Individual license holders are responsible to hold and maintain the appropriate competencies (satisfactory knowledge and appropriate psychomotor skills) for the safe performance of these procedures. Clinical care is to be provided in accordance with the protocols and procedures as established by the Provincial Medical Director and all patient care duties and functions must be performed in accordance with the EMS Protocols and Procedures as published by the Minister.

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<td>Maintenance of Established Devices – Level 4</td>
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<td>P25</td>
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<tr>
<td>P26</td>
<td>Wound Management</td>
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<tr>
<td>P28</td>
<td>Impaling Object Management</td>
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</table>
### INDICATIONS:
- Unconscious patient with airway compromised by foreign body not relieved by basic life support maneuvers

### CONTRAINDICATIONS:
- Inability to visualize an obstructing foreign body

### NOTES:
- **Do not blindly probe with fingers or forceps**. You must visualize the foreign body before attempting to remove it.
- If the foreign body is visible in the mouth or oropharynx, attempt to remove it manually.
- Providers with appropriate delegation may attempt to remove using appropriate forceps and direct visualization.
- If unable to remove a foreign body after two attempts and/or unable to visualize foreign body, initiate emergent transport and continue attempts en route, if it is safe to do so.
INDICATIONS:

- Unconscious patient with airway compromised by tracheal foreign body not relieved by basic life support maneuvers

CONTRAINDICATIONS:

- Inability to visualize an obstructing foreign body

NOTES:

a. Do not blindly probe with forceps. You must visualize the foreign body with the laryngoscope before attempting to remove it.

b. Use only Magill forceps.

c. If the foreign body is visible in the subglottic larynx or near trachea (ie. within reach of the forceps), attempt to remove it. Do not attempt to retrieve tracheal foreign body from distal trachea or mainstem bronchi.

d. If unable to remove a foreign body after two attempts and/or unable to visualize foreign body, initiate emergent transport and continue attempts en route, if it is safe to do so.
## OROPHARYNGEAL AIRWAYS (OPA):

### INDICATIONS:
- Unconscious patient with no gag reflex

### CONTRAINDICATIONS:
- Intact gag reflex

### NOTES:
- Clear mouth and airway of all secretions, blood or vomitus
- Ensure suction is available
- Remove dentures if loose
- Perform head-tilt chin-lift, or jaw thrust technique for potential c-spine compromised patient
- If required use crossfinger technique to open mouth
- Size OPA by measuring from the corner of the mouth to the tip of the earlobe
- Insert the airway into the mouth with the curved end towards the roof of the mouth
- Slowly move the airway towards the posterior pharynx, until the distal end reaches the back of the hard palate
- Gently rotate airway 180° into its proper position behind the tongue in the posterior pharynx
- For an infant insert holding the tongue down using a tongue depressor, and follow the curve of the mouth
- If gagging, retching or vomiting occurs, remove the airway immediately, suction as required
- May be used together with nasopharyngeal airway(s) for difficult airway management
**NASOPHARYNGEAL AIRWAY (NPA):**

**INDICATIONS:**
- conscious or semi-conscious with compromised airway
- intact gag reflex requiring airway management
- injury to the mouth or jaw, making it impossible to use the mouth as the main air passageway
- clenched teeth and unable to open mouth due to trauma, seizure, other medical conditions, or poisoning

**CONTRAINDICATIONS:**
- suspected basilar skull fracture

**NOTES:**
- select an NPA which is slightly smaller than the size of the patient's largest nostril
- size for length by measuring from the corner of the nose to the tip of the earlobe
- lubricate 2 – 3 centimeters of the beveled edge of the NPA with water soluble lubricant
- insert the NPA into selected nostril with the lubricated end as close to the nasal septum as possible
- insert the NPA into the nostril, allowing it to follow the natural curve of the nasal passage
- if resistance is met, a gentle back and forth rotation of the NPA may allow it to advance
  - DO NOT USE FORCE
  - If resistance continues withdraw, relubricate and attempt to insert in other nostril
- insert until the measured point rests against the opening of the nares, secure in place if required
- if patient gags during final stages of insertion withdraw the NPA slightly, if gagging continues remove completely
- assess for patent airway
- may be used together with oropharyngeal airway for difficult airway management
From
AIRWAY & BREATHING MANAGEMENT or
AIRWAY OBSTRUCTION

Yes
Esophageal disease
or caustic ingestion

No

LMA or iGel

BIAD

Confirm correct placement

Ventilate through device

Patient regains consciousness &/or
gag reflex

Yes
Remove device

No

Continue ventilation
through device

Yes
Return to
AIRWAY & BREATHING MANAGEMENT
or AIRWAY OBSTRUCTION

No
**Section A: Laryngeal Mask Airway (LMA) & I-GEL Supraglottic Airway**

**INDICATIONS:**
- Airway that is not patent and/or cannot be maintained
- Not spontaneously breathing or spontaneous but inadequate

**CONTRAINDICATIONS:**
- Patient is conscious
- Patient has protective airway reflexes (intact gag reflex)

**NOTES:**
Devices approved by Health Canada may be used with this protocol.
- Pre-oxygenate with 100% O2 by BVM, with basic airway device(s) as required.
- Rigid suction should be readily available.
- Select the appropriate size device (appendix A & B) and prepare all equipment as per manufacturer’s recommendations.
- Remove any dentures or other dental devices prior to attempting insertion.
- Insert as per manufacturer’s recommendations.
- Discontinue all further attempts at insertion if significant resistance is encountered, patient gags or vomits, or patient otherwise resists insertion.
- Confirm correct device placement by auscultating both sides of the thorax for audible breath sounds and the epigastrium to exclude gastric insufflations. If correct placement is confirmed, proceed with ventilation through the device.
- If correct device placement is not achieved, attempt once to reinsert. Limit each attempt at insertion to 30 seconds and reoxygenate between attempts.
- If insertion is unsuccesful, return to airway management using basic airway device.
- If the patient regains consciousness, turn the patient on their side (if possible) and remove the device. Rigid suction should be readily available.
- Continue ventilation as required with 100% O2 by bag valve mask.
### Section B: Esophageal Tracheal Combitube (ETC) and King Laryngeo-Tracheal Airway (King-LT)

**INDICATIONS:**
- Airway that is not patent and/or cannot be maintained
- Not spontaneously breathing or spontaneous but inadequate

**CONTRAINDICATIONS:**
- Patient is conscious
- Patient has protective airway reflexes (intact gag reflex)
- Known esophageal disease
- Known or suspected caustic ingestion

**NOTES:**
Devices approved by Health Canada may be used with this protocol.
- Pre-oxygenate with 100% O2 by BVM, with basic airway device(s) as required.
- Rigid suction should be readily available.
- Select the appropriate size device (appendix C & D) and prepare all equipment as per manufacturer’s recommendations.
- Remove any dentures or other dental devices prior to attempting insertion.
- Insert as per manufacturer’s recommendations.
- Discontinue all further attempts at insertion if significant resistance is encountered, patient gags or vomits, or patient otherwise resists insertion.
- Always deflate cuff(s) before removal.
- Confirm correct device placement by auscultating both sides of the thorax for audible breath sounds and the epigastrium to exclude gastric insufflations. If correct placement is confirmed, proceed with ventilation through the device.
- If correct device placement is not achieved, attempt once to reinsert. Limit each attempt at insertion to 30 seconds and reoxygenate between attempts.
- If insertion is unsuccessful, return to airway management using basic airway device.
- If the patient regains consciousness, turn the patient on their side (if possible) and remove the device. Rigid suction should be readily available.
## Appendix A: Laryngeal Mask Airway (LMA) Size Chart

