

# Clinical practice procedures



Version 2.3 June 2013

## CLINICAL PRACTICE PROCEDURES

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# 01-Access

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### Authorisation to practice

External jugular venous cannulation



External jugular venous cannulation is used to gain emergent IV access when peripheral access is anticipated to be unobtainable.

### Indications



- Emergent need for IV drug or fluid administration

### Contraindications



- Nil in this setting

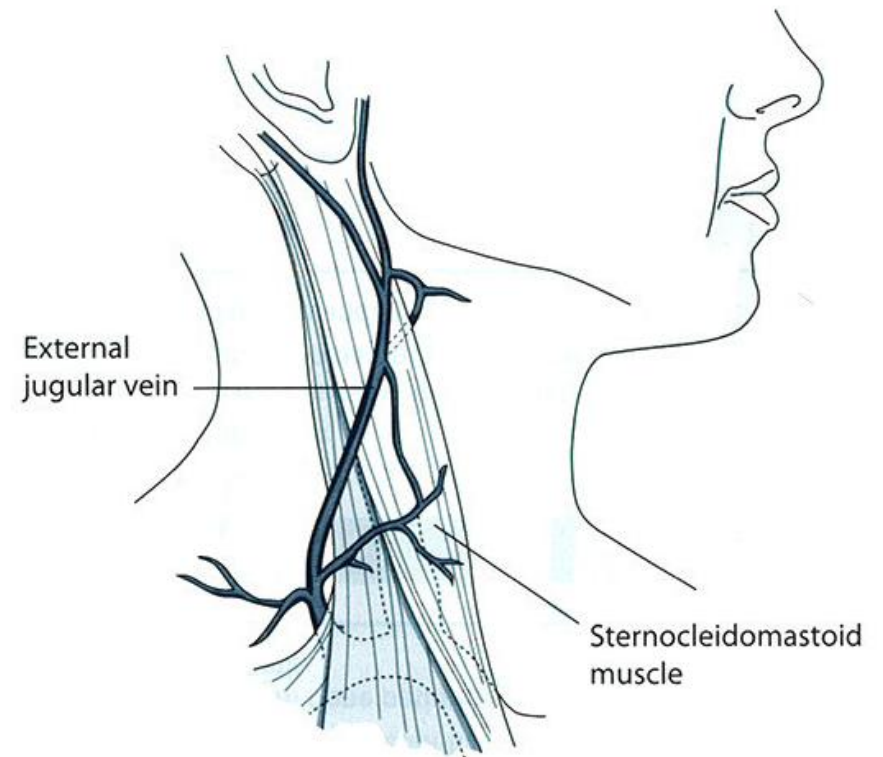
### Precautions



- Complications can include all those associated with conventional cannulation, pneumothorax and damage to the greater vessels in the neck
- Agitated, unco-operative patients due to the danger of damaging other structures
- Obvious injury to neck or requirement for C-collar

## Procedure

- Position the patient supine or head down.
- Locate the external jugular vein running over the posterior border of the sternocleidomastoid.
- Select the appropriate size cannula.
- Prepare equipment and cannulation site.
- Stabilise vein and facilitate filling by gentle occlusion.
- Insert needle bevel up.
- Confirm IV placement by flashback and advance further into the vein.
- Advance catheter over the needle and into the vein.
- Retract needle while stabilising the vein.
- Flush with saline and ensure patency.
- Secure site taking care not to dislodge cannula with giving set.



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### Authorisation to practice

Intraosseous access



Intraosseous access (Cardiac Arrest)



Intraosseous (IO) access is an alternative method for the administration of fluids and medications when no alternative IV access is possible.

### Indications



- Critically ill patients requiring resuscitation

### Contraindications



- Whenever possible avoid sites of burn, infection or localised cellulitis
- IO in the same bone within 48 hours
- Prosthesis
- Known bone pathology including fracture of limb

### Precautions



- Pain
- Infection
- Extravasation into superficial tissues (e.g. compartment syndrome)
- Fracture and/or epiphyseal plate damage

## Procedure

Explain the procedure to the patient and family.

- Locate appropriate landmarks for insertion:

### Adults

- *Proximal tibia:* **proximal** and **medial** to the tibial tuberosity. See *figure a*.
- *Distal tibia:* medial aspect of the distal tibia, two centimetres above the medial malleolus.
- *Humerus:* greater tuberosity, anterior to the lateral midline of the arm. See *figure b*.

### Children 6-12 years

- *Proximal tibia:* **medial** and **distal** to the tibial tuberosity. See *figure c*.

### Children 0-6 years of age

- *Proximal tibia:* **medial** and **distal** to the tibial tuberosity. See *figure d*.

- Clean site with an alcohol swab.
- Select correctly sized needle.

### EZ-IO® insertion procedure

- Prime the EZ-IO® fluid set.
- Attach needle set to the driver and ensure it is securely seated.
- Remove and discard the needle set safety cap.
- Position driver at insertion site at 90° to the bone.
- Insert needle into the skin onto the bone.
- confirm 5mm black mark on the needle is visible
- Penetrate the bone cortex by squeezing the trigger and applying gentle steady pressure.

## Procedure (continued)

- Release trigger and stop insertion process when either a sudden give or pop is felt, or the desired depth is obtained.
- Remove power driver and stylet.
- Confirm catheter stability.
- Attach primed easy-connect extension set.
- Gently aspirate to confirm placement (marrow or blood may not always be present).
- Administer lignocaine 2% in accordance with the DTP **prior** to drugs or fluid administration.
- Flush with sodium chloride 0.9%, Adults 10 mL and children up to 5 ml (failure to flush the EZ-IO® catheter may result in limited or no flow).
- Administer fluids or medications as necessary.

### Cook® procedure

- Prepare the intended insertion site with an alcohol swab.
- Grasp the handle with the thumb and middle finger, stabilise the needle by placing the index finger on the skin surface next to the needle tip.
- Stabilise the extremity and begin inserting the needle with firm, downward pressure into the bone, with the needle tip directed away from the joint space and epiphyseal plate. Always maintain needle orientation perpendicular to the long axis of the bone.
- As the needle tip enters the bone, continue firm downward pressure with a steady clockwise rotation of the needle assembly. Continue advancing the needle in this manner until a slight give is felt. When in the bone, the needle should stand upright, unsupported. Remove the needle trocar stylet by stabilising the baseplate of the needle cannula and turning the handle counter clockwise to disengage.

**Cook Procedure** (*continued*)

- Confirm intramedullary needle tip position by:
  - aspiration of bone marrow;
  - ability to flush saline with no evidence of subcutaneous extravasation.
- Continuous assessment must be carried out to ensure position and patency.

**Additional information**

- The potential for needle stick injury during this procedure is **HIGH**. All precautions that serve to minimise risk to the clinician and patient are to be applied. Ensure the used trocar is placed into a sharps container immediately following insertion.
- Clinicians must remain vigilant when administering drugs via this route. It may take longer for the drug to take effect and it is important to avoid an accumulative toxic dose.
- The EZ-IO® is the preferred device. The Cook® IO needle should only be utilised in paediatric patients when an EZ-IO® is not available.
- EZ-IO® needle sizes
  - Child (3-39 kg): 15 gauge x 15 mm long, pink
  - Adult (≥ 40 kg): 15 gauge x 25 mm long, blue
  - Long: 15 gauge x 45 mm long, yellow.
- The saline flush serves to open the pathway for fluid and medication administration. Adults 10 ml, children up to 5 ml.

## Number of attempts

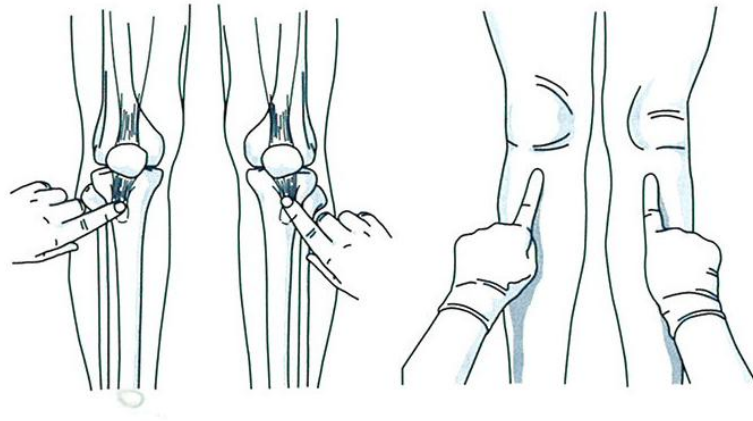
- This procedure is limited to one attempt in each limb.

## Audit

- In all cases where the EZ-IO® is used:
  - record that the EZ-IO® was used in the notes section of the ePCR in accordance with current standards.



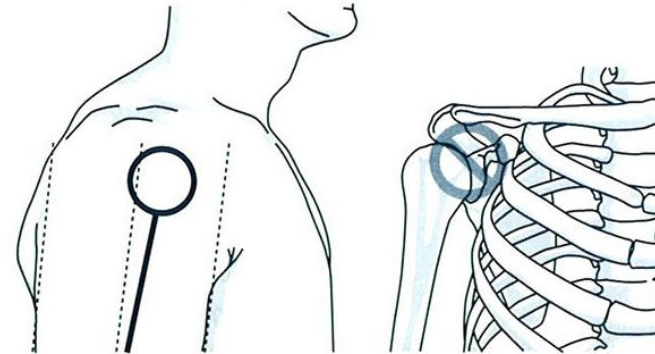
Figure a).



Anterior (front) view  
(fingers on tibial tuberosities)

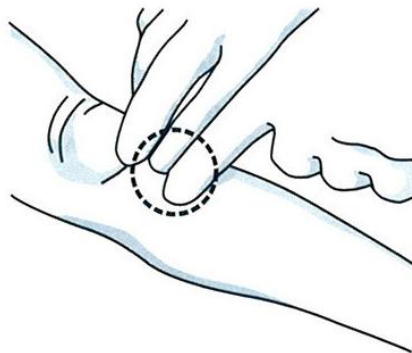
Actual insertion sites located  
(fingers on insertion sites)

Figure b).

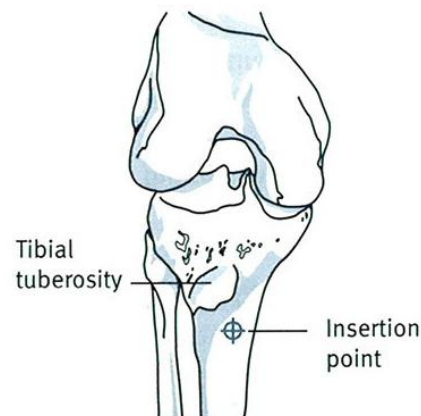


EZ-IO® adult humerus insertion site (found slightly  
anterior to the arm's lateral midline)

Figure c).

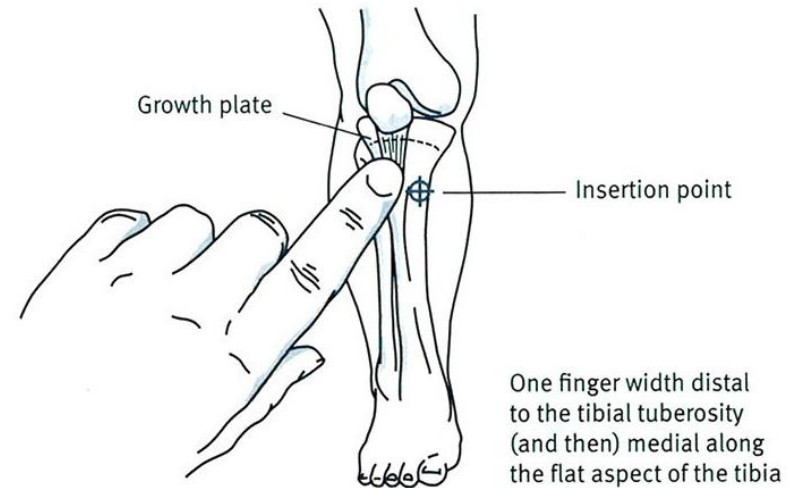


Two finger widths below the patella  
(and then) medial along the flat  
aspect of the tibia



The tibial tuberosity can  
be difficult or impossible to  
palpate in younger patients

Figure d).



One finger width distal  
to the tibial tuberosity  
(and then) medial along  
the flat aspect of the tibia

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### Authorisation to practice

Intravenous access



Intravenous (IV) cannulation provides access to the circulation to administer drug therapy or fluids.

IV access is an invasive procedure and appropriate consideration must be given to its requirement in the pre-hospital setting.

### Additional information

- IV access should only be implemented after all basic cares.
- The number of cannulation attempts should reflect the urgency of the case.
- The following sites are not to be used for IV access:
  - lower limbs when pelvic, abdominal or thoracic trauma is suspected
  - distal to a complex limb injury
  - limb with a fistula present
  - an area of phlebitis or cellulitis
  - when a limb has potential or existing lymphodema (e.g. the same side as lymph node clearance).

### Indications



- The administration of a drug or fluid

### Contraindications



- Whenever possible avoid sites of burn, infection or localised cellulitis

### Precautions



- Air embolus
- Arterial puncture
- Cannula shear or breakage
- Drug/fluid extravasion
- Haematoma or haemorrhage from the site
- Infection or phlebitis
- Irritation to the vein wall
- Nerve damage
- Vasovagal syncope

## Procedure

### Choice of insertion site:

#### General drug administration

- small to medium gauge cannula (i.e. adult: 18 – 20 g, child: 22 – 24 g)
- best most distal available vein.
- use non-dominant limb when possible.
- avoid joints.

#### Likely need for fluid replacement

- large gauge cannula sited in a large vein (i.e. adult: 16 – 18 g, child: 20 – 22 g).
- in significant trauma a 16g cannula is sufficient to facilitate rapid fluid replacement.

#### Difficult IV access/poor vein presentation

- consider the lower limbs, or external jugular vein.
- consider IO access (*Note: a small gauge cannula provides more reliable access than the IO route.*)

## Procedure (*continued*)

- Explain the procedure including why IV therapy is necessary.
- Select the appropriate size cannula.
- Prepare equipment and cannulation site.
- Stabilise vein and insert needle bevel up.
- Confirm IV placement by flashback and advance further into the vein.
- Advance catheter over the needle and into the vein.
- Retract needle while stabilising the vein.
- Release tourniquet, attach tubing where applicable and flush with sodium chloride 0.9%.
- Secure site: where possible avoid the use of cohesive bandage to allow a clear view of patency.
- Draw up and prepare the medication and expel any excess air from the syringe.
- Clean the injection port of the cannula or the bung with an antiseptic swab and allow to dry.
- Supporting the cannula, insert the leur lock syringe or administration set into the centre of the port.
- If using the injection port of the IV tubing, occlude the IV line prior to connecting.
- Follow any drug administration with a 20 mL sodium chloride 0.9% flush.

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## Authorisation to practice

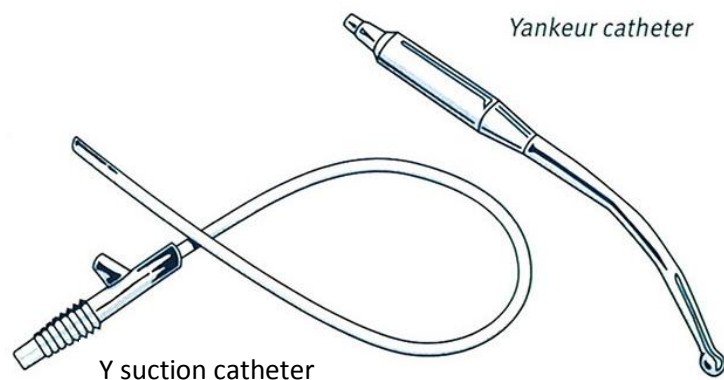
Airway suctioning



An airway can become obstructed by secretions, blood and vomitus, potentially leading to aspiration. Suction is used to minimise these risks.

Suction catheters consist of rigid (Yankeur) catheters, or soft flexible Y suction catheters.

A Yankeur suction catheter is a hard plastic catheter used to remove secretions from the oropharynx and external nares. It has an opening close to the handle which is occluded to initiate suctioning.



Y suction catheters are available in many sizes and are typically used for suctioning down endotracheal tubes; however they can be used to clear the nares, nasopharynx, oropharynx, stomas or airway adjuncts.

## Y suction catheter sizes

ETT size	Y suction catheter size
6 – 9	12 FG
4 – 5	8 FG

## Indications



- To remove secretions, blood, or vomitus from a patient's airway
- For standby use in preparation for endotracheal intubation

## Contraindications



- Nil in this setting

## Complications



- Airway trauma
- Stimulate coughing or gagging
- Hypoxia from delays in ventilation with tracheal tube suctioning
- Vagal stimulation can result in bradycardia and hypotension

## Procedure

### Oropharyngeal suctioning (adults)

- Preoxygenate the patient prior to procedure if possible.
- Ensure the Yankeur suction catheter is connected to tubing.
- Test for adequate suction by occluding the side port on catheter.
- Under direct vision, insert the catheter into the oropharynx.
- Occlude side port to commence suctioning.

### Oropharyngeal suctioning (neonates)

- Preoxygenate the neonate prior to procedure if possible.
- Ensure the Y suction catheter is connected to tubing.
- Test for adequate suction by occluding the side port on catheter.
- Under direct vision, gently insert the catheter into the nasopharynx.
- Occlude side port to commence suctioning while gently withdrawing catheter.
- Repeat procedure for oropharynx.

## Procedure *(continued)*

### Tracheal suctioning (ICP skill)

- Ensure comprehensive non-invasive monitoring.
- Preoxygenate prior to procedure.
- Ensure Y suction catheter is connected to tubing.
- Test for adequate suction by occluding the side port on catheter.
- Disconnect the ventilating bag from the tracheal tube.
- Insert the catheter into the tracheal tube to the proper depth without applying suction.
- Occlude side port to begin suctioning.
- Carefully withdraw the catheter while applying suction.
- Reconnect ventilating bag.
- Ventilate the patient with 100% oxygen for approximately 30 seconds and flush the suction catheter and tubing with saline prior to any repeat of the procedure.

### Additional information

- When performing tracheal suctioning ensure the disruption to ventilation is less than 30 seconds.
- Consider managing the patient in a lateral position if secretions are overwhelming.



### Authorisation to practice

Basic airway management



Basic airway management is a fundamental skill that must be mastered by any professional paramedic as it enables them to provide a certain degree of protection to the patient's airway. It forms the basis of emergency airway management and is a cornerstone skill from which advanced airway procedures progress.

### Indications



- Patients unable to maintain airway patency



### Contraindications

- Conscious breathing patients



### Precautions

- Potential C-spine injury

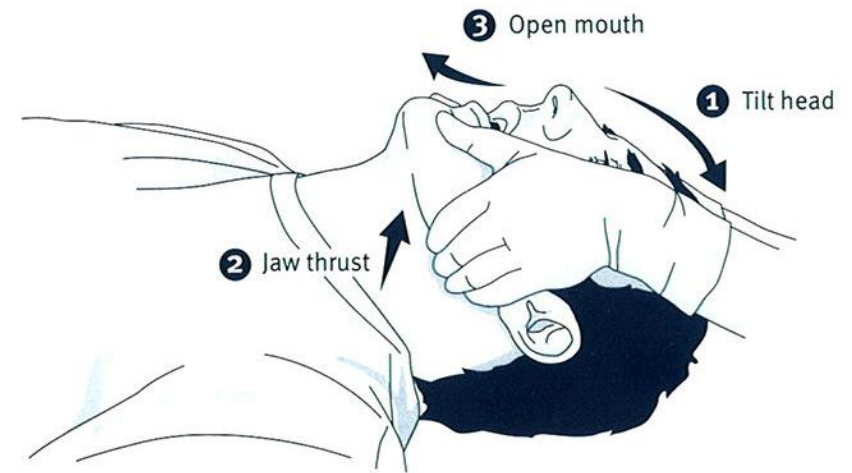


## Procedure

### Triple airway manoeuvre

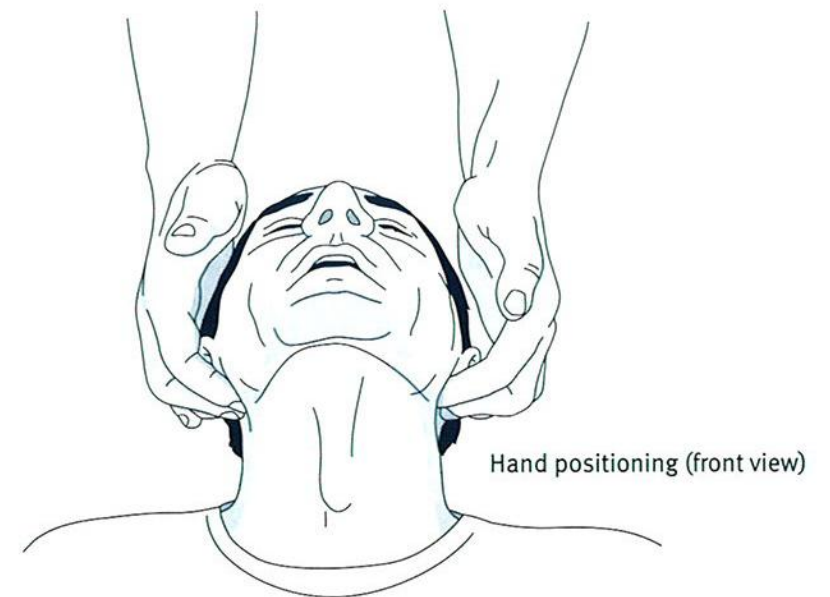
- Two hands are used to tilt the head in order to open the airway.
- Jaw thrust moves the tongue anteriorly with the jaw, further minimising obstruction. Lifting from under the angle of the jaw on both sides causes the jaw to thrust up and forward. This position is maintained often with assistance from an oral airway adjunct.
- The tips of both thumbs are used to open the mouth to visualise the oropharynx.

**Note:** In patients with potential spinal injuries the procedure is modified to include only jaw thrust and open mouth components.



### Additional information

- It must be remembered that the simple act of positioning a patient in a lateral position is a form of basic airway management.
- The trachea is soft and pliable in infants and may become occluded with excessive head tilt. The head should therefore be kept in a neutral position with pressure on the soft tissue of the neck avoided. Padding under the shoulders may assist to achieve and maintain this position.



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## Authorisation to practice

Bougie assisted endotracheal intubation

ICP

Endotracheal intubation (ETI) is an advanced airway procedure where an orotracheal tube is placed under direct vision through the larynx into the trachea. It has the advantage of providing a protected airway whilst enabling ventilation, a route for oxygenation and suctioning.

Airway management in the pre-hospital setting presents a unique set of challenges for clinicians. These include issues with access, available resources, environmental considerations (e.g. noise, lighting, weather) and patient factors (e.g. unfasted; combative; airway trauma; foreign material in the upper airway, such as blood and vomit). It is important to have a defined procedure that can be reproduced each time ETI is employed to maximise the chance of a successful first attempt.

## Indications



Bougie assisted ETI is indicated in circumstances of **actual loss of airway patency** or **protection, as in:**

- cardiac arrest
- deeply unconscious patients with a loss of gag reflex



## Contraindications

- Conscious breathing patients



## Precautions

Endotracheal intubation is an intricate procedure with many potentially life-threatening complications which can be related to the initial laryngoscopy, the intubation process, or subsequent ventilation:

### Laryngoscopy:

- direct trauma to mucous membrane, teeth, larynx, etc
- vagal stimulation: profound bradycardia
- raised intracranial pressure

### Intubation:

- prolonged apnoea: hypoxia
- failed intubation
- oesophageal intubation
- inadequate tube size: excessive leak/high pressures
- aspiration
- cuff leak
- tube occlusion

### Ventilation:

- barotraumas: pneumothorax
- hypoventilation: hypoxia, hypercarbia
- hyperventilation: hypocarbia, cerebral hypoxia
- reduction in preload: hypotension

## Procedure

### Preparation

Adequate preparation is crucial to the success of field ETI. Consideration must be given to preparing the patient, equipment and the environment.

#### Preparation of the patient

- Cardiac monitoring
- Pre-oxygenation
- IV access and patency ensured
  - remove any bandaging around the IVC to ensure that it is not tissue
  - where IV access is unobtainable, confirm patient IO access
- Briefly assess the airway for predictors of technical difficulty. Identification of a potentially difficult intubation should lower the threshold for ensuring adequate back-up in terms of rescue airway devices as well as senior clinician expertise. Markers of a potentially difficult laryngoscopy can be identified using the following mnemonic (LEMON):
  - **L: Look**
    - ethnicity, particularly women of Asian descent
    - obesity
    - third trimester of pregnancy
    - airway, facial, or neck trauma.
  - **E: Evaluate the 3-3-2 rule**
    - small mouth
    - receding jaw
    - short neck

## Procedure (continued)

- **M:** Manual inline stabilisation (MILS)\* required
- **O:** Obstruction
  - presumed airway burn
  - protruding teeth
  - foreign material in upper airway
- **N:** Neck mobility

#### Preparation of the equipment

- suction
- oxygen
- BVM device
- airway adjuncts
  - appropriately sized **naso/oropharyngeal airways** available
  - appropriately sized **LMA** available
- **Laryngoscope** with appropriate blade available and light source checked
  - spare handle available
- **ETT** – appropriately sized, cuff checked, plus a size above and below
- Bougie – appropriate size.
- **monitoring and EtCO<sub>2</sub>**
  - it is mandatory that the continuous waveform EtCO<sub>2</sub> is working and included in the circuit prior to ETI.

\* **M** originally referred to the Mallampati score, but as this has little relevance in the pre-hospital setting, it has been changed to **MILS**, which has greater trauma significance.

**Procedure (continued)****Preparation of the environment**

ETI will typically be performed on scene either in the field, or within the ambulance. The airway team should always consist of an ICP and airway assistant.

If, on patient assessment, the airway appears particularly difficult, or there are patient factors that suggest the intubation will be very high risk (e.g. significant haemodynamic instability, hypoxia), the most experienced ICP should undertake the first attempt.

The ICP performing the intubation is to take control of the patient's airway during the preparation phase. The airway assistant is to stand behind and to the right of the operator doing the intubating, and will pass **ALL** the intubating equipment.

In trauma, a separate person to stabilise the C-spine is also warranted.

It is important to ensure the above equipment is laid out within easy reach of the airway assistant prior to intubation being attempted. Within an ambulance, this is best achieved by laying equipment out on the bench beside the left cabin compartment door. In the field, the equipment should rest to the right of the patient's head.

Suction should be available, with the Yankeur catheter located under the right shoulder of the patient.

**Procedure (continued)****Endotracheal intubation**

- Place the patient's head in the sniffing position.
- MILS in the neutral position if suspected C-spine injury.
- Open mouth AND inspect oral cavity.
- Remove dentures or debris as necessary.
- Place laryngoscope with the left hand into the right side of the patient's mouth, sweeping the tongue to the left.
- Elevate the laryngoscope to lift the mandible without levering on the teeth. The end of the blade should rest in the epiglottic vallecula allowing direct visualisation of the larynx.
- Suction the airway as required.
- Introduce the bougie gently through the cords – tracheal clicks and some resistance may be felt .
- Advance the endotracheal tube over the bougie until the cuff is seen to pass through the cords.
  - Approximate ETT length at lips for women is 20-21 and men 22-24 centimetres.
- Remove bougie.
- Inflate cuff.
- Confirm tube placement, via EtCO<sub>2</sub> and auscultation.
- Connect BVM and commence ventilation.

### Procedure *(continued)*

#### **BURP:**

The backward, upward, rightward and posterior laryngeal manipulation manoeuvre can be attempted in an effort to improve larynx visualisation in the difficult intubation. This is typically performed by the clinician performing the laryngoscopy.

#### **Cricoid pressure:**

Advocated in some arenas to reduce gastric content aspiration, cricoid pressure is a technique which involves firm pressure over the cricoid to occlude a patient's oesophagus during intubation. There is a lack of supporting data demonstrating the technique's efficacy and it is often poorly applied. The intubation process is more difficult in many patients. In light of this, cricoid pressure is not recommended routinely in endotracheal intubation by the SJANT.

#### **Bougie use:**

This is recommended in **every ETI attempt**, as it will facilitate the likelihood of a successful 'first-pass' intubation, as well as improving familiarity with the device in preparation for more difficult airways. Once the bougie has been inserted into the trachea, a well lubricated ETT is exchanged over the bougie while the laryngoscope is left in place to lift the epiglottis. It is preferable to be visualising the vocal cords throughout the entire procedure.

### Procedure *(continued)*

#### **Confirming tube placement**

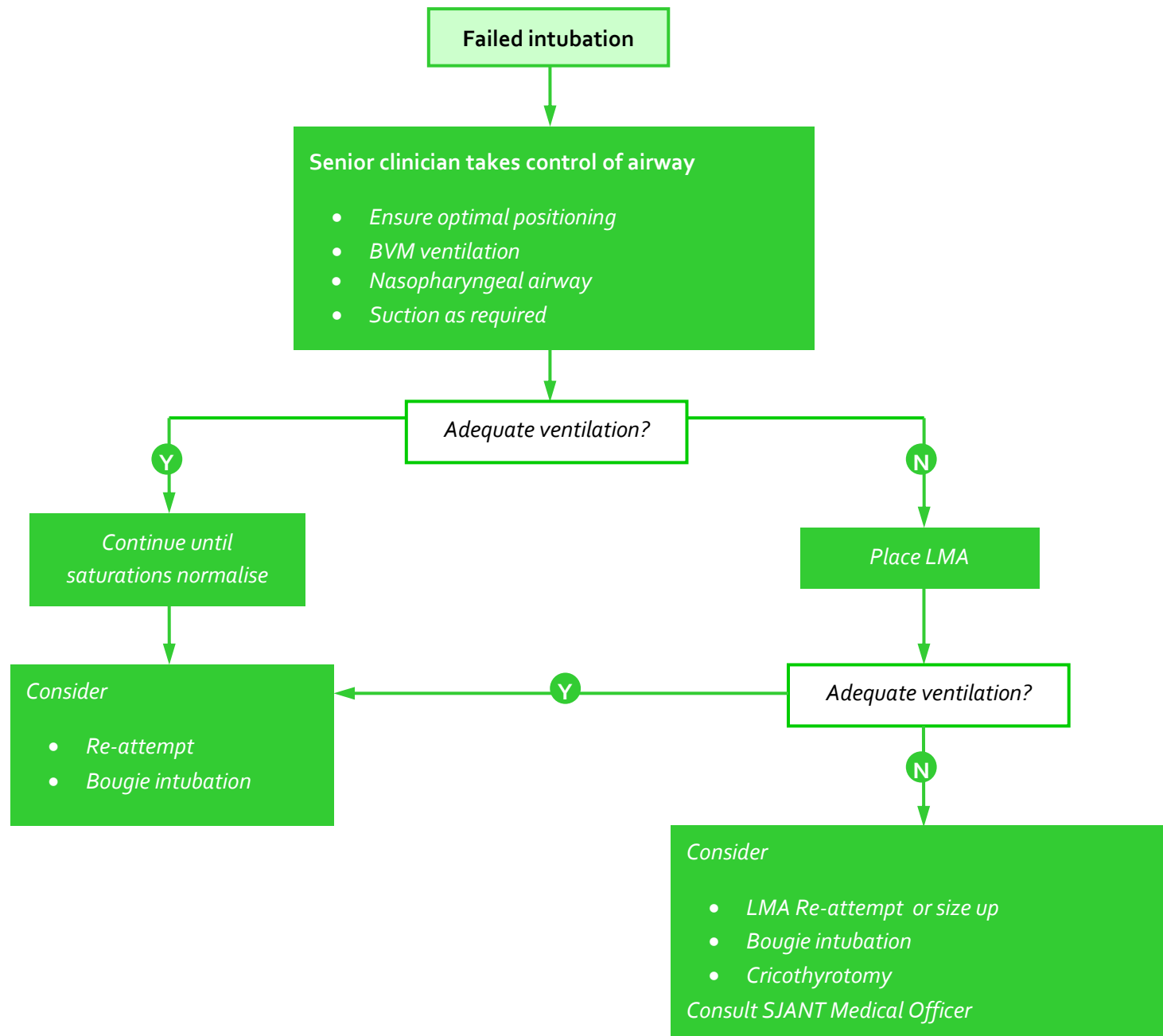
The only accepted method for correct placement confirmation is:

- EtCO<sub>2</sub> capnography
  - EtCO<sub>2</sub> monitoring is mandatory throughout ETI and subsequent ventilation.
  - Ensure that the EtCO<sub>2</sub> detector is attached proximal to the filter (i.e. filter close to the patient) to prevent water or blood contamination.

**\*If there is no EtCO<sub>2</sub> capnometry remove the ETT immediately**

#### **Supporting methods of confirmation include:**

- direct visualisation of the Bougie and the ETT passing through the vocal cords.
- misting of the ETT.
- oesophageal tube detector device (OTDD).
- auscultation over the epigastrium, and in both left and right axillae.
- equal rise and fall of the chest.



## Additional information

### *Post-intubation management*

- Secure ETT adequately with a cloth tie
  - if patient in hard C-collar, tie ETT over the collar.
- Manually ventilate patient to achieve EtCO<sub>2</sub> 35 – 40 mmHg (30 – 35 for significant head injury).
- Post-intubation sedation for tube tolerance as required
  - titrated aliquots of morphine and midazolam.
- Continue comprehensive monitoring including ETCO<sub>2</sub>.
- Continue any resuscitation as indicated.

