ONTARIO BASE HOSPITAL GROUP

Reference and Educational Notes

Companion Document for the Advanced Life Support Patient Care Standards

Version 5.4 – June 2025

ONTARIO
BASE HOSPITALS

Introduction

Paramedics face complex and dynamic scenarios in which each patient presents unique challenges requiring thorough assessment and robust clinical judgment. The Advanced Life Support Patient Care Standards (ALS PCS) guide paramedics in providing essential, timely care within their scope of practice. However, as medical knowledge and prehospital care evolve, supplementary resources are needed to bridge the gap between guidelines and practice. The provincial Medical Advisory Committee's (MAC) consensus and best practice approach to these unique scenarios are highlighted within this document.

The revised Companion Document aims to provide paramedics with a cohesive and comprehensive reference guide. This revision introduces a structured approach where background information about the medical directives is organized into clearly defined subheadings, promoting ease of use and understanding. The intention is to promote the consistent application of ALS PCS by offering detailed explanations that enhance clinical insight and reinforce evidence-based decision-making.

Preamble

The updated Companion Document is designed to support paramedics in delivering effective and confident patient care by providing deeper context and guidance on medical directives within the ALS PCS. This version emphasizes clarity, flow, and purpose, ensuring paramedics can quickly find relevant information to make informed decisions in diverse situations.

Key changes in this revision include dividing content into subheadings to assist paramedics in navigating the document to find relevant information, regardless of the scope of practice. This organization facilitates targeted learning and allows paramedics to access supportive details more efficiently.

The purpose of this revised document is not only to clarify and reinforce the ALS PCS standards but also to provide paramedics with the rationale behind treatment plans, considerations for complex cases, and guidance for navigating unique patient situations. These enhancements aim to promote consistent, high-quality prehospital care and streamline education and training processes across Ontario.

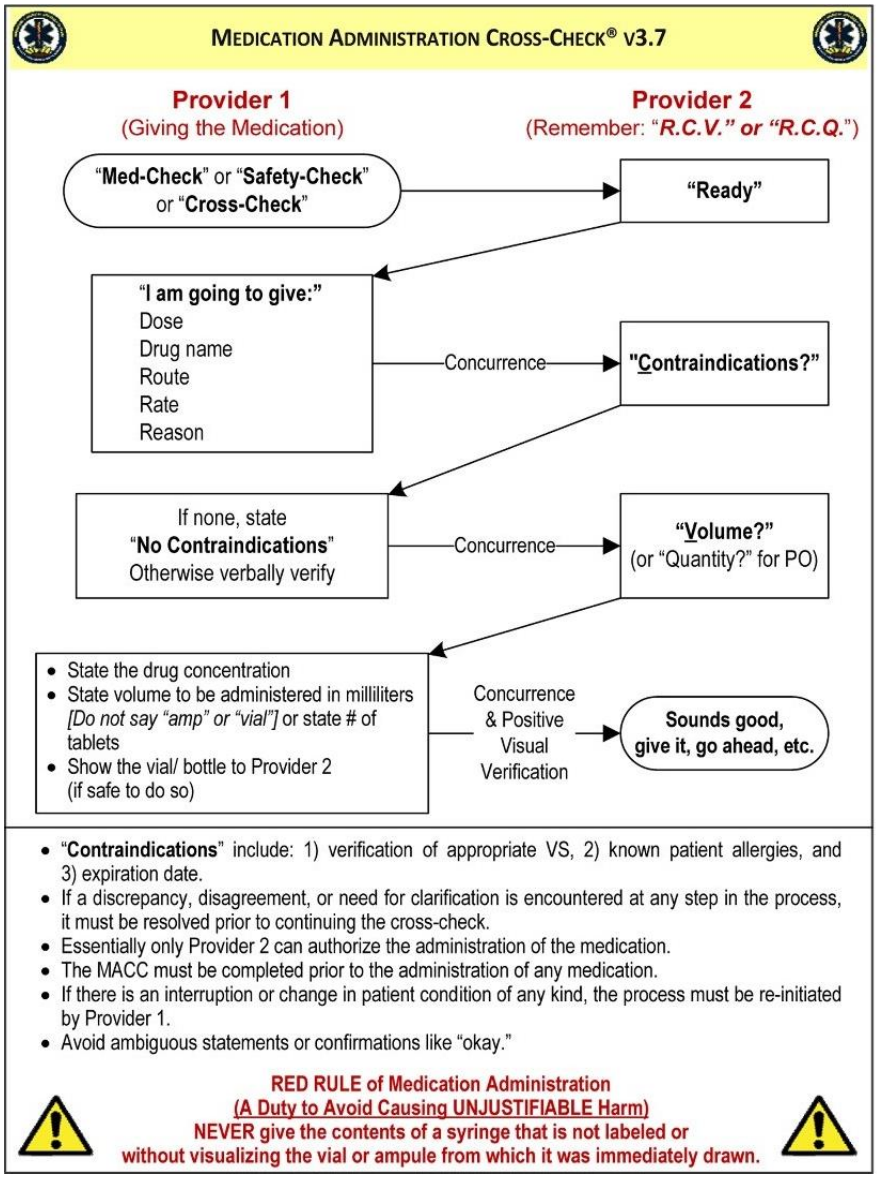
This companion document serves as an evolving resource, with updates ensuring continued alignment with the latest clinical practices and standards. The electronic version will remain the most current, available through the Ontario Base Hospital Group's website.

Medication Administration Practices

Paramedics must perform medication administration cross-checks before administering all medications. Please refer to the Medication Administration Cross-Check reference. In situations where a paramedic is treating a patient alone and a partner is not available for a medication

administration cross-check, the attending paramedic should employ alternative safety strategies with other providers or bystanders on scene to ensure accurate and safe medication administration. This may include:

- Using cognitive aids, such as checklists or medication reference tools.
- Conducting a deliberate self-check by verbalizing the medication order and dose to reinforce accuracy, utilizing remote support when feasible (e.g., consulting a supervisor or medical control).



Medication doses may be calculated based on weight or other factors and result in a fraction that cannot be measured accurately. Depending on the delivery method used, medication doses may require rounding from the exact dose calculated. In these cases, the medication dose delivered will be rounded to the closest dose that can accurately be measured.

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the medication drug monograph. The OBHG MAC will approve off-label routes for the administration of medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, ketorolac and dexamethasone

Medications listed in the following directives may be administered via 50 ml 0.9% Normal Saline (NS) or D5W Medication bag, if available, intravenously at the discretion of the paramedic as an alternative to bolus/slow IV push administration:

Medication	Medical Directive
dimenhyDRINATE (Gravol)	Nausea/Vomiting Medical Directive
diphenhydrAMINE (Benadryl)	Moderate to Severe Allergic Reaction Medical Directive
amiodarone	Tachydysrhythmia Medical Directive
morphine	Analgesia Medical Directive
fentaNYL	Analgesia Medical Directive
ketamine	Analgesia Medical Directive
tranexamic acid	Traumatic Hemorrhage Medical Directive
calcium gluconate	Hyperkalemia Medical Directive

1. All medications given via 50 ml 0.9% NS or D5W bag must be appropriately labelled with the following minimum information:
    a. Drug Name
    b. Drug Dosage
    c. Time initiated
    d. Attending Paramedic Name and initials
2. Only one medication may be administered per 50 ml 0.9% NS or D5W bag.
3. Volume of 50 ml 0.9% NS or D5W bag and medication is not to be counted towards total fluid volume administered to the patient.
4. IV drug dosages remain the same, medication bag infusion allows for slow IV administration to be accomplished while providing ongoing patient care. Follow current directives for drug dosing. (i.e. Hyperkalemia Medical Directive – Administer 1.0g of Calcium Gluconate over 3 minutes. Inject your medication into the medication bag and titrate drip rate accordingly for a 3-minute delivery).

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Acute Cardiogenic Pulmonary Edema

Introduction

Pulmonary edema is a medical condition characterized by the accumulation of fluid in the lung's alveoli, which impedes oxygen exchange and leads to difficulty breathing.

This condition can manifest gradually over several days or suddenly.

In the prehospital setting, the most common cause of cardiogenic pulmonary edema is congestive heart failure (CHF), where impaired ventricular function results in the buildup of fluid in the pulmonary and/or systemic circulatory systems[1]..

Essentials

When considering the application of the Acute Cardiogenic Pulmonary Edema medical directive, paramedics should strive to identify the cause of the clinical presentation and consider differentials such as: cardiogenic pulmonary edema, asthma, pneumonia, or chronic obstructive pulmonary disease (COPD)[4].

The typical patient presenting with acute cardiogenic pulmonary edema will present with dyspnea, bilateral crackles to the lungs, hypertension, and other signs of fluid overload. They often have a cardiac history such as congestive heart failure, acute coronary syndrome or dysrhythmia. However, a lack of cardiac history does not preclude a patient from this directive.

Note: Nitroglycerin administration is not indicated for non-cardiogenic pulmonary edema. Non-cardiogenic pulmonary edema can occur as a result of pneumonia, sepsis, acute respiratory distress syndrome (ARDS), drug ingestion, toxic inhalation, or near-drowning[2].

The treatment of these patients should prioritize effective oxygenation and ventilation. The use of continuous positive airway pressure (CPAP) would be appropriate in cases of non-cardiogenic pulmonary edema[2].

In the early-stages of pulmonary edema, symptoms may include respiratory wheezing. In these cases, the wheezing is due to airway edema from the increased pressure in the pulmonary capillaries rather than bronchospasm[8]. Paramedics are encouraged to use their clinical judgment when considering salbutamol use.

Treatment priorities for acute cardiogenic pulmonary edema patients can include providing high-concentration oxygen, supportive ventilation including CPAP, nitrate administration, and rapid transport[3]

Nitroglycerin administration for acute cardiogenic pulmonary edema is given primarily for peripheral vasodilatory effects to reduce cardiac preload and afterload. The coronary vasodilating properties also help improve blood flow to cardiac tissue, which helps to improve the contractility of the heart[1].

Interventions

- A 12 or 15 lead ECG acquisition and interpretation is not required for initial nitroglycerin administration in this medical directive because right ventricular infarctions do not generally present with acute cardiogenic pulmonary edema. Paramedics should acquire and interpret a 12 or 15-lead ECG as soon as possible.

- If a STEMI is identified, follow the Cardiac Ischemia Medical Directive as it pertains to nitroglycerin administration and dose scheduling. The reduced number of nitroglycerin doses in the context of STEMI is related to reducing adverse outcomes associated with liberal nitroglycerin use[5].

- Patients presenting with both acute cardiogenic pulmonary edema and suspected cardiac ischemia, may receive nitroglycerin under the Acute Cardiogenic Pulmonary Edema Medical Directive, in addition to ASA under the Cardiac Ischemia Medical Directive.

- The patient may **not** receive nitroglycerin from **both** Cardiac Ischemia and Acute Cardiogenic Pulmonary Edema Medical Directives.

- A fluid bolus is permitted despite the presence of crackles on auscultation in cases where the administration of nitroglycerin results in hypotension.[8] Further doses of nitroglycerin should be withheld. Where appropriate, Paramedics may patch for consultation to discuss initiation of inotropes[8].

Adult Intraosseous

- This auxiliary directive requires service operator and Base Hospital advocacy, training and education prior to implementation.

- "IV access is unobtainable" does not imply that you must attempt an IV and fail before proceeding to the IO, but it must be considered. Documentation on the ACR to support the rationale to bypass the IV attempt will be expected.

- Typical IO needles range from 15-18 gauge.

- The typical insertion site is the proximal tibia. Other sites are dependent upon RBH approval and manufacturer recommendation.

- Aspiration may be recommended as part of the procedural skill, but an inability to aspirate should be confirmed by testing patency by attempting to push fluid in.

Analgesia Medical Directive

Introduction

Prompt and efficient pain management is an impactful intervention that paramedics can perform in the pre-hospital setting. Given the wide range of opiate and non-opiate options for analgesia available, paramedics should use clinical discretion in determining the most appropriate medication for each patient.

Essentials

Paramedics are encouraged to use a progressive and multimodal approach to managing pain. Selecting the most appropriate analgesic for your patient depends on the following factors: patient condition, pain severity, risks/benefits of chosen analgesic, hemodynamic stability, potential for respiratory depression, and call circumstances.

Acetaminophen and ibuprofen should be utilized as first-line analgesia for patients who can tolerate oral medication. Oral medication is effective and is less invasive than parenteral analgesia. Coadministration of acetaminophen and ibuprofen can provide analgesia similar to low-dose opioids without the euphoric effect.

Suspected renal colic patients should routinely be considered for NSAID (either ibuprofen or ketorolac) administration in addition to morphine or fentaNYL because of the anti-inflammatory action and smooth muscle relaxation they provide. NSAIDs reduce the glomerular filtration rate which reduces renal pelvic pressure and stimulation of the stretch receptors, thereby providing analgesia. They also reduce local inflammation through the inhibition of prostaglandin production.

Ketorolac should not be administered in conjunction with ibuprofen as they are both NSAIDs, and administration of both would increase the adverse effects.

Active bleeding in this medical directive is defined as a hemorrhage that cannot be controlled (ex. hematemesis or gastrointestinal bleed). External hemorrhages that can be controlled, such as epistaxis or a soft tissue laceration, are not considered active bleeds. Menstrual bleeding is not a contraindication for this directive.

Morphine can be used when the pain is long-lasting, such as trauma or cardiac ischemia. Morphine also remains a suitable option when other analgesics are not readily available. However, consideration should be given to potential side effects such as respiratory depression and hemodynamic changes. Hypotension as a consequence of morphine administration is more common in patients who are hypovolemic, at the extremes of age, opiate naive and when morphine is administered rapidly. Nausea or itching may be reduced by administering morphine in aliquots and/or diluting with saline.

FentaNYL is commonly used for rapid pain relief due to its high potency and quick onset of action, making it ideal when immediate pain control in cases of severe trauma. Unlike some other analgesics, fentaNYL is not vasoactive at the doses typically administered, which means it does not significantly affect blood pressure or heart rate. This characteristic is especially advantageous in trauma care, where maintaining stable hemodynamics is essential. However, careful monitoring of the patient's respiratory status and dose adjustments are necessary to mitigate the risk of respiratory depression associated with fentaNYL.

Low-dose ketamine provides a non-opioid analgesia option and does not affect hemodynamic stability. Ketamine can be used alone or in combination with an opioid to provide rapid, effective pain relief for patients experiencing pain. Ketamine can be used when opioids are contraindicated as it does not impact hemodynamic stability. For example, ketamine would be the preferred analgesic option for hypotensive patients or when there is a risk of hemorrhagic shock or respiratory depression. Paramedics should be aware of the risk of side effects such as laryngospasm, increased secretions and ketamine emergence reaction. Administer ketamine over a 2 to 3-minute period to lower the risk of these adverse reactions.

Nausea associated with the administration of fentaNYL, ketamine or morphine is rare and routine antiemetics should not be administered. Antiemetics may be considered if nausea develops during or after administration.

***Interventions*:**

Aliquots for the Analgesia Medical Directive are defined as small, (usually) equal parts of the maximum single dose that are administered in 3-minute intervals until the desired analgesia is achieved or the maximum single dose is reached. Paramedics should document the total amount of a single dose administered and not each aliquot as a separate dose. The next dose of morphine can be administered 15 minutes after the last aliquot or the maximum single dose was administered. The next dose of fentaNYL can be administered 5 minutes after the last aliquot or the max single dose was administered.

Morphine, fentaNYL and ketamine may all be administered via 50 ml 0.9% Normal Saline (NS) or D5W Medication bag, if available, intravenously at the discretion of the paramedic as an alternative to bolus/slow IV push administration.

Assessment of Patients with Covid-19 Medical Directive

This directive is intended for implementation in the event that there is a surge in patient volumes that may overwhelm the existing system. This directive may only be implemented upon authorization of the Regional Base Hospital medical director.

Approach the directive in a systematic way.

1. Assess the patient for eligibility under the release from care criteria.

2. Patch to confirm that the patient can be released from care. A BHP patch is required for any patient who has been assessed to be CTAS 3 with mild or no respiratory distress.

3. Once it has been confirmed that the patient will be released from care, perform the COVID testing swab (if available/authorized).

The directive refers specifically to patients who call 911 due to COVID-19 related symptoms/complaints.

COVID-19 Symptoms may include but are not limited to

- Fever
- Dry cough
- Shortness of breath
- Fatigue
- Lack of appetite
- Body aches
- Sore throat
- Stuffy/runny nose
- New vomiting/diarrhea/abdominal pain with no pre-existing condition
- Loss of smell/taste disturbance

Note that the indications do not follow the MOH screening tool exactly due to the broad nature of the MOH screening tool. Indications include primarily respiratory symptoms.

- Due to potential increased risk of leaving pediatric patients or patients over 65 years of age at home we should consider transport of these patients to the hospital.

- Vital signs listed under conditions align with CTAS considerations.

- Pregnancy is listed as a contraindication for the consideration of this directive as pregnancy may increase the risk of COVID-19 to the patient.

- Ensure the patient/SDM has capacity prior to your BHP patch.

    - patient has capacity
    - relates to patient disposition decision (in this case)
    - informed (fully informed; not just what the patient asks)
    - voluntary (without coercion/threats)
    - without misrepresentation or fraud (open and honest, as unbiased as possible)

- Provide the following information to the BHP during your patch for consideration of release from care under the directive:

    - Age (gender)
    - patient's COVID-19 screening result

- travel history
- history of illness and symptoms
- past medical history
- vital signs
- additional assessment findings, including respiratory assessment
- patient and/or SDM's wishes and follow-up plans (if known)

- If considering release from care, ensure that the patient is able to self-isolate, can care for themselves or there is a caregiver available and has access to 911 if needed.

    - Best practice means that prior to release from care, the patient should be able to:
    - verbalize/communicate an understanding and appreciation of their clinical situation
    - verbalize/communicate an understanding and appreciation of the applicable risks
    - verbalize/communicate the ability to make an alternate care plan
    - verbalize/communicate an understanding of how to self-isolate for 14 days

- Ensure you know how to direct the patient/SDM to contact their local public health unit.

- A signature is not required to release a patient from care however ensure that thorough documentation includes the following information:
    - Describe all aid to capacity assessments completed and who they refer to (i.e. patient or SDM),
    - Describe all actions taken with regards to the directive,
    - Describe all discussions had with the patient with regards to the directive
    - Describe the alternate care plan discussed with the patient/SDM including a plan to self-isolate for 14 days.

- Symptom management is specific to COVID-19 related symptoms. The patient should be able to complete activities of daily living at home by themselves, or with assistance from family. The patient should have the necessities of sustenance (food, water, warmth, shelter, etc.). Patients should be informed of the possible progression, sometimes rapid progression, of their specific illness or complaint, in addition to progression of respiratory symptoms related to COVID-19, and given information for contacting PH, primary care (if able), paramedics, or arranging transport to the ED if they are able. Please provide follow up instructions as per your Regional Base Hospital.

- *Definitions provided under the clinical considerations section may not be all inclusive*

Bronchoconstriction Medical Directive

Introduction

Bronchoconstriction is a condition in which the bronchial tubes that lead to the lungs swell or contract leading to constriction of the airways. Bronchoconstriction can be caused by various

etiologies including asthma and COPD. Symptoms of bronchoconstriction may include dyspnea, wheezing, coughing, and decreased air entry or silent chest.

Essentials

Paramedics should use caution when ventilating asthmatic patients. The increased ventilatory volume and air trapping can increase the intrathoracic pressure, leading to decreased venous return to the heart as well as disrupting normal lung functioning. To prevent possible complications from this, such as tension pneumothorax, atelectasis or hemodynamic compromise from impaired cardiac output, allow for a longer expiratory phase when ventilating an asthmatic patient.

For COPD or asthma patients in respiratory failure who have an initial $EtCO_2$ of >50 mmHg, attempt to maintain EtCO2 between 50-60 mmHg to prevent further respiratory compromise due to hypercapnia and to avoid worsening acidosis.
Dexamethasone, a corticosteroid, primarily reduces inflammation and suppresses immune responses by modulating glucocorticoid receptors.

In patients using anabolic steroids or undergoing hormone replacement therapy, the risks of administering dexamethasone are relatively low because corticosteroids like dexamethasone bind to the glucocorticoid receptor, not the androgen receptor that anabolic steroids target. Corticosteroids and anabolic steroids, though both termed "steroids," act through different mechanisms and have distinct effects on the body. In these situations, dexamethasone is a reasonable option for treatment.