<table>
<thead>
<tr>
<th>Size #</th>
<th>Weight (kg)</th>
<th>Weight (lbs)</th>
<th>Maximum Inflation Volume (ml)</th>
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<tbody>
<tr>
<td>1</td>
<td>Neonatal</td>
<td>&lt; 5</td>
<td>&lt; 10</td>
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<tr>
<td>1.5</td>
<td>Paediatric</td>
<td>5 – 10</td>
<td>10 – 20</td>
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<tr>
<td>2</td>
<td>Paediatric</td>
<td>10 – 20</td>
<td>20 – 45</td>
</tr>
<tr>
<td>2.5</td>
<td>Paediatric</td>
<td>20 – 30</td>
<td>45 – 65</td>
</tr>
<tr>
<td>3</td>
<td>Paediatric</td>
<td>30 – 50</td>
<td>65 – 110</td>
</tr>
<tr>
<td>4</td>
<td>Adult</td>
<td>50 – 70</td>
<td>110 – 150</td>
</tr>
<tr>
<td>5</td>
<td>Adult</td>
<td>70 – 100</td>
<td>150 – 220</td>
</tr>
<tr>
<td>6</td>
<td>Adult</td>
<td>&gt; 100 kg</td>
<td>&gt; 220</td>
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## Appendix B: I-GEL Supraglottic Airway Size Chart

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<tr>
<th>Size</th>
<th>Kg</th>
<th>Neonate</th>
<th>Infant</th>
<th>Small pediatric</th>
<th>Large pediatric</th>
<th>Small adult</th>
<th>Medium adult</th>
<th>Large adult</th>
<th>&gt; 90 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>2 - 5</td>
<td>Neonate</td>
<td>Infant</td>
<td>Small pediatric</td>
<td>Large pediatric</td>
<td>Small adult</td>
<td>Medium adult</td>
<td>Large adult</td>
<td>&gt; 90 kg</td>
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<tr>
<td>1.5</td>
<td>5 - 12</td>
<td>Infant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>2.0</td>
<td>10 – 25</td>
<td>Small pediatric</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2.5</td>
<td>25 - 35</td>
<td>Large pediatric</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>3</td>
<td>30 - 60</td>
<td>Small adult</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>50 – 90 kg</td>
<td>Medium adult</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>&gt; 90 kg</td>
<td>Large adult</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size #</td>
<td>Height (m)</td>
<td>Height (ft)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Contraindicated</td>
<td>&lt; 1.22</td>
<td>&lt; 4.0</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>37 Fr</td>
<td>1.22 – 1.62</td>
<td>4.0 – 5.5</td>
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<td>Standard</td>
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<td>5.5 – 6.5</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Contraindicated</td>
<td>&gt; 1.95</td>
<td>&gt; 6.5</td>
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## Appendix D: King LT-D and LTS-D Supraglottic Airway

<table>
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<tr>
<th>Size #</th>
<th>Color Code</th>
<th>Height (cm)</th>
<th>Height (in)</th>
<th>Weight (kg)</th>
<th>Cuff Volume (ml)</th>
<th>LTD</th>
<th>LTSD</th>
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<tr>
<td>2</td>
<td>Green</td>
<td>90 – 115</td>
<td>35 - 45</td>
<td>12 - 25</td>
<td>25 - 35</td>
<td>NA</td>
<td></td>
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<tr>
<td>2.5</td>
<td>Orange</td>
<td>105 – 130</td>
<td>41 - 51</td>
<td>25 - 35</td>
<td>30 - 40</td>
<td>NA</td>
<td></td>
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<tr>
<td>3</td>
<td>Yellow</td>
<td>122 – 155</td>
<td>48-60</td>
<td>NA</td>
<td>45 - 60</td>
<td>40 - 55</td>
<td></td>
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<tr>
<td>4</td>
<td>Red</td>
<td>155 – 180</td>
<td>60 - 72</td>
<td>NA</td>
<td>60 - 80</td>
<td>50 - 70</td>
<td></td>
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<tr>
<td>5</td>
<td>Purple</td>
<td>&gt; 180</td>
<td>&gt; 72</td>
<td>NA</td>
<td>70 - 90</td>
<td>60 - 80</td>
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Endotracheal Intubation (ETI) - Adult

17 years & older

1. Preoxygenate
2. Prepare all equipment
3. Prepare patient
4. Consider cricoid pressure
5. Consider bougie

- ETT is confirmed to be in trachea
  - No
    - Inflate ETT cuff
    - Release cricoid pressure
    - Determine tube depth
    - Secure ETT
    - Insert bite block
    - Consider EGT
  - Yes
    - Ventilate as required
    - Monitor SaO2
    - Monitor EtCO2
    - Monitor tube depth

- Patient remains unconscious
  - No
    - Consider sedation
  - Yes
    - Return to patient assessment & management

- TRANSPORT

Consider Spinal Motion Restriction

Advanced Critical
INDICATIONS:
- Patient is unconscious with no gag reflex and
- Airway that is not patent and/or cannot be maintained and/or is not protected from aspiration
- Not spontaneously breathing or spontaneous but inadequate
- Patient is hypoxemic and hypoxemia cannot be corrected by other means

CONTRAINDICATIONS:
- None

NOTES:
- Pre-oxygenate with 100% O2 by BVM with an OPA and/or NPA as required. Rigid suction should be readily available.
- Prepare all equipment in standard fashion. Select the appropriate size ETT as follows:
  - Male – size 7, 8 or 9
  - Female – size 6, 7 or 8
- Remove any dentures or other dental devices. Do not forcibly open clenched jaws. If cervical spine trauma is suspected, limit spinal motion while performing airway maneuvers.
- Cricoid pressure or BURP maneuver may be used to improve visualization of the glottis. If cricoid pressure is applied, do not release it until the ETT is placed within the trachea and the cuff is inflated.
- If the glottis cannot be directly visualized consider placing a gum elastic bougie in the trachea, and advancing the ETT over the bougie.
- Limit each attempt at ETT insertion to 30 seconds. Reoxygenate between attempts. A maximum of two attempts should be made. Discontinue attempts at insertion if patient gags or vomits, or patient otherwise resists insertion. Consider alternative device (such as LMA or supraglottic airway device) or continue with basic airway management technique.
- If placement within the trachea is achieved, inflate the cuff, and confirm correct position. Correct ETT placement can be confirmed by:
  - Direct visualization of placement through the vocal cords.
  - Water vapour appearing within the ETT.
  - Auscultation of breath sounds within the thorax.
  - Absence of breath sounds within the epigastrium.
  - Colorimetric change of an EtCO2 detector or appropriate waveform on capnometry.
  - Improvement or maintenance of oxygen saturation.
- If there is no confirmation of correct ETT position, remove the tube and consider alternative device (such as LMA or supraglottic airway device) or continue with basic airway management technique.
- Note ETT depth and adjust as necessary (20 – 24 cm). If correct placement is confirmed, secure the ETT with an appropriate device or taping method. Consider inserting a commercial bite blocking device or OPA into the mouth alongside the ETT.

