ONTARIO BASE HOSPITAL GROUP

REFERENCE AND EDUCATIONAL NOTES

Companion Document for the Advanced Life Support Patient Care Standards

September 2015

Version 3.3

PREAMBLE

Medicine is a discipline in which no two situations are the same. Every patient needs to be thoroughly assessed and decisions are made based on the caregiver's interpretation. The aim of the provincial Advanced Life Support Patient Care Standards (ALS PCS) is to provide guidance for certain clinical scenarios that fall within the scope of practice of Ontario Paramedics. That being said, no directive can be all encompassing to provide guidance for each and every situation encountered. The Ontario Base Hospital Group (OBHG) has purposefully reformatted the ALS PCS in order to provide Paramedics with a succinct yet practical reference book that provides the ability to obtain information quickly. As such, many of the previously found detailed clinical notes and references have been omitted from the ALS PCS and have been placed into this companion document to provide the intent and clarifications regarding the application of the directives. Much of the information contained herein was generated as a result of the many "Frequently Asked Questions" post implementation of the new directives in 2011.

This companion document should be used as a reference tool to further understand the applicability of the Medical Directives as per the ALS PCS. In an attempt to standardize Paramedics' education and certification provincially, this document further provides guidance for scenarios that historically have had differing treatments across Ontario Regional Base Hospital Programs. The provincial Medical Advisory Committee's (MAC) consensus and best practice approach to these unique scenarios are highlighted.

This document will be updated regularly and the most current version will always be the electronic version available on the Ontario Base Hospital Group's website. (http://www.ontariobasehospitalgroup.ca)

- A patch may be made to the BHP for critically ill or injured patients that may benefit from further treatment beyond that specified in a medical directive and within your scope of practice.
- Patch points or dosing end points within directives have been created as safe margins or check points this is where the Physicians want to be involved in patient care.
- In the ALS-PCS, Version 3.1, a calculation for normotensive systolic blood pressure was provided as 70 mmHg + (2 x age in years). In the ALS-PCS Version 3.3, this formula has been used to more accurately define hypotension in the pediatric population. AHA guidelines 2010 page S878. A formula for normotension is now described as 90 + (2 x age in years).

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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 interpretations/analyses should occur at two (2) minute intervals with focus on the delivery of high quality chest compressions.

- The energy settings used for defibrillation typically follow the specific manufacturer's guidelines and are confirmed by each respective Regional Base Hospital 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 will complete 3 analyses themselves rather than "count" the number completed prior to their arrival.

- Firefighters are also included in the statement regarding a "witnessed" cardiac arrest.

- To minimize the peri-shock pause, compressions during the charge cycle should be considered.

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

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

    1. The reduced importance placed on the airway as outlined in the 2010 AHA guidelines
    2. The ease of supraglottic airway insertion vs. the complexity and risks of intubation
    3. The emphasis placed on minimally interrupted compressions.

- This does not preclude the PCP from placing a supraglottic airway when more than an OPA is required for VSA patients or in a prolonged resuscitation.

- **Mandatory Patch point**: For PCPs, the patch will follow the 3rd rhythm interpretation/analysis if considering the medical TOR. The intention of this patch point is to receive advice as to whether rapid transport or termination of resuscitation is most appropriate.

- In the event a ROSC is achieved and the patient re-arrests en-route, Paramedics will adhere to the following sequence:

    1. Pull over
    2. Initiate one immediate rhythm interpretation
    3. Defibrillate as appropriate (1 shock max) AND
    4. Continue with transportation to the receiving facility.

- If in the opinion of the Paramedic(s) the patient would benefit from further interpretation/analysis/defibrillation, a patch to the BHP would be indicated for direction.

- For sudden cardiac arrests that occur "on scene" or en-route, the patient should, in absence of unusual circumstances, be treated utilizing the entire medical cardiac arrest directive (complete 4 analyses).

- Glucometry in the vital signs absent (VSA) patient is of no clinical value.

- **Anaphylactic cardiac arrest:** IM Epinephrine 1:1,000 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 "unusual circumstances" clinical consideration. An IM dose of Epinephrine for anaphylaxis should not delay defibrillation.

- **Asthmatic cardiac arrest :** While there is provision for treatment with Epinephrine 1:1,000 in the anaphylactic arrest, there is no similar recommendation in the asthmatic arrest. It is very 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 simple medical arrest that should respond well to defibrillation, but in the event the electrocution was associated with significant trauma, it should be treated as a trauma arrest.

- **Pulse checks**: After the initial pulse check, subsequent checks are indicated when an interpretation/analysis reveals a non- shockable rhythm (organized electrical activity that could have output or Asystole).

- **Clinical consideration**: Considering early transportation is not limited to the 2 examples provided (pediatrics and toxicological overdoses).

- **Commotio cordis and hangings:** are typically treated as medical cardiac arrests.

TRAUMA CARDIAC ARREST MEDICAL DIRECTIVE

- Fluid bolus is not listed in the directive and is not indicated.

- The age difference between Medical and Trauma TOR is based on the definition of a pediatric trauma patient.

- The 30 minute time reference is a reflection of transportation time.

HYPOTHERMIA CARDIAC ARREST MEDICAL DIRECTIVE

- **Pulse check**: the specific reference to a prolonged pulse check was removed as the AHA guidelines advocate for a 10 second pulse check.

- When treating the hypothermic arrest, the focus is on passive re-warming and gentle handling.

- The expectation is that these patients will be transported as the old adage says that "***the patient is not dead until they are warm and dead.***"

FOREIGN BODY AIRWAY OBSTRUCTION CARDIAC ARREST MEDICAL DIRECTIVE

- This directive is intended to apply to a simple airway obstruction that is unrelieved and where the patient presents in cardiac arrest. Initiating a medical cardiac arrest treatment plan is most appropriate if and when the obstruction is relieved and the patient remains pulseless.

- Should the obstruction not be relieved, early/rapid transport is indicated.

- This is an infrequently encountered patient presentation but quick and accurate interventions can make a significant impact on the patient's outcome.

NEONATAL RESUSCITATION MEDICAL DIRECTIVE

- The conditions listed under "***other***" are not intended to be all encompassing but serve as the "***most likely***" presentations warranting resuscitation.
- The presence of one or all of the listed contraindications (***clear of meconium, breathing or crying, good muscle tone or pink in colour***) does not imply that that a resuscitation will not be indicated.
- While the steps of warm, dry, position and stimulate are pointed specifically to the newborn, this directive is applicable to all patients under 30 days of age. In the patient that is not newly born, the first treatment bubble in the flow chart may be omitted.
- When a newborn or recently born patient is in cardiac arrest, chest compressions are indicated immediately and would not be delayed to warm, dry and stimulate and then provide only ventilations. At the 60 second treatment bubble, it is correctly stated that the BVM ventilations are to be performed with room air ONLY and not with an attached oxygen source. The neonate is more susceptible to harm from increased oxygen concentrations (hyperoxemia).
- The administration of Epinephrine IM for anaphylaxis does not apply to this directive. It would be a very rare circumstance, and the differential diagnosis even more complicated.