### *Failed intubation*

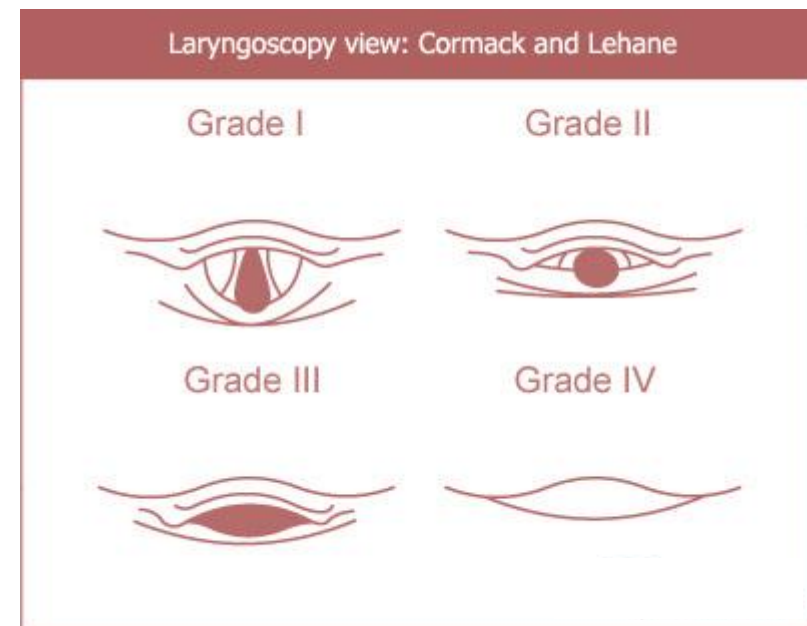
The failed intubation algorithm is to be instituted if intubation cannot be achieved within 30 seconds of laryngoscopy.

### *Documentation*

Documentation describing ETI is provided for in the ePCR through a drop down menu. Laryngeal grading is specified using the Cormack-Lehane system.

### *Paediatric patients*

Paediatric patients may prove difficult to intubate in the pre-hospital setting. Challenging airway anatomy and the infrequency of intubating opportunities are thought to be the main factors accounting for the lower success rate in paediatric ETI. Specialised training in paediatric airway is important to acquire and maintain skills in this population.



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## Authorisation to practice

Cricothyrotomy

ICP

Cricothyrotomy is an advanced airway procedure where a tracheal tube or a Cook® emergency cricothyrotomy airway catheter is placed into the trachea via the cricothyroid membrane. It has the advantage of providing a protected airway whilst enabling ventilation.

Airway access is achieved by either Cook® emergency cricothyrotomy catheter set (percutaneous standard wire-guided - Seldinger) or surgical technique via the cricothyroid membrane.

Dilation of the surgical tracheal entrance site permits passage of the emergency airway.

## Indications



Cricothyrotomy is indicated in circumstances of actual loss of airway patency and/or airway obstruction, as in:

- Can't intubate / LMA insertion
- Can't ventilate
  - Face mask / Naso/ Oro-pharyngeal airway
  - LMA
  - ETT
- Severe facial or nasal injuries (that do not allow oral or nasal tracheal intubation or LMA insertion)



## Contraindications

- Conscious breathing patients
- Patients that you can ventilate via other means



## Precautions

Cricothyrotomy is an intricate procedure with many potentially life-threatening complications which can be related to the initial process, or subsequent ventilation:

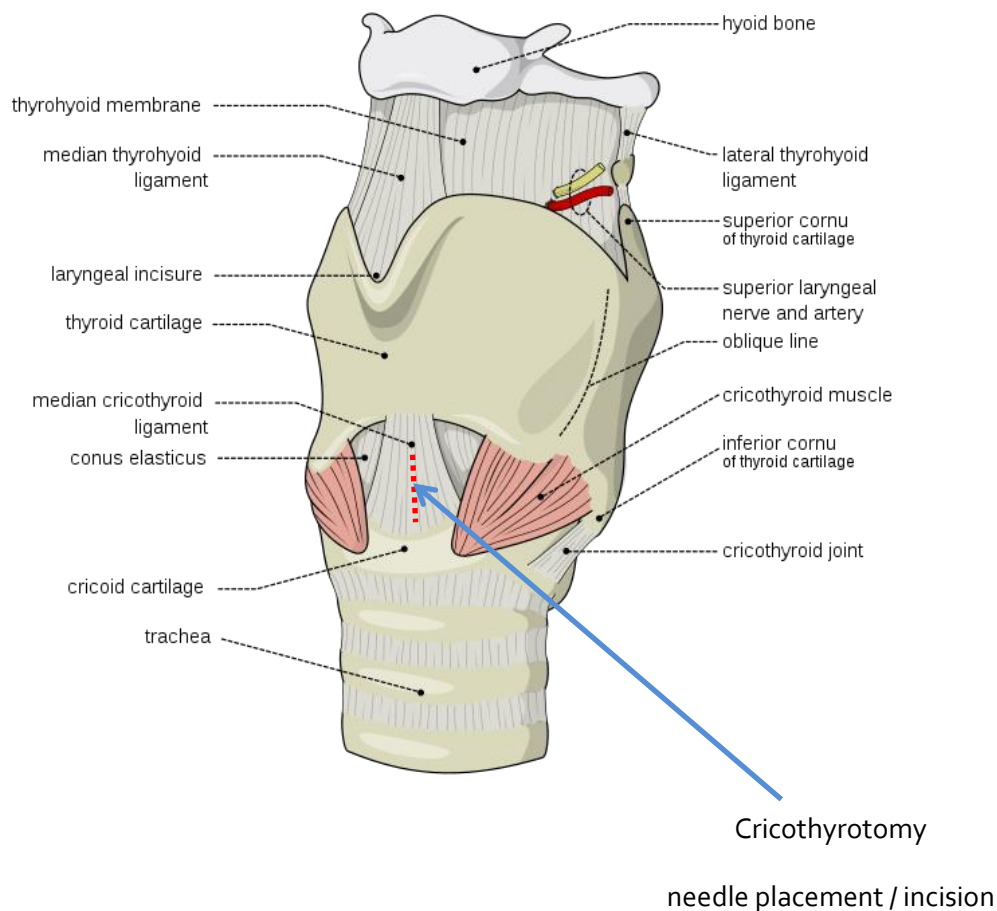
**Cricothyrotomy:**

- prolonged apnoea: hypoxia
- failed attempt leaving a tracheal opening
- haemorrhage from the cricothyroid vessels
- puncture of the posterior wall of the trachea

**Ventilation:**

- cuff leak
- tube occlusion
- barotraumas: pneumothorax
- hypoventilation: hypoxia, hypercarbia
- hyperventilation: hypocarbia, cerebral hypoxia
- reduction in preload: hypotension





## Procedure

### Preparation

Adequate preparation is crucial to the success of the cricothyrotomy. Consideration must be given to preparing the patient, equipment and the environment.

Because cricothyrotomy is a rarely performed but potentially life-saving procedure of last resort in the patient with a failed airway, clinicians responsible for airway management must retain familiarity with the necessary equipment and relevant anatomy.

### Preparation of the patient

- Cardiac monitoring
- Pre-oxygenation
- IV/IO access and patency thereof ensured
- EtCO<sub>2</sub> capnography available

The airway assistant is to stand behind and to the right of the operator doing the cric, and will pass **ALL** the equipment.

### Preparation of the equipment

- Clean surface prepared for placement of the following;
- 10 mL syringe with 5 mL NaCl / water for injection
- 14g iv cannula
- Disposable scalpel and holder
- Cook® emergency cricothyrotomy catheter set

**Procedure (continued)****Preparation of the environment**

A cricothyrotomy will typically be performed on scene either in the field, or within the ambulance. The airway team should always consist of an ICP and airway assistant. The most experienced ICP should undertake the cricothyrotomy.

The ICP performing the cricothyrotomy is to take control of the patient's airway during the preparation phase. In trauma, a separate person to stabilise the C-spine is also warranted.

It is important to ensure the above equipment is laid out within easy reach of the airway assistant prior to cricothyrotomy being attempted. Within an ambulance, this is best achieved by laying equipment out on the bench. In the field, the equipment should rest to the right of the patient's head.

Suction should be available, with the Yankeur catheter located under the right shoulder of the patient.

**Procedure (continued)****Needle Cricothyrotomy**

- Place the patient's head in the sniffing position.
- MILS in the neutral position if suspected C-spine injury
- Prepare a 10 mL syringe filled with 5 mL NaCl / water for injection
- Visualise and locate the cricothyroid membrane.

- Stabilisation of the cricoid cartilage is to be maintained throughout the entire procedure.
- Attach the 14g needle to the syringe, holding the anatomy steady, puncture the cricothyroid membrane, percutaneous 45° downward to the frontal plane in a caudad direction, in the midline.
- On entering the trachea, apply negative pressure to the syringe, aspiration of air resulting in free air return and creating bubbles.
- Holding the needle in place, use the scalpel to cut an incision vertical into the cricothyroid membrane to the blade's full length.
- Remove the syringe and needle.
- Advance an appropriate sized tracheal tube into the trachea and where necessary inflate the cuff to the appropriate volume.
- Confirm tube placement, via EtCO<sub>2</sub> and auscultation
- Connect BVM and commence adequate ventilation.
- Secure the ET tube in place and note the depth.

**Cook™ Meleker Cricothyrotomy catheter set**

- Place the patient's head in the sniffing position.
- MILS in the neutral position if suspected C-spine injury
- Prepare a 10 mL syringe filled with 5 mL NaCl / water for injection
- Visualise and locate the cricothyroid membrane
- Stabilisation of the cricoid cartilage is to be maintained throughout the entire procedure.
- Attach the 18g needle to the syringe, holding the anatomy steady, puncture the cricothyroid membrane, percutaneous 45° downward to the frontal plane in a caudad direction, in the midline.

- On entering the trachea, apply negative pressure to the syringe, aspiration of air resulting in free air return and creating bubbles.
- Holding the needle in place, use the scalpel to cut an incision vertical into the cricothyroid membrane to the blade's full length.
- Remove the syringe, leaving the needle in place.
- Insert the wire guide via the needle into the trachea,
- Holding the catheter in place, advance the soft, flexible end of the wire guide through the catheter and into the airway several centimetres.
- Remove the catheter, leaving the wire guide in place.
- Advance the 12 Fr short handled dilator, tapered end first, into the connector end of the airway catheter until the handle stops against the connector.
- Advance the airway catheter/dilator assembly over the guide wire until the proximal stiff end of the wire guide is completely through and visible at the handle end of the dilator.
- It is important to continually visualise the proximal end of the wire guide during the airway insertion procedure to prevent its inadvertent loss into the trachea.
- Maintaining wire guide position, continue to advance the airway catheter/dilator assembly over the wire guide with a reciprocating motion completely into the trachea.
- Take care not to advance the tip of the dilator beyond the tip of the wire guide within the trachea.
- Remove the wire guide and dilator simultaneously.
- Confirm tube placement, via EtCO<sub>2</sub> and auscultation
- Connect BVM and commence ventilation.
- Secure the airway catheter in place and note the depth.

## Procedure (*continued*)

### Confirming tube placement

The only accepted method for correct placement confirmation is:

- EtCO<sub>2</sub> capnography
  - EtCO<sub>2</sub> monitoring is mandatory throughout cricothyrotomy and subsequent ventilation.
  - Ensure that the EtCO<sub>2</sub> detector is attached proximal to the filter (i.e. filter close to the patient) to prevent water or blood contamination.

**\*If there is no EtCO<sub>2</sub> capnometry consider removing the tube immediately**

### Supporting methods of confirmation include:

- direct visualisation of bubbles/air on aspiration of the syringe.
- misting of the ETT.
- auscultation over the epigastrium, and in both left and right axillae.
- equal chest rise and fall.
- oesophageal tube detector device (OTDD).
- equal rise and fall of the chest.

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### Authorisation to practice

External laryngeal manipulation



The backward, upward, rightward pressure or 'BURP' technique is a simple airway manoeuvre performed to facilitate laryngoscopy. It is typically carried out by the clinician performing laryngoscopy.

This manoeuvre displaces the larynx superiorly, posteriorly and somewhat rightward laterally to improve visualisation of the larynx. It is thought to do this by bringing the glottis back to its original position, countering the movement made by the laryngoscope positioning.

### Indications



- To assist difficult laryngoscopy

### Contraindications



- Nil in this setting

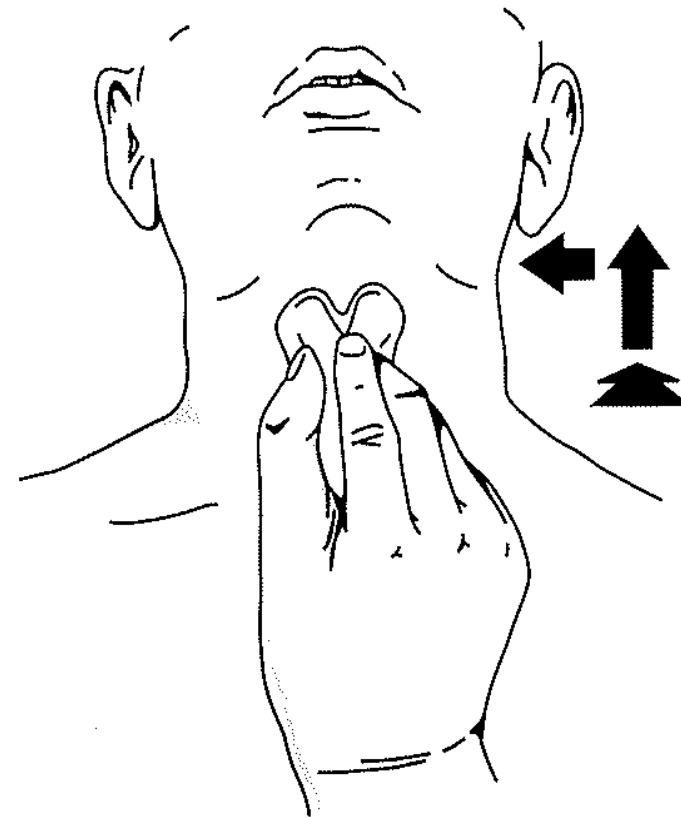
### Precautions



- Incorrect application
- Can worsen glottis view in laryngoscopy
- Potential for airway trauma

## Procedure

- Grasp the thyroid cartilage between the thumb and index or middle finger.
- Apply pressure in the backwards direction so the larynx abuts the cervical vertebrae.
- Add pressure in the upward direction so the larynx is pushed as far superiorly as possible.
- Add pressure in the rightward direction, such that there is lateral movement of the larynx – limit this to two centimetres in adults.



*Displacement of the larynx by backward, upward and rightward pressure. Arrows indicate the directions of pressure application.*

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## Authorisation to practice

Laryngeal mask airway

Para

ICP

A laryngeal mask airway (LMA) is a supraglottic airway device with its main advantage being that it does not require laryngeal visualisation for adequate placement. It consists of tubing, with a 15 millimetre connector, attached to an elliptical, inflatable cuff.

LMAs come in a variety of makes and sizes to accommodate both neonates and adults.

The LMA Supreme™ is a single use airway with a fixed curve that makes it very easy to insert and helps keep it in place during transport. The integrated drainage tube is designed to channel fluid and gas safely away from the airway.

An approximate guide to sizing is displayed in the table.



Size	Weight guide	Suggested population
1	< 5 kg	infant
2	10 – 20 kg	small child
3	30 – 50 kg	adolescent, small adult
4	50 – 70 kg	average adult
5	70 – 100 kg	large adult

## Indications



- Impending or actual loss of airway patency or protection, where advanced airway management is necessary, but the clinician is unable to secure airway through endotracheal intubation
- Rescue airway in the failed intubation algorithm



## Contraindications

- Nil in this setting



## Precautions

- Failure to provide adequate airway or ventilation
- Can precipitate vomiting and aspiration in a patient with intact airway reflexes
- Airway trauma
- Patient intolerance

## Procedure

- Prepare LMA Supreme™:
  - ensure cuff is patent
  - apply water-based lubricant to posterior side of cuff.
- Place patient in sniffing position (neutral if suspicion of C-spine injury).
- Choose the required size for your patient.
- Remove the LMA Supreme™ from the packaging and remove the red tab on the inflation line, deflate the mask using a syringe and remove the plastic shell from around the mask.
- Lubricate the posterior side of the mask.
- Advance the mask tip over the hard and soft palate.
- Rotate the LMA Supreme™ inward with a circular motion; continue to advance the mask until resistance is met.
- Inflate the cuff with a volume of air appropriate (refer to manufacturer's guidelines).
- Confirm effectiveness of placement:
  - EtCO<sub>2</sub> detection and waveform
  - misting of tube
  - auscultation
- Secure the LMA Supreme™
- If you auscultate a leak, deflate the cuff and re-adjust the mask.
- If the leak persists remove the mask, go up a size, and reinsert a new mask.

## LMA removal

- If practical, roll patient to lateral position, and gently remove.
- If rapid removal is necessary, immediately cut tie and remove LMA.
- Suction airway as required.

## Additional information

- An LMA does not protect the airway from aspiration.
- An LMA typically causes less gastric insufflations than bag-valve mask ventilation alone.

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## Authorisation to practice

Laryngoscopy

Para  
ICPLaryngoscope with  
Macintosh blade

Miller blade

Laryngoscopy is the process of directly visualising the glottis. In the pre-hospital setting this is best achieved with a laryngoscope.

The SJANT uses the Macintosh and Miller disposable blades. The Macintosh, or curved blade, is designed to rest in the epiglottic vallecula, such that when the laryngoscope is elevated, the epiglottis is lifted, allowing visualisation of the larynx.

The Miller blade is preferred in young children. Its straight blade is designed to lift the epiglottis directly, which is often bulkier compared to adults.

An approximate age guide related to blade size is listed below:

Blade	Size	Patient
Miller	0	infant
Miller	1	small child
Macintosh	2	large child
Macintosh	3	small adult
Macintosh	4	large adult

## Indications



- Clearing the airway
- Insertion of an endotracheal tube
- Insertion of a gastric tube



## Contraindications

- Epiglottitis



## Complications

- Laryngospasm
- Hypoxia due to delays in oxygenation while performing procedure
- Trauma to mouth or upper airway, particularly teeth/dentures
- Exacerbation of underlying C-spine injuries
- Failure to visualise glottis



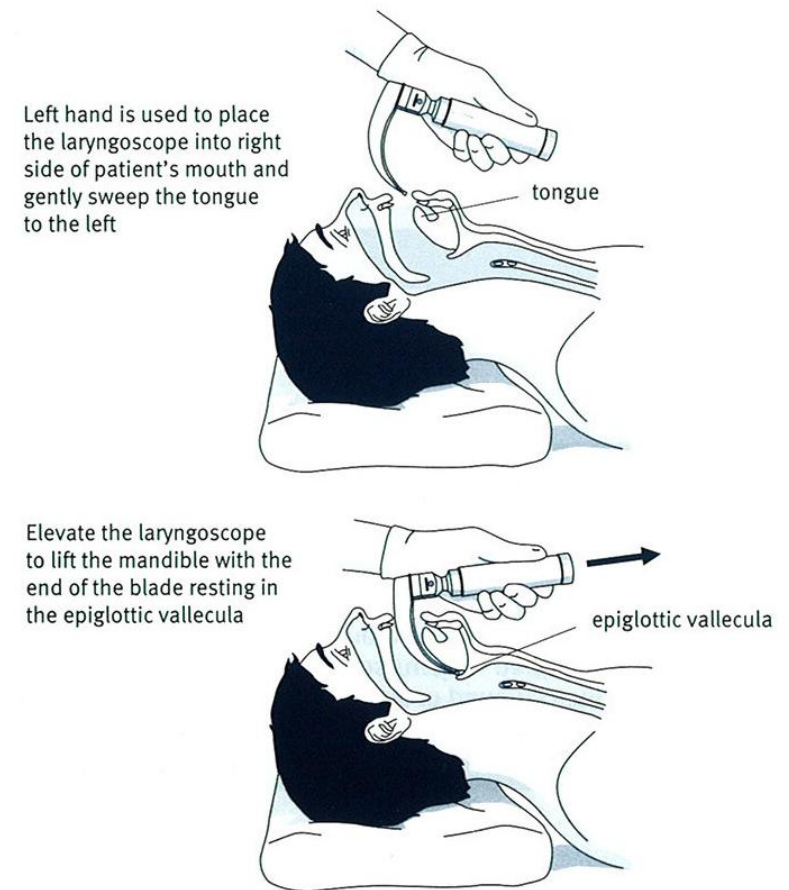
## Procedure

- Ensure patient's oxygenation is optimised prior to laryngoscopy.
- Ensure comprehensive non-invasive monitoring.
- Place the patient's head in the sniffing position, or implement MILS if C-spine injury is suspected.
- Open mouth and inspect oral cavity, removing dentures or debris as required.
- Using the left hand, place the laryngoscope into the right side of the patient's mouth, gently sweeping the patient's tongue to the left.
- Elevate the laryngoscope to lift the mandible without levering on the teeth. The end of the blade should rest in the epiglottic vallecula, allowing direct visualisation of the larynx.

**Note:** Paramedics are *NOT* authorised to perform laryngoscopy on patients less than twelve years old.

## Additional information

- Laryngoscopy is not advised in patients with intact airway reflexes.
- It is possible to use a blade which is larger than necessary and still visualise the glottis effectively. However, using a blade which is inappropriately small will make adequate laryngoscopy impossible.



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Nasopharyngeal airway (NPA)



A nasopharyngeal airway (NPA) is a bevelled soft rubber or plastic tube which is designed to provide patency to the nasopharynx.

They are available in sizes of 14Fr, 18Fr, 24Fr, & 32Fr. It is important to accurately size an NPA prior to insertion, with the correct size reaching from the tip of the patient's nose to their ear lobe.

**Indications**

- Airway adjunct for use in patients with potential or actual airway obstruction, particularly in circumstances where an oropharyngeal airway is inappropriate (e.g. patient has trismus or an intact gag reflex)

**Contraindications**

- Nil in this setting

**Complications**

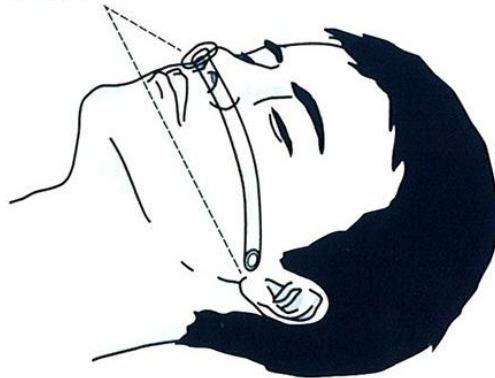
- Airway trauma, particularly epistaxis.
- Incorrect size or placement will compromise effectiveness.
- Exacerbate injury in base of skull fracture, with NPA potentially displacing into the cranial vault.
- Can still stimulate a gag reflex in sensitive patients, precipitating vomiting or aspiration

## Procedure

- Lubricate the end of the tube well with lubricating jelly.
- Gently insert NPA into the patient's nostril with the bevel facing the nasal septum.
- Advance the device carefully along the floor of the nasopharynx, following its natural curvature until the flange rests against the nostril.

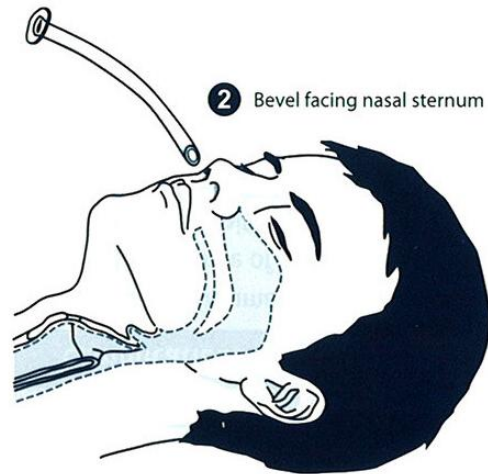
**Note:** Take care not to force insertion as the highly vascular nasal mucosa is easily damaged.

- 1 A correctly sized NPA will reach from the tip of the nose to the earlobe

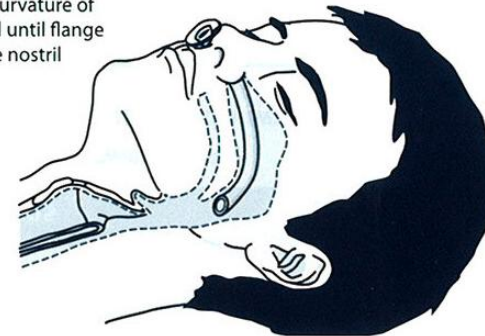


## Additional information

- An NPA does not protect the patient's airway from aspiration.
- The right nostril is often preferred for NPA insertion given that it is typically larger and straighter than the left.



- 3 Follow natural curvature of nasopharyngeal until flange rests against the nostril



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Oropharyngeal airway



An oropharyngeal airway (OPA) is an adjunct extending from the lips to the pharynx, preventing the tongue from occluding the airway.

A correctly sized OPA will reach from the centre of the incisors/mouth to the angle of the jaw.

Size	Colour	Suggested population
000	Clear	neonate (under 6 weeks)
00	Blue	infant (1-6 months)
0	Black	older infants/toddlers (6 months – 3 years)
1	White	small child (3 – 10 years)
2	Green	adolescent/adult female
3	Yellow	adult male
4	Red	large adult male

**Indications**

- Maintain airway patency
- Bite block in advanced airways

**Contraindications**

- Nil in this setting

**Complications**

- Airway trauma from OPA placement
- Intolerance of OPA requiring removal
- Can precipitate vomiting/aspiration in patient with intact gag reflex
- Incorrect size or placement can potentially exacerbate airway obstruction

## Procedure

### Adults

- Correctly size and insert OPA ensuring the **concavity of the adjunct is facing the roof of the mouth**.
- Once a third of the OPA has been inserted, rotate 180° over the tongue.
- Gently advance the OPA until the flange is pressing against the lips.

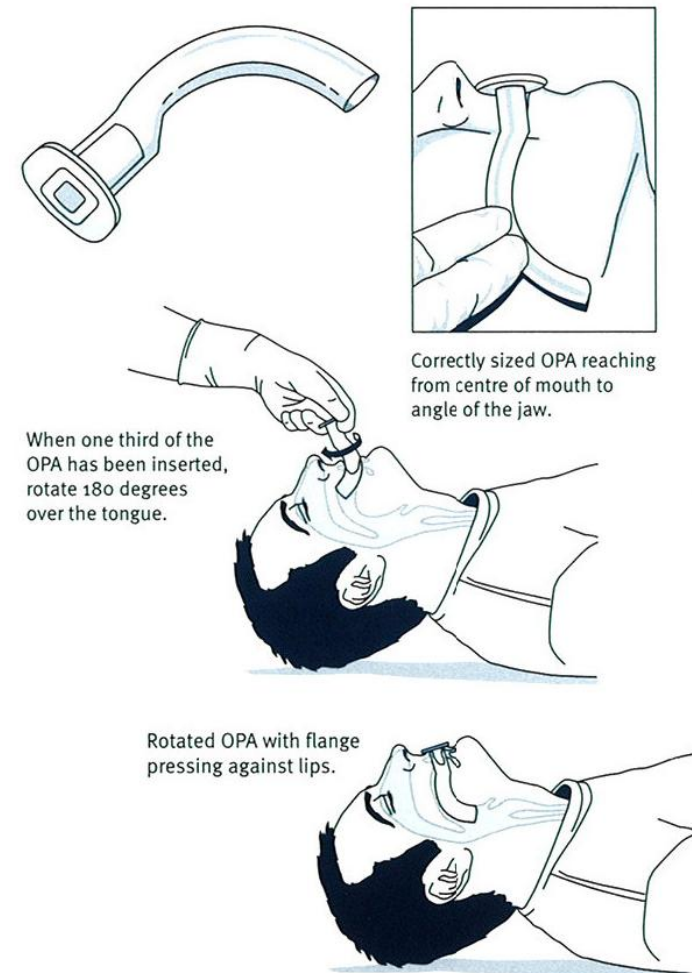
### Paediatrics (sizes 000 – 1)

- Correctly size and carefully insert OPA ensuring the **concavity of the adjunct follows the curve of the tongue**.
- Gently advance the OPA until the flange is pressing against the lips.

**Note:** A modified technique is employed in paediatric patients to avoid hard and soft palate trauma.

## Additional information

- Do not attempt to place an OPA if the patient has an intact gag reflex, or actively resists OPA placement.
- An OPA does not protect the airway from aspiration.



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## Authorisation to practice

APGAR



The APGAR score is a valuable method to determine the health of newborns immediately after birth. It is determined by allocating scores to five simple criteria:

- *colour* (**A**ppearance)
- *heart rate* (**P**ulse)
- *reflex irritability* (**G**rimace)
- *muscle tone* (**A**ctivity)
- *breathing* (**R**espiration)

The purpose of the APGAR score is to determine whether a newborn needs immediate medical care. It is not designed to make long-term predictions of a child's health.

## Indications



- An APGAR score is required for all newborns at one minute and five minutes following delivery



## Contraindications

- Nil in this setting



## Complications

- Nil in this setting



## Procedure

- Using the table provided, assign the newborn a score (0 – 2) for each of the five criteria. Add all individual scores to calculate the total APGAR score (0 – 10).

APGAR SCORE				
	Action	0	1	2
<b>Appearance</b>	Look at skin colour	blue/pale	pink (extremities blue)	all pink
<b>Pulse</b>	Count heart rate	absent	< 100	> 100
<b>Grimace</b>	Monitor response	no response	grimace	vigorous cough
<b>Activity</b>	Look at muscle tone	limp	some flexion/extension	active motion
<b>Respiration</b>	Count and assess	absent	slow/irregular	good cry

## Procedure (continued)

- An APGAR score of:
  - 0 – 3 represents severe distress, (refer to *CPG Resuscitation – newborn*);
  - 4 – 7 indicates moderate distress, (refer to *CPG Resuscitation – newborn*);
  - 7 – 10 indicates an absence of difficulty in adjusting to extrauterine life; and
  - 10 at 1 minute is uncommon due to the prevalence of transient cyanosis.
- Document the APGAR score accordingly on the ePCR.

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### Authorisation to practice

Glasgow coma score



The Glasgow Coma Score (GCS) was first introduced in 1974 as a measure of conscious level – in the setting of traumatic brain injury. Its ease of application has seen its use progress to the assessment of conscious level in many other patient types.

To obtain a total score, three categories are assessed:

- eye opening
- verbal response
- motor response.

Ensure that the best response is recorded for each category.

If at all possible, have the same person assess the patient's GCS each time.



### Indications

- The assessment of a patient's conscious state



### Contraindications

- GCS is not applied to the newborn as the APGAR score is used in this patient group



### Precautions

- As GCS was developed for the assessment of traumatic brain injury, its adaptation to other patient groups can sometimes present limitations. Paramedics must use their clinical judgement to provide an accurate assessment of conscious state

### Additional information

- Ensure accuracy in the assessment of each category.
- The clinical handover of a GCS should involve the finding of each category in addition to the total score.
- The categories in isolation also provide an indication of severity, with motor response of highest importance when correlated to patient outcome.
- If there is a suspicion of spinal injury, painful stimuli above the injury site is recommended (e.g. supra-orbital pressure).
- In some circumstances, painful stimulus may be required for 15 – 30 seconds to elicit an accurate response.

## Procedure

### Assess eye opening as:

- spontaneous
- to voice
- to pain
- nil

### Assess verbal response through the patient's speech as being:

- orientated
- confused
- the use of inappropriate words
- only incomprehensible sounds
- nil

### Assess motor response through:

- an obeying of commands

### or with the application of a painful stimulus the patient:

- localises to the painful site
- withdraws from the painful site
- displays a flexion response (decorticate posture)
- displays an extension response (decerebrate posture)
- shows no motor response.

**Note:** when applying painful stimuli, always use the least amount necessary to elicit a response. A central painful stimulus is recommended to elicit an appropriate reflex response.

Scores are placed as per the attached table with a total out of 15 obtained. Note that an infant assessment can also be attained.

## GLASGOW COMA SCALE

Infant		Child/Adult	
Eye opening			
Spontaneously	4	Spontaneously	4
Reacts to speech	3	Reacts to speech	3
Reacts to pain	2	Reacts to pain	2
No response	1	No response	1
Best verbal response			
Babbles, follows objects	5	Orientated	5
Irritable, cries	4	Confused	4
Cries to pain	3	Inappropriate words	3
Moans and grunts	2	Incomprehensible	2
No response	1	No response	1
Best motor response			
Spontaneously	6	Obeys commands	6
Localises to pain	5	Localises to pain	5
Withdraws from pain	4	Withdraws from pain	4
Flexion response	3	Flexion response	3
Extension response	2	Extension response	2
No response	1	No response	1

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## Authorisation to practice

Glucometry



Field blood glucose testing, using a glucometer, is a quick and convenient way of obtaining an indication of a patient's blood glucose level (BGL).

**Common BGL for:**

- hypoglycaemia < 4 mmol/L
- hyperglycaemia > 10 mmol/L

**Note:** chronic or poorly controlled diabetics may be hypoglycaemic despite a BGL > 4 mmol/L.

## Indications



- seizures
- sick paediatric patients
- impaired consciousness
- post collapse
- abnormal behaviour
- any patient who is suspected of being hypoglycaemic

**Note:** A patient with impaired consciousness must have BGL checked whenever practical, even if the ALOC is suspected to be of other causes

## Contraindications



- Although no actual contraindication exists to glucometry and the recording of BGL, it must be remembered that this procedure is invasive and so judgement must be used as to the appropriateness of performing the procedure

## Precautions



- BGL readings should not be interpreted in isolation, but with consideration of other clinical signs and available history
- Numerous variables may distort test results such as:
  - blood volume on the sensor
  - oxygen level of the blood
  - glucose contaminants on the skin

## Procedure

- Ensure SJANT infection control guidelines are applied.
- Clean area to be tested using an alcohol swab and allow to dry.
- Prepare lancing device, ensuring it is a fully disposable lancet.
- Without touching the 'blood target area', insert the sensor electrode into the test port of the glucometer, ensuring it turns on.
- Lance the side of the finger with the lancet and obtain a hanging drop of blood.
- Move the glucometer to the finger and apply a drop of blood to the target area of the sensor strip.
- The test will start automatically and the BGL reading will appear on the screen.
- Discard the lancet and sensor electrode appropriately.
- Cover the wound with a bandaid.
- Record the patient's BGL on the ePCR.