ABBREVIATIONS:
- BIAD – blind insertion airway device
- BURP – backward / upward / rightward pressure
- cm - centimeters
- EGT – endogastric tube
- EtCO2 – end tidal CO2
- ETT – endotracheal tube
- LMA – laryngeal mask airway
- NPA – nasopharyngeal airway
- OPA – oropharyngeal airway
Endotracheal Intubation (ETI) - Adolescent

10 up to 17 years

Preoxygenate
Prepare all equipment
Prepare patient
Consider cricoid pressure
Consider bougie

ETT is confirmed to be in trachea

Inflate ETT cuff
Release cricoid pressure
Determine tube depth
Secure ETT
Insert bite block
Consider EGT

Ventilate as required

Monitor SaO2
Monitor EtCO2
Monitor tube depth

Consider sedation

Return to patient assessment & management

Consider Spinal Motion Restriction

Consider BIAD or other device

TRANSPORT
INDICATIONS:
- Patient is unconscious with no gag reflex and
  - Airway that is not patent and/or cannot be maintained and/or is not protected from aspiration
  - Not spontaneously breathing or spontaneous but inadequate
  - Patient is hypoxemic and hypoxemia cannot be corrected by other means

CONTRAINDICATIONS:
- None

NOTES:
- Pre-oxygenate with 100% O2 by BVM with an OPA and/or NPAs required. Rigid suction should be readily available.
- Prepare all equipment in standard fashion. Select the appropriate size laryngoscope and ETT as per appendix A.
- Remove any dental devices. Do not forcibly open clenched jaws. If cervical spine trauma is suspected, limit spinal motion while performing airway maneuvers.
- Cricoid pressure or BURP maneuver may be used to improve visualization of the glottis. If cricoid pressure is applied, do not release it until the ETT is placed within the trachea and the cuff is inflated.
- If the glottis cannot be directly visualized consider placing a gum elastic bougie in the trachea, and advancing the ETT over the bougie.
- Limit each attempt at ETT insertion to 30 seconds. Reoxygenate between attempts. A maximum of two attempts should be made. Discontinue attempts at insertion if patient gags or vomits, or patient otherwise resists insertion. Consider alternative device (such as LMA or supraglottic airway device) or continue with basic airway management technique.
- If placement within the trachea is achieved, inflate the cuff, and confirm correct position. Correct ETT placement can be confirmed by:
  - Direct visualization of placement through the vocal cords.
  - Water vapour appearing within the ETT.
  - Auscultation of breath sounds within the thorax.
  - Absence of breath sounds within the epigastrium.
  - Colorimetric change of an EtCO2 detector or appropriate waveform on capnometry.
  - Improvement or maintenance of oxygen saturation.
- If there is no confirmation of correct ETT position, remove the tube and consider alternative device (such as LMA or supraglottic airway device) or continue with basic airway management technique.
- Note ETT depth and adjust as necessary (see appendix A). If correct placement is confirmed, secure the ETT with an appropriate device or taping method. Consider inserting a commercial bite blocking device or OPA into the mouth alongside the ETT.

ABBREVIATIONS:
- BIAD – blind insertion airway device
- BURP – backward / upward / rightward pressure
- cm - centimeters
- EGT – endogastric tube
- EtCO2 – end tidal CO2
- ETT – endotracheal tube
- LMA – laryngeal mask airway
- NPA – nasopharyngeal airway
- OPA – oropharyngeal airway
Appendix A: Adolescent tracheal tube size and depth

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Laryngoscope blade</th>
<th>Straight blade</th>
<th>Curved blade</th>
<th>Endotracheal tube size (OD)</th>
<th>Depth (cm to lips)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 14</td>
<td>2,3</td>
<td>X</td>
<td>X</td>
<td>5.5 – 6.0</td>
<td>14 - 16</td>
</tr>
<tr>
<td>14 - 17</td>
<td>3</td>
<td>X</td>
<td></td>
<td>6.0 – 7.0</td>
<td>16 - 20</td>
</tr>
</tbody>
</table>
1 up to 10 years

Endotracheal Intubation (ETI) - Child

Preoxygenate
Prepare all equipment
Prepare patient
Consider cricoid pressure
Consider bougie

ETT is confirmed to be in trachea

Inflate ETT cuff
Release cricoid pressure
Determine tube depth
Secure ETT
Insert bite block
Consider EGT

Ventilate as required

Monitor SaO2
Monitor EtCO2
Monitor tube depth

Consider Spinal Motion Restriction

Patient remains unconscious

Consider sedation
Consider BIAD or other device
Return to patient assessment & management

TRANSPORT

P02.4C ETI  Page 1
### INDICATIONS:
- Patient is unconscious with no gag reflex and
- Airway that is not patent and/or cannot be maintained and/or is not protected from aspiration
- Not spontaneously breathing or spontaneous but inadequate
- Patient is hypoxemic and hypoxemia cannot be corrected by other means

### CONTRAINDICATIONS:
- None

### NOTES:
- Pre-oxygenate with 100% O2 by BVM with an OPA and/or NPA as required. Rigid suction should be readily available.
- Prepare all equipment in standard fashion. Select the appropriate size laryngoscope and ETT as per the Broselow tape or appendix A.
- Do not forcibly open clenched jaws. If cervical spine trauma is suspected, limit spinal motion while performing airway maneuvers.
- Cricoid pressure may be used to improve visualization of the glottis. If cricoid pressure is applied, do not release it until the ETT is placed within the trachea and the cuff is inflated.
- If the glottis cannot be directly visualized consider placing a gum elastic bougie in the trachea, and advancing the ETT over the bougie.
- Limit each attempt at ETT insertion to 20 seconds. Reoxygenate between attempts. A maximum of two attempts should be made. Discontinue attempts at insertion if patient gags or vomits, or patient otherwise resists insertion. Consider alternative device (such as LMA) or continue with basic airway management technique.
- If placement within the trachea is achieved, inflate the cuff if using cuffed tube, and confirm correct position. Correct ETT placement can be confirmed by:
  o Direct visualization of placement through the vocal cords.
  o Water vapour appearing within the ET.
  o Auscultation of breath sounds within the thorax.
  o Absence of breath sounds within the epigastrium.
  o Colorimetric change of an EtCO2 detector or appropriate waveform on capnometry.
  o Improvement or maintenance of oxygen saturation.
- If there is no confirmation of correct ETT position, remove the tube and consider LMA insertion or continue with basic airway management technique.
- Note ET depth and adjust as necessary (see appendix A). If correct placement is confirmed, secure the ET with an appropriate device or taping method. Consider inserting a commercial bite blocking device or OPA into the mouth alongside the ET.

### ABBREVIATIONS:
- BIAD – blind insertion airway device
- cm - centimeters
- EGT – endogastric tube
- EtCO2 – end tidal CO2
- ETT – endotracheal tube
- LMA – laryngeal mask airway
- NPA – nasopharyngeal airway
- OPA – oropharyngeal airway
Appendix A:
Child tracheal tube size and depth

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight (kg)</th>
<th>Laryngoscope blade</th>
<th>Straight blade</th>
<th>Curved blade</th>
<th>Endotracheal tube size (OD)</th>
<th>Uncuffed ET</th>
<th>Depth (cm to lips)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 4 y</td>
<td>10 - 14</td>
<td>2</td>
<td>X</td>
<td></td>
<td>4.0 – 4.5</td>
<td>+/-</td>
<td>12 - 13</td>
</tr>
<tr>
<td>5 – 8 y</td>
<td>15 - 22</td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>4.5 – 5.0</td>
<td>+/-</td>
<td>14 - 16</td>
</tr>
<tr>
<td>8 – 10 y</td>
<td>24 - 30</td>
<td>2,3</td>
<td>X</td>
<td>X</td>
<td>5.0 - 5.5</td>
<td>+/-</td>
<td>16 - 18</td>
</tr>
</tbody>
</table>

Estimation of uncuffed ET size based on age: \((\text{age}/4) + 4\)

Estimation of cuffed ET size based on age: \((\text{age}/4) + 3\)
Endotracheal Intubation (ETI) - Infant

0 up to 12 months

Consider Spinal Motion Restriction

Preoxygenate
Prepare all equipment
Prepare patient
Consider cricoid pressure
Consider bougie

ETT is confirmed to be in trachea

Inflate ETT cuff
Release cricoid pressure
Determine tube depth
Secure ETT
Insert bite block
Consider EGT

