the patient head about 7 cm above the umbilicus. Move the prop inferiorly above the bladder as well as to the right and left and look for any free fluids in Rectovesical pouch or Douglas pouch in men and women respectively.**
- **Splenorenal angle (LUQ): Move to the Left midaxillary and above the lower ribs, look for any free fluids superior to spleen as well as in the splenorenal pocket, slide the prop little up to see the lower chest for any hemothorax at the left side as well.**

- **Pericardial sac (Sub X): apply the prop horizontal at the bellow xiphisternal region with the indicator toward the patient wright or left side aiming up toward the cardiac space, look for any pericardial effusion inside the pericardial sac, the prop need to be flat against the abdomen.**
- **For EFAST (Extended FAST exam) Thoracic: examine for presence of pneumothorax, apply the indicator toward the head of the patient in the second intercostal space typically with the prop in perpendicular axis crossing the ribs, look at the right side then the left side to examine for any pneumothorax.**



FAST and EFAST prop location

Patient Care Protocols References

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

1. American Heart Association – 2010 Science Guidelines (http://circ.ahajournals.org/content/122/18_suppl_3.toc)
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4. ISLA International Conference on Drowning Research Papers 2011 (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. Abu Dhabi National Police EPS Patient Care Protocols
13. 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
14. 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
15. Trauma and burn update
16. Prehospital Trauma life support book
17. Cardiac arrest protocol
18. ACLS-Experienced provider book
19. Cervical spine protocol, burn,
20. National Institute of health and care excellence (NICE) . https://www.nice.org.uk/guidance

DOCUMENT CONFIGURATIONS

A review and update of this document will take place as necessary, when changes occur that identify the need to revise this Policy such as changes in roles and responsibilities, release of new legislative or technical guidance, or identification of a new policy area.

This document ownership for editing is identified as:

Medical Director, National Ambulance

Change Brief

Version No.	Date	Changes
1.0	18/03/15	Initial Publication
1.0	30/08/15	CMA edits in scope of practice reflected in protocols.
1.0	28/09/15	Three statement replacements and all coloration corrected for final print.
1.0	20/10/15	Final concurrence with ancillary policies and 2015 ILCOR guidelines
1.0	21/01/16	Changed Urinary catheter to Paramedic ESP level and moved all diagnostics to tier 1 procedures
1.0	22/02/16	Changes per Pharmacy and CMA referencing drugs and tiers
1.0	28/02/16	Changes per Pharmacy to Pain Protocols
1.0	29/02/16	Changes per Clinical Services Lead Meeting on 28/02/16
1.0	01/03/16	Changes per Clinical Services Lead Meeting on 01/03/16
1.0	03/03/16	Changes per Education Manager on 3/3/16 at 0130hrs
1.0	01/05/16	Changes per Education Manager on 01/05/16 at 1547hrs in Death in the Field Protocol
2.0	28/12/16	Incorporation of 2016 Medication Formulary. Addition of Eclampsia as an indication on GTN SL, Addition of definition of Cardiovascular instability in penthrox. Addition of definition of absolute bradycardia in Metoprolol
3.0	09/04/2019	Major changes in the protocols and the procedures done by a clinical committee assigned by the Medical Director
4	12/11/2019	Replace BSL with BGL (page 7, 10, 39, 51, 78) CMA terminology change with MD in page 58 Delete Chief Medical Advisor terminology in page 120

Review & Approval:

_____ _____

Medical Director Date

APPENDIX B – MEDICATION FORMULARY

الإسعاف National
الوطني Ambulance

Calculations

Weight – Pediatrics

All medication doses for patient's ≤ 15 years shall be calculated on a weight basis unless an age-elated dose is specified for that medication.

Neonate: 3.5 kg

Six months: 6 kg

One to five years: (age × 2) + 8 = weight in kg

Greater than 5 years: (age × 3) + 7 = weight in kg

NB: Pediatric doses may never exceed the adult dose!

Use of pediatric length-based tape system is recommended and preferred.

Drug Dose

$$\frac{Dose\ required\ (mg)}{Dose\ available\ (mg)} \times \frac{volume\ of\ diltent\ (ml)}{1} = volume\ to\ be\ administered\ (ml)$$

NB: Always check concentrations as these may change!

Infusion Rate

$$\frac{Volume\ (ml)}{Minutes} \times Drop\ factor\ of\ giving\ set\ \left(\frac{gtt}{\min}\right) = Flow\ rate\ \left(\frac{gtt}{\min}\right)$$

Notes

- Sodium Chloride 0.9% (NaCl) is the IV/IO fluid of choice for pre-hospital emergency care.
- Water for injection shall be used when diluting medications, however if not available NaCl (0.9%) may be used if not contraindicated.
- The route of administration should be appropriate to the patient's clinical presentation.

1 kilogram (kg) = 1,000 (g)
1 gram (g) = 1,000 Milligrams (mg)
1 milligrams (mg) = 1,000 micrograms (mcg)
1 liter (L) = 1,000 milliliters (mL)

TIERS

TIER 0-I	Drugs in this category may be utilized by Basic Life Support Clinicians and above provided that they have received the right DoH Credentials as well as NA required privileges.
TIER 0-II	Drugs in this category may only be utilized by Basic Life Support clinicians and above who have passed IV/IO Therapy and Cardiac Arrest course.
TIER I	Drugs in this category may be utilized by Intermediate Life Support Clinicians and above provided that they have received the right DoH Credentials as well as NA required privileges.
TIER 2-I	Drugs in this category may be utilized by Advanced Life Support Clinicians and above provided that they have received the right DoH Credentials as well as NA required privileges.
TIER 2-II	Drugs in the category may be utilized by Advanced Life Support Clinicians but also require pre-authorization from a DoH licensed physician prior to administration.
TIER 3	Drugs in this category may only be administered under direct supervision and presence of a Physician provided that they have received the right DoH Credentials as well as NA required privileges.

DRUG	TIER
Adenosine	2-I
Adrenaline (1:1,000)	0-I
Adrenaline (1:10,000)	0-II
Amiodarone	1
Aspirin	0-I
Atropine	2-I
Chlorpheniramine	1
Clopidogrel	1
Deep Heat Spray	0
Dexamethasone	2-I
Dextrose 10%	1
Entonox	0-I
Fentanyl	3
Furosemide	2-I
Glucagon	0-I
Glucose Gel	0-I
GTN IV	3
GTN SL	0-I
Haloperidol	2-II
Ibuprofen	0-I

DRUG	TIER
Ipratropium Bromide	1
Ketamine	2-II
Lidocaine	1
Methoxyflurane	0-I
Metoclopramide	2-I
Metorplol	3
Midazolam	2-II
Morphine	2-II
Naloxone	1
Ondansetron	1
Oral Rehydration Salt	0
Oxygen	0-I
Paracetamol	0-I (PO) & 1 (IV)
Propofol	3
Rocuronium	3
Salbutamol	0-I
Sodium Chloride	0-II
Sodium Lactate	2-I
Thiopental	3
Tranexamic Acid	2-I

Adenosine

Physician
Paramedic

Storage: ALS Drug Kit

Authorization: Paramedic

Tier: 2-I

Classification: Antiarrhythmic

INDICATION:
Conversion of Paroxysmal Supraventricular Tachycardia

PRESENTATION:
Please remember drug presentations change! Check before administration!
Vial containing 6 mg adenosine in 2 ml

DOSAGE AND ADMINISTRATION

Adult: > 18 yrs:

- IV/IO: Initial dose is a 6 mg rapid bolus over 2 seconds into large proximal peripheral vein followed by a rapid 20 ml flush of normal saline

–If no response within 1 – 2 minutes, a 12 mg IV/IO repeat dose should be administered.
–Patients with a heart transplant are very sensitive to effects of adenosine and should receive initial dose of 3mg over 2 seconds, followed if necessary by 6 mg after 1–2 minutes

Pediatric: < 18 yrs:

- IV/IO: Initial dose 0.1 mg/kg (to a maximum of 6 mg) followed by a rapid 10 ml flush of saline

–If no response within 1 – 2 minutes, a repeat 0.2 mg/kg (to a maximum of 12 mg) dose should be administered
–Patients with a heart transplant are very sensitive to effects of adenosine and should receive initial dose of 3 mg over 2 seconds, followed if necessary by 6 mg after 1 –2 minute.

ACTIONS:
An endogenous purine nucleoside that slows conduction through the AV node, interrupts AV-nodal reentry pathways and can restore normal sinus rhythm in PSVT via modulation of K+ currents and the blunting of catecholamine response

- ONSET: immediate
- PEAK: approx. 20 seconds
- DURATION: approx. 40 seconds

CONTRAINDICATIONS:

- Hypersensitivity
- 2nd or 3rd degree AV block (except in patients with a functioning artificial pacemaker)
- Severe hypotension
- Decompensated Heart Failure COPD (including asthma)
- Wolff-Parkinson-White Syndrome

— Discontinue if: Arrhythmia (Asystole/Severe Bradycardia), Angina, Respiratory failure, Hypotension.

CAUTIONS:
Patients receiving Digoxin and/or Verapamil

SIDE EFFECTS:

- Convulsions, Dizziness, Headache, Weakness
- Palpitations, Sweating, Syncope, Feeling of impending doom
- Bronchospasm, Hyperventilation, Dyspnoea
- Nausea/Vomiting, Metallic taste, Blurred Vision, Flushing
- Injection-site reactions
- Cardiac Arrest

Worsening of intracranial hypertension

ADDITIONAL INFORMATION:

- The effects of Adenosine are antagonized by methylxanthines, caffeine, theophylline (larger doses may be required to be effective)
- When clinically advisable, use appropriate vagal maneouvres prior to adenosine administration
- At the time of conversion to normal sinus rhythm, a variety of new rhythms may appear on ECG including: short period of asystole, premature ventricular contractions, atrial premature contractions, sinus bradycardia, sinus tachycardia, skipped beats, AV nodal block (may occur in up to 55% of patients)

Adrenaline 1:1,000(1mg/ml)

High Alert Medication

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: BLS Drug Kit

Authorization: EMT-Basic

Classification: Sympathetic Agonist

INDICATION:

- Anaphylaxis
- Reversal of laryngeal oedema & bronchospasm
- Life threatening asthma
- Croup/Epiglottitis (Paramedics and above only)
- Shock: including Sepsis (Doctors only)
- Unstable bradycardia unresponsive to TCP and Atropine (Doctors only)

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Ampoule containing 1 mg adrenaline in 1 ml

DOSAGE AND ADMINISTRATION:

Adult > 12 yrs:

- IM: Anaphylaxis, laryngeal oedema & bronchospasm, life threatening asthma: 0.5 mg (0.5 ml), repeat every 5 minutes until symptoms relieved

Pediatric < 12 yrs:

- IM: Anaphylaxis, laryngeal oedema & bronchospasm, life threatening asthma: 6 years to 12 years 0.3mg (0.3ml) repeat every 5 minutes until symptoms relieved; Newborn to 6 years 0.15mg (0.15ml) Repeat every 5 minutes until symptoms relieved
- Nebulizer: Croup/Epiglottitis: 0.5 mg/kg repeat after 30 minutes if necessary, max 5mg

ACTIONS:

- Reverses allergic manifestations of acute anaphylaxis
- Relieves bronchospasm in acute severe asthma

➢ ONSET: 3 – 10 minutes IM
➢ PEAK: 20 minutes IM
➢ DURATION: 20 – 30 minutes

CONTRAINDICATIONS:

- Do not give repeated doses of adrenaline to hypothermic patients
- Uncorrected tachyarrhythmias (HR > 120)
- Do not administer to patients diagnosed with a pheochromocytoma

CAUTIONS:

- Severe hypertension may occur in patients on beta-blockers and half doses should be administered unless there is profound hypotension
- For patients taking tricyclic anti-depressants (e.g. amitriptyline, imipramine) half doses of adrenaline should be administered for anaphylaxis

SIDE EFFECTS:

- Palpitations
- Respiratory difficulty
- Restlessness, feelings of panic
- Hypertension
- Angina like symptoms

ADDITIONAL INFORMATION:

- Be sure to differentiate between the 1:1,000 and 1:10,000 concentrations before administering
- Protect vials from light
- Do not use solution if brown in color or contains precipitate

Adrenaline 1:10,000(1mg/ml)

High Alert Medication

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-II

Storage: ALS/IV Drug Kit

Authorization: EMT-Basic

Classification: Sympathetic Agonist

INDICATION:
Cardiac Arrest

PRESENTATION:
Please remember drug presentations change!
Check before administration!