RETURN OF SPONTANEOUS CIRCULATION (ROSC) MEDICAL DIRECTIVE

- Optimizing oxygenation and targeting a SpO2 of ≥ 94% (and avoiding 100%) will provide adequate oxygenation and minimize vasoconstriction and the development of oxygen free radicals. These changes have been recommended for inclusion in the BLS-PCS to be consistent. Refer to the oxygen utilization standard in the BLS PCS.
- Therapeutic hypothermia is applicable to PCPs certified and authorized in its application. It may include, but is not limited to: cold saline or cold packs.
- Post arrest the goal is to maintain normoventilation at a rate of approximately 10 – 12 breaths per minute and then titrate to achieve the ETCO2 (where available) to a range of 35 - 40 mmHg. Hyperventilation NEEDS to be avoided, but do not hypoventilate only to artificially raise a low ETCO2 as a low ETCO2 may be due to metabolic acidosis.
- Regardless of the amount of fluid administered prior to ROSC and if chest auscultation is "clear", a 10 ml/kg 0.9% NaCl fluid bolus may be administered to a maximum of 1000 ml targeting a SBP of ≥ 90 mmHg.

CARDIAC ISCHEMIA MEDICAL DIRECTIVE

- 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 tested 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.

- Contraindications to Nitroglycerin:
  - Phosphodiesterase inhibitors. Also known as Viagra, Levitra, Cialis, Revatio etc…and now more broadly as Erectile Dysfunction Drugs (EDD). The use of these medications has diversified to include treatment of pulmonary hypertension and CHF. The most appropriate categorization is as phosphodiesterase (PDE) 5 inhibitors.

- PDE5 inhibitor list: Sildenafil, Tadalafil, Vardenafil, Udenafil and Avanafil, Lodenafil Mirodenafil, Acetildenafil, Aildenafil, and Zaprinast. This may not be an exhaustive list and is current as of the date written.

- **12 and/or modified 12 lead ECG(s) consistent with Right Ventricular Infarct (RVI):** These patients are often preload dependent and the administration of Nitroglycerin to these patients may cause hypotension.

- If the myocardial ischemia symptoms resolve prior to the arrival of the Paramedics, a decision to administer ASA will be made based on patient assessment(s) and critical thinking.

- Once a patient's vital signs fall outside the directive's parameters (i.e.: hypotension), the patient can no longer receive that medication (i.e.: Nitroglycerin or Morphine) even if the vital signs return to acceptable ranges.

- The Nitroglycerin canister should be considered a single patient use device.

ACUTE CARDIOGENIC PULMONARY EDEMA MEDICAL DIRECTIVE

- The notes listed above regarding the Cardiac Ischemia Medical Directive are applicable to the Acute Cardiogenic Pulmonary Edema Medical Directive as well.

- The dosing chart is accurate:
  - When the Systolic Blood Pressure (SBP) is ≥ 140 mmHg, and neither an IV nor prior history exists, a 0.4 mg dose of Nitroglycerin is indicated.
  - If the patient has a history of Nitroglycerin use or an IV in place and the SBP is between 100 and 139 mmHg, a 0.4 mg dose of Nitroglycerin is indicated.
  - If the patient has the history or the IV and the SBP is ≥ 140 mmHg, a 0.8 mg dose of Nitroglycerin is indicated.

- The maximum of 6 doses is of either 0.4 mg or 0.8 mg. The patient may not receive 6 doses for pulmonary edema and 6 more doses for cardiac ischemia symptoms should they co-exist.

- The rule of once out always out for Nitroglycerin applies. If the patient were receiving 0.8 mg doses of nitroglycerin and the SBP drops below 140 mmHg, then 0.4 mg doses are indicated as long as the 1/3rd drop is not observed from the initial SBP and the SBP does not drop below 100 mmHg.

CARDIOGENIC SHOCK MEDICAL DIRECTIVE

- This directive is applicable only to those Paramedics that have 12 lead and IV therapy certification.

- The age condition has been changed from ≥ 2 years of age to ≥18 years of age.

- 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 systems, organs, tissues and cells of the body.

- Volume of fluid bolus is limited to 10 ml/kg. This is based on the premise that the patient is not actually volume depleted but in need of preload.

- The clinical consideration “patch to the BHP if the patient is bradycardic with respect to age” is intended to allow the Paramedic to use his/her judgment.

HYPOGLYCEMIA MEDICAL DIRECTIVE

- The directive includes a fairly broad set of patient presentations to enable the Paramedic to use the glucometer to rule in or rule out a blood sugar related event.
- Performing glucometry is performed using the EMS’ supplied device.
- Glucometry will not 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.
- If Glucagon is utilized, the dosing is based on ≥ 25 kg or < 25 kg. Glucagon is only administered via the IM route. Both Dextrose and Glucagon may be repeated once if the patient does not improve and the repeat glucometry remains low. The repeat times are 20 min between Glucagon doses and 10 min between Dextrose doses.
- 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.
- Should the patient declare a refusal of transportation post treatment, a repeat glucometry must be performed along with a full set of vital signs. The patient (along with family or bystanders) requires a clear explanation of the risks involved, what signs to be vigilant of, and instructions to eat complex carbohydrates. This is to be recorded in the procedures section of the ACR as well as an appropriately completed refusal of care section. Paramedics should always attempt to ensure a responsible adult remains with the patient prior to leaving the scene. Minors refusing transport will need to be signed off by a substitute decision maker and left with that responsible person. Hypoglycemia due to oral hypoglycemic agents or long-acting insulin is associated with the need for ongoing IV therapy, hospital admission and poor outcomes (repeat EMS responses and death). Thus, these patients need to be advised of these risks.

BRONCHOCONSTRICTION MEDICAL DIRECTIVE

- Suspected bronchoconstriction applies to asthma, COPD, and other causes of bronchoconstriction that typically cause wheezing. This also addresses the old teaching point of the “silent chest” as that is considered “extreme” bronchoconstriction.
- Epinephrine is indicated when the patient is asthmatic and BVM ventilation is required. This is typically after Salbutamol has had no effect, however could be the initial patient presentation whereas Salbutamol is bypassed immediately due to the severity of the patient presentation. The indications to administer Epinephrine do not change based on the ability to administer Salbutamol.
- Dosing for Salbutamol has been adjusted to match the 25 kg weight used in many directives.
- The adult dosing has been adjusted from 900 mcg to 800 mcg per dose, based on recommendations from respiratory experts. The larger change is the timing of the repeats. It is no longer immediate, but is 5 – 15 minutes following the completion of the prior dose.
- When a dose of MDI Salbutamol is administered, the intent is to deliver all 6 (pediatric) or 8 (adult) sprays to complete a dose. It would be under unusual circumstances to deliver less than the full dose.
- MDI administration is preferred over nebulization. If patient is unable to accept or cooperate with MDI administration, the nebulized route may be considered – still to a max of 3 doses.

- The accepted technique for administration is to provide a single MDI spray and to allow for inhalation with the next dose provided 4 breaths later. It will take 1 minute to deliver a full adult dose to a patient breathing at a rate of 32 breaths per minute.
- The MDI should be considered a single patient use device.
- Nebulization increases the mobilization of any contagion and a Paramedic should use PPE to protect themselves when in close proximity to an infected patient.