Interventions

The initial treatment for bronchoconstriction will depend on the patient's underlying cause and severity and may include EPINEPHrine (asthmatics only), salbutamol and CPAP (COPD only). Salbutamol should be considered immediately following EPINEPHrine administration for asthmatics.

Dexamethasone is a glucocorticoid medication commonly used to relieve inflammation associated with asthma and COPD exacerbations and may be administered in conjunction with other treatments. Although dexamethasone has no immediate life-saving effects, it may reduce patient morbidity, ICU admissions, and intubation rates, and improve patient's long-term outcome.

Cardiac Ischemia

12 Lead Acquisition:

- Considering 12 lead acquisition and interpretation for STEMI is now a defined step in the treatment of cardiac ischemia and precedes Nitroglycerin consideration.

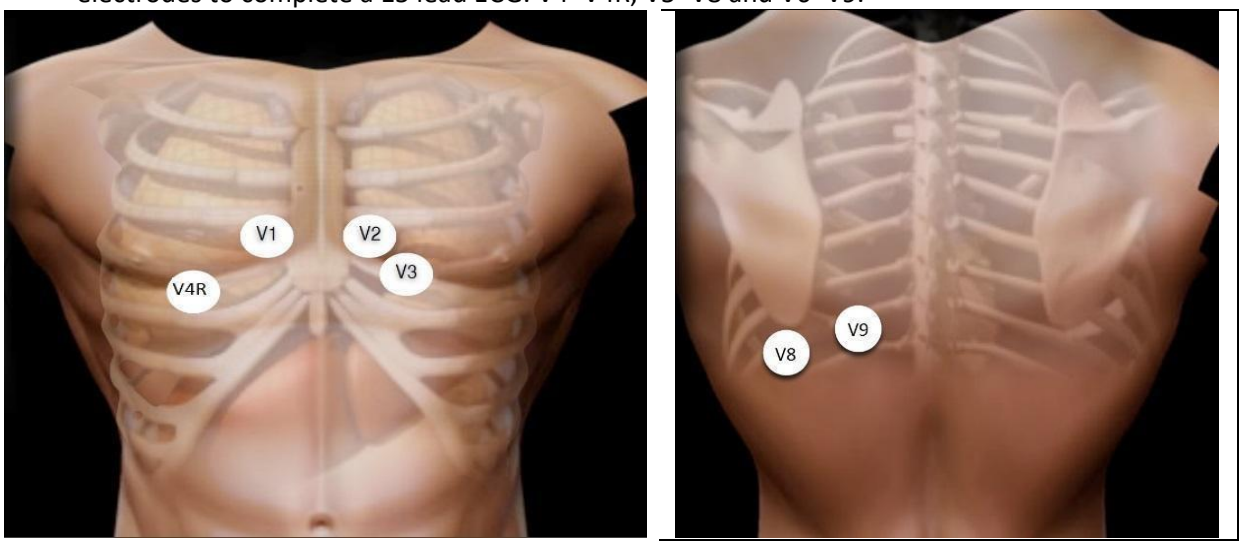
- While not specified, manual interpretation of the 12 lead is preferred over a computer generated interpretation.

- The recommendation that a 12 lead be performed within the first 10 minutes of patient contact is a goal.

- Understanding that not all situations allow for a 12 lead to be performed within the first 10 minutes of patient contact, the Paramedic should document barriers that did not allow for this goal to be achieved.

- In the event the 12 lead ECG identifies an Inferior STEMI, a minimum V4R must be completed to rule in or out a RVI when considering nitroglycerin. These patients are often preload dependent and the administration of nitroglycerin to these patients may cause significant hypotension.

- If performing a complete 15 lead ECG, the following image depicts the proper placement of electrodes to complete a 15 lead ECG. V4=V4R, V5=V8 and V6=V9.



- Once a STEMI has been identified there is no need to repeat the 12 lead ECG.

- If there is no evidence of STEMI, serial 12 lead ECGs would be recommended.

ASA Administration:

- ASA is a safe medication with a wide therapeutic index (the effective dose without side effects can be from 80 – 1500 mg). The additional dose provided by Paramedics will not exceed the therapeutic dose while ensuring the correct administration of correct dose of the medication. Therefore, apply the cardiac ischemia medical directive as if no care had been rendered prior to your arrival.

Nitroglycerin Administration:

- Conditions for nitroglycerin use are: “a prior history OR an established IV”. An IV must be initiated prior to the administration of nitroglycerin in first time suspected cardiac ischemia patients. If the patient already had an IV in place (i.e. outpatient), the IV would need to be

assessed for patency and once confirmed, would allow for first time administration. This will only apply to the PCP(s) with Autonomous IV Certification.

- Prior history is defined as previously authorized or prescribed to the patient for use by a certified Medical Doctor.

- Many patients who are at risk of having a cardiac event (MI) may also have a history of CHF and it can sometimes be difficult to determine what issue is driving the other. It is likely that the STEMI is causing, or exacerbating the CHF, and as such, following the Cardiac Ischemia Medical Directive and administering a maximum of 3 x 0.4mg doses of nitroglycerin is most appropriate. The reduced number of doses in STEMI reduces adverse outcomes associated with liberal nitroglycerin use. Also, a reminder that CPAP is appropriate for these patients should they meet the criteria outlined in the Continuous Positive Airway Pressure Medical Directive.

- Nitroglycerin is a symptom relief medication that has not demonstrated changes in a patient's morbidity or mortality and should be used with caution in patients presenting with tachycardia or with SBP close to 100 mmHg.

- Nitroglycerin may be administered for an isolated posterior STEMI.

STEMI Positive:

- In the setting of right ventricular STEMI (identified via V4R), no nitroglycerin is to be administered.

Phosphodiesterase Inhibitors:

- The use of these medications has diversified to include treatment of pulmonary hypertension and congestive heart failure (CHF).

- The most appropriate categorization is as phosphodiesterase (PDE) 5 inhibitors.

- Phosphodiesterase (PDE) 5 inhibitor list (many known as erectile dysfunction drugs [EDD]): Viagra, Levitra, Cialis, Revatio, Sildenafil, Tadalafil, Vardenafil, Udenafil and Avanafil, Lodenafil, Mirodenafil, Acetildenafil, Aildenafil, Benzamidenafil, Zaprinast and Icariin (a natural product). This may not be an exhaustive list and was current as of the date written.

- If myocardial ischemic symptoms/acute coronary syndromes resolve prior to the arrival of Paramedics, a decision to administer ASA will be made based on patient assessment and critical thinking.

- Morphine is only to be considered following the third dose of nitroglycerin (unless nitroglycerin is contraindicated) and where pain is severe.

- If a patient's vital signs fall outside the medical directive's parameters (i.e.: hypotension), the patient can no longer receive that medication (i.e.: nitroglycerin or morphine) even if the

patient's vital signs return to acceptable ranges, given risk for recurrent decompensation (i.e. hypotension).

Cardiogenic Shock

- Cardiogenic shock is normally defined as a state in which the heart has been damaged to such an extent that it is unable to supply enough blood to the organs, tissues and cells of the body leading to hypoperfusion and commonly hypotension.
- The directive specifies that fluid (if applicable) is to be used as a means to reverse hypotension prior to the administration of DOPamine. IO and CVAD have been added as routes for fluid administration.
- The clinical consideration: 'contact BHP if patient is bradycardic' is intended to allow the Paramedic to use his/her judgment.
- A contraindication to Dopamine administration is mechanical shock. Examples of mechanical shock include tension pneumothorax, pulmonary embolism, and cardiac tamponade.
- Notify the receiving hospital staff if the DOPamine drip goes interstitial as DOPamine can cause tissue necrosis which can be mitigated by a phentolamine injection at the hospital into the affected tissue

Central Venous Access Device Access (CVAD)

- While establishing a new peripheral IV line is preferred in the prehospital environment, central venous access devices (CVAD) offer additional parenteral routes of therapy administration should a routine IV be difficult or impossible to place and a patient has a CVAD in place.
- The patient must be critically ill to access a CVAD device. This requirement is due to the associated risks involved with CVAD access including contamination of the line requiring replacement.
- The steps for accessing a CVAD are very specific. Please refer to provided skill sheets.
- Access must be performed with meticulous consideration of maintaining sterility, as CVAD lines carry with them an increased risk of infection. Connectors must be cleaned thoroughly before access, including all the cracks and grooves.
- If unable to aspirate blood, re-clamp the lumen and attempt to use another if available. If clots are present during aspiration, do not proceed. Failure to properly aspirate can embolize microthrombi that can form around the distal tip of these catheters, bringing with them a risk of stroke, coronary event, pulmonary embolus or extremity thrombus.

- If a CVAD is accidentally dislodged, place firm pressure on the insertion site for at least 10 minutes with several sterile 4x4 gauze squares or a trauma dressing to control bleeding.

- The following are some examples of CVAD devices (not an exhaustive list):
    - Hickman: Central catheter inserted through the anterior chest wall.
    - Peripherally Inserted Central Catheter (PICC): Located on the patient's upper arm, but is still direct to central circulation.

Combative Patient Medical Directive

- Patients who require a volume greater than 5 ml will require two separate injections in different limbs to achieve a desired dose. Separate injections to achieve a single dose should be administered within the closest, safest timeframe as possible to each other. The vastus lateralis muscle can accommodate up to 5 ml per injection per leg.

- Paramedics should consider establishing IV access once the patient is sedated.

- When using emergent high dose sedation, patients are at risk of cardiovascular collapse and respiratory arrest, which necessitates full cardiorespitatory monitoring $ETCO_2$.

- The dosing range of midazolam enables the paramedic to use their clinical judgment to determine an appropriate dose. The patient's physical size is not always the best determinant of required dose.

Continuous Positive Airway Pressure (CPAP) Medical Directive

This is for the treatment of severe respiratory distress AND acute pulmonary edema (regardless of origin) or COPD.

- CPAP should be considered as additive therapy to the bronchoconstriction (specifically COPD exacerbation) or acute cardiogenic pulmonary edema medical directives, not a replacement.

- CPAP may be interrupted momentarily to administer nitroglycerin (salbutamol can be administered via MDI port).

Cricothyrotomy Medical Directive

- This is a last resort option for airway management. Cricothyrotomy should only be considered if the Paramedic cannot ventilate with the BVM and is unable to intubate or place a supraglottic airway.

- The frequency of complete airway obstructions that cannot be relieved is very low and therefore the frequency of use of this medical directive application is equally low. Frequent practice and review is necessary.

Croup Medical Directive

- For severe presentations, EPINEPHrine should be your priority treatment. Dexamethasone can be considered. For mild to moderate presentation, only dexamethasone should be considered.

- Prior to initiating nebulized EPINEPHrine, moist/cold air may be attempted if available and patient's condition permits.

- Croup is occurring more and more frequently in older patients including adults, and if the indications are met, a patch to a BHP would be required to consider treatment under this medical directive.

- When treating with dexamethasone, the contraindication to steroids only applies to systemic steroids (PO, parenteral) and not inhaled or topical steroids. Inhaled steroids are very specific to lung tissue and do not contribute to systemic absorption.

- If a patient has received systemic steroids in the past 48 hours, an additional dose is unlikely to improve their condition due to its long half-life.

Emergency Childbirth

The Condition of "Age - Childbearing years" for Delivery, Umbilical Cord Management and External Uterine Massage refers to the approximate ages of 14 – 50 years.

*Par*amedics are not authorized to perform internal vaginal exams to determine cervical dilation.

- Paramedics should consider inspection of the perineum in the following situations to determine whether signs of imminent birth are present:

    - History is suggestive of ruptured membranes or umbilical cord prolapse.

    - The patient is in labor and reports an urge to push, bear down, strain or move the bowels with contractions or reports that "the baby is coming".

- The patient is near term, level of consciousness is decreased and history is unavailable, inconclusive or indicates that labor was on-going prior to decrease in/loss of consciousness.

- Vaginal bleeding is heavy and the patient is hypotensive or in shock.

Signs of second stage labor include:

- Contractions every two to three minutes, lasting 60-90 seconds;
  - Contractions associated with maternal urge to push or to move the bowels;
  - Heavy red show visible at the vaginal opening; or
  - Presenting part or bulging membranes visible at vaginal opening and / or perineum bulging with contraction.

Signs of imminent birth:

- Crowning or other presenting part is visible or;
  - In primips, presenting part is visible during and between contractions, maternal urge to push or bear down, and contractions are less than two (2) minutes apart, or;
  - In multips, contractions five minutes apart or less and any other signs of second stage labor present.

Complicated Delivery includes:

Shoulder dystocia - An inability of the fetal shoulders to deliver spontaneously

- Paramedics should suspect shoulder dystocia if the fetus's body does not emerge with the contraction following the delivery of head. It is important not to direct the patient to push if a contraction is not present to allow restitution of the head. The presence of 'turtling' or the 'turtle sign' (the fetal head, often quite purple, retracting firmly against the perineum following the contraction) is an indication to attempt the McRoberts Manoeuvre.

  - Paramedics should attempt the McRoberts Manoeuvre and apply suprapubic pressure.

    1. With the patient lying flat, flex the maternal thighs onto the abdomen (squatting position); this is achieved by one person grasping a leg and assisting with hyperflexion of the maternal thighs against the abdomen.
    2. If a second Paramedic is available, have him/her place their hand slightly above and just behind the maternal symphysis pubis and exert steady firm downward pressure with the heel of the hand.

  If delivery is not achieved, Paramedics should attempt the Gaskin Manoeuvre (position change to hands-and-knees):

- Attempt to deliver the posterior shoulder.

Breech Delivery – The delivery of a fetus with the buttocks or feet presenting first.

- In the presence of a breech presentation, Paramedics should remain relatively "hands off" the fetus until it has delivered to the umbilicus to avoid stimulating premature respiration.

- Allow the head to deliver spontaneously, or gently lift and hold the neonate upwards and backwards while avoiding hyperextension.

- Attempt the "Mauriceau – Smellie – Veit Manoeuvre" if the head does not deliver within three minutes of the body:

    - Lay the neonate along one forearm with palm supporting the neonate's chest and the two fingers exerting gentle pressure on the neonate's face to increase flexion.

    - Place other hand on the neonate's back and with two fingers hooked over the shoulders and the middle finger pushing up on the occiput to aid flexion.

    - When the hairline becomes visible, lift the body in an arc to assist the fetal head to pivot around the symphysis pubis and allow the face to be born slowly.

    - If a second Paramedic is available, have him/her apply suprapubic pressure.

Nuchal or Prolapsed Cord

- If a cord prolapse is present, place the patient in a knee-chest position or Exaggerated Sims Position. Gently cradle cord in hand and replace cord in vagina while inserting fingers/hand into vagina to apply manual digital pressure to the presenting part. Elevate the presenting fetal part off the cord and maintain manual elevation until transfer of care.

    Exaggerated Sims Position:

    - The patient lies in left lateral position with left arm lying along the back and the right knee drawn towards the chest.
    - Place a pillow/wedge under the left hip/buttocks to raise the pelvis and use gravity to move fetus toward the fundus.
    - Exaggerated Sims Position is preferred for safe transport, however, the knee chest position is more effective at elevating the presenting part of the cord in the presence of strong uterine contractions.

- If a nuchal cord is present, the cord should be slipped over the neonate's head or over the shoulders. If the nuchal cord cannot be relieved by manual means, it should be clamped and cut while the neonate is still on the perineum.

- Lack of progression of labor refers to situations where there are signs of imminent birth but there has been no further progression of delivery. Paramedics should discourage the patient from pushing or bearing down during contractions and initiate transport.

- Once the newborn is delivered, the cord should immediately be clamped and cut only if multiple gestation is suspected, neonatal or maternal resuscitation is required or due to transport considerations (after approximately three minutes; once cord pulsations have ceased).

  Clamp the umbilical cord in two places using the OBS clamps:

  - Approximately 15 cm from the neonate's abdomen and approximately 5-7 cm from the first clamp.
  - Cut the umbilical cord between the clamps using the OBS scissors

- External uterine massage should be performed only when the placenta has been delivered and there is presence of excessive bleeding. External uterine massage should continue until bleeding stops. Do not pack the vagina to control bleeding.

- In the circumstance where the Paramedic is unable to control excessive bleeding, external bimanual compression should be performed. External bimanual compression can be performed regardless of if the placenta is delivered or not.

- Oxytocin has been added for administration immediately after delivery of all fetuses and/or placenta and up to 4 hours post-placenta delivery. The addition of oxytocin has potential to dramatically affect maternal morbidity and mortality in a high acuity low occurrence event (massive post-partum hemorrhage). Oxytocin is an ideal agent with evidence supported and endorsed globally by the World Health Organization for the management and care of post-partum hemorrhage.

- There is some evidence indicating that oxytocin can induce vasoconstriction, therefore exacerbating hypertension.

Endotracheal and Tracheostomy Suctioning & Reinsertion

- Insert the catheter and apply suction (10 seconds or less) while gently twisting and withdrawing the catheter.

- To minimize hypoxia and possible trauma, do not suction more frequently than once per minute.

- Exceeding the recommended suction pressures or maximum number can cause injury and swelling to the mucosal tissues of the airway and increases the risk of arrhythmia.

- If all suctioning attempts have been made to clear the tracheostomy and the Paramedic is unable to oxygenate/ventilate using positive pressure ventilation (PPV), the tracheostomy is to be considered a foreign body airway obstruction (FBAO). In an attempt to relieve the FBAO, remove the tracheostomy to gain access to the stoma for oxygenation/PPV.

- In the event that the tracheostomy tube or inner cannula has been withdrawn and the patient is in respiratory distress consider utilizing a family member or caregiver who is on scene and knowledgeable to replace the tracheostomy tube or inner cannula. The rationale for this consideration is the expectation that they will be more experienced and comfortable with the act of replacing the tracheostomy tube or inner cannula.

- If there is no family member/caregiver available who is knowledgeable in replacing the tracheostomy tube or inner cannula consider proceeding with the tracheostomy/cannula reinsertion. If available, prepare a new tracheostomy tube or inner cannula for reinsertion. If a new tracheostomy tube or inner cannula is not available, remove the inner cannula (if not already done), deflate the cuff, if present, and clean the current tracheostomy tube or inner cannula with a saline or water rinse.

- To optimize the insertion of the tracheostomy tube, optimal patient positioning is a 30-90 degree sitting position.

- Insert the obturator into the outer cannula and lubricate the end of the tracheostomy tube with water based lubricant or saline to prevent tissue damage.

- In the absence of an obturator, paramedics are still able to insert the outer cannula, but are advised to be cautious because the outer cannula may damage soft tissue of the trachea.

- The tracheostomy tube or inner cannula should be inserted during the inhalation phase.

- If a patient requires assisted ventilations, and there is no appropriate inner cannula available with a 15 mm adaptor, paramedics are recommended to utilize an appropriate sized mask attached to a BVM to provide ventilation through the outer cannula ensuring an adequate seal.

- In situations where a reinsertion fails, paramedics should occlude the stoma and attempt standard oral airway maneuvers and ventilation through the mouth and nose. Attempts to ventilate through the mouth and nose with the stoma occluded may not work depending on the reason the patient has a tracheostomy.

- In situations where occlusion of the stoma and attempts to ventilate the patient through the mouth and nose is unsuccessful or impossible (Laryngectomy), paramedics should utilize an appropriate sized mask that can provide a seal around the stoma attached to a BVM to provide ventilation through the stoma ensuring an adequate seal.

Headache

- The patient cannot have taken acetaminophen within the last 4 hours to receive it from the Paramedic

Home Dialysis Emergency Disconnect

- While there are several variations of dialysis machines/tubing, the best practice is to disconnect the patient by using the materials and instructions that are typically found in the disconnect kit.

- In the event instructions are not available, the tubing should be clamped first on the patient side, secondly on the machine side, and finally separated in the middle.

Hyperkalemia

Recognition of hyperkalemia can be improved by considering:

- Patients most at risk:
    - Patients unable to excrete potassium, for example the chronic kidney disease patient on dialysis that may have missed treatment(s),
    - Conditions that may precipitate extracellular potassium shift such as crush syndrome, acid-base disturbances, prolonged status seizures, major burns or prolonged immobilization.

- Signs and symptoms:
    - CNS: muscle twitches, cramps or paresthesia.
    - GI: abdominal cramps, diarrhea or nausea/vomiting.
    - CVS: progression to hypotension, decreased LOA, bradycardia or ECG changes.
- ECG changes consistent with severe hyperkalemia:
    - Peaked T-waves, flattened P-waves, lengthened PR interval or widened QRS.
    - Progressive widening of QRS or bizarre QRS morphology such as sine-wave appearance.
    - Not all severe hyperkalemia manifests with all possible ECG changes. Consider the overall patient condition and risk factors and include these findings in your patch to the BHP.