DOSAGE AND ADMINISTRATION:
Adult: > 12 yrs:

- Cardiac Arrest – IV/IO: 1 mg (10 ml) rapid push, every 3 –5 minutes for the duration of the arrest
- IV infusion – refer to 1:1000 (1mg/ml) ampoule monograph

Paediatric: < 12 yrs:

- IV/IO: 0.01 mg/kg (0.1 ml/kg) rapid push, every 3 –5 minutes for the duration of the arrest

ACTIONS:
Adrenaline is a sympathomimetic that stimulates both alpha- and beta-adrenergic receptors. As a result the myocardial and cerebral blood flow is enhanced during CPR and CPR becomes more effective due to increased peripheral resistance maintaining a central blood reserve IV

- ONSET: < 2 minutes
- IV PEAK: < 5 minutes
- IV DURATION: 5 – 10 minutes

CONTRAINDICATIONS:
Do not give repeated doses of adrenaline in hypothermic patients

CAUTIONS:
None in Cardiac Arrest

SIDE EFFECTS:

- Palpitations
- Respiratory difficulty
- Restlessness
- Feelings of panic
- Hypertension

ADDITIONAL INFORMATION:

- Be sure to differentiate between the 1:1,000 versus the 1:10,000 concentrations before administering
- Protect Syringe from light
- Do not use solution if brown in colour or contains precipitate Compatible in D5W, NS, Ringer's Lactate
- Do not administer in same line as alkaline solutions
- Ensure drug administration is followed by 5 – 10ml NaCl flush

Amiodarone

High Alert Medication

Physician
Paramedic
EMT–Intermediate

Tier: 1

Storage: ALS Drug Kit

Authorization: EMT-Intermediate

Classification: Antiarrhythmic

INDICATION:

- VF/VT cardiac arrest (shockable rhythm) refractory to defibrillation
- Wide complex tachycardia HR>150

PRESENTATION:

Please remember drug presentations change!
Check before administration!
Vial 150 mg in 3 ml

DOSAGE AND ADMINISTRATION:

Adult: > 18 yrs:

- Cardiac Arrest IV/IO: 300mg rapid push initial dose, followed (once) by 150mg IV/IO push if still in VT/VF.

–Administer refractory to the 3rd and 5th shock

- Tachycardia IV: 5mg/kg up to maximum 300mg only in 250mls dextrose 5% over 20–120 min.

Pediatric: < 18 yrs:

- 1 month – 18 yrs IV/IO: 5 mg/kg bolus over 3 minutes (Maximum of 300 mg), repeat once. Administer refractory to the 3rd and 5th shock
- Neonate IV/IO: 5 mg/kg bolus over 3 minutes, repeat once. Administer refractory to the 3rd and 5th shock

ACTIONS:

- Class 3 antiarrhythmic, lengthens cardiac action potential and therefore effective refractory period and QT interval on ECG
- Prolongs atrioventricular conduction
- Blocks potassium channels in cardiac muscle
- Significant sodium channel blocking activity
- Acts to stabilize and reduce electrical irritability of cardiac muscle

CONTRAINDICATIONS:

No contraindications in the context of the treatment of cardiac arrest

CAUTIONS:

Patients already receiving beta and calcium channel blockers and anti-arrhythmic medication, however in cardiac arrest amiodarone should not be withheld

SIDE EFFECTS:

- Bradycardia
- Torsades de pointes
- Vasodilation causing hypotension flushing
- Bronchospasm

ADDITIONAL INFORMATION:

- Administer into large vein as extravasation can cause irritation/necrosis
- Never to be given via endotracheal route
- Should be followed by 0.9% NaCl flush
- Draw up slowly to prevent bubbling
- For ease of use in the pediatric calculations when using 150mg in 3 ml ampoule, add 2mls Dextrose 5% making a concentration of 150mg in 5ml.
- ECG monitoring and resuscitation facilities must be available during IV use.

Aspirin

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: BLS Drug Kit

Authorization: EMT-Basic

Classification: Platelet aggregator inhibitor

INDICATION:
Ischemic myocardial chest pain/suspected myocardial infarction

PRESENTATION:
Please remember drug presentations change!
Check before administration!
100 mg soluble/chewable tablet

DOSAGE AND ADMINISTRATION:
Adult: >16 years
PO: 300 mg ONCE. To be chewed or dispersed in water
Pediatric:
Contraindicated

ACTIONS:
Anti-inflammatory agent and an inhibitor of platelet function.
Useful agent in the treatment of various thromboembolic diseases such as acute myocardial infarction

- ONSET: < 5 minutes
- PEAK: 2 hours
- DURATION: dose dependent

CONTRAINDICATIONS:

- Known severe adverse reaction
- Bleeding disorder(e.g. haemophilia)
- Patients < 16 years old
- Severe hepatic disease

CAUTIONS:
As the likely benefits of a single 300 mg aspirin outweigh the potential risks, aspirin may be given to patients with:

- Asthma
- Pregnancy
- Kidney or liver failure
- Gastric or duodenal ulcer
- Current treatment with anticoagulants

SIDE EFFECTS:

- Gastric bleeding
- Epigastric pain and discomfort
- Wheezing in some asthmatics

ADDITIONAL INFORMATION:

- Aspirin is contra-indicated in children under the age of 16 years as it may precipitate Reye's syndrome. This syndrome is very rare and occurs in young children, damaging the liver and brain and has a mortality rate of 50%

In suspected M I, administer 300 mg aspirin regardless of any previously taken that day

Atropine

Physician
Paramedic

Tier: 2-I

Storage: ALS Drug Kit

Authorization: Paramedic

Classification: Anticholinergic/Vagolytic

INDICATION:

- Unstable bradycardia
- Organophosphate poisoning

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Prefilled syringe containing 1 mg atropine sulphate in 5 ml

DOSAGE AND ADMINISTRATION:

Adult: >12 yrs:

- Symptomatic Bradycardia IV/IO: 0.5 mg push, repeat at 3 – 5 min intervals to max 3 mg
- Organophosphate poisoning IV/IO: 1 mg, repeat at 3 –5 minute intervals until muscarinic symptoms reverse

Pediatric: <12 yrs:

- Symptomatic Bradycardia IV/IO: 0.02 mg/kg push, repeat ONCE. Single dose (max 0.5mg)
- Organophosphate poisoning IV/IO: initial dose 0.02 – 0.05 mg/kg bolus, repeat every 20 – 30 minutes until muscarinic symptoms reverse

ACTIONS:

- May reverse effects of vagal overdrive
- May increase heart rate by blocking vagal activity in sinus bradycardia, second or third degree heart block
- Enhances SA node automaticity
- Enhances A-V conduction

➢ ONSET: immediate
➢ PEAK: 2 – 4 minutes
➢ DURATION: 4 hours

CONTRAINDICATIONS:

Hypothermic bradycardia

CAUTIONS:

May induce tachycardia when used after myocardial infarction, which will increase myocardial oxygen demand and worsen ischemia. Hence, bradycardia in a patient with an MI should ONLY be treated if the low heart rate is causing problems with perfusion such as hypotension

SIDE EFFECTS:

- Tachycardia
- Dry mouth
- Dilated pupils and visual blurring
- In the elderly retention of urine may occur
- Confusion and hallucination

ADDITIONAL INFORMATION:

- Hypoxia is the most common cause of bradycardia in children, therefore interventions to support ABC's, and oxygen therapy should be the first-line therapy.
- Accidental exposure to the eye causes blurred vision
- Unlikely to increase heart rate in a transplanted heart (due to severed vagal nerve)
- Do not use small doses (< 100 mcg) as they may cause paradoxical bradycardia
- Symptoms of poisoning reversal include skin flushing, pupil dilation, and bradycardia resolves.

Cholrpheniramine

Physician
Paramedic
EMT–Intermediate

Storage: ALS Drug Kit

Authorization: EMT-Intermediate

Tier: 1

Classification: Antihistamine

INDICATION:

- Severe anaphylactic reactions
- Symptomatic allergic reactions falling short of anaphylaxis but causing patient distress e.g. severe itching

PRESENTATION:

Please remember drug presentations change!
Check before administration!

- An ampoule containing 10 mg chlorpheniramine maleate in 1 ml
- 4 mg tablet
- Oral solution – 2mg chlorpheniramine maleate in 5 ml

DOSAGE AND ADMINISTRATION:

Adult: > 12 yrs:

- IV/IO: 10 mg slow injection over 1 minute, single dose
- PO: 4 mg tablet once
- PO: 4 mg oral solution once

Pediatric:

- Neonates to 12 months not indicated
- IV/IO: 12 months to 6 years – 2.5 mg slow injection over 1 minute single dose
- PO: 12 months to 6 years – 1 mg once
- IV/IO: 6 to 12 years – 5 – 10 mg slow injection over 1 minute single dose
- PO: 6 to 12 yrs – 2 mg once

ACTIONS:

- Antihistamine that blocks the effect of histamine released during a hypersensitivity reaction
- H1 blocker
- Anticholinergic properties

CONTRAINDICATIONS:

- Known hypersensitivity
- Children < 1 year old

CAUTIONS:

- Hypotension
- Epilepsy
- Glaucoma
- Use antihistamines with caution in patients with asthma
- Pregnancy/Breastfeeding
- Hepatic impairment
- Elderly
- Prostatic disease
- Patients taking MAOIs

SIDE EFFECTS:

- Sedative effects – drowsiness, dizzy, blurred vision, headache
- Cardiac arrhythmias
- Paradoxical CNS stimulation – seizures (rare)
- Psychomotor impairment
- GI disturbances
- Transient hypotension

ADDITIONAL INFORMATION:

- Chlorpheniramine should be avoided during an acute asthmatic attack. The anticholinergic activity of H1- antagonists may result in thickened bronchial secretions in the respiratory tract aggravating an acute asthmatic attack or chronic obstructive pulmonary disease (COPD)
- Elderly patients are more susceptible to side effects
- Warn when administering chlorpheniramine against driving or undertaking complex psychomotor tasks due to sedative/psychomotor effects.

Clopidogrel

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Storage: ALS Drug Kit

Authorization: EMT-Basic

Tier: 1

Classification: Antiplatelet

INDICATION:

Acute ST segment elevation myocardial infarction (STEMI) in patients:

- Receiving thrombolytic treatment
- Anticipated thrombolytic treatment
- Anticipated percutaneous coronary intervention(PPCI)
- Not already taking clopidogrel

PRESENTATION:

Please remember drug presentations change!
Check before administration!
300 mg tablet or 75mg tablet

DOSAGE AND ADMINISTRATION:

Adult: > 18 – 75 yrs: PO:

- Anticipated thrombolysis: 300 mg
- Anticipated PPCI: 600 mg*

–Note: If a patient is anticipated to receive PPCI and has already taken 300 mg, an additional 300 mg can be administered (to take total dose to 600 mg)

Adult: > 75 yrs: PO:
75 mg regardless of anticipated procedure type

Pediatric:
Not indicated

ACTIONS:

Clopidogrel selectively inhibits the binding of adenosine diphosphate (ADP) to its platelet receptor, and the subsequent ADP-mediated activation of the GPIIb/IIIa complex, thereby inhibiting platelet aggregation. Biotransformation of clopidogrel is necessary to produce inhibition of platelet aggregation. Clopidogrel acts by irreversibly modifying the platelet ADP receptor

- ONSET: 2 hrs
- PEAK: 1 hr
- DURATION: 5 days

CONTRAINDICATIONS:

- Known allergy or sensitivity to clopidogrel
- Severe liver impairment
- Active pathological bleeding such as peptic ulcer or intracranial haemorrhage
- Breastfeeding

CAUTIONS:

As the likely benefits of a single dose of clopidogrel outweigh the potential risks, clopidogrel may be administered in:

- Pregnancy
- Patients taking non-steroidal anti-inflammatory drugs (NSAIDs)
- Patients with renal impairment

SIDE EFFECTS:

- Dyspepsia
- Abdominal pain
- Diarrhea
- Bleeding (gastrointestinal and intracranial) – the occurrence of severe bleeding is similar to that observed with the administration of aspirin

ADDITIONAL INFORMATION:

To be administered in conjunction with aspirin unless there is a known contraindication to aspirin therapy.

Deep Heat Spray

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0

Storage: Supplementary Supply

Authorization: EMT-Basic

Classification: Muscular pain relief

INDICATION:
Symptomatic relief of

- Arthritic Joints
- Muscular Strain
- Bruises.

PRESENTATION:
Please remember drug presentations change!
Check before administration!
150mL Spray bottle

DOSAGE AND ADMINISTRATION:
Adult: > 12
Spray 3-5 puffs into the affected area three times daily.