MODERATE TO SEVERE ALLERGIC REACTION MEDICAL DIRECTIVE

- The Medical Directive now includes a range of allergic reactions from moderate to severe and the administration of Diphenhydramine.
- Anaphylaxis is life-threatening and delays in administration of Epinephrine are associated with greater mortality. If the patient meets the indications and contraindications, epinephrine should be administered because it may prove to be life-saving.
- Epinephrine 1:1000 is administered via the IM route only.
- Epinephrine Dose = 0.01 mg/kg to a maximum of 0.5 mg (rounded to the nearest 0.05 mg) and is limited to one dose in the Prehospital setting. If the patient's clinical condition does not improve and that in the opinion of the Paramedic(s) the patient would benefit from further doses, a patch with a BHP must be initiated.
- Epinephrine may be administered via auto-injector.
- Skin findings are most common but up to 20% of patients do not have hives or other skin symptoms. Therefore ensure that all body systems are assessed to come up with the most appropriate treatment plan.
- Urticaria alone is not an indication for administration of Epinephrine IM, the patient must present with at least one other sign or symptom.
- Diphenhydramine administration should always follow the administration of Epinephrine as outlined in the Medical Directive, when available and the paramedic is certified and authorized.

Please refer to the table on page 12 for an aid in differentiating an anaphylactic reaction from a local reaction.

CROUP MEDICAL DIRECTIVE

- The presentation must be severe. Most presentations of croup are mild and are well tolerated by the patient.
- Prior to initiating nebulized epinephrine, moist air and 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 the BHP would be required to consider treatment under this directive.
- Dosing for epinephrine has not changed from previous versions of the directive with the exception that there are no repeat administrations.

How to differentiate between a localized allergic reaction versus an anaphylactic reaction[1]

Diagnosis based on detailed history and recognition of presenting signs & symptoms post possible exposure to a possible allergen	
Body System Involvement • **Integumentary** (skin): Hives, Itching, flushing, swelling, angioedema • **Cardio-Vascular**: Increased HR, decrease BP, syncope, decrease LOC, hypoxemia • **Respiratory**: Shortness of breath, wheeze, cough, stridor • **Gastro-Intestinal**: Cramping, nausea, vomiting, diarrhea	
Localized allergic Reaction	**Anaphylactic Reaction**
→ Minor to Moderate Allergic Reaction	**→ Moderate to Severe Allergic Reaction**
Localized reaction	Systemic reaction
Degranulation of localized mediators	Degranulation of systemic mediators
• Involves one local area or one body organ system ****Severe symptoms to a single body system (respiratory system) should be considered as a severe allergic reaction****	• usually involves symptoms in more than one body organ or system, with symptoms presenting as per above post exposure
Degranulation of localized chemical mediators	Degranulation of systemic chemical mediators
	Some patient 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 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, urticaria, angioedema, eye and nasal symptoms) does NOT prevent or relieve upper airway obstruction, hypotension, shock.	**Primary treatment:** • Epinephrine 1:1000 IM (fast onset) will increase blood pressure, prevent and relieves hypotension, decreases upper airway obstruction, decreases wheezing, decreases urticaria and angioedema. **Secondary treatment to be considered post Epinephrine administration:** • Diphenhydramine IM/IV • PRN IV Fluids as per Medical Directive • PRN Salbutamol as per Medical Directive

Simons et al. World Allergy Organization Guidelines for the Assessment and Management of Anaphylaxis WAO Journal February 2011

http://www.uptodate.com/contents/anaphylaxis-symptoms-and-diagnosis-beyond-the-basics, accessed January 29 2013

ADULT ANALGESIA MEDICAL DIRECTIVE

- This medical directive replaces the Analgesia and the Moderate to Severe Pain directives. This was done to reduce the confusion of overlapping directives and to broaden the treatment of patients in pain.
- Ketorolac dosing has been revised from that prescribed in the ALS-PCS, Version 3.1, to a range of 10 – 15 mg. The range has been provided to simplify dose preparation. A 10 mg dose has been determined to be the analgesic effective dose.
- The age restriction of "< 50 years of age" for both Ketorolac and Ibuprofen have been removed.
- As indicated in the clinical considerations, the preferred treatment for isolated hip and / or extremity trauma is Acetaminophen and Ibuprofen. Oral administration is as effective and is less invasive. Reference: Ann Pharmacother 1994;28:309-12.
- A clinical consideration states "Suspected renal colic patients should routinely be considered for Ketorolac". More correctly, this statement should include NSAIDS like Ibuprofen. Ketorolac is preferred when the patient is unable to tolerate oral medication. NSAIDs anti-inflammatory action and their smooth muscle relaxant effects (reduces the glomerular filtration rate which reduces renal pelvic pressure and stimulation of the stretch receptors) as well as its inhibition of prostaglandin production makes them ideal agents to treat renal colic. Reference: *Pharmaceuticals* **2010**, *3*, 1304-1310; doi:10.3390/ph3051304 and Anesth Pain Medv.4(1); 2014 FebPMC3961032
- Ketorolac should not be administered in conjunction with Ibuprofen as they are both NSAIDs and concomitant administration would increase the adverse effects.
- External trauma that has been dressed and controlled is not considered an active bleed.
- Occult bleeding should be considered active bleeding (hematuria/GI bleed).
- What does unable to take oral medications mean? For example: A patient that: must remain in the supine position (ie. on a backboard), is vomiting or nauseated, has difficulty swallowing or has a feeding tube in place.

OPIOID TOXICITY MEDICAL DIRECTIVE

- The ACP version of the directive is different as it does not include an "inability to ventilate" due to their advanced airway skills.
- Intranasal (IN) is introduced as a new route for naloxone administration. The subcutaneous (SC) route of administration has been added back into the PCP scope of practice.
- In keeping with the conventions of the medical directives, the order of preference of route of administration is as listed: SC is first, then IM, then IN and then IV (where certified and authorized in IV initiation). SC is the preferred route Acad Emerg Med1998;5:293–9.
- Titration, in this medical directive relates only to the IV route of administration and implies a slow deliberate administration of 0.1 mg increments allowing for a response before continuing the administration. The dose is complete when a desired response has been observed, or the complete 0.4 mg dose has been administered.
- In the setting of publicly administered naloxone the paramedic should use their judgment to determine the most appropriate patient care, being mindful of the risks (i.e. unmasking alternative toxidromes) and those associated with the route of administration. As referenced in the preamble on page 11, medication may be administered regardless of any previously administered.

PRIMARY CARE PARAMEDIC AUXILIARY MEDICAL DIRECTIVES

INTRAVENOUS AND FLUID THERAPY MEDICAL DIRECTIVE – AUXILIARY

- 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.
- A sign of fluid overload secondary to a fluid bolus is pulmonary edema. As such, frequent chest assessments as are required per this directive.
- The treatment line specifies “consider IV cannulation”. This may encompass upper and lower extremity veins depending on your Base Hospital’s authorization.
- **Mandatory Patch Point:** For the diabetic patient in ketoacidosis < 12 years of age who is hypotensive. A patch is required so that the physician can carefully control the volume of fluid administered to prevent cerebral edema.
- Under the “consider 0.9% NaCl fluid bolus” treatment, is a note stating the maximum volume of NaCl is lower for patients in cardiogenic shock. This is also applicable to the patient with a ROSC. Please refer to those specific directives for the dosing.
- The references to macro, mini, and buretrol drip sets have been removed. Although the choice of drip sets have been left to service operators based on local requirements and Base Hospital insight, some form of rate control must be utilized for patients less than 12 years of age to prevent accidental fluid overload.

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) MEDICAL DIRECTIVE – AUXILIARY

- This is for the treatment of acute pulmonary edema (regardless of origin) or COPD.
- CPAP should be considered as additive therapy to the bronchoconstriction (specifically COPD exacerbation) or pulmonary edema medical directives, not a replacement.
- CPAP may be interrupted momentarily to administer Salbutamol or Nitroglycerin. CPAP is not for asthma exacerbation.
- CPAP should be discontinued when the patient’s SBP is < 100 mmHg as described in the conditions of the directive.