## Additional information

- Blood may be drawn from a cannula while gaining IV access.
- Some machine configurations allow the sensor strip to touch the skin, while others specify that the sensor must not touch the skin.
- Ensure glucometer is calibrated as per manufacturer's recommendation.
- Alcohol can affect the BGL result; the use of a new bandaid represents a readily available near-sterile option for drying the site.

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### Authorisation to practice

Mental status assessment



A mental status assessment is the process of conducting a systematic evaluation of the patient's thought processes at a particular time. The intention of such an examination is to guide the paramedic in identifying pertinent behavioural manifestations, but not to diagnose a specific condition. The information gained along with any pertinent history, is useful in providing to CAT and/or NTPOL, if required.

### Indications



- Behavioural abnormalities

### Contraindications



- Nil in this setting

### Complications



- Violent patients
- Refusal of assessment and/or treatment

## Procedure

- Assess the patient appropriately to try to ascertain the cause of the presenting signs and symptoms.
- Exclude and/or manage other causes of behaviour.
- Attempt to treat the patient only if safe to do so.
- Using the guide to mental status examination observe, question and note relevant information.

## Additional information

MENTAL STATUS ASSESSMENT GUIDE			
<b>Appearance</b>	<ul style="list-style-type: none"> <li>• grooming</li> <li>• posture</li> <li>• build</li> <li>• clothing</li> <li>• cleanliness</li> </ul>	<b>Thought form</b>	<ul style="list-style-type: none"> <li>• amount</li> <li>• rate</li> <li>• derailment</li> <li>• flight of ideas</li> </ul>
<b>Behaviour</b>	<ul style="list-style-type: none"> <li>• eye contact</li> <li>• mannerisms</li> <li>• gait</li> <li>• activity level</li> </ul>	<b>Thought content</b>	<ul style="list-style-type: none"> <li>• disturbances</li> <li>• delusions</li> <li>• suicidal</li> <li>• obsessions</li> </ul>
<b>Speech</b>	<ul style="list-style-type: none"> <li>• rate</li> <li>• volume</li> <li>• pitch</li> <li>• tone</li> <li>• flow</li> <li>• pressure</li> </ul>	<b>Perception</b>	<ul style="list-style-type: none"> <li>• illusions</li> <li>• thought insertion</li> <li>• broadcasting</li> <li>• hallucinations               <ul style="list-style-type: none"> <li>- auditory</li> <li>- olfactory</li> <li>- tactile</li> <li>- visual</li> <li>- gustatory</li> </ul> </li> </ul>
<b>Mood</b>	Emotion as described: <ul style="list-style-type: none"> <li>• anxious</li> <li>• depressed</li> <li>• cheerful</li> </ul>	<b>Insight &amp; judgement</b>	<ul style="list-style-type: none"> <li>• cognition</li> <li>• illness               <ul style="list-style-type: none"> <li>- understanding</li> <li>- cause &amp; effect</li> </ul> </li> </ul>
<b>Affect</b>	Emotion as observed: <ul style="list-style-type: none"> <li>• restrictive</li> <li>• blunted</li> <li>• labile</li> </ul>		

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### Authorisation to practice

Neurological status assessment



The neurological status assessment forms part of the overall patient assessment process.

Patients with an impaired level of consciousness require as detailed a neurological assessment as is practicable to the circumstances.



### Indications

- To assess the patient's neurological status



### Contraindications

- Nil in this setting



### Precautions

- The normal neurological status of a patient must be taken into account during assessment



## Procedure

### There are five critical areas to a neurological assessment:

#### Level of consciousness

- The AVPU scale represents a tool easily applied during the initial patient assessment. In the AVPU assessment, three questions are asked:

<b>Alert</b>	Is the patient alert?
<b>Verbal</b>	Does the patient respond to a verbal command?
<b>Pain</b>	Does the patient respond to a painful stimulus?
<b>Unconscious</b>	With no response to any of the above, the patient is considered unconscious.

- A formal assessment of the GCS is subsequently performed as soon as possible and repeated throughout patient management.

#### Pupils

- Pupil size must be determined as:
  - pinpoint (< 2 mm)
  - normal (2 – 6 mm)
  - dilated (> 6 mm)
- Assess the papillary reaction to light using a small bright light. Direct light reflex is assessed by covering one eye and shining the light directly into the open eye which should result in a rapid constriction.

## Procedure (continued)

- Assessment is repeated on the other eye. Both reactions should be equal.
- Document any unusual eye movement such as deviation from midline, dilated, or non reactive pupils on one side, indicating possible raised intracranial pressure (ICP) or nerve compression.

## Procedure *(continued)*

### Five critical areas to a neurological assessment: *(continued)*

#### Motor function

- Muscle strength and tone, including any obvious facial weakness
- Abnormal movements such as seizures, tremors or decorticate/decerebrate posturing. The latter is an ominous sign and may occur spontaneously, or to painful stimuli.

#### Sensory function

- Hearing and ability to understand verbal communication.
- Superficial sensation (light touch or pain).

#### Vital signs

- Assess respirations for rate, rhythm and effort.
- Assess blood pressure and pulse to ensure adequate perfusion status. Note that a widening pulse pressure and slowing pulse rate may indicate a rising ICP.
- Assess body temperature and maintain normothermia.

Patient Name: \_\_\_\_\_

Examiner Name: \_\_\_\_\_ Date/Time of Exam: \_\_\_\_\_



## STANDARD NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY



### MOTOR

KEY MUSCLES

C5	<input type="checkbox"/>	<input type="checkbox"/>	Elbow flexors
C6	<input type="checkbox"/>	<input type="checkbox"/>	Wrist extensors
C7	<input type="checkbox"/>	<input type="checkbox"/>	Elbow extensors
C8	<input type="checkbox"/>	<input type="checkbox"/>	Finger flexors
T1	<input type="checkbox"/>	<input type="checkbox"/>	Finger abductors

UPPER LIMB TOTAL (MAXIMUM) ☐ + ☐ = ☐  
(25) (25) (50)

L2	<input type="checkbox"/>	<input type="checkbox"/>	Hip flexors
L3	<input type="checkbox"/>	<input type="checkbox"/>	Knee extensors
L4	<input type="checkbox"/>	<input type="checkbox"/>	Ankle dorsiflexors
L5	<input type="checkbox"/>	<input type="checkbox"/>	Long toe extensors
S1	<input type="checkbox"/>	<input type="checkbox"/>	Ankle plantar flexors

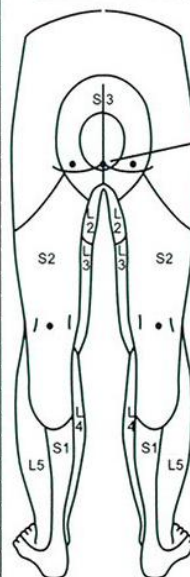
LOWER LIMB TOTAL (MAXIMUM) ☐ + ☐ = ☐  
(25) (25) (50)

Voluntary anal contraction (Yes/No) ☐

	LIGHT TOUCH		PIN PRICK	
	R	L	R	L
C2				
C3				
C4				
C5				
C6				
C7				
C8				
T1				
T2				
T3				
T4				
T5				
T6				
T7				
T8				
T9				
T10				
T11				
T12				
L1				
L2				
L3				
L4				
L5				
S1				
S2				
S3				
S4-5				

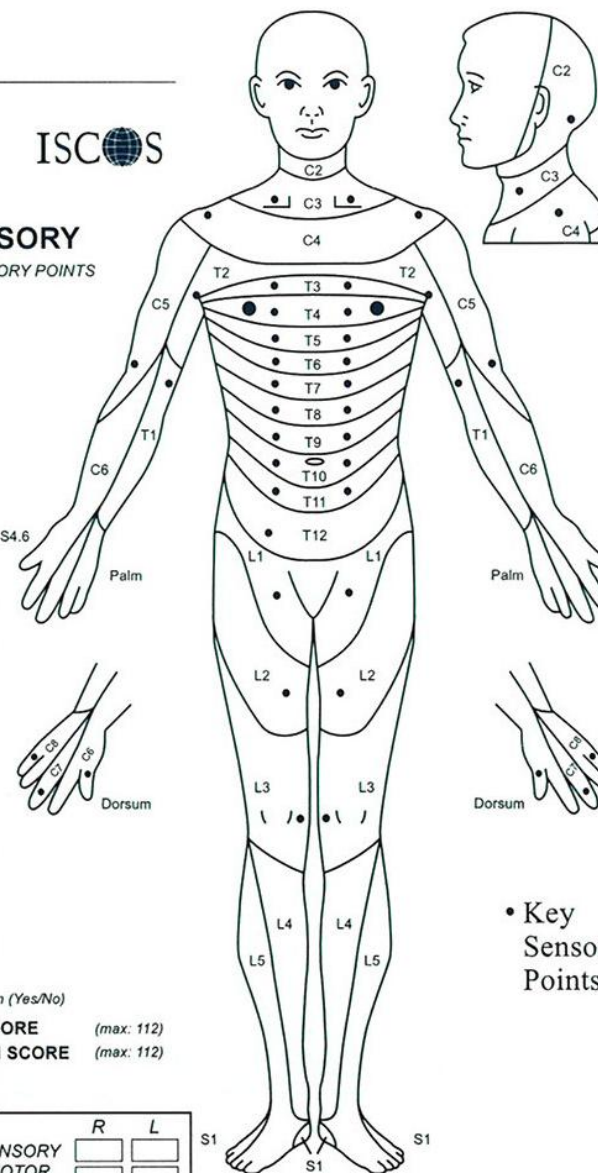
TOTALS { ☐ + ☐ = ☐ } ☐ + ☐ = ☐  
(MAXIMUM) (56) (56) (56) (56)

0 = absent  
1 = impaired  
2 = normal  
NT = not testable



### SENSORY

KEY SENSORY POINTS



• Key  
Sensory  
Points

NEUROLOGICAL LEVEL <small>The most caudal segment with normal function</small>	SENSORY	R <input type="checkbox"/>	L <input type="checkbox"/>	COMPLETE OR INCOMPLETE? <small>Incomplete = Any sensory or motor function in S4-S5</small>	<input type="checkbox"/>	ZONE OF PARTIAL PRESERVATION <small>Caudal extent of partially innervated segments</small>	SENSORY	R <input type="checkbox"/>	L <input type="checkbox"/>
	MOTOR	R <input type="checkbox"/>	L <input type="checkbox"/>				MOTOR	R <input type="checkbox"/>	L <input type="checkbox"/>

ASIA IMPAIRMENT SCALE ☐

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[Home](#)

### Authorisation to practice

Paediatric assessment



SJANT clinical practice defines a paediatric patient as 12 years of age or less.

Children are not to be considered small adults due to marked anatomical and physiological differences. Further to this, their exceptional ability to compensate well for significant injury or illness means that the severity of their condition may be overlooked or underestimated.

The assessment of a paediatric patient requires a high level of clinical knowledge and judgement, incorporating not only the patient's age, development and social circumstances, but also their anatomical, physiological and psychological status.

This is pertinent to all paediatric age groups, but it is of particular relevance in patients **under 2 years of age** where signs and symptoms of serious injury or illness may be subtle and rapid deterioration is common. It is therefore recommended that all paediatric patients be transported by SJANT for further assessment.

### Indications



- A detailed patient assessment is required on all paediatric patients irrespective of the nature of case



### Contraindications

- Nil in this setting



### Precautions

- When paediatric compensatory mechanisms fail they can do so rapidly, catastrophically and often irreversibly

## Procedure

The process of paediatric assessment includes the same elements as the assessment of an adult. However, assessment is performed with consideration of four key categories that encompass the primary differences:

- weight
- anatomical
- physiological
- psychological

### Weight

Most paediatric drugs or therapies are administered on a per kilogram of weight basis. A new paediatric weight estimation method – the Luscombe formula – is more accurate than the Argall and Advanced Paediatric Life Support formulas, as well as the 'best guess' method.

Several studies have shown that it is the most accurate estimation formula for paediatrics in developed countries, and, as such, it has been adopted by the SJANT to estimate paediatric weights:

$$(Age \times 3) + 7$$

## Procedure (*continued*)

### Anatomical

#### *Airway*

There are significant differences between adult and paediatric airways, including

- narrow nostrils
- large tongue
- loose teeth
- compressible mouth floor
- horseshoe-shaped epiglottis
- high anterior larynx.

#### *Breathing*

- A small amount of airway obstruction can have significant effects on airflow.
- Infants are considered diaphragmatic breathers, therefore rapid gastric decompression can improve respiratory function.
- Muscles can fatigue quickly.
- A compliant chest wall means significant underlying injury can occur without rib fracture.

### Procedure *(continued)*

#### *Circulation*

- Small blood or fluid loss in the infant or small child is clinically significant due to a small total blood volume.
- Hypotension is a serious and late sign in the paediatric patient. The decision to resuscitate should be primarily based on other clinical signs such as:
  - heart rate
  - capillary refill
  - appearance.

## Procedure *(continued)*

### Physiological

The expected vital signs throughout paediatric age groups differ to that of the adult patient. These are summarised as follows:

Age	Neonate	6 months	Age in Years											
			1	2	3	4	5	6	7	8	9	10	11	12
Weight (kg)	3.5	7	10	13	16	19	22	25	28	31	34	37	40	43
Heart rate	100 – 160	100 – 160	90 – 150	80 – 140				70 – 120						
Respiration	25 – 50			20 – 30				15 – 25						
Systolic BP	60 – 70	70 – 100		80 – 110				90 – 115						

### Psychological

- Paramedics must consider stages of child development and behaviour when assessing paediatric patients.
- Specific challenges lie in communication and alleviation of a child's fear.
- Parents and carers should be involved in the assessment process whenever practical.

[Home](#)

### Authorisation to practice

Pain assessment



Relieving pain is an important component of patient care. Appropriate assessment and adequate analgesia underpins all aspects of paramedic practice.

The accurate assessment of pain is challenging as pain is a subjective sensation and unique to the individual. For this reason the paramedic must take care not to let personal experience or preconceptions affect their assessment and appropriate management.

### Indications



- Any patient suspected of experiencing pain or discomfort



### Contraindications

- Nil in this setting



### Precautions

- The absence of pain does not always indicate the absence of injury



## Procedure

The assessment of pain is dependent on age, verbal and cognitive capacity of the patient.

A commonly accepted mnemonic used for the assessment of pain is:

- **O Onset:** What was the patient doing when the pain started (active, inactive, stressed), and was the onset sudden, gradual or part of an ongoing chronic problem?
- **P Position/palliation:** Where is the pain? Does anything make the pain better or worse?
- **Q Quality:** Describe the pain. For example, is it dull, sharp or crushing?
- **R Region/radiation:** Does the pain radiate or move anywhere?
- **S Severity:** How severe is the pain (*see below*)?
- **T Timing:** When did the pain start and does it come and go?

Self reporting of pain is the recommended method to assess severity. Strategies have been developed dependant on age.

### Adult

- The most common method for assessing pain severity in the adult is with a numerical rating scale of 0 to 10 (0 denoting no pain through to 10 denoting the worst pain imaginable).
  - 0 = nil pain,
  - 1 – 4 = mild pain,
  - 5 – 7 = moderate pain,
  - 8 – 10 = severe pain.

## Procedure (*continued*)

- Should the patient be unable to comprehend the numerical scale, a verbal rating scan can be used with the patient describing severity as no pain, mild, moderate or severe.

### Child

- The Wong-Baker FACES Pain Rating Scale is the preferred severity assessment tool in children aged three and above.

### Wong-Baker FACES Pain Rating Scale



- Point to each face using the words to describe the pain intensity. Ask the child to choose a face that best describes their own pain and record the appropriate number.

From: Hockenberry MJ, Wilson D: *Wong's essentials of paediatric nursing*, ed. 8, St. Louis, 2009, Mosby. Used with permission. Copyright Mosby.

### Infant

- Behavioural cues may become the primary means to assess pain in infants who are unable to speak, comprehend or use self-reporting tools due to their varying developmental stages of life.

**Procedure** (*continued*)

- This is achieved with the use of the FLACC behavioural assessment scale:

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

**Psychological**

- Paramedics must consider stages of child development and behaviour when assessing paediatric patients.
- Specific challenges lie in communication and alleviation of a child's fear.
- Parents and carers should be involved in the assessment process whenever practical.

### Additional information

- The paramedic is to perform regular pain assessments throughout their treatment. Of particular importance is severity, particularly after analgesic administration.
- Severe, uncontrolled pain may lead to irrational and unexpected behaviour in some individuals.

[Home](#)**Authorisation to practice**

Perfusion status assessment



Perfusion is the ability of the cardiovascular system to supply the body tissues with an adequate blood supply to meet their functional demands.

With inadequate systemic perfusion there is usually an initial loss of blood flow and pressure to less crucial organs (e.g. skin and gastro intestinal system) in order to maintain the flow to more vital organs (e.g. brain and heart).

Early vital sign assessment is crucial within the systematic approach to patient care, which considers perfusion as a time critical determinant of management.

**Indications**

- All patients who raise a suspicion of haemodynamic compromise, either clinically, in history, or by mechanism of injury

**Contraindications**

- Nil in this setting

**Precautions**

- Nil in this setting

**Additional information**

- Other factors may affect the interpretation of perfusion, for example, the environment, medication, age and anxiety.
- It is important to remember that, despite normal vital signs, significant hypovolaemia may be present.

## Procedure

ADULT PERFUSION STATUS ASSESSMENT				
	Skin	Pulse	BP	Consciousness
<i>Adequate perfusion</i>	Warm, pink, dry	60 – 100 bpm	> 100 mmHg systolic	Alert and orientated in time and place
<i>Borderline perfusion</i>	Cool, pale, clammy	50 – 100 bpm	80 – 100 mmHg systolic	Alert and orientated in time and place
<i>Inadequate perfusion</i>	Cool, pale, clammy	< 50 bpm or > 100 bpm	60 – 80 mmHg systolic	Either alert or altered in their orientation to time and place
<i>Grossly inadequate perfusion</i>	Cool, pale, clammy	< 50 bpm or > 120 bpm	< 60 mmHg systolic or unrecordable	Altered state of consciousness or unconscious
<i>No perfusion</i>	Cool, pale, clammy	Absence of palpable pulses	Unrecordable	Unconscious

CHILD PERFUSION STATUS ASSESSMENT				
	Skin	Pulse	BP	Consciousness
<i>Adequate perfusion</i>	Warm, pink, dry	80 – 160 bpm	>70 mmHg systolic	Alert and orientated in time and place
<i>Borderline perfusion</i>	Cool, pale, clammy	50 – 80 bpm	50 – 70 mmHg systolic	Alert and orientated in time and place
<i>Inadequate perfusion</i>	Cool, pale, clammy	< 75 bpm or > 130 bpm	40 – 50 mmHg systolic	Either alert or altered in their orientation to time and place
<i>Grossly inadequate perfusion</i>	Cool, pale, clammy	< 50 bpm or > 140 bpm	< 40 mmHg systolic or unrecordable	Altered state of consciousness or unconscious
<i>No perfusion</i>	Cool, pale, clammy	Absence of palpable pulses	Unrecordable	Unconscious

**Note:** The lowest criterion determines the overall perfusion status.

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### Authorisation to practice

Primary and secondary survey



This assessment forms an essential component of patient management. It comprises many individual and often 'stand-alone' components all of which, when viewed together, provide a comprehensive clinical picture of the patient.

The paramedic should initiate a primary and secondary assessment as soon as possible in every case. The collecting of patient assessment information and administering care are carried out simultaneously.



### Indications

- All patients in SJANT care are to be provided with a comprehensive clinical assessment irrespective of the reason for contact



### Contraindications

- Nil in this setting



### Precautions

- Nil in this setting

## Procedure

The purpose of a primary survey is to identify and immediately treat life-threatening conditions. The sequencing of the primary survey has been changed to bring it in line with contemporary clinical practices.

**Primary survey:**      *Danger*  
                                  *Response*  
                                  *Circulation*  
                                  *Airway*  
                                  *Breathing*

The secondary survey is aimed at obtaining a detailed history, along with vital signs and then performing a focused physical examination based on the patient's symptoms.

**Secondary survey:**      *History*  
                                  *Vital signs survey*  
                                  *Physical examination*

PRIMARY SURVEY	
<b>DANGER</b>	Check for <b>DANGER</b> (yourself, partner, bystanders and patient)
<b>RESPONSE</b>	Check the patient's <b>RESPONSE</b> to stimulus to determine level of consciousness. Use the AVPU scale: Is the patient <b>Alert</b> ? Is the patient responding to <b>Verbal</b> stimuli, responding only to <b>Painful</b> stimuli, or <b>Unresponsive</b> ?
<b>CIRCULATION</b>	Check if the patient has a pulse ( <b>CIRCULATION</b> ) and if so, determine if it is adequate. Access capillary refill in paediatric patients. <b>Consider: Defibrillation, haemorrhage control, leg elevation (except for spinal injury), IV/IO access and fluid therapy</b>
<b>AIRWAY</b>	Check if the patient has a patent <b>AIRWAY</b> and ensure there is no danger of future airway obstruction (e.g. stridor). <b>Consider: C-spine immobilisation, simple airway manoeuvres, suctioning, basic and advanced airway adjuncts – OPA, NPA, LMA, ETT</b>
<b>BREATHING</b>	Check if the patient is <b>BREATHING</b> and has adequate ventilations. <b>Consider: Oxygen and IPPV</b>

## Procedure (continued)

### SECONDARY SURVEY

#### HISTORY

Obtain a comprehensive history:

- |                      |                          |
|----------------------|--------------------------|
| <b>O</b> Onset       | <b>S</b> Signs/symptoms  |
| <b>P</b> Provocation | <b>A</b> Allergies       |
| <b>Q</b> Quality     | <b>M</b> Medications     |
| <b>R</b> Radiation   | <b>P</b> Past medical Hx |
| <b>S</b> Severity    | <b>L</b> Last meal       |
| <b>T</b> Timing      | <b>E</b> Events prior    |

#### VITAL SIGN SURVEY

Complete a more detailed assessment of all appropriate vital signs:

- pulse
- respiration rate
- blood pressure
- temperature
- SpO<sub>2</sub>
- blood glucose level
- Glasgow Coma Scale
- 3 or 12-Lead ECG

#### PHYSICAL EXAMINATION (head-to-toe)

Complete a comprehensive physical examination of the patient as appropriate. This is particularly applicable in trauma, but may not be relevant in many medical presentations.

## Procedure (continued)

### HEAD

#### Inspect

#### General

Lacerations, deformity, facial muscle, or asymmetry

#### Eyes

Pupils or evidence of raccoon eyes (bruising around orbits suggestive of basal skull fracture)

#### Ears

Blood in canal or evidence of battle's sign (significant bruising behind the ears, over mastoid process, suggestive of base of skull fracture).

#### Nose

Deformity or epistaxis

#### Mouth

Loose teeth, bite malocclusion (suggestive of a mandibular fracture) or airway/tongue swelling

#### Voice

Hoarseness

#### Palpate

#### General

Crepitus, bony tenderness, or subcutaneous emphysema

### NECK

#### Inspect

Deformity, laceration or either raised JVP or JVD or jugular venous distension.

#### Palpate

Tracheal position, bony tenderness, carotid pulse, subcutaneous emphysema, or lymphadenopathy.



**Procedure (continued)**

CHEST	
<b>Inspect</b>	Expansion, paradoxical movement, accessory muscle use, lacerations, or deformity
<b>Palpate</b>	Tenderness, subcutaneous emphysema, bony crepitus, or apex beat
<b>Auscultate</b>	Heart sounds, air entry and breath sounds, or additional sounds
ABDOMEN	
<b>Inspect</b>	Laceration, bruising, distension, or priapism (spinal trauma)
<b>Palpate</b>	Tenderness, guarding, rigidity, rebound tenderness, or masses
<b>Auscultate</b>	Bowel sounds
PELVIS	
<b>Inspect</b>	Laceration, bruising, or deformity
<b>Palpate</b>	Bony tenderness
UPPER AND LOWER LIMBS	
<b>Inspect</b>	Laceration, bruising, deformity, shortening, or rotation
<b>Palpate</b>	Neurovascular status, bony tenderness, or crepitus
BACK	
<b>Inspect</b>	Laceration, bruising, or deformity
<b>Palpate</b>	Bony tenderness, or evidence of a bony step

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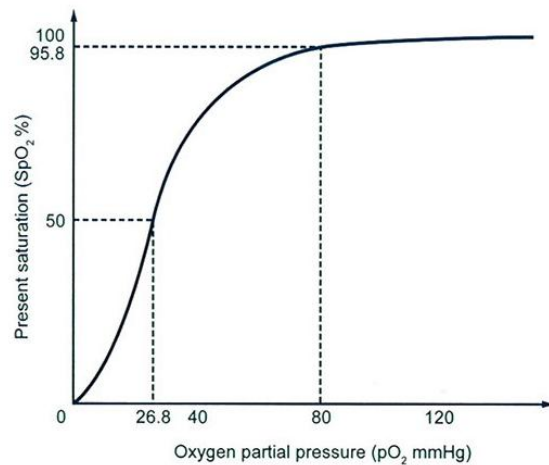
## Authorisation to practice

Pulse oximetry assessment

SAP  
Para  
ICP

Pulse oximetry estimates the oxygen saturation in arterial blood ( $\text{SaO}_2$ ), by directing both red and infrared light from two LEDs through a patient's translucent fleshy body site (usually a finger or earlobe). The absorption of the two wavelengths differs significantly dependant on the level of haemoglobin oxygenation and the pulse oximeter translates this ratio into a percentage ( $\text{SpO}_2$ ).

It is important to consider the relationship between blood oxygenation and measurable haemoglobin saturation when interpreting pulse oximetry. A graphical interpretation is represented below.



Oxygen dissociation curve

A small change in saturations (e.g. a drop of 97% to 90%) represents a large change in blood oxygenation ( $\text{PO}_2$  100 to 60 mmHg).

## Indications



- To determine patient oxygen saturation



## Contraindications

- Nil in this setting



## Precautions

The reliability of  $\text{SpO}_2$  readings depends on the following factors:

- correct sensor size and placement
- adequate blood flow through the sensor site

Inaccurate pulse oximetry readings may occur when the following factors are present:

- excessive patient movement
- exposure to ambient light
- dirt or nail polish under the sensor site
- methaemoglobinaemia
- carbon monoxide
- insufficient amplitude on the pulsing pleth wave

## Procedure

- Ensure SpO<sub>2</sub> cable is connected and the sensor is placed on the patient.
- Observe the pulse bar/pleth wave for amplitude; this indicates relative signal strength.
- Note the SpO<sub>2</sub> reading and document accordingly.

## Additional information

- The SpO<sub>2</sub> of arterial blood is usually 94-100%.
- SJANT oxygen saturation monitors are unable to differentiate between carboxyhaemoglobin and oxyhaemoglobin therefore patients with carbon monoxide poisoning are to be administered the maximum oxygen dose irrespective of SpO<sub>2</sub>.
- Pulse oximetry is not a complete measure of respiratory or circulatory sufficiency.

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### Authorisation to practice

Respiratory status assessment



There are several components to a comprehensive respiratory assessment in the pre-hospital setting.

### Indications



- All chest and respiratory symptoms and complaints including chest pain or shortness of breath
- Impaired consciousness

### Contraindications



- Nil in this setting

### Precautions



- Nil in this setting

## Procedure

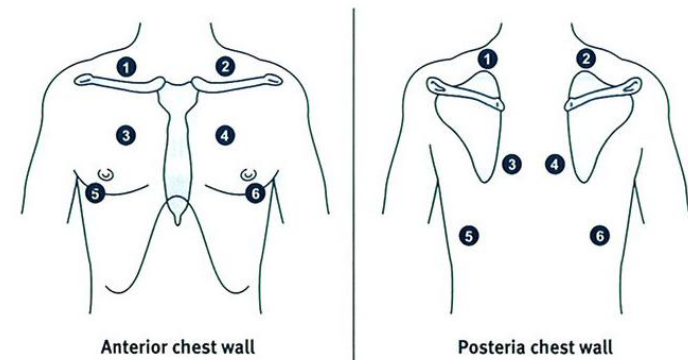
RESPIRATORY STATUS ASSESSMENT		
Components	Normal	Respiratory distress
Conscious state	Alert	Altered
General appearance	Calm and quiet	Distressed, anxious, struggling to breathe, exhausted
Speech	Clear, fluent and steady	Difficult, short sentences or phrases, unable to verbalise
Ventilatory rate *	12 – 18 (adult)	> 18 (adult)
Ventilatory rhythm	Regular or even cycles	No respiratory pause, prolonged expiratory phase
Ventilatory effort	Minimal with little chest or abdominal movement	Marked chest movement, use of accessory muscles
Skin	Pink	Pale and sweaty; cyanosis is a late and serious sign
Pulse rate *	60 – 80 (adult)	Tachycardia; bradycardia is a late and serious sign
Breath sounds	Usually quiet	Upper airway stridor Bronchospasm: wheeze Pulmonary oedema: crackles with possible wheeze.

\* Refer to paediatric assessment CPP for relevant physiological parameters for paediatric patients.

## Procedure (continued)

### Chest auscultation

- Limit external noise where possible.
- Position patient upright where possible.
- Ask patient to breathe normally through their mouth.
- Ensure that the stethoscope is held still and that the conductive tubing is kept clear of contact with any surface to avoid extraneous noise.
- Listen to both sides of the chest in a methodical manner. It is important to listen to several respiratory cycles in each location, noting the quality and intensity of the lung sounds.
- For an advanced airway, confirm tube placement, via EtCO<sub>2</sub> and auscultation of the epigastrium prior to auscultating the lung fields.



Recommended auscultation locations on the anterior and posterior chest

[Home](#)

### Authorisation to practice

Vital signs survey



There are several components to a comprehensive assessment in the pre-hospital setting.



### Indications

- SJANT paramedics are to obtain vital signs on all patients under their care
- As a minimum requirement, two full sets of vital signs are to be documented for all patients



### Contraindications

- Nil in this setting



### Precautions

- Vital signs may not be taken when doing so would, place the paramedic at undue risk of harm
- A blood pressure is not to be taken on the arm of a patient that has an AV fistula present or on the arm that corresponds to the side of a mastectomy
- Machine measurements must be correlated with patient condition

## Procedure

### Respirations

- The patient should be assessed to note respiratory rate, rhythm, effort and symmetry of chest, which is often most accurately viewed from the foot end of a supine patient.
- Auscultation should then be performed.

### Pulse

- Assess pulse at the carotid artery, or radial pulse points.
- Other pulse points can be assessed when there is a requirement to determine more specific perfusion. Examples include: distal perfusion to the lower extremities (pedal pulse) or the patient who is *in extremis* (femoral pulse).
- Note that the brachial artery also provides a pulse point and is commonly used in the paediatric patient.
- **Paramedics must palpate the presence of a pulse.** It is not sufficient to rely exclusively on a rate obtained from an ECG, or pulse oximeter.

### Blood pressure

- Accepted methods to measure BP include *auscultation*, *automated NIBP* and, in appropriate circumstances, *palpation*.
- The operation of any automated NIBP monitor used within the SJANT should be in accordance with SJANT training and manufacturer's instructions.

## Procedure (continued)

### Capillary refill

- Capillary refill can be used as an indicator of perfusion and is assessed by applying pressure to the skin for five seconds and then observing the return of colour to the area. The area should return to a pink colour (well perfused) within two seconds to be classed as normal. To assess distal perfusion, apply pressure to the nail bed of a finger or toe. Central perfusion may be assessed through pressure to the forehead, or sternal area.

### Temperature

- The SJANT recommends tympanic thermometers for the measurement of temperature.
- Paramedics should familiarise themselves with the specific tympanic thermometer available to them.
- Ensure a disposable sleeve or cover is used over the thermometer probe.
- The probe is gently placed into the patient's ear pointed at the tympanic membrane and held for an indicated time frame after the thermometer button is depressed.

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## 04 - Cardiac

04 - [12-Lead ECG acquisition](#)

05 - [Cardiac monitoring](#)

06 - [Synchronised cardioversion](#)

07 - [Transcutaneous cardiac pacing](#)

08 - [Valsalva manoeuvre](#)

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## Authorisation to practice

12-Lead ECG acquisition



The 12-lead electrocardiogram (ECG) is used to detect many conditions affecting the heart, underlying myocardial ischaemia, dysrhythmias, drug toxicity and electrolyte imbalances.

Use in the pre-hospital setting is paramount to the diagnosis and treatment of STEMI (via the SJANT cardiac reperfusion strategy).

**Additional information**

- The 12-Lead ECG should be acquired as part of an early secondary assessment of the patient, especially in the setting of suspected cardiac ischaemia or infarct.
- Electrodes should remain in their original placement throughout management to facilitate the comparison of serial 12-Lead ECGs.

**Note:** Similar complications as with cardiac monitoring, also ensuring that:

- ECG frequency is set at 0.05 – 40 Hz, and
- paper speed is set at 25 mm/sec

These factors ensure the 12-Lead ECG printout is of diagnostic quality.