Pediatric:
Not recommended

ACTIONS:
When Deep Heat is sprayed into the skin, the essential oils of Eucalyptus and Turpentine combine with Methyl Salicylate and Menthol to produce an immediate sensation of warmth due to their rubefacient and counter-irritant properties. Consequently muscular aches and pains, neuralgia and stiffness of chronic inflammatory conditions, are relieved.

- ONSET: 5 min
- PEAK: 1 hr
- DURATION: 8 hr

CONTRAINDICATIONS:

- Burned skin
- Known allergies to Salicylate, NSAIDs and Menthol

CAUTIONS:

- For external use only.
- Avoid contact with eyes.
- Do not apply to broken skin and excessively raw areas.

SIDE EFFECTS:

- Mild burning sensation
- In rare instances, skin sensitivity may develop -discontinue immediately.

ADDITIONAL INFORMATION:
To be administered in conjunction with aspirin unless there is a known contraindication to aspirin therapy.

Dexamethasone

Physician
Paramedic

Storage: ALS Drug Kit

Authorization: Paramedic

Tier: 2-I

Classification: Sympathetic glucocorticoid

INDICATION:

Moderate/Severe Croup

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Solution containing 4 mg dexamethasone (as sodium phosphate) in 1 ml

DOSAGE AND ADMINISTRATION:

Adult: > 7 yrs:
IM/IV/IO: Cerebral tumours: 4 mg
Pediatric: < 7 yrs:
Intravenous preparation is administered orally

- Croup: Neonates contraindicated
- PO: Croup: 1 month to 18 months: 2 mg once
- PO: Croup: 18 months to 7 yrs: 4 mg once
- IV: Cerebral tumours: 1mg/kg, max 12mg

ACTIONS:

- A synthetic glucocorticoid used as an anti-inflammatory or immunosuppressive agent
- Reduces subglottic inflammation
- 20 – 30 times more potent than hydrocortisone and 5 – 7 times more potent than prednisolone
- Used for treatment over a few days
- ONSET: 1 hr.
- PEAK: 4 hrs.

CONTRAINDICATIONS:

- Cushing's syndrome
- Known hypersensitivity

CAUTIONS:

- Upper airway compromise can be worsened by any procedure distressing to the patient as well as oral intake
- Glaucoma
- Cardiovascular disease
- Hepatic and Renal impairment

SIDE EFFECTS:

None for small and short term administration

ADDITIONAL INFORMATION:

During prolonged therapy with corticosteroids, adrenal atrophy develops and can persist for years after stopping. Abrupt withdrawal after a prolonged period can lead to acute adrenal insufficiency, hypotension or death

- Withdrawal can also be associated with fever, myalgia, arthralgia, rhinitis, conjunctivitis, painful itchy skin nodules and weight loss
- Additional doses given acutely do not have additional benefits
- Administer oral dose with orange juice for pediatrics

Dextrose 10%

Physician
Paramedic
EMT–Intermediate

Tier: 1

Storage: Supplementary Supply

Authorization: EMT-Intermediate

Classification: Antihypoglycaemic Agent

INDICATION:

- Hypoglycemia (blood glucose < 4.0 mmol/l OR 72 mg/ dl)
- Clinically suspected hypoglycemia where oral glucose administration is not possible
- Unconsciousness where likely cause is hypoglycemia
- In Cardiac Arrest: Hyperkaliemia (> 6.5 mmol) (ESP only)

PRESENTATION:

Please remember drug presentations change!
Check before administration!

500 ml of 10% glucose solution (50 g)

DOSAGE AND ADMINISTRATION:

Adult: > 12 yrs:

- IV/IO: 10 g (100 ml) repeat every 5 minutes. Maximum dose 30 g

–Titrate to serum glucose level as per protocol

–If no response after 2nd dose rapidly transport to hospital and pre-alert. Consider differential diagnosis

Pediatric: < 12 yrs:

- IV/IO: 1 month to 12 yrs: 0.5 g/kg repeat every 5 minutes. Maximum of 3 doses
- IV/IO: Neonate: 0.9 g repeat every 5 minutes. Maximum of 3 doses

–Titrate to serum glucose level as per protocol

–If no response after 2nd dose rapidly transport to hospital and pre-alert. Consider differential – diagnosis

ACTIONS:

- Reversal of hypoglycemia
- Glucose is a monosaccharide or simple sugar or carbohydrate
  - ONSET: immediate
  - PEAK: 15 minutes

CONTRAINDICATIONS:

None

CAUTIONS:

- Administer by large bore cannula into a large vein to avoid extravasation. Concentration of 10% glucose is an irritant to veins
- Use with caution when administering intravenous dextrose solutions to patients with renal impairment and particularly neonates, low birth weight infants, and premature neonates since dextrose solution contains aluminum, which may be toxic

SIDE EFFECTS:

- Hyperglycemia
- Electrolyte disturbance

ADDITIONAL INFORMATION:

- Use all clinical information available so you are able to make an informed decision between glucose 10% IV, glucose gel 40% PO, or glucagon IM
- Glucose and dextrose administration pose no particular risks during breastfeeding
- Electrolyte imbalance, particularly in serum potassium and phosphate, may occur during prolonged use of concentrated dextrose solutions. The intravenous administration of dextrose solutions can cause fluid and/or solute overload resulting in dilution of serum electrolyte concentrations, over hydration, congested states (congestive heart failure) or pulmonary oedema
- Clinically, no drug interactions are of concern as long as blood glucose and other serum chemistries are monitored
- Allergic reactions after administration of dextrose injection are very rare.

Entonox

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: Supplementary Supply

Authorization: EMT-Basic

Classification: Inhaled Analgesic agent

INDICATION:

- Moderate to severe pain
- Labour pains

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Entonox is a combination of nitrous oxide 50% and oxygen 50%. It is stored in medical cylinders that have a blue body and white shoulders

DOSAGE AND ADMINISTRATION:

Adult:

- Self-administered via facemask or mouthpiece after suitable instruction

Pediatric:

- Only if capable of understanding instruction
- Self-administered via facemask or mouthpiece after suitable instruction

ACTIONS:

- Nitrous oxide has analgesic and weak anesthetic properties
- It has no dose related muscle relaxant effect
  - ONSET: 3 – 5 minutes
  - PEAK: 5 – 10 minute
  - DURATION: continuous with application

CONTRAINDICATIONS:

- Severe head injuries with impaired consciousness
- Decompression sickness (the bends)
- Violently disturbed psychiatric patients
- Significant Chest Injury
- Intestinal obstruction
- Inhalation injury
- Carbon monoxide poisoning
- Known severe adverse reaction

CAUTIONS:

Patients at risk of having a pneumothorax, pneumomediastinum, and/or a pneumoperitoneum (i.e. significant torso trauma)

SIDE EFFECTS:

Minimal in short term use – disinhibition, decreased level of consciousness, light headedness

ADDITIONAL INFORMATION:

- The metabolism of nitrous oxide is minimal
- Nitrous oxide is eliminated from the body mostly by the lungs
- Nitrous oxide with oxygen (Entonox) is indicated in adults and children for analgesia.
- Addiction and abuse of nitrous oxide has been reported.
- Care should be taken with long term usage of nitrous oxide. Chronic exposure to nitrous oxide, such as in abuse, can inactivate vitamin B12 and may result in polyneuropathy, megaloblastic anaemia, bone marrow depression and reproductive effects
- Administer Entonox in conjunction with pain scoring
- Analgesic effect rapidly wears off once administration stopped
- Entonox can be administered whilst preparing to deliver other analgesics
- Care for the Entonox equipment, the cylinder MUST be inverted several times to mix the gases when temperatures are low
- In decompression sickness Entonox can cause nitrogen bubbles within the bloodstream to expand, worsening the problem. Consider anyone who has been diving in the previous 24 hours.

Fentanyl

Physician

Tier: 3

Storage: ELS Drug Kit

Authorization: Physician

Classification: Synthetic Narcotic

INDICATIONS:

- Analgesia for moderate to severe pain
- Enhancement of anesthesia in rapid sequence induction

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Ampoule containing 100 mcg fentanyl (as citrate) in 2 ml

DOSAGE AND ADMINISTRATION:

Adult:

Analgesia: > 12 yrs:

- IV/IO: Initial dose 1 – 2 mcg/kg, (max. 200 micrograms on specialist advice), then 1 – 2 mcg/kg as required slow injection
- IN: Initial dose 0.5 – 1 mcg/kg (1 spray) administered evenly between both nostrils. Repeated once if necessary after 10 minutes. Maximum cumulative dose 2 mcg/kg

Enhancement of anesthesia (On specialist advice only):

Adult: > 18 yrs:

- IV/IO: Initial dose 1 – 2 mcg/kg, (max. 200 micrograms on specialist advice), then 1 – 2 mcg/kg as required by slow injection
- IV/IO Infusion: initially 10 mcg/kg over 10 minutes, then 6 mcg/kg/hour adjusted according to response

Pediatric:

Analgesia: 1 month – 12 yrs:

- IV/IO: Initially 1 – 2 mcg/kg then 1 mcg/kg as required
- IN: Initial dose 1.0 mcg/kg repeat ONCE after 10 minutes prn 0.75 – 1.5 mcg/kg

Enhancement of anesthesia (on specialist advice only):

- 12 yrs – 18 yrs: IV/IO: Initially 1 – 5 mcg/kg, then 50 – 200 mcg as required
- 1 month – 12 yrs: IV/IO: Initially 1 – 5 mcg/kg, then 1 – 3 mcg/kg as required
- Neonate: IV/IO: Initially 1 – 5 mcg/kg, then 1 – 3 mcg/kg as required

ACTIONS:

Fentanyl is a synthetic narcotic analgesic that acts on the central nervous system by binding with the opioid receptors.

- ONSET: immediate
- DURATION: 0.5 – 1 hr

CONTRAINDICATIONS:

Known allergy or hypersensitivity
Not compatible with pentobarbital and thiopental

CAUTIONS:

- When using with other CNS depressants reduce dose of one or both gents
- Respiratory depression, apnoea, laryngospasm, respiratory tract burns and circulatory depression including orthostatic hypotension
- Patients on oral amiodarone (can lead to increased amiodarone levels through drug interaction) or taking monoamine oxidase inhibitors
- Elderly patients, Hypotension

SIDE EFFECTS:

- Bradycardia, Hypotension, Drowsiness
- Nausea and/or vomiting, Pin point pupils
- Respiratory depression, Muscular rigidity (particularly muscles of respiration)

ADDITIONAL INFORMATION:

- Be aware that dosages are in MICROGRAMS. Fentanyl is approximately 80 times more potent than morphine by weight
- Do not administer intranasally (IN) unless you have the specific, appropriate atomiser tool to do so. Simply spraying non-atomised drugs into a patient's nose does not work
- Lost or stolen Fentanyl should be reported immediately to pharmacist and/or duty manager

Furosemide

Physician
Paramedic

Storage: ALS Drug Kit

Authorization: Paramedic

Tier: 2-I

Classification: Loop diuretic

INDICATION:
Adjunct in treatment of acute pulmonary oedema secondary to left ventricular failure

PRESENTATION:
Please remember drug presentations change!
Check before administration!
Ampoule containing 20 mg furosemide in 2 ml
DOSAGE AND ADMINISTRATION:
Adult :> 18 yrs:

- IV/IO: 40 mg slow injection over 2 minutes. ONCE

Pediatric :< 18 yrs:

- Not indicated

ACTIONS:
Non-Potassium sparing potent loop diuretic that inhibits sodium and chloride re-absorption at the proximal and distal tubules and ascending Loop of Henle

- ONSET: 5 minutes
- PEAK: 30 minutes
- DURATION: 2 hours

CONTRAINDICATIONS:

- Hypersensitivity to the medication
- Severe renal failure with anuria
- Pre-comatose state secondary to liver cirrhosis
- < 18 yrs

CAUTIONS:

- Hypokalaemia could induce arrhythmias
- Pregnancy
- Hypotension – avoid administration if patients systolic BP 90 mmHg or less

SIDE EFFECTS:

- Electrolyte imbalance (particularly hypokalaemia)
- Volume depletion
- Postural hypotension
- GI disturbances
- Deafness or tinnitus with large parenteral doses
- Dermatitis, pruritus, blurred vision, dizziness, bladder spasms, pancreatitis, thrombocytopenia, agranulocytosis
- Very rarely cardiac arrest has occurred after IV or IM administration (may occur especially in digitalised patients with hypokalaemia)

ADDITIONAL INFORMATION:

- Nitrates are the first line treatment for acute pulmonary oedema. Use furosemide as secondary treatment where transfer times are prolonged
- Co-administration with catecholamines (i.e. dopamine, dobutamine, and epinephrine): precipitation is likely to occur (avoid simultaneous infusion/injection via same IV line).
- Many incompatibilities; do not mix with any other injectable drugs
- Monitor BP and pulse rate routinely
- Monitor blood glucose in diabetic patients
- Watch for signs of hypokalaemia
- May precipitate gout; hyperglycaemia in diabetics; vascular thrombosis in elderly or debilitated

Glucagon

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Storage: BLS Drug Kit

Authorization: EMT-Basic

Tier: 0-I

Classification: Anti-hypoglycaemic

INDICATION:

- Hypoglycemia (blood glucose < 4.0 mmol/l or 72 mg/dl) especially in known diabetics
- Clinically suspected hypoglycemia WHERE ORAL GLUCOSE ADMINISTRATION IS NOT POSSIBLE
- The unconscious patient, where hypoglycemia is considered a likely cause
- Calcium channel blocker & Beta blocker overdose (Paramedic and above only

PRESENTATION:

Please remember drug presentations change!
Check before administration!