SUPRAGLOTTIC AIRWAY MEDICAL DIRECTIVE– AUXILIARY

- **Contraindications**: Active vomiting is considered ongoing vomiting where the paramedic is unable to clear the airway. In this situation, the supraglottic airway (SGA) should not be inserted.
- If the patient vomited once and the airway was cleared successfully, a supraglottic airway may be inserted.
- **Definition of supraglottic airway attempt**: Introducing the SGA into the patient’s mouth is considered an attempt and should be documented as such including success or failure.
- The number of attempts are clearly defined as 2 total per patient and not per provider.

- Placement of a SGA should be treated and confirmed as methodically as an ETT. SGA placement should be verified again at the time/point of transfer of care. Findings and witness (where possible) should be documented on the patient care record.

- In the event that a SGA is placed in cardiac arrest and the patient sustains a ROSC, the airway should only be removed as the gag reflex starts to be stimulated, but expect to remove it as the level of awareness improves.

NAUSEA / VOMITING MEDICAL DIRECTIVE – AUXILIARY

- 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 Base Hospital.

- If Dimenhydrinate is administered via the IV route, it must be diluted 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 saline) or 10 mg/ml (diluted with 4 ml of saline) is acceptable.

ELECTRONIC CONTROL DEVICE PROBE REMOVAL MEDICAL DIRECTIVE – AUXILIARY

- Probes are sharps that should be considered contaminated and need to be handled and disposed of accordingly.

- Conditions indicate that an “unaltered” LOA is required for probe removal. If the patient’s LOA is “altered” they are not able to provide consent to remove the probes and as such will not be removed by Paramedics.

- It is important to understand why the electronic control device was deployed in relation to the patient’s presenting or underlying medical condition with specific attention to the potential for excited delirium.

MINOR ABRASIONS MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

- Topical antibiotic ointment is left generic.

- Paramedic judgment is very important here as the design and application of this directive allows for the patient to NOT go to the hospital..

MINOR ALLERGIC REACTION MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

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

- SBP ≥ 100 mmHg.

- The route of administration is PO.

MUSCULOSKELETAL PAIN MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

- The contraindication regarding acetaminophen use in the last 4 hours has been revised to read that the patient cannot have taken acetaminophen within the last 4 hours to receive it from the Paramedic.

- The route of administration is PO.

- The interpretation regarding the contraindication should be that the patient cannot have taken acetaminophen within the last 4 hours to receive it from the Paramedic. The route of administration is PO.

HEADACHE MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

- The interpretation regarding the contraindication should be that the patient cannot have taken acetaminophen within the last 4 hours to receive it from the Paramedic. The route of administration is PO.

HOME DIALYSIS EMERGENCY DISCONNECT MEDICAL DIRECTIVE – AUXILIARY

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

ADVANCED CARE PARAMEDIC CORE MEDICAL DIRECTIVES

MEDICAL CARDIAC ARREST MEDICAL DIRECTIVE

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

- The energy settings used for defibrillation typically follow the specific manufacturer's guidelines and are confirmed by each respective Regional Base Hospital 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 will complete 3 analyses themselves rather than "count" the number completed prior to their arrival.

- Firefighters are also included in the statement regarding a "witnessed" cardiac arrest.

- To minimize the peri-shock pause, compressions during the charge cycle should be considered.

- When en-route and using a semi-automated system, the ambulance must be stopped to minimize artifact and the risk of an incorrect rhythm interpretation.

- Central Venous Access Device (CVAD) access, where authorized, is currently only applicable for patients greater than 12 years of age. A BHP patch is required to access an existing device in a patient less than 12 years of age.

- The sequence listed for the advanced airways is deliberate, it is based on:
    1. The reduced importance placed on the airway as outlined in the 2010 AHA guidelines
    2. The ease of supraglottic airway insertion vs. the complexity and risks of intubation
    3. The emphasis placed on minimally interrupted compressions.

- This 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 since any pause in compressions can lead to a poor outcome.

- Amiodarone is the preferred antiarrhythmic medication when a choice exists and/or if available. This is demonstrated in the directive by the preferred medication being listed first.

- Lidocaine dosing for patients has been simplified. The reference to body weight and ages has been simplified by removing the weight restriction. Patients aged 30 days up to 12 years of age receive 1 mg/kg via the IV/IO/CVAD routes or 2 mg/kg via the ETT route and patients ≥ 12 years of age receive 1.5 mg/kg via the IV/IO/CVAD routes and 3 mg/kg via the ETT route.

- Once Epinephrine is administered, it is to be repeated every 4 minutes until the arrest is terminated, Return of Spontaneous Circulation (ROSC) is achieved, transfer of care is completed or TOR is ordered.

- 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. The dose is 20 ml/kg to a maximum of 2,000 ml.

- **Mandatory Patch point**: For ACPs, the patch will follow the 3rd administration of Epinephrine, but in the event an IV or an IO cannot be placed (and there is no CVAD access) the patch should follow the 3rd rhythm interpretation. This patch will be to obtain additional orders not addressed within the directive or to terminate resuscitation.

- For cardiac arrests that occur on scene or en-route the patient should, in absence of unusual circumstances, be treated utilizing the entire medical cardiac arrest directive.

- Anti-arrhythmic therapy is indicated (if not previously maxed out) following the shock if the patient had been previously defibrillated or following a second defibrillation if none delivered previously.

- In the event a ROSC is achieved and the patient re-arrests en route, Paramedics will adhere to the following sequence:
    1. Pull over
    2. Initiate one immediate rhythm interpretation
    3. Defibrillate as appropriate (max of 1 shock) AND
    4. Continue with transportation to the receiving facility.

- If in the opinion of the Paramedic(s) the patient would benefit from further interpretations/defibrillation, a patch to the BHP would be indicated for direction.

- **Anaphylactic cardiac arrest:** IM Epinephrine 1:1,000 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. They may be transported early as specified in the first clinical consideration “in unusual circumstance.” An IM dose of epinephrine for anaphylaxis does not alter the sequence and timing of IV administered epinephrine.

- **Asthmatic cardiac arrest:** While there is provision for treatment with Epinephrine 1:1,000 in the anaphylactic arrest, there is no similar recommendation in the asthmatic arrest. It is very 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 simple medical arrest that should respond well to defibrillation, but in the event the electrocution was associated with significant trauma, it should be treated as a trauma arrest.

- **Commotio cordis and hangings:** should be treated as medical cardiac arrests.

- 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.

- **Medication administration:** If the timing were to fall such that Epinephrine and an antiarrhythmic were to be administered in the same CPR cycle, this is acceptable provided as a saline flush occurs between the two (2) administrations.

- **Pulse checks:** After the initial pulse check, subsequent checks are indicated when an interpretation reveals a non shockable rhythm (organized electrical activity that could have output, or asystole).

- **Clinical consideration**: Consider early transportation is not limited to the two (2) examples provided (i.e.: pediatrics and toxicological overdoses).

TRAUMA CARDIAC ARREST MEDICAL DIRECTIVE

- Mandatory provincial patch point regarding the Trauma TOR is really provided as a reference. An ACP may patch for a termination of resuscitation at any time.

- Age difference between Medical and Trauma TORs is based on the definition of a pediatric trauma patient.

- The 30 minute time reference is based on the transportation time.

HYPOTHERMIA CARDIAC ARREST MEDICAL DIRECTIVE

- **Pulse check:** the specific reference to a prolonged pulse check was removed as the AHA guidelines advocate for a 10 second pulse check.

