Emergency Medical Services Program
Policies – Procedures – Protocols

FP-C/CCP-C Unified Optional Scope 10005.00

I. Purpose

To establish a uniform approach to patient care as delivered from qualified transport program paramedics throughout California. Qualified Transport Programs (Ground or flight crews) that cross regional boundaries may qualify for this scope with approval by the local EMS Agency (LEMSA) in conjunction with the California EMS Authority.

II. Authority

California Health & Safety Code, Division 2.5 and California Code of Regulations, Title 22, Division 9.

III. Definitions:

A. **CAMTS**: Commission on Accreditation of Medical Transport Systems

B. **CAMTS ECC Level Certification**: CAMTS recognizes both the CCP-C and the FP-C for the *Emergency Critical Care (ECC)* accreditation level. *This CAMTS "ECC"* level also requires a qualified nurse partner and is required for programs participating in this optional scope - *see CAMTS current edition*

C. **CCP-C:** A "Critical Care Paramedic" is a paramedic educated and trained in critical care transport, whose scope of practice is in accordance to the standards prescribed in Title 22 - Division 9 - Chapter 4, holds a current certification as a CCP by the Board for Critical Care Transport Paramedic Certification (BCCTPC), has a valid license issued pursuant to Title 22 - Division 9 - Chapter 4, practices within a Qualified Transport Program, and is accredited by a LEMSA. The **CCP-C in training** must take the CCP-C exam within 6 months and pass the exam by the end of their first year with the Qualified Transport Program. See Appendix and the following link:
http://www.emsa.ca.gov/Media/Default/PDF/Chapter4Effctive2816.pdf

D. **Emergency Medical Services (EMS) Medical Directors Association of California (EMDAC)**: Is an association which is advisory to the EMS Authority on issues of scope of practice (SOP).

E. **FP-C:** A "Certified Flight Paramedic" is a paramedic educated and trained in critical care transport and flight medicine, holds a current certification as an FP-C by the Board for Critical Care Transport Paramedic Certification (BCCTPC), has a valid license issued pursuant to Title 22 - Division 9 - Chapter 4, practices within a Qualified Transport Program, and is accredited by a LEMSA. The FP-C in training must take the FP-C exam within 6 months and pass the exam by the end of their first year with the Qualified Transport Program. See Appendix and the following link:

http://www.emsa.ca.gov/Media/Default/PDF/Chapter4Effctive2816.pdf
The FP-C examination consists of 125 questions and takes 2.5 hours to complete. See Appendix

F. **Qualified Flight Paramedic:** A certified and LEMSA accredited EMT-P that meets the requirements for participating in this Unified Optional Scope. These Qualified FP-C or CCP-C paramedics have at least 3 years of critical care experience and have completed the Qualified Flight Program's initial academy training and fall into one of these categories: FP-C, or FP-in training, or CCP-C or CC- in training with additional education in flight and altitude physiology as specified in the attached Appendix, and are working for a Qualified Transport Program and are paired with a Qualified Transport Nurse as required in the "ECC level" of CAMTS current edition standards.

G. **Qualified Transport Program:** a ground or aeromedical transport program that has met the requirements to participate in this optional scope program by meeting CAMTS Emergency Critical Care (ECC) current edition level Accreditation (if aeromedical program) or equivalent and demonstrates the required training, education, competencies, QI and Medical Direction required (see appendices).

H. **Qualified Transport Nurse:** A Registered Nurse with at least 3 years of critical care experience, who has completed the Qualified Transport Program training and is working toward the CEN, CCRN, CFRN or CTRN as required by the CAMTS ECC Accreditation. The Qualified Transport Nurse is employed by and practicing with the Qualified Transport Program. *(For aeromedical nurses, see CAMTS current edition Accreditation Standard)*

I. **Qualified Transport Program Medical Director:** The Qualified Transport Program Medical Director is Board certified or eligible in

Emergency Medicine by American Board of Emergency Medicine or the American Board of Osteopathic Medicine, and if the Medical Director directs an aeromedical service, meets CAMTS ECC level requirements for Medical Director.

J. **Qualified Transport Program Physician:** A physician who is affiliated with the Qualified Transport Program as an associate or consultant, is not the Medical Director, but also is Board certified or eligible by an American Board of Medical Specialties board in emergency medicine or in the specialty appropriate for the scope of service (e.g, pediatrics, critical care) and for aeromedical service meets all the CAMTS requirements for Medical Director.

K. **FP-C in training:** These Paramedics have completed the Qualified Transport Program's initial academy training and are fully functional Paramedics for the program but have not yet completed their FP-C testing/certificate. The FP-C in training must take the FP-C exam within 6 months and pass the exam by the end of their first year with the Qualified Transport Program.

L. **Local EMS Agency (LEMSA):** The Agency designated by each County in accordance with the Health and Safety Code of the State of California that is responsible for local emergency medical services administration.

IV. Overview

This Unified Optional Scope provides a standardized scope of practice for qualified Paramedics who practice either on rotor or fixed wing aircraft or on ground ambulances. The goal for this optional scope is to allow a uniform practice environment for Qualified Transport Program teams and their patients that remains consistent throughout California and across regional boundaries and helps ensure that our patients receive the best critical care possible on both scene calls and interfacility transports.

The LEMSA Medical Director shall ensure that each Qualified Transport Program for which an application is made has appropriate medical oversight for the program, and that crew configuration for aeromedical programs consists of a qualified transport nurse and either a FP-C or a CCP-C with addition education in flight and altitude physiology, and for ground ambulances consists of a qualified transport nurse and either a FP-C or CCP-C.

V. Procedures and Requirements:

(please see the Unified Scope Appendix B for the 6 corresponding treatment protocols)

A. Unified Paramedic Optional Scope of Practice items include:

1) Pediatric intubation

2) RSI (rapid sequence induction) medication administration including: sedatives, paralytics, analgesics, and induction agents

3) Video laryngoscopy (indirect laryngoscopy)

4) Supraglottic airways

5) Ventilator initiation, maintenance and management

6) I/O (intraosseous access) for both adult and pediatrics

B. Qualified Transport Program Requirements for Participation in this Optional Scope

1) The Aeromedical Transport Program must be CAMTS ECC level certified.

2) The Qualified Transport Program must provide enhanced training, education and competency verification consistent with the requirements of this optional scope, for CAMTS current edition ECC level, and as necessary for the FPC/CCP (see Appendix). Submission and verification of educational programs as specified in Appendix is required.

3) The Qualified Transport Program must provide all 6 Unified Paramedic Optional Scope of Practice items, appropriate Quality Improvement (QI) and all LEMSA required metrics, providing a uniform report approved by EMDAC/SOP and delivered biannually to all LEMSAs.

4) The Program Medical Director must meet requirements as a “Qualified Transport Program Medical Director” must be board certified/ eligible in Emergency Medicine and which for flight programs includes CAMTS current edition ECC level requirements for the Medical Director.

C. Qualified Paramedic Requirements for Participation in this Optional Scope

1) The Qualified Paramedic must be employed by a Qualified Transport Program (and working with the program during any transports where these optional scope items are utilized).

2) The Qualified Paramedic must be partnered with a Qualified Transport Nurse, Qualified Program Medical Director or Qualified Program Physician during transports utilizing these optional scope items.

3) Be accredited by a LEMSA offering this optional scope

4) Must remain competent/proficient in these 6 optional scope procedures by passing the competency testing noted in the Appendix with the frequency required and noted here:

a. Pediatric Intubation	Quarterly
b. Rapid Sequence Intubation	Quarterly
c. Video Laryngoscopy	Quarterly
d. Supraglottic Airway	Quarterly
e. Ventilator Management	Annually
f. Intraosseous Access	Annually

5) Must have completed a minimum of 200 hours of training and all requisite training by the Qualified Transport Program (Appendix) and meet the requirements as outlined in definitions for one of the following:

   a. CCP-in training
   b. FPC-in training
   c. CCP
   d. FPC

VI. Medical Control

Medical Control shall remain the primary responsibility of the LEMSA and is delivered in conjunction with the qualified transport program's policies and procedures when they are approved by the LEMSA:

1) Online Medical Control via direct conversation between the Qualified transport teams and Qualified transport program Medical Director (this would be permitted if described within the qualified transport program Medical Control Policy when the policy is approved by the LEMSA.)

2) Online Medical Control as per current regulation via direct access to base hospitals

3) Offline Medical Control through the Qualified Transport program policies and procedures when approved by the LEMSA (only items within the paramedic scope or approved optional scope).

4) Offline Medical Control through the policies, procedures, scope of practice and optional scopes of practice of the accrediting LEMSA.

5) During an interfacility transport Online Medical Control may be obtained from the sending or receiving physician if on duty at a designated base hospital.

A. Qualified Transport Program Medical Director

The Qualified Transport Program Medical Director will be required to be Board certified or eligible in Emergency Medicine, and for aeromedical programs, meet CAMTS ECC level Medical Director requirements – CAMTS current Edition

VII. Quality Improvement Program

A. Collaborative process between EMDAC/SOP, LEMSAs, and the Qualified Transport Program for on-going quality Improvement (QI), data analysis, and performance improvement.

B. Provide EMDAC/SOP and LEMSAs with a standardized database report consistent with current national guidelines to be agreed upon in a collaborative process between EMDAC/SOP, LEMSAs and the Qualified Transport Programs.

C. Quality Improvement reporting will be delivered biannually and include all pertinent aspects of service and care surrounding the 6 items in this optional scope as well other critical care bundles

D. There will be QI reports submitted to the LEMSA and EMDAC/SOP on a scheduled basis (biannually), to include at minimum the following systemwide aggregate data:

1) Pediatric intubation (frequency, success and adverse events).

a. Percent successful placement of ETI by age

i. Numerator: # successful attempts = yes, Denominator: # of patients in whom ETI placement was attempted (defined as placement of a laryngoscope with intent of performing ETI)

b. Percent first-attempt success.

i. Numerator: # successful attempts = yes with attempts =1, Denominator: # of patients in whom ETI placement was attempted

c. Percent of each complication (emesis, trauma, hypoxia, dislodgement) and of total complications.

i. Numerator: # with complication = yes, Denominator: # of patients in whom ETI placement was attempted

d. Median time to insertion (if collected)

2) RSI (rapid sequence induction) medication administration including: sedatives, paralytics, analgesics, and induction agents - Frequency of use, success rate by age, and adverse events) – as per section a. Pediatric intubation

3) Supraglottic airways (SGA): Frequency as primary and rescue airway, success and adverse events).

Percent used as primary versus rescue airway

a. Percent successful placement of SGA by age

i. Numerator: # successful attempts = yes, Denominator: # of patients in whom SGA placement was attempted (defined as placement of a laryngoscope with intent of performing ETI)

b. Percent first-attempt success.

i. Numerator: # successful attempts = yes with attempts =1, Denominator: # of patients in whom SGA placement was attempted

c. Percent of each complication (emesis, trauma, hypoxia, dislodgement) and of total complications.

i. Numerator: # with complication = yes, Denominator: # of patients in whom SGA placement was attempted

d. Median time to insertion (if collected)

4) Video laryngoscopy (indirect laryngoscopy): Frequency as primary and rescue airway, success, and adverse events as per ETI.