1 mg glucagon powder for reconstitution with water for injection

DOSAGE AND ADMINISTRATION:

Adult :> 8 yrs

- IM: Hypoglycemia: 1 mg ONCE only
- IV: Calcium channel blocker & Beta blocker overdose: 2 mg bolus ONCE only (Paramedic and above only)

Pediatric :< 8 yrs

- IM: Hypoglycemia: 0.5 mg ONCE

Neonate:

- IM: 0.1 mg ONCE
- IV: Calcium channel blocker & Beta blocker overdose: NOT INDICATED

ACTIONS:

Glucagon is a hormone that induces the conversion of glycogen to glucose in the liver, thereby raising blood glucose levels

- ONSET: 4 – 10 minutes
- PEAK: No documentation found
- DURATION: 10 – 30 minutes

CONTRAINDICATIONS:

- Low glycogen stores (e.g. alcoholics, malnourished, cachexic patients, recent use of glucagon)
- Known severe adverse reaction
- Phaeochromocytoma

CAUTIONS:

- Avoid intramuscular administration of any drug when a patient is likely to require thrombolysis
- Use with caution when administering in active seizures caused by hypoglycemia, needle stick injuries may occur, follow sharps protocol

SIDE EFFECTS:

Nausea, Vomiting, Diarrhea, Acute hypersensitivity reaction (rare), Hypokalemia, Hypotension, Bronchospasm

ADDITIONAL INFORMATION:

- Where ALS is not present BEFORE administering Glucagon, contact CSD to confirm appropriateness
- Oral carbohydrates, such as bread and bananas, are the preferred method of treatment where possible
- Give complex carbohydrates as mentioned above after administration of glucagon to replenish glycogen levels
- Confirm effectiveness by checking blood glucose 5 – 10 minutes after administration
- Glucagon may be required where IV Glucose is unavailable and the patients resposiveness is P/U on AVPU assessment. Oral carbohydrate/oral glucose may be more appropriate where response is A/V on AVPU assessment
- Glucagon is relatively ineffective once body glycogen stores have been exhausted (especially hypoglycemic, non-diabetic children). In such patients, use oral glucose gel smeared round the mouth/gums or glucose 10% IV as first-line treatments
- The neonate's liver has very limited glycogen stores, so glucagon may not be effective
- Glucagon may also be ineffective in some instances of alcohol-induced hypoglycemia

Glucose 40% Oral Gel

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: BLS Drug Kit

Authorization: EMT-Basic

Classification: Oral anti-hypoglycaemic

INDICATION:
Known or suspected hypoglycemia (< 4 mmol/l or 72 mg/dl) in a conscious patient where there is no risk of choking or aspiration

PRESENTATION:
Please remember drug presentations change!
Check before administration!
Plastic tube containing 25 g glucose 40% oral gel

DOSAGE AND ADMINISTRATION:
Adult: > 12 yrs
- One-half tube – buccal administration. Repeat every 5 minutes as required

Pediatric: < 12 yrs
- Up to half tube – buccal administration. Repeat every 5 minutes as required

ACTIONS:
Rapid increase in blood glucose levels via buccal absorption

CONTRAINDICATIONS:
- Unconscious patient
- Known severe adverse reaction

CAUTIONS:
Altered level of consciousness where there is risk of choking or aspiration

SIDE EFFECTS:
May cause vomiting in patients under the age of five if administered too quickly

ADDITIONAL INFORMATION:
- Can be repeated as necessary in hypoglycemic patient
- Treatment failure should prompt the use of an alternative such as glucagon IM or glucose 10% IV
- Where there is risk of choking or aspiration glucose gel may be administered by soaking a gauze swab and placing it between the patient's lips and gum to aid absorption. USE EXTREME CAUTION
- Treatment should be used in conjunction with blood glucose checks every 5 minutes
- After a full assessment and improvement in blood glucose levels ensure the patient eats complex carbohydrates such as bread and bananas

GTN IV

Physician

Tier: 3

Storage: ALS Drug Kit

Authorization: Physician

Classification: Nitrate, anti-anginal

INDICATION:

- Unstable angina
- Chest pain associated with MI/Unstable angina
- Congestive heart failure

PRESENTATION:

Please remember drug presentations change!
Check before administration!

50ml vial – 1mg/1ml concentration

DOSAGE AND ADMINISTRATION:

Adult: > 18 yrs:

- IV/IO: Initial dose 5 mcg/min infusion via infusion pump, increase or decrease by 5 mcg/min every 5 min up to 20 mcg/min prn. Add 50mg of GTN to 450mls of Dextrose 10% to give a final volume of 500mls

–If no effect then increase by 10 mcg/min every 5 minutes prn. Max 200 mcg/min

Pediatric: < 18 yrs: NOT INDICATED

ACTIONS:

Relaxes smooth muscle and a potent vasodilator resulting in:

- Dilation of coronary arteries
- Relief of coronary spasm
- Systemic vasodilation, lowering preload
- Reduce blood pressure

➢ ONSET: immediate PEAK: immediate DURATION: 3 – 5 mins

CONTRAINDICATIONS:

- Hypersensitivity to the medication
- Uncorrected hypotension
- Inadequate cerebral circulation
- Constrictive pericarditis and pericardial tamponade
- Current use of phosphodiesterase-5 (PDE-5) inhibitors such as sildenafil or vardenafil

CAUTIONS:

- Closed angle glaucoma
- Malnutrition
- Hypothyroidism
- Severe hypothermia
- Impaired renal and/or hepatic function
- Safety in pregnancy/lactation has not been established
- A drop in systolic blood pressure > 1/3 upon initiation of infusion
- Right ventricular infarct (check V4R in the setting of inferior MI)
- GTN may aggravate angina caused by hypertrophic cardiomyopathy

SIDE EFFECTS:

- Hypotension, tachycardia, palpitations
- Diaphoresis, apprehension
- Restlessness, muscle twitching
- Headache, lightheadedness

ADDITIONAL INFORMATION:

- Nitrate Tolerance: Haemodynamic and antianginal tolerance often develop with 24–48 hours of continuous nitrate administration. A nitrate-free interval of 10– 12 hours a day is recommended to avoid tolerance
- In acute hypertension reduce MAP by no more than 25% in the first minutes to 1 hour, followed by further reduction if stable toward a SBP of 160 and a DBP of 100 –110 mm/Hg within the next 2 – 6 hours, avoid excessive declines in pressure
- Must be administered through a non-PVC infusion set which is as short as possible, and does not have a blood filter or burette chamber in line
- Concurrent administration of other vasodilators, antihypertensive agents, calcium antagonists, tricyclic antidepressants and alcohol may enhance the antihypertensive effect of GTN

GTN SL

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: BLS Drug Kit

Authorization: EMT-Basic

Classification: Nitrate, anti-anginal

INDICATION:

- Cardiac chest pain due to angina or myocardial infarction
- Acute cardiogenic pulmonary oedema (EMT-I and above only) Eclampsia (EMT-I and above only)

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Metered dose spray of 0.4 mg (400 mcg) GTN per dose

DOSAGE AND ADMINISTRATION:

Adult:

- Angina or M I: 0.4 mg (400 mcg). Administer 1 spray sublingual. Repeat at 3 – 5 min intervals prn
- Pulmonary 0edema: 0.4 mg (400 mcg). Administer 1 spray sublingual. Repeat at 3 – 5 min intervals prn (EMT-I and above only)
- Eclampsia: 0.4 mg (400 mcg). Administer 1 spray sublingual. Repeat at 3 – 5 min intervals prn (EMT-I and above only)

Pediatric: Not indicated (unless already prescribed)

ACTIONS:

Releases nitric oxide which acts as a vasodilator, resulting in

- Dilatation of coronary arteries/relief of coronary spasm
- Dilatation of systemic veins resulting in lower preload
- Reduced blood pressure
- ONSET: < 2 minutes
- PEAK: 4 – 10 minutes
- DURATION: 10 – 30 minutes

CONTRAINDICATIONS:

- Hypersensitivity to the medication
- Hypotension (actual or estimated systolic blood pressure < 90mmHg)
- Hypovolaemia
- Head trauma
- Cerebral haemorrhage
- GTN must not be given to patients who have taken any PDE5 inhibitors (Sildenafil (Viagra), Tadalafil (Cialis) or Vardenafil (Levitra)) within the previous 24 hours. Profound, refractory hypotension may occur
- Unconscious patients

CAUTIONS:

Clinicians with the ability to do a 12 lead should rule out right ventricular infarctions (RVI) before administering GTN. In the presence of R V I, GTN can precipitously drop preload

SIDE EFFECTS:

- Headache
- Transient Hypotension
- Flushing
- Dizziness

ADDITIONAL INFORMATION:

- Hold the pump spray vertically with the valve head uppermost
- Place as close to the mouth as possible and spray under the tongue
- The mouth should be closed after each dose
- Failure to deliver a SL administration (i.e. spraying on top of the tongue instead) will result in 90% of the drug being hepatically metabolized before reaching the systemic circulation
- If the pump is new or it has not been used for a week or more the first spray should be released into the air to prime the pump
- Patients should not rinse their mouth for 5–10 minutes after administration of GTN, therefore it is better to administer aspirin first to chest pain patients so that they can take a sip of water if needed

Haloperidol

Physician
Paramedic

Tier: 2-II

Storage: ELS Drug Kit

Authorization: physician

Classification: Antipsychotic

INDICATION:
Aggressive or combative behavior caused by a medical or psychiatric condition (including intoxication) which risks harm to the patient or others

PRESENTATION:
Please remember drug presentations change!
Check before administration!
Ampoule containing 5 mg haloperidol in 1 ml

DOSAGE AND ADMINISTRATION:
Adult:
- IM: Acutely disturbed: 0.1 – 0.2 mg/kg
- IM: 5 – 10 mg Repeat in 20 minutes (Maximum cumulative dose 10 mg)

Pediatric:
Not recommended in < 12 yrs

ACTIONS:
Haloperidol blocks postsynaptic dopamine D1 and D2 receptors in the mesolimbic system and decreases the release of hypothalamic and hypophyseal hormones. It produces calmness and reduces aggressiveness with disappearance of hallucinations and delusions.

- ONSET: 30 – 60 mins

CONTRAINDICATIONS:
- < 12 years
- Movement disorder (e.g. Parkinson's disease, Tardive dyskinesia)
- Severe liver disease
- Cardiovascular disease and elongated QT-interval
- Bradycardia
- CNS depression
- IV administration in combative patient

CAUTIONS:
- Epilepsy
- Renal impairment (use smaller doses)
- Neonatal thrombocytopenia reported, but risk should be balanced against risk of uncontrolled maternal hypertension; manufacturer advises avoid before third trimester
- Elderly patients

SIDE EFFECTS:
- Hypersensitive reaction
- Dyspnoea
- Oedema
- Rarely bronchospasm
- Hypoglycemia
- Toxic epidermal necrolysis (TEN)
- Hypertension
- Sweating
- Stevens-Johnson syndrome (SJS)
- Inappropriate antidiuretic hormone secretion

ADDITIONAL INFORMATION:
- Protect from light (slight yellowing of injection is common)
- Can be mixed in the same syringe as lorazepam or midazolam
- Smaller doses should be used in elderly patients (2.5 – 5 mg)
- Administer haloperidol refractory to non-pharmacological attempts at de-escalation
- Lost or stolen Haloperidol should be reported immediately to pharmacist and/or duty manager

Ibuprofen

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: BLS Drug Kit

Authorization: EMT-Basic

Classification: NSAID

INDICATION:

- Relief of mild to moderate pain and/or high temperature
- Soft tissue injuries
- As part of a balanced analgesic regimen

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Tablet containing 400 mg

DOSAGE AND ADMINISTRATION:

Adult: >12 yrs

- PO: 400mg, every 6 hours prn, Maximum cumulative dose 1.2g in 24 hrs
- Only available as tablet.