Prehospital Goals in Hyperkalemia Treatment are focused on:

- Electrophysiological effects of excessive extracellular potassium on myocardium. Calcium Gluconate stabilizes cardiac cell membranes and may prevent life-threatening dysrhythmias. In circumstances of severe hyperkalemia such as cardiac arrest, multiple administrations may be indicated. In the unstable hyperkalemia patient, calcium Gluconate should always be the priority

treatment. Routine treatments common in medical cardiac arrest management may not respond until calcium is administered

- Redistribution of extracellular potassium into the cells. Salbutamol in large doses may temporarily enhance potassium cellular uptake.

Considerations:

- Sodium bicarbonate is not a very effective agent for hyperkalemia and it should not be routinely administered. This would be a patch point for discussion with a BHP.

Safety Consideration

- Ensure the IV line is patent and flowing well as calcium gluconate may cause necrosis if it extravasates.

- In the treatments, 12 lead acquisition and interpretation is listed both before and after treatment with calcium gluconate and salbutamol. This is intentional to measure ECG changes. This is only applicable to the patient NOT in cardiac arrest.

Hypoglycemia

Blood glucometry is performed using the Paramedic's supplied device.

Capillary Blood Sample Sites:

- Finger tips and the heel of the foot (pediatric patients who have not begun to walk).

- Samples cannot be obtained from the flash chamber of an IV catheter. Not only is the practice inherently unsafe, but it involves manipulating a medical device for purposes that it is not intended for and the blood sample obtained is not a capillary sample.

- It is recommended that the max single dose of D10W OR D50W for your hypoglycemic patient be administered gradually over 3 minutes, with a discontinuation in the event your patient attains a level of consciousness where they can safely consume carbohydrates. The goal is to avoid over treatment since this can result in rebound hyperglycemia.

- Premixed D10W should be run as a piggyback onto an existing IV line to ensure accurate dose administration.

- If Glucagon was initially administered with no patient improvement and an IV is subsequently established (if certified and authorized); perform a second glucometry and if the patient remains hypoglycemic administer dextrose regardless of the elapsed time since glucagon administration.

Preparation of 10% Solution:

- Waste 40 ml of the preload and replace the 40 ml with sterile water or saline. This will create a 5 g/50 ml solution. Administer 0.2 g/kg for the gram dose or 2 ml/kg for fluid volume and administer no more than 50 ml.

- When considering providing oral carbohydrates, the 15-15 rule can be used to treat hypoglycemia in patients who are able to safely ingest carbohydrates. The patient is to ingest 15 grams of simple carbohydrates followed by a repeat glucose check in 15 minutes, which allows time for the glucose to enter the bloodstream and raise the blood glucose. If the blood sugar remains low after 15 minutes, the process can be repeated. By utilizing the 15-15 rule, ingesting only 15 grams of simple carbohydrates helps to prevent rebound hyperglycemia from occurring after eating a large quantity of food. In most patients, 15 grams of carbohydrates is enough glucose to raise blood glucose by 2.1 mmol/L in approximately 20 minutes.

  Examples of 15 grams of simple carbohydrates include:
  - 15 grams of glucose tabs, paste, or other formulation.
  - 15 ml of water with 3 sugar packets dissolved.
  - 150 ml of juice or regular soft drink
  - 15 ml of honey

Intravenous and Fluid Therapy

- The contraindication of a suspected fracture may not seem obvious, but a lack of integrity in a bone may jeopardize the integrity of the associated vascular structures and may result in extravasation.

- Pulmonary edema is a sign of fluid overload secondary to a fluid bolus. As such, frequent chest assessments are required.

- The treatment line specifies “consider IV cannulation”. This may encompass upper and lower extremity veins depending on your Base Hospital’s authorization.

- The Indications for the Intravenous and Fluid Therapy Medical Directive state; “Actual or potential need for intravenous medication OR fluid therapy”. These indications apply to not only prehospital use of the intravenous but also for some in-hospital use. If the patient meets the criteria of the Paramedic Prompt Card for Acute Stroke Protocol or the STEMI Hospital Bypass Protocol Prompt Card, then paramedics may consider the initiation of an intravenous. The initiation of an intravenous for these purposes should never delay transport and should only be attempted en route. Some hospital partners may prefer specific gauge needles and access sites. If available, refer to your local base hospital direction for this specific information.

Mandatory Patch Point:

- Is required before administering a fluid bolus to a patient <12 years old, who is hypotensive and suspected of being in ketoacidosis. A patch is required so that the physician can carefully control the volume of fluid administered to prevent cerebral edema.

Cariogenic Shock and ROSC:

- The maximum volume of NaCl is lower for patients in cardiogenic shock or with ROSC. The maximum volume in those settings is 10 ml/kg or 1,000 ml.

- Formulas for pediatric normotension and hypotension are to be used until the calculation meets or exceeds the adult definitions at which point the adult values are to be used. For example, at 6 years of age, the pediatric calculation for normotension results in 102 mmHg; therefore, use the adult value of 100 mmHg.

- Hypotension in pediatric patients (up to 10 years old) is based on the formula: SBP = 70 + (2 x age).

- The references to macro, mini, and buretrol drip sets have been removed. Although the choice of drip sets has been left to service operators based on local requirements and RBH insight, some form of rate control must be utilized for patients less than 12 years of age to prevent accidental fluid overload.

- External jugular access, while not stated in the directives, remains in the ACP scope of practice and is typically reserved for cardiac arrest.

- Prior to initiating a fluid bolus, two blood pressures (of which one must be manually obtained) indicating hypotension are expected.

- Once a bolus has been initiated, a minimum volume of 100 ml in pediatrics and 250 ml in adults may be administered prior to discontinuing the fluid bolus should the patient become normotensive.

Lateral Patellar Dislocation

Introduction

Patellar dislocations are more common in younger age groups. The highest incidence of patellar dislocations occurs in the 12 to 20-year-old age group, with 75% of all first-time patellar dislocations occurring in patients under 25. The musculature that supports the patella is usually unbalanced before the age of 20 creating susceptibility to the injury.

Lateral patellar dislocations are usually the result of plant and twist, non-contact, injuries. The powerful contraction of the quadriceps occurring in combination with the sudden flexion and external rotation of the tibia on the femur, causes a patellar dislocation.

Essentials

High-velocity trauma typically involves significant forces exerted on the body, often resulting from motor vehicle accidents, falls from height, or high-speed athletic injuries such as. Direct knee trauma refers to injuries sustained directly to the knee joint, causing damage to its structures. These incidents can lead to severe injuries, including knee dislocations, quadriceps tendon ruptures, and patella fractures.

A thorough assessment of the mechanism of injury and clinical findings is essential to distinguish between a lateral patella dislocation and more serious knee injuries.

If paramedics suspect, based on the mechanism of injury or clinical findings, that the presenting injury is not an isolated lateral patella dislocation, do not attempt patellar reduction.

Interventions

Patellar reduction is a relatively quick procedure to perform. While analgesia can be considered pre-reduction, often performing the reduction will reduce the patient's pain score by about 5 points.

If the first attempt is unsuccessful, consider using analgesia, coaching the patient to relax their quadriceps, and adapt a two-person approach to the patella reduction.

Post-reduction pain analgesia should be considered

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- **PMC (PubMed Central)**: "A Review of Knee Dislocations." *PubMed Central (PMC)*, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC. Accessed 17 July 2024.
- **YouTube**: "Procedure Demonstration." *YouTube*, uploaded by PEMblog, https://youtu.be/57dGvS4JL4k. Accessed 17 July 2024.

Medical Cardiac Arrest Medical Directive

- The initial rhythm interpretation/analysis and defibrillation should be performed as soon as possible. Following the initial rhythm interpretation/analysis, additional rhythm interpretations/analyses should occur at two (2) minute intervals with a focus on the delivery of high quality chest compressions.

- The energy settings used for defibrillation typically follow specific manufacturer guidelines and are supported by each respective RBH program.

- As a general rule, Paramedics do NOT count pre-arrival interventions into their patient care. Care delivered prior to arrival can be "considered" and documented. However, in the setting of cardiac arrest where a medical TOR might apply, the Paramedics should complete a full 20 minutes of resuscitation. Consider patching early if there are extenuating circumstances.

- Compressions during the charge cycle should be considered to minimize the peri-shock pause.

- When en-route and using semi-automated rhythm analysis, the ambulance must be stopped to minimize artifact and the risk of an inaccurate rhythm interpretation/analysis.

    - For a witnessed arrest in the back of the ambulance paramedics can decide whether to stay and perform three full analysis and then proceed/patch or to provide one analysis and go.
    - The paramedic should provide at minimum one analysis. Factors that are part of the decision process include distance to closest hospital, probable cause of arrest, ability to provide adequate CPR/ventilation, shockable vs non-shockable etc.

Supraglottic Airways (SGA):

- The sequence listed for the advanced airways is deliberate, and based on:

    1. The reduced importance placed on the airway as outlined in the 2015 AHA guidelines,
    2. The ease of supraglottic airway insertion vs. the complexity and risks of intubation,
    3. The emphasis placed on minimally interrupted compressions.

    and does not preclude the ACP from placing an Endotracheal Tube (ETT) when there is airway compromise or in a prolonged resuscitation. Intubation should normally not require compressions to be stopped or altered as any pause in compressions can lead to a poor outcome.

- Once the ETT or supraglottic airway is placed, compressions should be continuous and ventilations provided asynchronously at a rate of 10 breaths/minute (one [1] every six [6] seconds) for adults, and at a rate of twenty (20) breaths/minute (one [1] every three [3] seconds) for child and infants.

Medication and Fluid Administration:

- If the timing were to fall such that EPINEPHrine and an antiarrhythmic were to be administered within the same CPR cycle, proceed, ensuring to provide a saline flush between the two medications. The IV and IO (and CVAD) routes of administration are preferred over ETT. ETT may be utilized if the preferred routes are delayed by more than 5 minutes.

- Fluid bolus may be indicated for patients in PEA to provide preload and possibly enough circulation to support vital functions. If hypovolemia is suspected, a bolus is also indicated.

Mandatory Patch Point:

- ACPs will patch following 20 minutes of resuscitation if considering the medical TOR. The intention of this patch point is to receive advice as to whether transport, terminate resuscitation or to follow additional orders.

Early Transport Considerations:

- The medical directive defines some specific clinical considerations for early transport after a minimum of one analysis (and defibrillation if indicated) once an egress plan is organized. To expand on the consideration of other known reversible cause of arrest not addressed could be:

    - Hypovolemia
    - Hydrogen ion (acidosis)
    - Hyper/Hypokalemia
    - Toxins
    - Tension Pneumothorax
    - Thrombosis (pulmonary & coronary)
    - Tamponade (cardiac)

Re-Arrest:

- In the event a return of spontaneous circulation (ROSC) is achieved and the patient re-arrests en-route, Paramedics utilizing semi-automated defibrillators will adhere to the following sequence:

    1. Pull over,
    2. Initiate one immediate rhythm interpretation,
    3. Treat the rhythm appropriately AND,
    4. Continue with transportation to the receiving facility with no further stops.

Blood Glucometry:

- Glucometry in the vital signs absent (VSA) patient is of no clinical value and is not indicated.

Anaphylactic Cardiac Arrest:

- A single dose of IM EPINEPHrine 1:1,000 (1 mg/ml) is indicated if the Paramedic believes the arrest is directly related to the anaphylactic reaction. This patient then continues to be treated under the medical arrest directive and may be transported early as specified in the primary clinical consideration. An IM dose of EPINEPHrine for anaphylaxis does not alter the sequence and timing of IV administered EPINEPHrine and should not delay defibrillation.

Asthmatic Cardiac Arrest:

- While there is provision for treatment with EPINEPHrine 1:1,000 (1 mg/ml) in the anaphylactic arrest, there is no similar recommendation in the asthmatic cardiac arrest. It may be difficult to deliver salbutamol effectively in cardiac arrests, so the focus is placed on effective ventilation and oxygenation.

Electrocution:

- The Paramedic must use judgment in this setting. A simple electrocution is a medical cardiac arrest that should respond well to defibrillation. In the event the electrocution is associated with significant trauma, it should be treated as a trauma cardiac arrest.

Pulse Checks:

- Following the initial pulse check, subsequent pulse checks are indicated when a rhythm interpretation/analysis reveals a non-shockable rhythm (PEA or Asystole), or there are signs of life present.

Commotio Cordis and Hangings:

- Should be treated as medical cardiac arrests (unless life threatening trauma is noted).

ACP vs. PCP Care Plan:

- An ACP crew will not defer patient care decisions when a PCP crew is on-scene with a potential TOR. Once an ACP arrives on scene; the ACP shall assume patient care.

Minor Abrasions Medical Directive

- Topical antibiotic ointment is left generic to allow for service provider specifications in consultation with the BHP

Minor Allergic Reaction Medical Directive

- Signs and symptoms MUST be consistent with a mild allergic reaction.

Moderate to Severe Allergic Reaction Medical Directive

Introduction

An allergic reaction is defined as an inappropriate response of the immune system to a normally harmless substance. The immune response can vary from a mild reaction, with symptoms that are generally localized, such as urticaria or itchy skin; to a more severe response, which can include shortness of breath, facial edema, vomiting, diarrhea, and hypotension[2].

Anaphylaxis is a life-threatening allergic reaction caused by systemic release of inflammatory mediators that produces widespread capillary permeability, vasodilation and smooth muscle contractility. This reaction typically manifests in multiple body systems, however, there are instances where a single system is primarily and severely affected. For example, hypotension may be the only manifestation of anaphylaxis.

Essentials

In patients experiencing anaphylaxis, the onset of symptoms and respiratory or cardiac arrest can occur within five (5) minutes[1]. EPINEPHrine should be administered as soon as anaphylaxis is recognized to prevent the progression of symptoms. Any delays in the administration of EPINEPHrine are associated with greater mortality[1].

Patients with a previous history of anaphylaxis and those presenting with flushing, diaphoresis, or dyspnea are more likely to require multiple doses of EPINEPHrine to control symptoms[2].

Paramedics need to be aware of patients presenting with biphasic anaphylaxis. Biphasic reactions are characterized by an initial reaction that meets criteria for anaphylaxis, followed by an asymptomatic period, and then a subsequent return of symptoms meeting the criteria for anaphylaxis without further exposure to the antigen[3]. Biphasic reactions have been reported with an array of allergens, including ingested, injected, and intravenously administered substances, as well as in idiopathic anaphylaxis. The time period between the resolution of the first reaction and the start of the second can range from 1 hour to up to 48 hours[3].

H1 antihistamines, such as diphenhydrAMINE, relieve minor symptoms associated with localized allergic reactions. These medications do not relieve upper or lower airway edema, hypotension, or shock caused by systemic anaphylaxis[1]. Therefore, diphenhydrAMINE should not be used in the place of EPINEPHrine .

For the treatment of bronchospasm not responsive to EPINEPHrine, inhaled bronchodilators, such as salbutamol, should be administered. Bronchodilators are adjunctive treatments to EPINEPHrine because they do not prevent or relieve mucosal edema in the upper airway, for which the alpha-1-adrenergic effects of EPINEPHrine are required[1].

Interventions

The anterolateral mid-thigh is the preferred site for intramuscular EPINEPHrine administration due to improved absorption.

In some situations, patients may remain severely hypotensive after the administration of EPINEPHrine and should be treated according to the Intravenous and Fluid Therapy Medical Directive.

In the prehospital setting, patients experiencing anaphylaxis should not be considered for dexamethasone. There is little evidence that it improves patient outcomes[1]. In the emergency

department, other steroids may be administered to treat or prevent rebound anaphylaxis, however dexamethasone is not the steroid of choice.

Medical App References

<table>
<tr><th colspan="2">Diagnosis based on detailed history and recognition of presenting signs and symptoms post possible exposure to a possible allergen</th></tr>
<tr><td colspan="2">Body System Involvement
· Integumentary (skin): hives, itching, flushing, swelling, angioedema
· Cardiovascular: tachycardia, hypotension, syncope, decreased LOC, hypoxemia
· Respiratory: dyspnea, wheezing, cough, stridor
· Gastro-intestinal: cramping, nausea, vomiting, diarrhea</td></tr>
<tr><th>Localized Allergic Reaction</th><th>Anaphylactic Reaction</th></tr>
<tr><td>• Minor to moderate allergic reaction</td><td>• Moderate to severe allergic reaction</td></tr>
<tr><td>Localized reaction</td><td>Systemic reaction</td></tr>
<tr><td>Degranulation of localized mediators</td><td>Degranulation of systemic mediators</td></tr>
<tr><td>Involves one local area to one body organ system
Severe symptoms to a single body system (ex. Respiratory system) should be considered as a severe allergic reaction</td><td>Usually involves symptoms in more than one body organ system, with symptoms presenting as per the above post-exposure</td></tr>
<tr><td>Degranulation of localized chemical mediators</td><td>Degranulation of systemic chemical mediators</td></tr>
</table>

	Some patients may present with a biphasic reaction within 72 hours of the initial symptoms having resolved without further exposure to an allergen
	Consider the following groups of high-risk patients: · Very young and very old · Hx asthma · Hx cardiovascular disease · Hx mast cell disease
Primary treatment: · diphenhydrAMINE (slow onset) relieves symptoms (itching, flushing, urticarial, angioedema, eye and nasal symptoms) and does NOT prevent or relieve upper airway obstruction, hypotension, or shock.	**Primary treatment:** · EPINEPHrine 1:1000 (fast onset) – will increase blood pressure, prevent and relieve hypotension, decrease upper airway obstruction, decrease wheezing, decrease urticaria and angioedema **Secondary treatment:** · diphenhydrAMINE · PRN IV Fluid · PRN salbutamol

References

1. Campbell, R., Kelso, J., et al., (2023). Anaphylaxis: Emergency Treatment. Retrieved from online from UpToDate: https://www.uptodate.com/contents/anaphylaxis-emergency-treatment
2. Fernandez, James., (2022). Overview of Allergic Reactions. Retrieved from online from Merck Manuals: https://www.merckmanuals.com/en-ca/home/immune-disorders/allergic-reactions-and-other-hypersensitivity-disorders/overview-of-allergic-reactions
3. Lieberman, P. L., Kelso, J. M., & Feldweg, A. M. (2023). Biphasic and protracted anaphylaxis. In T. UpToDate (Ed.), UpToDate. Retrieved from [https://www.uptodate.com/contents/biphasic-and-protracted-anaphylaxis?search=bimodal%20anaphylaxis&topicRef=392&source=see_link#H7]
4. Golden, David B.K., et al. "Anaphylaxis: A 2023 Practice Parameter Update." Annals of Allergy, Asthma & Immunology, vol. 132, no. 2, 2024, pp. 124-176. ScienceDirect, https://doi.org/10.1016/j.anai.2023.09.015. Published December 17, 2023.

Medical App References

- OBHG Skill Sheet Medication Administration IM
- OBHG Skill Sheet Medication Administration IV
- OBHG Skill Sheet IV Cannulation
- Drug Monograph(s)

Musculoskeletal Pain Medical Directive

- The patient cannot have taken acetaminophen within the last 4 hours to receive it from the Paramedic.

Nasotracheal intubation

- Topical Lidocaine dosing has been updated: A single spray is 10 mg, and the maximum body dose is 5 mg/kg which includes Lidocaine administered by any route (IV and topical).

- NTI confirmation has been updated and now requires ETCO2 waveform capnography as the only primary method. It is the most reliable method to monitor placement of an advanced airway (AHA guidelines 2015, Part 7). In the event it is not available, two (2) secondary methods must be used; for example: colormetric detector that changes color with exposure to CO2.

- Definition of intubation attempt: Insertion into a nare is considered one attempt and should be documented as such including success or failure.

- The number of attempts is clearly defined as two (2) intubation attempts per patient regardless of the route chosen.

Nausea / Vomiting

- While the indications list nausea or vomiting, patients presenting with these symptoms do not necessarily require treatment.

- Overdose on antihistamines, anticholinergics or TCAs are contraindications for the administration of dimenhyDRINATE. For a comprehensive list of these medications, please refer to the most current CPS or contact your RBH.

- If dimenhyDRINATE is administered via the IV route, it must be diluted as per the medical directive with saline to facilitate a slower and less painful administration. Based on a supply of

50 mg in 1 ml, either dilution method of 5 mg/ml (diluted with 9 ml of NaCl) or 10 mg/ml (diluted with 4 ml of NaCl) is acceptable.