- When treating the hypothermic arrest, the focus is on passive rewarming and gentle handling.

- The expectation is that these patients will be transported as the old adage says that ***"the patient is not dead until they are warm and dead".***

FOREIGN BODY AIRWAY OBSTRUCTION CARDIAC ARREST MEDICAL DIRECTIVE

- This directive is intended to apply to a simple airway obstruction that is unrelieved and where the patient presents in cardiac arrest. Initiating a medical cardiac arrest treatment plan is most appropriate if and when the obstruction is relieved and the patient remains pulseless.

- Should the obstruction **not** be relieved, early/rapid transport is indicated.

- This is an infrequently encountered patient presentation but quick and accurate interventions can make a significant impact on the patient's outcome.

- The simplest therapy is the application of chest thrusts and when that fails, progression to direct laryngoscopy and the use of Magill forceps is indicated. When that is unsuccessful, ACPs authorized in the Auxiliary Cricothyrotomy Medical Directive may attempt that procedure.

NEONATAL RESUSCITATION MEDICAL DIRECTIVE

- The conditions listed under "other" are not intended to be all encompassing but serve as the "most likely" presentations warranting resuscitation.

- The presence of one or all of the listed contraindications (***clear of meconium, breathing or crying, good muscle tone or pink in colour***) does not imply that that a resuscitation will not be indicated.

- While the step of warm, dry, position and stimulate is applicable specifically to the newborn, this directive is applicable to all patients under 30 days of age, not just the newborn. In the patient that is not newly born, the first treatment bubble in the flow chart may be omitted.

- When a newborn or recently born patient is in cardiac arrest, chest compressions are indicated immediately and would not be delayed to warm, dry and stimulate and then provide only ventilations.

- The dosing of Epinephrine is very specific in this directive. ONLY the 1:10,000 solution is used for any route of administration. Unlike the adult, the dose administered via the ETT route is 10 times the dose of the IV/IO routes.

- At the 60 second treatment bubble, it is correctly stated that the BVM ventilation is to be performed with room air ONLY and not with an attached oxygen source. The neonate is more susceptible to harm from increased oxygen concentrations, and they must be limited where possible.

RETURN OF SPONTANEOUS CIRCULATION (ROSC) MEDICAL DIRECTIVE

- Optimizing oxygenation and targeting a SpO2 of ≥ 94% (and avoiding 100%) will provide adequate oxygenation and minimize vasoconstriction and the development of oxygen free radicals. These changes have been recommended for inclusion in the BLS-PCS to be consistent. Refer to the oxygen utilization standard in the BLS PCS.

- The fluid bolus precedes the administration of Dopamine. If started, ensure time is allowed for the intervention to have effect and be evaluated before attempting a different or additional intervention.

- Dopamine is optimally administered via a dedicated IV line. At a minimum it may be piggybacked onto a primary line.

- When starting Dopamine, you must start at 5 mcg/kg/min and increase incrementally.

- Where it is electively discontinued, Dopamine administration must be weaned slowly.

- Therapeutic hypothermia is applicable to ACPs certified and authorized in its application. It may include, but is not limited to: cold saline or cold packs.

- Post arrest the goal is to maintain normoventilation at a rate of approximately 10 – 12 breaths per minute and then titrate to achieve the ETCO2 (where available) to a range of 35 - 40 mmHg. Hyperventilation NEEDS to be avoided, but do not hypoventilate only to artificially raise a low ETCO2 as a low ETCO2 may be due to metabolic acidosis.

- Regardless of the amount of fluid administered prior to ROSC and if chest auscultation is “clear”, a 10 ml/kg 0.9% NaCl fluid bolus may be administered to a maximum of 1000 ml targeting a SBP of ≥ 90 mmHg.

CARDIAC ISCHEMIA MEDICAL DIRECTIVE

- 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 tested 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. Nitroglycerin doses taken by the patient for their current ischemic episode should not be counted towards a decision on when to administer Morphine.

- **12 and/or modified 12 lead ECG(s) consistent with Right Ventricular Infarct (RVI):** These patients are often preload dependent and the administration of Nitroglycerin to these patients may cause hypotension.

- Contraindications to Nitroglycerin:
  - Phosphodiesterase inhibitors. Also known as Viagra, Levitra, Cialis, Revatio etc. and now more broadly as Erectile Dysfunction Drugs (EDD). The use of these medications has diversified to include treatment of pulmonary hypertension and CHF. The most appropriate categorization is as phosphodiesterase (PDE) 5 inhibitors.

- PDE5 inhibitor list: Sildenafil, Tadalafil, Vardenafil, Udenafil and Avanafil, Lodenafil, Mirodenafil, Acetildenafil, Aildenafil and Zaprinast. This may not be an exhaustive list and is current as of the date written.

- Morphine is only to be considered following the third Nitroglycerin administration (unless Nitroglycerin is contraindicated).

- If the myocardial ischemia symptoms resolve prior to the arrival of the Paramedics, a decision to administer ASA will be made based on patient assessment(s) and critical thinking.

- Once a patient's vital signs fall outside the directive's parameters (ie: hypotension), the patient can no longer receive that medication (ie: Nitroglycerin or Morphine) even if the vital signs return to acceptable ranges.

- The Nitroglycerin canister should be considered a single patient use device.

ACUTE CARDIOGENIC PULMONARY EDEMA MEDICAL DIRECTIVE

- The notes listed above regarding the Cardiac Ischemia Medical Directive are applicable to the Acute Cardiogenic Pulmonary Edema Medical Directive as well.

- The Nitroglycerin treatment table appears confusing and by strict definition it is in contradiction to the conditions. The dosing chart is accurate:

- When the Systolic Blood Pressure (SBP) is ≥ 140 mmHg, and neither an IV nor prior history exists, a 0.4 mg dose of Nitroglycerin is indicated.

- If the patient has a history of Nitroglycerin use or an IV in place and the SBP is between 100 and 139 mmHg, a 0.4 mg dose of Nitroglycerin is indicated.

- If the patient has a history of Nitroglycerin use or an IV is in place and the SBP is ≥ 140 mmHg, a 0.8 mg dose of Nitroglycerin is indicated.

- The maximum of 6 doses is of either 0.4 mg or 0.8 mg. The patient may not receive 6 doses for pulmonary edema and 6 more doses for cardiac ischemia symptoms should they co-exist.

- The rule of once out always out for Nitroglycerin applies. If the patient were receiving 0.8 mg doses of nitroglycerin and the SBP drops below 140 mmHg, then 0.4 mg doses are indicated as long as the 1/3rd drop is not observed from the initial SBP and the SBP does not drop below 100 mmHg.

CARDIOGENIC SHOCK MEDICAL DIRECTIVE

- This directive is applicable only to those Paramedics that have 12 lead ECG capabilities.

- The age condition has been changed from N/A to ≥18 years of age for both fluid bolus and Dopamine.

- 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 systems, organs, tissues and cells of the body.
- Under Dopamine: Contraindications - Hypovolemia is not listed however it is a contraindication to be considered prior to Dopamine administration.
- The directive specifies that fluid (if applicable) is to be used as a means to reverse hypotension prior to the administration of Dopamine.
- The clinical consideration "patch to the BHP if the patient is bradycardic with respect to age" is intended to allow the Paramedic to use his/her judgment.