ACTIONS:

Suppresses prostaglandins, which cause pain via its inhibition of cyclooxygenase. Analgesic, antipyretic, anti-inflammatory

- ONSET: 30 – 60mins
- PEAK: 1 – 2 hrs
- DURATION: 2 – 4 hrs

CONTRAINDICATIONS:

- Dehydration
- Hypovolaemia
- Known renal insufficiency
- Suffering active upper gastrointestinal disturbance e.g. oesophagitis, peptic ulcer, dyspepsia
- Pregnancy
- Avoid giving further non-steroidal anti-inflammatory drugs (NSAIDs) i.e. ibuprofen, if an NSAID containing product (e.g. Diclofenac, Naproxen) has been used within the previous four hours or if the maximum cumulative daily dose has already been given

CAUTIONS:

- Asthma: Use cautiously in asthmatic patients due to the possible risk of hypersensitivity and bronchoconstriction. If an asthmatic has not used NSAIDs previously, do not use acutely in the pre-hospital setting
- Elderly: Exercise caution in older patients (> 65 years old) that have not used and tolerated NSAIDs recently

SIDE EFFECTS:

May cause nausea, vomiting and tinnitus

ADDITIONAL INFORMATION:

- Ibuprofen can be given in addition to paracetamol – both drugs may be safely administered in full dosages as they are metabolised differently and work synergistically
- Administered preferably following food

Ipratropium Bromide

Physician
Paramedic
EMT–Intermediate

Tier: 1

Storage: ALS Drug Kit

Authorization: EMT-Intermediate

Classification: Anticholinergic/Antimuscarinic

INDICATION:

- Acute severe/life threatening asthma
- Acute asthma unresponsive to salbutamol
- Exacerbation of COPD not responding to initial salbutamol dose.

PRESENTATION:

Please remember drug presentations change!
Check before administration!
Nebules containing 250 mcg in 2 ml

DOSAGE AND ADMINISTRATION:

Adult: > 12yrs:

- Nebulised: 0.5 mg by nebuliser with 6 – 8 l/min oxygen

–Note: Should be given in combination with a short-acting beta-adrenergic agonist

Pediatric: < 12yrs:

- Nebulised: 1 month – 12 yrs: 0.25 mg by nebuliser with l/min oxygen

–Note: Should be given in combination with a short-acting beta-adrenergic agonist

ACTIONS:

Parasympatholytic bronchodilator that is chemically related to atropine. It blocks muscarinic receptors associated with parasympathetic stimulation of the bronchial air passageways. This results in bronchial dilation and reduced bronchial secretions

- NEBULISER ONSET: 1 5 – 30 mins
- NEBULISER PEAK: 1 – 2 hr
- NEBULISER DURATION: 4 – 5 hrs

CONTRAINDICATIONS:

None in emergency situation

CAUTIONS:

- Narrow angle glaucoma
- Pregnancy and breastfeeding
- Prostatic hyperplasia

SIDE EFFECTS:

- Transient dry mouth, Blurred vision
- Tachycardia/Arrhythmia, palpitations
- Skin rash, Headache, Dizziness, Nervousness
- Nausea, vomiting
- Difficulty passing urine
- Paroxysmal tightness of chest

ADDITIONAL INFORMATION:

- β2 agonists (e.g. salbutamol) have a faster onset of action and are a priority. Delivery of ipratropium should not cause a delay in β2 agonist administration.
- Salbutamol and ipratropium can be combined in the same nebuliser
- In COPD limit nebulisation to 6 minutes
- Not indicated for the initial treatment of acute episodes of bronchospasm where rescue therapy is required for rapid response

Should only be used in acute exacerbations of asthma in conjunction with short-acting B-adrenergic agonists for acute episodes

Ketamine

High Alert Medication

Physician
Paramedic

Tier: 3

Storage: ELS Drug Kit

Authorization: Paramedic

Classification: Dissociative sedative

INDICATION:

- Analgesia for moderate to severe pain as a result of trauma
- Sedation for manipulation of fractured limbs or painful/difficult extrication
- Rapid Sequence Intubation (ESP only)

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Ampoule containing 500 mg ketamine in 10 ml

DOSAGE AND ADMINISTRATION:

Adult: > 50 kg:

- IV: Analgesia 0.5 mg/kg, repeat every 3 – 5 minutes to effect
- IV: Sedation initial dose 1.0 mg/kg (up to 100 mg max), repeat doses 0.5 mg/kg every 3 – 5 minutes
- IV: RSI 2 mg/kg rapid IV push dose (ESP only)
- IM: Analgesia 1.0 mg/kg, repeat every 5 – 10 minutes to effect
- IM: Sedation initial dose 5.0 mg/kg (up to 300 mg max), repeat doses 1.0 mg/kg every 5 – 10 minutes

Pediatric: < 50 kg:

- Not indicated for age > 12 months
- IV: Analgesia 0.5 mg/kg, repeat every 3 – 5 minutes to effect
- IV: Sedation initial dose 1.0 mg/kg, repeat doses 0.5 mg/kg every 3 – 5 minutes
- IV: RSI 2mg/kg rapid IV push dose (ESP only)
- IM: Analgesia 1.0 mg/kg, repeat every 5 – 10 minutes to effect
- IM: Sedation initial dose 2.5 mg/kg, repeat 0.5 mg/kg every 5 – 10 minutes

ACTIONS:

Ketamine blocks signals from the PNS from reaching the CNS.

This results in sedation, analgesia and anesthesia.

- IV ONSET: 1 – 2 minutes
- IV DURATION: 5 – 10 minutes
- IM ONSET: 5 – 10 minutes
- IM DURATION: 20 – 30 minutes

CONTRAINDICATIONS:

- Hypersensitivity to the medication
- Myocardial ischemia
- Active psychosis or history of schizophrenia
- Glaucoma or acute globe injury

CAUTIONS:

- Haemorrhagic stroke
- Significant hypertension (> 180 mmHg)
- CHF
- Thyroid medications

SIDE EFFECTS:

Serious:

- Laryngospasm, emergence, recovery reactions, cardiac ischemia

Less serious:

- Nausea and vomiting, hyper salivation, dysphoria, dystonic type movements, nystagmus, transient hypertension

ADDITIONAL INFORMATION:

- Monitor for EMERGENCE REACTION from procedural sedation. Complete an incident report and submit to Supervisor for all emergence reactions
- Follow NA Protocol when administering Ketamine
- Ketamine is not recommended as first line treatment analgesia in children
- Pay close attention to respiratory rate, effort and depth, SpO2, ETCO2 and BP
- Lost or stolen Ketamine should be reported immediately to pharmacist and/or duty manager

Lidocaine

Physician
Paramedic
EMT–Intermediate

Storage: ALS Drug Kit

Authorization: EMT-Intermediate

Tier: 1

Classification: Local anaesthetic, antiarrhythmic

INDICATION:

- Local anaesthesia/pain associated with IO drug and fluid administration
- VF/VT cardiac arrest
- Procedural use for nasogastric/orogastric tubes (Paramedic and above)

PRESENTATION:

Please remember drug presentations change!
Check before administration!

1% lidocaine (20 ml)

DOSAGE AND ADMINISTRATION:

Adult: > 12 yrs:

- IO: Local Anaesthesia: Initial dose 40 mg push.
  Immediately administer a repeat dose of 20 mg push.
- IV/IO: VF/VT Cardiac Arrest: Initial dose 1 – 1.5 mg/kg bolus. Repeat 0.5 – 0.75 mg/kg prn every 5 – 10 mins. Maximum cumulative dose 3 mg/kg
- Nebuliser/IN: Procedural use for nasogastric/orogastric tubes: 3 ml (1% lidocaine) via nebuliser ONCE

Pediatric: < 12 yrs:

- IO: Local Anaesthesia: 3 mg/kg push. No repeat dose.
  Maximum dose of 20 mg
- IV/IO: VF/VT Cardiac Arrest: 3 mg/kg
- Nebuliser/IN: Procedural use for nasogastric/orogastric tubes: 3 ml (1% lidocaine) via nebuliser ONCE

Nebuliser/IN: Procedural use for nasogastric/orogastric tubes: 3 ml (1% lidocaine) via nebuliser ONCE

ACTIONS:

- Stabilises the neuronal membrane and prevents the initiation and transmission of nerve impulses, causing local anaesthesia
- Class 1b antiarrhythmic, suppresses automaticity of conduction tissue by increasing electrical stimulation threshold of ventricle, His-Purkinje system, and spontaneous depolarisation of the ventricles during diastole by a direct action on the tissues
- Blocks both the initiation and conduction of nerve impulses by decreasing the neuronal membrane's permeability to sodium ions, resulting in inhibition of depolarization with resultant blockade of conduction
  - IV ONSET: < 3 minutes
  - IV PEAK: 2 – 7 minutes
  - IV DURATION: 8 – 20 minutes

CONTRAINDICATIONS:

- Known allergy
- Open wounds at site of administration

CAUTIONS:

- Renal and hepatic disease
- Cardiovascular disease
- Blood disorders
- G6PD deficiency

SIDE EFFECTS:

- Drowsiness, dizziness
- Burning sensation
- Bradycardia
- Redness or swelling at the site of application
- Seizures
- Heart rate abnormalities

ADDITIONAL INFORMATION:

- Local anaesthesia injections should always be made slowly with frequent aspirations to avoid inadvertent intravascular injection
- Must be followed by 10 ml flush of sodium chloride 0.9%
- Incompatible with alkaline solutions (i.e. sodium bicarbonate)
- Compatible with all commercially available IV fluids

Methoxyflurane (Penthrox)

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: BLS Drug Kit

Authorization: EMT-Basic

Classification: Inhaled analgesia

INDICATION:
Moderate pain, especially MSK pain

PRESENTATION:
Please remember drug presentations change!
Check before administration!
A hand-held inhaler device for the self-administration of methoxyflurane vapour 3 ml

DOSAGE AND ADMINISTRATION:
Adult:
- Inhaler: 'whistle' device: 3 ml

–Have patients inhale until pain is relieved, or until they can't hold the 'whistle' administration device on their own
–Repeat 3 ml once, if required
–Patients should not receive more than 6 ml in any 24 hours. Be sure to inquire if patient has been treated with methoxyflurane at all within the last 24 hours
–Maximum dose 15 ml/week
Pediatric:
- Children too young to hold the administrator by themselves are too young to receive the medication

ACTIONS:
An extremely potent and highly lipid soluble anaesthetic agent with analgesic effects
- ONSET: 6 – 10 breaths
- DURATION: constant whilst in use

CONTRAINDICATIONS:
- Renal impairment, including reduced glomerular filtration rate (GFR), urine output and reduced renal blood flow
- Renal failure
- Severe liver disease
- Hypersensitivity to fluorinated anaesthetics
- Cardiovascular instability:
  - HR: <40 / min or >140 / min
  - RR: <8/min or >36 / min
  - SPO2: <85%
  - Systolic BP: <80 or >200 mm Hg

SIDE EFFECTS:
- Drowsiness
- Hypotension
- Bradycardia

ADDITIONAL INFORMATION:
- 3 ml will last approximately 10 – 20 minutes. You can tell when the drug has been used as the smell will be gone.
- Patients may need to be coached to breathe IN through the mouth, and OUT through the nose in order to receive the medication effectively. After 1 – 2 breaths the therapeutic effect will wear off
- Patients may also recoil from the smell of the drug, they should be encouraged to breathe it as long as they can tolerate it
- DO NOT hold the administrator to a patient's mouth if they are unable to do so themselves
- Ensure adequate ventilation in clinical environment to avoid passive inhalation
- Penthrox MUST NOT be used in cabin during flight. Place in a sealable bag during flight. May be re-used after flight for the same patient
- Do not expose medication to temperatures over 40°C especially when used in conjunction with oxygen

Metoclopramide

Physician
Paramedic

Tier: 2-I

Storage: ALS Drug Kit

Authorization: Paramedic

Classification: Anti-emetic

INDICATION:

- Symptomatic treatment of nausea/vomiting
- Prevention of nausea/vomiting following morphine administration

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Ampoule containing metoclopramide 10 mg in 2 mls

DOSAGE AND ADMINISTRATION:

Adult: >20 yrs:

- I V / I O/ I M: 10mg slow over 2 min, maximum 30 mg/day

Paediatric: < 20 yrs:

- Not indicated

ACTIONS:

- An effective anti-emetic which acts centrally by blocking dopaminergic receptors
- Enhances GI motility without stimulating gastric secretions
- Central dopamine antagonist
- ONSET: 1 – 3 mins
- DURATION: 1 – 2 hrs

CONTRAINDICATIONS:

- < 20 years old
- Renal failure
- Pheochromocytoma
- GI obstruction
- Perforation/haemorrhage/3 – 4 days after GI surgery

CAUTIONS:

- Hepatic impairment (reduce dose)
- Renal impairment – avoid or use small dose in severe impairment; increased risk of extrapyramidal reactions
- Pregnancy/Breastfeeding
- Avoid in cases of overdose

SIDE EFFECTS:

- Extrapyramidal effects – more common in children and young adults
- Cardiac conduction abnormalities following intravenous administration (rare)
- Diarrhoea
- Rash
- Hypotension
- Dyspnoea
- Anxiety, confusion, and restlessness
- Drowsiness
- Dizziness
- Tremors

ADDITIONAL INFORMATION:

- Should always be administered in separate syringe from morphine – must not be mixed
- Metoclopramide should not be used in those patients with hypersensitivity to the drug or its components. Since metoclopramide is structurally related to procainamide, metoclopramide should be used cautiously in patients with a known procainamide hypersensitivity.
- Metoclopramide can increase the rate or extent of absorption of other drugs because of accelerated gastric emptying, which increases the contact time with the small bowel where these drugs are absorbed.