5) I/O (intraosseous): Frequency of use, overall success rate and adverse events

6) Ventilator initiation, maintenance and management: Frequency and adverse events

E. Data collection will be consistent with the EMDAC derived metrics for endotracheal intubation and supraglottic airway placement:

1) Pediatric intubation, RSI and Video laryngoscopy

a. Rescue device? – yes / no / not documented

Rescue device is defined as a device used after failure of the initial device attempted for secondary airway management, after bag-mask-ventilation.

b. Successful placement? – yes / no / not documented

Successful placement is defined as the ability to ventilate the patient with minimal or no air leak, confirmed primarily with $ETCO_2$ measurement with capnography. Secondary confirmation methods include visible chest rise during ventilation and air movement on pulmonary auscultation.

c. Number of attempts – numeric in integers / not documented

Attempt is defined as insertion of the laryngoscope in the mouth with the purpose of ETI.

d. Time to insertion *(optional)* – numeric in seconds / not documented

Time to insertion is defined as the time from insertion of the laryngoscope into the mouth for the first attempt until the time of the first successful ventilation with minimal or no air leak.

e. Complications

i. Regurgitation/emesis? – yes / no / not documented

Regurgitation/emesis is defined as the presence of gastric contents noted in the oropharynx or on device during or after placement.

ii. Bleeding/trauma? – yes / no / not documented

Trauma/bleeding is defined as the presence of blood noted in the oropharynx or on the device during or after placement, or any abrasion, laceration, dental trauma or other trauma occurring during placement or repositioning of the device. This excludes bleeding or trauma present prior to attempted device placement.

iii. Hypoxia? – yes / no / not documented

Hypoxia is defined as any O_2 saturation ≤ 90% during or after placement in a patient previously normoxic prior to placement.

iv. Dislodgement? – yes / no / not documented

Dislodgement is defined as loss of the ability to adequately ventilate the patient after successful placement was achieved.

v. Cardiovascular effects? – yes/ no/ not documented

If yes,
Hypotension yes/ no/ not documented
Bradycardia yes/ no / not documented
Cardiopulmonary arrest yes / no/ not documented

f. If dislodgement after placement, successful replacement?

yes / no / not documented / not applicable

Successful replacement is defined the as the ability to ventilate the patient with minimal or no air leak, after dislodgement and replacement of the same device, confirmed primarily with $ETCO_2$ measurement with capnography. Secondary confirmation methods include visible chest rise during ventilation and air movement on pulmonary auscultation.

2) Supraglottic airway:

a. Rescue device? – yes / no / not documented

   Rescue device is defined as a device used after failure of the initial device attempted for secondary airway management, after bag-mask-ventilation.

b. Successful placement? – yes / no / not documented

   Successful placement is defined as the ability to ventilate the patient with minimal or no air leak, confirmed primarily with $ETCO_2$ measurement with capnography. Secondary confirmation methods include visible chest rise during ventilation and air movement on pulmonary auscultation.

c. Number of attempts – numeric in integers / not documented

   Attempt is defined as insertion of the supraglottic airway device (SAD) into the mouth.

d. Time to insertion *(optional)* – numeric in seconds / not documented

   Time to insertion is defined as the time from insertion of the supraglottic airway device into the mouth for the first attempt until the time of the first successful ventilation with minimal or no air leak.

e. Complications

   i. Regurgitation/emesis? – yes / no / not documented

      Regurgitation/emesis is defined as the presence of gastric contents noted in the oropharynx or on device during or after placement.

   ii. Bleeding/trauma? – yes / no / not documented

      Trauma/bleeding is defined as the presence of blood noted in the oropharynx or on the device during or after placement, or any abrasion, laceration, dental trauma or other trauma occurring during placement or repositioning of the device. This excludes bleeding or trauma present prior to attempted device placement.

iii. Hypoxia? – yes / no / not documented

Hypoxia is defined as any O_2 saturation ≤ 90% during or after placement in a patient previously normoxic prior to placement.

iv. Dislodgement? – yes / no / not documented

Dislodgement is defined as loss of the ability to adequately ventilate the patient after successful placement was achieved.

f. If dislodgement after placement, successful replacement? – yes / no / not documented / not applicable

Successful replacement is defined the as the ability to ventilate the patient with minimal or no air leak, after dislodgement and replacement of the same device, confirmed primarily with $ETCO_2$ measurement with capnography. Secondary confirmation methods include visible chest rise during ventilation and air movement on pulmonary auscultation.

APPENDIX

A. Training Requirements and Comparisons

B. Treatment Protocols

1. Pediatric intubation

2. RSI (rapid sequence induction) medication administration including: sedatives, paralytics, analgesics, and induction agents

3. Video laryngoscopy (indirect laryngoscopy)

4. Supraglottic airways

5. Ventilator initiation, maintenance and management

6. Intraosseous access for both adult and pediatrics

C. Competency Evaluations

APPENDIX A -Training and Education Program, Skills and Competency Evaluations for Unified Optional Scope of Practice

Overview and Goals:

This Unified Optional Scope educational plan carries a goal of delivering proficient critical care paramedics, who have completed all the requirements for the FP-C or CCP-C, with respect to the 6 optional scope items. This will be accomplished through assurance that the Qualified Programs are held to the highest recognized standard in the industry – CAMTS ECC level accreditation.

Qualified Programs also must ensure that all FP-C or CCP-C paramedics utilizing the Unified Optional Scope of Practice are certified within the first 2 years, and that FP-C or CCP-C trainees, once they complete the education, will attempt the certification exam within 6 months with certification required by 1 year of employment.

CAMTS ECC level also requires that a FP-C or CCP-C operate with a critical care nurse partner with one of the following certifications (certified emergency nurse (CEN), certified critical care nurse (CCRN), certified flight nurse (CFRN) or certified transport (CTRN)).

CAMTS also demands rigorous attention to maintaining the highest standards in medical care, transport program reliability/safety and quality improvement. CAMTS ECC Certification requires passing a 2-3 day survey every 2 years. The CAMTS ECC requirements set the threshold as high as possible for the paramedics participating in this optional scope of practice.

Specific Objectives:

1) Enhanced training, competency verification, and quality improvement for the Unified Optional Scope of Practice for the qualified paramedic shall be provided by the qualified transport program (see attached Excel training outline and verification form).

2) All qualified paramedics will participate in a structured orientation and educational process including but not limited to the following:

    a. Initial training academy following the core curriculum content from the following certifications, CCP-C and/or FP-C:

        1) Flight Physiology (only required for flight transport programs)

            1. Identify causes of hypoxia
            2. Relate the stages of hypoxia to patient condition and treatment
            3. Take corrective measures to prevent altitude related hypoxia
            4. Identify signs of barometric trauma

5. Identify stressors related to transport (including thermal, humidity, noise, vibration, or fatigue related conditions)
6. Take corrective action for patient stressors related to transport
7. Relate the relevant gas laws to patient condition and treatment
8. Identify immediate causes of altitude related conditions in patients
9. Identify immediate causes of altitude related conditions as they affect the air medical crew
10. Provide interventions to prevent the adverse effects of altitude changes during patient transport

2) Advanced Airway Management

1. Identify the indications for basic and advanced airway management
2. Demonstrate advanced airway management techniques in both adult and children

    a. Determine the appropriate laryngoscope blade type and size.
    b. Determine appropriate endotracheal tube size
    c. Demonstrate technique for securing the endotracheal tube
    d. Demonstrate confirmation of endotracheal tube placement
    e. Demonstrate appropriate troubleshooting techniques for poor response to intubation
    f. Discuss the management of complications of intubation.

3. Administer appropriate medications for airway management.
4. Identify the indications and contraindications for specific airway interventions
5. Implement the appropriate airway algorithms
6. Perform alternative airway management techniques

    a. Outline indications and contraindications for these techniques
    b. Manage complications of alternative airway technique

7. Monitor airway management and ventilation.
8. Discuss the importance and the requirement of continuous waveform End Tidal CO_2 capnography during transport.

9. Perform post-intubation management
10. Identify causes of hypoxia
11. Relate the stages of hypoxia to patient condition and treatment
12. Take corrective measures to prevent altitude related hypoxia
13. Identify stressors related to transport (including thermal, humidity, noise, vibration, or fatigue-related conditions)
14. Take corrective action for patient stressors related to transport
15. Relate the relevant gas laws to patient condition and treatment
16. Identify immediate causes of altitude related conditions in patients (flight transport programs only)
17. Identify immediate causes of altitude related conditions as they affect the air medical crew (flight transport programs only)
18. Provide interventions to prevent the adverse effects of altitude changes during patient transport (flight transport programs only)

3) Ventilation initiation, maintenance, and management:

1. Respiratory pathophysiology.
2. Recognition of respiratory failure (hypercapnia and hypoxia).
3. Basic ventilator function.
4. Ventilation and oxygenation of the critically ill medical and trauma patient
5. Discuss the implementation of ventilation settings to react to the patient's condition

b. Preceptorship with preceptor "sign-off" of various required aspects of critical care. This includes all items in the Unified Scope of Practice.

1) This may require skills demonstration on manikins, dynamic human patient simulators, animals or cadavers.

2) **Initial airway education and training**: no less than five (5) infant (birth to one year), (5) pediatric (age 14 years and below), and (5) adult intubations (live, cadaver, animal lab, or dynamic Human Patient Simulators (HPS) are acceptable). Airway management experiences to include alternative airway management: **direct laryngoscopy, video laryngoscopy, pediatric airway specific issues, utilization of the bougie, and supraglottic airways (SGA's).**

c. All qualified paramedics will become either FP-C (Certified Flight Paramedic) or CCP-C (Certified Critical Care Paramedic) certified by the end of their first year.
d. The qualified transport program will provide on-going training, education, and skills competency verification that will help ensure patient safety and quality improvement (the programs will use a proactive, concurrent, and retrospective approaches).

    1) Training will occur quarterly and include psychomotor, cognitive, and affective competency-based assessments for the Unified Scope of Practice interventions.

    2) **Ongoing airway education and training: No less than one (1) infant, pediatric, and adult successful intubations (live, cadaver, HPS or mannequin) <u>per quarter</u>** (calendar or fiscal year). Airway management experiences for each type of airway adjuncts listed within the program's protocols. Quarterly vetted intubation experience is required.

3) Participation in Quality Improvement plans.