- The addition of ondansetron allows the Paramedics to use their clinical judgment in their selection of medication based on the suspected underlying cause of nausea or vomiting.

dimenhyDRINATE	ondansetron
• Motion sickness or vertigo. • Upset stomach due to food ingestion. • Best for people on SSRIS. • Hyperemesis for a pregnant patient. *Avoid with head injuries as it can cause increased ICP*	• Cause from drug interactions – i.e. Chemotherapy, Alcohol, Cannabis, Illicit Drugs. • Head Trauma (less risk of ICP) • Taking DiphenhydrAMINE, anticholinergics or tricyclic antidepressants (TCAs). • Elderly patients.

- If a patient has received dimenHYDRINATE and has no relief of their nausea & vomiting symptoms after 30 minutes, ondansetron may be considered if the patient meets the conditions and has no contraindications.

- The rationale for the contraindication of dimenhyDRINATE being co-administered with diphenhydrAMINE is that the combined effect can lead to anticholinergic side effects, and over-sedation.

- The rationale for the contraindication of apomorphine use with ondansetron is that it may precipitate profound hypotension.

- dimenhyDRINATE has negative effects of somnolence and confusion, especially in the elderly. For further information on dangerous medications for the elderly population, reference ISMP "Beers List": https://www.ismp-canada.org/beers_list/#l=tab2

Newborn Resuscitation Medical Directive

Introduction

While the vast majority of live births are uneventful for both the birthing patient and the newborn, approximately 10% of newborns require some assistance to begin breathing following delivery, and less than 1% require extensive resuscitation to restore cardiorespiratory function. The primary goal of neonatal care at birth is to facilitate the transition from the uterus to the external environment. The most important priority for newborn survival is the establishment of adequate lung inflation and ventilation after birth.

Essentials

While drying, positioning and stimulating are applicable for all newborns, this medical directive is only applicable to patients under <24hrs of age. Prevention of hypothermia is an important focus for newborn resuscitation. Inflation and ventilation of the lungs are the priority in newly born infants who need support after birth.

Ensure cardiac monitoring is initiated to accurately determine heart rate. Cardiac monitoring provides the most rapid and accurate measurement of the newborn's heart rate at birth and during resuscitation. In the event that cardiac monitoring is delayed, clinical assessment of heart rate can also be completed by auscultation, palpation of brachial pulse, or measurement from an oxygen saturation probe on the newborn's right hand.

Oxygen titration is considered best practice to mitigate the risk of tissue damage caused by over-oxygenation. However, in the prehospital setting, paramedics only have the ability to administer either 100% oxygen or room air during positive pressure ventilation and therefore cannot titrate oxygen flow.

An oxygen saturation chart is in the medical directive as a guideline. These values are ideal targets of the pre-ductal SpO2 using a probe attached to the right hand and can take more than 10 minutes to become normal. If the SpO2 levels are below the expected range, consider continuing 100% oxygen. If the SpO2 levels are above the expected range, PPV should be provided with room air.

Interventions

Routine suctioning of the airway is not required, even when meconium is present, if the newborn is breathing effectively. As newborns are obligate nose breathers, suctioning the mouth and pharynx before the nose may be required if the newborn has poor muscle tone, isn't breathing/crying, and meconium is present.

If ventilations are ineffective consider trying 'MR SOPA' before moving to more invasive airway management:

Mask seal - Adjust mask or size to ensure good seal
Reposition airway to "sniffing" position
Suction mouth and nose of secretions if necessary
Open mouth using manual manoeuvres
Positive pressure - increase the positive pressure to achieve adequate chest rise
Alternate Airway if available (ex. SGA, ETT, etc.)

In the patient that is <24 hours, begin by stimulating while assessing respirations and heart rate; then proceed with resuscitative efforts in accordance with the current Heart and Stroke Foundation of Canada Guidelines and the Cardiac Arrest Standard in the BLS PCS.

The concentration and dosing of EPINEPHrine is very specific to this medical directive. ONLY the 1:10,000 (0.1 mg/ml) solution is used during newborn resuscitation, regardless of route of administration. Unlike the adult, the dose administered via the ETT route is 10 times the dose of the IV/IO routes.

References

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Opioid Toxicity and Withdrawal Medical Directive

Introduction:

Opioid is a term that refers to a group of natural, synthetic, or semi-synthetic drugs such as hydromorphone, fentanyl, heroin, oxycodone, morphine, oxycontin, hydrocodone, merperidine.

When an opioid bonds with an opioid receptor, it blocks the transmission of a pain stimulus through the nervous system.

Common signs of opioid overdose include miosis (constriction of the pupil of the eyes), hypotension, respiratory depression, hypothermia, and decreased level of consciousness, which all potentiate hypoxemia leading to death.

The Medical Directive is designed for treatment options for acute overdose (naloxone) and/or treatment of withdrawal symptoms (buprenorphine/naloxone [Suboxone])

***Essentials*:**

The cornerstone of managing opioid overdoses is ensuring effective ventilation, which should be prioritized over medication administration. Paramedics must focus on proper airway management to facilitate ventilation. Continuous monitoring of oxygenation is critical.

Administering naloxone in mixed overdose scenarios can unmask underlying toxidromes, revealing symptoms that were previously suppressed by opioid-induced central nervous system depression. For example, stimulant toxicity may emerge potentially leading to seizures, hypertensive crises, or severe agitation. Paramedics must remain vigilant for these shifts in clinical presentation and be prepared to manage the complications associated with unmasked toxidromes, such as airway protection, seizure control, or cardiovascular support.

When buprenorphine/naloxone is misused, such as through intranasal or injectable routes, the naloxone component acts as an opioid antagonist and precipitates withdrawal. These patients require buprenorphine/naloxone as per the medical directive.

When managing patients on long-acting opioids, such as methadone, it is critical to exercise caution when administering opioid agonists or antagonists. These medications can abruptly displace methadone from their bonded opioid receptors, causing precipitated withdrawal. This reaction is a sudden and severe form of withdrawal that can be highly distressing for the patient and pose significant medical risks. Awareness of the patient's opioid use history and careful medication management are essential to avoid this complication.

***Interventions*:**

Naloxone

When administering naloxone via IV, it's recommended to use a titration approach; gradually delivering small aliquots of the 0.4 mg dose[3]. Paramedics may also consider dilution with normal saline to help facilitate a more controlled titration.

The age Condition of >/= 24h for naloxone minimizes the risk of life-threatening opiate withdrawal syndrome in the newborn.

If a patient displays opioid withdrawal symptoms but hasn't received naloxone from paramedics or a bystander, consulting with a BHP would be a suitable and effective treatment strategy.

The BLS PCS DNR Standard and Ministry of Health Do Not Resuscitate Form was created to ensure that appropriate and compassionate measures could be taken for patients who are considered palliative and/or nearing the end of life. Opiate antagonist administration for an accidental or intentional overdose in this patient population may still be considered, where appropriate.

Buprenorphine/naloxone (Suboxone)

Utilizing the Clinical Opiate Withdrawal Scale (COWS) during clinical evaluation ensures that patients are properly chosen for buprenorphine/naloxone treatment, taking into account the intensity of their withdrawal symptoms[6]. Moreover, distinguishing between objective signs and subjective symptoms in withdrawal assessment reinforces clinical judgment[7].

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Medical App References

- Skill sheets - IM injection
- COWS scoring sheet

Orotracheal Intubation

- ETI (Endotracheal Intubation) is not mandatory. The importance of definitive airway management has given way to basic airway management and less invasive approaches.

- The contraindication which references age < 50 refers specifically to patients experiencing an asthma exacerbation and who are NOT in or near cardiac arrest.

- The onset of action for topical Lidocaine is within 1 minute but it may take up to 3 – 5 minutes to have full effect.

- In the treatment statement, “consider intubation” is followed by “with or without facilitation devices”. This is a generic statement to address everything from the air trach, to the bougie to all things as yet undefined. The generic statement enables us to continue to use the directives despite changes in technology without being prescriptive.

- The formula that is recommended for sizing a cuffed pediatric endotracheal tube is 3.5+(Age in years/4). This formula allows for a slightly smaller tube as the cuff will create the seal versus the tube only.

- It is recommended that paramedics start with smaller volume of air when inflating the cuff (example 1 ml increments) and continue until no air is heard on auscultation escaping past the cuff. It is also appropriate to use a smaller syringe such a 3ml or 5ml to avoid over inflating the cuff in smaller patients.

- ETI confirmation has been updated and now requires ETCO2 waveform capnography as the only primary method. It is the most reliable method to monitor placement of an advanced airway

(AHA guidelines 2015, Part 7). In the event it is not available, three (3) secondary methods must be used; for example: colormetric detector that changes color with exposure to CO2.

- Definition of intubation attempt: Introducing the laryngoscope into the patient's mouth with the intent to then insert an endotracheal tube is considered an attempt and should be documented as such including success or failure.

- The number of advanced airway attempts is clearly defined as two (2) attempts per patient regardless of the route chosen.

Pediatric Intraosseous

- "IV access is unobtainable" does not imply that you must attempt an IV and fail before proceeding to the IO, but it must be considered. Documentation on the ACR to support the rationale to bypass the IV attempt will be expected.

- The typical insertion site is the proximal tibia. Other sites are dependent on RBH approval.

- Aspiration may be recommended as part of the procedural skill, but an inability to aspirate should be confirmed by testing patency by attempting to push fluid

Procedural Sedation Medical Directive

This directive applies only after the ETT has been placed OR after pacing has been initiated.

- Once hypotension has been corrected, it is no longer a contraindication to use midazolam or fentaNYL.

- The intent of the directive is to administer both midazolam and fentaNYL concurrently.

Return of Spontaneous Circulation Medical Directive

- Optimizing oxygenation and targeting SpO2 of 94 to 98% (avoiding 100%) will provide adequate oxygenation and will minimize vasoconstriction and the development of oxygen free radicals. Despite ideal SpO2 values, oxygen administration should be continued if the patient remains unstable (Callaway et al., 2015).

- There is insufficient evidence to support the routine use of an antiarrhythmic post ROSC (AHA guidelines 2015, Part 7)

Fluid Bolus and DOPamine Administration:

- The fluid bolus precedes the administration of DOPamine. If started, ensure time is allowed for the intervention to have effect and be evaluated prior to initiating DOPamine. IO and CVAD have been added as appropriate routes for fluid administration.

- DOPamine is optimally administered via a dedicated IV line, however if required, may be piggybacked onto a primary line.

$ETCO_2$:

- Post ROSC, the goal is to maintain ventilation at a rate of approximately ten (10) breaths per minute (or one [1] breath every six [6] seconds) for adults, and at a rate of twenty (20) breaths/minute (one [1] every three [3] seconds) for child and infants and titrate to achieve an ETCO2 (with waveform capnography) of 30 - 40 mmHg (Callaway et al., 2015). Hyperventilation MUST be avoided, but be mindful not to hypoventilate in an attempt to artificially raise a low ETCO2; a low ETCO2 may reflect metabolic acidosis.

Fluid Therapy:

- Regardless of the amount of fluid administered prior to ROSC and if chest auscultation is "clear", a 10 ml/kg fluid bolus may be administered to a maximum of 1,000 ml targeting a SBP of ≥ 90 mmHg.

Seizure Medical Directive

- The indications have been simplified to describe an active generalized motor seizure. This implies the classic tonic clonic presentation (regardless of causation) and therefore excludes partial seizures, petit mals, Jacksonian, etc.

Routes of Administration:

- Midazolam has a wide variety of routes of administration to suit the varied presentations. Utilize the route that can be accessed the quickest.

- IV: best route to provide anti-seizure medication, but the administration and time required to secure the route can be difficult. When in place, midazolam should be administered over 1 – 2 minutes.

- IO: is to be accessed only in the setting of pre-arrest.

- IM: easy access to large muscle groups with excellent blood flow, but the patient may be difficult to restrain. Consider sharp safety.

- IN: rapid access to the circulation with no sharps to worry about. Split doses between nares.

- Buccal: good absorptive surface and ease of administration. Consider the risk of aspiration

Suspected Adrenal Crisis Medical Directive

- Patients with primary adrenal failure generally require little assistance from EMS, except in cases of stress when they can become critically ill; in which case they will require the administration of hydrocortisone.

  Hydrocortisone is not carried by paramedics.

  - Examples of stress may include, but are not limited to:

    - Hypoglycemia
    - Hypotension
    - Gastrointestinal issues

- Fractures If the patient presents with signs and symptoms consistent with the medical directive, AND his/her medication is available, a Paramedic may administer 2 mg/kg up to 100 mg IM/IV/IO/CVAD of hydrocortisone.

- These patients should be transported to a receiving facility for additional care and follow up.

Supraglottic Airway Medical Directive

- Consider withholding the supraglottic airway (SGA) if the patient is actively vomiting due to an increased risk of aspiration. Active vomiting is considered ongoing vomiting where the Paramedic is unable to clear the airway.

- If the patient has vomited, and the airway has been cleared successfully, a supraglottic airway may be inserted.

- The number of attempts is clearly defined as two (2) total per patient, and not per provider.

- Confirmation of SGA insertion requires ETCO2 waveform capnography. It is the most reliable method to monitor placement of an advanced airway (AHA guidelines 2015, Part 7). If it is not available, at least two (2) secondary methods must be used. SGA placement should be verified frequently and again at transfer of care. Findings and witness (where possible) should be documented on the patient care record.

ROSC:

- In the event the patient with a SGA in place sustains a ROSC, the SGA should only be removed if the gag reflex is stimulated or the patient begins to vomit; expect to remove it as the level of awareness improves.

Symptomatic Bradycardia

- Hemodynamic instability refers specifically to hypotension (SBP < 90 mmHg) that requires pharmacologic or electrical intervention(s).
- 12 lead ECG should be obtained as early as possible.
- Atropine is to be administered in the setting of sinus bradycardia, junctional bradycardia, atrial fibrillation, first degree block or second degree block type I. Further, patients presenting in second degree type II or third degree block may receive a single dose of atropine while preparing pacing or if pacing is unavailable or unsuccessful.
- Transcutaneous pacing should not be delayed to initiate IV access if the patient is unstable.
- Transcutaneous pacing is to be initiated at a rate of 80 bpm with milliamps (mAmps) then increased to obtain electrical capture. Capture is highly variable depending on patient size, weight, pad placement, skin condition, etc. It is difficult to state the target values for capture, however 80 to 100 mAmps is common. If unable to gain capture at maximum mAmps, pacing should be discontinued. Treatment should not be discontinued if the patient responds and develops an improved blood pressure.
- Pad placement for pacing should follow the cardiac monitor manufacturer's recommendations but typically include anterior/posterior or sternum/apex.
- Transcutaneous pacing is initiated when the patient is hypotensive. As the blood pressure improves, pacing is not discontinued, but the patient may be more aware of the discomfort and may require sedation.
- Patients may receive multiple interventions to maintain their heart rate and blood pressure. The treatment provided must be permitted time to take effect and to be evaluated before moving on to the next treatment.
- A contraindication to DOPamine administration is mechanical shock. Examples of mechanical shock include tension pneumothorax, pulmonary embolism, and cardiac tamponade.
- Notify the receiving hospital staff if the DOPamine drip goes interstitial as DOPamine can cause tissue necrosis which can be mitigated by a phentolamine injection at the hospital into the affected tissue.

Tachydysrhythmia Medical Directive

Introduction

Tachydysrhythmias are abnormal cardiac rhythms presenting with a rate over 100 beats per minute (BPM) and can be broadly classified as either narrow complex (QRS duration < 120 ms) or wide complex (QRS duration ≥ 120 ms). Supraventricular tachycardia (SVT) is one type of narrow complex tachycardia. The term SVT refers to any tachydysrhythmia originating above the level of the Bundle of His and can include regular and irregular tachydysrhythmias. This division assists with rhythm differentiation and treatment. Patient factors such as age and comorbidities play a significant role in helping to determine which tachydysrhythmia they are experiencing. Patients can experience a sudden onset of symptoms which may include:

- Chest pain
- Palpitations
- Dyspnea or shortness of breath
- Presyncope or syncope
- Lightheadedness
- Anxiety

These symptoms can be due to the heart pumping less efficiently as a result of the increased rate and/or the altered cardiac conduction pathway.

Essentials

The generic symptoms experienced as a result of tachydysrhythmias can create a long list of differential diagnoses for paramedics to consider. Taking a thorough history, physical exam, and obtaining a 12-Lead ECG, where possible, is necessary to assist in the accurate identification of the cause of these symptoms.

Obtaining a 12-lead ECG is strongly recommended, where possible, to accurately identify the cardiac rhythm. A 3-lead or rhythm strip does not always provide enough information to make a complete or accurate assessment. A paramedic should observe the rate, regularity, presence and morphology of p-waves, and width of the QRS complex to assist in identifying the correct tachycardic rhythm to provide appropriate treatment.

Tachycardia can be a physiologic compensatory mechanism in response to various underlying causes (e.g. pain, hypovolemia, fever, and hypoxia). In these cases, the underlying cause of the tachycardia should be treated and interventions within this medical directive should not be initiated.

Patients may experience chest pain as a result of the increased cardiac demand created by the tachydysrhythmia. Chest pain is not a contraindication to treatment under this Medical Directive. A paramedic should use their clinical judgment after treating the tachydysrhythmia to determine if the chest pain is ongoing, ischemic in nature and if that patient meets the conditions for treatment under the Cardiac Ischemia Medical Directive.

Valsalva Maneuvers:

Before initiating a Valsalva maneuver, it is best practice to start an intravenous on the patient (if authorized) due to the small risk that the patient may become hypotensive during the procedure. Both PCPs and ACPs can safely perform a Valsalva maneuver or modified Valsalva maneuver for a patient experiencing a supraventricular tachycardia (SVT). Paramedics should use their clinical judgment in determining if modified Valsalva or Valsalva maneuver should be utilized. The standard Valsalva maneuver may be considered in circumstances when the patient is unable to lay flat or paramedics are not safely able to elevate the patient's legs.

Complications that may occur are:

- Rupture of the round window of the ear
- Lightheadedness, dizziness or syncope
- Chest pain
- Nausea/vomiting

There is a low risk of initiating labour in pregnant patients by performing a Valsalva technique. Pregnancy is not a contraindication, however, pregnant patients are excluded from the Treat & Discharge portion of the Tachydysrhythmia Medical Directive.

Adenosine (ACP only)

Adenosine is the preferred treatment option for patients exhibiting mild to moderate symptoms associated with supraventricular tachycardia that is unresponsive to a Valsalva technique. However, in cases where patients present with severe symptoms or demonstrate significant hemodynamic instability, electrical cardioversion is warranted.

A diagnosed history of asthma is not a contraindication to the administration of adenosine. The patient must be actively exhibiting signs and symptoms of bronchoconstriction.

Cardioversion

In the hemodynamically unstable patient experiencing tachydysrhythmia, electrical cardioversion is the safest and most reliable treatment for conversion. Patients who are not obtunded may require analgesia and sedation in order to tolerate this procedure. Consider discussing this with the BHP during the patch.

Interventions

Specific to this Medical Directive, treatments are not listed in the order in which they should be administered. The initial choice will be based on the rhythm interpretation (narrow vs wide) and hemodynamic stability of the patient.

Narrow Complex Tachycardia

The maximum attempts listed in the ALS PCS are two (2) attempts per episode. Patients may convert with a Valsalva technique and revert to an SVT several minutes later. In these circumstances, this is considered a new episode, and the paramedic may provide additional Valsalva attempts, however, the patient would not qualify for Treat and Discharge.

Adenosine (ACP only)

When adenosine is administered, it should be immediately followed by a 20 mL normal saline bolus.

Lidocaine and Wide Complex Tachycardia (ACP only)

Any topical doses of lidocaine administered during orotracheal intubation count towards the 5 mg/kg total dose.

In the event that the patient receives the maximum dose of lidocaine and then experiences cardiac arrest, further doses of lidocaine should be withheld due to the potential for adverse effects. Local Anesthetic Systemic Toxicity (LAST) occurs when local anesthetics, like lidocaine, accumulate in the bloodstream at toxic levels, often from excessive dosing, rapid absorption, or accidental intravascular injection. LAST can affect the central nervous and cardiovascular systems, causing symptoms that range from mild to severe. Symptoms may include dizziness, tinnitus, confusion, seizures, and arrhythmias.

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Medical App References

- Videos
- Skill sheets

Tension Pneumothorax Medical Directive

- A chest seal with a one-way valve over a catheter. The chest seal blocks your view of the needle, and there is limited evidence to demonstrate a benefit.