Metoprolol

High Alert Medication

Physician

Tier: 3

Storage: ALS(HEMS) Drug Kit

Authorization: Physician

Classification: Beta Blocker

INDICATION:

- Narrow Complex Tachcardia (> 150, possible A-Fib) and Wide Complex Tachycardia (> 150) with cardiac instability and/or brittle medical history
- Myocardial infarction – early intervention (within 12 hrs) haemodynamically stable patients with definite or suspected acute MI, to reduce cardiovascular mortality

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Ampoule containing 5 mg in 5 ml

DOSAGE AND ADMINISTRATION:

Adult:

- Tachyarrhythmias: > 18 yrs: IV/IO: 5 mg slow injection over 2 minutes. If no effect repeat to a maxium of 15mg
- Myocardial infarction: > 18 yrs: IV/IO: 5 mg slow injection over 2 minutes. If no effect repeat to a maxium of 15 mg

Paediatric:

Not indicated

ACTIONS:

- Beta-adrenergic receptor blocking agent with a preferential effect on the β1 adrenoreceptors, chiefly located in cardiac muscle.
- At higher doses inhibits β2 adrenoreceptors, chiefly located in the bronchial and vascular musculature
- Competitive ability to antagonise catecholamine-induced tachycardia at the β-receptor sites in the heart, thus decreasing heart rate, cardiac contractility and cardiac output
  - ONSET: Immediate
  - PEAK: 20 mins
  - DURATION: 5 – 8 hrs

CONTRAINDICATIONS:

- Hypersensitivity to the medication and its derivatives
- If systolic BP <90 mm Hg and / or absolute bradycardia when HR is <40 bpm
- Sick sinus syndrome, 2 nd and 3 rd degree AV block
- Right ventricular failure secondary to pulmonary hypertension
- Cardiogenic shock, and/or systolic BP < 100 mmHg
- IV form is contraindicated in the presence of asthma or other obstructive respiratory diseases
- Concurrent administration with calcium channel blockers (i.e. verapamil, diltiazam) can cause severe hypotension

CAUTIONS:

- COPD and Asthma
- Diabetes and hypoglycaemia (may mask the premonitory signs and symptoms of hypoglycaemia)
- May cause myocardial depression

SIDE EFFECTS:

- Serious: hypotension, CHF, bronchospasm
- Most common:GI disorders, exertional tiredness and sleep disturbances

ADDITIONAL INFORMATION:

- Beta blockers agents may enhance the negative inotropic and negative dromotropic effect of quinidine and amiodarone
- Monitor closely with patients receiving monoamine oxidase Inhibitors (MAOIs) and adrenergic neuron-blockers
- Digitalis glycoside, in association with beta blockers, may increase atrioventricular conduction time inducing bradycardia
- Closely monitor cardiac and pulmonary status

Midazolam

High Alert Medication

Physician
Paramedic

Tier: 2-II

Storage: ELS Drug Kit

Authorization: Physician

Classification: Benzodiazepine

INDICATION:

- Procedural sedation
- Maintenance of established sedation (post RSI)
- Sedation of agitated patients
- Seizures/status epilepticus
- Ketamine emergence and dysphoria (> 5 years only)
- Cocaine toxicity (ESP only)

PRESENTATION:

Please remember drug presentations change!

Check before administration!

Vial containing 15 mg in 3 ml

DOSAGE AND ADMINISTRATION:

Adult:

- Seizures, Agitated patients & Cocaine

–IV/IO: 0.05 mg/kg, repeat 3 – 5 minutes, Maximum cumulative dose 10 mg

–IM: Initial dose 0.1 mg/kg, repeat 0.05 mg/kg 10 – 15 minutes, maximum cumulative dose 15 mg

- Emergence & Maintenance of sedation:

–IV/IO: 0.02 mg/kg, repeat 3 – 5 minutes, maximum cumulative dose 5 mg

–IM: 0.1 mg/kg, repeat every 10 – 15 minutes, maximum cumulative dose 10 mg

Pediatric:

- IV/IO: Seizures & Cocaine toxicity:

–0.05 mg/kg, repeat every 3 – 5 minutes, maximum cumulative dose 5 mg

- IV/IO: Emergence:

–0.025 mg/kg, repeat ONCE only after 3 – 5 minutes

- IV/IO: Maintenance of sedation:

–0.025 mg/kg, repeat THREE times only every 3 – 5 minutes

- IM: Seizures, Emergence & Post Endotracheal intubation:

-Initial dose 0.2 mg/kg, repeat dose 0.1 mg/kg ONCE only after 10 – 15 minutes to maximum of 10 mg

ACTIONS:

Short acting CNS depressant

- IV ONSET: 1 – 5 minutes
- PEAK: 2 – 5 minutes
- IV DURATION: 20 – 30 minutes
- IM ONSET: 10 – 15 minutes
- IM PEAK: 0.5 – 1 hour
- IM DURATION: up to 6 hrs (mean 2 hrs)

CONTRAINDICATIONS:

- Hypersensitivity to benzodiazepines
- Shock, depressed vital signs or alcohol related altered level of consciousness
- Known severe adverse reaction
- Respiratory depression

CAUTIONS:

- Reduce dosage in the elderly, renal or hepatic function impairment or very ill patients
- Symptomatic CHF (due to reduced cardiac output), COPD
- Myasthenia gravis, Multiple sclerosis
- Burns with large surface area

SIDE EFFECTS:

Increase or decrease in BP/HR/RR, Apnoea, Coughing, Headache, Drowsiness, Excessive sedation, Dizziness, Hiccups, Nausea & Vomiting, Erythema, Rash, Pruritis, Hives, Muscle stiffness, Cold sensation at site of administration

ADDITIONAL INFORMATION:

- Avoid extravasation or intra-arterial injection
- Consideration should be given to informing patient that there may be a lack of recall (i.e. amnesia), for events up to 1 – 2 hours post injection
- Ensure oxygen and resuscitation equipment are available prior to administration
- The maximum dose of midazolam includes that administered by a caregiver prior to arrival of Practitioner
- Consider procedural sedation when transcutaneous pacing or synchronised cardioversion. Call ACC for advice
- Lost or stolen Midazolam should be reported immediately to pharmacist and/or duty manager

Morphine

High Alert Medication

Physician
Paramedic

Storage: ELS Drug Kit

Authorization: Physician

Tier: 2-II

Classification: Narcotic analgesic

INDICATION:

- Pain associated with suspected myocardial infarction (analgesic of first choice)
- Severe pain as a component of a balanced analgesia regimen. Consider ketamine for MSK pain

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Ampoule containing 10 mg in 1 ml

DOSAGE AND ADMINISTRATION:

Adult:

–Dilute with sodium chloride 0.9% to make up solution of 10 ml

- Acute alcoholism
- >12 yrs: IV/IO: 2 – 2.5 mg slow injection over 2 minutes.

–Repeat every 5 min to maximum 20 mg in 1 hr. Titrate to effect

- Consider lower doses in elderly

Pediatric: 1 yr – 12 yrs

–IV/IO: 0.1 mg/kg slow injection over 2 minutes.
–Repeat 0.1 mg/kg after 5 minutes. Maximum cumulative dose 0.2 mg/kg

ACTIONS:

- Morphine is a strong opioid analgesic
- Produces sedation, euphoria and analgesia
- Induces vasodilatation resulting in reduced pre-load to myocardium.
  - ONSET: 2 – 3 minutes
  - PEAK: 10 – 20 minutes
  - DURATION: 2 – 7 hours

CONTRAINDICATIONS:

- < 1 year old
- Known severe adverse reaction
- Labour pains (use Entonox instead)
- Acute respiratory depression
- Systolic BP < 90 mmHg
- Migraine

CAUTIONS:

- Use with caution in the elderly/young
- Renal or hepatic impairment or pregnancy – use smaller doses carefully and titrate to effect
- Use with GREAT CAUTION in chest injuries, especially with any respiratory difficulty (although if respiration is inhibited by pain, analgesia may actually improve respiratory status).
- Head injury: closely monitor, since opioids can cause respiratory depression & drowsiness
- Morphine frequently induces nausea or vomiting which may be potentiated by the movement of the ambulance.

Titrating to the lowest dose and administering slowly to achieve analgesia will reduce the risk of vomiting. The use of an anti-emetic should also be considered

SIDE EFFECTS:

- Respiratory depression
- Cardiovascular depression
- Nausea and vomiting
- Drowsiness
- Pupillary constriction
- Histamine release/rash
- Increased intracranial pressure

ADDITIONAL INFORMATION:

- Unused morphine must be discarded of safely into a clinical waste bin
- Lost, stolen or missing morphine must be reported immediately to a Duty Manager and/or ACC
- Most patients do not require doses greater than 10 mg/hr but terminal patients may require > 100 mg/hr

Naloxone

Physician
Paramedic
EMT–Intermediate

Tier: 1

Storage: ALS Drug Kit

Authorization: EMT-Intermediate

Classification: Narcotic antagonist

INDICATION:

- Opioid overdose (including compound analgesics) producing respiratory, cardiovascular and central nervous system depression
- Unconsciousness associated with respiratory depression of unknown cause where opioid overdose is a possibility
- Reversal of respiratory and central nervous system depression in a neonate following maternal opioid use during labour

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Ampoule containing naloxone hydrochloride 400 mcg in 1 ml

DOSAGE AND ADMINISTRATION:

Adult: > 12 yrs:

- IV/IO: 400 mcg
- IM: 400 mcg
- IN: 800 mcg with Mucosal Atomization Device

–For all of the above repeat after 3 min prn to a Max 2 mg

Pediatric: < 12 yrs:

- IV/IO: 10 mcg/kg
- IM: 10 mcg/kg
- IN: 20 mcg/kg with Mucosal Atomization Device (MAD)

–For all of the above repeat dose to maintain opioid reversal to a maximum total dose of 0.1 mg/kg or 2mg

–Reversal in neonates following maternal opioid use during labour:

- IM (Paramedic and above only): 0.2 mg (200 mcg) ONCE only

–To administer, draw 800 mcg naloxone in 8 ml of saline (total solution of 10 ml) in a syringe and administer SLOWLY 1 ml at a time, titrating to effect.
–Ensure regular re-assessment of ventilation and circulation

ACTIONS:

Competitive narcotic receptor antagonist

- IV ONSET: 2 – 10 minutes
- IV PEAK: 2– 10 minutes
- IV DURATION: 20 minutes – 2 hours

CONTRAINDICATIONS:

Known severe adverse reaction

CAUTIONS:

Neonates born to opioid addicted mothers – produces serious withdrawal effects. Emphasis should be on bag valve-mask ventilation and oxygenation – as with all patients

SIDE EFFECTS:

In patients who are physically dependent on opiates, naloxone may precipitate violent withdrawal symptoms, including cardiac dysrrhythmias. It's better in these cases to titrate the dose of naloxone to effectively reverse the cardiac and respiratory depression, but still leave the patient in a 'groggy' state.