APPENDIX B

FP-C/CCP-C

OPTIONAL SCOPE
TREATMENT PROTOCOLS

Pediatric Intubation

Pediatrics *(13 years and under)*

ALS Prior to Base Hospital Contact: FP-C and CCP-C Paramedic only

- Ensure BLS procedures are in place.
- Utilize a length or weight-based tape or application to select ETT size. Have a ½ size larger and smaller ETT also ready. Cuffed tubes are preferred excluding neonates.
- Confirm laryngoscope size with a length or weight-based tape or application. A Miller (straight) blade may be required for smaller patients and video laryngoscopy (VL) should be utilized whenever possible.
- Pre-oxygenate using a non-rebreather mask or BVM with a FiO2 of 100% for at least 2-3 minutes; or 8 vital capacity breaths if patient is able.
  - If pulse oximetry of less than 95%, initiate ventilatory assistance with a BVM.
  - When using a BVM during pre-oxygenation, ventilate at a rate only to maintain oxygen saturation at 95%, and avoid hyperventilation.
  - Utilize passive oxygenation via NC at 1 liter/kg/min up to max 15 liters/min during apnea and intubation attempts
- Position patient. Apply in-line cervical spine stabilization (not traction) if indicated or sniffing if allowable.
- Consider fluid bolus 20ml/kg if hypovolemic, asthmatic, COPD, or in shock.
- **Ensure all equipment and practitioners are ready. Think about your next step if this fails. Ensure all practitioners know at what point we will stop and BVM the patient. If any questions remain regarding readiness, do not proceed until everyone and everything is ready.**
- Administer premedication as indicated, 3-5 minutes prior if possible. RSI medications: etomidate (0.3 mg/kg IV) or ketamine (2 mg/kg slow IV push over 2 minutes), then rocuronium (1mg/kg IV) – allow 60 seconds before placing laryngoscope).
- Position head appropriately given age and diagnosis (no extension in trauma)
- Suction oropharynx as required.
- Perform intubation, preferable with VL (DL and/or bougie if indicated)
- Verify placement of endotracheal intubation using a minimum of 4 methods:
  - Equal lung sounds bilaterally, chest rise and fall
  - Mist present in ETT with exhalation
  - Presence of ETCO2 wave form (ETCO2 capnography is the standard however in rare circumstances where ETCO2 not available, EMS clinicians may use appropriate color change on colorimetric ETCO2 device.
  - Normal SpO2 reading
- Secure the ETT with tape or a compatible commercial device.
- Monitor placement continuously:
  - Monitor ETCO2 and SpO2 continuously.

- Reconfirm placement using a minimum of 4 methods (chest rise, lung sounds, appropriate ETCO2 reading, appropriate SpO2 reading, mist in tube, tube depth based @ lip line) after every patient move
- To facilitate ventilation and avoid regurgitation, place an OG or NG tube
- Perform post-intubation management
- Document full procedure note
  - Procedural Time Out
  - Appropriate times for intubation
  - DL and ETT size and depth
  - Document frequency of assisted ventilations and patient's respiratory rate (will be the same or higher if over-breathing)
  - Document VS, SpO2, ETCO2 and ETT placement confirmation at transfer of care.

Base Hospital Contact Required

Special Considerations

Only Qualified paramedics meeting the requirements for this optional scope under the definitions may utilize this protocol

Preparation

- Ensure equipment is ready and functioning including suction
- Maintain oxygenation during the apneic period of intubation utilizing High Flow Nasal Canula O2 @ 1 liter/kg, max=15 liters prior to initiating the procedure
- Establish an open airway – place as needed a NPA for conscious patients and/or OPA for unconscious patients
- Place a nasogastric or orogastric tube as needed

Equipment

- PPE
- Monitors
- Premedication's (including high flow nasal canula O2 per protocol)
- Appropriate RSI Medications given Age/Weight/Diagnosis
- Suction
- Endotracheal tubes (Note: deflate the cuff prior to insertion)
- Intubating Stylet (Pediatric Bougie)
- Laryngoscope
- Lubricant
- Supraglottic Airway Device (SAD) as a rescue
- BVM

- Securing device
- Confirmation devices including capnography
- Postintubation medications

Policy

1) **Function:** To secure a pediatric airway with orotracheal intubation when indicated.

2) **Circumstances under which Paramedics under optional scope may perform function:**

   a. Setting: Qualified Transport Program Paramedic with Qualified Transport Program Nurse

3) **Indications:**

   a. Respiratory failure (e.g., apnea or hypoventilation)
   b. Hypoxia despite supplemental oxygen
   c. Combative with traumatic brain injury and GCS ≤ 8
   d. Inability to protect airway
   e. Anticipated imminent airway failure

4) **Contraindications:**

   a. Complete airway obstruction (utilize obstructed airway policy)
   b. Complete distortion of oropharyngeal anatomy such that landmarks for performing intubation are not present

5) **Cautions:**

   a. Predicted difficult airway
   b. Adequate/functioning less invasive device in place (and no need for definitive airway protection)

Rapid Sequence Intubation	
ALS Prior to Base Hospital Contact: FP-C/CCP-C Only	**ALS Prior to Base Hospital Contact: FP-C/CCP-C Only**

• Pre-oxygenate using a non-rebreather mask or BVM with a FiO2 of 100% for at least 5 minutes; or 8 vital capacity breaths if patient is able. Utilize high flow nasal cannula (12-15Lpm) in addition to non-rebreather mask in spontaneously breathing adult or pediatric patients to augment pre-oxygenation.
• Continue utilizing passive oxygenation via NC at 1liter/min/kg up to max 15 liters/min during apnea and intubation attempts.
• Position patient. Apply in-line cervical spine stabilization (not traction) when indicated.
• Initiate ventilatory assistance with a BVM if pulse oximetry less than 95%.
• **Ensure all equipment and practitioners are ready. Think about your next step if this fails. Ensure all practitioners know at what point we will stop and BVM the patient. If any questions remain regarding readiness, do not proceed until everyone and everything is ready.**
• Administer Etomidate (0.3 mg/kg IV) or Ketamine (2 mg/kg slow IV push over 2 minutes), and Rocuronium (1 mg/kg IV) as first choice or required alternatives as per protocol – must wait one minute after paralytic before attempting intubation or risk vomiting and aspiration.
  • If patient was adequately pre-oxygenated, do not ventilate patient prior to intubation during relaxation phase in order to avoid inflation of the stomach. This will take 60 seconds, as measured from the time rocuronium was given. If oxygen saturation is less than 95% or below agreed upon target, initiate or continue BVM ventilation to
	• Pre-oxygenate using a non-rebreather mask or BVM with a FiO2 of 100% for at least 5 minutes; or 8 vital capacity breaths if patient is able. Utilize high flow nasal cannula (12-15Lpm) in addition to non-rebreather mask in spontaneously breathing adult or pediatric patients to augment pre-oxygenation.
	• Continue utilizing passive oxygenation via NC at 1liter/min/kg up to max 15 liters/min during apnea and intubation attempts.
	• Position patient. Apply in-line cervical spine stabilization (not traction) when indicated.
	• Initiate ventilatory assistance with a BVM if pulse oximetry less than 95%.
	• **Ensure all equipment and practitioners are ready. Think about your next step if this fails. Ensure all practitioners know at what point we will stop and BVM the patient. If any questions remain regarding readiness, do not proceed until everyone and everything is ready.**
	• Administer Etomidate (0.3 mg/kg IV) or Ketamine (2 mg/kg slow IV push over 2 minutes), and Rocuronium (1 mg/kg IV) as first choice or required alternatives as per protocol – must wait one minute after paralytic before attempting intubation or risk vomiting and aspiration.
	  • If patient was adequately pre-oxygenated, do not ventilate patient prior to intubation during relaxation phase in order to avoid inflation of the stomach. This will take 60 seconds, as measured from the time rocuronium was given. If oxygen saturation is less than 95% or below agreed upon target, initiate or continue BVM ventilation to

maximize oxygenation prior to intubation attempt. • For patients with a contraindication to Etomidate, administer midazolam or ketamine per protocol. (Ketamine is preferred in patients with asthma, bronchospasm, sepsis or hypotension. It may cause salivation, laryngospasm, hypertension or tachycardia.) • Perform orotracheal intubation per protocol 603. • Place a Gastric Drainage device. To facilitate ventilation and avoid regurgitation, an OG or NG tube should be placed. • Continue evaluation/management of pain based on physiologic signs in the sedated/paralyzed patient. • If re-dosing of medication is required, do not re-administer Etomidate as per the Etomidate protocol. • Document procedure including: time, # of attempts (defined as insertion of laryngoscope), tube size, cuffed or uncuffed, inflation of cuff with #mL, depth of insertion measured at lip line, lowest oxygen saturation during attempt, blood pressure during attempt, securing device and at least 4 different ways to confirm tracheal placement and any adverse outcomes/ challenges and treatment related to those challenges.	maximize oxygenation prior to intubation attempt. • For patients with a contraindication to Etomidate, administer midazolam or ketamine per protocol. (Ketamine is preferred in patients with asthma, bronchospasm, sepsis or hypotension. It may cause salivation, laryngospasm, hypertension or tachycardia.) • Perform orotracheal intubation per FP-C/CCP-C pediatric intubation procedure. • Place a Gastric Drainage device. To facilitate ventilation and avoid regurgitation, an OG or NG tube should be placed. • Continue evaluation/management of pain based on physiologic signs in the sedated/paralyzed patient. • If re-dosing of medication is required, do not re-administer Etomidate as per the Etomidate protocol. • Document procedure including: time, # of attempts (defined as insertion of laryngoscope), tube size, cuffed or uncuffed, inflation of cuff with #mL, depth of insertion measured at lip line, lowest oxygen saturation during attempt, blood pressure during attempt, securing device and at least 4 different ways to confirm tracheal placement and any adverse outcomes/ challenges and treatment related to those challenges. **PEDIATRIC AND NEONATAL CONSIDERATIONS:** • Atropine administration is not required but should be available if bradycardia during intubation is not responsive to BVM. • In the event of Etomidate shortage, when Ketamine is not an option, the Nurse may substitute use of Etomidate with the use of midazolam per protocol. • Passive apneic oxygenation:

	• May use blow-by at 12-15 L per min • Utilize NC, max of 5 L per min for neonate • If utilize NC, max 6-15 L per min for pediatric. • Pretreatment fluid resuscitation: • Fluid bolus 10mL/kg in Neonates if hypovolemic • Fluid bolus 20mL/kg in Pediatric patients if hypovolemic
Base Hospital Contact Required	**Base Hospital Contact Required**
N/A	N/A

Only Qualified Flight Paramedics meeting the requirements for this optional scope under the definitions may utilize this protocol

- FP-C certificate holders may utilize this protocol completely
- FP-C in training may assist the Qualified Nurse by drawing up and administering the medications in this protocol, but the Qualified Nurse will determine the medications and dose

Preparation

- Procedural and Medication Time Outs
- Patient pre-oxygenated and airway assessed
- Equipment ready and functioning
- Agree upon end points to abort attempt, i.e.: desaturation
- Contingency plan if RSI is not successful

Provide BVM to patients if oxygen saturations are less than 95%

Policy:

1) **Function:** To facilitate secure definitive control of the airway by endotracheal intubation (ETI) in an expeditious and safe manner.

2) **Circumstances under which clinical personnel may perform function:**

   a. Setting: Qualified Transport Program Paramedic with a Qualified Transport Program Nurse
   b. Supervision: If FP-C in training, Qualified Nurse selects drug and dose
   c. Indications met

3) **Indications:**

a. Failure to oxygenate
b. Failure to ventilate
c. Failure to protect the airway
d. Altered Mental Status GCS<8 or demonstrated inability to protect the airway
e. Status epilepticus
f. Expected course is likely to end in airway deterioration including airway swelling secondary to burn/inhalation/anaphylaxis/hematoma, etc.

4) **Contraindications:**

a. Facial/neck injuries or anatomy which would preclude reasonable expectation of successful endotracheal intubation
b. Findings on Airway Evaluation (See Plan B.1) which raise concerns over successful endotracheal intubation (consider BLS airway maneuvers and/or back up plan before RSI)
c. Epiglottitis

RSI PROTOCOL:

1) **Definition:** Administration of medication for sedation and paralysis to facilitate oral tracheal intubation.