Ventilate as required

Monitor SaO2
Monitor ETCO2
Monitor tube depth

No

Patient remains unconscious

Consider sedation

Return to patient assessment & management

Consider BIAD or other device

TRANSPORT
INDICATIONS:
- Patient is unconscious with no gag reflex and
  - Airway that is not patent and/or cannot be maintained and/or is not protected from aspiration
  - Not spontaneously breathing or spontaneous but inadequate
  - Patient is hypoxemic and hypoxemia cannot be corrected by other means

CONTRAINDICATIONS:
- None

NOTES:
- Pre-oxygenate with 100% O2 by BVM with an OPA and/or NPA as required. Rigid suction should be readily available.
- Prepare all equipment in standard fashion. Select the appropriate size laryngoscope and ETT as per the Broselow tape or appendix A.
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  - Water vapour appearing within the ET.
  - Auscultation of breath sounds within the thorax.
  - Absence of breath sounds within the epigastrium.
  - Colorimetric change of an EtCO2 detector or appropriate waveform on capnometry.
  - Improvement or maintenance of oxygen saturation.
- If there is no confirmation of correct ETT position, remove the tube and consider LMA insertion or continue with basic airway management technique.
- Note ET depth and adjust as necessary (see appendix A). If correct placement is confirmed, secure the ET with an appropriate device or taping method. Consider inserting a commercial bite blocking device or OPA into the mouth alongside the ET.

ABBREVIATIONS:
- BIAD – blind insertion airway device
- BURP – backward / upward / rightward pressure
- cm - centimeters
- EGT – endogastric tube
- EtCO2 – end tidal CO2
- ETT – endotracheal tube
- LMA – laryngeal mask airway
- NPA – nasopharyngeal airway
- OPA – oropharyngeal airway
## Appendix A:
### Infant tracheal tube size and depth

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Weight (kg)</th>
<th>Laryngoscope blade</th>
<th>Straight blade</th>
<th>Endotracheal tube size (OD)</th>
<th>Uncuffed ET</th>
<th>Depth (cm to lips)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm</td>
<td>&lt; 1.25</td>
<td>0</td>
<td>X</td>
<td>2.5</td>
<td>+</td>
<td>6 - 7</td>
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<tr>
<td>0 – 3</td>
<td>3 – 5</td>
<td>0, 1</td>
<td>X</td>
<td>3.0 – 3.5</td>
<td>+</td>
<td>8 – 10</td>
</tr>
<tr>
<td>3 – 12</td>
<td>6 – 9</td>
<td>1</td>
<td>X</td>
<td>3.5 – 4.0</td>
<td>+</td>
<td>10 – 11</td>
</tr>
</tbody>
</table>
INDICATIONS:

- Interfacility transfer of patient on medication infusion established by health care providers at the referring facility.

CONTRAINDICATIONS:

- Medication category is not listed below.

NOTES:

- EMS provider must have sufficient knowledge of infusion device to safely maintain medication infusion established prior to transport.
- EMS providers must have **Maintenance of Established Device Level 2** delegation to maintain infusion through a PICC line.
- EMS Providers must have **Maintenance of Established Device Level 3** delegation to maintain infusion through a central venous line.
- EMS providers must have **Maintenance of Established Device Level 3** delegation to titrate or adjust medication dosages and the medication must fall within their delegated scope of practice.
- All medication infusions established by health care providers at the referring facility require a written order from the health care provider (or designate) originally ordering the medication infusion.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Basic Care Delegations</th>
<th>Primary Care Delegations</th>
<th>Intermediate Care Delegations</th>
<th>Advanced Care Delegations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Dextrose (&gt; 25%)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Diltiazem</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Dobutamine</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Dopamine</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Epinephrine</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Esmolol</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>Flumazenil</td>
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<td>Glucagon</td>
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<td>Heparin</td>
<td>✓</td>
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</tr>
<tr>
<td>IV solutions (see table A)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Insulin</td>
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<td>Labetolol</td>
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<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>Magnesium sulfate</td>
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<td>--------------------------------</td>
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<td></td>
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<tr>
<td>Mannitol</td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N-acetylcysteine</td>
<td>☑</td>
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<td></td>
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<tr>
<td>Naloxone</td>
<td>☑</td>
<td></td>
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<tr>
<td>Nitroglycerin</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Norepinephrine</td>
<td></td>
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<td>☑</td>
<td></td>
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<tr>
<td>Octreotide</td>
<td></td>
<td>☑</td>
<td></td>
<td></td>
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<tr>
<td>Opioid analgesics</td>
<td></td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxytocin</td>
<td></td>
<td>☑</td>
<td></td>
<td></td>
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<tr>
<td>Pantoprazole</td>
<td></td>
<td></td>
<td>☑</td>
<td></td>
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<tr>
<td>Phenytoin</td>
<td></td>
<td></td>
<td>☑</td>
<td></td>
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<tr>
<td>Propofol</td>
<td></td>
<td></td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Sodium nitroprusside</td>
<td></td>
<td></td>
<td>☑</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE A:**

IV fluids that may be maintained by all EMS providers through established IV infusion device.

- Ringer’s lactate solution
- 0.9% (normal) saline solution
- 0.45% (half normal) saline solution
- 5% dextrose solution (D5W)
- 10% dextrose solution (D10W)
- Any standard combination of the above fluids (eg. D5W / 0.45% saline solution)
- Maximum rate of infusion = 250 ml / hr
- Additives to IV solution
  - KCl up to 40 mEq/l
  - MgSO4 up to 1 gm/l
  - Oxytocin up to 40 units per liter

**ABBREVIATIONS:**

- gm/l = gram per liter
- IV = intravenous
- KCL = potassium chloride
- mEq/l = millequivalent per liter
- MgSO4 = magnesium sulfate
**INDICATIONS:**
- Critically ill or injured patient in whom IV access cannot be obtained within 90 seconds or with two attempts, or
- Critically ill or injured patient in whom it is anticipated IV access will not likely be obtained within 90 seconds or with two attempts

**CONTRAINDICATIONS:**
- Bone fracture near or proximal to site in consideration
- Intraosseous (IO) placement at same site within 72 hours
- Burn or overlying infection at site in consideration
- Landmarks cannot be adequately localized
- Transport time less than time required to initiate IO access
- Osteogenesis imperfecta

**NOTES:**
- Any devices approved by Health Canada may be used with this protocol.
- Prepare the equipment as per the manufacturer’s recommendations.
- Select appropriate site for insertion.
- Position and stabilize the limb.
- Using strict sterile technique prepare the insertion site.
- Insert the device in the method prescribed by the manufacturer.
- Aspirate using a sterile syringe. Return of bone marrow confirms correct intramedullary needle tip placement. Note that absence of marrow does not rule out correct placement.
- Test irrigation with 5 to 10 ml of sterile NS:
  - Watch for evidence of fluid extravasation into overlying soft tissue. If device does not irrigate properly or there appears to be fluid extravasation, do not use this site but secure the device in place.
  - If the device irrigates properly and there is no sign of fluid extravasation, connect to an IV line as per the manufacturer’s recommendations and initiate fluid infusion and/or medication administration.
- Stabilize and dress the device in the method prescribed by the device manufacturer.
- Assess site every 15 minutes for evidence of fluid extravasation into overlying soft tissues.
- If IO cannulation attempt is not successful, do not repeat attempt at or near the same site.
- If IO cannulation is initially successful, but fluid flow subsequently stops, repeat irrigation with 5 to 10 ml of sterile NS. Watch for any sign of fluid extravasation. If device does not irrigate properly or there appears to be fluid extravasation, do not continue to use this site but leave the device secured in place.
- Providers with appropriate delegation may consider the local injection of 1% lidocaine solution in the awake or awakening patient.
**INDICATIONS:**
- Medication or fluid administration required (or anticipated to be required) for any clinical indication as established by the Patient Care Maps