ADDITIONAL INFORMATION:

- IV administration is preferred. If access is impossible, naloxone may be administered intramuscularly, undiluted (into the outer aspect of the thigh or upper arm), but absorption may be unpredictable
- When used, naloxone's effects are short lived – respiratory and cardiovascular depression can recur with fatal consequences
- All cases of opioid overdose should be transported to hospital, even if the initial response to naloxone has been good.

Ondansetron

Physician
Paramedic
EMT–Intermediate

Storage: ALS Drug Kit

Authorization: EMT-Intermediate

Tier: 1

Classification: Anti-emetic

INDICATION:

Adults:

- Prevention and treatment of opiate induced nausea and vomiting
- Treatment of nausea and vomiting

Pediatrics:

- Prevention and treatment of opiate induced nausea and vomiting
- Treatment of travel associated nausea and vomiting

PRESENTATION:

Please remember drug presentations change!
Check before administration!

- Ampoule containing 4 mg of ondansetron (as hydrochloride) in 2 ml
- Melt 8 mg for dissolving on the tongue

DOSAGE AND ADMINISTRATION:

Adult: > 12 yrs:

- IV/IO: 4 mg slow injection over 2 minutes. Single dose
- PO: 8 mg melt single dose. Disintegrate on tongue

Pediatric: 1 month – 12 yrs

- IV: 0.1 mg/kg slow injection over 2 minutes. Single dose.
- PO: 4 – 11 yrs: 4 mg (half) melt single dose. Disintegrate on tongue.

ACTIONS:

- Potent, highly selective 5-HT3 receptor-antagonist
- Blocks 5HT receptors centrally and in the GI tract

➢ IV ONSET: 30 minutes
➢ MELT ONSET: 1 – 2 hrs

CONTRAINDICATIONS:

- Known sensitivity to ondansetron
- Infants < 1 month old

CAUTIONS:

- QT interval prolongation
- Hepatic impairment
- Pregnancy
- Breastfeeding

SIDE EFFECTS:

- Headache
- Constipation
- Flushing
- Hiccups
- Hypotension
- Chest Pain
- Arrhythmias
- Bradycardia
- Seizures
- Movement disorders
- Injection site reactions

ADDITIONAL INFORMATION:

- Melt – disintegrating tablet
- Do not remove from blister until needed
- Do not push from blister, peel the backing off as the melt is fragile and will break
- Using dry gloved hands, place melt on tongue and allow to dissolve. Do not swallow with water

Oral Rehydration Salt

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0

Storage: Supplementary supply

Authorization: EMT-Basic

Classification: Fluid therapy

Indications

- To prevent or treat dehydration especially during heat exhaustion.
- Replace fluids and minerals (such as sodium, potassium) lost due to diarrhea and vomiting.

Presentation

Please remember drug presentations change! Check before administration!

One sachet of powder to be diluted in 1 liter (1000mL) of clean water.

Dosage and administration

Adult: >12 yrs (over 30kg)

- 2200 ml - 4000 mL / 4 hrs
- Adults can consume as much as 1000 mL of ORS solution per hour, if necessary.

Pediatric: (1-12 yrs)

- 1-5 yrs (8-16 kg)
  - 600 - 1200 mL / 4 hrs
- 5-12 yrs (16-30 kg)
  - 1200 - 2200 mL / 4 hrs

Note: Severe dehydration must be treated with intravenous electrolyte solutions

Action

The glucose contained in ORS solution enables the intestine to absorb the fluid and the salts more efficiently. ORS alone is an effective treatment for 90-95% of patients, regardless of cause.

Contraindications

- Chronic heart failure
- Severe renal impairment
- Visible water retention
- Kidney problems causing a decreased urine output
- Extreme loss of body water
- Known case of hyperkalemia
- Familial Hyperkalemic Periodic Paralysis
- Severe heart block
- Stomach Muscle Paralysis and Decreased Function

Cautions

- **STOP ORS in these cases:**
  - When vomiting is protracted despite proper administration of ORS
  - If signs of dehydration worsen despite giving ORS
  - When the person is unable to drink due to a decreased level of consciousness, or there is evidence of intestinal blockage or ileus.
  - If the eyelids become puffy during the treatment

Side effects

- Hypernatremia (dizziness; fast heartbeat; high blood pressure; irritability; muscle twitching; restlessness; seizures; swelling of feet or lower legs; weakness)
- Puffy eyelids is a symptom of over hydration

Additional information

- It is unknown if this product passes into breast milk.
- Do not use the powder if it has turned into a yellow-brownish sticky substance.
- Once prepared, the solution must be used within 24 hours.
- The volumes and time shown are guidelines based on usual needs. If necessary, amount and frequency can be increased, or the ORS solution can be given at the same rate for a longer period to achieve adequate rehydration. Similarly, the amount of fluid can be decreased if hydration is achieved earlier than expected.

Oxygen

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I

Storage: Supplementary supply

Authorization: EMT-Basic

Classification: Compressed Medical Gas

INDICATION:
Adult:
- Critical illness requiring high levels of O2
- Serious illness requiring moderate levels of O2 if hypoxaemic
- COPD and other conditions requiring controlled or low-dose O2 therapy
- Conditions where O2 therapy not normally required unless the patient is hypoxaemic

Pediatric:
- Significant illness and/or injury

PRESENTATION:
Please remember drug presentations change!
Check before administration!
A gas provided in compressed form in a cylinder

DOSAGE AND ADMINISTRATION:
Adult:
- Do not withold if clinically indicated.
- Maintain target saturations > 95%. Adjust to aim for target saturations of 88 – 92% in COPD patients
- Do not rely solely on SpO2. Use other indicators such as adequacy of respirations

Paediatric:
- ALL with significant illness and/or injury receive high levels of O2

ACTIONS:
Essential for cell metabolism. Maintaining tissue perfusion is vital for normal physiological function
Reverse hypoxia

CONTRAINDICATIONS:
- Explosive environments
- Paraquat poisoning

CAUTIONS:
- Fire hazards
- Defibrillation (unlikely with self-adhesive pads)

SIDE EFFECTS:
- Drying and irritating to mucous membranes
- Respiratory depression in COPD patients (long term inappropriate administration)

ADDITIONAL INFORMATION:
- Hypoxia will only improve if respiratory effort/ ventilation and perfusion are adequate (consider assisting ventilations)
- Measure SPO2 and ETCO2 in all patients where possible
- If target saturations cannot be maintained with a simple face mask change to a NRBM
- NRBM and BVM may be used in conjunction with nasal cannula to achieve maximum effect
- Critical Illness and Major trauma: administer maximum dose achievable
- Conditions not normally required: ACS, CVA, nontraumatic pain, pregnancy and labour, headache, hyperventilation, post seizure, GI bleed, heat stroke unless SpO2 < 95%

Paracetamol

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-I (PO)/ 1 (IV)

Storage: BLS Drug Kit(PO) / ALS Drug Kit(IV)

Authorization: EMT-Basic

Classification: Analgesic and antipyretic

INDICATION:

- Relief of minor or moderate pain
- High temperature
- As part of a balanced analgesic regimen for severe pain (IV paracetamol is effective in reducing opioid requirements while improving analgesic efficacy). Only use IV paracetamol for severe pain or if a contraindication to opiates exists (EMT-I and above

PRESENTATION:

Please remember drug presentations change!
Check before administration!

- Tablets 500 mg
- Suspension 120 mg in 5 ml
- Bottle containing paracetamol 1 g in 100 ml

DOSAGE AND ADMINISTRATION:

Adult: > 50 kg:

- PO: 1 g every 4 – 6 hours up to a maximum of 4 g in 24 hrs
- IV/IO: 1 g slow infusion over 15 minutes. Repeat every 4 – 6 hrs up to a maximum of 4 g in 24 hrs (EMT-I and above only)

Pediatric: < 50 kg:

- PO (Suspension ONLY): 15 mg/kg every 4 – 6 hours up to a maximum of four doses per 24 hours (must not exceed adult dose)
- IV/IO: 10 mg/kg infusion over 15 minutes. Repeat every 4 – 6 hrs up to a maximum daily dose of 30 mg/kg (must not exceed adult dose) (EMT-I and above only)

ACTIONS:

Antipyretic, Analgesic

- PO ONSET: 30 – 60 minutes
- PO PEAK: 1 – 3 hours
- PO DURATION: 3 – 8 hours
- IV ONSET: < 30 minutes
- IV PEAK: 30 minutes
- IV DURATION: 4 – 6 hours

CONTRAINDICATIONS:

- Known paracetamol allergy
- Do NOT give further paracetamol if a product containing paracetamol has already been given within the last four hours or if the maximum cumulative daily dose has been given already

CAUTIONS:

Previous administration within 4 hours

SIDE EFFECTS:

Occasionally IV paracetamol may cause systemic hypotension if administered too rapidly. Should be given over 5 – 10 minutes

ADDITIONAL INFORMATION:

- A febrile child should not be left at home
- Any IV paracetamol that remains within the giving set can be flushed using 0.9% saline. Take care to ensure that air does not become entrained into the giving set; if there is air in the giving set ensure that it does not run into the patient with further fluids
- Consider oral solution administration over tablet administration in; young children, the elderly, and individuals with difficulty in swallowing tablet form medications

Propofol

High Alert Medication

Physician

Tier: 3

Storage: ELS Drug Kit

Authorization: Physician

Classification: Sedative hynotic/Anaesthetic

INDICATION:

- Induction of anaesthesia
- Maintenance of anaesthesia

PRESENTATION:

Please remember drug presentations change!
Check before administration!

Vial containing 200 mg propofol 1 % in 20 ml

DOSAGE AND ADMINISTRATION:

Adult:

Induction

- 18 – 55 yrs: IV/IO: 1.5 – 2.5 mg/kg slow IV injection, at a rate of 20 – 40mg every 10 seconds until response
- 55 yrs (or hemodynamically unstable adult):
- IV/IO: 1 – 1.5 mg/kg slow IV injection at a rate of 20mg every 10 seconds until response.

Maintenance

- 18 – 55 yrs: IV/IO Infusion: 4 – 12 mg/kg/hr via syringe pump
- 55 yrs: IV/IO Infusion: consider 3 – 6 mg/kg/hr via syringe pump
- IV/IO Bolus: 20 – 50 mg as slow intravenous injection.

Repeat prn

Paediatric:

Induction

- 1 month – 18 yrs: IV/IO: 2.5 – 4 mg/kg slow IV injection at a rate of 20 – 40 mg every 10 seconds until response

Maintenance

- 1 month – 18 yrs: IV/IO Infusion: 9 – 15 mg/kg/hr infusion, adjust according to response via syringe pump

ACTIONS:

Produces a dose dependent CNS depression similar to benzodiazepines and barbiturates

- ONSET: 30 – 60 seconds
- PEAK: patient dependent
- DURATION: 7 – 8 minutes post termination of infusion

CONTRAINDICATIONS:

Known allergy or hypersensitivity to propofol
Allergies to soya beans or eggs

CAUTIONS:

- Elderly patients
- Hypotension
- Respiratory impairment
- Cardiac impairment
- Hypovolaemia
- Raised intra-cranial pressure
- Epilepsy
- Extreme caution must be used when given with opiate analgesics or sedatives
- Do not mix with other drugs or blood products (therefore should not be administered in the same IV line)

SIDE EFFECTS:

- Hypotension
- Transient apnoea
- Painful on IV injection
- Dystonia (rare)

ADDITIONAL INFORMATION:

- Do not commence with propofol as part of initial therapy
- If initiated by a Physician, maintenance therapy may be continued
- Propofol has no analgesic properties, concomitant analgesia is mandatory
- Lost or stolen Propofol should be reported immediately to pharmacist and/or duty manager

Rocuronium

High Alert Medication

Physician

Tier: 3

Storage: ELS Drug Kit

Authorization: Physician

Classification: Neuromuscular blocker

INDICATION:

- Rapid Sequence Intubation
- Neuromuscular blockade (maintenance)
- Post cardiac arrest care

PRESENTATION:

Please remember drug presentations change!
Check before administration!
Vial containing 50 mg in 5 ml

DOSAGE AND ADMINISTRATION:

Adult:

- IV/IO: RSI & Post cardiac arrest care:

– > 18 yrs: Initial dose 600 mcg/kg injection followed by maintenance dose 150 mcg/kg injection prn
– Elderly consider maintenance dose 75 – 100 mcg/kg IV/ IO injection

- IV/IO Infusion: RSI & Post cardiac arrest care:

– > 18 yrs: 300 – 600 mcg/kg/hr
– Elderly up to 400 mcg/kg/hr IV/IO infusion

- IV/IO: Neuromuscular blockade:

– > 18 yrs: Initial dose
600 mcg/kg IV/IO injection (OPTIONAL)
– Maintenance 300 – 600 mcg/kg/hr IV/IO infusion for first hour then adjust to response

Pediatric:

- RSI & Post cardiac arrest care: 1 month – 18 yrs: Same as adult
- Neuromuscular blockade: 1 month – 18 yrs: Same as adult

ACTIONS:

- Aminosteroid neuromuscular blocking drug with an intermediate duration of action
- Muscle relaxant

➢ ONSET: Rapid/Immediate
➢ PEAK: 3 minutes
➢ DURATION: 25 – 30 mins

CONTRAINDICATIONS:

- Hypersensitivity to rocuronium
- Known myasthenia gravis

CAUTIONS:

- Failure of the clinician to immediately take over ventilation of the patient will result in severe deoxygenation of the patient and cardiac arrest
- Patients with neuromuscular disorders (response is unpredictable)
- Patients with fluid and electrolyte imbalances (response is unpredictable)
- Patients with burns (may require increased dose – titrate to effect)

SIDE EFFECTS:

- Allergic reactions (including possible anaphylaxis)
- Minimal cardiovascular effects
- Hypotension, vasodilatation (flushing), tachycardia, bradycardia
- Dyspnoea, bronchospasm, laryngospasm
- Rash, urticaria, reaction at injection site

ADDITIONAL INFORMATION:

- Non-depolarising neuromuscular blocking drugs have a slower onset of action than depolarising neuromuscular blocking drugs such as succinylcholine
- Neuromuscular blocking drugs have no sedative or analgesic effects
- Rocuronium is not considered to trigger malignant hyperthermia
- Prior administration of succinylcholine does not enhance the duration, but quickens the onset and may increase the depth, of neuromuscular block induced by rocuronium

This drug should only be administered by, or under direct supervision of, personnel experienced in their use, with adequate training in anaesthesia and airway maintenance.

Salbutamol

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-1

Storage: BLS Drug Kit

Authorization: EMT-Basic

Classification: Beta 2 agonist

INDICATION:

- Bronchospasm
- Exacerbation of COPD
- Respiratory distress following submersion incident
- Wheeze

PRESENTATION:

Please remember drug presentations change!
Check before administration!

- Nebule containing 2.5 mg in 2.5 ml
- Aerosol inhaler metered dose 100 mcg per puff

DOSAGE AND ADMINISTRATION:

Adult: > 12 yrs:

- Nebulised: 5 mg with 6 – 8 l/min oxygen. Repeat every 5 minutes prn. Maximum cumulative dose 15 mg
- Aerosol Inhaler: 2 puffs (200mcg). Repeat PRN
- Aerosal Spacer: For acute cases, when administering via large volume spacer administer 10 puffs

Pediatric: < 12 yrs:

- Nebulised: 5 – 12 yrs: 5 mg with 6 – 8 l/min oxygen.

Repeat every 5 minutes prn. Maximum cumulative dose 15mg

- Nebulised: < 5 yrs: 2.5 mg nebulised with 6 – 8 l/min oxygen. Repeat every 5 minutes prn. Maximum cumulative dose 15mg
- Aerosol Inhaler: 2 puffs (200mcg). Repeat PRN
- Aerosal Spacer: For acute cases, when administering via large volume spacer administer 10 puffs.

ACTIONS:

Salbutamol is a selective β2 adrenoreceptor stimulant drug. This has a relaxant effect on the smooth muscle in the medium and smaller airways

- ONSET: immediate
- DURATION: 3 – 5 hrs

CONTRAINDICATIONS:

Known severe adverse reaction

CAUTIONS:

- Hypertension, Angina, Cardiac tachyarrhythmias, Coronary insufficiency, Overactive thyroid, and late pregnancy (can relax uterus).
- Severe hypertension may occur in patients on beta blockers and half doses should be used unless there is profound hypotension.

SIDE EFFECTS:

Tremor (shaking), Tachycardia, Palpitations, Headache, Feeling of tension, Peripheral vasodilatation, Muscle cramps, Rash, Hyperglycaemia, Hypokalaemia

ADDITIONAL INFORMATION:

- In acute severe or life-threatening asthma ipratropium should be given after the first dose of salbutamol.
- In more severe attacks the use of steroids by injection or orally and further nebuliser therapy will be required. Do not be lulled into a false sense of security by an initial improvement after salbutamol.
- Beware of the “silent chest asthmatic” as severe bronchospasm may present with absent air entry and no evidence of wheezing. If this occurs and the patient requires assisted ventilations, consider administration of IM adrenaline.
- Shake aerosol spray well before use. Prime inhaler prior to first dose (spray into air)
- It is more efficient to use a volumiser in conjunction with aerosol inhaler.

0.9% Sodium chloride

Physician
Paramedic
EMT–Intermediate
EMT–Basic

Tier: 0-II

Storage: Supplementary supply

Authorization: EMT-Basic

Classification: Fluid therapy

INDICATION:

- Trauma and Medical conditions with signs of poor perfusion
- Flush to confirm and maintain patency of IV/IO cannula & following drug administration
- Symptomatic Hyperglycemia (> 250 mg/dl, > 13.9 mmol/l) (Paramedic and above)

PRESENTATION:

Please remember drug presentations change!
Check before administration!

500 ml and 250 ml packs of sodium chloride 0.9% 5 – 10 ml ampoules for flushes

DOSAGE AND ADMINISTRATION:

Adult: > 12 yrs:

- IV/IO: 20ml/kg infusion over 3 – 5 mins to the physiological perimeters in CGP134 Patient Care Protocols. In some instances, CGP134 also specifically provides for any change from the 3 – 5 min infusion time standard
- IV/IO Flush: 10 – 20 ml flush before and after IV/IO drug administrations

Pediatric: < 12 yrs:

- IV/IO < 12 yrs: 20 ml/kg infusion over 3-5 mins to the physiological perimeters in CGP134 Patient Care Protocols. In some instances, CGP134 also specifically provides for any change from the 3 – 5 min infusion time standard. Maximum dose 40 ml/kg
- IV/IO Neonates: 10 ml/kg infusion over 3 – 5 mins to the physiological perimeters in CGP134 Patient Care Protocols. In some instances, CGP134 also specifically provides for any change from the 3 – 5 min infusion time standard
- IV/IO Flush: 5 yrs – 12 yrs: 5 – 10 ml flush before and after IV/IO drug administrations
- IV/IO Flush: Neonate – 5 yrs: 2 – 5 ml flush before and after IV/IO drug administrations

ACTIONS:

Increases vascular fluid volume, raising cardiac output and improving perfusion

CONTRAINDICATIONS:

Pulmonary Oedema

CAUTIONS:

- Fluid replacement in dehydration should occur over hours
- In pediatric patients suffering from heart failure, renal failure and diabetic ketoacidosis smaller doses are given 10 ml/kg. In DKA administer ONCE only over 15 minutes

SIDE EFFECTS:

Over infusion precipitates pulmonary oedema causing breathlessness

ADDITIONAL INFORMATION:

- Despite a lack of evidence demonstrating any significant beneficial effects, prehospital fluid therapy has become established practice. DO NOT DELAY TRANSPORT
- Routine use of fluid may be detrimental to patient

Sodium Lactate compound

Physician
Paramedic

Tier: 2-II

Storage: Supplementary Supply

Authorization: Paramedic

Classification: Compound solution

INDICATION:
Fluid Resuscitation

PRESENTATION:
Please remember drug presentations change!
Check before administration!
500 ml or 1000 ml bags or bottles of Compound Sodium Lactate (Ringers Lactate)

DOSAGE AND ADMINISTRATION:
Adult:

- IV/IO: 20ml/kg for 3 – 5 minutes to keep vein open.

–Administer to the physiological perimeters in CGP134
–Patient Care Protocols. In some instances, CGP134 also specifically provides for any change from the 3 – 5 min infusion time standard

Pediatric:

- IV/IO: 20 ml/kg for 3 – 5 mins or to keep vein open.

–Administer to the physiological perimeters in CGP134
–Patient Care Protocols. In some instances, CGP134 also specifically provides for any change from the 3 – 5 min infusion time standard

ACTIONS:
Increases vascular fluid volume, raising cardiac output and improves perfusion

CONTRAINDICATIONS:

- DKA coma and pre-coma
- Neonates

CAUTIONS:

- Avoid use in limb crush injury
- Renal failure
- Liver failure

SIDE EFFECTS:
Excessive volume may overload the system precipitating heart failure

ADDITIONAL INFORMATION:

- The volume of compound sodium lactate IV/IO infusion needed is 3 times as great as the volume of blood loss
- Sodium lactate has NO oxygen carrying capacity

Thiopental

High Alert Medication

Physician

Tier: 3

Storage: ELS Drug Kit

Authorization: Physician

Classification: Short acting barbiurate

INDICATION:
Induction of Anaesthesia

PRESENTATION:
Please remember drug presentations change!
Check before administration!

500 mg vial

DOSAGE AND ADMINISTRATION:
Adult: > 18 yrs:

- Healthy and pre-medicated
- IV/IO: Initial dose 100 – 150 mg (reduced in elderly or debilitated) over 10 – 15 seconds (longer in elderly or debilitated), followed by further quantity if necessary according to response after 30 – 60 seconds. Up to 4 mg/kg (max. 500 mg)

Pediatric :< 18 yrs:

- 1 month – 18 yrs: IV/IO: Initial dose up to 4 mg/kg IV IO slow injection, then 1 mg/kg injection prn. Maximum cumulative dose 7 mg/kg
- Neonate: IV/IO: Initial dose up to 2 mg/kg IV/IO slow injection, then 1 mg/kg injection prn. Maximum cumulative dose 4 mg/kg

ACTIONS:

- Short acting barbiturate
- Barbiturates depress neuronal activity
- Anaesthetic agent
  - ONSET: 10 – 40 secs
  - PEAK: 1 min
  - DURATION: 5 – 8 mins

CONTRAINDICATIONS:

- Barbiturate allergy
- Acute intermittent porphyria
- History of paradoxic excitation
- Status asthmaticus

CAUTIONS:

- Hypovolaemic hypotension
- Partial airway obstructions
- Hepatic or renal dysfunction
- Uncontrolled Diabetes/ Adrenal cortical insufficiency/ myxoedema
- Hypokalaemic familial periodic paralysis
- Dystrophia myotonica, Myaesthenia Gravis, Huntington's chorea
- Alcoholic patient taking disulfiram

SIDE EFFECTS:
Cardiac depression, Hypotension, Arrhythmias, Myocardial depression, Laryngeal spasm, Cough, Headache, Sneezing, Hypersensitivity reactions, Rash

ADDITIONAL INFORMATION:

- Excessive doses are associated with hypothermia and profound cerebral impairment
- An initial fall in blood pressure is often seen
- Postoperative vomiting is infrequent, but shivering may occur and there may be persistent drowsiness, confusion and amnesia
- There may be depression in neonatal respiration when used during delivery

Tranexamic Acid

High Alert Medication

Physician
Paramedic

Tier: 2-I

Storage: ALS Drug Kit

Authorization: Paramedic

Classification: Anti-fibrinolytic

INDICATION:
Patients with TIME CRITICAL injury where significant internal/external haemorrhage is suspected

PRESENTATION:
Please remember drug presentations change!
Check before administration!

Vial containing 500 mg tranexamic acid in 5 ml (100 mg/ml)

DOSAGE AND ADMINISTRATION:
Adult: > 12 yr:

- IV: 1 g slow injection over 10 minutes. ONCE only

Pediatric: < 12 yr:

- IV: 20 mg/kg slow injection over 10 minutes. ONCE only

ACTIONS:
Tranexamic acid is an anti-fibrinolytic which reduces breakdown of blood clots

CONTRAINDICATIONS:

- When bleeding has stopped
- Hypersensitivity to the drug
- Acute venous or arterial thrombosis
- Severe hepatic impairment

CAUTIONS:

- Head injury
- History of convulsions

SIDE EFFECTS:

- Diarrhoea, vomiting, nausea
- Rapid injection may cause hypotension (RARE)

ADDITIONAL INFORMATION:

- There is good data that this treatment is safe and effective (giving a 9% reduction in the number of deaths in patients in the CRASH2 trial)
- There is no evidence about whether or not this is effective in patients with head injury; however there is also no evidence of harm

High dose regimes have been associated with convulsions; however in the low dose regime recommended here, the benefit from giving TXA in trauma outweighs the risk of convulsions