SYMPTOMATIC BRADYCARDIA MEDICAL DIRECTIVE

- Hemodynamic instability refers specifically to hypotension (SBP < 90 mmHg) that requires pharmacologic or electrical intervention(s).
- All symptomatic patients that present with a heart rate of < 50 bpm are eligible to receive Atropine if found to be hypotensive.
- A fluid bolus may be administered to bradycardic patients according to the IV and fluid bolus medical directive.
- 12 lead ECG should be obtained as early as possible.
- Atropine is to be administered in the setting of sinus 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 is to be initiated at a rate of 80 bpm. The milliamps (mAmps) are then increased to obtain electrical capture. Capture is highly variable depending on the patients size, weight, placement of the pads, skin condition etc. It is difficult to state the values to target for capture, however 80 to 100 mAmps is quite common. If unable to gain capture at maximum mAmps, pacing should be discontinued. The therapy should not be discontinued if the patient does respond 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.
- Patients may receive multiple interventions to maintain their heart rate and blood pressure. The therapy provided must be permitted time to take effect and to be evaluated before moving on to the next therapy.

TACHYDYSRHYTHMIA MEDICAL DIRECTIVE

- Specific to this directive, treatments do not necessarily follow the order in which they should be administered. The initial treatment choice will be based on rhythm interpretation (narrow vs. wide) and hemodynamic stability.
- Early lead II and 12 lead acquisitions will prove invaluable for determining the origin of the electrical impulses, the regularity and the QRS durations.
- Contraindications to Adenosine:
    - Dipyridamole – brand name of Persantine.
    - Carbamazepine – brand name of Tegretol

- Bronchoconstriction – some research has demonstrated that inhaled adenosine provoked bronchoconstriction in asthmatic individuals but not in the control group.

- Adenosine therapy has changed to only 6 mg and 12 mg. This change is based on AHA guideline findings that a second 12 mg dose will likely be ineffective. No BHP patch is required for the administration of Adenosine in narrow complex tachycardia patients.

- Lidocaine dosing: Initial dose is 1.5 mg/kg to a max of 150 mg. patients in excess of 100 kg will receive 150 mg. The second and third doses are calculated as 0.75 mg/kg with the same max of 150 mg.

- Lidocaine is limited to a maximum of 3 mg/kg total dosing via IV. Note topical doses of Lidocaine as administered in the intubation directive count towards a 5 mg/kg total dose.

- In the event the patient receives the max dose of Lidocaine and then experiences a cardiac arrest, they will not receive further doses of Lidocaine.

INTRAVENOUS AND FLUID THERAPY MEDICAL DIRECTIVE

- 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.

- A sign of fluid overload secondary to a fluid bolus is pulmonary edema. As such, frequent chest assessments as are required per this directive.

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

- **Mandatory Patch Point:** For the diabetic patient in ketoacidosis < 12 years of age who is hypotensive. A patch is required so that the physician can carefully control the volume of fluid administered to prevent cerebral edema.

- CVAD access is only for patients ≥ 12 years of age and by Paramedics that have been authorized by their local Base Hospital. To access it for patients < 12 years of age, a patch to the BHP is required.

- Fluid bolus via IO and CVAD are addressed in the clinical considerations, the volume of fluid remains the same, but you must be authorized by your Base Hospital program to access or initiate these prior to implementing a bolus.

- Under the “consider 0.9% NaCl fluid bolus” treatment, is a note stating the maximum volume of NaCl is lower for patients in cardiogenic shock. This is also applicable to the patient with a ROSC. Please refer to those specific directives for the dosing.

- The references to macro, mini, and buretrol drip sets have been removed. Although the choice of drip sets have been left to service operators based on local requirements and Base Hospital 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 settings.

PEDIATRIC INTRAOSSEOUS MEDICAL DIRECTIVE

- “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.

HYPOGLYCEMIA MEDICAL DIRECTIVE

- The directive includes a fairly broad set of patient presentations to enable the Paramedic to use the glucometer to rule in or rule out a blood sugar related event. Performing glucometry is performed using the EMS' supplied device.

- Glucometry will not 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.

- If Glucagon is utilized, the dosing is based on **≥ 25 kg or < 25 kg**. Glucagon is only administered via the **IM route**. Both Dextrose and Glucagon may be repeated once if the patient does not improve and their repeat glucometry remains low. The repeat times are 20 minutes between Glucagon doses and 10 minutes between Dextrose doses.

- 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.

- To prepare a **25%** solution: Waste 25 ml of the preload and replace the 25 ml with sterile water or saline. This will create a 12.5 g / 50ml solution. Administer 0.5 g/kg for the gram dose or 2 ml/kg for the fluid volume and administer no more than 40 ml.

- To prepare a **10%** solution: Waste 40 ml of the preload and replace the 40 ml with sterile water or saline. This will create a 5g / 50 ml solution. Administer 0.2 g/kg for the gram dose or 2 ml/kg for the fluid volume and administer no more than 50 ml.

- Should the patient declare a refusal of transportation post treatment, a repeat glucometry must be performed along with a full set of vital signs. The patient (along with family or bystanders) requires a clear explanation of the risks involved, what signs to be vigilant of, and instructions to eat complex carbohydrates. This is to be recorded in the procedures section of the ACR as well as an appropriately completed refusal of care section. Paramedics should always attempt to ensure a responsible adult remains with the patient prior to leaving the scene. Minors refusing transport will need to be signed off by a substitute decision maker and left with that responsible person. Hypoglycemia due to oral hypoglycemic agents or long-acting insulin is associated with the need for ongoing IV therapy, hospital admission and poor outcomes (repeat EMS responses and death). Thus, these patients need to be advised of these risks.

SEIZURE MEDICAL DIRECTIVE

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

- Most seizures are self-limiting. The application of this directive is intended for those patients in which the seizure is continuous or repetitive.

- Contraindications list hypoglycemia – this is a specific reversible cause that is appropriate to correct prior to determining the need for Midazolam.

- Midazolam has the widest variety of routes of administration to suit the varied presentations.

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

- IM – easy access to large muscle groups could be difficult to restrain, sharp safety an issue, excellent blood flow to the muscles for drug pick up.
- IN – rapid access to the circulation, no sharps to worry about, splitting doses between nares, dead space to fill in the mucosal adapter.
- Buccal – good absorptive surface, risk of aspiration, ease of administration

OPIOID TOXICITY MEDICAL DIRECTIVE

- Contraindications list uncorrected hypoglycemia – this is a specific reversible cause that is appropriate to correct prior to determining the need for additional therapy.
- Mandatory patch is required for Naloxone administration.
- Naloxone has a similar broad range of routes of administration to Midazolam. Remember, Naloxone is ONLY being administered to improve respiratory status, NOT to improve LOA or for any other purpose.
- In keeping with the conventions of the medical directives, the order of preference of route of administration is as listed: SC is first, then IM, then IN and then IV. SC is the preferred route. Acad Emerg Med1998;5:293–9.
- While we want to reverse the respiratory depression, we need to do it for as long as the ingested drug is in the patient's system and SC can do this.
- IM – more rapid onset, shorter duration of effect than SC.
- IN – excellent absorption, concern over coming close to patient's mouth, no sharps issues.
- IV – listed last and therefore last in order of preference. Smaller dose, but virtually instantaneous effect and, of very short duration. Great in apneic patient.
- Note: IV Naloxone titration refers to administering only small increments of the 0.4 mg dose at a time to limit the rise in wakefulness.