**CONTRAINDICATIONS:**
- Transport time is less than time required to establish intravenous access

**NOTES:**
- If possible, avoid sites with overlying infection and/or burns and/or distal to known or suspected long bone fractures.
- Intravenous cannulation may be conducted en route in situations requiring emergent transport.
- Use an intravenous catheter with the largest gauge (diameter) and shortest length that can reasonably be established if fluid resuscitation is required or anticipated.
- Ensure that the intravenous catheter is securely fastened and the vascular access site is appropriately dressed to prevent inadvertent loss of access en route.
- Dispose of used needles according to manufacturer’s instructions and MHHLS recommendations.
- In critically ill or injured patients consider intraosseous access if intravenous access cannot be obtained within 90 seconds or two attempts.
NOTES:

- Providers with this delegation must be able to perform three lead electrocardiometry (ECG) for cardiac monitoring, and
- Providers with this delegation must be able to recognize and describe:

DYSRHYTHMIAS:

- Normal sinus rhythm
- Significant common tachycardias
  - Sinus tachycardia
  - Atrial fibrillation / flutter
  - AVN re-entry tachycardia (previously referred to as PSVT or paroxysmal supraventricular tachycardia)
  - Wide complex tachycardia
- Significant common bradycardias
  - Sinus bradycardia
  - AVN blocks
**BI-PHASIC DEFIBRILLATION:**
- Biphasic = 120 to 200 J (or default / max current)

**SYNCHRONIZED CARDIOVERSION:**
- Biphasic = 100 J
- Monophasic = 200 J

**MONO-PHASIC DEFIBRILLATION:**
- Monophasic = 360 J (or default / max current)

### ADULT:
- Initial shock = 2 J / kg
- Second shock = 4 J / kg (Max = 200 J)

### ADOLESCENT:
- Initial shock = 2 J / kg
- Second shock = 4 J / kg (Max 360 joule)

### CHILD:
- Initial shock = 2 J / kg
- Second shock = 4 J / kg (Max 360 joule)

**INDICATIONS:**
- **Defibrillation:**
  - Ventricular fibrillation and pulseless ventricular tachycardia
- **Cardioversion:**
  - Sustained tachycardia with a heart rate > 150 beats per min, and
  - SBP less than 100 mmHg or age-adjusted minimum, and
  - At least one other sign of poor perfusion (see also **C06 Unstable Tachycardia**)
- **Pacing:**
  - Sustained bradycardia with heart rate < 60 beats per minute, and
  - SBP less than 100 mmHg or age-adjusted minimum, and
  - At least one other sign of poor perfusion (see also **C05 Unstable Bradycardia**)

**CONTRAINDICATIONS:**
- None

**NOTES:** Ensure familiarity with your device before you need to use it.
- **Defibrillation:**
  - Apply the hands-free pads according to the manufacturer’s recommendations.
  - Operate the device according to the manufacturer’s recommendations.
  - Ensure that the device is not in “synchronized” mode.
  - Defibrillators will default to manufacturer’s ideal initial energy selection (120 to 200 J). If in doubt, select maximum available energy.
  - Ensure that providers are not in contact with the patient when administering shock (s).
  - Use pediatric sized pads or paddles for children < 10 kg. If unavailable, use adult sized pads or paddles.
  - For adolescents and children, providers with appropriate delegation may consider energy selection up to 10 J / kg (to adult maximum) if first 2 shocks are not successful.
  - Immediately resume CPR after each shock administration.
Cardioversion:
- Apply the hands-free pads according to the manufacturer’s recommendations.
- Operate the device according to the manufacturer’s recommendations.
- **Ensure that the device is in “synchronized” mode.**
- If the patient’s condition allows, consider procedural sedation.
- Ensure that providers are not in contact with the patient when administering shock(s).
- Use pediatric sized pads or paddles for children < 10 kg. If unavailable, use adult sized pads or paddles.

Pacing:
- Apply the hands-free pads according to the manufacturer’s recommendations.
- Operate the device according to the manufacturer’s recommendations.
- Ensure that the device is in “demand” mode.
- If the patient’s condition allows, consider procedural sedation or systemic analgesia.
- Use pediatric sized pads or paddles for children < 10 kg. If unavailable, use adult sized pads or paddles.
Obvious death is confirmed by:

1. Evidence of significant time lapse:
   a. Dependent lividity
   b. Rigor mortis
   c. Generalized tissue decomposition / putrefaction
   d. Torso freezing (chest cannot be compressed)

2. Injuries incompatible with life
   a. Decapitation
   b. Incineration
   c. Transection
   d. Open head wound and
      i. Separation of the entire brain from the skull, or
      ii. Visible total destruction of the brain
   e. Open torso wound and
      i. Separation of the entire heart from the thorax, or
      ii. Visible total destruction of the heart, or
      iii. Separation of both lungs from the thorax, or
      iv. Visible total destruction of both lungs

NOTES:

1. All EMS providers who encounter a patient with any of the above conditions should not initiate life saving interventions and should not initiate emergent or urgent transport. However, in some circumstances EMS personnel may be required to assist with transporting the deceased to an appropriate facility.

2. All EMS providers must comply with their Regional / Service protocols & procedures for reporting of deaths and for care of the deceased.

3. In many cases of obvious death (eg. decapitation) formal assessment for absent pulse and / or respirations will not be required.
EMS personnel must initiate resuscitative measures on any fetus that delivers with absent respirations or pulse, as per **D01E Newborn Care & Resuscitation**, except as indicated below:

1. Unexpected stillbirth
2. Expected stillbirth
3. Miscarriage

**NOTES:**
- In the event of a miscarriage or stillbirth, EMS personnel transport mother and fetus / products of conception together to the closest appropriate facility.
- All EMS providers must comply with their Regional or service protocols & procedures for reporting of stillbirths.

**DEFINITIONS:**

1. **UNEXPECTED STILLBIRTH:**
   - The gestational age of the fetus is known or suspected to be twenty weeks or greater, and
   - The fetus is born without pulse and respirations, and
   - There is obvious generalized tissue maceration.

2. **EXPECTED STILLBIRTH:**
   - The gestational age of the fetus is known to be twenty weeks or greater, and
   - The fetus is born without pulse and respirations, and
   - Patient has a current diagnosis of intrauterine death as established by a qualified health care provider.

3. **MISCARRIAGE:**
   - The gestational age of the fetus is established with certainty to be less than twenty weeks.
**INDICATIONS:**
- Cardiopulmonary arrest (CPA) with a period of continuous pulselessness of at least twenty minutes duration
- Visual confirmation of asystole
- Further treatment of asystole is judged to be futile

**CONTRAINDICATIONS:**
- Known or suspected hypothermic cardiopulmonary arrest
- Traumatic cardiopulmonary arrest *(A04 Traumatic CPA)*

**NOTES:**
In the event of CPA with electrical activity (VF, VT, PEA), all efforts should be made to resuscitate on scene. Excluding hypothermia, once electrical activity ceases survival with satisfactory neurological outcome is very unlikely. At no time should EMS personnel put themselves or the general public at risk from emergent transport that will not benefit the patient.

At any time EMS personnel may initiate on-line medical support (OLMS) for guidance with transport decision-making.