2) **Diagnosis:** Failure to oxygenate, ventilate, or protect the airway

3) **Plan:**

a. Equipment:
- Laryngoscope Handle/Blade
- Video Laryngoscope
- Stylet and Bougie
- Endotracheal tubes – ideal size and one size smaller
- Oxygen and suction
- BVM
- IV Fluids
- Syringe and Needles
- Medications (etomidate or ketamine, and rocuronium)
- Pulse Oximeter
- Continuous End Tidal CO2 monitor
- Supraglottic Airway Device as rescue airway
- Surgical Airway Kit (nurse only)
- Resuscitation medications for complications such as cardiopulmonary arrest.

b. Assessment for a Difficult Airway:
   1. Evaluate the potential for difficult intubation, **"LEMON"**
      - **L**ook
      - **E**xamine
      - **M**allampati or Cormack Lehane scale
      - **O**bstruction
      - **N**eck Mobility

   2. Evaluate the potential for difficult mask ventilation, **"MOANS"**
      - **M**ask seal
      - **O**bese
      - **A**ged (>55 y/o)
      - **N**o teeth
      - **S**tiff (increased ventilatory pressures – asthma, COPD, ARDS, term pregnancy)

   3. Evaluate the potential for difficult supraglottic device, **"RODS"**
      - **R**estricted mouth opening
      - **O**bstruction (upper airway obstruction)
      - **D**isrupted or distorted airway
      - **S**tiff lungs or cervical spine

   4. Assess the potential for difficult Cricothyrotomy, **"SHORT"**
      - **S**urgery (or other airway disruption)
      - **H**ematoma (includes infection or abscess)
      - **O**besity
      - **R**adiation distortion
      - **T**umor

   5. Once a patient has been given paralytics, they will no longer be able to ventilate on their own, nor will be they be able to protect their own airway. Therefore, the airway manager must be confident in providing effective BVM ventilations, achieving successful intubation, placing a supraglottic device or performing cricothyrotomy.

   6. Hypotension is common in the post intubation period and is often caused by diminished venous blood return as a result of the increased intrathoracic pressure that accompanies mechanical ventilation or exacerbation of the hemodynamic effects of the induction agent. This is usually self-limiting and responds well to treatment with IV fluids.

   7. Patients being transported by air are especially vulnerable to worsening pneumothorax in the setting of positive pressure ventilation. Be vigilant and prepared for thoracic decompression should your patient exhibit tension

physiology or worsening oxygenation/ventilation despite proven ETT placement

8. If airway has potential to be difficult, consider continued BLS, use of endotracheal tube introducer or bougie and reattempt intubation or intubate without paralysis using sedation only (See #10 below). Keep in mind the risks of vomiting and aspiration when evaluating a patient for rapid sequence intubation (RSI). Be prepared with the rescue and surgical airway equipment before initiating RSI.

Video Laryngoscopy

ALS Prior to Base Hospital Contact: FP-C/CCP-C Only	ALS Prior to Base Hospital Contact: FP-C/CCP-C Only

• Pre-oxygenate using a non-rebreather mask or BVM with a FiO2 of 100% for at least 2-3 minutes; or 8 vital capacity breaths if patient is able.
  • If pulse oximetry of less than 95%, initiate ventilatory assistance with a BVM.
  • When using a BVM during pre-oxygenation, ventilate at a rate only to maintain oxygen saturation at 95%, and avoid hyperventilation.
  • Utilize passive oxygenation via NC at 1 liter/kg/min up to max 15 liters/min during apnea and intubation attempts
• Position patient. Apply in-line cervical spine stabilization (not traction) if indicated or sniffing if allowable.
• Consider fluid bolus 20ml/kg if hypovolemic, asthmatic, COPD, or in shock.
• **Ensure:**
  • **All equipment is ready**
  • **All practitioners are ready**
  • **What is the next step if this step fails**
  • **At what point will we stop and BVM the patient**
  • **If any questions remain regarding readiness, do not proceed until everyone and everything is ready**
• Administer premedication as indicated, 3-5 minutes prior if possible.
• RSI medications: etomidate (0.3 mg/kg IV) or ketamine (2 mg/kg slow IV push over 2 minutes), and rocuronium (1mg/kg IV) – allow 60 seconds before placing laryngoscope).
• Position head appropriately given age and diagnosis (no extension in trauma)
• Suction oropharynx as required.
• Perform Videolaryngoscopy
	• **Same as adult**

• Prebend stylet appropriately for device and ETT
• Suction early – small amounts of fluid may obscure camera view
• Look Mouth: Place VL centrally on tongue and gently advance back until the blade has passed the posterior aspect of the tongue.
• Look Screen: Look for epiglottis in the scope and preferably place the blade in the vallecula like with DL. Consider Laryngeal Manipulation (Self-Assess --- is blade is too deep?)
• Look Mouth: Gently place ETT along the right side of the VL blade just past the posterior aspect of the tongue.
• Look Screen: Gently manipulate the ETT through the cords and advance to place the black marks on the ETT around the cords
NOTE: with rigid stylets/hyperacute blades like the Glidescope, the stylet must be removed before the ETT is advanced or it will damage the anterior wall of the trachea.
• Pull the stylet or bougie
• Inflate cuff (if present).
• Verify placement of endotracheal intubation using a minimum of 4 methods:
  • Equal lung sounds bilaterally, chest rise and fall
  • Mist present in ETT with exhalation
  • Presence of ETCO2 wave form (ETCO2 capnography is the standard however in rare circumstances where ETCO2 not available may use appropriate color change on colorimetric ETCO2 device).
  • Normal SpO2 reading
• Secure the ETT using tape or a compatible commercial device.	

• Monitor placement continuously:
  • Monitor ETCO2 and SpO2 continuously.
  • Reconfirm placement using a minimum of 4 methods (chest rise, lung sounds, appropriate ETCO2 reading, appropriate SpO2 reading, mist in tube, tube depth based @ lip line) after every patient move
• Consider placement of Gastric Drainage device. To facilitate ventilation and avoid regurgitation, an OG or NG tube should be placed.
• Perform post-intubation management.
• Document full procedure note
  • Procedural Time Out
  • Appropriate times for intubation
  • VL and ETT size and depth
  • Document frequency of assisted ventilations and patient's respiratory rate (will be the same or higher if over-breathing).
  • Document VS, SpO2, ETCO2 and ETT placement confirmation at transfer of care.	

Base Hospital Contact Required	**Base Hospital Contact Required**
N/A	N/A

Only Qualified Paramedics meeting the requirements for this optional scope under the definitions may utilize this protocol

Preparation

- Equipment ready and functioning – suction
- Consider High Flow Nasal Canula O2 @ 1 liter/kg, max=15 liters
- Do not use on conscious patients
- Mouth – Screen – Mouth – Screen
- Be VERY gentle advancing the tube – especially with a "Hyperacute" blade

Policy:

1) **Function**: To utilize VL to secure an ETT via orotracheal intubation when Direct Laryngoscopy is less desirable or contraindicated

2) **Circumstances under which RN (or Paramedics within Scope) may perform function:**

    a. Setting: Qualified Transport Program Paramedic
    b. Patient condition: failure to oxygenate, ventilate, protect the airway or predicted airway compromise requiring definitive airway control
    c. Device utilized must be that device the Qualified Transport Program and personnel utilize and train with. Unfamiliar devices should not be utilized.

3) **Relative Indications:**

    a. Predicted difficult airway
    b. Spinal precautions
    c. Possible rescue for failed direct laryngoscopy

4) **Contraindications:**

    a. Responsive patients with an intact gag reflex
        - Must be unresponsive as in a “crash airway patient” or assure paralytic is on board – typically 1 full minute after rocuronium.

5) **Cautions**:

    a. Overwhelming fluid in the airway (blood/vomit will obscure view)
    b. Operator inexperience

6) **Size Selection:**

    a. Is typically the same as for direct laryngoscopy.
    b. Always have one device larger and one device smaller ready
    c. Confirm the size chosen with the package insert/table as the devices vary slightly.
    d. For pediatric patients utilize a length or weight-based tape or application and confirm with the package insert/table

7) **Equipment:**

    - Appropriate PPE
    - Video Laryngoscope with appropriately sized blades – typically the same as DL, but double check with weight/length-based system and with

package insert. Have a smaller and a larger blade available.

- Appropriate stylet (rigid for Glideslope) and bougie backup
- Endotracheal tubes
- Oxygen – high flow nasal cannula
- BVM
- IV Fluids
- Syringes and Needles
- Appropriate premedication’s and RSI medications
- SPO2 and ETCO2 monitors
- Supraglottic Rescue Airway
- Direct Laryngoscope for rescue
- Surgical Airway Rescue

Supraglottic Airway Device Placement	
ALS Prior to Base Hospital Contact: FP-C/CCP-C Only	**ALS Prior to Base Hospital Contact: FP-C/CCP-C Only**

• For inflatable devices, deflate the cuff
• Position patient. Apply in-line cervical spine stabilization (not traction) if indicated or sniffing if allowable.
• Consider fluid bolus 20ml/kg if hypovolemic, asthmatic, COPD, or in shock.
• **Ensure:**
• **All equipment is ready**
• **All practitioners are ready**
• **What is the next step if this step fails**
• **At what point will we stop and BVM the patient**
• **If any questions remain regarding readiness, do not proceed until everyone and everything is ready**
• Insert the device
  • Lubricate the posterior surface of the mask and airway tube with a water soluble lubricant just prior to insertion.
  • Place the head in the neutral or slight "sniffing" position. Head extension may be beneficial in non-trauma patients.
  • Hold the device firmly and near the cup to maintain maximum control.
  • Press the distal tip against the inner aspect of the upper teeth or gums.
  • Slide/Advance the device along the roof of the mouth behind the tongue until it meets resistance with complete insertion to the hypopharynx.
  • Be careful it does not get caught on the posterior tongue and fail to advance --- if it does a tongue blade may be helpful
  • Be careful the tip of the device does not fold over as it advances behind the tongue – rendering it dysfunctional
	• Same as adult

NOTE: Never use excessive force – you may need a smaller device • If it does not seal appropriately attempt to pull it out very slightly and advance it back in. • The device is now fully inserted. For inflatable devices, inflate the cuff per manufacturer recommendations. • Verify placement of device using a minimum of 4 methods: • Equal lung sounds bilaterally, chest rise and fall • Mist present in tube with exhalation • Presence of ETCO2 wave form (ETCO2 capnography is the standard however in rare circumstances where ETCO2 not available may use appropriate color change on colorimetric ETCO2 device. • Normal SpO2 reading NOTE: Correct placement should produce a leak free seal against the glottis with the mask tip at the upper esophageal sphincter. Devices with an integral bite block ensure the bite block is between the teeth. • Secure the device with tape or a compatible commercial device • Monitor placement continuously: • Monitor ETCO2 and SpO2 continuously. • Reconfirm placement using a minimum of 4 methods (chest rise, lung sounds, appropriate ETCO2 reading, appropriate SpO2 reading, mist in tube, device depth based @ lipline) after every patient move • Place Gastric Drainage when indicated/available: To facilitate gastric drainage, a gastric tube may be passed	

through the drain tube or around the device into the stomach. The gastric tube should be well lubricated and passed slowly and carefully.
• NOTE: The presence of a gastric tube does not rule out the possibility of aspiration if the device is not correctly located and fixed in place.
• Perform post-insertion airway management.
• Document full procedure note:
  • Procedural Time Out
  • SGA size
  • If inflatable device - Amount of air used to inflate the cuff
  • Document frequency of assisted ventilations and patient's respiratory rate (will be the same or higher if over-breathing).
  • Document VS, SpO2, ETCO2 and SGA placement confirmation at transfer of care.	