- A Heimlich valve or Cook chest drain valve may be applied at or below the level of the catheter to assist in the evacuation of air from the pleural space.

- When determining the catheter sizing for pediatrics, the age of the patient should be taken into consideration. Pediatrics that are adolescents of adult size, should be treated as adults and a needle thoracostomy should be performed using the 4th intercostal space anterior axillary line with a minimum of a 14G 2 inch angiocath needle.

- For pediatrics that are less than 13 years of age, or small adolescents, a 14G or 16G 1.5 inch angiocath needle is appropriate for performing a needle thoracostomy. Any needle that is longer can increase the risk of iatrogenic injury to the patient. A 2-inch needle is more than double the chest wall thickness of most children. The 2nd intercostal space is the preferred location for this patient population.

Trauma Cardiac Arrest Medical Directive

- An intravenous fluid bolus may be considered to assist with reversible causes if transport to the ED will not be delayed.

Traumatic Hemorrhage Medical Directive

Introduction

Trauma management involves rapid assessment and treatment of life-threatening injuries at the scene. Priorities should focus on maintaining hemodynamic stability and preventing hypovolemic shock in the prehospital setting.

Paramedics should suspect severe traumatic hemorrhage when there is evidence of severe blood loss (either external or internal) and altered hemodynamics in the presence of a traumatic mechanism of injury.

Essentials

External hemorrhage can often be controlled with direct pressure; however, tranexamic acid (TXA) can be administered to help manage uncontrolled traumatic hemorrhage, whether internal or external.

Tranexamic acid (TXA) is an antifibrinolytic and reversibly inhibits the plasminogen activation, thereby stabilizing blood clots and preventing further hemorrhage[5]. Currently, published prehospital research has only demonstrated the efficacy of TXA in adult populations[1].

Interventions

The preferred route of administration is IV due to its immediate onset, as long as IV initiation does not delay transport. This can be accomplished by adding 1 g of TXA into a 50 ml bag of normal saline or D5W and administering it over 5 minutes. If a 50 ml bag of normal saline or D5W is unavailable, administration in a 10 ml syringe can be accomplished by pushing the medication over at least 5 min. The alternate route of administration is IM[5, 4]. TXA should not delay transport and should not be prioritized over the management of other reversible causes.

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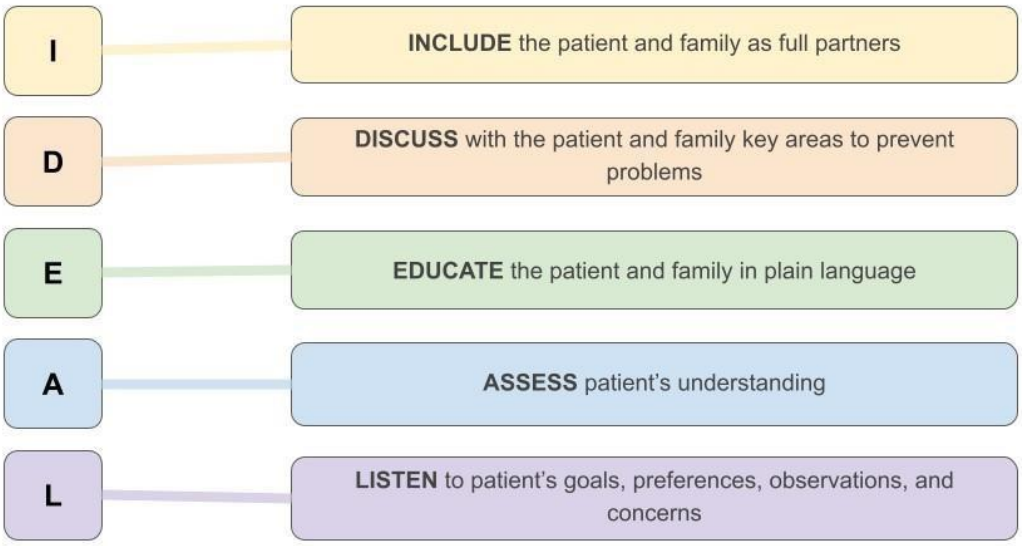
TREAT AND DISCHARGE MEDICAL DIRECTIVES

General:

- Conveying a diagnosis is a controlled medical act, therefore, treat and discharge from care is a fundamentally distinct and different process from a patient refusing treatment as defined in the BLS PCS.

- A responsible adult is defined as a person that is the age of majority (>18 years old) and is someone who, in the reasonable belief of the paramedic, is capable of remaining with the patient and will assume responsibility for the patient.

- The **IDEAL** mnemonic for patient discharge comes from a hospital evidence-based system that was put together with patient safety in mind.



INCLUDE the patient and family as full partners in the discharge planning process
DISCUSS with the patient and family key areas to prevent problems

- Highlight warning signs and problems
- Exacerbation of symptoms or new symptoms
- Explain assessments you've done
- Discuss plans for follow-up
- Discuss patient/family wishes

EDUCATE the patient and family in plain language about the patient's condition, the discharge process, and the next steps.

- Patient's current condition
- Clinically reasonable differential diagnosis

- Inform/acknowledge our limitations
- Discharge process
- Calling 911 back

ASSESS patient's understanding

- Use teach back to determine patient comprehension
- Ensure understanding and accuracy

LISTEN to patient's goals, preferences, observations, and concerns

- Pay attention to body language
- Use open-ended questions to elicit answers

Hypoglycemia

- Patients can receive multiple forms of treatment for hypoglycemia. For example, a patient may initially not be able to safely consume carbohydrates and require dextrose and/or glucagon prior to consuming carbohydrates. These patients can still be considered for Discharge from Care.

- Patients who receive multiple doses of the same medication for example, two doses of glucagon, D50 or D10, should be transported to hospital.

- New and novel medications are constantly being approved and prescribed to patients who are diagnosed with diabetes. If you are unable to determine what class the medication is (i.e. insulin, oral hypoglycemic, other), then a patch to the Base Hospital Physician should be initiated to discuss the suitability of the patient in meeting the treat and discharge medical directive.

Seizure

- A confirmed history of epilepsy must be diagnosed by a physician.

- "New medication" refers to any new anti-seizure medication that is newly prescribed or where a recent dosage change has occurred. The addition of new or changes to anti-seizure medications (dosage or type) in the past 30 days should be considered as they can potentially lower a patient's seizure threshold. Some medications may be increased weekly to achieve optimal clinical response.

- A "single seizure episode" is defined as a single seizure.

- A seizure cluster is multiple seizures that occur within a 24-hour period. Patients who experience seizure clusters do not qualify for treat and discharge.

Appendix A

The following delegated acts/procedures reference sheets have been developed to provide Paramedics across Ontario with a standardized step-by-step guide on how to perform the delegated skills utilized within the Advanced Life Support Patient Care Standards. It is acknowledged that there may be multiple methods of performing some of the delegated acts/procedures based on manufacturer recommendations for specific devices and/or equipment utilized by the paramedics. Where possible, these delegated acts/procedures have been written to be generic in regards to equipment utilized in the performance of the procedure.

DELEGATED ACTS/PROCEDURES

Semi-Automated External Defibrillation (SAED)
Childbirth Complication: Prolapsed Cord
Childbirth Complications: Breech Delivery
Childbirth Complication: External Bi-Manual Compression
Childbirth Complication: Shoulder Dystocia
Childbirth: External Uterine massage
Childbirth: Uncomplicated with Nuchal Cord and Placental Delivery
Closed Suctioning of Endotracheal and Tracheostomy Tube
Continuous Positive Airway Pressure (CPAP) Mac/Port-A-Vent Type
Continuous Positive Airway Pressure (CPAP) Venturi/Boussignac Type
CTOMS Critothyrotomy
Central Venous Access Device (CVAD)—External
Central Venous Access Device Access (CVAD)—Implanted
Electronic Control Device Probe Removal
Emergency Dialysis Disconnect
Emergency Tracheostomy Reinsertion
Endotracheal Medication Administration (ETT)
Endotracheal or Tracheostomy Tube Suctioning Open
External Jugular Venous Access
Intraosseous (EZ-IO®) Cannulation
Intraosseous Cannulation – Driver Device
Intravenous Cannulation
Intravenous Medication Administration
Manual Defibrillation
Medication Administration: Subcutaneous Injection (SC)
Medication Administration: Intranasal (IN)

Medication Administration: Buccal
Medication Administration: Intramuscular Injection
Medication Administration: Oral (PO)
Medication Administration: Sublingual (SL)
Medication Administration: Metered Dose Inhaler (MDI)
Medication Administration: Nebulized (Neb)
Medication Administration: Basqimi Intranasal Glucagon
Modified Valsalva Maneuver
Nasotracheal Intubation (NTI)
Needle Thoracostomy
Orotracheal Intubation
Pediatric Intraosseous (Manual Technique)
Supraglottic Airway (SGA)
Supraglottic Airway: i-gel
Surgical Airway: Portex® Cricothyrotomy
Surgical Airway: QuickTrach® Cricothyrotomy
Surgical Airway: Needle Cricothyrotomy
Synchronized Cardioversion
Transcutaneous Pacing (TCP)

Childbirth Complication: Prolapsed Cord

EQUIPMENT

- ☐ Appropriate PPE
- ☐ O2 as per BLS Standards
- ☐ Cardiac Monitor
- ☐ Obstetrical Kit

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment.
- ☐ Gain consent to inspect perineum for prolapsed cord.
- ☐ Explain procedure and expected outcome to patient.
- ☐ Consider extrication strategy.
- ☐ As soon as possible assist patient into knee-chest position or exaggerated Sims position
- ☐ Encourage, if cord has not retracted into the patient to breathe through contractions
- ☐ Keep patient informed of your actions (you will feel me touch you…you will feel pressure etc.).
- ☐ Gently cradle cord in hand and replace cord into the vagina; insert finger(s)/hand into vagina until you feel
  presenting part and apply manual digital pressure lifting it off the cord (this will be maintained until transfer of

care at hospital. Ideally, do not remove hand until instructed to do so)

Childbirth Complications: Breech Delivery

EQUIPMENT:

- ☐ Appropriate PPE
- ☐ Cardiac Monitor and SPO2 (if required)
- ☐ Obstetrical Kit
- ☐ Airway Equipment (neonate)
- ☐ O2 as per BLS Standard

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Explain Procedure and expected outcome to patient.
- ☐ Obtain consent.
- ☐ Assess for signs of imminent breech birth.
- ☐ Position the patient to allow gravity to birth the baby
  - o Assist patient into an upright or supported squat position; OR
  - o Bring buttocks to edge of bed, place feet on chair (if possible).
- ☐ Hands off the breech.
- ☐ Consider manual delivery of legs (if possible/necessary);
  - o Apply pressure to the popliteal fossa once visible; AND
  - o Gently sweep foot down and out.
- ☐ Note time baby delivered to umbilicus.
  - o You have 4 MINUTES to complete delivery of the head after umbilicus is visible
- ☐ Consider manual delivery of arms (if possible/necessary);
  - o If hand or elbow visible on fetal chest gently sweep hand down and out
- ☐ Allow baby to descent with gravity.
- ☐ Hands off the breech
- ☐ Another paramedic may apply gentle suprapubic pressure to maintain flexion of the head
- ☐ Hands off the breech
- ☐ Initiate Mauriceau-Smellie-Veit (MSV) Manœuvre once:
  - o Hairline/nape of the neck is visible; OR
  - o Head does not deliver within 3 MINUTES after the umbilicus is visible
- ☐ If head does NOT deliver:
  - o Maintain MSV Manoeuvre and transport.
- ☐ Once head delivers:
  - o Assess and monitor adult patient and newborn for Breech Delivery complications.
  - o Provide newborn care as per the current BLS and ALS PCS.
  - o Address complications in accordance with BLS and ALS PCS.

MAURICEAU-SMELLIE-VEIT (MSV) MANOEUVER

- ☐ Discourage the patient from pushing during the manoeuvre.
- ☐ Support baby with forearm, palm supporting the chest.
  Place second and fourth fingers on the malar bones (cheekbones) (not in the mouth).
  Exert pressure on cheekbones to increase flexion of the neck.
- ☐ Place other hand on baby's back
  - o Two fingers hooked over the shoulders.
  - o Middle finger pushing the occiput to aid flexion.
- ☐ Once hairline/nape of neck is visible:
  - o Lift the body in an arc.
  - o Assist the head to pivot around the symphysis pubis.
  - o Allow face to delivered.
- ☐ Ensure **controlled delivery of the head.**

Childbirth Complication: External Bi-Manual Compression

EQUIPMENT:

- ☐ Appropriate PPE
- ☐ Consider IV/Fluid Therapy (if available)

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Explain Procedure and expected outcome to patient.
- ☐ Obtain consent.
- ☐ If not already performed/attempted:
  - o Encourage infant latching/nipple stimulation.
  - o Encourage patient to void her bladder

Placenta In:

- o Attempt to deliver the placenta; guarding the uterus use gentle controlled cord traction during contraction with the patient pushing.
- o If the delivery of the placenta is unsuccessful and patient is exhibiting signs of post-partum hemorrhage; ensure resuscitative measures are in place and perform external bimanual compression as described below.

External Bi-Manual Compression:

- Place one hand on the lower portion of the abdomen, at the level of the symphysis pubis; cup hand, supporting the lower portion of the uterus.
- Place the other hand at the top of the uterine fundus. (The uterus should now be palpable between the hands.)
- Compress the uterus between each hand continuously compressing the uterus (perform for as long as possible; this may require rotation of providers) until post-partum hemorrhage stops.

Placenta Out:

- Perform external uterine massage (EUM).
- If EUM is unsuccessful, perform external bi-manual compression as described above

Childbirth Complication: Shoulder Dystocia

EQUIPMENT:

- ☐ Appropriate PPE
- ☐ Cardiac Monitor
- ☐ Obstetrical Kit
- ☐ Airway Equipment (neonate)
- ☐ O2 as per BLS Standards

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Explain Procedure and expected outcome to patient.
- ☐ Assess for signs of imminent shoulder dystocia birth.
- ☐ Inform patient, support person(s) and second paramedic of the emergency situation.
- ☐ Explain procedure and expected outcome to patient.
- ☐ Obtain consent.
- ☐ Position the patient supine on the edge of a firm surface (if possible).
- ☐ Note time of baby's head delivered:
  - You have 8 MINUTES to complete delivery from time head is delivered.
- ☐ Perform ALARM manoeuvers.
- ☐ If first ALARM unsuccessful:
  - Paramedic partner performs ALARM manoeuvers.
- ☐ If second ALARM unsuccessful:

Transport immediately.

- Perform ALARM en route to the hospital (as safely as possible).

☐ If successful delivery of baby:

- Assess and monitor adult patient and newborn for Shoulder Dystocia Delivery complications.
- Provide newborn care in accordance with the current BLS and ALS PCS.
- Address complications in accordance with the current BLS and ALS PCS.

ALARM MANOEUVERS

Use the following 5 interventions.

1. **A - Ask for assistance**

- Ask patient to lay flat, on a firm surface (if not already done).
- Ask spouse/family/other healthcare professional to assist during ALARM.
- Ask Paramedic Partner to assist during ALARM.

2. **L - Legs abduction (MCROBERT'S MANOEUVER)**

- Hyperflex hips by lifting legs and knees.
  Aim to:
  - Bring knees to ears.
  - Form a squatting position.

Best performed by 2 people holding legs.

3. **A - Adduct Shoulder** (SUPRAPUBIC PRESSURE)

- Apply suprapubic pressure before the next contraction (to be performed by paramedic partner).
- Maintain throughout entire contraction.
- Instruct the patient to push in this position.
- Apply gentle downward lateral flexion of the head.

4. **R - Roll Over** (GASKIN MANOEUVER)

- If steps 1, 2 and 3 are unsuccessful:
- Perform Gaskin manoeuver (hands and knees).
- Ask patient to change position, rolling over onto hands-and-knees position.
- Apply upward lateral flexion of the baby's head to facilitate delivery of the body.

5. **M - Manually release posterior arm.**
   If hand visible:
   - Follow humorous.
   - Sweep arm across fetal chest and out.
   - Deliver the posterior arm.

Childbirth: External Uterine massage

EQUIPMENT:

☐ Appropriate PPE

☐ O_2 as per BLS Standards

PROCEDURE:

☐ Don appropriate PPE.
☐ Gather all required equipment
☐ Explain procedure and expected outcome to patient.
☐ Obtain consent.
☐ Assist with placental delivery utilizing controlled cord traction when signs of placental separation are observed:

- o Lengthening of the cord;
- o Sudden gush/trickle of blood from vagina with uterine contraction.

☐ Conduct external uterine massage once the placenta has been delivered if the fundus remains soft/'boggy' or there is continuous bleeding:

- o Place one hand on the lower portion of the abdomen, at the level of the symphysis pubis in a cupped position supporting the lower portion of the uterus.
- o Place one hand at the top of the uterine fundus. The uterus should now be palpable between the hands.
- o Begin massaging with the upper hand using a circular motion. The lower hand should remain still, supporting the lower portion of the uterus.

☐ Continue massaging until post-partum bleeding stops.
☐ If bleeding continues, perform:
- o External bi-manual compression; (see procedure list)

- Encourage the patient to empty bladder

Childbirth: Uncomplicated with Nuchal Cord and Placental Delivery

EQUIPMENT:

- ☐ Appropriate PPE
- ☐ O2 as per BLS Standards
- ☐ Obstetrical Kit
- ☐ Cardiac Monitor
- ☐ Obstetrical Kit

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Explain procedure and expected outcome to patient.
- ☐ Obtain consent.
- ☐ Provide warmth and adequate lighting (as much as possible).
- ☐ Position the patient supine on a firm surface with her head and shoulders slightly raised, legs flexed and abducted at hips and knees.
- ☐ Visualize the perineum.
- ☐ Place plastic sheet/bag/towel/drape under patient's buttocks.
- ☐ Observe for rupture of membranes (if not already ruptured) and note colour of fluid if possible.
- ☐ With non-dominant hand guard the perineum with a 4x4.
- ☐ Deliver the head in a controlled fashion.
- ☐ Apply gentle pressure to vertex (neonate's head) to control delivery of the head
- ☐ Once head is delivered; allow restitution of head to occur naturally
- ☐ Observe for nuchal cord
  - If cord is present and loose, slip cord over baby's head.
  - Only if nuchal cord is tight and cannot be slipped over baby's head, clamp and cut the cord.
- ☐ Encourage patient to push with next contraction (or sooner if restitution has occurred and patient ready to push).
- ☐ Provide gentle lateral flexion, followed by gentle upward flexion to deliver shoulders and body.
- ☐ Place newborn directly onto the patient's abdomen, prone with head to the side allowing airway to drain (skin to skin for warmth).
- ☐ Dry, stimulate newborn, and assess for tone, breathing and crying.
- ☐ Note the time of delivery

☐ Cover newborn with new blanket/towel to maintain warmth. (Do not re-use towel/blanket used to dry
newborn.)
☐ Allow cord to pulse before clamping and cutting cord (at least 2 minutes) unless neonatal resuscitation is
required or multips are known or suspected.
☐ Clamp the umbilical cord in two places approximately 15 cm from the infant's abdomen and approximately 5
cm apart.
☐ Cut the umbilical cord using sterile (disposable) scissors
☐ Assess for placental detachment.

Placental Delivery:

☐ Guarding the uterus; place a hand on the lower portion of the abdomen, just above the symphysis pubis in a cupped position (supporting the lower portion of the uterus).
☐ With other hand apply gentle controlled cord traction (working with patient's contractions) using up and downward motion; when membrane trail is seen; ask patient to cough or laugh and gently tease out membranes in an up and down motion, until completely delivered.
☐ Perform external uterine massage (see procedure list).
☐ Place placenta into provided plastic bag and transport with Mom and newborn. Label bag with patient's name and document time of delivery.

Continuous Positive Airway Pressure

EQUIPMENT:

Set up equipment and ensure provider safety by applying appropriate PPE

☐ BVM with filter(s)
☐ CPAP Equipment
☐ ETCO2 monitor
☐ Oxygen source

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

☐ Assemble the circuit as per manufacturer requirements (including a face mask, filter and ETCO2) and attach it to the CPAP device.
☐ Connect CPAP device to a pressure regulated oxygen source.
☐ Adjust the CPAP control to the level desired as per the current CPAP Medical Directive.

Procedure

☐ Guide mask to the patient's face.
☐ Attach the head strap to the hook rings.
☐ Check around the mask for any leaks.
☐ Adjust the mask and/or head strap accordingly.
☐ Consider titration of Fi02 (if available) as per the medical directive.