- Pre-arrival “down-time” should be included in calculation of duration of pulselessness.
- CPR delivered by non-EMS providers may be included in calculating the duration of pulselessness as long as it is performed as per the HSFC 2015 Canadian Resuscitation & First Aid Guidelines.
- If there is any transient return of spontaneous circulation (ROSC) the duration of pulselessness should be recalculated from the time the pulse is once again lost. If ROSC is recurrent and intermittent, the longest episode of pulselessness must exceed twenty minutes to consider discontinuation.
- Check for asystole in two opposing ECG monitor leads for a maximum of ten seconds. Include a copy in the PCR of ECG (both leads) tracing confirming asystole.
- Immediately turn off monitor, stop oxygen and IV or IO fluid. Leave all medical devices in place.
- Surviving family, acquaintances or bystanders may need psychological support at scene.
- All EMS providers must comply with their Regional / Service protocols & procedures for reporting of deaths and for care of the deceased.
- EMS providers should remain with the deceased until released by law enforcement or the Medical Examiner’s Office, or dispatched to another high priority call.
- Transportation is not routinely required. Patient may be transported non-emergently to hospital upon request of Medical Examiner or law enforcement as per local protocol or practice.
INDICATIONS:
- Suspicion of myocardial ischemia or infarction due to chest / abdominal / back / throat / jaw / arm discomfort
- Suspicion of myocardial ischemia or infarction due to other consistent symptoms
- Altered level of consciousness
- Suspected drug overdose
- Hypotension or shock
- Tachycardia
- Bradycardia

CONTRAINDICATIONS:
- Patients requiring emergent transport where ECG will not immediately impact treatment or destination

NOTES:
- Prepare the equipment as per the manufacturer’s recommendations.
- Consider addition of leads RV4, V8 and V9 if suspicion of right ventricular or posterior wall ischemia or infarction.
- Operate the equipment as per the manufacturer’s recommendations.
- Providers with appropriate delegation may be required to transmit the tracing to the receiving health care provider (eg. Code STEMI Bypass) or online medical support (OLMS).
NOTES:

- Providers with this delegation must be able to acquire an appropriate 12 or 15 lead electrocardiogram (ECG)
- Providers with this delegation must be able to recognize and describe:

DYSRHYTHMIAS:

- Normal sinus rhythm
- Sinus tachycardia
- Atrial tachycardia (including MAT or multifocal atrial tachycardia)
- Atrial fibrillation
- Atrial flutter
- AVN re-entry tachycardia (previously referred to as PSVT or paroxysmal supraventricular tachycardia)
- Wide complex tachycardia (presumed ventricular tachycardia in most cases)
- Polymorphic ventricular tachycardia (including torsades des pointes)
- Sinus bradycardia
- Second degree AV block
- Third degree AV block
- Prolonged QT

MYOCARDIAL ISCHEMIA, INJURY, or INFARCTION:

- ST depression (consistent with ischemia or injury)
- ST elevation (consistent with infarction; also known as STEMI)
- Anterior or antero-septal myocardial infarction
- Inferior myocardial infarction
- Right ventricular myocardial infarction
INDICATIONS:
- Signs and symptoms consistent with hypoglycemia or a diabetic emergency (hyperglycemia)
- Seizures
- Altered level of consciousness
- Suspected ETOH intoxication

NOTES:
- Prepare the equipment as per the manufacturer’s recommendations.
- Clean patient’s finger with alcohol.
- Puncture site with lancet and dispose of lancet appropriately. Alternatively, if vascular access is being attempted, blood may be obtained from the access site.
- Apply blood as per manufactures recommendations.
- Obtain reading as per manufactures recommendations.
- Apply dessing to wound site if required.
INDICATIONS:

- Known or suspected tension pneumothorax where cardiovascular collapse has occurred or appears imminent

CONTRAINDICATIONS:

- None

NOTES:

- Tension pneumothorax is diagnosed clinically and confirmed by a favorable response to needle thoracostomy.
- Apply antiseptic to the overlying skin only if time allows.
- Place the catheter in the second intercostals space immediately above the third rib in the mid-clavicular line.
- If patient is receiving positive pressure ventilation (PPV) by either mechanical (ventilator) or manual (BVM) means, allow the vascular catheter to remain open to the air.
- If patient is breathing spontaneously, attach a one-way (Heimlich) valve to the vascular catheter.
- Apply a supportive dressing prior to transport to avoid kinking of the catheter.
- If there is suspicion of recurrent tension pneumothorax after initial favorable response to needle thoracostomy, consider repeat needle thoracostomy on the same side, near to the original insertion site.
- For cardiac arrest with pulseless electrical activity (PEA), consider bilateral needle thoracostomies.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Catheter gauge</th>
<th>Minimum catheter length (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult (17 years &amp; older)</td>
<td>10 to 12</td>
<td>3.5</td>
</tr>
<tr>
<td>Adolescent (10 up to 17 years)</td>
<td>10 to 12</td>
<td>3.5</td>
</tr>
<tr>
<td>Child (1 up to 10 years)</td>
<td>12 to 14</td>
<td>2</td>
</tr>
<tr>
<td>Infant (0 up to 12 months)</td>
<td>16</td>
<td>1.5</td>
</tr>
</tbody>
</table>
INDICATIONS:

- At least one initial reading is indicated in all stable patients
- On-going monitoring of patient with dyspnea, respiratory distress or respiratory failure
- On-going monitoring of patients with altered level of consciousness

CONTRAINDICATIONS:

- None

NOTES:

- Operate the pulse oximeter as per the manufacturer’s recommendations.
- Do not withhold oxygen to obtain a pulse oximetry reading in unstable patients
- A cool or poorly perfused extremity may limit the sensitivity of pulse oximetry. Consider the use of an alternate site or ear probe.
- Pathological conditions, such as carbon monoxide (CO) poisoning may yield falsely normal results. If CO poisoning is known or suspected, administer O2 at 15 lpm flow rate by NRB mask or BVM apparatus.
INDICATIONS:

- Patient with one or more of the following medical devices already established by another health care provider
  - Endogastric tube (nasal / oral)
  - Infusion pump device (not requiring titration of medication or adjustment of flow rate)
  - Peripheral intravenous catheter (capped, or running but not requiring adjustment of flow rate)
  - Peripherally inserted central catheter (PICC - capped only)
  - Urinary catheter (suprapubic or transurethral insertion site)

NOTES:

- Ensure devices are adequately secured and appropriately dressed prior to transport.
- Ensure all connections are adequately secured.
- Ensure there is no tension on devices or the attached tubing.
- Urinary or gastric drainage bags should be emptied by referring facility staff prior to transport.
- Intravenous bags must be maintained above the level of patient’s heart.
- Urinary or gastric drainage bags must be be maintained below level of patient’s body.
- Do not manipulate established device in moving vehicle.
- If an established endogastric tube becomes partially or fully misplaced during transport, do not attempt to reinsert. Remove the device completely. Providers with appropriate delegation may consider re-establishing endogastric access.
- Prior to transport, ensure familiarity with any infusion pump device, know how to trouble shoot any malfunction or alarm, and determine whether the medication can be stopped if required. Should a malfunction or alarm occur, troubleshoot according to the manufacturer’s specifications. If unable to resolve, turn the device off.
- If an established peripheral intravenous catheter becomes misplaced during transport, remove, apply pressure over the access site until bleeding stops, then apply a waterproof absorbent dressing.
- If an established urinary catheter becomes misplaced during transport, do not attempt to reinsert but deflate the balloon and remove. Providers with appropriate delegation may consider re-establishing the device.
INDICATIONS:

- Patient with one or more of the following medical devices already established by another health care provider
  - Central venous catheter (capped only)
  - Internal temperature probe (esophageal / rectal)
  - Intraosseous (IO) catheter or device
  - Percutaneous intrapleural catheter or chest tube connected to a Heimlich valve or gravity drain
  - Peripherally inserted central catheter – PICC (running)

NOTES:

- Ensure all devices are adequately secured and appropriately dressed prior to transport.
- Ensure all connections are adequately secured.
- Ensure there is no tension on devices or the attached tubing.
- Intravenous bags must be maintained above the level of patient’s heart.
- Do not manipulate established device in moving vehicle.
- If an established central venous catheter becomes partially or fully misplaced during transport, do not attempt to reinsert. Apply pressure over the access site until bleeding stops, then apply a waterproof absorbent dressing. Providers with appropriate delegation may consider re-establishing vascular access by an appropriate route.
- If an established internal temperature probe becomes partially or fully misplaced during transport, providers with appropriate delegation may attempt to reinsert.
- If an established IO catheter or device becomes partially or fully misplaced during transport, do not attempt to reinsert. Apply pressure over the access site until bleeding stops, then apply a waterproof absorbent dressing. Providers with appropriate delegation may consider re-establishing vascular access by an appropriate route. If there is any evidence of fluid leakage from an IO device into the surrounding tissues, discontinue the infusion and cap off the IO device (ensure it remains secured in place).
- Ensure that all intrapleural catheter or chest tube valves, stop-cocks, etc. are in the open position, unless otherwise specified by the sending facility staff. For any catheter or tube connected to gravity drain, ensure that the collection device / receptacle are below the level of the chest at all times. If an intrapleural catheter or chest tube becomes partially or fully misplaced during transport, do not attempt to reinsert. Initiate on-line support with the on-call supervisor (OCS) or medical director (MD).
- If an established peripheral intravenous catheter becomes misplaced during transport, gently attempt to reinsert if possible. If unsuccessful, remove, apply pressure over the access site until bleeding stops, and then apply a waterproof absorbent dressing. Providers with appropriate delegation may consider re-establishing intravenous access.
- If an established PICC line becomes partially or fully misplaced during transport, do not attempt to reinsert. Apply pressure over the access site until bleeding stops, then apply a waterproof absorbent dressing. Providers with appropriate delegation may consider re-establishing vascular access by an appropriate route.
INDICATIONS:
- Patient with one or more of the following medical devices already established by another health care provider
  - Central venous catheter (running)
  - Infusion pump (with titration of medication or adjustment of flow rate)
  - Intraperitoneal / paracentesis catheter
  - Percutaneous intrapleural catheter or chest tube connected to a mechanical suction device

NOTES:
- Ensure all devices are adequately secured and appropriately dressed prior to transport.
- Ensure all connections are adequately secured.
- Ensure there is no tension on devices or the attached tubing.
- Intravenous bags must be maintained above the level of patient’s heart.
- Do not manipulate established device in moving vehicle.
- If an established central venous catheter becomes partially or fully misplaced during transport, do not attempt to reinsert. Apply pressure over the access site until bleeding stops, then apply a waterproof absorbent dressing. Providers with appropriate delegation may consider re-establishing vascular access by an appropriate route.
- Prior to transport, ensure familiarity with any infusion pump device, know how to trouble shoot any malfunction or alarm, and determine whether the medication can be stopped if required. Should a malfunction or alarm occur, trouble-shoot according to the manufacturer’s specifications. If unable to resolve, turn the device off and initiate on-line support with the on-call supervisor (OCS) or medical director (MD).
- If an established Intraperitoneal / paracentesis catheter becomes partially misplaced during transport, do not attempt to reinsert. Secure the device where it is and cover the access site with an absorbent dressing. If an established Intraperitoneal / paracentesis catheter becomes fully misplaced during transport, do not attempt to reinsert. Cover the access site with an absorbent dressing.
- Ensure that all intrapleural catheter and chest tube valves, stop-cocks, etc. are in the open position, unless otherwise specified by the sending facility staff. Ensure that for any intrapleural catheter or chest tube connected to a mechanical suction device that the device is properly functioning prior to transport. If a malfunction should occur, trouble-shoot according to the manufacturer’s specifications. If an intrapleural catheter or chest tube becomes partially or fully misplaced during transport, do not attempt to reinsert.
**INDICATIONS:**

- Patient with one or more of the following medical devices already established by another health care provider
  - Arterial catheter (capped or functioning)
  - Central venous catheter being used for central monitoring
  - Transvenous pacing catheter and pacemaker
- Ensure all devices are adequately secured and appropriately dressed prior to transport.
- Ensure all connections are adequately secured.
- Ensure there is no tension on devices or the attached tubing.
- Intravenous bags must be maintained above the level of patient’s heart.
- Do not manipulate established device in moving vehicle.
- If an established intra-arterial device becomes partially or fully misplaced during transport, apply direct pressure over the access site for **15 minutes after any bleeding stops**, then apply a waterproof pressure dressing dressing.
- If an established central venous catheter becomes partially or fully misplaced during transport, **do not attempt to resinsert**. Apply pressure over the access site until bleeding stops, then apply a waterproof absorbent dressing. Providers with appropriate delegation may consider re-establishing vascular access by an appropriate route.
- In consultation with the most responsible health care provider(s) in the referring or receiving facility, determine the dependency of the patient on the pacemaker, as well as pacemaker settings (minimum output level at capture). If a transvenous pacing device malfunctions or alarms, trouble-shoot according to the manufacturer’s specifications. If unable to resolve contact on-line medical support (OLMS).
INDICATIONS:
- Thermal or chemical eye injury
- Corneal abrasion or loose superficial foreign bodies

CONTRAINDICATIONS:
- Known or suspected open globe injury

NOTES:
- Topical anesthetic or oral analgesia may facilitate irrigation.
- For chemical eye injuries, irrigate with at least 1000 ml sterile 0.9% saline solution per injured eye.
**INDICATIONS:**

- Medication by any of the following methods or routes:
  - Autoinjector
  - Buccal application of paste or gel
  - Oral administration
  - Inhalational administration by metered dose inhaler
  - Sublingual application of paste or gel

**NOTES:**

- ALWAYS ENSURE THE CORRECT MEDICATION, DOSE and ROUTE.
- Always ensure there are no contraindications to administration of the specific medication.
- Prepare and administer according to the manufacturer’s recommendations.
- Document the time and date of administration, drug name (preferably generic), dose, route and indication on the patient care record.
INDICATIONS:

- Medication by any of the following methods or routes:
  - Intranasal
  - Nebulizer
  - Percutaneous feeding tube (gastrostomy or jejunostomy tube)
  - Sublingual application of spray or tablet

NOTES:

- ALWAYS ENSURE THE CORRECT MEDICATION, DOSE and ROUTE.
- Always ensure there are no contraindications to administration of the specific medication.
- Prepare and administer according to the manufacturer’s recommendations.
- Document the time and date of administration, drug name (preferably generic), dose, route and indication on the patient care record.
INDICATIONS:

- Medication by any of the following methods or routes:
  - Intramuscular injection
  - Ophthalmic application
  - Rectal insertion
  - Subcutaneous injection
  - Topical application

NOTES:

- ALWAYS ENSURE THE CORRECT MEDICATION, DOSE and ROUTE.
- Always ensure there are no contraindications to administration of the specific medication.
- Prepare and administer according to the manufacturer’s recommendations.
- Document the time and date of administration, drug name (preferably generic), dose, route and indication on the patient care record.
### INDICATIONS:
- Medication administration by any of the following methods or routes:
  - Intraosseous injection or infusion
  - Intravenous injection or infusion

### NOTES:
- ALWAYS ENSURE THE CORRECT MEDICATION, DOSE and ROUTE.
- Always ensure there are no contraindications to administration of the specific medication.
- Prepare and administer according to the manufacturer’s recommendations.
- Document the time and date of administration, drug name (preferably generic), dose, route and indication on the patient care record.
**INDICATIONS:**

- Emergency administration of medication(s) by any of the following methods or routes:
  - Endotracheal tube
  - Emergency use of central vein catheter, dialysis catheter, or dialysis fistula