Base Hospital Contact Required	**Base Hospital Contact Required**
N/A	N/A

Only Qualified paramedics meeting the requirements for this optional scope under the definitions may utilize this protocol

Preparation

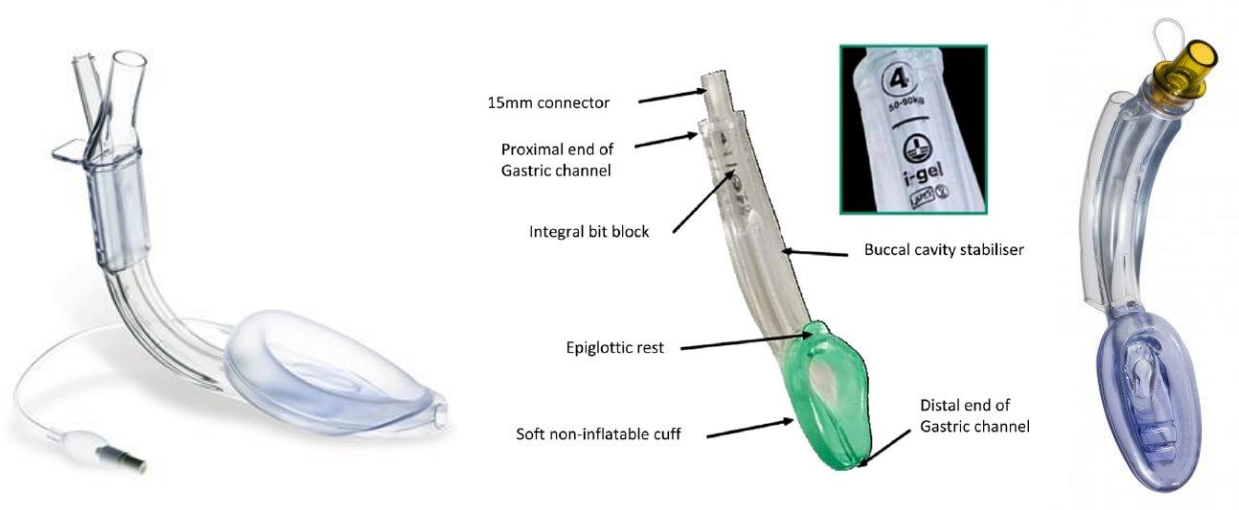
- Ensure equipment is ready and functioning including suction
- Do not use on conscious patients
- Maintain oxygenation during the apneic period of intubation utilizing High Flow Nasal Canula O2 @ 1 liter/kg, max=15 liters prior to initiating the procedure
- Avoid letting the device fold upon insertion
- Establish a contingency plan if placement is unsuccessful

Policy:

1) **Function:** To place a supraglottic airway when endotracheal intubation is either unsuccessful or deemed a high probability of failed attempt

2) **Circumstances under Paramedics under optional scope may perform function:**

a. Setting: Qualified Transport Program Paramedic
b. Patient condition: When endotracheal intubation or BVM is not desirable, unsuccessful or inadequate.
c. Devices allowed include any FDA approved supraglottic airway device (e.g., LMA supreme, igel and Air-Q)



3) **Contraindications:**

a. Responsive patients with an intact gag reflex.
b. Patients who have ingested caustic substances.

4) **Cautions:**

a. Patients who have been injured shortly after ingesting a substantial meal.

b. Patients who have had radiotherapy to the neck involving the hypopharynx (risk of trauma, failure to seal effectively).

c. Patients with decreased pulmonary compliance due to fixed obstructive airway disease. This may render the device ineffective, because airway positive pressure requirement may exceed seal pressure.

IMPORTANT: The benefits of establishing ventilation with the Supraglottic Airway Device must be weighed against the potential risk of aspiration.

5) **Size Selection:**

a. Confirm the size chosen with the package insert/table as the devices vary slightly.

b. For pediatric patients utilize a length or weigh- based tape or application and confirm with the package insert/table

c. Always have one device larger and once device smaller available

6) **Equipment:**

- PPE
- Monitors
- Premedication’s (including high flow nasal canula O2 per protocol)
- Suction
- Lubricant
- BVM
- Confirmation devices including capnography
- Post SAD placement medications

Transport Ventilator

- **Qualified Paramedics that have not yet obtained their FP-C or CCP-C may assist the Qualified Nurse with Ventilator setup, maintenance and management. Settings are determined by the Qualified Nurse.**
- **Qualified Paramedics that have completed their FP-C or CCP-C may fully utilize this protocol**
- **Check weight or size limitations for transport ventilator prior to transport**
- **High Pressure Alarm limit terminates breath when activated**
- **PEEP Compensated: PS and PC settings originate from set PEEP**
- **Circuit must NOT contain external PEEP valve**
- **Sprint Pack must not be charged or utilized while in transport vehicle**
- **RAM cannula is NOT an option with specific ventilators (e.g., LTV)**

Purpose: To provide guidelines for initiating and managing mechanical ventilator support

1) Ventilator strategies vary according to the clinical scenario and are initiated to:
    a. Maintain alveolar ventilation to ensure adequate elimination of carbon dioxide
    b. Maintain alveolar/arterial oxygenation to ensure adequate delivery of oxygen to the tissues
    c. Minimize the risk of adverse pressure and volume effects on the lungs and cardiovascular system
    d. Decrease the work of breathing, and optimize patient comfort
2) There is no single optimal mode of mechanical ventilation. Patient disease processes and condition vary over time; therefore, clinicians must regularly assess and adjust ventilator mode and/or settings to optimize oxygenation and ventilation.

Protocol: General Ventilator Management

1) All intubated patients should be placed on ventilator for transport times > 10 minutes

2) If patient received on vent support and appears to be tolerating current settings with acceptable values (PIP, Sp02, ETC02, Vte, VS, etc) those settings should be continued during out-of-hospital care.
3) Medical Crew has the ability to adjust any and all settings as necessary based on full patient assessment utilizing the guidelines in this outline and or with MD consult.
4) ETC02 monitoring (numerical and capnography) should be performed for all patients with advanced airway on ventilator support
5) Crew must have both high and low pressure 02 source equipment available
6) Providers must document supportive rationale for all changes and or values outside recommended parameters in PCR.
7) Check weight or size restrictions for the transport ventilator (e.g., the LTV 1200 ventilator is only for use on patients 3 kg and up)

Policy Application:

Applies to all patients transported by a Qualified Transport Program requiring mechanical ventilation

Setting:

1) Prehospital Mechanical ventilation should be utilized whenever possible post Intubation
2) Interfacility
    a. Assess all labs and radiology exams (ABG, Chemistry, CBC, chest x-ray, CT)
    b. Utilize respiratory therapist when available

General guidelines for values and parameters:

The following should be used as target values unless otherwise directed by a physician or when clinical assessment dictates alterations:

1) pH: 7.35 – 7.45
2) PaC02 and/or ETC02: 35 - 45 unless:

    a. The patient's PaCO2 is chronically elevated as the result of a persistent disease state
    (i.e. Chronic Obstructive Pulmonary Disease -do not attempt to correct to normal physiologic range as hypercapnia is expected)
    b. Follow physician order for target PaCO2/ETCO2 when available
    c. PaO2: 60 to 100 and/or SpO2 > 92%

3) Normal Initial Settings should be guided by ETCO2, SpO2 and/or ABG.
4) Consider all acute or chronic conditions which may skew normal ventilation management strategies.
5) Adult settings

    a. Consider all acute or chronic conditions which may skew normal ventilation management strategies
    b. Spontaneous Intermittent Mandatory Ventilation (SIMV) in Volume or Pressure Mode
    c. Starting rate: 12-16/min
    d. Tidal Volume: 6-8ml/kg ideal body weight
    e. FiO2: 50% to 100%. Start at 100% in emergency intubation and reduce as indicated
    f. PEEP: 5cm H20 (if possible, avoid increasing PEEP in patients with: increased ICP,
    hypotension, or uncontrolled pneumothorax)
    g. I:E Ratio: 1:2 (consider longer “E” time in carbon dioxide trapping conditions)
    h. Inspiratory time: 0.8 – 1.2 sec; however, in situations when this is not possible, I:E
    ratio should guide inspiratory time
    i. PIP: 20 H20
    j. Flow: 60ml/min
    k. Pressure Support (PS): Initiate at 10cm H2O for spontaneous breathing patients
    l. Utilize thermavent for humidification if applicable

6) Pediatric settings

    a. Pediatric ventilator settings should be guided by physician consultation whenever possible.
    b. Spontaneous Intermittent Mandatory Ventilation (SIMV) in Pressure Control Mode
    c. Starting Rate: Neonates: 30-40, Pediatric: 20-24
    d. Exhaled Tidal Volume: Start at 8ml/kg. Range is from 6-10ml/kg. Look at chest rise,
    listen for breath sounds and check PIP
    e. FiO2: 50% to 100%. Use lowest possible FiO2 to maintain normal SpO2 and/or
    PaO2

7) Correcting Abnormalities:

    a. PaCO2 > 45, and/or ETCO2 > 45

1. Increase tidal volume by increments of 1ml/kg until acceptable values are obtained (not to exceed 10ml/kg) and/or
2. Increase rate by increments of 2 until acceptable values are obtained (not to exceed 30, and reduce if evidence of breath stacking)
3. “I time” should not be below 0.5 seconds

b. PaCO2 < 35, and/or ETCO2 of < 35

1. Rule out a cardiovascular cause
2. Decrease tidal volume by increments of 50ml until acceptable values are obtained (not to go below 6ml/kg) and/or
3. Decrease rate by increments of 2 until acceptable values are obtained (not to go below 10)

c. Pa02 < 60 and/or Sp02 <92%

1. Increase FiO2 in increments of 20% until acceptable values are obtained
2. If FiO2 100%, increase PEEP in increments of 1-3cmH2O until acceptable values are obtained (not to exceed 10cm H20 unless directed by a physician)
3. The increasing of PEEP is typically justified when a PaO2 of 60 mmHg or SaO2 > 92% cannot be achieved by increasing FIO2

8) Mechanical Ventilation with Acute Respiratory Distress Syndrome (ARDS)

a. In mechanically ventilated patients with ARDS consider low tidal volume ventilation
(LTTV), with or without increased PEEP (open lung ventilation):

1. Tidal volume: Set to 8ml/kg of IBW and check plateau pressure. May decrease
to 6ml/kg in 1ml/kg increments if plateau pressures exceed 30 cm H2O.
2. May require extra sedation for asynchrony during LTTV.
3. Frequency: Set to meet minute ventilation requirements and monitor for autoPEEP.
4. PEEP: Consider increasing in increments of 1 to 3 cm H2O while maintaining
plateau pressure < 30 cm H2O.

i. May not exceed 10 cm H2O without physician order.
ii. Avoid if possible, in patients with known or suspected hypotension, elevated ICP, or uncontrolled pneumothorax