Continuous Positive Airway Pressure (CPAP) Mac/Port-A-Vent Type

EQUIPMENT:

- ☐ Appropriate PPE
- ☐ CPAP Equipment
- ☐ O_2 as per BLS Standards
- ☐ Cardiac Monitor
- ☐ $ETCO_2$ adaptor *(if applicable)*
- ☐ Oxygen source

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Explain procedure and expected outcome to patient.
- ☐ Obtain consent.
- ☐ Assemble circuit as per manufacturer requirements *(including face mask, filter and $ETCO_2$ adaptor)* and attach to the CPAP device.
- ☐ Attach CPAP device to a high-pressure oxygen source.
- ☐ Turn on oxygen source.
- ☐ Adjust the CPAP control to the level desired as per the current CPAP Medical Directive.
- ☐ Guide mask to the patient's face, ensuring snug fit.
- ☐ Attach the head strap on the hook rings.
- ☐ Check around the mask for any leaks.
- ☐ Adjust the mask and/or head strap accordingly.
- ☐ Re-assess patient every 5 minutes and adjust CPAP as required.

Continuous Positive Airway Pressure (CPAP) Venturi/Boussignac Type

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Cardiac monitor
- ☐ ETCO2 monitor
- ☐ CPAP Equipment
- ☐

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Assemble CPAP circuit as per manufacturer instructions (including face mask, filter and ETCO2 adaptor) and attach to the CPAP device.
- ☐ Attach CPAP device to an oxygen source.
- ☐ Turn on the oxygen source.

Procedure

- ☐ Adjust O2 flow to the level as directed by manufacturer directions to meet pressure as per the current CPAP medical directive.
- ☐ Guide mask to the patient's face, ensuring a snug fit.
- ☐ Attach the head strap on the hook rings.
- ☐ Check around the mask for any leaks.
- ☐ Adjust the mask and/or head strap accordingly.
- ☐ Re-assess patient condition every 5 minutes and adjust/titrate CPAP as required

Central Venous Access Device (CVAD)—External

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 10 ml syringe x 2
- ☐ Alcohol swabs
- ☐ Tape
- ☐ clear sterile dressing
- ☐ Blunt tip needle
- ☐ Sharps container
- ☐ 0.9% NaCl

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Fill a 10 ml syringe with sterile 0.9% NaCl.
- ☐ Ensure that the lumen to be accessed is clamped.
- ☐ Remove the cap/PRN adaptor from the luer lock end (if necessary).
- ☐ Clean the connection area with an alcohol swab
- ☐ Connect an empty 10 ml syringe to the lumen.

Procedure

- ☐ Unclamp the lumen and aspirate 3-5 ml of blood from the lumen to remove instilled anticoagulant.
- ☐ Clamp the lumen and disconnect the syringe used to aspirate blood.
- ☐ Connect the 10 ml 0.9% NaCl filled syringe, and then unclamp the lumen.
- ☐ Inject approximately 2 ml of NaCl, then withdraw 1-2 ml and visualize blood return to ensure the line is patent, then flush remaining NaCl. If resistance is met, assume the lumen is obstructed and repeat the procedure on the second lumen (if a second lumen is available).

    - Alternatively, push 2 ml, pause, push 2 ml and continue until the full flush is delivered.
- ☐ Once lumen patency has been confirmed, re-clamp lumen and remove the syringe.
- ☐ Utilize CVAD as required.

Defibrillation - Manual

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Cardiac Monitor
- ☐ Razor
- ☐ Defibrillation pads
- ☐ Towel

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Expose and prepare the chest to apply defibrillation pads (i.e. dry, and/or shave if required).
- ☐ Select and apply appropriately sized defibrillation pads to the patient as per the manufacturer's recommendation.
- ☐ Turn on the monitor and enable CPR metronome/CPR feedback tools (if available).
- ☐ Enter manual mode (if required).

Procedure

- ☐ Stop CPR and ensure no one is touching the patient.
- ☐ Manually interpret the rhythm.

Shockable Rhythm:

- Perform CPR during the charging phase.
- Ensure proper joule setting.
- Charge the defibrillator.
- Once defibrillator is charged, cease all resuscitation efforts and ensure everyone is clear of the patient.
- Deliver shock once it is safe (minimizing hands off chest time).

Defibrillation - SAED

EQUIPMENT

Set up equipment and ensure provider safety by applying appropriate PPE:

- ☐ Razor (if required)
- ☐ SAED cardiac monitor/defibrillator

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Expose and prepare the chest for the application of defibrillation pads (i.e. dry, and/or shave if required).

- ☐ Select and apply appropriately sized defibrillation pads to the patient as per manufacturer's recommendation.
- ☐ Turn on the monitor and enable CPR metronome/CPR feedback tools (if available).

Procedure

- ☐ Follow machine prompts. Do not touch the patient during analysis.

Emergency Dialysis Disconnect

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Alcohol swab
- ☐ Filled saline lock (optional)
- ☐ Sterile syringe (optional)
- ☐ End caps found in patient's kit (preferred)
- ☐ Gauze or abdominal pad
- ☐ Tape

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Ensure aseptic technique throughout the procedure.
- ☐ Prepare sterile end caps, filled saline lock or sterile syringe.
- ☐ Ensure that the dialysis machine is turned off.
- ☐ Vigorously clean the connection area with an alcohol swab before use.

Procedure

Hemodialysis Steps:

- ☐ Clamp the two clamps on the patient side (vascular access) of the connection tubing.
- ☐ Clamp the two clamps on the machine side (hemodialysis) of the connection tubing.
- ☐ Disconnect each luer lock connection between the two sets of clamps, one at a time, and attach a sterile end cap (if available) or saline lock to the patient's connection tubing.
- ☐ Secure and cover all access tubing to the patient with tape and a sterile abdominal pad.

Continuous Ambulatory Peritoneal Dialysis (CAPD) and Continuous Cycling Peritoneal Dialysis (CCPD) Steps:

- ☐ Twist closed the transfer set clamp on the patient side of the connection.
- ☐ Clamp both the fill bag and drain bag tubing.
- ☐ Disconnect the luer lock connection on the transfer set.
- ☐ Attach sterile mini cap to exposed transfer set tubing.
- ☐ Secure and cover all access tubing to the patient with tape and a sterile abdominal pad.

Automatic Peritoneal Dialysis (APD) Steps:

- ☐ Twist closed the transfer set clamp on the patient side of the connection.
- ☐ Disconnect the patient tubing from the machine tubing.

- ☐ Attach a sterile mini cap on the patient tubing.
- ☐ Attach a mini cap on the machine tubing.
- ☐ Secure patient tubing by coiling the tubing and taping it to the skin.
- ☐ Secure and cover all access tubing to the patient with tape and a sterile abdominal pad.

Emergency Tracheostomy Reinsertion

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 10 ml syringe
- ☐ Tracheostomy tube (supplied by patient)

Sterile water/normal saline

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Prepare a new tracheostomy tube. If a new one is not available, clean the existing tracheostomy tube with clean water.
- ☐ Inspect the stoma for patency and remove any foreign bodies if present.
- ☐ Prepare the tracheostomy kit by:
    - Deflate the cuff (*if present*).
    - Remove the inner cannula (*if applicable*).
    - Insert the obturator into the outer cannula (*if available*).
    - Lubricate the end of the outer cannula (with the obturator tube in place) with a water-based lubricant or sterile water/normal saline.

    ***In the absence of an obturator, paramedics can insert a lubricated outer cannula but must be cautious as the outer cannula may damage the soft tissue of the trachea.*

Procedure

- ☐ Slightly extend the neck to open the stoma.
- ☐ Time insertion with the patient's breathing cycle. As the patient inhales, gently insert the tube into the stoma following the natural curvature of the neck into the trachea, but do not force it.
- ☐ Hold the outer cannula in place and immediately remove the obturator (if applicable).
- ☐ Secure the outer cannula by inflating the cuff with the appropriate volume of air (5 to 8 cc, if applicable) and by using the tube tie provided.
- ☐ Insert a new inner cannula into the outer cannula and lock it in place (if applicable).

Endotracheal Medication Administration (ETT)

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Alcohol swabs
- ☐ Blunt tip needle
- ☐ Normal saline
- Appropriate size syringe
- Medication, which could be supplied as a preload, an ampule, or a vial
- Sharps container

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Remove the dust cap of the vial, or use a gauze/ampule cracker to safely crack the ampule and dispose of the top into a sharps container.
- ☐ If using a vial, clean the top of the vial with an alcohol swab.
- ☐ Attach a blunt tip needle to an appropriately sized syringe.
- ☐ Fill the syringe to the desired volume, ensuring there is no air in the syringe. Be cautious of any medication overflow/spray.
- ☐ Remove the blunt tip needle and dispose into a sharps container.
- ☐ If the medication requires dilution, draw up the required amount of saline using an aseptic technique with a new blunt-tip needle.
- ☐ Perform a medication cross-check with your partner, if available.
- ☐ Dispose of the ampule/vial into a sharps container.

Procedure

If Administering Medication via Syringe *-* ***<u>NO</u> Injection Port*** *(includes preloads)*:

- ☐ Pre-oxygenate patient.
- ☐ Remove ventilation adjuncts from ETT.
- ☐ Inject medication directly into the ETT.
- ☐ Re-attach ventilation adjuncts and continue with positive pressure ventilation (PPV).
- ☐ Dispose of the preload or remaining medication into a sharps container.

If Administering Medication via Syringe - <u>WITH</u> Injection Port *(includes preloads):*

- ☐ Continue oxygenation throughout the procedure.
- ☐ Clean the injection port with an alcohol swab.
- ☐ Inject medication directly into the injection port.
- ☐ Dispose of the preload or remaining medication into a sharps container.

Endotracheal and Tracheostomy Suctioning

EQUIPMENT:

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ BVM with filter
- ☐ ETCO2 adapter
- ☐ SPO2 monitor
- ☐ Syringe
- ☐ Electronic suction unit
- ☐ Saline
- ☐ Suction catheters (appropriate sizes)

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Position patient at 30 to 90 degree sitting position (if applicable).
- ☐ Pre-oxygenate the patient.
- ☐ Ensure pulse oximetry and end-tidal are attached and being monitored.
- ☐ Select the appropriately sized catheter (half the inner diameter of the artificial airway). Select the appropriate negative pressure setting:
    - Infant = 60-100 mmHg
    - Child = 100 - 120 mmHg
    - Adult = 100-150 mmHg

Procedure

Closed Suctioning:

- ☐ Support the endotracheal tube (ETT) or tracheostomy tube with one hand and then grasp the catheter and advance the catheter slowly until there is a cough reflex or resistance is met. Do not suction while advancing the catheter.
- ☐ Withdraw 0.5 cm, activate suctioning and gently pull back slowly until the suction catheter is fully retracted (10 seconds or less).
- ☐ Re-oxygenate the patient between suctioning events.
- ☐ Clean the catheter with saline thoroughly prior to the next attempt (if applicable).

Open Suctioning:

- ☐ Lubricate the catheter with water/saline.
- ☐ Gently advance the catheter into the ETT or Tracheostomy tube until cough reflex or resistance is met. Do not suction while advancing the catheter.
- ☐ Withdraw the suction catheter approximately 0.5 cm.
- ☐ Begin suctioning and gently withdraw the catheter continuously with a twisting motion for a maximum of 10 seconds or until the suction catheter is removed from the ETT or tracheostomy tube.
- ☐ Re-oxygenate the patient between suction attempts.
- ☐ Rinse the catheter thoroughly in sterile water or normal saline prior to each attempt.

External Jugular Venous Access

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 10mL syringe with normal saline
- ☐ Gauze dressing
- ☐ Sharps container
- ☐ Transparent sterile dressing
- ☐ Alcohol swabs
- ☐ IV catheter (appropriate size)
- ☐ Tape

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Place the patient in a supine position with the head turned away from the side being accessed.
- ☐ Cleanse the site with an alcohol swab. Maintain aseptic technique throughout.

Procedure

- ☐ Align the IV catheter with the vein to be punctured.
- ☐ Manually occlude the vein at the proximal end, just above the clavicle, with the index finger of the non-dominant hand. Use the thumb of the same hand to anchor the distal end of the vein.
- ☐ Puncture the vein in the middle, between the angle of the jaw and the clavicle. To prevent the vein from rolling, puncture from the side. Maintain a 5-10-degree angle throughout the puncture.
- ☐ Observe early for flashback along the catheter and/or flash chamber.
- ☐ Upon flashback, lower the catheter parallel with the skin and advance approximately 2 mm.
- ☐ Slide the catheter over the needle and into the vein while maintaining the anchor with the index finger and thumb.
- ☐ Remove the needle from the catheter and dispose of it in a sharps container.
- ☐ Release the non-dominant hand anchor and use the index finger to occlude the catheter hub to prevent air from entering the venous system. The thumb can be used to manually stabilize the catheter hub at the same time.
- ☐ Secure the catheter and utilize it as required.
- ☐ Assess for patency using a normal saline flush or drip set.

Intraosseous (EZ-IO®) Cannulation

Equipment

- ☐ 10 ml syringe filled with normal saline
- ☐ Appropriate PPE
- ☐ Alcohol swabs
- ☐ Dressings x2, tape, splint and gauze if no securing device

- ☐ Extension set
- ☐ EZ-IO® driver with assorted EZ-IO® needles and required accessories as per manufacturer
- ☐ Pressure bag for infusing fluids or 30-60 ml fluid bolus
- ☐ Sharps container

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Explain procedure and expected outcome to patient/guardian.
- ☐ Obtain consent (if possible)
- ☐ Locate and prep the appropriate site using aseptic technique: As authorized by local Base Hospital.
- ☐ Select appropriate gauge needle and attach to drill:

    1. EZ-IO® 45 mm Needle Set (*yellow* hub) should be considered for proximal humerus insertion in patients ≥40 kg or patients with excessive tissue over any insertion site.
    2. EZ-IO® 25 mm Needle Set (*blue hub*) should be considered for patients ≥3 kg.
    3. EZ-IO®15 mm Needle Set (*pink hub*) should be considered for patients 3-39 kg.

- ☐ Attach needle to driver.
- ☐ Insert needle.

Proximal Tibia – Adult and Pediatric <12 years of age

Adult:

- ☐ Landmark anteromedial aspect of tibia, approximately 2 cm medial to the tibial tuberosity or approximately 3 cm below the patella and approximately 2 cm medial, along the flat aspect of the tibia.

- ☐ Aim the needle set at a 90-degree angle to the bone. Push the needle set tip through the skin until the tip rests against the bone. **The 5 mm mark must be visible above the skin for confirmation of adequate needle set length.**

- ☐ Gently drill, advancing the needle set approximately 1-2 cm after entry into the medullary space or until the needle set hub is close to the skin

Pediatric:

- ☐ Landmark anteromedial aspect of tibia, approximately 1 cm medial to the tibial tuberosity, or just below the patella (approximately 1 cm) and slightly medial (approximately 1 cm), along the flat aspect of the tibia
- ☐ Gently drill, immediately release the trigger when you feel the loss of resistance as the needle set enters the medullary space.

Proximal Humerus – Adult

- ☐ Landmark by placing the patient's hand over the abdomen (*elbow adducted and humerus internally rotated*).
- ☐ Place palm on the patient's shoulder anteriorly to identify the "ball" under the palm as a general target area.
- ☐ Place the ulnar aspect of one hand vertically over the axilla and the ulnar aspect of the other hand along the midline of the upper arm laterally.
- ☐ Place the thumbs together over the arm to identify the vertical line of insertion on the proximal humerus.
- ☐ Palpate deeply up the humerus to surgical neck then move 1-2 cm proximal to the most prominent aspect of the greater tubercle.
- ☐ Aim the needle set at a 45-degree angle to the anterior plane but 90 degrees to the skin. o Push the needles set tip through the skin until the tip rests against the bone. **The 5 mm mark must be visible above the skin for confirmation of adequate needle set length.**
- ☐ Gently drill into the humerus approximately 2 cm or until the hub is close to the skin; the hub of the needle set should be perpendicular to the skin.

☐ Remove stylet from the catheter in a counter clockwise motion. The catheter should feel firmly seated in the bone (*1st confirmation of proper placement*).

☐ Dispose of stylet into a sharps container.

☐ Apply stabilizer (*if available*) over catheter and attach the primed extension to the catheter hub by twisting clockwise.

☐ Aspirate for bone marrow (*2nd confirmation of proper placement*).

- o If bone marrow is not aspirated then attempt confirmation of intraosseous insertion by other means (*flushes with no extravasation, IO needle at appropriate depth, site and inserted well into bone*).

☐ Flush the device with 10 ml normal saline checking for extravasation.

☐ If no extravasation, attach primed line and secure arm in place across the abdomen.

☐ Initiate infusion of appropriate fluid/drugs based on patient condition:

- o Use a pressure bag inflated to 300 mmHg for fluid infusion.
- o Discontinue infusion if extravasation occurs.

☐ **REMOVAL TECHNIQUE:**

- ☐ Remove extension set and dressing.
- ☐ Stabilize catheter hub and attach a Luer lock syringe to the hub
- ☐ Maintaining axial alignment, twist clockwise and pull straight out. Do **not** rock the syringe.
- ☐ Dispose of catheter with syringe attached into sharps container.
- ☐ Apply pressure to site as needed to control bleeding and apply dressing as indicated.

Intraosseous Cannulation – Driver Device

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 10 ml syringe filled with normal saline
- ☐ Gauze rolls, tape, to splint if no securing device
- ☐ IO needles, and required accessories as per the manufacturer
- ☐ Sharps container
- ☐ Alcohol swabs
- ☐ IO drill/driver
- ☐ securing device (if available)

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Locate and prepare the appropriate site using aseptic technique
- ☐ Select appropriate gauge needle and attach to drill/driver:
    a) 45 mm Needle Set should be considered for proximal humerus insertion in patients ≥40 kg or patients with excessive tissue over any other insertion site
    b) 25 mm Needle Set should be considered for patients ≥3 kg.
    c) 15 mm Needle Set should be considered for patients 3-39 kg.
- ☐ Attach the needle to the drill/driver.

Procedure – Proximal Tibia

Adult:

- ☐ Landmark anteromedial aspect of tibia, approximately 2 cm medial to the tibial tuberosity or approximately 3 cm below the patella and approximately 2 cm medial, along the flat aspect of the tibia.
- ☐ Aim the needle set at a 90-degree angle to the bone. Push the needle set tip through the skin until the tip rests against the bone. The 5 mm mark must be visible above the skin for confirmation of adequate needle set length.
- ☐ Gently drill and apply steady pressure advancing the needle set approximately 1-2 cm after entry into the medullary space or until the needle set hub is close to the skin.

Pediatric (<12 years of age):

- ☐ Landmark anteromedial aspect of tibia, approximately 1 cm medial to the tibial tuberosity, or just below the patella (approximately 1 cm) and slightly medial (approximately 1 cm), along the flat aspect of the tibia.
- ☐ Gently drill and apply steady pressure but immediately release the trigger when you feel the loss of resistance as the needle set enters the medullary space. **The 5 mm mark must be visible above the skin for confirmation of adequate needle set length.**

Procedure – Proximal Humerus

Adult:

- ☐ Prepare by placing the patient's hand over the abdomen (elbow adducted and humerus internally rotated) or position the patient's arm at their side (rotate the patient's thumb medially and place hand under their hip, palm down).
- ☐ Place your palm on the patient's anterior shoulder to identify the "ball" under the palm as a general target area.
- ☐ Place the ulnar aspect of one hand vertically over the axilla and the ulnar aspect of the other hand along the midline of the upper arm laterally.
- ☐ Place the thumbs together over the arm to identify the vertical line of insertion on the proximal humerus.
- ☐ Palpate deeply up the humerus to the surgical neck then move 1-2 cm proximal to the most prominent aspect of the greater tubercle.
- ☐ The needle should be placed 2 cm above the surgical neck into the greater tubercle at about 45 degrees to the anterior plane (opposite hip).
- ☐ Push the needle set tip through the skin until the tip rests against the bone. **The 5 mm mark must be visible above the skin for confirmation of adequate needle set length.**
- ☐ Gently drill with steady pressure into the humerus approximately 2 cm or until the hub is close to the skin at a perpendicular angle.
- ☐ Remove stylet from the catheter by twisting in a counterclockwise motion. The catheter should feel firmly seated in the bone (1st confirmation of proper placement).
- ☐ Dispose of stylet into a sharps container.
- ☐ Attach the primed extension to the catheter hub by twisting clockwise.
- ☐ Aspirate for bone marrow (2nd confirmation of proper placement).
    - If bone marrow is not aspirated then attempt confirmation of intraosseous insertion by other means (*flushes with no extravasation, IO needle at the appropriate depth, site and inserted well into bone*).
- ☐ Flush the device with 10 ml of normal saline checking for extravasation.
- ☐ Secure the catheter in place using gauze rolls or stabilizer (if available) over catheter
- ☐ If the proximal humerus site has been utilized, secure the arm in place.