## Indications



- To aid in the identification of:
  - myocardial ischaemia or infarct
  - rhythm and conduction disturbance
  - electrolyte imbalance
  - hypertrophy of the heart
  - drug toxicity



## Contraindications

- Nil in this setting



## Precautions

- Nil in this setting

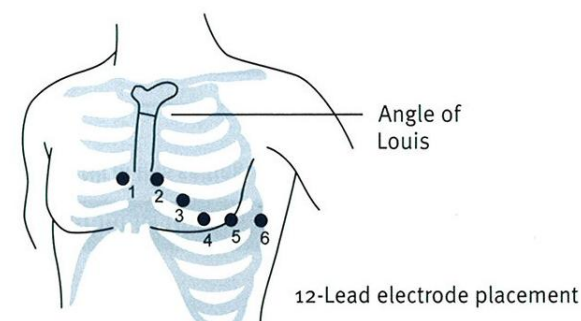
## Procedure

- Explain to the patient what is required, ensure privacy and obtain consent to place electrodes.
- Position the patient preferably supine or semi-recumbent, (without arms or legs crossed).
- Attach electrodes to the snap connectors on each wire, ensuring electrodes are in date and gel is still moist.
- Accurately position the electrodes on the patient:
  - *Limb electrodes*
    - Limb leads can be placed on the distal location of the inner wrists and the medial aspect of the ankles.
    - If required, electrodes may be placed more proximally along the limbs to reduce electrical and mechanic artefact.
  - *Chest electrodes*
    - Refer to the table opposite.
- Ask the patient to breathe normally and to remain still, without talking.
- Commence 12-Lead ECG acquisition as per specific manufacturer's instructions.

## Procedure (continued)

PLACEMENT OF ECG CHEST ELECTRODES		
Placement order	Chest lead	Anatomical position
1 <sup>st</sup>	V1	4 <sup>th</sup> intercostal space, right of the sternum
2 <sup>nd</sup>	V2	4 <sup>th</sup> intercostal space, left of the sternum
3 <sup>rd</sup>	V4	5 <sup>th</sup> intercostal space, on left midclavicular line
4 <sup>th</sup>	V6	On the left mid-axillary line, level with V4
5 <sup>th</sup>	V3	Midway between V2 and V4
6 <sup>th</sup>	V5	Midway between V4 and V6
Optional*	V4R	5 <sup>th</sup> intercostal space, on the right midclavicular line.

\* For evaluation of right ventricular involvement with inferior STEMI, consider acquiring a 12-Lead ECG with V4 repositioned to V4R. If V4R is acquired, the 12-Lead ECG **must** be annotated to indicate that V4 is now representing V4R.



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## Authorisation to practice

Cardiac monitoring



Continuous cardiac monitoring records the electrical activity of the heart as an electrocardiogram (ECG) either on the cardiac monitor screen or via a paper print out.

Cardiac monitoring is indicated for identification of potentially lethal dysrhythmias.

ST segment analysis via the monitor screen is non-diagnostic.

**Note:** The VF/VT alarm should always be turned on.

## Indications



Cardiac monitoring is essential in the following patient groups, though not limited to:

- all unconscious patients or collapse patients (or those who have recently been unconscious);
- patients complaining of chest pain or dyspnoea;
- poisoned patients;
- patients who are poorly perfused/shocked or hypoxic, or with abnormal vital signs;
- when a medical officer requests the patient to be monitored;
- patients in cardiac arrest are also to be monitored but this is done through the defibrillation pads in anticipation of a shockable rhythm.



## Contraindications

- Nil in this setting



## Precautions

Be aware of potential artefacts in the ECG from:

- detached electrodes due to diaphoresis, oily skin, or chest hair;
- patient movement, breathing, muscle tremor or lead movement;
- AC electricity/50 hertz interference
- broken cable tip, wire or machine malfunction
- dry electrode conductive gel

**Note:** If the patient goes into cardiac arrest, any electrodes impeding the proper application of the defibrillator pads must be removed

## Procedure

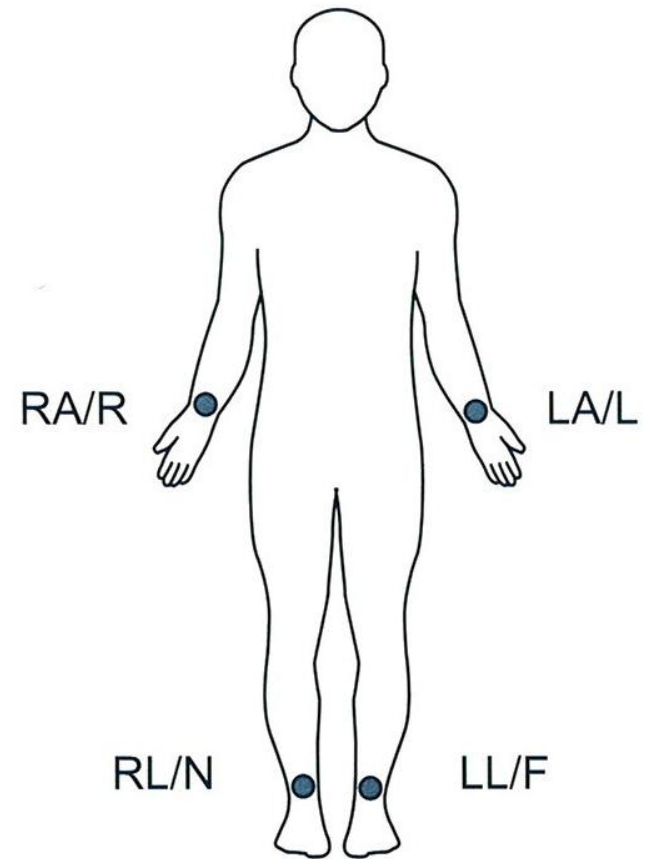
- Explain procedure to patient and ensure privacy where possible.
- Clean the surface of the skin to ensure monitoring electrodes will adhere.
- It may also be necessary to:
  - shave chest hair.
  - inspect the monitoring electrode pad to ensure that the surface is going to adhere and the gel in the centre of the pad is moist.
- Attach the leads to the monitoring electrode pads.
- Smooth electrode pads on from one edge.

The leads primarily used in continuous cardiac monitoring are those referred to as 'limb leads', identified as follows:

- RA = right arm
- LA = left arm
- RL = right leg
- LL = left leg

The monitoring electrodes for these leads are generally placed distally on the limbs, but to limit motion artefact they can be applied as follows:

- RA & LA placed proximally on arms, but not on torso;
- RL & LL placed proximally, but not higher than iliac crests.



*Placement of limb lead monitoring electrodes*

[Home](#)

## Authorisation to practice

Synchronised cardioversion

ICP

Synchronised cardioversion is a method of restoring the normal rhythm of the heart in patients presenting with a rapid ventricular rate associated with severely compromised cardiac output (i.e. GCS is < 15, SBP < 90 mmHg, chest pain, heart failure).

This is achieved using a purpose modified defibrillator capable of delivering a controlled direct current shock, synchronised with the R-wave of the ECG.

***Synchronised DC shock***

## Indications



Rapid ventricular rate with severely compromised cardiac output, in the following cardiac rhythms:

- pulsatile ventricular tachycardia
- supra-ventricular tachycardia
- atrial fibrillation
- atrial flutter

**CAUTION:** *Cardioversion of SVT including Atrial Fibrillation and Atrial Flutter is rarely required in the pre-hospital setting*

## Contraindications



- VF/pulseless VT
- Dysrhythmias where the patient is adequately perfused

## Complications



- Pain and discomfort
- Paradoxical asystole or VF

## Procedure

- Explain the procedure to the patient.
- Establish IV access with a sodium chloride 0.9% running line.
- Ensure resuscitative drugs are available.
- Prepare airway, suction and ventilation equipment.
- Consider sedation as per Sedation CPG.
- Position electrodes and pads as appropriate.
- Ensure that the synchroniser is on.
- Confirm synchronisation is occurring on the R wave. Change the ECG amplitude on the monitor if necessary.
- Ensure the patient is well oxygenated/ventilated prior to and after sedation and cardioversion.
- Perform a maximum of three attempted synchronised cardioversions in accordance with the following joule sequence:  
100 : 150 : 200 joules
- Press and hold the shock button until the synchronised shock is delivered.
- Assess the patient following each cardioversion attempt.
- Ensure the synchroniser button is pressed again before each shock is delivered.

**Note:** The requirement for pre-hospital synchronised cardioversion in the paediatric patient is extremely rare. Should it be deemed as necessary, consultation with the on-call SJANT medical officer is required in all circumstances with a recommended sequence at 0.5 – 1 joule/kg increasing to 2 joules/kg if required.

## Additional information

- If synchronised cardioversion initiates VF/Asystole then immediately treat as per guidelines.
- Always consider other possible causes of the tachyarrhythmia such as hypovolaemia.
- Should synchronised cardioversion be unsuccessful, confirm monitoring electrodes and pads are appropriately placed, ensure the synchroniser is on and the R wave is being sensed, and consider alternative pad placement.

[Home](#)

## Authorisation to practice

Transcutaneous cardiac pacing

ICP

Transcutaneous cardiac pacing (TCP) works as an artificial pacemaker, delivering repetitive electrical currents when the natural pacemaker has become blocked or dysfunctional.

TCP is often beneficial for patients with haemodynamically unstable bradycardia, especially if the patient is unresponsive to Atropine.

To have effect, the myocardium must be capable of generating cardiac output with the muscular contractions.

There are two modes of TCP:

- demand pacing and
- non-demand/asynchronous pacing.

Demand pacing is designed to sense the inherent QRS complex, delivering electrical stimuli only when needed.

**Note:** Non-demand/asynchronous pacing is not indicated within SJANT.

## Indications



Poor perfusion resulting from significant:

- bradycardia
- heart block



## Contraindications

TCP is contraindicated within the SJANT for:

- asystole/PEA
- overdrive pacing of a ventricular dysrrhythmia



## Complications

- Pain
- Discomfort
- Anxiety



## Procedure

- Explain the procedure to the patient (cutaneous nerve stimulation and/or skeletal muscle contraction).
- Establish IV access with a sodium chloride 0.9% running line.
- Ensure adequate oxygenation and ventilation and basic cares are completed.
- Consider sedation and/or analgesia as per the *Sedation and procedural sedation* and *Pain management CPG*.
- Position electrodes and pads as appropriate.
- Turn pacer on and select appropriate rate (60 – 80 in adults: rates > 90 may be associated with worsening myocardial perfusion).
- Increase current incrementally, while observing the patient and assessing for electrical and mechanical capture; this may change over time.
- The minimum current effective to obtain reliable mechanical capture should be used to minimise heart damage and patient discomfort.
- If the patient becomes intolerant of the procedure, consider further analgesia/sedation.

## Additional information

Patients in cardiac arrest do not respond to pacing because the heart is metabolically compromised from inadequate perfusion and is therefore incapable of effective contractions. There is no evidence to support routine pacing in cardiac arrest as there is no improved return of spontaneous circulation or survival.

Capture is defined as depolarisation of the heart by an artificial electrical stimulus:

- electrical capture is evidenced by a wide QRS complex followed by a tall, broad T wave;
- mechanical capture is myocardial contraction and is evidenced by a pulse and signs of improved cardiac output.

The most common reason for failing to achieve capture is insufficient current. Additional reasons to consider are:

- the cause of the natural pacemaker failure and whether the myocardium is capable of contractions (e.g. hypoxia and acidosis impair cardiac contractility);
- adequate sensing of demand pacemaker by ensuring ECG trace is properly sized;
- alternative pad placement (anterior/posterior), pad adherence, and machine and lead check.

[Home](#)

## Authorisation to practice

Valsalva manoeuvre

ICP

The Valsalva manoeuvre is a first line treatment for the management of haemodynamically stable, narrow complex SVT.

**The Valsalva manoeuvre has four phases:**

**Phase one:** onset of strain brings about an increase in intrathoracic pressure. This has a compressive effect on the aorta, resulting in a transient increase in aortic pressure.

**Phase two:** the end of this transient period, which results in decreasing aortic pressure and increasing heart rate.

**Phase three:** release of the strain leading to sudden pressure drop within the aorta with a resultant compensatory increase in heart rate.

**Phase four:** increased venous return, preload and therefore cardiac output results in an increased aortic pressure with compensatory 'overshoot' of blood pressure, leading to a reflex bradycardia.

This reflex bradycardia is induced in an effort to break the pattern of a re-entrant circuit causing the SVT.

A maximum of three attempts at the Valsalva manoeuvre is recommended.

## Indications



- Haemodynamically stable SVT

## Contraindications



- Haemodynamic compromise

## Complications



- Syncope
- Prolonged hypotensive state

## Procedure

- Ensure all standard cares have been performed.
- Explain the procedure to the patient.
- Obtain IV access with a one litre bag of sodium chloride 0.9% attached.
- Position the patient supine.
- Instruct the patient to blow into a sterile 10 mL syringe for 15 seconds, aiming to move the plunger up the barrel of the syringe.
- Print the ECG, indicating the start of the manoeuvre.
- After 15 seconds, stop the procedure and retrieve the syringe from the patient.
- Indicate the end of the manoeuvre on the ECG print out and continue the print out until the ECG has stabilised.
- Ensure the patient has returned to a haemodynamically stable SVT presentation prior to repeating the procedure.

## Additional information

- Evidence suggests the following 'gold standard' criteria for the Valsalva manoeuvre technique:
  - minimum pressure of 40 mmHg
  - optimal duration of 15 seconds
  - supine position as an ideal posture

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## 05 - Drug Administration

- 01 - [Intramuscular injection](#)
- 02 - [Intranasal drug administration](#)
- 03 - [Nebulisation](#)
- 04 - [Oral disintegrating tablet](#)
- 05 - [Oral drug administration](#)
- 06 - [Sublingual drug administration](#)

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## Authorisation to practice

Intramuscular injection



Intramuscular (IM) injections are a method of administering a drug into a muscle.

## Indications



- The administration of medications via the IM route



## Contraindications

- Evidence of infection or trauma at the injection site



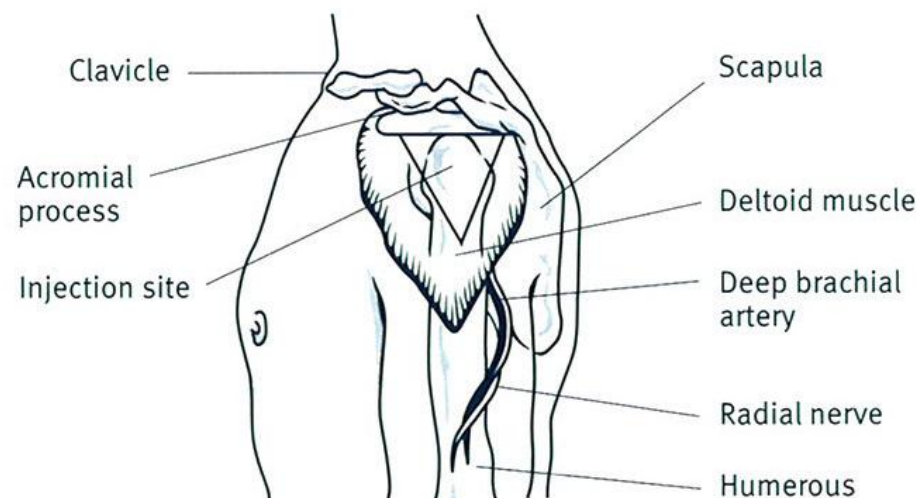
## Complications

- Pain
- Bleeding

## Additional Information

- The speed of absorption is faster than the subcutaneous route, owing to the muscle tissue having a greater blood supply.
- An advantage of the IM route as opposed to the subcutaneous route is that the muscle can accommodate a larger volume of fluid being injected, i.e. 3-5 mL in an adult in the vastus lateralis and approximately 2 mL in a child, also in the vastus lateralis.
- For any calculated IM volumes that exceed 2 mL, the dose must be split and administered at different IM sites (does not apply to Box Jellyfish antivenom – refer to DTP).
- The use of VanishPoint® syringes is highly recommended.

## Approved injection sites



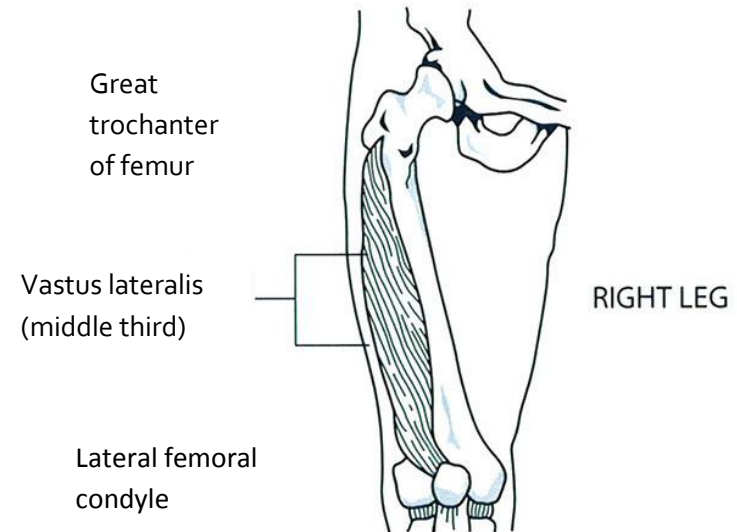
*The deltoid muscle for an IM injection*

## Procedure

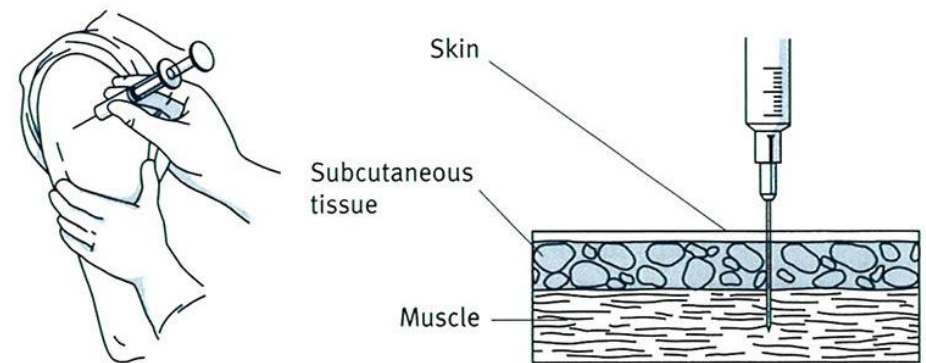
- If the patient's clinical presentation allows, explain the procedure to the patient and gain consent.
- Select a needle.
- Draw up the correct dose of medication and expel any excess air from the syringe.
- Select the appropriate site for injection and clean the area with an alcohol swab.
- Insert the needle by piercing the skin with the needle at a 90° angle, using a quick, dart-like technique.
- Aspirate by pulling back on the plunger of the syringe. If blood appears in the syringe, withdraw the needle a little and then aspirate again. If blood continues to appear, withdraw the needle completely and inject in a slightly different site. When blood does not appear it is safe to inject the drug.
- Inject the drug by holding the syringe barrel firmly and push slowly on the syringe plunger.
- Remove the needle swiftly.

**Note:** Use different sites for subsequent injections.

## Approved injection sites *(continued)*



*The vastus lateralis for an intramuscular injection*



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## Authorisation to practice

Intranasal drug administration



The nasal cavity has an easily accessible, rich vascular plexus that permits topically administered drugs to rapidly achieve effective blood levels. This is most effectively accomplished by distributing drug solutions as a mist rather than as larger droplets, which may run off instead of being absorbed.



## Indications

- To deliver fast acting medications where IM and IV access is inappropriate and/or difficult (e.g. rapid analgesia in children)



## Contraindications

- Suspected nasal fractures
- Blood obstructing the nasal passage
- Mucus obstructing the nasal passage
- Drug not approved to be administered via atomiser (refer to DTP)



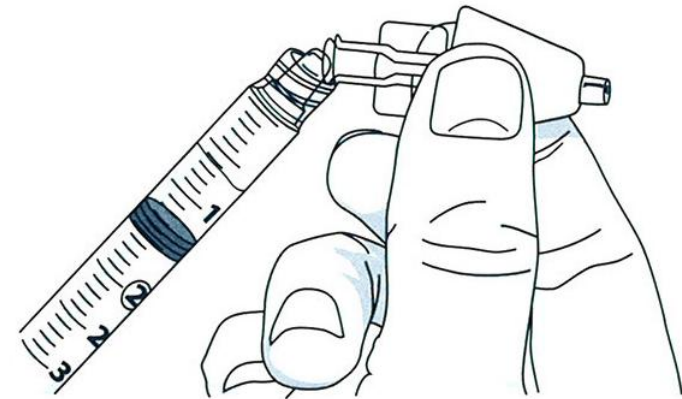
## Precautions

- Underdose is possible if not administered properly
- Mild, short lasting discomfort (typically burning) from the drug itself



## Procedure

- If the patient's clinical presentation allows, explain the procedure to the patient and gain consent.
- Calculate the dosage required.
- Draw up dose in the one [or three] millilitre syringe:
  - for volumes  $> 0.5$  mL and  $< 2.0$  mL optimise drug absorption by delivering half the dose into each nostril;
  - if volumes of  $> 2$  mL are required, an alternative route of administration should be sought.
- Connect the atomiser to the syringe via the Luer-Lok™ mechanism. Twist into place.
- Control and stabilise the patient's head with one hand.
- Apply the atomiser gently but firmly into the nostril.
- Aim slightly upward and towards the ear on the same side as the nostril.
- Briskly compress the syringe plunger to deliver approximately half of the medication into the nostril.
- Move the device over to the opposite nostril and briskly administer the remaining half of the medication into that nostril.  
(Administering half the dose in one nostril and half in the other doubles the surface area available for absorption.)



*Connection of atomiser to syringe*



*Aim slightly upwards and towards the ear on the same side as the nostril*

[Home](#)**Authorisation to practice**

Nebulisation



Nebulisation converts a drug in a solution into an aerosol mist by passing a pressurised gas through it. The drug is then inhaled directly into the lungs.

Nebulisation is a highly effective method of delivering certain drugs directly into the lungs, for local and systemic action.

**Indications**

- Bronchospasm (e.g. asthma, COPD, allergy)
- Isolated laryngeal oedema
- Croup with stridor at rest
- Hyperkalaemia

**Contraindications**

- Nil in this setting

**Precautions**

- Nil in this setting

**Procedure**

- Posture patient appropriately.
- Explain the procedure to the patient and gain consent.
- Place the appropriate drug in its correct presentation into the nebuliser chamber, which must be kept upright.
- Attach the oxygen hosing to the base of the nebuliser and to the oxygen source.
- Place nebuliser face mask onto the patient and set the oxygen flow rate at 6 – 8 litres per minute. \* (6 litres per minute for COPD).
- Nebulise the drug until vapour stops.
- Continue with intermittent or continuous nebulisation as required.

[Home](#)**Authorisation to practice**

Oral disintegrating tablet (ODT)

**Indications**

- Administration of Ondansetron

**Contraindications**

- Nil in this setting

**Precautions**

- Nil in this setting

**Procedure for Orally Disintegrating Tablets (ODT)**

- Explain the procedure to the patient and gain consent.
- With dry hands, peel back the foil backing of 1 blister and gently remove the tablet.
- Confirm the dose required, if necessary break the tablet in half or one quarter as required.
- Immediately place the ODT on top of the tongue where it will dissolve in seconds, then swallow with saliva.
- Administration with liquid is not necessary.

[Home](#)**Authorisation to practice**

Oral drug administration



Drugs are given orally because of convenience, absorption of the drug, and ease of administration.

**Indications**

- For the administration of oral medications

**Contraindications**

- Impaired conscious state, or swallowing ability

**Complications**

- Aspiration and airway compromise

**Procedure**

- Place patient in sitting position.
- Explain the procedure to the patient and gain consent.
- Provide an adequate volume of water with tablets.
- Monitor patient until all medications are swallowed. If tablets are dissolvable/.dispersible, ensure the whole volume of solution is taken.

[Home](#)

## Authorisation to practice

### Sublingual drug administration



Sublingual (SL) medications are delivered under the tongue and absorbed through the mucous membranes of the mouth.

Sublingual drug administration allows the drug to be directly absorbed into the systemic circulation, hence avoiding a rapid decrease in its bioavailability that can be caused by the first pass effect.

## Indications



- Delivery of GTN



## Contraindications

- Specific to GTN (see *GTN DTP*)



## Complications

- Specific to GTN (see *GTN DTP*)

## Procedure

- Explain the procedure to the patient.
- Have the patient open their mouth and raise the tip of their tongue to the roof of their mouth.
- Place the tablet under the patient's tongue.  
Care must be taken to avoid the risk of any cross infection.

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## o6 - Obstetrics

o1 - [Bimanual compression](#)

o2 - [Breech birth](#)

o3 - [Cephalic delivery](#)

o4 - [Shoulder dystocia](#)

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## Authorisation to practice

Bimanual compression

ICP

Bimanual compression is used only in cases of torrential primary postpartum haemorrhage (PPH), as a last resort when all else has failed to save the mother's life. Primary PPH occurs within 24 hours of delivery and constitutes bleeding from or into the genital tract of greater than 500 millilitres, or sufficient to cause deterioration of the mother's condition.

## Indications



- Significant bleeding from the vagina
- Enlarged soft uterus upon abdominal palpation
- Tachycardia
- Restlessness
- Profound hypotension



## Contraindications

- Nil in this setting



## Complications

- Trauma
- Pain

## Procedure

## Management

- Urgent transport to definitive care.
- Make a thorough physiological assessment, including an estimate of blood loss.
- If trauma is suspected, try to locate the source of the bleeding and apply pressure to the traumatised area externally with a sterile dressing.
- If bleeding is secondary to uterine hypotonicity or retained products of conception, massage the uterus in a circular motion with a cupped hand over the fundus to stimulate uterine contraction. This will assist to expel blood and blood clots. Blood clots trapped in the uterus will inhibit effective uterine contractions.
- Encourage the woman to empty her bladder, as uterine contractions are inhibited when the urinary bladder is full.
- If possible, encourage neonate to suckle.
- Consider appropriate fluid resuscitation.
- Consider medical retrieval for blood products and oxytocic drugs.

## In the case of torrential/uncontrollable haemorrhage

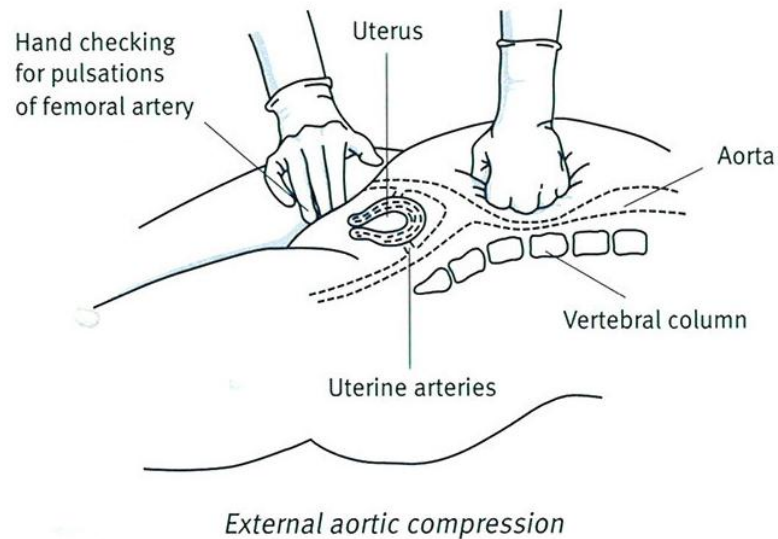
The following methods should be attempted in ascending order.

1) *External aortic compression*

This is an effective treatment for severe PPH and should be attempted before bimanual compression as it is less invasive. It also has the advantage of being quicker to apply, with no aseptic precautions to consider and no requirement for medical consultation.



### Procedure (continued)



The procedure is carried out as follows:

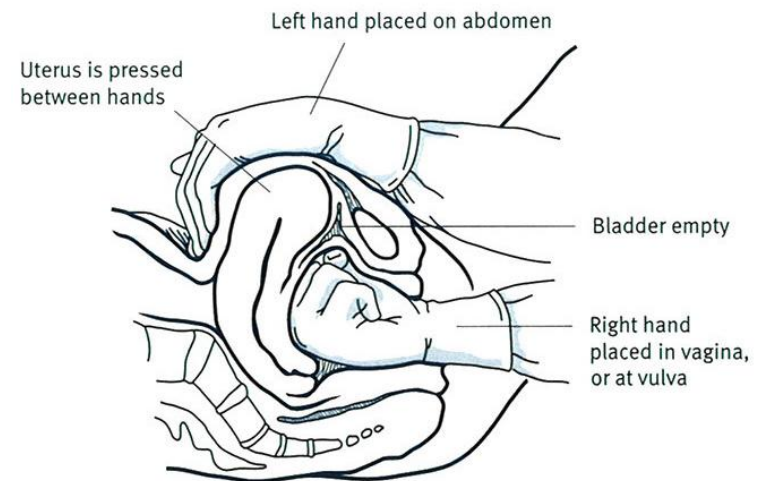
- Downward pressure is applied through the abdominal wall with a closed fist placed over the abdominal aorta; the point of compression is just above the umbilicus and slightly to the patient's left. Aortic pulsations can often be felt easily through the abdominal wall in the immediate postpartum period.
- With the other hand, palpate the femoral pulse to check the adequacy of the compression. If the femoral pulse is palpable during compression, it is not effective. Check the position of the fist and exert more pressure until the femoral pulse is no longer palpable.
- Maintain compression until bleeding is controlled.

### Procedure (continued)

#### 2) Bimanual compression

This procedure is difficult, extremely painful and must **only be performed after medical consultation**.

- Wash and scrub hands.
- Wear sterile gloves if available.
- Insert a gloved lubricated hand into the vagina and form a fist in the anterior vaginal fornix.
- Apply pressure against the anterior wall of the uterus.
- At the same time, the other hand is pushed deeply into the abdomen behind the fundus of the uterus and pressure is applied against the posterior wall of the uterus.
- Maintain compression until bleeding is controlled and the uterus contracts.



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## Authorisation to practice

Breech birth

Para  
ICP

A breech birth is the delivery of a baby from a breech presentation, where the foetus enters the birth canal with the buttocks or feet first, as opposed to the normal head first presentation.

The main categories of breech births include:

- *Frank breech* – the foetus's bottom comes first, with the legs flexed at the hip and extended at the knees, placing the feet near the ears. Most breech babies, (65 – 79 %) are in the Frank breech position.
- *Complete breech* – here the hips and knees are flexed so that the foetus is sitting cross-legged, with feet beside the bottom.
- *Footling breech* – one or both feet come first, with the bottom at a higher position. This is rare at term, but relatively common with premature babies.
- *Kneeling breech* – the foetus is in a kneeling position, with one or both legs extended at the hips and flexed at the knees. This is extremely rare and often grouped with footling to form the category 'incomplete breech'.



Complete breech



Frank breech



Footling breech



Kneeling breech

## Indications



- To assist a labouring woman in the delivery of her child when the child presents in a breech position



## Contraindications

- Nil in this setting



## Complications

- Failure to deliver
- Pain
- Prolapsed cord
- Shoulder dystocia (refer CPP)
- Head entrapment
- Meconium aspiration
- Post-partum haemorrhage (refer CPG)
- Inversion of the uterus (refer CPG)
- Complications of breech delivery can lead to foetal distress and hypoxia potentiating a compromised neonate
- Preparation for neonate resuscitation should be made at the earliest sign of breech presentation
- Consideration should be sought to early ICP/obstetric retrieval team backup
- Ensure an aseptic technique with appropriate infection control measures to be taken at all times

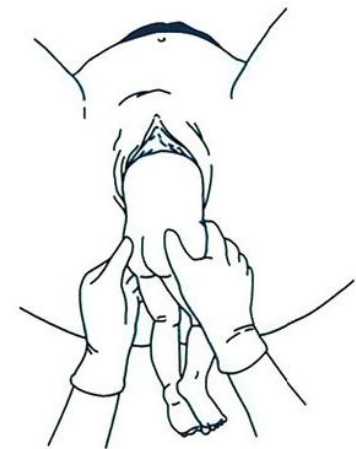
## Procedure

*The following procedure has been adapted from guidelines provided by the World Health Organisation.*

**Note:** Perform all manoeuvres gently and without undue force.

### Delivery of the buttocks and legs.

- Once the buttocks have entered the vagina and the cervix is fully dilated, tell the woman she can push with the contractions.
- Let the buttocks deliver until the lower back and then the shoulder blades are seen.
- Gently hold the buttocks in one hand, but do not pull.
- If the legs do not deliver spontaneously, deliver one leg at a time:
  - push behind the knee to bend the leg;
  - grasp the ankle and delivery the foot and leg;
  - repeat for the other leg.
- Hold the baby by the hips, as shown here. Do not hold the baby by the flanks or abdomen as this may cause kidney or liver damage.



### Procedure (continued)

#### Delivery of the arms

*Arms are felt on chest*

- Allow the arms to disengage spontaneously one by one. Only assist if necessary.
- After delivery of the first arm, lift the buttocks towards the mother's abdomen to enable the second arm to deliver.
- If an arm does not spontaneously deliver, place one or two fingers in the elbow and bend the arm, bringing the hand down over the baby's face.