9) Clamping Endotracheal Tube to Maintain Peep when transferring between two ventilator circuits

a. Rationale: To avoid preventable de-recruitment, loss of Functional Residual Capacity
(FRC) in specific pulmonary compromised patients during disconnect from positive pressure / PEEP with the goal of maintaining existing baseline PEEP/recruitment
b. Indications:

1. PEEP greater than or equal to 8 cmH20
2. Fi02 1.0 (and not able to wean)
3. Specific cases: high mean airway pressures (Paw >15 cmH20), Fi02 > 0.60

c. Contraindications:

1. Patients presenting with known or suspected auto PEEP (air trapping)
2. COPD, asthma
3. Patients with any air leak disease process (ie: Pulmonary Interstitial Emphysema, Pneumothorax)
4. Uncuffed ETT's with significant leak

d. Procedure

1. Prepare receiving ventilation device
2. At end exhalation clamp ETT hemostats or Kelly clamps
   i. DO NOT clamp at any time during inspiratory phase
   ii. this will require diligent timing for unclamping to prevent inadvertent breath stacking
3. Secure clamped ETT and disconnect from current support- ventilator or BVT.
4. Place patient on prepared ventilator circuit or BVT device.
5. Unclamp ETT
6. Assess VS, ETC02, Sp02, Vte's, PIP, chest rise/fall
7. Adjust ventilator settings as needed

Potential complications during mechanical ventilation:

1) Increased Intrathoracic Pressure (with diminished cardiac output and/or hypotension)
2) Hypoxia
3) Hypercapnia or Hypocapnia
4) Pulmonary barotrauma (i.e. pneumothorax)
5) Ventilator-associated lung injury
6) Auto-PEEP (i.e. intrinsic PEEP or breath stacking)
7) Elevated intracranial pressure
8) Psychological Effects (Anxiety, Inability to communicate, etc.)

Vital signs and reassessment:

1) ETC02, Sp02, and heart rate must be continuously monitored
2) Blood Pressure must be frequently monitored
3) Reassess patient after any observed changes in vital signs, changes in condition, changes in ventilator settings, and after patient repositioning

Special considerations:

1) If at any point an uncertainty regarding ventilator settings arises, seek physician guidance.
2) Use the pediatric circuit for patients weighing less than 20 kilograms.
3) Elevate head of bed to 30 degrees unless contraindicated; this decreases the risk of ventilator-associated pneumonia.
4) In patients with PEEP greater than 10cm H2O and when changing ventilator circuits, apply clamp to ETT prior to disconnect and use haste when reconnecting.
5) Provide suctioning when the patient requires it, based on assessment. Suctioning should not be performed as a routine intervention.
6) Consider oral or nasal gastric tube placement – particularly in the pediatric population.
7) Use caution with sedation and analgesia in the hypotensive patient.
8) Consider neuromuscular blockade to optimize ventilation.
9) Adjust ventilator settings one at a time, allowing for adequate time to determine the effects of the change before making additional changes.
10) For ventilator failure or uncertainty – revert to bag mask ventilation.

Miscellaneous:

1) Monitored Values in LED display window:

    a. Monitored values will auto scroll open when turning on vent
    b. Monitored volumes and pressure have a normal variance of +/-10% from set
    c. All volumes and pressures are measured at the airway therefore considered accurate except in cases with significant ETT leaks
    d. Monitored values are NOT visible during any active alarm
    e. To clear Alarm message hit SILENCE/RESET- if alarm has been rectified message will be cleared

Troubleshooting:

1) External Power Lost Alarm:

    a. External power has been removed or no longer adequate
    b. Vent is running off battery

c. Check / troubleshoot external power connection(s) and source

2) Vent “Inop”:

a. When vent turned off Vent Inop (inoperable) LED will illuminate until SILENCE/RESET is pressed, may remain illuminated for up to 30 minutes
b. If Vent Inop LED occurs in conjunction with unintentional vent power down
    1. Remove from patient immediately
    2. Unit must be removed from service and sent for inspection/repair

3) High 02 pressure Alarm:

a. Occurs when gas inlet pressure exceeds the following:

    1. >89 psi active High-pressure source
    2. >11 psi active Low-pressure source

b. Increased pressure will NOT be delivered to patient
c. Ensure you are not in Low 02 Pressure Source and connected to high pressure
d. Change to alternative 02 port or source
e. If unable to rectify switch to alternative 02 delivery option per protocol

4) Low 02 pressure Alarm:

a. Alarm INACTIVE in Low Pressure Source (LPS)
b. Occurs when gas inlet pressure < 39 psi AND Fi02 set > 0.21
c. This will NOT impede ventilator pressures delivered to patient

    1. Ventilator will continue to ventilate
    2. Fi02 is unknown

d. Check 02 source psi
e. Check 02 source is ON
f. Check ALL high-pressure connections
g. Ensure 02 high-pressure hose is NOT kinked
h. Switch to alternative high-pressure 02 port
i. If unable to rectify switch to LPS 02 delivery per protocol

5) High pressure limit:

a. Check for DOPE (Dislodgement, Obstruction, Pneumothorax, or Equipment problem)
b. Verify alarm setting is adequate based on current PIP
c. Assess for the following additional causes

1. Patient out of synch, agitated
2. Vt too large
3. Abdominal distention
4. Kinked ETT
5. Bronchospasm
6. Secretions

6) Low pressure limit:

   a. Check for DOPE (Dislodgement, Obstruction, Pneumothorax, or Equipment problem)
   b. Verify alarm setting is adequate based on current PIP
   c. Assess typical causes

      1. Circuit leak
      2. Disconnect
      3. Increase in ETT leak
      4. ETT Cuff failure

7) Low VE:

   a. Check for DOPE (Dislodgement, Obstruction, Pneumothorax, or Equipment problem)
   b. Verify alarm setting is adequate based on current VE
   c. Primary alarm for PC

      1. Has Vte changed?
      2. In PC Vte will decrease in presence of decreased compliance, obstruction, bronchospasm, kinked ETT, secretions, etc.

   d. Has RR changed?

8) High PEEP

   a. Rule out airdropping / AutoPEEP
   b. Consider the following causes

      1. Inadequate I:E ratio
      2. Spontaneous breathing patient inadvertently generating excessive pressure on exhalation
      3. Excessive RR and or agitation

   c. Common in immersion injury and CNS patient scenarios

9) Low PEEP

a. Rule out leak in circuit or ETT
b. Consider spontaneous breathing patient with excessive negative inspiratory demand
c. Classic in agonal breathing patterns (sever neuro, immersion injury cases, etc.)

10) Vt and / or I-time unobtainable

a. Depending on patient size selected not all I-times and set Vt are compatible
b. If a specific set I-time and Vt are necessary and not compatible in Volume

1. Ensure the values you selected are appropriate
2. Switch to PC using appropriate pressure to deliver desired Vte
   Adjust 'background' inactive Volume to a value that supports desired set I-time

making vent changes

Assuming DOPE algorithm assessed (Dislodgement, Obstruction, Pneumothorax, Equipment) and ETT position verified

1) To increase PaO2 / Sp02:

a. Increase FiO2
b. Ensure Vte within desired range based on ideal body weight
c. Increase Mean Airway Pressure (Paw):

1. Increase PEEP
2. Increase I-time
3. Increase breath rate
4. Consult with MD for inverse I:E ratios

2) To decrease PaCO2 / ETC02:

a. Remember to consider and allow permissive hypercapnia when appropriate
b. CAUTION and rationale must be utilized if attempting to normalize C02 in obstructive disease patients
c. Increase Minute Ventilation (VE= RR x Vt)

1. Ensure Vte within desired range
2. Increase breath rate

3) To Increase PaCO2 / ETC02:

a. Ensure an increased PaCO2 is what is truly desired

b. Take into consideration reliability of ETC02 value based on V/Q, disease process, compensatory mechanism, patient driven, ETT leaks, etc.
c. Decrease Minute Ventilation (VE= RR x Vt)

    1. Ensure Vte within desired range and not excessive
    2. Decrease ventilation rate
    3. Certain cases may be result of patient driven minute ventilation

        i. Sedation
        ii. Paralytics

Considerations for changes:

1) Take into consideration reliability of ETC02 value based on poor cardiac output
2) Assess capnogram (ETC02 waveform) for signs of obstruction (shark fin pattern) or air stacking and adjust settings accordingly
3) Decreasing ventilation rate in presence of obstructive lung disease:

    a. Allows longer time for exhalation and therefore better CO2 removal
    b. May result in initial elevated ETCO2 - this is GOOD- CO2 is now being eliminated

4) In severe cases where excessive pressures are required, may need to consider:

    a. Low Vt strategy 4-6 ml/kg
    b. Higher ventilation rates
    c. Increased I-times
    d. Accepting hypercapnia
    e. Accepting lower Sp02

Intraosseous Cannulation

ALS Prior to Base Hospital Contact: FP-C/CCP-C Only	ALS Prior to Base Hospital Contact: FP-C/CCP-C Only

• Initiation using the EZ-IO (patients ≥3kg):
• Locate appropriate insertion site
  • Proximal Tibia – Insertion site is approximately 2 cm below the patella and approximately 2 cm medial to the tibial tuberosity.
  • Distal Tibia - Insertion site is located approximately 3 cm proximal to the most prominent aspect of the medial malleolus. Place one finger directly over the medial malleolus; move approximately 2 cm proximal and palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone.
  • Proximal Humerus (adults only)– Insertion site is located directly on the most prominent aspect of the greater tubercle. Ensure that the patient's hand is resting on the abdomen and that the elbow is adducted (close to the body).
• Prepare insertion site using aseptic technique
• Select appropriate IO needle:
  • Adult tibial insertion sites: 25mm needle set (consider 45mm needle set for patients with excessive tissue at insertion site)
  • Adult patients <40kg proximal humerus site: 25mm needle set
  • Adult patients >40kg proximal humerus site: 45mm needle set
• Prepare the EZ-IO driver
• Stabilize site and insert appropriate needle set
  • Position the driver at the insertion site with the needle set at a 90-degree angle to the bone surface. Gently
	• Initiation using the EZ-IO (patients ≥3kg):
	• Locate appropriate insertion site
	  • Proximal Tibia – Insertion site is approximately 2 cm below the patella and approximately 2 cm medial to the tibial tuberosity.
	  • Distal Tibia - Insertion site is located approximately 3 cm proximal to the most prominent aspect of the medial malleolus. Place one finger directly over the medial malleolus; move approximately 2 cm proximal and palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone.
	• Prepare insertion site using aseptic technique
	• Select appropriate IO needle:
	  • Pediatric tibial insertion sites (3-39kg): 15mm needle set (consider 25mm needle set for patients with excessive tissue at insertion site)
	• Prepare the EZ-IO driver
	• Stabilize site and insert appropriate needle set
	  • Position the driver at the insertion site with the needle set at a 90-degree angle to the bone surface. Gently pierce the skin with the needle set until the needle set tip touches the bone
	  • Check to ensure that at least one black line is visible. If no black line is visible, patient may have excessive soft tissue over selected insertion site and needle set may not reach the medullary space. Consider an alternative site for insertion or a longer needle set