Removal Technique

- ☐ Disconnect all securing devices and attachments.
- ☐ Stabilize the catheter hub and attach a luer lock syringe to the hub.
- ☐ Maintaining axial alignment, rotate the syringe clockwise (to the right) utilizing gentle upward traction until the needle is removed. Do not rock the syringe.
- ☐ Place the needle into a specifically designed locking device or dispose of into a sharps container.
- ☐ Apply pressure to the site as needed to control bleeding and apply dressing as indicated.

Intravenous Cannulation

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 0.9% normal saline bag (if applicable)
- ☐ Adhesive bandage
- ☐ Appropriate size IV catheter
- ☐ Saline lock (if applicable)
- ☐ Sterile 2x2 gauze dressing
- ☐ Transparent sterile dressing
- ☐ 10 cc syringe (if applicable)
- ☐ Alcohol swabs
- ☐ IV administration set (if applicable)
- ☐ Sharps container
- ☐ Tape
- ☐ Tourniquet

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Prime the saline lock or the IV solution administration set connected to the IV solution bag.
- ☐ Place the sharps container on your dominant hand side.
- ☐ Select the appropriate vein and IV catheter size for IV cannulation.

Procedure

- ☐ Apply a tourniquet above the joint, proximal to the location for IV cannulation.
- ☐ Inspect the integrity of the catheter and needle.
- ☐ Aseptically clean the insertion site with an alcohol swab.
- ☐ Stabilize the vein throughout the procedure by applying with tension parallel and/or adjacent to the vein.
- ☐ Using an appropriate angle of entry for IV insertion, puncture the skin with the catheter, bevel side up.
- ☐ Observe for flashback
- ☐ Lower the angle of the IV catheter and advance the cannula about 2 mm into the vein.
- ☐ While keeping the needle in place, advance the catheter into the vein, stabilizing the vein throughout.
- ☐ Release the tourniquet.
- ☐ Apply transparent sterile dressing to protect the puncture site and give some stability to the catheter, tenting the transparent dressing around the catheter hub.
- ☐ Place sterile 2x2 gauze dressing under the cannula hub for support and collection of blood (if required).
- ☐ Occlude the vein above the tip of the catheter with fingertip pressure (if applicable) and hold the hub of the catheter with the non-dominant hand. Remove the needle stylet with the dominant hand and dispose of the needle immediately into a sharps container.
- ☐ Assess for patency using a normal saline flush or IV drip set.

Medication Administration: Baqsimi Intranasal Glucagon

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label

routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment Required
Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Basqsimi pre-filled 3 mg glucagon

Preparation
Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Remove the shrink wrap by pulling on red stripe
- ☐ Open the lid and remove the device from the tube
- ☐ Hold the device between fingers and thumb

Procedure

- ☐ Insert the tip gently in one of the nostrils until fingers touch the outside of the nose
- ☐ Push the plunger all the way in
- ☐ The dose is complete when the green line is no longer showing at the bottom of the device
- ☐ Remove tip from nose and discard the device and tube

Medication Administration: Buccal

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment
Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Alcohol swab
- ☐ Gauze or Ampule Cracker (if applicable)
- ☐ Sharps container
- Blunt tip needle
- Medication
- Syringe

Preparation
Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

Syringe Technique

- ☐ Attach a blunt tip needle to an appropriately sized syringe.

☐ Fill the syringe to the desired volume, ensuring there is no air in the syringe. Be cautious of any medication overflow/spray.
☐ Remove the blunt tip needle and dispose in a sharps container.
☐ Perform a medication cross-check with your partner, if available.
☐ Dispose of the ampule/vial into a sharps container.

Film

☐ Remove medication from the packaging.

Procedure

Syringe Technique

☐ Place the patient in a head-up or lateral position.
☐ Open the patient's mouth.
☐ Stabilize the patient's head using the non-dominant hand.
☐ Insert the syringe tip into the patient's mouth, placing the tip between the patient's gum and cheek.
☐ Depress the plunger slowly in a sweeping motion along the buccal mucosa until the entire dose is administered.
☐ Dispose of the syringe into a sharps container.

Film

☐ Place the medication in the patient's mouth, between the patient's gum and cheek.
☐ Instruct the patient to allow the film to dissolve.

Medication Administration: Intranasal (IN)

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Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

☐ Alcohol Swabs
☐ Blunt Tip Needle
☐ Mucosal Atomizer Device
☐ Syringe (1 ml, 3 ml)
☐ Ampule or vial of medication
☐ Gauze or Ampule Cracker (if applicable)
☐ Sharps Container

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

Syringe Technique

☐ Attach a blunt tip needle to an appropriately sized syringe.

- ☐ Fill the syringe to the desired volume, ensuring there is no air in the syringe. Be cautious of any medication overflow/spray.
- ☐ Remove the blunt tip needle and dispose in a sharps container.
- ☐ Attach the atomizer to the syringe.
- ☐ Perform a medication cross-check with your partner, if available.
- ☐ Dispose of the ampule/vial into a sharps container.

Prepared Intranasal Device

- ☐ Remove the protective wrap from the device.
- ☐ Open the lid and remove the device from the tube.
- ☐ Hold the device between fingers and thumb.

Procedure

Syringe Technique

- ☐ Stabilize the patient's head with your non-dominant hand.
- ☐ Insert the atomizer into a nare and administer up to 1mL of medication per nare.
- ☐ Ensure that a reasonable amount of force is applied when depressing the plunger of the syringe in order to properly atomize the medication.
- ☐ Dispose of the atomizer and syringe into a sharps container.

Prepared Intranasal Device

- ☐ Stabilize the patient's head with the non-dominant hand.
- ☐ Insert the tip gently in one of the nares until fingers touch the outside of the nose
- ☐ Using a reasonable amount of force, completely depress the plunger.
- ☐ Remove the intranasal device from the nare and discard the device and tube.

Medication Administration: Intravenous

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Alcohol swabs
- ☐ Blunt tip needle
- ☐ Normal saline for flushing

Appropriate size syringe

Medication, which could be supplied as a preload, an ampule, or a vial

Sharps container

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Remove the dust cap of the vial, or use a gauze/ampule cracker to safely crack the ampule and dispose of the top into a sharps container.
- ☐ If using a vial, clean the top of the vial with an alcohol swab.
- ☐ Attach a blunt tip needle to an appropriately sized syringe.
- ☐ Fill the syringe to the desired volume, ensuring there is no air in the syringe. Be cautious of any medication overflow/spray.
- ☐ Remove the blunt tip needle and dispose into a sharps container.
- ☐ If the medication requires dilution, draw up the required amount of saline using an aseptic technique with a new blunt-tip needle.
- ☐ Perform a medication cross-check with your partner, if available.
- ☐ Dispose of the ampule/vial into a sharps container.

Procedure

- ☐ Confirm patency of IV line or saline lock.
- ☐ Clean the luer lock or IV port on the main IV line nearest to the patient that will be used as a connection point to administer the medication with an alcohol swab.
- ☐ Connect the medication:

For IV Line:

- Occlude the IV line between the medication port being used and the IV solution bag.
- Administer the appropriate volume (dose) of the medication over the appropriate time frame.
- Flush the IV line with an appropriate volume of normal saline.

For Saline Locks:

- Administer the appropriate volume (*dose*) of the medication over the appropriate time frame.
- Flush the saline lock with an appropriate volume of normal saline.

IV bag 0.9% NS or D5W (mini bag) preparation and administration:

- Cleanse the injection port of the 0.9% NS bag or D5W bag with an alcohol swab.
- Insert the needle of the syringe with the prepared medication into the bag via the injection port and inject the prepared dose.
- Ensure only a single dose is prepared in the bag and is appropriately labelled:
  - Medication name.
  - Medication dose.
  - Time initiated.
  - Paramedic name and initials.
- Attach a drip set to the bag with medication and prime the line.
- Attach the drip set to the IV line or saline lock using an aseptic technique.
- Open the roller clamp and set the desired drip rate based on the time required for the specific medication to be infused.

Medication Administration: Intramuscular Injection

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Adhesive bandage
- ☐ Ampule cracker (if applicable)
- ☐ Appropriately-sized syringe
- ☒ Gauze
- ☐ Alcohol Swab
- ☐ Appropriately-sized needle
- ☐ Blunt-tip needle
- ☐ Sharps container

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Draw up the medication using an appropriately sized syringe and blunt tip needle.
- ☐ Fill the syringe to the desired volume, ensuring there is no air in the syringe. Be cautious of any medication overflow/spray.
- ☐ Perform a medication cross-check with your partner, if available.
- ☐ If using a blunt tip needle, remove it and dispose of it in a sharps container. Then, apply the appropriately sized needle for injection.
- ☐ Dispose of the ampule/vial into a sharps container.
- ☐ Select an appropriate injection site for the medication volume and patient size.
- ☐ Cleanse the injection site using an aseptic technique.

Procedure

- ☐ Using the Z-track method, apply tension to the skin by pulling laterally away from the injection site until the dermis is taught over the injection site.
- ☐ Insert the needle swiftly, using a dart-like motion and well into the muscle tissue at a 90-degree angle.
- ☐ Depress the plunger slowly until the entire dose is administered and then release the skin tension.
- ☐ Wait a few seconds before smoothly pulling out the needle and releasing the skin. Dispose of the syringe into a sharps container.
- ☐ Apply pressure to the site with a piece of gauze (do not massage the site).
- ☐ Apply an adhesive bandage to the injection site.

Note:

Maximum volume per site:

- Adult
  - Vastus Lateralis: 5 mL
  - Deltoid: 2.5 mL

- Pediatric
  - Vastus lateralis:
  - Deltoid: 1 mL

Medication Administration: Metered Dose Inhaler (MDI)

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment

- ☐ Aerochamber
- ☐ BVM with MDI adaptor
- ☒ Inhalation Aerosol Medication
- ☐ Oxygen Source
- ☐ Appropriate PPE
- ☐ Face mask (if required)
- ☐ MDI
- ☐ Stethoscope

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Explain procedure and expected outcome to patient.
- ☐ Obtain consent.
- ☐ Ensure safe practice of medication administration process is utilized.

To prime inhalation aerosol medication:

- ☐ Shake the inhaler well and discharge 4 sprays away from you and the patient, into the air

Using an Aerochamber:

- ☐ As you insert the MDI of the inhaler into the Aerochamber, ask the patient to slowly breathe out as much as possible (without inducing a coughing spell).
- ☐ Bring the Aerochamber to the patient's mouth. Ask the patient to place the mouthpiece of the aerochamber in the mouth, between the teeth and seal with the lips. If the patient is unable to do this, use a face mask with the aerochamber.
- ☐ Instruct the patient to breathe in slowly and administer 1 puff of the medication into the aerochamber. Instruct the patient to continue to breath in/out and wait until at least 4 breaths have been taken prior to taking the aerochamber away for a break.
- ☐ Shake the inhaler for 30 - 60 seconds or follow manufactures direction prior to delivering another puff, in order to allow the MDI to properly recharge

☐ Repeat the above steps for subsequent puffs until the appropriate full dose of the medication is delivered as per the Medical Directive.

Using a BVM:

☐ Attach MDI BVM adaptor to 15 mm connector of the BVM and then to the face mask.
☐ Prime inhaler as needed.
☐ Shake MDI canister well prior to the delivery of the first puff.
☐ Insert MDI canister into BVM adaptor and deliver 1 puff of medication.
☐ Remove MDI canister from BVM adaptor and shake (or delegate shaking) for 30 - 60 seconds or follow
manufactures direction
☐ Continue with Positive Pressure Ventilations (PPV)
☐ Repeat the above steps for subsequent puffs until the appropriate full dose of the medications is delivered as per the medical directive.

Medication Administration: Nebulized (Neb)

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment

☐ Appropriate PPE
☐ Gauze or Ampule Cracker
☐ Nebulizer Mask
☐ Sharps Container
☐ Blunt Tip Needle
☐ Medication (nebule or ampule)
☐ O_2 Source
☐ Syringe (3 ml, 5 ml, 10 ml)

PROCEDURE:

☐ Don appropriate PPE.
☐ Gather all required equipment
☐ Explain procedure and expected outcome to patient.
☐ Obtain consent.
☒ Ensure safe practice of medication administration process is utilized.

For nebule medication:

☐ Remove the top of the nebule, using a twisting motion and dispose of the top appropriately.

- ☐ Remove nebulizer chamber from the nebulizer mask and open it.
- ☐ Empty the contents of the nebule(s) into the chamber. Close it and re-attach it to the nebulizer mask.
- ☐ Dispose of the nebule into the sharps container

For ampule medication:

- ☐ Use a gauze or an ampule cracker to safely crack the ampule(s) and dispose of the top(s) into a sharps container
- ☐ Attach the blunt tip needle to the syringe and draw up the required dosage.
- ☐ Remove the blunt tip needle from the syringe and dispose into the sharps container.
- ☐ Remove the nebulizer chamber from the nebulizer mask
- ☐ Empty the syringe into the nebulizer chamber and reattach it to the nebulizer mask.

☐ Attach oxygen tubing to oxygen source and select a flow rate of 6-8 liters per minute. When the mask begins to mist, apply to patient's face

Medication Administration: Subcutaneous Injection (SC)

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Adhesive bandages
- ☐ Ampule or vial of medication
- ☐ Blunt-tip needle
- ☐ Needle 25G-27G, 3/8" – 5/8"
- ☐ Alcohol swabs
- ☐ Appropriate size syringe
- ☐ Gauze/ampule cracker
- ☐ Sharps container

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Remove the top of the vial, or use a gauze/ampule cracker to safely crack the ampule and dispose of the top into a sharps container.
- ☐ If using a vial, clean the top of the vial with an alcohol swab.
- ☐ Attach a blunt tip needle to an appropriately sized syringe.
- ☐ Fill the syringe to the desired volume, ensuring there is no air in the syringe. Be cautious of any medication overflow/spray.

- ☐ Remove the blunt tip needle, dispose into a sharps container, and apply the appropriate needle for injection.
- ☐ Perform a medication cross-check, if available.
- ☐ Dispose of the ampule/vial into a sharps container.

Procedure

- ☐ Select and landmark an appropriate site for the injection.
- ☐ Cleanse the insertion site in an aseptic manner.
- ☐ Hold the syringe in your dominant hand.
- ☐ With your non-dominant hand, pinch the skin and insert the needle bevel-up at a 45-degree angle until the syringe is well into subcutaneous tissue.
- ☐ Stabilize the syringe with the fingers of your non-dominant hand and proceed with the injection.
- ☐ Withdraw the syringe with the needle at the same angle of insertion and dispose into a sharps container.
- ☐ Cover with a self-adhesive bandage.

Medication Administration: Sublingual (SL)

The ALS PCS may show that some medications can be administered via a different route than what is on the medication label or in the drug monograph. The OBHG MAC occasionally approves off-label routes for the administration of some medications if current evidence supports it. This includes, but is not limited to: ketamine, tranexamic acid, dexamethasone and ketorolac

Equipment

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ Medication

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

Spray:

- ☐ Do not shake the container.
- ☐ Prime the device, if applicable, before use by releasing a test spray away from your face and other people.
- ☐ Perform a medication cross-check with your partner, if available.

Tablet:

- ☐ Prepare the appropriate dose of medication in a sterile manner.
- ☐ Perform a medication cross-check with your partner, if available.

Procedure

Spray:

- ☐ Instruct the patient to open their mouth and lift their tongue to the roof of their mouth.
- ☐ Bring the container as close to under the tongue as possible.
- ☐ Deliver the appropriate number of sprays under the patient's tongue.
- ☐ Instruct the patient not to:
  - ☐ inhale or breathe in the spray.
  - ☐ immediately swallow.
  - ☐ rinse their mouth for at least 5 to 10 minutes.

Tablet:

- ☐ Instruct the patient to open their mouth and lift their tongue to the roof of their mouth.
- ☐ Place the tablet(s) under the patient's tongue.
- ☐ Advise the patient to let it dissolve under their tongue.

Modified Valsalva Maneuver

Equipment Required

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 10 ml syringe

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Position the patient in a semi-recumbent (45-degree) position.

Procedure

- ☐ Instruct the patient to perform a forced expiration into a 10 ml syringe for 15 seconds.
- ☐ At the end of the forced expiration put the syringe aside and lay the patient supine. Simultaneously, elevate the patient's straight legs to a 45-degree angle for 15 seconds.
- ☐ Return the patient to a semi-recumbent (45-degree) position for 45 seconds.

Nasotracheal Intubation (NTI)

EQUIPMENT REQUIRED:

- ☒ 10 ml syringe
- ☐ Cardiac Monitor
- ☐ Lidocaine Spray
- ☐ Bag-Valve Mask with Barrier Filter
- ☐ ETCO2 Device (quantitative or qualitative)
- ☐ Method to secure the tube (mechanical device, tape)

- ☐ Nasotracheal tubes
- ☐ Stethoscope
- ☐ Tube extender
- ☐ Xylometazoline Spray
- ☐ PPE
- ☐ Suctioning equipment
- ☐ Water-based Lubricant

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment
- ☐ Assess the patient's airway to determine the ease of intubation (i.e. LEMON).
- ☐ Assemble equipment.
- ☐ Prepare all intubation equipment, including back up airway management options, in the event that the intubation is unsuccessful.
- ☐ Prepare suctioning equipment.
- ☐ Prepare and test suctioning device.
- ☐ Pre-oxygenate the patient using Positive Pressure Ventilation (PPV) with high flow O2.
- ☐ Position the patient appropriately (external meatus of the ear aligned with the sternal notch) with the head of the bed elevated, if no contraindications exist
- ☐ Administer 2 sprays of Xylometazoline into each nare.
- ☐ Administer topical Lidocaine (maximum 5 mg/kg) into the nares and hypopharynx
- ☐ Choose the appropriate size NTT and test the cuff for integrity. Make sure cuff is fully deflated prior to procedure.
- ☐ Lubricate the distal end of the NTT.
- ☐ Visually inspect and select the nare that looks to have the biggest diameter pathway into the pharynx. Inspect for septal deviation at the same time.
- ☐ Insert the NTT directly backward, over the superior surface of the hard palate.
- ☐ Once the NTT enters the posterior nasopharynx, pull the trigger of the NTT to avoid damaging the adenoids located in the rear of the pharynx.
- ☐ Advance the NTT until the patient's breath sounds can be heard through the NTT.
- ☐ During inhalation, advance the NTT into the larynx and trachea. If unable to pass the tube into the trachea, pull back until breath sounds are heard again
- ☐ If the patient is maintaining an adequate SPO2 level, and you have not exceeded the 30 seconds time frame, attempt to pass the NTT into the trachea again. Upon successful intubation of the trachea, the patient will likely cough
- ☐ Inflate the cuff of the NTT with approximately 6-8 ml of air, using a 10 ml syringe.
- ☐ Confirm the placement of the NTT using a 5-point auscultation, look for chest rise and attach ETCO2
- ☐ Secure the NTT with tape or an approved mechanical device
- ☐ If unsuccessful after 30 seconds, stop and re-oxygenate the patient.
- ☐ The maximum number of intubation attempts is 2 per patient.

Needle Thoracostomy

Equipment Required
Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 0.9% Normal saline (optional)
- ☐ Blunt tip needle for saline (optional)
- ☐ Sharps container
- ☐ Vented chest seal
- ☐ Alcohol/Betadine swab
- ☐ Needle (12G or 14G) minimum 2.5”
- ☐ Syringe

Preparation
Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Perform appropriate oxygenation and ventilation during preparation.
- ☐ Partially fill a syringe with saline (optional) and attach the syringe to the needle.
- ☐ Landmark point of insertion:
  - Primary site - 4th intercostal space anterior axillary line, superior aspect of the 5th rib
  - Secondary site - 2nd intercostal space, midclavicular line, superior aspect of the 3rd rib
- ☐ Prepare site with alcohol swab

Procedure

- ☐ Insert a 12G or 14G needle with a syringe attached at a 90-degree angle.
- ☐ Aspirate for air while advancing the catheter.
- ☐ When free air is obtained, advance the needle about 2 mm further to ensure the bevel is through the chest wall.
- ☐ Slide catheter off needle into chest.
- ☐ Remove the needle and syringe and place them immediately into a sharps container.
- ☐ Secure the catheter in place with tape cravats.