Unassisted  
(arms disengage  
spontaneously)



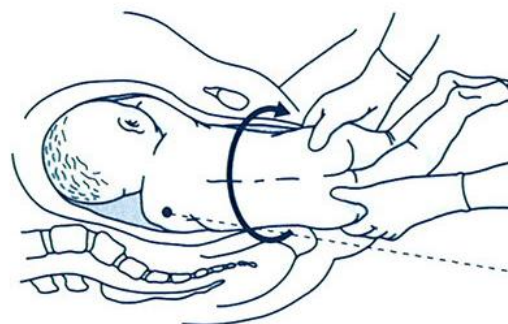
Assisted (bend arm to  
bring hand over face)

### Procedure (continued)

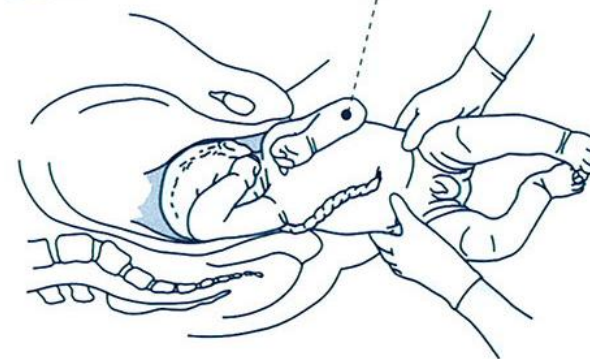
*Arms stretch above the head or folded around the neck.*

*Use the Loveset's manoeuvre.*

- Hold the baby by the hips and turn half a circle, keeping the back uppermost and applying downward traction at the same time, so that the arm that was posterior becomes anterior and can be delivered under the pubic arch.

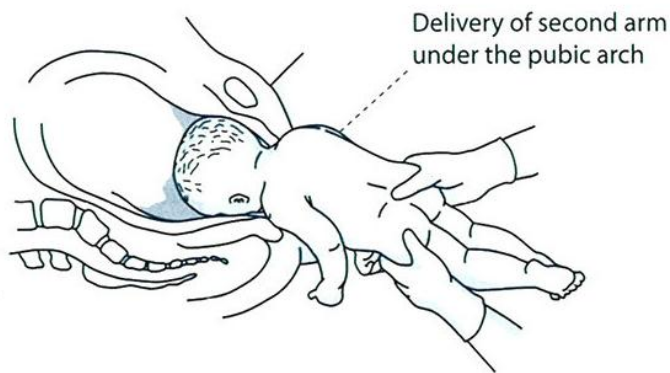
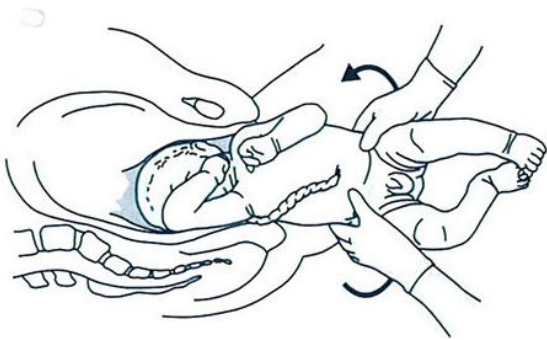


The arm that  
was posterior  
becomes anterior



### Procedure (continued)

- Assist delivery of the arm by placing one or two fingers on the upper part of the arm. Draw the arm down over the chest as the elbow is flexed, with the hand sweeping over the face.
- To deliver the second arm, turn the baby back half a circle, keeping the back uppermost and applying downward traction, delivering the second arm in the same way under the pubic arch.



### Procedure (continued)

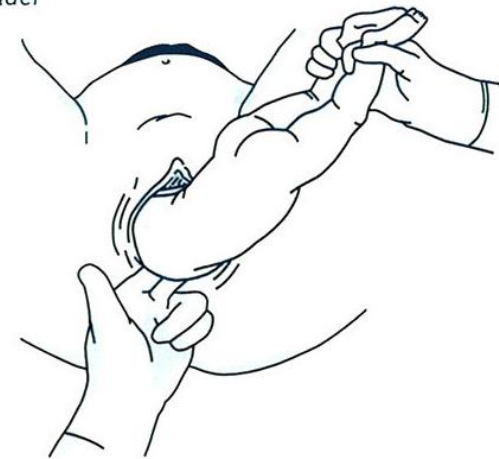
#### Baby's body cannot be turned

- If the baby's body cannot be turned to deliver the arm that is anterior first, deliver the shoulder that is posterior.
- Hold and lift the baby up by the ankles.
- Move the baby's chest towards the woman's inner leg. The shoulder that is posterior should deliver.

**Note:** This procedure is different to the Burn's Marshall Manoeuvre and once the shoulder is delivered the MSV Manoeuvre is then undertaken.

- Free the arm and hand.
- Lay the baby back down by the ankles. The shoulder that is anterior should now deliver.
- Free the arm and hand.

*Delivery of a shoulder that is posterior*





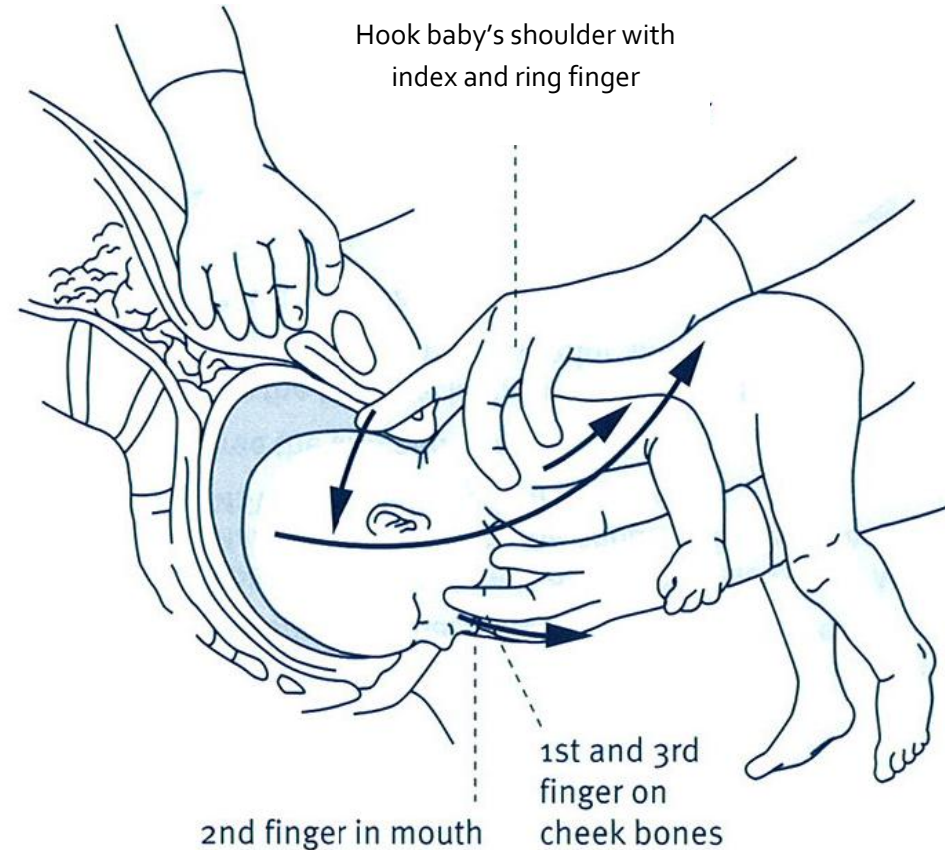
**Procedure (continued)****Delivery of the head**

*Deliver the head by the Mauriceau-Smellie-Veit (MSV) manoeuvre as follows:*

- Lay the baby face down with the length of its body over your hand and arm.
- Place the first and third fingers of this hand on the baby's cheek bones and place the second finger in the baby's mouth or chin to pull the jaw down and flex the head.
- Use the other hand to hook the baby's shoulders with the index and ring fingers.
- With the middle finger of the hand, gently flex the baby's head towards the chest while pulling on the jaw to bring the baby's head down until the hairline is visible.
- Pull gently to deliver the head.

**Note:** Ask an assistant to push above the mother's pubic bone as the head delivers. This helps to keep the baby's head flexed.

- Raise the baby, still astride the arm, until the mouth and nose are free.
- Deliver the baby onto the mother's abdomen for skin to skin contact.

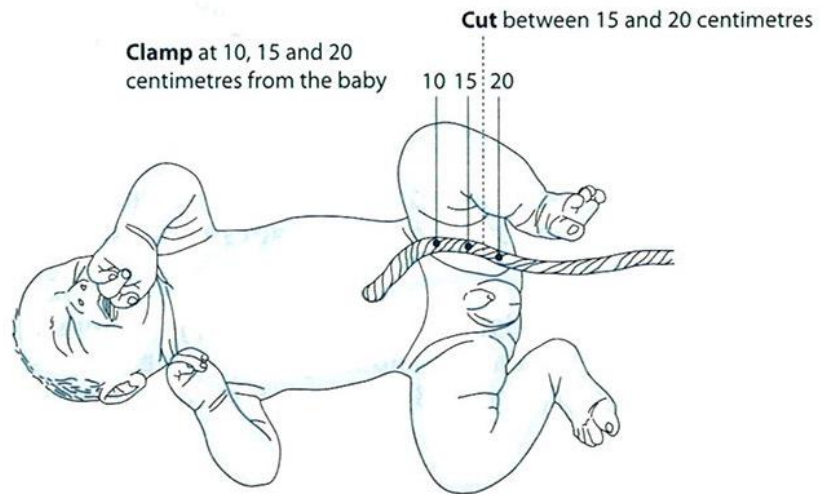


## Procedure *(continued)*

### Post-delivery care

- Suction the baby's mouth and nose, if meconium is present.
- Clamp and cut the cord.
- See the CPG normal cephalic delivery for care of the newborn.

### *Clamping and cutting of the cord*



[Home](#)**Authorisation to practice**

Cephalic delivery



Birth or parturition is a critical stage in foetal development, representing a transition from direct maternal support to establishment of the newborn's own respiratory, circulatory and digestive systems.

Labour is defined as the process by which the foetus, placenta and membranes are expelled via the birth canal. In normal labour:

- the foetus presents by the vertex;
- the occiput rotates anteriorly;
- the result is the birth of a living, mature foetus (28 – 42 weeks) with no complications.

**Indications**

- To assist a labouring woman in the delivery of her child

**Contraindications**

- Breech delivery
- Mother not in labour or delivery not imminent
- Normal transport to hospital a viable option

**Complications**

- Pain
- Malpresentation
- Cephalopelvic disproportion (CPD)
- Shoulder dystocia
- Infection
- Postpartum haemorrhage
- Prolapsed cord
- Inversion of the uterus



## Procedure

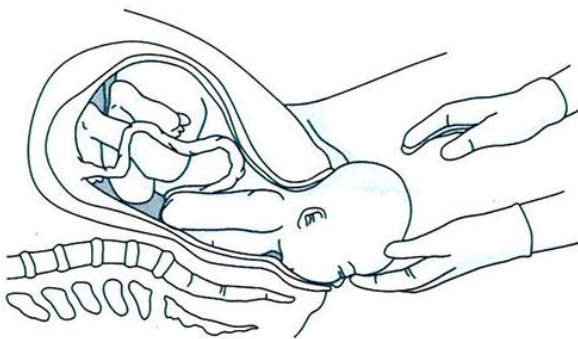
*The following procedure has been adapted from guidelines provided by the World Health Organisation.*

### Initial management

- Assess the mother and foetus and provide basic cares, including adequate history taking.
- Listen to the foetal heart rate immediately after a contraction:
  - if there are foetal heart rate abnormalities (less than 100 or more than 180 beats per minute), suspect nonreassuring foetal status.
- If the membranes have ruptured, note the colour of the draining amniotic fluid.
- Ensure adequate maternal and foetal oxygenation.
- Once the cervix is fully dilated, allow the women to assume the position she prefers and encourage her to push.

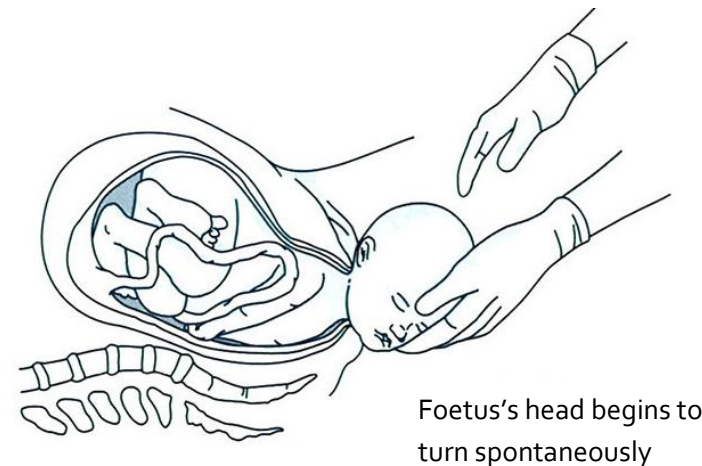
### Delivery of the Head

- Ask the women to pant or give only small pushes with contractions as the foetus's head delivers.



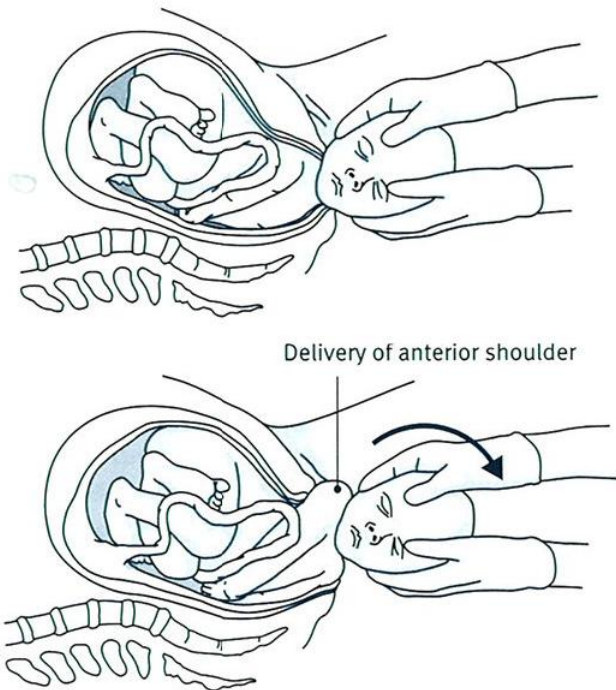
## Procedure (continued)

- To control birth of the head, place the fingers of one hand against the foetus's head to keep it flexed (bent).
- Continue to gently support the perineum as the baby's head delivers.
- Once the foetus's head delivers, ask the women not to push.
- If there is meconium present, attempt to suction the baby's mouth then nose.
- Feel around the foetus's neck for the umbilical cord:
  - if the cord is around the neck but loose, slip it over the foetus's head;
  - if the cord is tight around the neck, apply two cord clamps and carefully cut between them before unwinding the cord from around the neck.



## Procedure

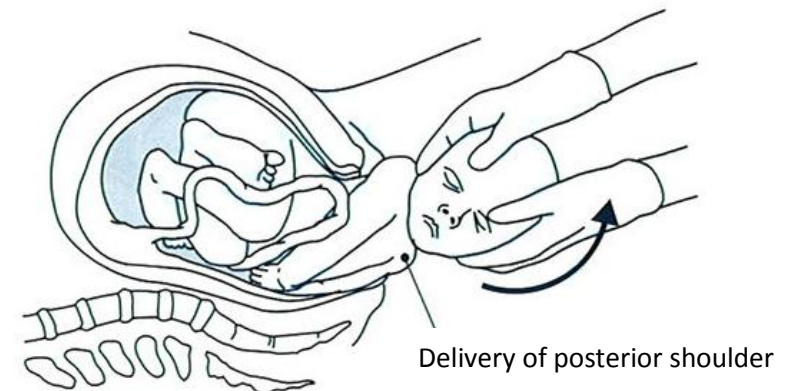
- Allow the foetus's head to turn spontaneously.
- After the head turns, place a hand on each side of the foetus's head. Ask the mother to push gently with the next contraction.



- Move the foetus's head posteriorly to deliver the shoulder that is anterior.

## Procedure (continued)

**Note:** If there is difficulty delivering the shoulders, see shoulder dystocia CPP.



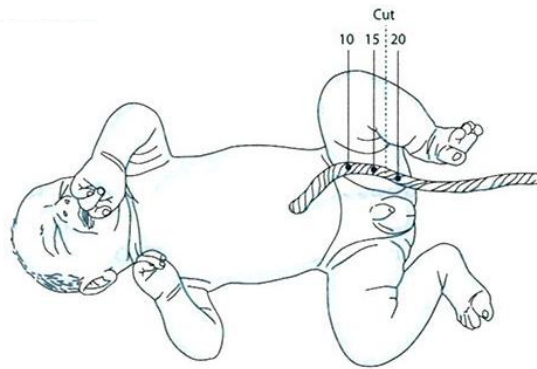
- Lift the foetus's head anteriorly to deliver the shoulder that is posterior.
- Support the rest of the foetus's body with one hand as it slides out.

## Procedure

- The fundus should be massaged through the woman's abdomen until the uterus is contracted. Repeat uterine massage every 15 minutes for the first two hours.

### Care of the Newborn

- Place the baby on the mother's abdomen, providing skin to skin contact. Thoroughly dry the baby, wipe the eyes and assess the baby's breathing.
- If the baby is crying or breathing (chest rising at least 30 times per minute) leave the baby with the mother.
- If the baby does not start breathing within 30 seconds, take steps to resuscitate the baby.
- Complete an APGAR score on the baby at 1 and 5 minutes after birth.



- Clamp cord at 10, 15 and 20 centimetres from the baby and cut between 15 and 20 centimetres.
- Manage delivery of the placenta and membranes if necessary.
- Ensure the baby is kept warm en route to the receiving facility. Maintain skin to skin contact with the mother and cover the baby's head and back with a warm blanket.

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## Authorisation to practice

Shoulder dystocia

ICP

Shoulder dystocia occurs when the anterior shoulder of the foetus becomes impacted behind the symphysis pubis of the mother, which prevents delivery, either spontaneously or with gentle traction.

This is a time-critical emergency because the pH of the umbilical artery drops rapidly between delivery of the head and initiation of breathing. The aim should be to resolve the situation within four minutes as asphyxia injury is likely when the dystocia lasts for more than six minutes.

If management is not accomplished correctly, the mother may suffer PPH and there may be birth trauma to the infant, including brachial plexus injury and fractures to either humerus or clavicles.

## Indications



- The anterior shoulder does not deliver spontaneously with good contractions
- The head does not restitute and externally rotate
- The chin burrows into the perineum as the anterior shoulder is caught on the symphysis pubis



## Contraindications

- Nil



## Complications

- Damage to the upper brachial plexus nerves
- Foetal hypoxia
- Foetal death
- Cerebral palsy
- Maternal postpartum haemorrhage

## Procedure

The goal of management is to facilitate delivery of the anterior shoulder, which should follow the shoulder dystocia CPG. However, the individual techniques are described here in their order of priority:

### External interventions:

#### *Exaggerated manoeuvre for delivery:*

If possible, move the mother so her buttocks are at the edge of the bed and apply moderate downward traction to the foetal head, aiming to release the anterior shoulder.

#### *McRoberts manoeuvre:*

With the woman on her back, ask her to flex both thighs, bringing her knees as far up as possible towards her chest, assisting her to achieve this position, if necessary. Again apply moderate downward traction to the foetal head.

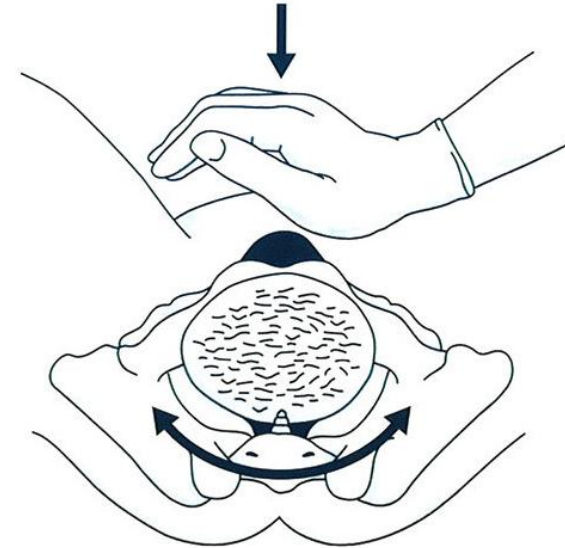


## Procedure (continued)

### *Rubin I (suprapubic pressure)*

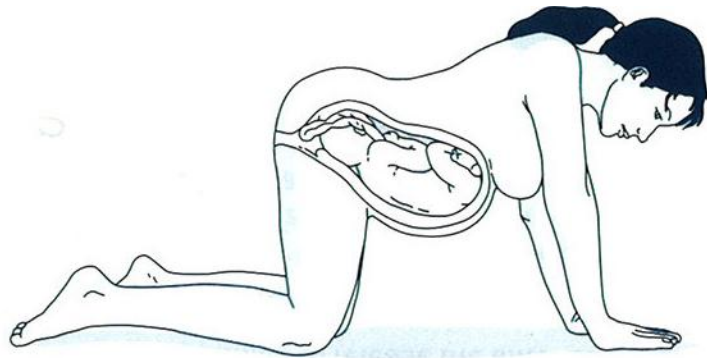
While continuing to apply moderate downward traction, and with the mother still in the McRoberts position, have another person apply downward pressure just superior to the pubic bone, either continuously or in a rocking motion for 30 – 60 seconds. This is aimed at rotating the foetus so the anterior shoulder slips under the symphysis pubis and, accordingly, the pressure should be directed somewhat obliquely to the anterior scapula. It is therefore important to know the direction the foetus is facing and crucial not to apply fundal pressure, as the latter can cause uterine rupture.

Apply downward pressure just superior to the pubic bone in a continuous or rocking motion



**Procedure (continued)***All-fours (Gaskin) manoeuvre:*

This involves getting the mother on her hands and knees, which may help to increase the pelvic outlet diameter. There are associated difficulties with this technique, especially with exhausted or obese patients, or birthing in a restricted space, and the time to attain the position must be taken into consideration.

**Internal interventions:**

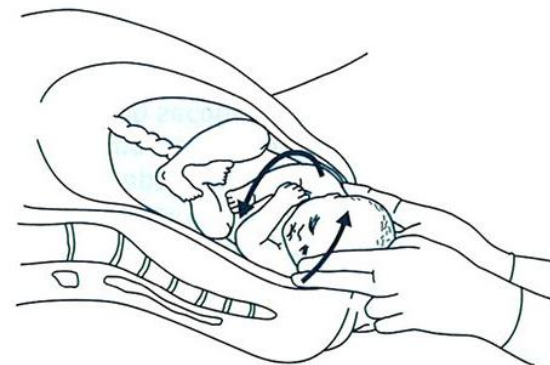
Within the limited time available, paramedics should exhaust external options before attempting to internally manipulate the foetus.

*Rubin II manoeuvre*

While suprapubic pressure is being applied (Rubin I) the fingers of one hand are inserted into the vagina and used to apply pressure behind the anterior shoulder, pushing the shoulder towards the foetal chest.

**Procedure (continued)***Woods screw manoeuvre*

If the Rubin II manoeuvre fails to deliver the foetus, the fingers of the first hand remain in position, while the fingers of the second hand are inserted in front of the posterior shoulder and used to add further pressure to rotate the foetal shoulders.





### Procedure (continued)

#### *Reverse Woods Screw Manoeuvre*

Again, failure of the previous technique requires this attempt to turn the foetus 180° in the opposite direction, applying pressure to the back of the posterior shoulder.



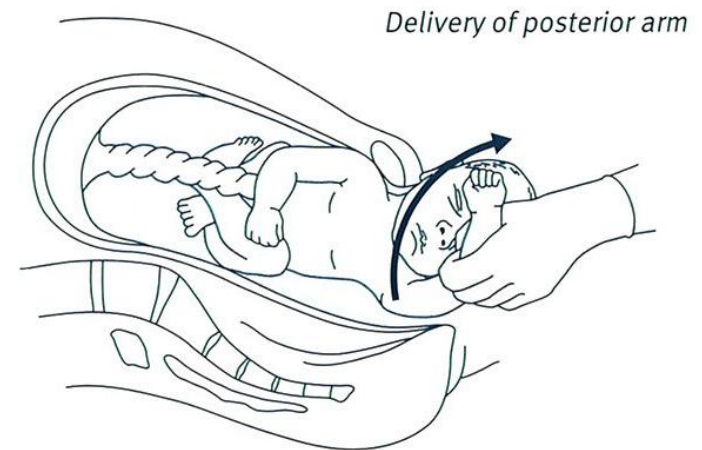
#### *Delivery of the posterior arm*

The elbow of the posterior arm is located and flexed, sweeping the arm across the foetal chest and out of the vagina to lie beside the head. This often allows the anterior shoulder to be displaced and delivered.

The infant should be observed closely post-partum for cerebral and neurologic damage. The mother should be observed for potential uterine atony, shock or PPH.

**If all these measures fail, transport code 1 to the nearest suitable facility and request urgent assistance en route.**

### Procedure (continued)



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## 07 - Respiratory

- 01 - [Bag valve mask \(BVM\) ventilation](#)
- 02 - [Controlled mechanical ventilation \(CMV\)](#)
- 03 - [Continuous Positive Airway Pressure \(CPAP\)](#)
- 04 - [Positive End Expiratory Pressure](#)
- 05 - [Tension pneumothorax decompression](#)

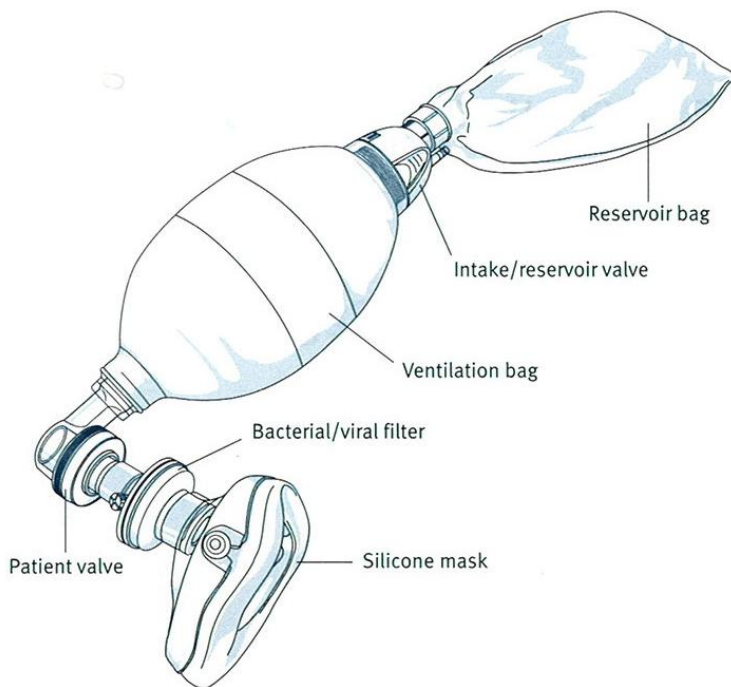
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### Authorisation to practice

Bag valve mask ventilation



The ability to oxygenate and ventilate the critically ill patient with bag valve mask (BVM) ventilation is a life-saving skill. This is also called intermittent positive pressure ventilation (IPPV).



### Indications



- Acute respiratory distress or arrest requiring assistance to reach adequate ventilation

### Contraindications



- Adequate oxygenation and ventilation

### Complications



- Apprehension/anxiety in the conscious patient
- Gastric inflation
- Barotrauma
- Undesirable cardiovascular effects such as hypotension

## Procedure

- Determine the need for IPPV.
- If patient is conscious, reassure them and explain what is happening. Remember that resistance or combativeness may be due to hypoxia.
- Continuously ensure the patient has a patent airway, apply basic airway management procedures and progress to advanced airway techniques when appropriate.
- Position of the patient is important to performing the procedure effectively.
- Test that the resuscitator functions properly:
  - With no fresh gas flowing into the self-expanding squeeze bag and with patient port (mask) completely occluded, compress the squeeze bag and feel for resistance, checking for leaks.
  - With the patient port open, compress the squeeze bag and visually inspect for opening of patient valve.
- If PEEP is required connect the PEEP valve firmly to the expiratory flow diverter (refer to CPP PEEP).
- Using the BVM with reservoir bag attached apply supplemental oxygen to the inlet port and ensure the reservoir bag inflates fully.
- Create an effective seal between the cuffed mask and the face.
- Gently compress the squeeze bag to deliver a breath and observe the chest rise to confirm inspiration.

- Gauge the effort required to ventilate through the feel of the recoil bag and rise and fall of the chest.
- Release the pressure on the squeeze bag to allow passive exhalation and re-expansion of the bag.
- During ventilation, check for:
  - signs of cyanosis
  - adequacy of ventilation
  - airway pressure
  - correct functioning of all valves and tubing
  - continuous supply of oxygen to the resuscitator and inflation of the reservoir bag
- The recoil bag should be squeezed to a volume corresponding to an estimated tidal volume of the patient.
- The volumes of BVM resuscitator kits are approximately:
  - adult: 1600 mL
  - child: 500 mL
  - infant: 240 mL

## Additional information

- Use extreme caution if ventilating asthmatics or neonates.
- Creating an effective seal between the mask and face is a skill requiring practice and revision to ensure competency.

### Caution:

The pressure release valve plug is to be unlocked/open for normal BVM ventilation.

[Home](#)**Authorisation to practice**

Controlled mechanical ventilation

ICP

Controlled mechanical ventilation (CMV) describes a process whereby a ventilator is used to provide positive pressure ventilation.

**Indications**

- To facilitate ventilation in intubated patients

**Contraindications**

- Nil in this setting

**Complications**

- Barotrauma
- Tension pneumothorax
- Decreased cardiac output

**Procedure****Patient preparation**

- Confirm ETT placement and ensure adequate security and cuff inflation.
- Ensure the patient has an appropriately inserted and functioning:
  - oro/nasogastric tube with drainage bag;
  - indwelling catheter with drainage bag;
  - two separate intravenous access sites.

**CMV procedure**

- Connect ventilator to an oxygen supply at the patient's bedside and ensure oxygen supply is sufficient.
- Attach disposable ventilator circuit to the ventilator ensuring all connections are secure.
- Set the required ventilator settings (tidal volume, rate, peak airway pressure, PEEP and I:E ratio).
- Recheck all ventilator settings.
- Turn the ventilator on and confirm ventilation.
- Connect ETT to the ventilator.
- Confirm adequate patient ventilation:
  - EtCO<sub>2</sub> capnometry and capnography;
  - SpO<sub>2</sub> (>95%);
  - appropriate airway pressures.

### Procedure (continued)

- Regularly reassess the patient and adjust ventilator settings according to patient requirement and physiological response.
- Administer paralysis and sedation as required.
- Airway pressures should be maintained  $< 40 \text{ cm H}_2\text{O}$  to prevent barotraumas.
- Consider adjusting PEEP if hypoxaemia persists despite  $\text{FiO}_2$  100%.
- If hypotension develops, adjust the respiration rate and PEEP to lower mean airway pressure.

SETTING	SUGGESTED PARAMETER
$\text{FiO}_2$	0.6 – 1.0
<i>Tidal volume</i>	Normally 6 – 8 mL/kg but may vary depending on presenting physiology. In severe airflow limitation (e.g. asthma, acute bronchitis) smaller tidal volumes may be required to allow for prolonged expiration.
<i>Rate</i>	Usually set in accordance with tidal volume to provide a minute volume of 85 – 100 mL/kg/min
<i>Airway pressure</i>	$\leq 40 \text{ cm H}_2\text{O}$
<i>PEEP</i>	5 cm H <sub>2</sub> O

### Additional information

#### Transfer Requirements

- During transfer, the following equipment must be readily available:
  - bag valve mask;
  - emergency airway equipment;
  - suction and assorted catheters;
  - emergency chest decompression equipment.
- During aeromedical transfers, cuff pressures should be monitored at 'top of climb' and after descent.

#### After use care

- After each operational use of the ventilator, dismantle and discard the patient circuit directly into a hospital contaminated waste bin.
- The ventilator and compressed gas hose must also be cleaned if soiled.

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## Authorisation to practice

Continuous positive airway pressure

Para

ICP

Continuous positive airway pressure (CPAP) is the maintenance of 5-10 cm H<sub>2</sub>O pressure during inspiration and exhalation, in the spontaneously breathing patient.

## Indications



- Congestive Heart Failure
- Hypoxic respiratory failure
- COPD



## Contraindications

- Respiratory arrest
- Agonal respirations
- Unconscious
- Shock associated with cardiac insufficiency
- Pneumothorax
- Facial anomalies e.g. burns, fractures, etc

## Complications



- Decreased L.O.C.
- Hypotension
- Claustrophobia
- Patient Intolerance to equipment (e.g. mask)
- Risk of barotrauma

## Procedure

### Preparation of equipment

- Comprises of the following;
  - Intake port
  - Oxygen tubing
  - CPAP mask (size 5,4,3)
  - Head strap
- Ensure the face mask is of the appropriate size for the patient
- Confirm the mask is inflated, able to provide a good seal
- Adjust the oxygen flow to the required PEEP(see table below)
- Confirm sufficient oxygen supply

The setting selections noted on the device provide an accurate constant airway pressure at each flow setting:

Flow rate (L/min)	8	10	12	15	20	25
Pressure (cmH <sub>2</sub> O)	5	8	10	16	18	20

Monitor the flow of oxygen, NOT to exceed 12 L/min and/or 10 cm H<sub>2</sub>O under any circumstances

## CPAP procedure

- Has the patient had CPAP before?

**Yes** – The patient is comfortable with the procedure and knows what to expect.

**No** - Reassurance of the patient is essential, with a full explanation of what to expect.

- Once all connected and oxygen flow is on, avoid the head strap initially until the patient is comfortable with the flow/pressure
  - Inform the patient what to expect
  - Apply mask to mouth and nose slowly
  - Rush of air in the patients face/eyes/nose
  - Loud noise
  - May be uncomfortable at first, hence reassurance required
  - Attach the head strap ensuring no leaks
- Confirm adequate patient ventilation:
  - **Attach EtCO<sub>2</sub>** capnometry and capnography;
  - Improved vital signs with ↑ perfusion
  - SpO<sub>2</sub> (>95%)
  - Appropriate airway pressure.
- Paramedics can only use CPAP up to a maximum flow of 8 L/min giving a maximum pressure of 5 cmH<sub>2</sub>O where indicated.
- ICPs' may consider CPAP up to a maximum flow of 12 L/min giving a maximum pressure of 10 cmH<sub>2</sub>O where indicated.