**NOTES:**

- ALWAYS ENSURE THE CORRECT MEDICATION, DOSE and ROUTE.
- Always ensure there are no contraindications to administration of the specific medication.
- Prepare and administer according to the manufacturer’s recommendations.
- Endotracheal drug administration can only be used in situations of cardiopulmonary arrest where there is no other intravascular access.
- Emergency use of central vein catheter, dialysis catheter or fistula can only be used in life threatening situations where there is no other intravascular access.
- Document the time and date of administration, drug name (preferably generic), dose, route and indication on the patient care record.
INDICATIONS:
- Significant respiratory distress and/or respiratory failure due to pulmonary edema or chronic obstructive pulmonary disease, and
- Unsatisfactory response to conventional oxygen therapy

CONTRAINDICATIONS:
- Systolic BP less than 100 mmHg
- GCS < 15
- Active vomiting or significant risk of same developing
- Inability to sit upright and follow instructions
- Inability to tolerate mask application
- Known or suspected pneumothorax

NOTES:
1. Successful CPAP ventilation requires appropriate patient education before application and ongoing coaching during use. Generally speaking, if the patient can tolerate the first minute of CPAP ventilation, they will feel its benefit and become more cooperative.
2. Increased patient agitation or decreased cooperativity during successful CPAP ventilation may indicate worsening hypoxemia.
3. The use of CPAP may increase minute oxygen consumption (see appendix A). An E-cylinder may provide only 30 to 60 minutes of flow even at full pressure. Always ensure there are sufficient O2 stores available (see H04 Oxygen Consumption Guideline).
4. Prepare and apply as per the manufacturer’s recommendations. An appropriately sized mask should cover from the bridge of the nose to the chin.
5. Begin at 5 cm water pressure (oxygen flow = 8 liters per minute). Slowly increase the pressure (flow) until patient shows desired improvement as measured by subjective comfort, improved oxygen saturation and decreased respiratory distress, or to a maximum pressure of 20 cm water pressure (oxygen flow = 25 liters per minute).
6. Continuously monitor for air leaks.
7. Immediately discontinue CPAP ventilation and manage airway, breathing and BP as required if:
   - Patient cannot tolerate the mask and/or blasts of high air flow for at least 5 breaths.
   - Patient condition does not improve after a 5 minute trial period.
   - Systolic BP decreases to less than 100 mmHg.
   - LOC decreases (GCS < 15).
   - Vomitting occurs.
Appendix A:
CPAP pressure and oxygen flow rate

<table>
<thead>
<tr>
<th>Mouth pressure (cm H2O)</th>
<th>5</th>
<th>7.5</th>
<th>10</th>
<th>15</th>
<th>17.5</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen Flow (l/ min)</td>
<td>5</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>
### Indications:
- Known or suspected fracture or dislocation

### Contraindications:
- None

### Notes:
- Expose the injury site. Remove constricting jewelry or clothing.
- Assess circulation (and neurological function, if possible).
- Manually stabilize the limb and maintain stabilization until the limb is immobilized.
- Providers with appropriate delegation may consider administration of analgesia before any attempts at management.
- Dress open wounds. Exposed bone (compound fracture) should be cleaned of any gross debris.
- Significant external bleeding may require direct pressure and/or application of a hemostatic dressing to achieve control. Uncontrollable life threatening bleeding may require tourniquet application.
- Immobilize joints above and below the suspected fracture site with an appropriate splinting device. Pad rigid splints appropriately.
- Reassess circulation after splinting, repeat as required. If there has been a loss of circulation or sensation due to the splinting process, loosen any constricting bandages or other devices and reassess.
- If deformity prevents extrication or transport, or if angulation compromises circulation, refer to 23.2 Emergency Reduction of Fractures & Dislocations.
**INDICATIONS:**
- Known or suspected long bone fracture interfering with extrication, transport, or compromised distal circulation of injured limb.
- Known or suspected joint dislocation interfering with extrication or transport.

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Expose the injury site. Remove constricting jewelry or clothing.
- Manually stabilize the limb and maintain stabilization until the limb is immobilized.
- Assess circulation prior to any attempts at reduction.
- Providers with appropriate delegation should consider administration of analgesia before any attempts at reduction.
- Dress open wounds. Exposed bone (compound fracture) should be cleansed of gross debris. **This does not contraindicate necessary reduction with possible vascular compromise.**
- With firm axial traction, gently attempt to align the limb as near to a normal anatomic position as possible. If resistance is encountered, discontinue and splint as found.
- Reassess circulation after reduction.
- Immobilize joints above and below the injury site with an appropriate splinting device. Pad rigid splints appropriately.
- Reassess distal circulation following splinting. If there has been a loss of pulse(s) due to the splinting process, loosen any constricting bandages.
**INDICATIONS:**

- Fentanyl - analgesia when vascular access is not available
- Glucagon - suspected or confirmed hypoglycemia (glucose less than 4 mmol/l)
- Midazolam - active seizures
- Naloxone - known or suspected opioid overdose causing respiratory depression

**CONTRAINDICATIONS:**

- Known or suspected head injury with potential for basilar skull fracture
- Other specific contraindications are addressed in the medication protocols as outlined below

**NOTES:**

- Use a commercial atomizer as per the manufacturers recommendations.
- Use the most concentrated formulation available for each drug.
- For volumes greater than 1 ml, apply half of the dose into each nostril.
- If possible, drugs should be administered to with the patient in the recumbent position with the head extended (occiput down).
INDICATIONS:
- All patients with open wounds

CONTRAINDICATIONS:
- None

NOTES:
- Expose the wound
- Clean wound(s) of loose foreign material
- Control bleeding by applying a dressing with direct pressure:
  - replace dressings only if they impede bleeding control (unnecessary removal of your initial sterile dressing may impede clotting process)
  - reinforce as required
- Elevate bleeding site in extremities if no fractures are present
- Primary and advanced care providers may consider the use of hemostatic dressing. Apply as per manufacturer’s directions
- Apply a tourniquet for bleeding that cannot be controlled by direct pressure:
  - use a wide bandage or other material that will not damage skin or soft tissue below it
  - place the tourniquet as close to the injury site as possible, but not over joints
  - locate the tourniquet above the knee for injuries to the lower leg
  - do not loosen or remove the tourniquet once applied
  - ensure the tourniquet is in open view
  - document the time the tourniquet was applied
- Assess distal circulation before bandaging
- Secure dressing ensuring entire wound is covered
- Assess for distal circulation after bandage is applied – adjust if required
- Amputation:
  - rinse severed body parts gently with sterile saline solution to remove gross debris
  - wrapped part in sterile saline soaked dressings
  - seal in a waterproof container and placed on ice
  - do not soak severed parts
- Sucking chest wound:
  - upon initial identification immediately cover the wound with gloved hand
  - apply occlusive dressing, taping down on three sides
  - ensure dressing is working as a one-way valve
  - consider removal of dressing if patient exhibits increased dyspnea
- Evisceration:
  - cover with saline soaked dressings:
  - cover the dressings to maintain warmth
  - corralling technique may be used to support the organ with large eviscerations
**INDICATIONS:**
- All patients with impalement injuries to any area of the body

**NOTES:**
- An impaled object should be secured in place unless it interferes with:
  - airway management and/or chest compressions, or
  - safe extrication and cannot be cut or otherwise dismantled.
- Stabilize the impaled object, either manually or mechanically, during extrication, loading and transport to prevent further movement.
- If bleeding occurs around the point of entry, apply direct pressure to the skin surface avoiding pressure or movement of the object.
- Providers with appropriate delegation may need to provide analgesia during the cutting or dismantling process.