Needle Thoracostomy – Turkel Device

Equipment Required
Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 4 x 6 inch gauze rolls
- ☐ Alcohol/Betadine swab
- ☐ Sharps container
- ☐ Turkel
- ☐ #10/11 scalpel (if available and authorized)
- ☐ One-way valve attachment (optional)
- ☐ Tape

Preparation
Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

☐ Perform appropriate oxygenation and ventilation during preparation.
☒ Landmark point of insertion:
- Primary site - 4th intercostal space anterior axillary line, superior aspect of the 5th rib
- Secondary site - 2nd intercostal space, midclavicular line, superior aspect of the 3rd rib

☐ Prepare site with an alcohol swab.
☐ Holding the scalpel vertically, create a dermal puncture where the Turkel will be inserted. (if available and authorized)

Procedure

☐ Using a 90-degree angle, insert the Turkel at the landmark point and/or through the scalpel
incision. Keep advancing until you get a colour change on the indicator from red to green.
Advance 1 cm more to ensure placement in the pleural space.
☐ Stabilize the needle with one hand and advance the catheter into the pleural space completely.
☐ Withdraw the needle and dispose of it in the sharps container
☐ Ensure the one-way valve is open to allow air to release.
☐ Secure system for transport with gauze rolls and tape.

Orotracheal Intubation

Equipment Required
Set up equipment and ensure provider safety by applying appropriate PPE

☐ 10 ml syringe
☐ Bag-Valve Mask with Filter
☐ Endotracheal Tube Introducer (i.e. bougie or stylet)
☐ Laryngoscope with blade
☐ Pillow +/- blankets (for positioning)
☐ Suctioning equipment
☐ Water-based lubricant
☐ A method to secure the ETT (i.e commercial device or tape)
☐ Endotracheal tubes (various sizes)
☐ ETCO2 Device
☐ Lidocaine Spray
☐ Stethoscope
☐ Tube extender
☐

Preparation
Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

☐ Assess the patient's airway to determine the ease of intubation (i.e. LEMON).
☐ Assemble equipment.

☐ Prepare and test all intubation equipment, including backup airway management options, in the event that the intubation is unsuccessful.
☐ Prepare and test suctioning equipment.
☐ Pre-oxygenate the patient using Positive Pressure Ventilation (PPV) or nasal cannula with high flow O2.
☐ Position the patient appropriately (external meatus of the ear aligned with the sternal notch) with the head of the bed elevated, if no contraindications exist.
☐ Choose the appropriate size laryngoscope blade and test the light for luminance.
☐ Choose the appropriate ETT size and test the cuff for integrity.

Optional: Insert lubricated stylet into ETT to no more than 2.5cm from the tip of the ETT.

☐ Lubricate the distal end of the ETT.
☐ Consider topical lidocaine administration.
☐ Remove the patient's dentures before performing laryngoscopy.

Procedure

☐ Open the patient's mouth with the right hand.
☐ Grasp the laryngoscope with the left hand.

If Utilizing Curved Blade (Macintosh) Technique:

☒ Insert the blade between the teeth, being careful not to come in contact with the teeth.
☐ Pass the blade to the right of the tongue, advancing the blade into the hypopharynx, pushing the tongue to the left of the patient's mouth.
☐ Advance the blade, watching for the epiglottis to appear. Position the tip of the blade in the vallecula.
☐ Lift the laryngoscope upward and forward and slightly to the left, avoiding using the patient's teeth as a fulcrum.
☐ Insert the ETT to the right of the blade, through the vocal cords.
☐ If a stylet was used, remove the stylet while manually holding the ETT in place.

If Utilizing Straight Blade Technique:

☐ Follow the steps outlined above, but advance the blade down the hypopharynx, and lift the epiglottitis with the tip of the blade to expose the vocal cords.

If Utilizing an Introducer Device (Bougie):

Method #1

☐ Open the mouth and with the laryngoscope in the left hand and gently insert the blade into the patient's mouth.
☐ Attempt to displace the mandible and hypopharyngeal structures to reveal the glottis opening, without using the patient's teeth as a fulcrum.
☐ Hold the introducer with your right hand and insert it from the right corner through the vocal cords.
☐ Advance the introducer to an average depth of 25-30 cm, no more than the 40 cm mark or until tracial rings are felt or you feel resistance (carina).
☐ Ask your partner to place the ETT over the introducer and to slide the ETT to the lip line.
☐ While the partner holds the introducer in place, advance the ETT until it reaches the appropriate depth.

☐ If resistance is met above the glottis opening, rotate the ETT counter-clockwise a ¼ turn to minimize damage to the soft tissues (arytenoids).
☐ Ask your partner to remove the introducer while you holding the ETT in place.

Method #2:

☐ "Load" the introducer into the ETT tube; making sure to insert it past the end.
☐ Open the mouth and with the laryngoscope in the left hand, gently insert the blade into the patient's mouth.
☐ Attempt to displace the mandible and hypopharyngeal structures to reveal the glottis opening, without using the patient's teeth as a fulcrum.
☐ Hold the introducer and ETT with your right hand and insert the introducer from the right corner through the vocal cords.
☐ Ask your partner to hold the end of the introducer.
☐ While the partner holds the inducer in place, advance the ETT until it reaches the appropriate depth.
☐ If resistance is met above the glottis opening, rotate the ETT counter-clockwise a ¼ turn to minimize damage to the soft tissues.

Complete Insertion:

☐ Inflate the cuff of the ETT with approximately 6-8 ml of air.
☐ Attach BVM and begin PPV with a high concentration of O2.
☐ Confirm placement via ETCO2 (waveform capnography if available), auscultation and chest rise. Confirm placement of the ETT by auscultation, visualizing chest rise and/or ETCO2.
☐ Secure the ETT with tape or an approved tube holder device, as per the manufacturer's recommendations.
☒ If ETT is unsuccessful after 30 seconds, stop, re-oxygenate the patient and consider repeating the procedure to a maximum of 2 attempts per patient.

Pediatric Intraosseous (Manual Technique)

Equipment Required

Set up equipment and ensure provider safety by applying appropriate PPE

☐ 10 ml syringe filled with normal saline
☐ Alcohol swabs
☐ Dressing x2, tape, splint and gauze if no securing device
☐ IV administration set and solution
☐ Prefilled Saline Lock (optional)
☐ Sharps Container
☐ 30-60 ml syringe for fluid bolus (if applicable)
☐ Blunt cannula
☐ IO needle 16g or 18g
☐ Normal Saline bag (if applicable)
☐ Pressure infuser

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Locate the appropriate site: Proximal tibia site- located approximately 2 cm below the tibial tuberosity on the anteromedial aspect of the leg along the flat aspect of the tibia.
- ☐ Clean the site with an aseptic technique.
- ☐ Select the appropriate gauge needle:
    - *A.* < 1 year *(appropriate gauge as per manufacturer)* 18g.
    - *B.* > 1 year *(appropriate gauge as per manufacturer)* 16g.

- ☐ Stabilize the bone with the non-dominant hand-index finger and thumb on either side of the tibia. In addition, it may be required to place a towel roll or sheet under the knee to assist with stabilization.
- ☐ As a safety precaution, do not place your hand under the site to stabilize.

Procedure

- ☐ Insert IO at 90 degrees through the skin.
- ☐ Direct caudally away from the epiphyseal plate, begin a twisting motion with medium pressure.
- ☐ Stop insertion once a loss of resistance is felt (tactile pop); this signifies the needle is within the marrow.
- ☐ Remove the stylet and twist down the stabilizer (if needed). The catheter should feel firmly seated in the bone (1st confirmation of proper placement).
- ☐ Attach the prefilled saline lock (optional) with a 10 ml syringe filled with saline to IO.
- ☐ Aspirate for bone marrow.
- ☐ If bone marrow is not aspirated, then attempt confirmation of intraosseous insertion by other means (flushes with no extravasation, IO needle at an appropriate depth, and inserted well into bone).
- ☐ Flush with 8-10 ml NS in a syringe
- ☐ Secure IO catheter in place.
- ☐ Connect the IV set with the pressure infuser.
- ☐ Fluid administration may be provided under a pressure infuser of 300 mmHg maximum or by a syringe to bolus for a more accurate method.

Scalpel Bougie-Assisted Cricothrotomy

Equipment Required

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ 10 ml Syringe
- ☐ Bag Valve Mask with filter
- ☐ Dressings
- ☐ Scalpel
- ☐ #6.0 ETT
- ☐ Bougie
- ☐ ETCO2 Device
- ☐ Sharps container

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Pre-oxygenate the patient.
- ☐ Hyperextend the neck, (if not contraindicated) and locate the cricothyroid membrane by palpating the depression immediately below the prominence of the thyroid cartilage.
- ☐ Find the cricothyroid ligament; (in the midline between the thyroid cartilage and the cricoid cartilage) this is the puncture site.
- ☐ Prepare site with alcohol wipe.

Procedure

- ☐ Stabilize the thyroid cartilage with non-dominant hand.
- ☐ With dominant hand holding scalpel, rest the wrist/forearm on the patient's sternum for stability.
- ☐ Make a 4 cm vertical incision through the skin over the cricothyroid membrane.
- ☐ Palpate the cricothyroid membrane and bluntly dissect through the subcutaneous tissue using a finger until the membrane is readily identifiable. Puncture the membrane with the scalpel held horizontally.
- ☐ Remove the scalpel and place a little finger in the incision in the membrane to dilate and to identify the posterior wall cartilage. Ignore any bleeding at this point.
- ☐ Slide the bougie alongside the little finger into the trachea.
- ☐ Remove the finger and pass the endotracheal tube over the bougie and into the trachea. Only advance the endotracheal tube until the balloon is within the airway and no longer visible.
- ☐ Inflate the balloon with a 10 ml syringe.
- ☐ Holding the endotracheal tube firmly, remove the bougie and connect a bag-valve mask. Confirm endotracheal tube placement with end-tidal CO2 monitoring, auscultation, bilateral chest rise and fall, and misting of the tube.
- ☐ Control any hemorrhage with sterile dressings.

Supraglottic Airway (SGA)

Equipment Required

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ SGA (appropriately sized)
- ☐ 60 ml syringe (if applicable)
- ☐ A method to secure the SGA (i.e Mechanical device or tape)
- ☐ Water-based lubricant
- ☐ O2 source
- ☐ Pillow +/- blankets (for positioning)
- ☐ Bag-Valve Mask with Barrier Filter
- ☐ ETCO2 Device
- ☐ Stethoscope
- ☐

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Select a correctly-sized SGA based on height and/or weight of patient based on manufacturer guidelines
- ☐ Test the integrity of the cuffs by adding an appropriate maximum volume of air into the cuff inflation port.
- ☐ Apply lubricate to distal tip and posterior aspect of tube, avoid placing lubricant near ventilation aperture.
- ☐ Position patient appropriately (sniffing or neutral)

Procedure

- ☐ With the non-dominant hand, hold mouth open and apply chin lift.
- ☐ Hold SGA with dominant hand and introduce tip into corner of mouth.
- ☐ Advance tip into the oral cavity, behind base of tongue, rotating the tube to midline as it reaches posterior pharynx.
- ☐ Advance the tube slowly and smoothly until base of connector is aligned with teeth or gums.
- ☐ Inflate cuff with sufficient air to seal the airway (as indicated on SGA device).
- ☐ Attach BVM with filter and assess ventilation.
- ☐ If necessary, while ventilating the patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure).
- ☐ Secure tube. Place bite block to protect SGA.
- ☐ Confirm placement via ETCO2 (waveform capnography if available), auscultation and chest rise.

Supraglottic Airway: i-gel

Equipment Required

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ i-gel SGA (appropriately sized)
- ☐ Securing device or tape
- ☐ Water-based lubricant
- ☐ Suction equipment
- ☐ O_2 source
- ☐ Pillow +/- blankets (for positioning)
- ☐ Bag-valve mask with filter
- ☐ $ETCO_2$ device
- ☐ Stethoscope

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Add lubricant to the cradle channel.
- ☐ Apply lubricant from the cradle to the front and back of the distal tip, sides and spine of the device.
- ☐ Position the patient to facilitate insertion (sniffing position).
- ☐ Suction the oropharynx.
- ☐ Position the device so that the i-gel cuff outlet is facing toward the chin of the patient.

Procedure

- ☐ With the non-dominant hand, gently push the chin down before insertion.
- ☐ Introduce the leading soft tip into the mouth towards the hard palate.
- ☐ Glide the device downwards and backward along the hard palate with a continuous but gentle push until definitive resistance is felt (teeth resting on integral bite block).
- ☐ Attach BVM with filter and assess ventilation.
- ☐ Confirm placement using primary or secondary methods
- ☐ Secure the i-gel with the appropriate device or tape.

Surgical Airway: Portex® Cricothyrotomy

Equipment Required

Set up equipment and ensure provider safety by applying appropriate PPE

- ☐ PORTEX Kit
- ☐ O_2 source
- ☐ Stethoscope
- ☐ Water-based lubricant
- ☐ ETC02 Device
- ☐ Bag-v Valve Mask with filter
- ☐ Sharps container
- ☐ alcohol swab

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ Gather all required equipment.
- ☐ Prepare equipment (including; inflating the bulb and lubricating the introducer)
- ☐ Pre-oxygenate the patient.
- ☐ Hyperextend the neck, (if not contraindicated) and locate the cricothyroid membrane by palpating the depression immediately below the prominence of the thyroid cartilage. Find the cricothyroid ligament; (in the midline between the thyroid cartilage and the cricoid cartilage) this is the puncture site.
- ☐ Prep the site with an alcohol wipe.
- ☐ Stabilize the trachea between the thumb and the forefinger and locate the cricothyroid membrane by palpation of the depression immediately below the prominence of the thyroid cartilage.
- ☐ Make a 2 cm long horizontal incision through the skin only, over the cricothyroid membrane.
- ☐ Hold the device with the thumb on the needle hub and forefingers under the tube flange.
- ☐ Position the needle tip above the cricoid membrane perpendicular to the incision.

- ☐ Insert the device while constantly observing the red indicator flag in the needle hub. (This indicates contact of the needle tip with tissue).
- ☐ Advance the device until the red indicator flag in the needle hub disappears, confirming entry into the trachea
- ☐ Carefully continue insertion until the red indictor is seen again, indicating contact with the posterior cartilage.
- ☐ Angle the device towards the patient legs and advance another 1-2 cm.
- ☐ Remove the needle from the tube.
- ☐ While holding the dilator stationary slide the cricothyrotomy tube off the dilator and into the trachea until it is flush with the skin. (A slight twist of the dilator may assist removal.)
- ☐ Inflate the cricothyrotomy tube cuff with the minimum volume of air to form a seal.
- ☐ Secure the cricothyrotomy tube with the available tube holder.
- ☐ Attach to a 15 mm extension tube, filter and Bag Mask Valve.
- ☐ Initiate PPV via BVM with O2
- ☐ Confirm placement by auscultation and ETCO2 monitoring.
- ☐ Monitor/Revaluate.

Surgical Airway: QuickTrach® Cricothyrotomy

EQUIPMENT REQUIRED

- ☐ Appropriate PPE
- ☐ QuickTrach® Kit
- ☐ Sharps container
- ☐ Alcohol swabs/wipes
- ☐ Tape
- ☐ ETCO2 Device
- ☐ Bag Mask Valve with filter
- ☐ Stethoscope
- ☐ 10 ml Syringe
- ☐ O2 source

PROCEDURE:

- ☐ Don appropriate PPE.
- ☐ ❑ Gather all required equipment.
- ☐ ❑ Prepare equipment.
- ☐ ❑ Pre-oxygenate the patient.
- ☐ ❑ Hyperextend the neck, (if not contraindicated) and locate the cricothyroid membrane by palpating the depression immediately below the prominence of the thyroid cartilage.
- ☐ Find the cricothyroid ligament; (in the midline between the thyroid cartilage and the cricoid cartilage) this is the puncture site.
- ☐ Cleanse the site with an alcohol wipe.
- ☐ Firmly hold device and puncture the cricoid membrane at a 90-degree angle.

- ☐ After puncturing skin , continue advancing the needle and catheter into the cricothyroid space while applying negative pressure on the syringe.
- ☐ Change the angle of insertion to 45 degrees (from the head) and advance the device slowly forward into the trachea to the level of the stopper. (Should no aspiration of air be possible 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.)
- ☐ Remove stopper, 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 and discard into sharps container
- ☐ Attach the extension tube to the Cannula.
- ☐ Attach a bag Mask Valve and filter to the extension and initiate ventilations.
- ☐ Secure Tube using the provided neck strap.
- ☐ Confirm Tube placement by auscultation

Surgical Airway: Needle Cricothyrotomy

EQUIPMENT REQUIRED:

- ☐ Appropriate PPE
- ☐ 14 G catheter over needle
- ☐ Tape
- ☐ 10 ml Syringe
- ☐ Sharps container
- ☐ Stethoscope
- ☐ ETCO2 Device
- ☐ Bag Valve Mask with filter
- ☐ ETT # 3 and # 7 adapter NaCl 10 ml
- ☐ O2 source

PROCEDURE:

- ☐ Don appropriate PPE
- ☐ Gather all required equipment.
- ☐ Prepare the 14 G 1-1/4” catheter by attaching a 10 ml syringe (partially filled with saline – optional).
- ☐ Pre-oxygenate the patient.
- ☐ Hyperextend the neck, (if not contraindicated) and locate the cricothyroid membrane by palpating the depression immediately below the prominence of the thyroid cartilage.
- ☐ Find the cricothyroid ligament; (in the midline between the thyroid cartilage and the cricoid cartilage) this is the puncture site.
- ☐ Prepare site with alcohol wipe.
- ☐ Obtain the 14 G 1-1/4” catheter with partially filled (NaCl) 10 ml syringe attached.
- ☐ Stabilize the trachea between thumb and forefinger.
- ☐ With the trachea stabilized, place the needle tip central to cricothyroid ligament.
- ☐ Introduce the needle through the middle of the cricothyroid membrane, caudally at 45 degrees.

- ☐ Maintain negative pressure on the syringe while it is advanced until the trachea is penetrated (air or blood bubbles seen in partially filled syringe).
- ☐ Advance the needle and catheter an additional 1-2 mm, then advance only the catheter to the hub
- ☐ Remove and dispose of the needle and connect the hub to a #3 ETT adapter and attach the BVM with filter. OR attach the barrel of a 3 ml syringe with a #7 ETT adapter inserted into the syringe barrel and attach to a BVM with filter.
- ☐ Ventilate and allow for passive exhalation, while confirming placement (ETCO2 waveform, chest expansion and auscultation)
- ☐ Secure catheter with tape.
- ☐ Revaluate patient.

Synchronized Cardioversion

EQUIPMENT REQUIRED:

- ☐ Cardiac monitor with defibrillation pads and limb leads
- ☐ Razor
- ☐ Towel

Preparation
Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Patch to BHP for synchronized cardioversion
- ☐ Prepare the chest for the application of defibrillation pads (shave and/or dry if required).
- ☐ Apply limb leads and defibrillation pads as per the manufacturer's recommendation.

PROCEDURE:

- ☐ Activate synchronization as per the manufacturer's recommendations.
- ☐ Confirm SYNC markers appear above each QRS complex.
- ☐ Select joule setting ordered by BHP/manufacturer settings and charge the defibrillator.
- ☐ Confirm no one is touching the patient.
- ☐ **Press AND HOLD** “shock” button until energy is delivered.

Transcutaneous Pacing (TCP)

EQUIPMENT REQUIRED:

- ☐ Cardiac monitor with defibrillation pads and limb leads
- ☐ Towel
- ☐ Razor
- ☐

Preparation

Stop all non-essential activity, establish provider roles, patient care goals and obtain consent

- ☐ Prepare the chest for the application of defibrillation pads (shave and/or dry if required).
- ☐ Apply limb leads and defibrillator pads as per the manufacturer's recommendation.

PROCEDURE:

- ☐ Select pacing mode (as per manufacturer recommendation).
- ☐ Set the pacing rate to 80 bpm.
- ☐ Gradually increase output (mA) until electrical capture or maximum mA setting is achieved.
- ☐ Confirm correlating mechanical capture (palpable pulse + pulse oximetry at pacing rate).
- ☐ Increase output (mA) by 10% mA above the initial threshold capture to ensure mechanical capture is maintained.
- ☐ Continuously monitor the patient for maintenance of electrical/mechanical synchrony.