## Additional information

### Physiological benefits of CPAP

- Airway pressure maintained at a set level throughout inspiration and expiration
- Maintains patency of small airways and alveoli
- Improves gas exchange
- Improves delivery of bronchodilators
- Moves extracellular fluid into vasculature
- Reduces work of breathing



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## Authorisation to practice

## Positive end expiratory pressure

ICP

Positive end expiratory pressure (PEEP) is the application of a fixed pressure at the end of expiration. PEEP raises the functional residual capacity above the level at which alveolar closure occurs.

The goal of PEEP is to:

- minimise alveolar collapse and improve oxygenation
- reduce gas trapping (increase compliance)
- decrease the workload of breathing
- maintain ventilation/perfusion (V/Q) matching.

## Indications

- Non-cardiogenic pulmonary oedema
- Cardiogenic pulmonary oedema
- High physiological shunts: asthma and COPD patients with  $O_2$  saturations  $< 90\%$  on  $FiO_2 > 65\%$  and refractory to normal treatment.

**Note:**

*PEEP for asthma must follow high flow  $O_2$  and  $\beta_2$  agonists.*

- Profound hypoxaemia  
(flail segment, pulmonary contusion, aspiration, haemorrhage)



## Contraindications

PEEP is contraindicated in the patient with a systolic blood pressure  $< 100$  mmHg

Relative contraindications include:

- pneumothorax
- uni-lateral lung disease
- broncho-pleural fistula
- hypovolaemia



## Complications

- Caution should be used in asthma and those with obstructive lung disease due to increased risk of air trapping and causing a pneumothorax
- Hypotension



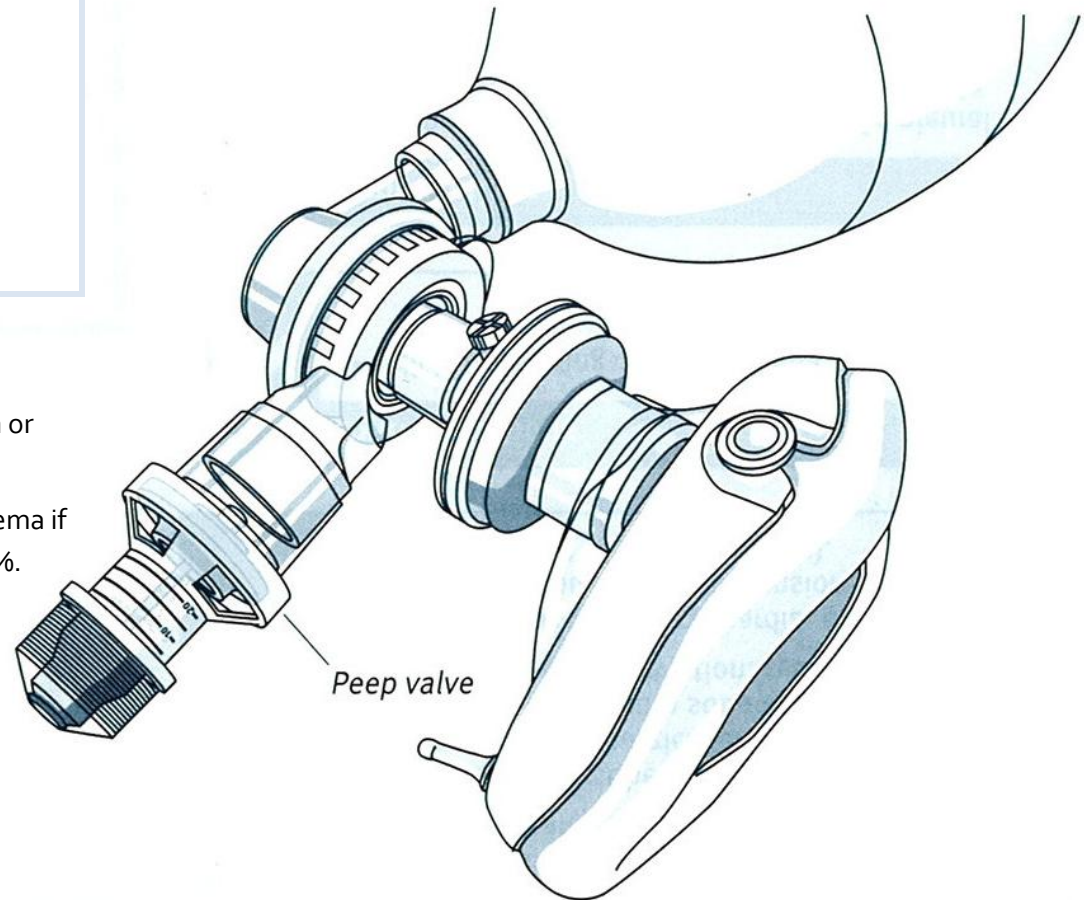
## Procedure

### PEEP valve assembly and use

- Patients should receive high flow oxygen before initiation of PEEP via non-rebreather mask or bag valve mask.
- Attach the PEEP valve onto the expiratory flow diverter.
- Attach the filter to the mask port.
- Adjust the PEEP valve to 5 cm H<sub>2</sub>O.
- Continuously monitor SpO<sub>2</sub>, BP, EtCO<sub>2</sub> and other vital signs.

### Additional information

- Do not increase PEEP above 5 cm H<sub>2</sub>O in patients with asthma or obstructive lung disease.
- PEEP may be increased to 10 cm H<sub>2</sub>O in acute pulmonary oedema if after 10 minutes oxygen saturations do not increase above 90%.



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## Authorisation to practice

## Tension pneumothorax decompression

ICP

Tension pneumothorax is a life-threatening condition characterised by an accumulation of air under pressure in the pleural space. This develops when injured tissues form a one-way valve, allowing air into the pleural space but prohibiting any outflow, collapsing the lung and causing hypoxia as well as obstructive shock.

## Indications



- Suspected tension pneumothorax with respiratory and/or haemodynamic compromise
  - **Respiratory:** Chest pain, dyspnoea, tachypnoea, surgical emphysema, diminished breath sounds on the affected side, tracheal deviation, cyanosis
  - **Cardiovascular:** Tachycardia, decreased level of consciousness, hypotension, JVD (may not be present with hypotension)



## Contraindications

- Nil in the setting of acute trauma



## Complications

- Improper diagnosis and insertion of a pleural catheter may lead to the creation of a simple or tension pneumothorax
- Incorrect placement may result in life-threatening injury to the heart, great vessels, or damage to the lung
- Bilateral pleural decompression in the spontaneously breathing patient may result in significant respiratory compromise

## Procedure

### Procedure for tension pneumothorax decompression with a 14G needle:

- locate the second intercostal space in the midclavicular line;
- swab site with an alcohol swab;
- insert a 14G IV cannula, perpendicular to the chest along the superior border of the third rib until a sudden loss of resistance is felt (see diagram);
- remove the stylet and advance the cannula fully into the pleural cavity until the hub is flush with the skin;
- re-evaluate breath sounds and haemodynamic status.

### Procedure for tension pneumothorax decompression with a COOK® emergency pneumothorax set:

- connect the syringe to the needle-catheter device;
- locate the second intercostal space in the midclavicular line;
- swab site with an alcohol swab;
- insert the catheter introducer/needle, perpendicular to the chest along the superior border of the third rib (see diagram). As one hand advances the device through the skin, subcutaneous tissue, muscle and parietal pleura, the second hand gently puts suction on the syringe;
- once air is freely aspirated into the syringe, the needle should not be advanced any further. While the first hand stabilises the needle and syringe, the second hand slowly advances the catheter into the pleural space. If any resistance is encountered the catheter should not be forced;

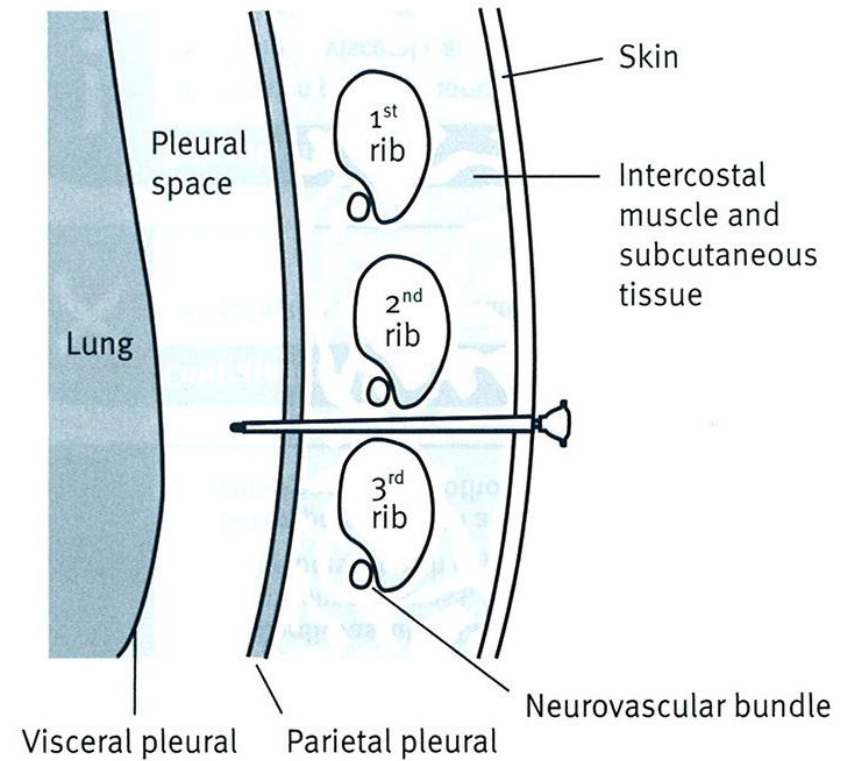
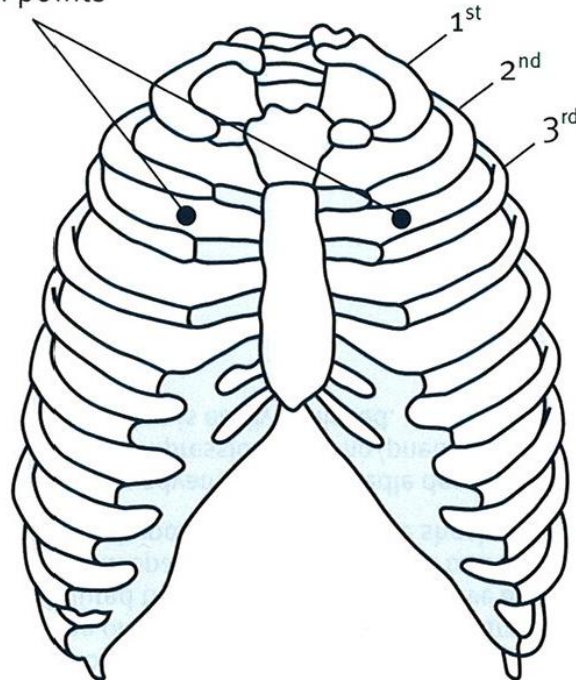
## Procedure *(continued)*

- once the catheter is inserted into the pleural space, the needle and syringe are to be withdrawn, leaving the catheter in place;
- fit the plastic skin flange around the catheter and secure using the self-locking tie;
- secure the flange to the skin;
- attach the connection tubing and the Heimlich valve to the catheter (*flow direction indicated by an arrow*);
- secure the Heimlich valve to the skin;
- re-evaluate breath sounds with haemodynamic status.

## Additional information

- Never remove a catheter once in place. Additional catheters may be required in extreme circumstances.
- Frequently check for redevelopment of a tension pneumothorax, especially if the patient is receiving positive pressure ventilation

Insertion points





## o8 - Resuscitation

01 - [Cardiopulmonary resuscitation \(CPR\)](#)

02 - [Defibrillation](#)

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Cardiopulmonary resuscitation



The purpose of cardiopulmonary resuscitation (CPR) is to provide sufficient vital organ blood flow to preserve life until definitive procedures can be performed.

The general principles of CPR are as follows:

- provide good quality compressions;
- minimise interruptions to chest compressions;
- oxygenate the lungs;
- avoid excessive ventilation.

Interruption to chest compressions results in a fall in coronary artery perfusion pressure, decreasing the likelihood of defibrillation success. Intubation attempts are not to interrupt chest compressions.

Those performing chest compressions should be rotated regularly (e.g. every two minutes).

CPR is to be restarted immediately after a defibrillation attempt, irrespective of any apparent success.

Following two minutes of CPR, or earlier if signs of responsiveness become apparent, the presenting rhythm should be checked. If the rhythm is capable of providing spontaneous output then a pulse check can be performed.

**Indications**

- Patients in cardiac arrest
- The unconscious profoundly bradycardic patient:
  - adult rate < 40, child rate < 60;
  - newborn rate < 60 despite a 30 second period of assisted ventilations

**Contraindications**

- Nil in this setting

**Precautions**

- Using the presence or absence of a pulse as the primary indicator of cardiac arrest is unreliable
- Injury to the chest may occur in some patients

## Procedure

### Adult

- Ensure patient is on a firm surface.
- Place the heel of one hand on the lower half of the sternum and the other hand on top of the first.
- Compress the sternum to one third the depth of the chest or at least five centimetres.
- Compress at a rate of 100 compressions per minute.
- Chest compressions should be performed with equal time spent in compression as in release.
- The compression to ventilation ratio is 30:2 until the placement of an advanced airway (ETT or LMA) at which time ventilation can then occur at a rate of 6 – 10 ventilations per minute with continual chest compressions. Ventilations should be timed with the release phase of compressions.

## Procedure

### Child

- Ensure patient is on a firm surface.
- *Infant (< 1yo)*: Compress using either two fingers on the sternum, or two thumbs with the fingers surrounding the thorax and supporting the back.
- *Younger child (1 – 8 yo)*: The heel of one hand is used.
- *Older child (9 – 14 yo)*: Two hand technique can be used, similar to the adult.
- Compress the sternum to one third the depth of the chest wall.
- Compression to ventilation ratio is 15:2, with five cycles in one minute. This is done until the placement of an ETT at which time ventilation can then occur at a rate of 12 – 14 ventilations per minute with continual chest compressions. Ventilations should be timed with the release phase of compressions.

## Procedure *(continued)*

### Newborn (just after birth)

- Ensure patient is on a firm surface.
- Compress over the lower sternum.
- The two thumb technique is preferred unless this impedes other procedures at which time the two finger technique is acceptable.
- Compress the sternum to one third the depth of the chest.
- The compression to ventilation ratio is 3:1. A half second pause after each third compression will allow an appropriate assisted ventilation. Co-ordination is required to ensure the assisted ventilation does not occur simultaneously with a compression.
- Although not as tiring as in the older child and adult, it is still recommended that those performing chest compressions are rotated regularly.
- CPR should be performed for at least 30 seconds, between any pause to assess for improvement in spontaneous heart rate or cardiac output.

### Additional information

- There is no evidence to suggest a compression rate of 120 per minute or above has any additional benefit.



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### Authorisation to practice

Defibrillation



Defibrillation is the definitive treatment for the life threatening cardiac dysrhythmias – ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT) – and is undertaken in parallel with advanced cardiac life support procedures.

A defibrillation shock when applied through the chest produces simultaneous depolarisation of a mass of myocardial cells and may enable resumption of organised electrical activity.

Depending on the type of defibrillator, shocks may be performed using:

- manual mode
- semi-automatic mode.



### Indications

- Ventricular fibrillation
- Pulseless ventricular tachycardia



### Contraindications

- Non shockable rhythms:
  - asystole
  - pulseless electrical activity
  - perfusing rhythms
- Patients presenting with signs of life



### Complications

- Patient injury including burns:
  - arcing between electrodes may occur if pads are incorrectly placed;
  - foreign bodies (including cardiac leads) between the pads and patient;
  - pads with insufficient lubrication
- Explosion:
  - discharge of the shock could initiate an explosion if there is a combustible gas or fluid in the vicinity
- Transmitted shock to the operator or bystanders

## Safety

### Ensure a *non-conductive* environment:

- Remove conductive items in the vicinity of the patient and/or the defibrillator.
  - wipe the chest dry of water, sweat, blood, excess gel, vomit, etc.

### Ensure a *non-explosive* environment:

- Do not defibrillate in the vicinity of petrol, LPG, or other such flammable materials.

### Ensure *no contact*:

- No person is to be in contact with the patient at time of defibrillation.
- Position electrodes correctly.
- Check for no contact and shout loudly 'All clear!' prior to defibrillation.
- Have only one operator responsible for the defibrillator.
- Ensure there is no contact between the patient and the ambulance vehicle prior to the defibrillation. (Place blankets over side arms of stretcher and pillows under the feet if necessary.)

### Ensure *no movement*:

- Rhythm analysis may be improved by stopping the ambulance where appropriate.
- Minimise patient movement.

**Note:** Authority to defibrillate in an aircraft must be obtained from the pilot prior to commencing defibrillation.

## Safety (*continued*)

### Prevent patient injury:

- Ensure pads are the correct size.
- Ensure pads are placed correctly.
- Ensure no foreign material is present between the pads and the patient (including cardiac leads or medication patches).
- Use pads within their expiry date.
- Ensure that the gel has not dried.
- Ensure good contact between the pads and the patient's skin.

### Prepare the patient:

- Expose the patient's chest.
- If required, shave, clean, and dry the area to ensure good skin contact between defibrillation pads and the skin.
- Remove monitoring electrodes if they are obstructing defibrillation pads.

### Pad placement:

- *Anterior lateral*
  - Adults, young children and large infants.
  - Right midclavicular line under the right clavicle and left anterior axillary line at the level of the 6<sup>th</sup> intercostal space.
  - In females, pad placement over the breast may increase impedance and decrease defibrillation efficiency. Place the left pad lateral to, or underneath the breast in large-breasted women.

## Procedures

- *Anterior posterior*
  - Consider for Adults, TCP and synchronised cardioversion.
  - Newborns, neonates and small infants.
  - Left parasternal region over the apex of the heart.
  - Left scapula region directly opposite anterior pad.

### Energy levels:

- As per the manufacturer's instructions.
- Adults and children nine years or over:

	Zoll	Philips MRX
<b>Shock 1</b>	200 J	200 J
<b>Shock 2</b>	200 J	200 J
<b>Shock 3</b>	200 J	200 J
<b>Subsequent shocks</b>	200 J	200 J

- Children eight years and below:
  - all shocks given at **4 J/kg**
  - round up the energy required to the next highest setting on the defibrillator.

### Defibrillation Procedure:

- It is recommended for trained STJANT officers to perform defibrillation in manual mode and not advisory defibrillation mode.

## Procedures for Zoll:

- For comprehensive instructions please refer to the operating instructions.

### Zoll - advisory defibrillation (AED) mode

- With Advisory defibrillation, the unit analyzes the patient's ECG rhythm to determine if a shockable rhythm exists.
- **Continue CPR** and place appropriate pads (adult/child) in correct placement.
- Turn the unit **ON** to **DEFIB**
- By adjusting the **ENERGY SELECT** arrow **UP** or **DOWN** select the appropriate joule setting, the energy setting is then displayed on the monitor.
- **Press ANALYZE** button

Press the ANALYZE button to begin analysis of the patient's ECG rhythm and to detect the presence of any shockable rhythms. An **ANALYZING** ECG message is displayed for approximately 9 to 12 seconds while the patient's ECG is analyzed.

Once the analysis is complete, the unit indicates **SHOCK ADVISED** alternatively **NO SHOCK ADV**.

When a non-shockable rhythm is detected, the message **NO SHOCK ADV** is displayed – continue CPR.

If **SHOCK ADVISED** – press **CHARGE**.

The **SHOCK** button illuminates and **PRESS SHOCK** is displayed.

Press and hold the illuminated **SHOCK** button until the energy is delivered, after the energy is delivered, the display returns to **XXX J DELIVERED**.

**Continue CPR** as per resuscitation guidelines.

## Zoll - Manual external defibrillation mode

### Manual external defibrillation mode

- **Continue CPR** and place appropriate pads (adult/child) in correct placement.
- Turn the unit **ON** to **DEFIB** it automatically defaults to 200 J
- Observe the display and verify the selected energy is appropriate, adjust accordingly. Press **ENERGY SELECT**  
If 200 J is selected the message on display will show,  
**DEFIB 200J SEL.**
- Press **CHARGE** to charge the defibrillator – a rising tone indicates that the defibrillator is charging and becomes continuous when the required energy is reached.
- **SHOCK** is illuminated on the front panel and **DEFIB 200 J READY** is displayed on the monitor.
- Stop CPR, clear oxygen, analyse rhythm and confirm shockable, if shockable
- Press and hold the **SHOCK** button to deliver the required energy to the patient.
- **Continue CPR** as per resuscitation guidelines
- Once energy is delivered the display simultaneously shows **200J DELIVERED** and **DEFIB 200 J SEL.** After approx. 5 seconds the **200 J DELIVERED** message disappears and the **DEFIB 200 J SEL.** message remains.

**Note:** If the shock button is not pressed within 60 seconds the charge is removed.

## Heart start 4000:

- For comprehensive instructions please refer to the Heartstart 4000 operating instructions.

### Semi-automatic external defibrillation (SAED) mode

- The defibrillator has been set to default to SAED mode when switched on.
- The voice and screen prompts guide the operator through the SAED process.
- Press **ANALYZE** and stop CPR.
- If a shockable rhythm is detected there is an audible prompt of **SHOCK ADVISED** and the defibrillator automatically begins charging to 150 joules with an intermittent charge tone.
- Once charged, the tone becomes continuous and the printer begins to print the ECG.
- Audio and visual prompts advise **STAND CLEAR PRESS SHOCK.**
- Press the **SHOCK** button
- ECG analysis automatically begins again – the joule setting remains at 150 joules throughout the SAED mode.

### Manual external defibrillation mode

- Lift the door labelled **MANUAL OPEN** and press the **MANUAL** button.
- Ensure the **PADS** have been selected via the **LEAD SELECTION** button
- Press the **ENERGY SELECT** button to cycle through the energy level choices.
- When the desired energy level is displayed, press the **CHARGE** button.

**Heart start 4000 (continued)**

- As the defibrillator charges, the current charge is displayed above the shock counter. A charging tone beeps until the desired energy level is reached, followed by a continuous charge tone.
- Press the **SHOCK** button – continue CPR as per guidelines.

**Note:** *If the shock button is not pressed in 30 seconds the defibrillator disarms automatically. To manually disarm the defibrillator press the DISARM button.*

**Phillips MRX - AED Mode**

- Turn the Therapy Knob to **AED**.
- Follow the voice and screen prompts.
- Continue CPR and connect the appropriate pads and pads cable.

Automatically analyzes the patient's rhythm and warns not to touch the patient.

**Shock Advised**

If a shockable rhythm is detected,

- Automatically charges to 150J.
- Generates voice and screen prompts and a steady high-pitched tone.
- Displays a flashing orange Shock button when fully charged.
- Analyzes heart rhythm while charging.
- Disarms if a rhythm change is detected before a shock is delivered and no longer appropriate.

**Note:** *You can disarm a fully charged device by turning the Therapy Knob to **Off** or by pressing the **Pause for CPR** soft key. Resume monitoring by turning the Therapy Knob back to **AED**.*

Press the orange **Shock** button, if prompted.

Call out "**Stand Clear!**" Then, press the orange **Shock** button.

- The **Shock Delivered** message confirms shock delivery.
- An annotated strip is automatically printed.

**MRX prompts Paused.**

**Continue CPR**, and commences analysis at the completion of the pause period or when you press the **Resume Analyzing** soft key. Follow the screen and voice prompts.

### Phillips MRX Manual Defibrillation

- Turn the **Therapy Knob** to **Manual Defib** and select the appropriate energy setting for the patient
- Press the Charge button on the MRX.

Make sure no one is touching patient or anything connected to patient before shock; call out loudly and clearly **"Stand Clear"**.

- Press the orange **Shock** button on the MRX – **continue CPR** as per guideline.

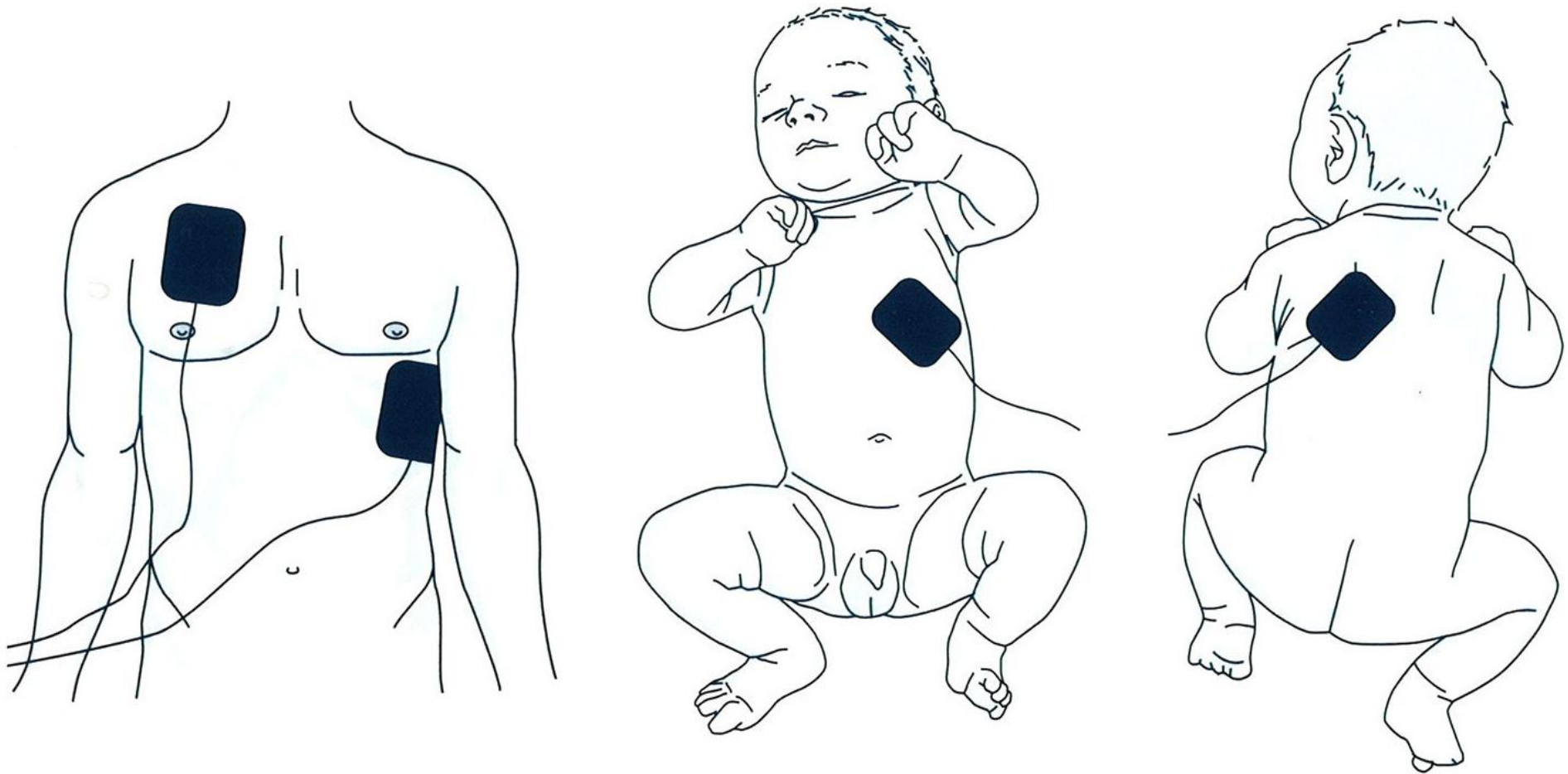
### Notes: Phillips MRX Manual Defibrillation

- The energy selection in the shock status area changes and a continuous, low-pitch charging tone sounds as the defibrillator charges.
- The current energy displays and a continuous, high-pitch 'charge' tone sounds at the end of the charge.
- Monitoring alarms are indefinitely paused once energy is selected for defibrillation; alarms are active once the Therapy Knob is moved to **Monitor**.
- Selected energy can be increased or decreased at any time during charging or after charging is complete; the defibrillator charges to the selected energy level automatically.
- Press **Disarm** to disarm the device; if the Shock button is not pressed within the time period specified in the Time to Auto Disarm configuration setting, the MRX disarms automatically.

### Additional information

#### Defibrillation in patients with pacemakers/implantable cardiac defibrillators (ICD)

- Patients with a pacemaker or ICD can be monitored in the usual way.
- Do not place defibrillation pads over the top of pacemakers or ICDs. Most pacemakers/ICDs are inserted under the left clavicle, but some are under the right clavicle. Therefore, in this situation, place the defibrillator pads in the anterior/posterior position.
- If a patient with an ICD is in cardiac arrest, look for evidence of the ICD discharging (contraction of the chest muscles or spike on the ECG strip).
- If the ICD is discharging:
  - allow the ICD to continue to discharge and continue CPR and ACLS;
  - do not externally defibrillate.
- If there is no evidence that the ICD is discharging then follow the described protocol for defibrillation.



**Pad placement positions**

## 09 - Trauma

- 01 - [Application of bandages and slings](#)
- 02 - [Application of Stifneck® collar](#)
- 03 - [Care of an amputated body part](#)
- 04 - [Combat application tourniquet® \(C.A.T®\)](#)
- 05 - [Traction splint](#)
- 06 - [Use of an extrication board](#)
- 07 - [Fracture reduction](#)
- 08 - [Helmet removal](#)
- 09 - [Manual inline stabilisation](#)
- 10 - [Kendrick Extrication Device](#)
- 11 - [Pelvic Sling](#)
- 12 - [Use of a scoop stretcher](#)
- 13 - [Use of vacuum splints](#)
- 14 - [Spider harness](#)



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### Authorisation to practice

Application of bandages and slings



Strategic use of bandages and slings can significantly improve patient pain, bleeding and even acutely reduce joints or bone deformity.

### Indications



- Wound cover and limb support

### Contraindications



- Nil in this setting

### Complications

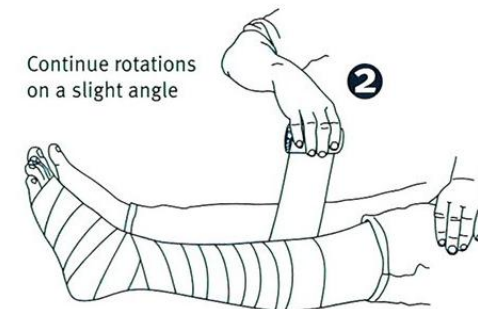
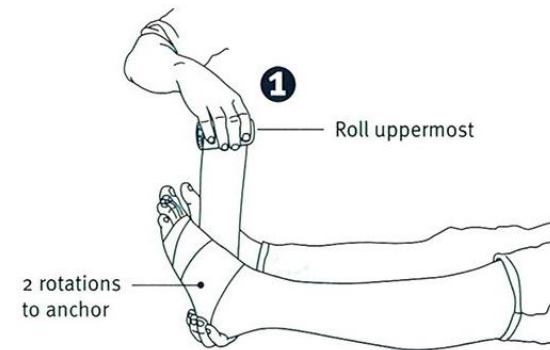


- Decreased perfusion due to restricted circulation

### Procedure

#### Simple spiral roller bandaging

- With roll uppermost, anchor bandage with two rotations around the limb, then continue rotations on a slight angle until affected area is suitably covered.



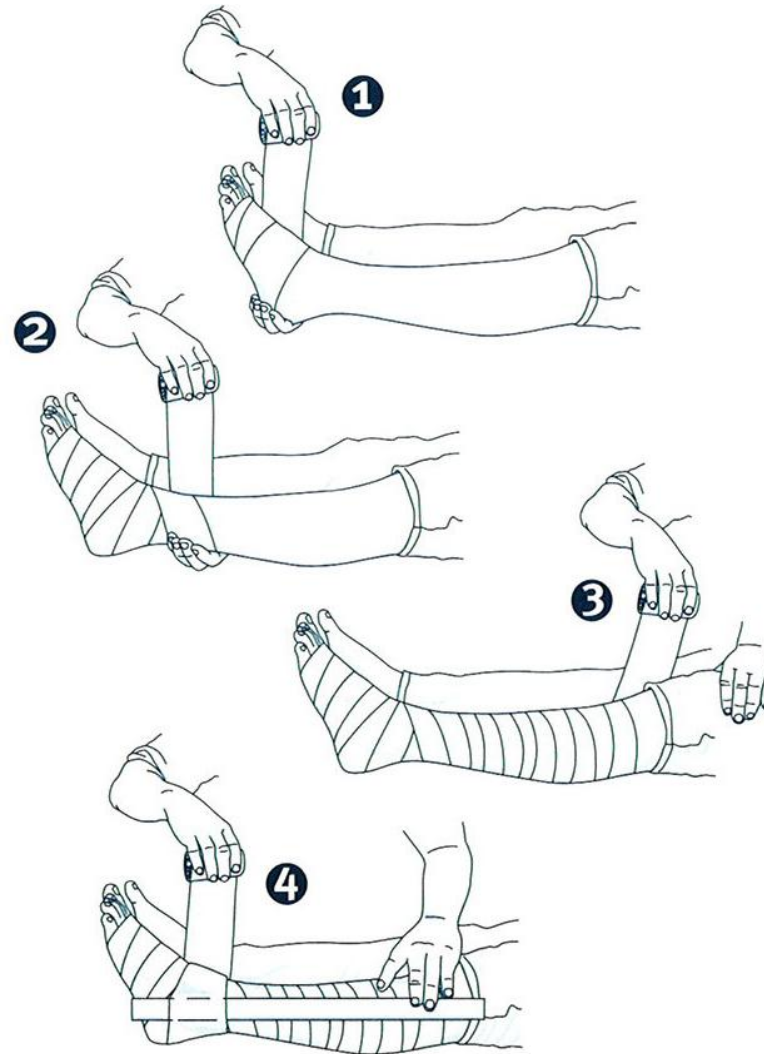
## Procedure

### Pressure immobilisation technique

The aim is to compress lymphatic tissues in the area of envenomation to prevent proximal spread. Venous supply is then compressed to prevent renewed lymphatic flow as a result of increased distal pressure from the effect of the first bandage.