OROTRACHEAL INTUBATION MEDICAL DIRECTIVE

- 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.
- Lidocaine spray is indicated for "awake" intubations only and should be applied to the hypopharynx.
- 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)
- 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.
- In the clinical considerations, endotracheal tube confirmation is specified in that you must use a minimum of 2 primary methods and 1 secondary method.

- Note that $ETCO_2$, the current gold standard in tube placement confirmation, is a secondary method in these directives. Remember, not every Paramedic has access to $ETCO_2$ and its primary use is in cardiac arrest where $ETCO_2$ is less reliable.

- Definition of intubation attempt: Introducing the laryngoscope into the patient's mouth with the intent to then to insert an endotracheal tube is considered an 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.

- Lidocaine administration prior to intubating a head injured patient is not indicated and has been removed.

BRONCHOCONSTRICTION MEDICAL DIRECTIVE

- Suspected bronchoconstriction applies to asthma and any other cause of wheezes. This also addresses the old teaching point of the "silent chest" as that is considered "extreme" bronchoconstriction.

- Epinephrine is indicated when the patient is asthmatic and BVM ventilation is required. This is typically after Salbutamol has had no effect, however could be the initial patient presentation whereas Salbutamol is bypassed immediately due to the severity of the patient presentation. The indications to administer Epinephrine do not change based on the ability to administer Salbutamol.

- Dosing for Salbutamol has been adjusted to match the 25 kg weight used in many directives.

- The adult dosing has been adjusted from 900 mcg to 800 mcg per dose, based on recommendations from respiratory experts. The larger change is the timing of the repeats. It is no longer immediate, but is 5 – 15 minutes following the completion of the prior dose.

- When a dose of MDI Salbutamol is administered, the intent is to deliver all 6 (pediatric) or 8 (adult) sprays to complete a dose. It would be under unusual circumstances to deliver less than the full dose.

- MDI administration is preferred over nebulization. If patient is unable to accept or cooperate with MDI administration, the nebulized route may be considered – still to a max of 3 doses.

- The technique for administration is to provide a single MDI spray and to allow for inhalation with the next spray provided 4 breaths later. It will take 1 minute to deliver a full adult dose to a patient breathing at a rate of 32 breaths per minute.

- The MDI should be considered a single patient use device.

- Nebulization increases the mobilization of any contagion and a Paramedic should use PPE to protect themselves when in close proximity to an infected patient.

MODERATE TO SEVERE ALLERGIC REACTION MEDICAL DIRECTIVE

- The Medical Directive now includes a range of allergic reactions from moderate to severe and the administration of Diphenhydramine.

- Anaphylaxis is life-threatening and delays in administration of Epinephrine are associated with greater mortality. If the patient meets the indications and contraindications, epinephrine should be administered because it may prove to be life-saving.

- Epinephrine 1:1000 is administered via the IM route only.
- Epinephrine may be administered via auto-injector.
- Epinephrine Dose = 0.01 mg/kg to a maximum of 0.5 mg (rounded to the nearest 0.05 mg) and is limited to one dose in the Prehospital setting. If the patient's clinical condition does not improve and that in the opinion of the Paramedic(s) the patient would benefit from further doses, a patch with a BHP must be initiated.
- Skin findings are most common but up to 20% of patients do not have hives or other skin symptoms. Therefore ensure that all body systems are assessed to come up with the most appropriate treatment plan.
- Urticaria alone is not an indication for administration of Epinephrine IM, the patient must present with at least one other sign or symptom.
- When indicated and available, Diphenhydramine administration should always follow the administration of Epinephrine as outlined in the Medical Directive.

Please refer to the table on page 12 for an aid in differentiating an anaphylactic reaction from a local reaction.

CROUP MEDICAL DIRECTIVE

- The presentation must be severe. Remember most presentations of croup are mild and are well tolerated by the patient.
- Prior to initiating nebulized epinephrine, moist air and 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 the BHP would be required to consider treatment under this directive.
- Dosing for epinephrine has not changed from previous versions of the directive with the exception of the following: There are no repeat administrations.

TENSION PNEUMOTHORAX MEDICAL DIRECTIVE

- A mandatory patch to the BHP is required.
- Only the second inter-costal space is approved for chest needle placement. These patients are typically supine and/or spinal immobilized and in that position, air rises and therefore will rise to escape at the second inter-costal space.
- A one way valve should be applied to cover/attach and protect the needle to provide air escape from the chest.

PEDIATRIC PAIN MEDICAL DIRECTIVE

- SC injection is a new route for the administration of Morphine. SC has less variable absorption and a shorter time to peak effect in the pediatric population and is considerably less painful.
- Injury to the head, chest, abdomen or pelvis is a contraindication to Morphine administration in pediatrics and not in adults. This is a new directive and therefore a conservative approach has been taken to minimize risks.

- The routes of administration for morphine are listed as IV/SC. Both routes are listed together and therefore are considered equivalent. The decision on the route chosen should be based on one of availability but also in discussion with the Base Hospital Physician during the patch.

ADULT ANALGESIA MEDICAL DIRECTIVE

- This medical directive replaces the Analgesia and the Moderate to Severe Pain directives. This was done to reduce the confusion of overlapping directives and to broaden the treatment of patients in pain.

- Ketorolac dosing has been revised from that prescribed in version 3.1, to a range of 10 – 15 mg. The range has been provided to simplify dose preparation. A 10 mg dose has been determined to be the analgesic effective dose.

- As indicated in the clinical considerations, the preferred treatment for isolated hip and / or extremity trauma is Acetaminophen and Ibuprofen. Oral administration is as effective and is less invasive. Reference: Ann Pharmacother 1994;28:309-12. Consider administering Morphine in addition to oral therapy for patients with moderate pain.

- A clinical consideration states “Suspected renal colic patients should routinely be considered for Ketorolac”. More correctly, this statement should include NSAIDS like Ibuprofen. Ketorolac is preferred when the patient is unable to tolerate oral medication. NSAIDs anti-inflammatory action and their smooth muscle relaxant effects (reduces the glomerular filtration rate which reduces renal pelvic pressure and stimulation of the stretch receptors) as well as its inhibition of prostaglandin production makes them ideal agents to treat renal colic. Reference: *Pharmaceuticals* **2010**, *3*, 1304-1310; doi:10.3390/ph3051304 and Anesth Pain Medv.4(1); 2014 FebPMC3961032

- Ketorolac should not be administered in conjunction with Ibuprofen as they are both NSAIDs and concomitant administration would increase the adverse effects.

- External trauma that has been dressed and controlled is not considered an active bleed.

- Occult bleeding should be considered active bleeding, (hematuria/GI bleed)

- What does unable to take oral medications mean? For example: A patient that must remain in the supine position (ie. on a backboard), is vomiting or nauseated, has difficulty swallowing or has a feeding tube in place.

- The routes of administration for morphine are listed as SC/IV. Both routes are listed together and therefore are considered equivalent. The decision on the route chosen should be based on one of availability.

- Note - it was unintentional that the order of the routes of administration in adult are listed as SC/IV and in the pediatric analgesia directive is IV/SC.

- Injury to the head, chest, abdomen or pelvis have been removed as contraindications to Morphine in adults to improve the treatment of patients in pain.

HYPERKALEMIA MEDICAL DIRECTIVE

- This directive enables ACPs to treat patients experiencing life threatening hyperkalemia. A patch to the BHP is required.

- Recognition of hyperkalemia can be improved by considering:
  1. Patients most at risk:
     a. patients unable to excrete potassium, for example the chronic kidney disease patient on dialysis that may have missed treatment(s)
     b. conditions that may precipitate extracellular potassium shift such as crush syndrome, acid-base disturbances, prolonged status seizures, major burns or prolonged immobilization.