pierce the skin with the needle set until the needle set tip touches the bone • Check to ensure that at least one black line is visible. If no black line is visible, patient may have excessive soft tissue over selected insertion site and needle set may not reach the medullary space. Consider an alternative site for insertion or a longer needle set • Penetrate the bone cortex by squeezing driver's trigger and applying gentle, consistent, downward pressure • Release the driver's trigger and stop the insertion process when: • On adult patients, you may stop by releasing the trigger when the hub is almost flush with the skin • Remove stylet from catheter • Connect primed EZ-Connect • Confirm placement with return of blood (marrow), or if no return of blood, easy flushing without evidence of extravasation. • For patients who are conscious and/or responsive to pain, SLOWLY (over 30 seconds) administer appropriate dose of Lidocaine 2% through the IO • Syringe bolus (flush) the EZ-IO with the appropriate amount of normal saline • Utilize pressure (pressure bag or infusion pump) for continuous infusions • Begin infusion • Secure site with IO stabilization device as indicated by manufacturer • Document time and date of placement in chart and communicate upon TOC. • Continuously monitor site and patient condition • Initiation using a manual IO needle (patients less than 3kg): • Locate appropriate insertion site (proximal tibia)	• Penetrate the bone cortex by squeezing driver's trigger and applying gentle, consistent, downward pressure • Release the driver's trigger and stop the insertion process when: • On pediatric patients, release the trigger when you feel a decrease in resistance indicating the needle set has entered the medullary space • Remove stylet from catheter • Connect primed EZ-Connect • Confirm placement with return of blood (marrow), or if no return of blood, easy flushing without evidence of extravasation. • For patients who are conscious and/or responsive to pain, SLOWLY (over 30 seconds) administer appropriate dose of Lidocaine 2% through the IO • Syringe bolus (flush) the EZ-IO with the appropriate amount of normal saline • Utilize pressure (pressure bag or infusion pump) for continuous infusions • Begin infusion • Secure site with IO stabilization device as indicated by manufacturer • Document time and date of placement in chart and communicate upon TOC. • Continuously monitor site and patient condition • Initiation using a manual IO needle (patients less than 3kg): • Locate appropriate insertion site (proximal tibia) • Prepare insertion site using aseptic technique • Stabilize site and utilize a rotary (drilling or twisting back and forth) motion to facilitate advancement of the standard IO needle (18 gauge) through the cortex • Remove stylet from catheter • Confirm placement with return of bone marrow, or if no return of bone marrow,

• Prepare insertion site using aseptic technique • Stabilize site and utilize a rotary (drilling or twisting back and forth) motion to facilitate advancement of the standard IO needle (18 gauge) through the cortex • Remove stylet from catheter • Confirm placement with return of bone marrow, or if no return of bone marrow, easy flushing without evidence of extravasation. • Stabilize and secure site with dressings • Begin infusion • Continuously monitor site and patient condition **Educate the family:** • Intraosseous cannulation is vital to patient's care. • Needle is positioned in the bone tissue and appears different than a standard intravenous infusion placement. • Intraosseous cannulation is a temporizing measure for delivery of vital fluids and/or medications. **Ongoing monitoring:** • Monitor patency of intraosseous device. • Monitor site for any signs of subcutaneous infiltration, (anterior and posterior to bone) and fluid leakage from the hub. Palpate/observe. • Monitor distal pulses and skin temperature. • If in doubt as to the proper position of the tip of the intraosseous needle, attempt to aspirate blood/marrow. If still in doubt, utilize this port for administration of intravenous chemicals only as a last resort. Instead, attempt to start a direct intravenous infusion or another intraosseous line in a different bone. **Recordkeeping:** • Document the following information for all IO insertions	easy flushing without evidence of extravasation. • Stabilize and secure site with dressings • Begin infusion • Continuously monitor site and patient condition **Educate the family:** • Intraosseous cannulation is vital to patient's care. • Needle is positioned in the bone tissue and appears different than a standard intravenous infusion placement. • Intraosseous cannulation is a temporizing measure for delivery of vital fluids and/or medications. **Ongoing monitoring:** • Monitor patency of intraosseous device. • Monitor site for any signs of subcutaneous infiltration, (anterior and posterior to bone) and fluid leakage from the hub. Palpate/observe. • Monitor distal pulses and skin temperature. • If in doubt as to the proper position of the tip of the intraosseous needle, attempt to aspirate blood/marrow. If still in doubt, utilize this port for administration of intravenous chemicals only as a last resort. Instead, attempt to start a direct intravenous infusion or another intraosseous line in a different bone. **Recordkeeping:** • Document the following information for all IO insertions • Time of insertion • Site • Needle set selection • Confirmation method (aspiration of marrow, flush without difficulty) • Total mg of Lidocaine used for pain management (if applicable) • Total fluids infused through IO

• Time of insertion • Site • Needle set selection • Confirmation method (aspiration of marrow, flush without difficulty) • Total mg of Lidocaine used for pain management (if applicable) • Total fluids infused through IO • Document on the patient care record any untoward effects of the intraosseous cannulation/infusion and any further interventions.	• Document on the patient care record any untoward effects of the intraosseous cannulation/infusion and any further interventions.
Base Hospital Contact Required	**Base Hospital Contact Required**
N/A	N/A

Policy:

1) **Function:** To facilitate infusion of fluids and/or resuscitative chemicals when intravenous access is not immediately available.

    a. IO needle as per manufacturer specification (e.g., EZIO needle sets 15mm, 25mm and 45mm lengths)
    b. Manual IO needles (< 3 kg)

2) **Circumstances under which clinical personnel may perform function:**

    a. Setting: Patient Care with urgent requirement for fluids
    b. Supervision: None – Qualified Paramedics may utilize
    c. Patient conditions:

        1. Intravenous fluids or medications are needed (i.e. Hemodynamic instability, ALOC, respiratory compromise, etc.) and a peripheral IV cannot be established in 90 seconds
        2. For IO insertion in patients less than 3kg, refer to the manual IO insertion procedure.

3) **Indications:**

    a. IO insertion may be considered after two failed IV attempts or PRIOR to peripheral IV attempts in the following situations:

        1. Cardiac arrest (medical or traumatic)
        2. Profound hypovolemia with alteration of mental status

3. Patient in extremis with immediate need for delivery of medications and or fluids.

4) Contraindications:

a. Fracture of the extremity (consider alternate site)
b. Excessive tissue at insertion site with the absence of anatomical landmarks (consider alternate site)

    1. Previous significant orthopedic procedures e.g. IO within 48 hours, prosthesis, etc. (consider alternate sites)

5) Cautions:

a. Infection in the area of anticipated insertion.
b. History of bone disease that affects bone strength or hardness (e.g., Osteogenesis imperfecta, osteopetrosis)
c. Adult patients with excess tissue over the insertion site may require the longest needle

6) Considerations:

a. Flow rates: Due to the anatomy of the IO space you will sometimes note flow rates to be slower than those achieved with IV catheters.

    1. Ensure the administration of an appropriate rapid syringe bolus (flush) prior to infusion NO FLUSH = NO FLOW.

        i. Rapid syringe bolus (flush) based on type and size of needle (e.g., EZ-IO AD® with 10 ml of normal saline, the EZ-IO PD® with 5 ml of normal saline
        ii. Repeat syringe bolus (flush) as needed

    2. To improve continuous infusion flow rates always use a syringe, pressure bag (for adults only) or infusion pump. To improve infusion rates for pediatric patients, use a syringe and 3-way stopcock to deliver bolus infusions.

b. Pain: For patients who are conscious and/or responsive to pain: Insertion of an IO in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a large bore IV). However, IO infusion for conscious patients has been noted to cause severe discomfort. If pain control is required (use clinical judgment), perform the following:

1. Upon insertion of the IO, aspirate to check placement. Then SLOWLY (over 30 seconds) administer Lidocaine 2% (Preservative Free) through the hub prior to either a bolus or continuous infusion via the IO.
    i. For all patients >3kg: Slowly administer 0.5mg/kg Lidocaine 2% (up to maximum dose of 40mg). Half of this bolus dose may be repeated x 1 via IO for pain relief.
    ii. Do NOT administer lidocaine bolus for patients < 3 kg.

c. All fluids or medications typically administered intravenously may be given via an intraosseous line.

d. IO is a bridge device that will facilitate medication and fluid administration until peripheral or central vascular access can be established. If possible, a peripheral IV should be initiated as soon as practical.

For information on EZIO visit:

http://www.teleflex.com/en/usa/ezioeducation/index.html

APPENDIX C

FP-C/CCP-C

Competency Evaluations

COMPETENCY #1: Pediatric Intubation
(frequency requirement = quarterly)

Name: _____ Title: _____ Date: _____

****All skills are to be performed within company protocols and in accordance with LEMSA requirements.**

Performance Evaluation: **Required Elements**	**Pass?**		**Remediation?** ☐**Verbal** ☐**Written** ☐**Demonstrated** **Or Comments:**	**Retest** **Pass?**	
	Yes	**No**		**Yes**	**No**
Upon arrival: Correctly dons appropriate PPE					
Assessment:					
Correctly identifies clinical indications and objective findings for intubation with or without RSI • Apnea or hypoventilation • Failure to oxygenate • Combative with Traumatic Brain Injury or GCS ≤ 8 • Inability to protect airway					
Verbalizes contraindications for placement of endotracheal tube (ETT)					
Considers appropriate premedication's if indicated (lidocaine or atropine are optional)					
Considers appropriate RSI Medications if approved and indicated					
Procedure:					
Pre-oxygenates with 100% O_2 (2-3 minutes)					
Prepares/Initiates all required items for Procedure including: • PPE • Suction • Intubating Stylet (Pediatric Bougie) • Lubricant • SGA Backup • BVM					
Demonstrates appropriate laryngoscope and ETT selection with length-based resuscitation tape (e.g., Broselow), calculation or other acceptable modality					
Performs endotracheal intubation appropriately and accurately per protocol Intubation with:					

1) Absence of “levering” the blade 2) Visualization of the epiglottis/cords 3) Passage of ETT to appropriate depth 4) Appropriate cuff filling when applicable					
Verifies placement of endotracheal intubation using a minimum of 4 methods: • Equal chest rise and lung sounds bilaterally • Mist present in ETT with exhalation • Presence of $ETC0_2$ wave form • Aprop. color change on Colorimetric $ETC0_2$ Device					
Secures ETT per protocol					
Performs post Intubation Management and Meds					
Verbalizes ongoing monitoring and reassesses position with each patient move					
Verbalizes possible complications and corrective actions • Dislodgement • Obstruction • Pneumothorax • Leak/equipment malfunction					
Verbalizes proper documentation of procedural information and patient response					
Proficiency Standard Met					

Evaluator: _____

Evaluator Signature: _____

COMPETENCY #2: Rapid Sequence Intubation (RSI)
QUALIFIED FLIGHT PROGRAMS ONLY
(frequency requirement = quarterly)