- Minimise all patient movement.
- Application of bandage is paramount to prevent the spread of venom.
- Take a conforming bandage, roll over the bite site, working from within out.
- If the bite/envenomation is on a limb, apply other bandages, starting at the distal end and apply upwards, to cover as much of the limb as possible.
- After initial compression bandaging, apply a splint to immobilise the limb where possible.

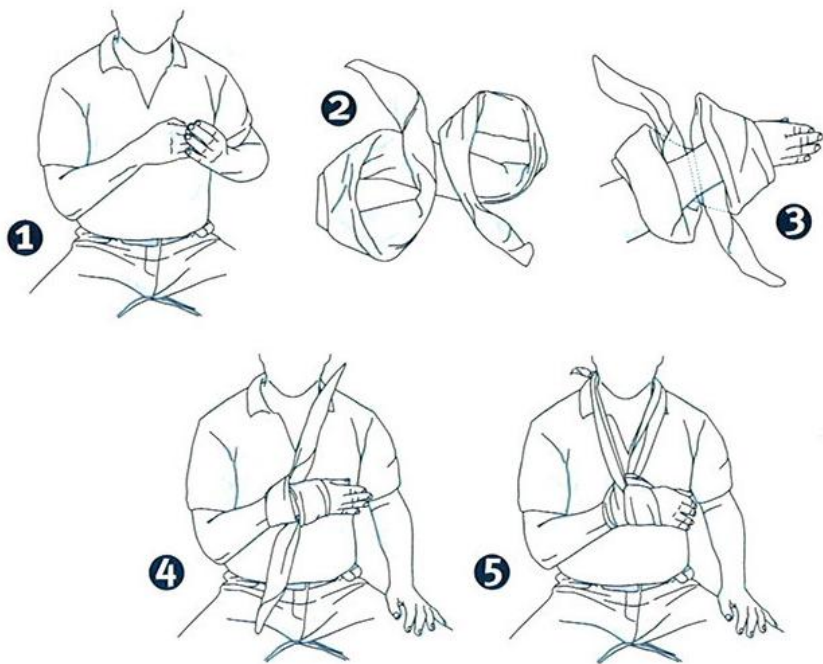
**Note:** Ensure bandages are applied firmly but not too tight as to restrict circulation. Bandages have been shown to loosen during transport, and generally they are not applied tight enough.



## Procedure (continued)

### Application of a collar and cuff sling using a triangular bandage

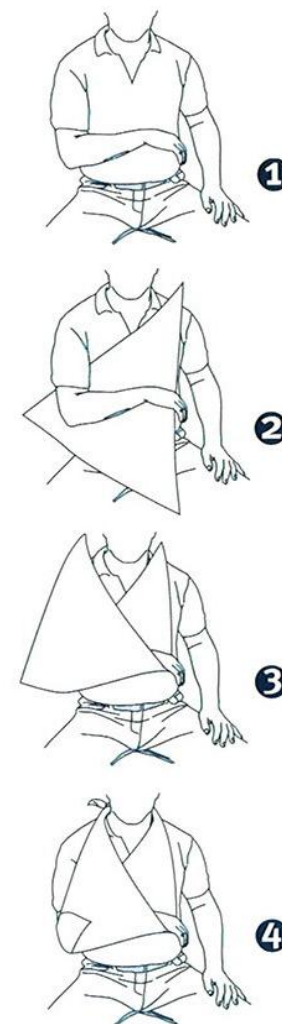
- Place patient with the forearm of the injured side across the chest with the fingers pointing towards the opposite shoulder.
- Take a narrow fold triangular bandage and secure the cuff around the wrist.
- Tie the ends of the bandage in a reef knot in the hollow of the neck on the opposite side.



## Procedure (continued)

### Application of a large arm sling

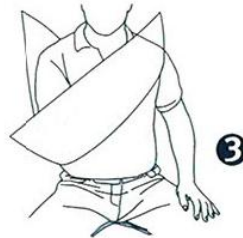
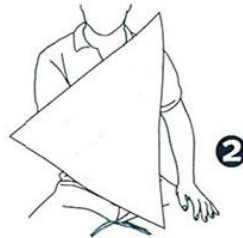
- Have the patient hold their injured arm across in front of their chest.
- Place the open triangular bandage between the injured arm and their chest with the point of the bandage well underneath the injured arm (the apex level with the elbow).
- Take the upper end around the neck on the injured side.
- Bring the lower end over the injured arm.
- Tie the two ends with a reef knot so that the knot fits into the hollow of the neck.
- Fold the apex in front of the arm and secure, making sure the hand is fully supported.



## Procedure *(continued)*

### Application of an elevation sling

- Place patient with the forearm of the injured side across the chest with the fingers pointing towards the opposite shoulder.
- Drape the open triangular bandage over the forearm with the apex beyond the elbow and the upper point over the uninjured shoulder.
- Ease the base of the bandage under the hand, forearm and elbow, taking the lower point of the bandage up diagonally across the back.
- Tie the two ends with a reef knot on the uninjured side.
- Twist the apex until the bandage supports the elbow and then secure.



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### Authorisation to practice

Application of Stifneck® cervical collar



Cervical collars limit unnecessary movement of the cervical spine. However, they only reduce neck mobility by about 60 per cent and should therefore be used in conjunction with other spinal immobilisation procedures.

### Additional information

- C-spine injury is extremely unlikely and the patient does not require a cervical collar if:
  - alert and orientated, AND
  - has no neck pain or tenderness, AND
  - not affected by drugs or alcohol, AND
  - not suffering severe pain elsewhere AND has no neurological abnormality.
- Incorrectly sized or placed cervical collars that place pressure on the neck may cause an increase in intracranial pressure.



### Indications

- Suspicion of a cervical spine or spinal cord injury



### Contraindications

- Nil in this setting



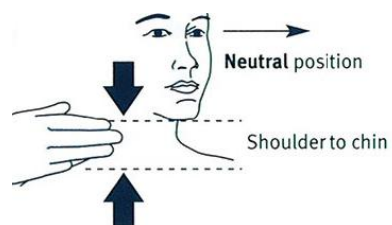
### Complications

- Discomfort
- Anxiety

## Procedure

### 1 Measure the patient.

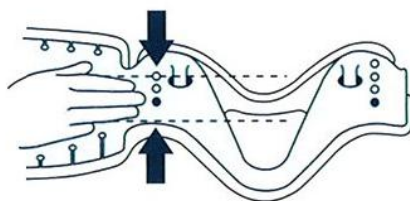
Align the head to neutral or 'eyes forward' position unless contraindicated by your protocol.



### 2 Match the collar size to the patient.

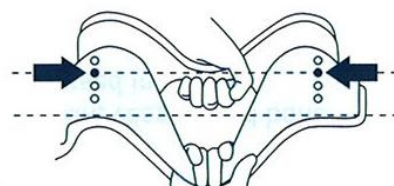
*Select:* Choose from four adult positions  
*Pedi select:* Choose from children positions. **Note:** Same basic method of adjustment for both collars.

Plastic edge to size window



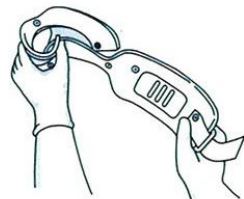
### 3 Adjust and lock the adjustable collar

Adjust the chin support to the size selected in step 2.



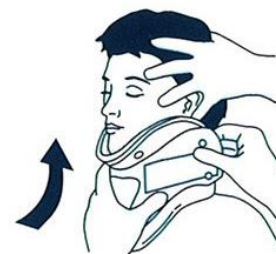
Lock both sides by pressing the two lock tabs.

### 4 Preform the collar

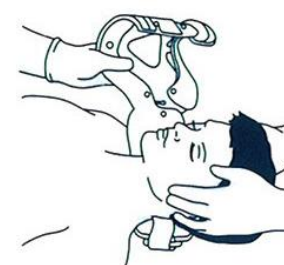


5

### Apply the collar size while manually maintaining neutral head position.



Place the chin support well under the chin. If a different size is needed, remove, re-size and re-apply the collar.



For a supine patient, slide the rear panel behind the neck before placing the chin support.

**Important:** Do not adjust the Select/Pedi-Select collar on patient.



Pull the back of the collar snug while holding the front in place, then fasten.

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### Authorisation to practice

Care of an amputated body part



Although rare, traumatic amputations do occur and the successful reattachment of the body part is significantly dependant on correct pre-hospital management.

Even if reattachment is not viable, skin, vessels and bone of the amputated body part may be used in repair.

### Indications



- Traumatic amputation of a body part



### Contraindications

- Nil in this setting



### Complications

- A traumatic amputation may be distracting on a primary survey. However, consideration must always be given to other injuries or illnesses the patient has that may be even more serious and less obvious

## Procedure

- Place amputated body part(s) in a clean dry plastic bag, sealed airtight.
- Place the sealed plastic bag in water/ice slurry.
- Transport the part(s) with the patient to receiving medical facility, notifying them as soon as possible to allow the timely preparation of appropriate medical teams.

## Additional information

- Do not allow any surface of the amputated part to freeze, suffer cold burn, or become wet.



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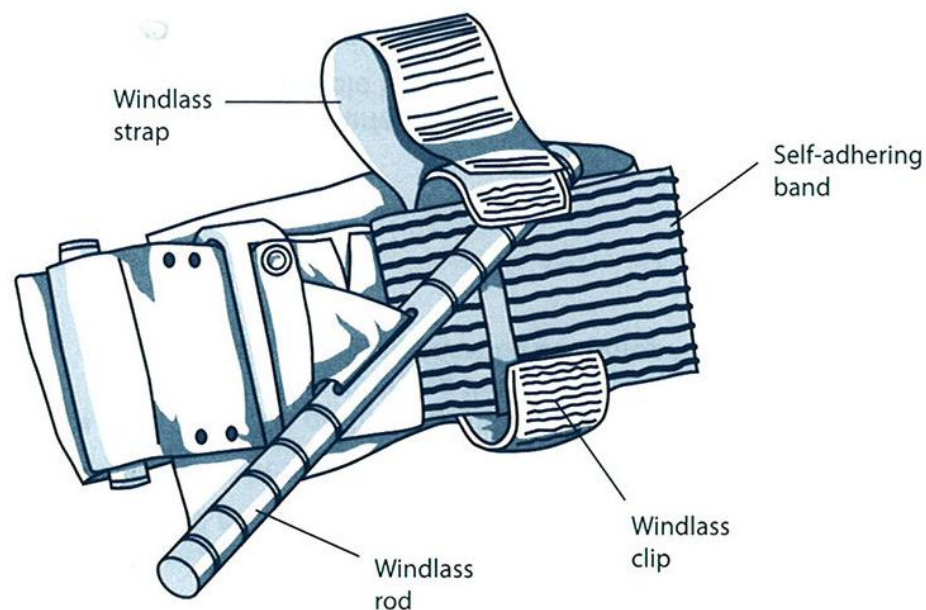
### Authorisation to practice

Combat application tourniquet®

Para

ICP

Combat application tourniquet® (C-A-T®) provides a consistent, controlled circumferential force to limbs in an attempt to control life-threatening haemorrhage.



### Indications



- Life-threatening haemorrhage not controlled by direct pressure
- Multiple casualties with extremity haemorrhage and a lack of resources to maintain simple measures of haemorrhage control



### Contraindications

- Bleeding that can be controlled using simple measures such as direct pressure



### Complications

- Compartment syndrome
- Pain or discomfort (may require analgesia)
- Reperfusion injury when released
- Embolism
- Permanent nerve damage, muscle injury, vascular injury, and/or skin necrosis
- Ischaemia
- Fractures – use on tibia and fibula or radius or ulna, as the device has the potential to cause fracture

**Note:** All risks must be balanced against the risk of exsanguinations

## Procedure

### Application of a C-A-T®

- Loop the self-adhering band of the C-A-T® around the wounded extremity at a distance of 5 – 10 centimetres proximal to the injury.
- Thread the band through the two slits of the buckle (inside slit first) and pull the band tight, securely fastening it back on itself.
- If the band is long enough, do not secure it past the windlass clip.
- Twist the windlass rod until arterial bleeding stops.
- Secure the rod by inserting it into the windlass clip.
- Any free end of the band can now be extended over the top of the windlass rod.
- Pull the windlass strap tight over the windlass clip.
- Mark the tourniquet with the time and date of application.

### Additional information

- The C-A-T® is to be applied to limbs only.
- Place the tourniquet as distal as possible, but at least 5cm proximal to the injury, avoiding joints as much as practically possible.
- The C-A-T® should be placed directly onto the skin to prevent it slipping.
- Effective application of the C-A-T® is determined by cessation of external haemorrhage, but slight oozing may occur from the exposed bone. The tourniquet should be tightened further if bleeding has not stopped.
- **The time and date of application must be written on the tourniquet** as well as ePCR, and handed over to hospital staff.
- Once applied, it **must be left in situ** and handed over to hospital staff to be taken off appropriately in the hospital environment.

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### Authorisation to practice

Traction splinting

SAP  
Para  
ICP

Traction splints are applied to patients presenting with femoral fractures to reduce:

- the fracture, as well as align and immobilise it;
- muscle spasm and pain;
- blood loss;
- further damage to anatomical structures.

### Indications

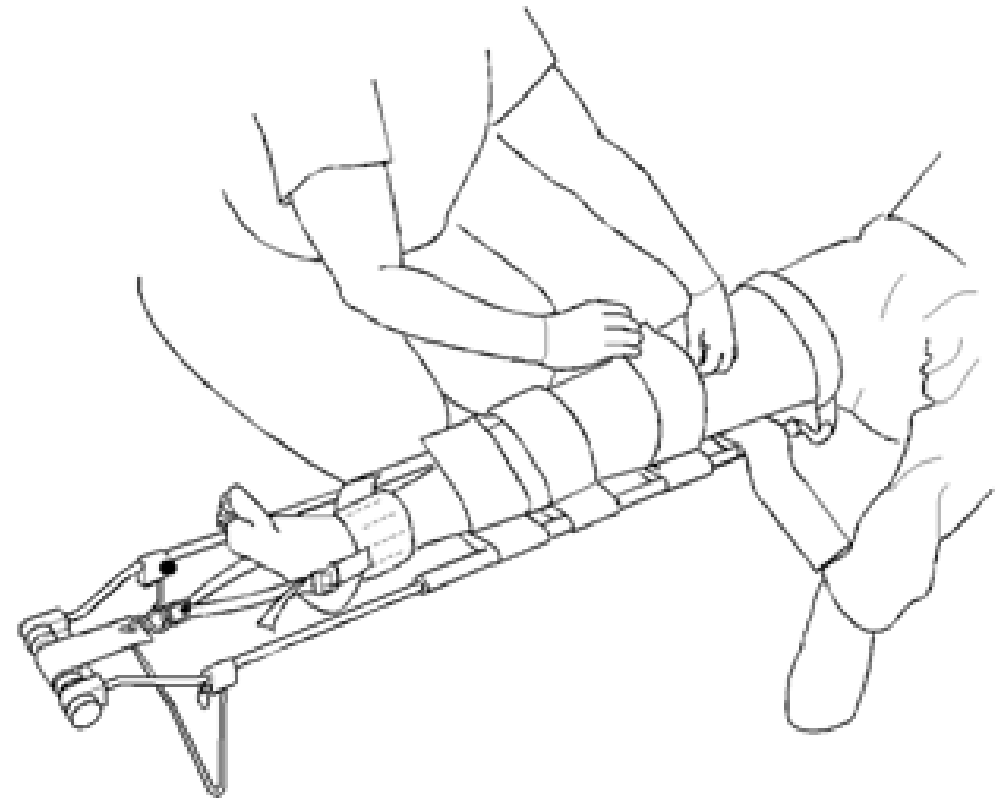
- Mid shaft femoral fractures

### Contraindications

- Pelvic injury
- Fracture/dislocation of the knee
- Ankle injury
- Bilateral femoral fractures
- Multiple fractures on the same leg

### Precautions

- Gently re-align to decrease the chance of a closed fracture becoming a compound fracture



## Procedure

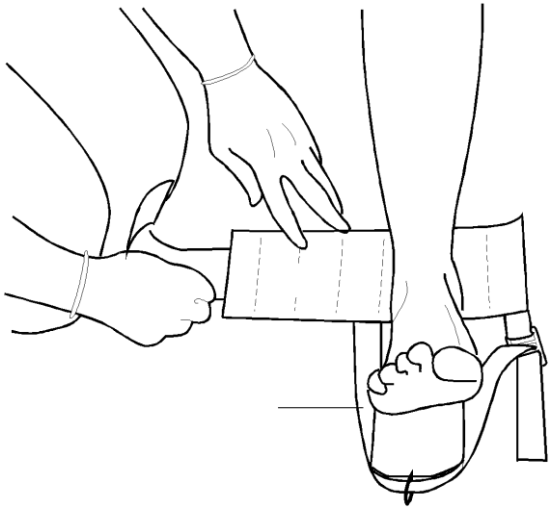
### Pre-application of the traction splint:

- assess the limb for perfusion;
- ensure appropriate analgesia;
- consider procedural sedation (ICP);
- irrigate and dress compound fractures.

### Application of the Traction splint

1. Expose the limb and remove footwear.
2. Assess neurological function distal to injury site , assess the circulatory function and mark the dorsalis pedis pulse with a pen.
3. Place the splint alongside the uninjured side and adjust to the desired length. Tighten by turning the locking collars clockwise.
4. Open the Velcro straps and place in position along the length of the splint.
5. Apply the ankle strap. With appropriate support, use slow manual traction to align the leg with slight elevation. Continually maintaining traction.
6. On the injured side, feed the ischial ring under the ischial tuberosity and fasten the buckle of the ischial strap.
7. Moderately tighten the straps to secure the limb, ensuring one above the fracture, one below the fracture. Providing sufficient stabilisation.
8. Attach the traction ratchet and take up traction.
9. Tension the velcro straps to provide the required support and secure.
10. Raise the heel stand. Recheck the traction level and adjust as necessary.
11. Reassess circulatory and neurological status.
12. Ensure maintenance of adequate analgesia during transport.

### Foot strap



### Additional information

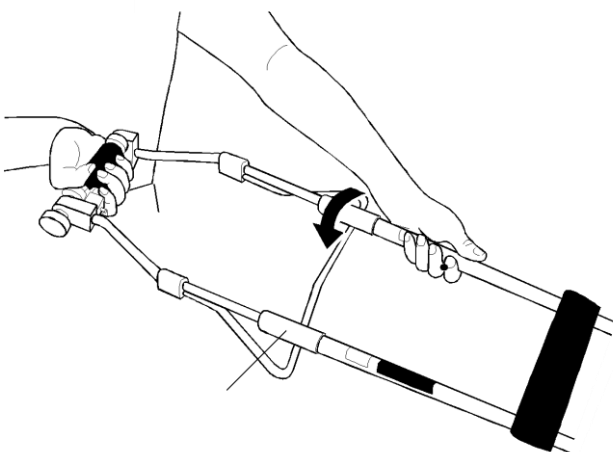
#### Traction splint

- The ankle strap and ratchet are designed to ensure that, when traction is applied, the direction of pull is through the axis of the leg.
- The recommended operating range of the splint is 4.5 Kg – 6.8 Kg of traction and should not exceed 18 Kg.

#### Paediatric patients

- Realignment to length with manual traction support followed by vacuum splinting, provides adequate support in the pre-hospital setting.
- While there is no indication for the use of traction splints on paediatric patients, clinical judgement should guide decision making in the larger paediatric patient.
- Paediatric femoral fractures are time critical injuries.

### Adjusting the length and locking device



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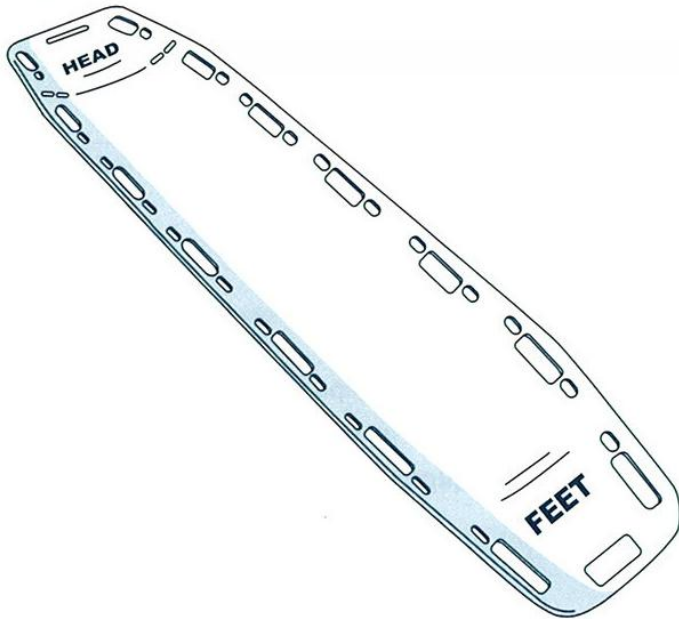
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## Authorisation to practice

Use of an extrication board

SAP  
Para  
ICP

The extrication board is designed to facilitate the extrication of a patient onto an ambulance stretcher. **An extrication board is not to be used during transport.**

*Extrication board*

## Indications

- Extrication of a patient onto the ambulance stretcher



## Contraindications

- Maximum load limit for the extrication board is 159 kg.  
This limit must not be exceeded



## Complications

- Pressure points
- Misalignment of the spine
- Pain and discomfort

## Procedure

- Consideration must be given to the many presenting variables during patient extrication. Clinical judgement will determine the most appropriate method of extrication, with consideration given to patient safety and clinical requirements.

**Note:** *The extrication board is to be removed prior to transport.*

## Additional information

- Ensure the extrication board is maintained as per manufacturer's guidelines.
- There is no evidence of benefit from immobilising a patient to a hard board. This forces the spine (and neck) into a straight line, which is not the normal anatomical alignment.
- Prolonged immobilisation predisposes to skin pressure areas especially in compromised patients.
- Conduct a risk assessment before lifting, ensuring the proper techniques of lifting are applied at all times.
- Restraints and slide sheets should be utilised where it is deemed necessary to aid in the extrication of a patient.



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### Authorisation to practice

Fracture reduction



Extremity fractures are common and may result in displacement and neurovascular compromise necessitating paramedic reduction and realignment.

An assessment must be made as to the appropriateness of performing this procedure, which takes into account:

- risks associated with sedation versus the benefit of performing the procedure;
- transport time to a medical officer more experienced in the procedure;
- the likelihood of successful reduction, noting that some fracture-dislocations, such as that of the ankle, may be very difficult to reduce.

### Indications



- Extremity fractures or fracture-dislocations with neurovascular compromise

### Contraindications



- Nil in this setting

### Complications



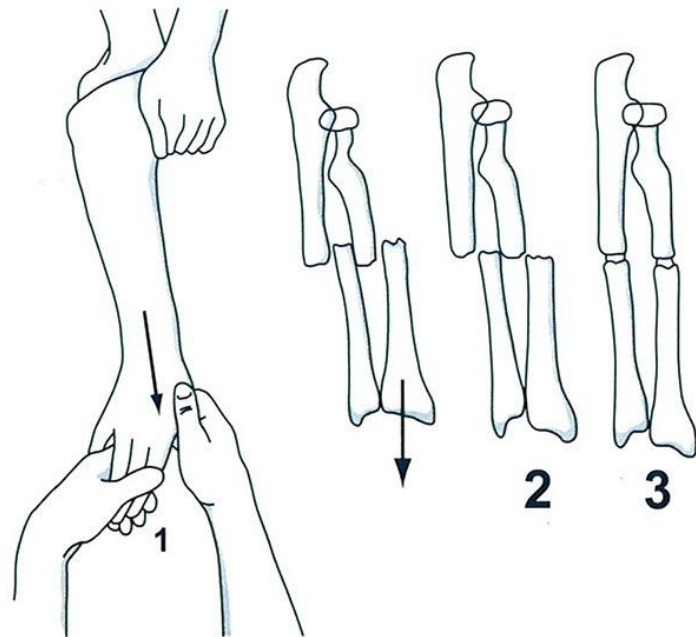
- Pain
- Possible worsening of neurovascular compromise
- Complications associated with sedation

### Additional information

- The active management and treatment of life threatening conditions take precedence over fracture management.
- The patient should be transported to the most appropriate facility.

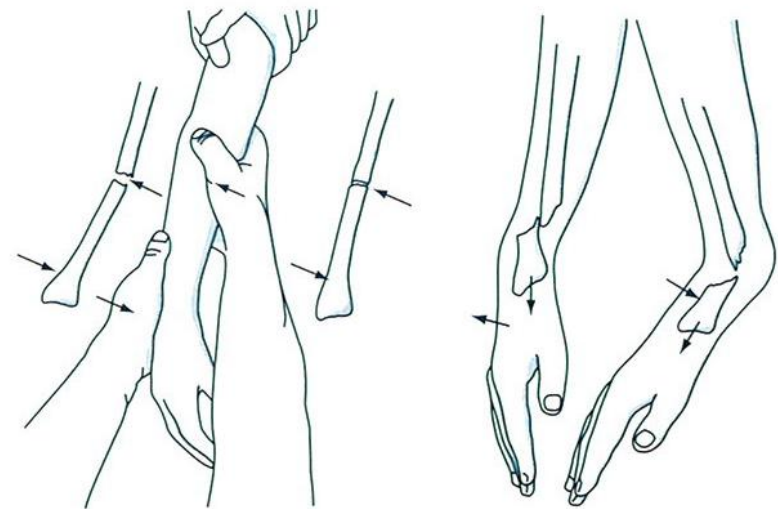
## Procedure

- Explain the procedure.
- Ensure adequate analgesia and/or sedation.
- Apply traction in the line of the limb.
- This should result in disimpaction of most fractures and lead to a resolution of shortening and, in most cases, reduce the deformity. (See diagram below)



## Procedure (continued)

- Following traction, any remaining angulation can be corrected by placing the heel of one hand under the fracture whilst applying pressure distally with the other hand. (See diagram below left).



- Fractures involving prominent bony spikes or soft tissue caught between fragments, may be difficult to reduce. In these instances, initially gently increasing the angulation prior to traction and manipulation may assist. (See diagram above right.)
- Splint the limb as appropriate.
- Transport while maintaining appropriate analgesia.

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## Authorisation to practice

Helmet removal



The removal of a helmet must be performed with consideration of possible cervical spine injury.

**Note:** *Optimally this procedure should be performed by two officers.*

## Indications



- Removal of a motorcycle helmet in the setting of trauma



## Contraindications

- Nil in this setting



## Complications

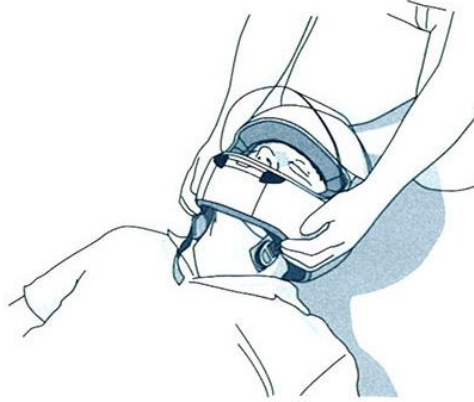
- Possible exacerbation of cervical spine injury

## Procedure

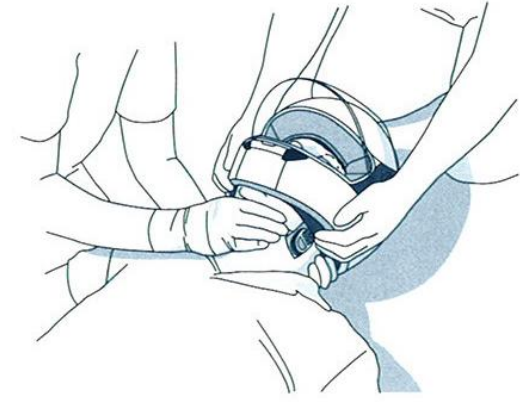
- One paramedic provides MILS from the front of the patient.
- Ensure the chin strap is released or cut.
- The second paramedic gently flexes the helmet apart at the chin strap attachment and lifts in a steady rearward motion avoiding movement of the neck.
- Communication is important between both officers, with the one performing MILS controlling the procedure.
- As the helmet is removed, the officer performing MILS needs to adjust their lower hand to provide adequate support below the occiput.
- If the patient is prone, maintain MILS and log roll into the lateral or supine position and then remove the helmet.
- If a bystander needs to be used to perform this procedure, the paramedic should maintain MILS.
- If the patient requires transport to hospital, ensure that the helmet goes with them, in order for the ED staff to assess the damage.



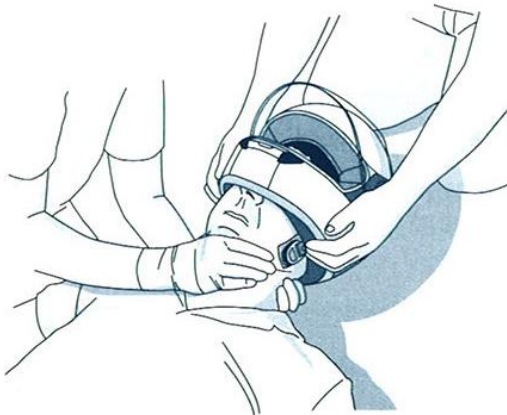
- 1 One paramedic provides inline immobilisation by placing hands on each side of the helmet with fingers on the victim's mandible.



- 2 A second rescuer cuts or loosens the strap at the D-rings.



- 3 The second rescuer places one hand on the mandible and with the other hand, applies pressure from the occipital region (This manoeuvre transfers inline immobilisation responsibility to the second rescuer).



- 4 The rescuer at the top removes the helmet, keeping in mind that the helmet is egg-shaped and must be expanded laterally to clear the ears. The second rescuer maintains inline immobilisation from below to prevent unnecessary neck motion.



- 5 After the helmet has been removed, the rescuer at the top replaces her hands on either side of the victim's head with palms over the ears.



- 6 Inline immobilisation is maintained from above until a backboard is in place and a cervical immobilisation device (collar) is applied.

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### Authorisation to practice

Manual in-line stabilisation



Manual in-line stabilisation (MILS) provides a degree of stability to the cervical spine prior to the application of a cervical collar.

It can then be used in conjunction with a collar to assist in the cervical spine management.

### Indications



- Stabilisation of the head and neck in a patient with suspected cervical spine injury

### Contraindications



- Nil in this setting

### Complications



- Difficult laryngoscopy

## Procedure

### From behind

- Hands are placed over the patient's ears.
- Thumbs are placed behind the patient's head.
- Little fingers are placed just under the angle of the jaw.
- Remaining fingers are spread across the flat planes of the patient's head.

### From the side

- An arm is placed across the patient's shoulder and the back of the head is cupped in the hand.
- the thumb and first finger of the other hand are placed either side of the patient's face.

### From the front

- Both hands are placed either side of the patient's head.
- Little fingers are placed at the rear of the head.
- Thumbs are placed in the notch between the upper teeth and maxilla on each cheek.
- Remaining fingers are spread across the flat planes of the patient's head.

### Supine patient

- The paramedic is positioned above the supine patient's head.
- Hands are placed either side of the patient's head covering the ears with the palms of the hand.
- Fingers are spread to stabilise the head with the tips pointing toward the patient's feet.
- The fourth and fifth digits should slightly wrap around to the rear of the patient's head.

## Procedure *(continued)*

### MILS in airway management

- The paramedic performing MILS is positioned next to the torso of the patient.
- When instructed to do so by the intubator, the paramedic places both hands on either side of the neck.
- Fingers wrap upward and toward the rear of the head and the thumbs sit just under the line of the jaw.
- This position is held until the endotracheal tube is secured and placement confirmed, at which point the cervical collar is reapplied.

### Additional information

- It is important that documentation of an intubation in the setting of potential cervical spine injury is recorded as being performed with MILS.

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### Authorisation to practice

KED



The Kendrick® immobilisation and extrication device is used to minimise spinal movement and assist with extrication from confined spaces.

### Indications



- To facilitate safe extrication from a confined space



### Contraindications

- When the patient is actual time critical and the application of the KED will delay transport to a trauma centre, or appropriate hospital

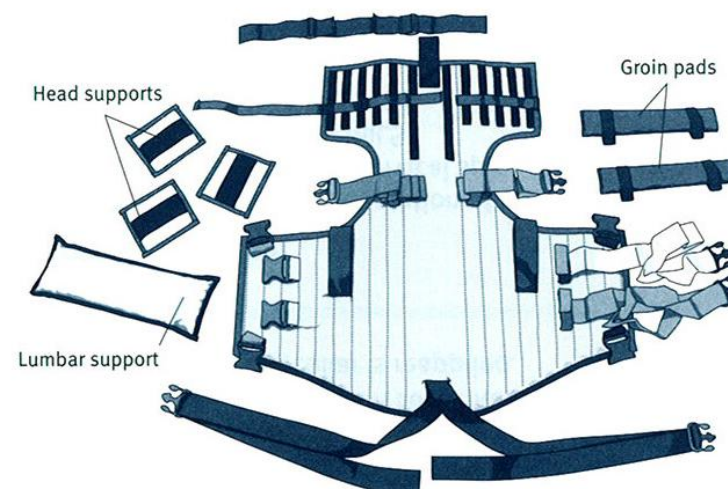


### Precautions

- Chest straps that are too tight tend to interfere with respiratory effort
- Groin straps need to be firmly secured to minimise jacket and neck movement during extrication
- Incorrect head padding can lead to C-spine hyperextension or hyperflexion
- Immobilising the head without properly securing the torso section may cause C-spine movement

### Procedure

- Explain the procedure to the patient and gain consent.
- Prepare the KED – remove from the carry case and unroll. Set aside the lumbar support, head supports and groin pads.