  2. Signs and symptoms:
     a. CNS findings such as muscle twitches, cramps or paresthesia
     b. GI: abdominal cramps, diarrhea or nausea/vomiting
     c. CVS: progression to hypotension, decreased LOA, bradycardia or ECG changes (see #3 below)

  3. ECG changes consistent with severe hyperkalemia:
     a. Peaked T-waves, flattened P-waves, lengthened PR interval or widened QRS
     b. Progressive widening of QRS or bizarre QRS morphology such as sine-wave appearance
     c. Bear in mind 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:
  1. 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. In cases of cardiac arrest due to hyperkalemia, patch to the BHP early. Routine treatments common in medical cardiac arrest management may not respond until calcium is administered.
  2. Redistribution of extracellular potassium into the cells. Salbutamol in large doses may temporarily enhance potassium cellular uptake.

- Safety consideration: ensure IV line is patent and flowing well as Calcium Gluconate may cause necrosis if it extravasates.

ADVANCED CARE PARAMEDIC AUXILIARY MEDICAL DIRECTIVES

ADULT INTRAOSSEOUS MEDICAL DIRECTIVE – AUXILIARY

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

- The indications for this directive are the same as the pediatric IO directive

- The IO needles for the adult are typically the same gauge as the pediatric patient.

CENTRAL VENOUS ACCESS DEVICE ACCESS (CVAD) MEDICAL DIRECTIVE – AUXILIARY

- The indications for access are the same as the IO directives.

- Due to the potential risk involved with CVAD access, the patients must be critically ill to access one of these devices.

- The following are some examples of CVAD devices (not an exhaustive list):
  - Hickman is a type of central catheter inserted through the anterior chest wall
  - Subcutaneous Implanted Port (SIP) is a port that resides under the skin and requires the use of a Huber needle to access it.
  - Peripherally Inserted Central Catheter (PICC) is typically located on the patient's upper arm, but is still direct to the central circulation.

- The steps for accessing a CVAD are very specific and the skill sheets should be referenced and practiced.

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) MEDICAL DIRECTIVE – AUXILIARY

- This is for the treatment of acute pulmonary edema (regardless of origin) or COPD

- CPAP should be discontinued when the patient's SBP is < 100 mmHg as described in the conditions of the directive.

- CPAP should be considered as additive therapy to the bronchoconstriction (specifically COPD exacerbation) or pulmonary edema medical directives, not a replacement. CPAP may be interrupted momentarily to administer Salbutamol or Nitroglycerin. CPAP is not for asthma exacerbation. CPAP is used for splinting of the airways in COPD, and is not meant to treat simple bronchoconstriction.

SUPRAGLOTTIC AIRWAY MEDICAL DIRECTIVE– AUXILIARY

- **Contraindications**: Active vomiting is considered ongoing vomiting where the paramedic is unable to clear the airway. In this situation, the supraglottic airway (SGA) should not be inserted.

- If the patient vomited once and the airway was cleared successfully, a SGA may be inserted.

- **Definition of supraglottic airway attempt**: Introducing the SGA into the patient's mouth is considered an attempt and should be documented as such including success or failure.

- Number of attempts are clearly defined as 2 total per patient and not per provider.

- Placement of a SGA should be treated and confirmed as methodically as an ETT. SGA placement should be verified again at the time/point of transfer of care. Findings and witness (where possible) should be documented on the patient care record.

- In the event that a SGA airway is placed in cardiac arrest and the patient sustains a ROSC, the airway should only be removed as the gag reflex starts to be stimulated, but expect to remove it as the level of awareness improves.

CRICOTHYROTOMY MEDICAL DIRECTIVE – AUXILIARY

- 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. **A patch to the BHP is required prior to the attempt.**

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

- In the clinical considerations, it specifies that you must use at least two (2) primary and one secondary method to confirm placement.

NAUSEA / VOMITING MEDICAL DIRECTIVE– AUXILIARY

- 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 Base Hospital.
- If Dimenhydrinate is administered via the IV route, it must be diluted 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 saline) or a 10 mg/ml (diluted with 4 ml of saline) is acceptable.
- A column for patients **< 25 kg** is provided, but only has patch and N/A in it. This was included to indicate to the Paramedic that the physicians felt it appropriate to treat these patients but that they wanted a patch to discuss the dose administered.

COMBATIVE PATIENT MEDICAL DIRECTIVE – AUXILIARY

- Prior to sedating patients, any possible reversible causes are to be addressed or ruled out. If the patient is combative to the point they cannot be assessed for reversible causes, a patch to the BHP is required before treating with Midazolam.
- This is one of the few directives that still has a dosing range and the Paramedic is expected to use their judgment in determining the appropriate dose. The patient's physical size is not always the best determinant of dose.

PROCEDURAL SEDATION MEDICAL DIRECTIVE – AUXILIARY

- This directive applies only after the ETT has been placed or after pacing has been initiated.
- 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 require sedation.

ELECTRONIC CONTROL DEVICE PROBE REMOVAL MEDICAL DIRECTIVE – AUXILIARY

- Probes are sharps that should be considered contaminated and need to be handled and disposed of accordingly.
- Conditions indicate that an "unaltered" LOA is required for probe removal. If the patient's LOA is "altered" they are not able to provide consent to remove the probes and as such will not be removed by Paramedics.
- While not specified in the directive, it is important to understand why the electronic control device was deployed in relation to the patient's presenting or underlying medical condition with specific attention to the potential for excited delirium.

MINOR ABRASIONS MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

- Topical antibiotic ointment is left generic.

- Paramedic judgment is very important here as the design and application of this directive allows for the patient to NOT go to the hospital.

MINOR ALLERGIC REACTION MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

- The signs and symptoms MUST be consistent with a mild allergic reaction
- SBP ≥ 100 mmHg.
- The route of administration is PO.

MUSCULOSKELETAL PAIN MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

- The contraindication regarding acetaminophen use in the last 4 hours has been revised to read that the patient cannot have taken acetaminophen within the last 4 hours to receive it from the Paramedic.

HEADACHE MEDICAL DIRECTIVE – AUXILIARY – SPECIAL EVENT

- The interpretation regarding the contraindication should be that the patient cannot have taken acetaminophen within the last 4 hours to receive it from the Paramedic. The route of administration is PO.

NASOTRACHEAL INTUBATION MEDICAL DIRECTIVE – AUXILIARY

- Nasotracheal intubation (NTI) has been separated from Orotracheal intubation and is no longer a core medical directive.
- The contraindication which references age < 50, refers specifically to patients experiencing an asthma exacerbation and who are NOT in or near cardiac arrest.
- NTI should only be attempted when deemed necessary and is reserved only for the “spontaneously breathing” patient in severe respiratory distress.
- Lidocaine spray is indicated for “awake” intubations only and should be administered to both nares and hypopharynx.
- 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).
- In the clinical considerations, endotracheal tube confirmation is specified in that you must use a minimum of 2 primary methods and 1 secondary method.
- Note that $ETCO_2$, the current gold standard in endotracheal tube placement confirmation, is a secondary confirmation method in these directives, but must be used if available for a nasotracheal tube confirmation.
- Definition of intubation attempt: Insertion of an endotracheal tube 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.

HOME DIALYSIS EMERGENCY DISCONNECT MEDICAL DIRECTIVE – AUXILIARY

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