Name: _____ Title: _____ Date: _____

****All skills are to be performed within company protocols and in accordance with LEMSA requirements.**

Performance Evaluation: **Required Elements**	**Pass?**		**Remediation?** ☐**Verbal** ☐**Written** ☐**Demonstrated** **Or Comments:**	**Retest** **Pass?**	
	Yes	**No**		**Yes**	**No**
Assessment:					
Correctly identifies clinical indications for RSI: • Failure to ventilate • Failure to oxygenate • Combative with Traumatic Brain Injury or GCS ≤ 8 • Inability to protect airway or maintain airway patency • Anticipated course = likely airway failure					
Verbalizes contraindications to RSI: • Total airway obstruction (cric.) • Total loss of anatomic landmarks (cric.) Verbalizes relative contraindications to RSI: • Difficult Airways with unlikely backup (BVM and/or cric. success unlikely) • Apneic and unconscious patient (Crash)					
Considers appropriate premedication's including high flow oxygen by nasal canula: NS bolus, push dose pressor, atropine, etc.					
Considers and chooses appropriate RSI Medications (etomidate or ketamine, and rocuronium) given age, diagnosis and vital signs if approved and indicated.					
Procedure:					
Pre-oxygenates with 100% 0_2 (2-3 minutes)					
Prepares all required and appropriate items (Broselow or similar may be required) for procedure including: • PPE • Suction • Nasal Canula with high flow 0_2 • NPA or OPA					

• Premedication's • RSI Medications • Intubating Stylet (bougie) • SGA Backup • BVM • DL and VL of appropriate size • Securing Device • Confirmation Devices • Postintubation Medications					
Demonstrates appropriate selection and administration of: • Premedication dosages • Laryngoscope • ETT selection • RSI Medications (etomidate or ketamine, and followed by rocuronium per program dosing – should be 60 seconds before placing laryngoscope after rocuronium) • Intubation with: 1) Absence of "levering" the blade 2) Visualization of the epiglottis/cords 3) Passage of ETT to appropriate depth 4) Appropriate cuff filling					
Verifies placement of endotracheal intubation using a minimum of 4 methods: • Equal chest rise and equal lung sounds bilaterally • Mist present in ETT with exhalation • Presence of $ETCO_2$ wave form • Aprop. color change on Colorimetric $ETCO_2$ Device					
• Secures ETT per protocol					
Post Intubation Management and Medications					
Verbalizes ongoing monitoring and reassesses airway with each patient move					
Verbalizes possible complications and corrective actions • Dislodgement • Obstruction • Pneumothorax • Leak/equipment malfunction					
Verbalizes proper documentation of procedural information and patient response					
Proficiency Standard Met					

Evaluator: _____

Evaluator Signature: _____

COMPETENCY #3: Video Laryngoscopy (VL)
(frequency requirement = quarterly)

Name: _____ Title: _____ Date: _____

****All skills are to be performed within company protocols and in accordance with LEMSA requirements.**

Performance Evaluation: **Required Elements**	**Pass?**		**Remediation?** ☐**Verbal** ☐**Written** ☐**Demonstrated** **Or Comments:**	**Retest** **Pass?**	
	Yes	**No**		**Yes**	**No**
Assessment:					
Correctly identifies clinical indications and objective findings for VL use with or without RSI: • Apnea or hypoventilation • Failure to oxygenate • Combative with Traumatic Brain Injury or GCS ≤ 8 • Inability to protect airway • Imminent course with expected airway failure					
Verbalizes relative contraindications for VL (no absolute contraindications when airway cannot otherwise be obtained) • Markedly distorted anatomy • Excessive vomit or blood, etc. • Inadequate mouth opening					
Pre-oxygenates with 100% 0_2					
Considers appropriate premedication's if indicated (lidocaine, etc.)					
Considers appropriate RSI Medications if approved and indicated					
Procedure:					
Prepares/Initiates all required items for VL Procedure including: • PPE • BVM • Suction • Laryngoscope (DL) and SGA Backup • Appropriate VL selection per weight, package insert, Broselow, etc. • Confirmation adjuncts					

Performs VL use appropriately per protocol. Identifies epiglottis and cords.					
Verifies the ETT placement with recording (preferred) or picture and using a minimum of 4 methods: • Equal chest rise and Equal lung sounds bilaterally • Mist present in ETT with exhalation • Presence of $ETC0_2$ wave form • Aprop. color change on Colorimetric $ETCO_2$ Device					
Secures ETT per protocol					
Verbalizes ongoing monitoring and reassesses ETT position with each patient move					
Verbalizes possible complications and corrective actions • Dislodgement • Obstruction • Equipment malfunction • Intolerance/gagging/vomiting					
Verbalizes proper documentation of procedural information and patient response					
Proficiency Standard Met					

Evaluator: _____

Evaluator Signature: _____

COMPETENCY #4: Supraglottic Airway (SGA) Placement

(frequency requirement = quarterly)

Name: _____ Title: _____ Date: _____

****All skills are to be performed within company protocols and in accordance with LEMSA requirements.**

Performance Evaluation: Required Elements	**Pass?**		**Remediation? ☐Verbal ☐Written ☐Demonstrated Or Comments:**	**Retest Pass?**	
	Yes	**No**		**Yes**	**No**
Assessment:					
Correctly identifies clinical indications for SGA placement with or without RSI • Apnea or hypoventilation • Failure to oxygenate • Combative with Traumatic Brain Injury or GCS ≤ 8 • Inability to protect airway					
Verbalizes contraindications for SGA • Intact gag reflex • Need for more definitive airway protection with ETT					
Considers/initiates appropriate pre/post medications and/or RSI medications if approved and indicated (High Flow 0_2, Zofran, versed, etc.)					
Procedure:					
Prepares/Initiates all required items for SGA Procedure including: • PPE • Suction • Laryngoscope/ETTs Backup • Lubricant • Appropriate SGA selection (LMA supreme requires filling syringe) • Confirmation adjuncts • BVM					
Preoxygenates and assures ventilation					
Performs SGA placement appropriately and accurately per organization protocol • Lubricates cuff					

• Neutral head position					
Verifies placement of SGA using a minimum of 4 methods: • Equal chest rise and lung sounds bilaterally • Mist present in SGA tube with exhalation • Presence of $ETC0_2$ wave form • Aprop. color change on Colorimetric $ETC0_2$ Device					
Secures SGA per protocol					
Verbalizes ongoing monitoring and reassesses position with each patient move					
Verbalizes possible complications and corrective actions • Dislodgement • Obstruction • Equipment malfunction • Intolerance/gagging/vomiting					
Verbalizes proper documentation of procedural information and patient response					
Proficiency Standard Met					

Evaluator: _____

Evaluator Signature: _____

COMPETENCY #5: Ventilator Management
(frequency requirement = annual)

Name: _____ Title: _____ Date: _____

****All skills are to be performed within company protocols and in accordance with LEMSA requirements.**

Performance Evaluation: Required Elements	**Pass?**		**Remediation?** ☐ **Verbal** ☐ **Written** ☐ **Demonstrated** **Or Comments:**	**Retest Pass?**	
	Yes	**No**		**Yes**	**No**
Assessment:					
Verbalize indications for the use of transport ventilator: • Pt in need of Continuous Positive Airway Pressure (or) • Pt in need of mechanical ventilation 1) ETT or Supraglottic Airway 2) Manual ventilation time >10 mins • Pt size >3kg					
Demonstrates proper set up of circuit: • Verbalizes weight range for vent circuit sizes • Demonstrates appropriate assembly & connection of circuit- including all adaptors					
Demonstrates initial Vent Op / Leak Test: • Verbalizes when this is to be performed • Verbalizes proper troubleshooting for LEAK FAIL					
Demonstrates basic vent mode settings: • Non-invasive vs Invasive • Indications and Contraindications for each					
Demonstrates understanding of battery power use: • Importance of external vs. internal use • Proper charging • How to verify battery status levels • Understands Battery Pack care/maintenance					
Demonstrates basic set up and selects proper ventilation settings for both Adult and Pediatric circuits: • Connects to high pressure 02 source • Sets Fi02 • Selects Mode • Selects breath type • Selects Pressure Control or Volume Control • Sets PEEP • Sets Rate • Sets I-time • Sets Pressure Support • Sets alarms					

• Verbalizes understanding of High Pressure and low volume Alarm functions • Verbalizes the range of sensitivity settings, function and importance					
Demonstrates set up of alternative 0_2 delivery: • Importance of external vs. internal use • Low Pressure Oxygen source vs. 'bleed in' • Understanding of how to utilize Low Press 0_2 chart • Verbalizes when this can be utilized					
Demonstrates basic troubleshooting: • Importance of external vs. internal use • High pressure • Low pressure • Low 0_2 Pressure • Vt / i-time limitation					
Demonstrates basic set up of CPAP / BiPAP: • Identifies clinical indications for use • Identifies absolute contraindications • Verbalizes key components of mask compatibility for use with the ventilator • Correct sizing and placement of mask • Sets up "bleed in" 0_2 method via mask CPAP: (states average ranges) • Selects Mode Selects breath type • Ensures Freq/RR is off • Sets CPAP pressure • Sets back up settings appropriate for patient BiPAP: (states average initial settings) • Selects Mode • Selects breath type • Ensures Freq/RR is off • Sets PS (IPAP) • Sets PEEP (EPAP) • Sets back up settings appropriate for patient					
Verbalizes proper documentation of procedural information and patient response					
Proficiency Standard Met					

Evaluator: _____

Evaluator Signature: _____

COMPETENCY #6: Intraosseous (IO) Placement
(frequency requirement = annual)

Name: _____ Title: _____ Date: _____

****All skills are to be performed within company protocols and in accordance with LEMSA requirements.**

Performance Evaluation: **Required Elements**	**Pass?**		**Remediation?** ☐ **Verbal** ☐ **Written** ☐ **Demonstrated** **Or Comments:**	**Retest** **Pass?**	
	Yes	**No**		**Yes**	**No**
Assessment:					
Correctly identifies clinical indications for the placement of IO access: • Peripheral IV cannot be placed in 90 s • Cardiac arrest • Profound hypovolemia with ALOC • Immediate need for medications or fluids • Apnea or hypoventilation • 3 kg or greater = EZ-IO • Under 3 kg = manual intraosseous					
Verbally states the contraindications for the placement of IO access: • Fracture of the same target bone • Absence of anatomical landmarks • Previous significant orthopedic procedure within 48 hours of the same target bone • Infection over target site • Wt < 3 kg					
Procedure:					
Assembles equipment: • PPE • Chlorhexidine or alcohol prep • Appropriate sized IO needle (EZ-IO or Manual) • EZ-IO driver • 10 mL syringe • IV fluid with tubing attached • Pressure bag or infusion pump • 2% Lidocaine (preservative free) • NS for rapid fluid bolus					

Correctly identifies appropriate and allowed insertion sites for your program: • Proximal Tibia • Distal Tibia • Proximal Humerus may be allowed • Distal femur may be allowed					
Performs appropriate IO procedure: • Selects, preps and stabilizes the site • Utilizes the appropriate IO size/system • Correctly inserts the needle into the bone • Removes EZ-IO driver from catheter while stabilizing hub • Removes stylet from needle while stabilizing needle – then placing stylet into sharps • Confirms placement with marrow return • Stabilizes/Secures/Protects IO needle • Connects preprimed tubing and flushes 1) Lidocaine for conscious patients 2) NS 5ml for peds/10ml for adults • Recognizes no flush = no flow • Applies pump/pressure bag for infusion					
Verbalizes monitoring of site, function, possible complications and corrective actions • Dislodgement • Obstruction • Equipment Malfunction					
Verbalizes proper documentation of procedural information and patient response					
Proficiency Standard Met					

Evaluator: _____

Evaluator Signature: _____