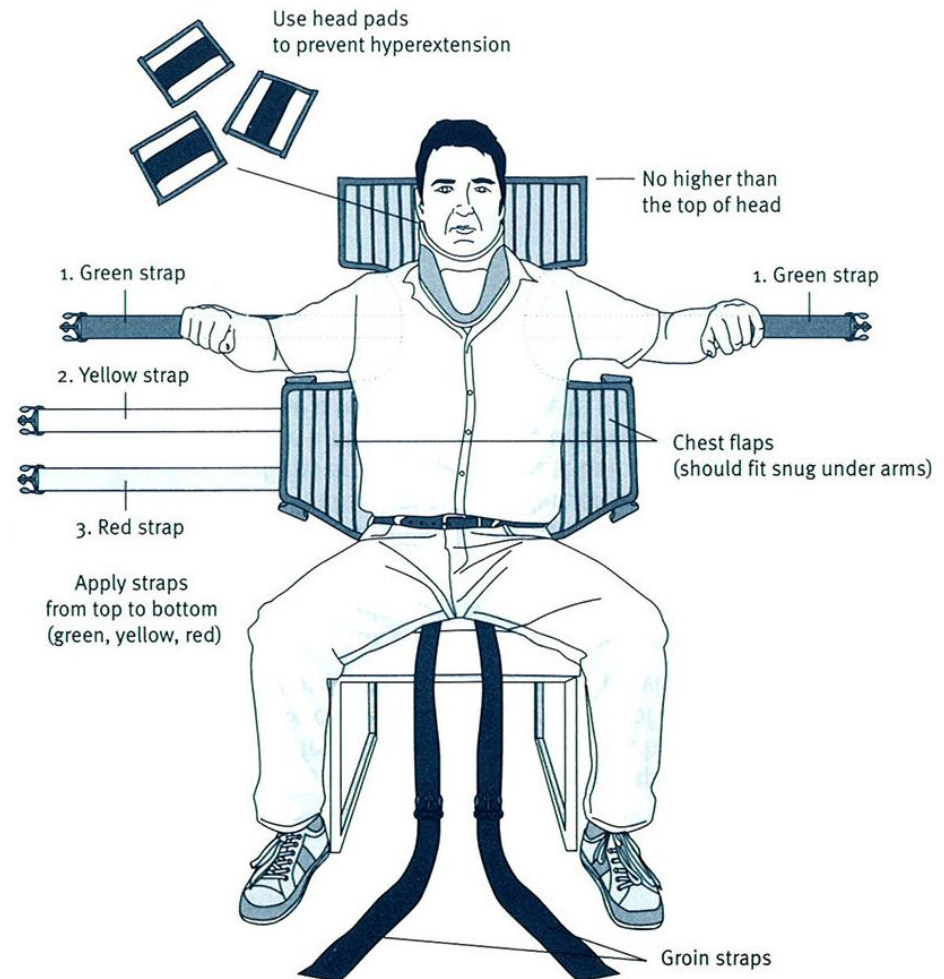
- C-collar immobilisation should always be used in conjunction with KED. Also ensure that MILS is maintained during the application of the C-collar and the KED.





## Procedure (continued)

- Slide the KED round the back of the patient, so that it is no higher than the top of the patient's head. If this is not possible, position jacket firmly in the patient's armpits.
- Ensure the chest flaps of the device are snug under the patient's arms. (Adjust carefully for children and pregnant patients.)
- Release the groin straps from back of the KED and hold both straps together, ensuring they are not twisted. Pull the groin straps down either side between the patient and the chest flap. Slide both straps under the legs and buttocks until they are in the gluteal fold. Pull groin straps and leave.
- Raise the patient's arms to shoulder height, then position the chest flaps against the chest. Apply straps from top to bottom (green, yellow, then red).
- The green straps should cross the chest, unless the patient has chest injuries or breathing difficulty. For the latter cases, the straps can run vertically.
- Connect the leg straps to the buckles on the same side and tighten by pulling.
- Recheck straps to confirm comfortable but firm fit.
- Use the appropriate amount of head pads to prevent hyperextension.





**Procedure (continued)**

- Secure the head support by applying the 25 millimetre collar strap. Do not place the strap on the jaw line as it may deform the collar or put pressure on the jaw.
- Apply the 50 millimetre forehead strap by attaching the side hook Velcro tabs to the head flaps with the sliders level with the front of the head flaps, ensuring that the bottom of the forehead strap aligns with the bottom of the patient's eyebrows. Tighten the strap ensuring the foam pad is centred on the forehead by placing thumbs on the centre of the forehead and pulling both ends with equal force. Velcro into place.

50 mm forehead strap  
(Ensure that bottom of strap  
aligns with bottom of eyebrows)

25 mm collar strap  
(Do not place on jaw line)



- Prior to extrication, if necessary, secure the knees with a triangular bandage to prevent excess movement of the KED.
- Carefully extricate the patient, maintaining spinal alignment and minimising body twisting, once extricated the groin straps may be loosened but not removed.
- Provide further treatment as necessary and remove the KED on arrival at hospital.

**Procedure (continued)****Specialised uses of the KED**

- **Pregnant patients:** The chest flaps of the KED may be folded inwards, leaving the abdomen exposed. Exercise care in the placement of the restraints, which should only be tensioned to provide support.
- **Paediatric patients:** Adjustments may be made by placing blankets or towels on either side of the patient to ensure support.
- **Hip immobilisation:** Invert the KED and secure the chest flaps over the pelvic area. Secure the head flaps around the legs, just below the knees and use the lumbar support as padding between the knees. Use a triangular bandage to secure the ankles and/or knees wrapped in a figure of eight.

**Additional information**

- The KED remains in situ during transit to facilitate a log roll in the case of vomiting.

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## Authorisation to practice

Pelvic Splint



Pelvic binders reduce and stabilise pelvic ring fractures with diastasis and thereby control haemorrhage from the pelvic vasculature.

## Indications



- Suspected pelvic fracture with evidence of haemodynamic compromise

## Contraindications



- Suspected isolated neck of femur fracture
- Suspected traumatic hip dislocation

## Precautions



- Once applied, a binder should not be removed due to the risk of haemodynamic instability
- Other methods (e.g. a vacuum splint) may be used in small children
- Apply carefully in gross compound fractures to minimise pain and further complications

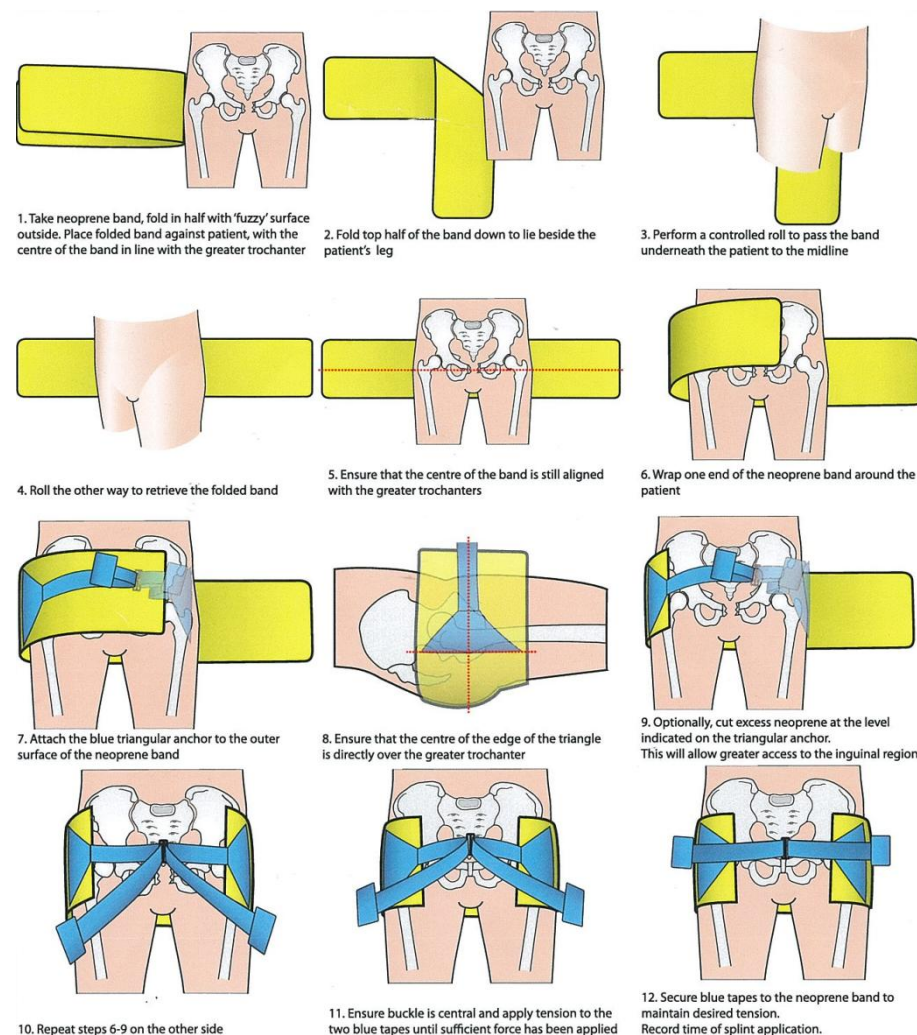
## Additional information

- It is not recommended to apply the pelvic splint before extricating the patient from a vehicle.
- Caution in the pregnant trauma patient with the use of the pelvic splint:  
*Theoretically, if the pelvic splint is applied correctly, i.e. at the level of the greater trochanters, the application should be safe for the pregnant patient, even late term. If it is evident that pelvic exsanguination exists and the risk of mortality is high, that you use your best judgement on a case by case basis.*
- Application of the pelvic binder can be painful and requires consideration for appropriate analgesia.

## Procedure

### Application of Prometheus pelvic splint

- Remove objects from the patient's pockets and pelvic area.
- Fold the neoprene band in half with the 'fuzzy' surface on the outside.
- Place the folded band against the patient, with the centre of the band in line with the greater trochanter.
- Fold the top half of the band down to lie beside the patient's leg.
- Perform a controlled log roll to pass the band underneath the patient to the midline.
- Log roll the patient the other way to retrieve the folded band.
- Ensure that the centre of the band is still aligned with the greater trochanters.
- Wrap one end of the neoprene band around the patient.
- Attach the blue triangular anchor to the outer surface of the neoprene band.
- Ensure that the centre of the edge of the triangle is directly over the greater trochanter.
- Optionally, cut excess neoprene at the level indicated on the triangular anchor, this will allow greater access to the inguinal region.
- Repeat as above for the other side.
- Ensure the buckle is central and apply tension to the two blue tapes until sufficient force has been applied to stabilise the pelvic fracture.
- Secure the blue tapes to the neoprene band to maintain the desired tension.



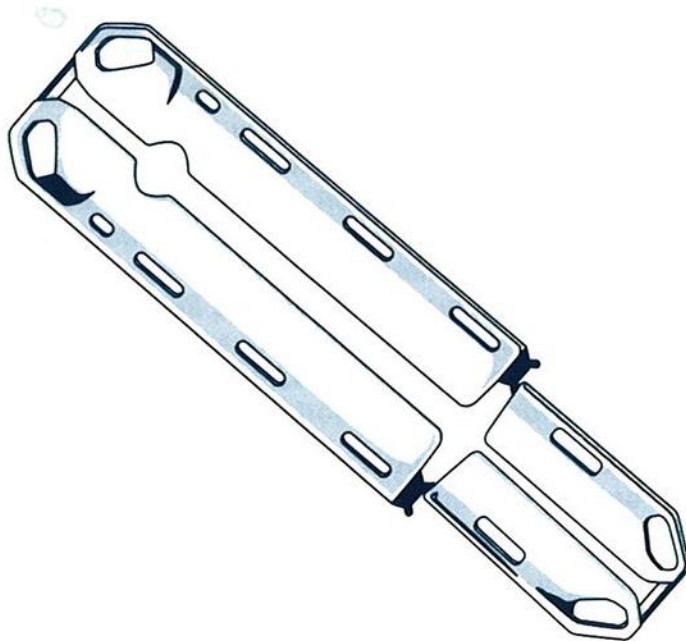
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## Authorisation to practice

Use of a scoop stretcher



The scoop stretcher is designed to facilitate the movement of a patient, particularly those who cannot be rolled or slid onto an extrication board.

*Scoop stretcher*

## Indications

- Extrication of a patient onto the ambulance stretcher



## Contraindications

- Maximum load limit for all scoop stretchers currently approved is 159 kilograms. This limit must not be exceeded



## Complications

- Exercise caution during application of the scoop to avoid pinching, or pulling the patient's skin, hair or clothing

## Procedure

- The scoop stretcher can be applied without separating, or it can be divided into two basic sections:
  - separate the end couplings by depressing the lock lever button on the inside of the top and bottom frames and pull the halves apart;
  - to rejoin couplings, simply push them together. The lock levers need not be depressed;
  - to adjust the length, disengage the latch lock pins on both sides by pulling the pins outwards. The foot section can be extended and, when the desired length has been obtained, engage the lock pins on both sides by pushing the pins inwards. The stretcher halves should remain coupled for this process to ensure equal length;
  - push and pull the foot section of the frame to check for positive engagement of the locking pins.
- If restraints are stored on the scoop they should be removed and reapplied after the patient is on the scoop. This ensures the restraints are not caught under the stretcher or the patient.
- Position the scoop to one side of the patient and adjust the length as required.
- Place two halves of the scoop either side of the patient and work inwards, under the patient until the end couplings can be engaged.

## Procedure (continued)

- The scoop can also be applied by log rolling the patient carefully to one side and placing the stretcher one half at a time. Or it can be applied coupled by log rolling the patient completely onto their side then back onto the intact scoop.

**Note:** *The scoop stretcher is to be removed prior to transport for distances > 10 minutes to hospital. If scoop remains in situ pad head with towel or blanket to provide support..*

## Additional information

- Ensure the scoop stretcher is maintained as per manufacturer's guidelines.

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## Authorisation to practice

Use of spider harness



The spider harness is designed to stabilise and secure a patient onto an extrication board or scoop stretcher.

### Indications



- Immobilisation of a patient onto a scoop stretcher or extrication board



### Contraindications

- Nil in this setting



### Complications

- Airway compromise to a patient secured supine that cannot manage his or her own airway



## Procedure

- The spider harness should be applied to all patients that are placed onto a scoop stretcher or extrication board.
- In a suspected spinal injury, one person should maintain head alignment until the head blocks are attached. A cervical collar alone has been shown in numerous studies to be ineffective in maintaining adequate cervical spine immobilisation.
- Place the Spider Straps on top of the patient and lay out the straps.
- Position the top end of the spider straps level with the sternal notch of the patients chest
- Attach the left shoulder strap by placing the strap over the left clavicle and feed through the hand hold under the patients left shoulder and velcro into place.
- Now attach the right shoulder strap by placing the strap over the right clavicle and feed through the hand hold under the patient's right shoulder and velcro into place.
- These first two straps will prevent upward sliding of the patient's body when the board is tilted head down, or when the brakes of the vehicle are applied during transport.
- Attach the chest straps by placing the straps under the patient's armpits and feed through the hand hold and velcro into place.
- This strap will assist in reducing lateral chest movement.
- Position the pelvic straps across the patient's pelvis.

## Procedure (*continued*)

- Attach the pelvic straps by placing the straps over the pelvic bone and feed through the pelvic hand hold and velcro into place. Ensure that the strap goes over the pelvic bone rather than the soft abdomen; otherwise abdominal organ damage may occur.
- This strap will help prevent lateral movement of the spine.
- Place the femur strap across the patient's femur, and feed through the femur hand holds and velcro into place.
- Place the lower leg straps across the patient's lower legs, feed through the lower leg hand holds and secure.
- This strap will assist in reducing lateral leg movement.
- Once the patient's body is secured properly to the board, **ONLY THEN** is the patient's head immobilised to the board using the head immobilisation device or rolled blankets/towels on each side of the head.

## Additional information

- Ensure the Velcro is securely fastened prior to lifting as per manufacturer's guidelines.
- The patient can now be log-rolled, tilted, vertically or horizontally etc. with almost no movement to the body and spinal column until an x-ray can confirm or exclude the presence of an unstable spinal injury.
- Have the suction device ready at the patient's head.



[Home](#)**Authorisation to practice**

Use of vacuum splints



Vacuum splints are used to provide immobilisation and support to extremity injuries.

**Indications**

- Suspected fractures and dislocation of arms, legs, or joints

**Contraindications**

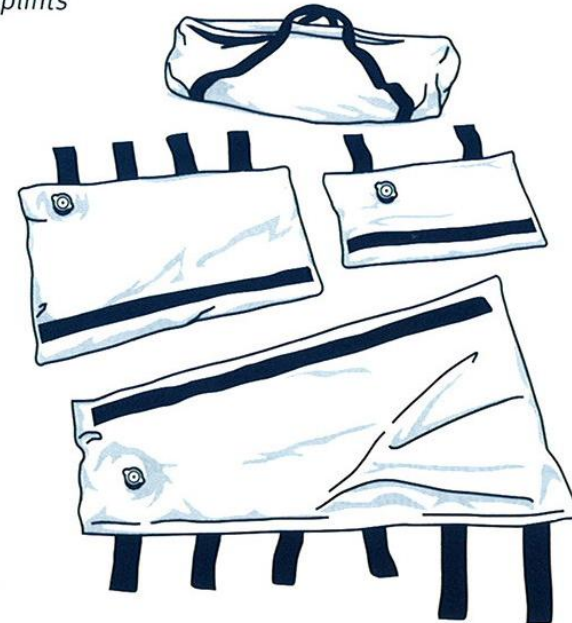
- Nil in this setting

**Complications**

- Vacuum splints may require further extraction of air to maintain rigidity during aeromedical transport

**Types of vacuum splints**

- Two types of vacuum splint remain in use within SJANT. Whether the valve remains open, or is required to be closed for air extraction, changes depending on the type. Additionally, it should be noted that the extraction pumps are not interchangeable between splint types.
- The type of splint and matching pump must be examined as part of each pre-shift equipment check.
- If the pump fails, the wall suctioning unit and tubing in the vehicle can be used to help extricate air from the vacuum splint.

*Vacuum splints*

## Procedure

- Explain procedure to the patient and gain consent.
- Open air valve fully to ensure the splint is flexible. Close the valve or leave open, depending on the splint used.
- Place affected limb or body part carefully into the splint, moulding the splint to the contours of the body.
- Secure the Velcro straps.
- Ensure the valve is in the appropriate position and then connect outlet pipe to the valve.
- Extract air using the pump until the splint becomes rigid.
- Disconnect the outlet pipe.
- Re-adjust Velcro straps if required.
- Check distal circulation regularly. Applying a pulse oximeter probe to a distal extremity affords a level of continued monitoring.

## Additional information

- In the setting of a suspected pelvic fracture and femur fracture, a full leg vacuum splint takes precedence over a traction splint, as it allows concentrated management of the suspected pelvic fracture with a pelvic binder.
- At times it may be appropriate to reduce and realign fractures prior to splinting, but this must be done with care so as not to open a closed fracture.
- A large vacuum splint can be used to manage spinal precautions in small children, employing it in a similar fashion as a vacuum mattress for adults.

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# 10 - Other

- 01 - [Clinical consultation](#)
- 02 - [Clinical handover](#)
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## Authorisation to practice

Clinical consultation



The pre-hospital environment poses many clinical challenges to practicing paramedics. When faced with these challenges it may be appropriate to seek clarity with an appropriate medical officer.

### Indications



- Prior to administration of certain drugs
- To gain clarity of a medical condition, or planned treatment pathway



### Contraindications

- Nil in this setting



### Precautions

- As a medical officer is providing guidance or advice without actually sighting the patient, a professional approach is required to give the medical officer confidence in the information provided

### Additional information

- Clinical consultation is not asking permission. It is gaining another opinion on a treatment option that in the paramedic's clinical judgement is determined appropriate.
- All consultation for **out of scope practice** must only be obtained from the on-call SJANT Medical Officer or nominated delegate.
- The receiving hospital must also be pre-notified.
- An attempt at a clinical consultation and any subsequent advice given must be added in the consultation section of the ePCR, which requires the name and contact details of the medical officer.

### Procedure: notification

"My name is \_\_\_\_\_ and I'm a Para/ICP with the ambulance service. I'm phoning with a notification.

I have a \_\_\_\_ year old male/female patient with \_\_\_\_\_.  
Treatment to this point has involved \_\_\_\_\_ and current vital signs are \_\_\_\_\_.

I have administered/performed \_\_\_\_\_.

Our ETA is \_\_\_\_\_ minutes."

*This format may be adapted dependant on who the notification is with. Primarily notification will be performed with a receiving facility, triage nurse, or appropriate SJANT Medical Director.*

### Procedure: consult

"My name is \_\_\_\_\_ and I'm a Para /ICP with the ambulance service. I'm phoning with a clinical consult.

I have a \_\_\_\_ year old male/female patient with \_\_\_\_\_.  
Treatment to this point has involved \_\_\_\_\_ and current vital signs are \_\_\_\_\_.

I would like to administer / perform / seek advice regarding \_\_\_\_\_.

*Do you feel this is appropriate? Is there anything else you would suggest?*

*Can I confirm that you would like me to \_\_\_\_\_? Thank you."*

*This format may be adapted depending on who the clinical consultation is with. Primarily a consult will be performed with the on-call SJANT medical officer in the first instance. However in occasional situations, it may be appropriate to consult with a receiving facility medical officer, NTCC, or the SJANT Medical Director.*

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### Authorisation to practice

Clinical handover



Clinical handover is a synopsis of SJANT assessment and treatment provided to medical staff responsible for the continued management and care of a patient.

### Indications



- Patients transported by SJANT to a medical facility

### Contraindications



- Nil in this setting

### Precautions



- A clinical handover must accurately and succinctly convey pertinent case details and any treatment or management received by the patient (IMIST – AMBO)
- In an emergency situation treatment decisions may be guided by the information provided in a clinical handover

## Procedure

The mnemonic IMIST-AMBO has been developed as a guide to assist in the delivery of a clear, concise handover:

<b>I:</b> Identification	Patient's name and age
<b>M:</b> Mechanism/medical complaint	What is the mechanism of injury or presenting problem?
<b>I:</b> Injuries/information relative to complaint	Patient assessment and history relevant to complaint
<b>S:</b> Signs	Vital signs and GCS
<b>T:</b> Treatment and trends	Interventions and response to treatment
<b>A:</b> Allergies	What is the patient allergic to?
<b>M:</b> Medications	What are the regular medications? Are the medications present?
<b>B:</b> Background	Medical history
<b>O:</b> Other issues	Characteristics of the scene Social situation Advanced health care directive Belongings or valuables

## Additional information

- A handover should be delivered at an appropriate time. This may often be after the patient is transferred from the stretcher. The handover should be delivered to appropriate medical staff.
- For a resuscitation patient, the generally accepted time to deliver a complete handover is when the patient is transferred to the hospital bed. Whether the handover is delivered to the ED team in general, or to one or two specific medical staff is often a preference of the specific medical facility. It is for the paramedic to be flexible with this regard and present their handover accordingly.



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## Authorisation to practice

Emergency evacuation from home dialysis



Some dialysis patients have equipment available allowing their dialysis treatment to occur at home. There are two forms of dialysis – *haemodialysis* and *peritoneal dialysis*.

### Haemodialysis:

In haemodialysis, blood is pumped from the body through special tubing into a dialysis machine. This machine removes waste products and excess fluid from the blood and, as such, acts as a type of artificial kidney. The blood passes through a dialyser (filter), which also assists in balancing fluid, minerals and chemicals in the blood. The machine then returns the filtered and cleansed blood to the body at the same rate as which it is removed.

### Peritoneal dialysis:

Peritoneal dialysis also replaces lost kidney function. However, instead of filtering the blood and removing excess fluid via an external machine, peritoneal dialysis uses the peritoneal membrane in the body itself as a filter. This membrane is a fine layer of tissue lining the peritoneal cavity. Its rich vascular supply makes the peritoneal membrane ideal for filtering wastes and excess fluid from the blood.

## Indications



- Emergency evacuation of a patient undergoing dialysis treatment at home

## Contraindications



- Nil in this setting

## Complications



- Haemorrhage

## Procedure

- Don gloves.
- Turn equipment off at the machine ON/OFF switch.
- Clamp cannula tubing both sides of the dialysis machine connection, with either artery forceps or available clamps.
- Disconnect patient at the connection, protected either side by the clamps.
- Where possible, flush tubing and cannula with 10 millilitres of sterile normal saline 0.9%.
- Cap cannula end and remove the patient.

### Arterio-venous fistula (AV fistula – cannulated)

- Cannulae can be left in situ allowing IV access for drug administration without further damage to veins. This also reduces risk of fistula damage, haemorrhage and infection.
- The fistula, cannula and blood line can be separated, bunged off and flushed with saline as per emergency evacuation procedure.
- Apply a firm dressing and bandage to the cannula site.
- Elevate limb and remove the patient.

## Additional information

- If possible, transport to an emergency department at a receiving facility capable of dialysis.
- The patients or their carers are usually more experienced in this process and their advice should be sought, if available.

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### Authorisation to practice

Gastric intubation

ICP

Gastric intubation involves placement of a tube into the stomach via the naso/oropharynx or LMA Supreme.

### Indications



- Relieve stomach distention
- Remove fluid from the stomach
- Aeromedical evacuation

### Contraindications



- Conscious patient

### Precautions



- Tracheal placement

## Procedure

- Select appropriate sized tube:
  - < 4 years 12 Fg
  - ≥ 4 years 14 Fg
- Length to be inserted is measured from nose to ear and then to the xiphisternum.
- Mark this length with tape around tube.
- Insert into nostril or oral cavity and advance into oesophagus to pre-measured length. ETT tube should be placed first when indicated.
- Check correct placement of tube by aspirating stomach contents via a 50 mL syringe and/or auscultating epigastrium whilst injecting 10 mL of air into the stomach.

## Additional information

- Laryngoscopy and McGills forceps may be required to assist placement.
- Orogastric intubation may be more appropriate in children.

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## Authorisation to practice

Sedation and procedural sedation

ICP

Sedation refers to an individual having a reduced awareness of their environment and/or a decreased level of consciousness, which has been drug-induced. It can be classified into the following levels:

- **Minimal sedation:** anxiolysis only with no depression of consciousness level
- **Moderate sedation:** a depressed level of consciousness with a purposeful response to verbal commands or light touch;
- **Deep sedation:** a depressed level of consciousness with a purposeful response only to intense painful stimuli. This level of sedation may depress airway reflexes and produce respiratory depression;
- **General anaesthesia:** unconscious and has no purposeful response to stimulation; airway and cardiorespiratory function may become profoundly depressed.

Generally, *moderate sedation* will be optimal in most situations. *Deep sedation* is to be avoided as it is unnecessary in the pre-hospital environment. Most, if not all, patients in the pre-hospital setting are not fasted and are therefore at a greater risk of aspiration.

## Indications



- Severely agitated patients
- Agitated head injuries to facilitate assessment and treatment
- Patients with trauma requiring fracture reduction, splinting or extrication distressed and agitated by pain despite appropriate morphine administration
- Procedures (e.g. TCP or cardioversion)
- Ketamine disinhibition or agitated emergence
- Maintenance of an established and patent ETT



## Contraindications

- Patients with current airway compromise where securing the airway will be difficult
- Facilitation of tracheal intubation



## Precautions

The induction of sedation by the clinician requires **CAREFUL ATTENTION** to all aspects of risk assessment and close adherence to accepted clinical guidelines.

The **risks** associated with sedation include:-

- potential for unintentional loss of consciousness;
- depressed airway reflexes;
- unpredictable responses due to drug effects and/or interactions;
- depressed cardiovascular system;
- inadequate analgesia;
- individual variations in responses and dosage requirements.

## Procedure

- Obtain a detailed history with particular attention to:
  - co-morbidities
  - previous anaesthetics
  - current medications
  - fasting status
  - drug use
  - drug allergies
- The patient should be thoroughly examined, especially focusing on:
  - vital signs
  - mental status
  - cardio-respiratory assessments

## Procedure (*continued*)

- Eliminate other factors that precipitate the need for sedation, such as:
  - hypoglycaemia
  - negotiation or conflict resolution
  - basic pain relief measures
- Prior to, or as soon as practical after sedation, patients are to have the following vital signs monitored continuously **AND** recorded on the :
  - SpO<sub>2</sub>
  - EtCO<sub>2</sub>
  - BP
  - ECG
- Assess the patient's airway and ventilation:
  - an attempt should be made to assess the patient's airway to establish the difficulty of obtaining and maintaining a patent airway should this be required;
  - assess whether the patient can be ventilated should this be required following sedation.
- Assess and ensure adequacy of breathing and perfusion.
- Obtain IV access. If this cannot be established due to severe agitation, then consideration may be given to the IM route where indicated in the relevant DTP, until a level of sedation is achieved that will permit safe intravenous access.
- Carry out sedation as per relevant indication and DTP.
- All patients who are sedated are to be managed in the lateral position unless an alternative position is required for the performance of a procedure, or they are intubated.

### Additional information

#### Airway management:

- Airway control and ventilation status is paramount with all sedative procedures and should remain the responsibility of the treating ICP.
- Under no circumstances is sedation to be performed to facilitate tracheal intubation.

#### Sedation of severely agitated patients:

- The aim of sedation in severely agitated patients is to ensure the safety of both the patient and officers, and ensuring a safe transfer to medical care.
- Prior to sedating a severely agitated patient, clinicians are to attempt de-escalation strategies.
- Clinicians are to ensure that, when considering sedation for an agitated patient, the procedure can be performed safely, cognisant of all risks.

#### Agitated patients who are restrained:

- **All patients who are being restrained in the prone position present a very high risk situation.** At the earliest possible time, the patient must be removed from the prone position and placed in a lateral position. **Close attention to the maintenance of airway and ventilation must occur at all times.**
- Any pressure currently being exerted against the patient's chest or neck to facilitate restraint must be eased during and following administration of sedation, considering the risk to the patient and others.
- If not already in attendance, NTPOL are to be called to assist in all occasions where a patient requires physical restraint.

#### Sedation to facilitate the safe assessment, treatment and transport of agitated head injuries

- Sedation for patients with head injuries **must** only be undertaken if the patient is agitated and it is used to facilitate assessment, treatment and the safe transfer to medical care.
- Close attention to adequacy of oxygenation and blood pressure is paramount in the setting of a head injury.
- All sedated patients must have oxygen applied and be considered for intravenous fluids.

#### Ketamine disinhibition:

- A small number of patients will develop a disinhibited state, due to marked changes in perception secondary to dissociation. This must not be confused with the transient hyper-tonicity and nystagmus that occurs with administration of ketamine.
- Initial management of the disinhibition should be reassurance and calming words to the patient. An attempt to reduce external stimulation should be made until the correct level of sedation is achieved. Failing this, administration of midazolam should be undertaken.
- Further ketamine administration may occur if required once the patient's state has settled.

**Ketamine agitated emergence:**

- Approximately 5 – 10 per cent of patients administered ketamine will be affected by emergence. In the majority of patients the symptoms will be mild.
- The effects of emergence can be mitigated by a quiet calm environment with reduced light. This requires the patients to be very closely monitored, especially for EtCO<sub>2</sub> – which will provide objective evidence of breathing patterns and pre-empt any reduction in oxygen saturation. For patients with more significant agitated emergence symptoms, the use of small doses of midazolam may be required. There is no role for prophylactic midazolam use in the SJANT practice.
- Under no circumstances is sedation to be performed to facilitate tracheal intubation.



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### Authorisation to practice

Intubation facilitated by sedation

ICP

### Intubation facilitated by sedation

- As per general preparation for intubation
- Pre-hydrate with 10mL/Kg normal saline 0.9% IVI unless APO
- If the patient is hypotensive and/or tachycardic, follow normal ETT process

### Indications



- GCS < 10
- Respiratory failure
  - Unresponsive to non-invasive ventilation and drug therapy
- Diabetic ketoacidosis with BGL reading "High"



### Contraindications

- Clinical situations where failed intubation drill would not be feasible
- No functional electronic capnography/capnometry
- Patients indicated for RSI
- Facilitation of tracheal intubation



### Precautions

- Anticipation of a difficult intubation, e.g. morbid obesity, short neck or facial
- Anticipation of difficulty with BVM/LMA ventilation
- If transport time < 10 minutes

### Special notes

- Sedation doses for IFS/RSI are based on initial observations, initial fluid challenges may resolve tachycardia and/or hypotension, however the patient is still at a risk of cardiovascular compromise and the blood pressure must be supported.
  - Half doses (or less) of sedation are required in this situation
- In patients with extremely poor perfusion, treat with fluid therapy and consider adrenaline infusion concurrent with IFS
  - Consider quarter doses of sedation
- Frail, elderly or hypotensive patients have prolonged circulation times, allow for this when administering a second dose of sedation during IFS

### Dosages IFS

Age < 60	Dose	Fentanyl IV	Midazolam IV
SBP > 100	Half	50 mcg	0.05 mg/ kg (max 5 mg)
SBP >100	Full	100 mcg	0.1 mg/Kg (max 10 mg)
Age > 60	Half dose for <i>All</i>	50 mcg	0.05 mg/Kg (max 5 mg)