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| **Practical Procedures: Central Line Insertion - Internal Jugular approach** |
| **­­**Central line insertion should be real-time ultrasound guidedInternal jugular is preferred to subclavian where possible as it is less likely to lead to pneumothorax**Indications for central line Insertion:*** Administration of medications that require central access e.g. amiodarone, inotropes, high concentration electrolytes
* Fluid balance monitoring with CVP
* Intravenous access (long term or difficult peripherally)

**Complications associated with insertion:*** Haemothorax
* Pneumothorax
* Haematoma
* Inadvertant arterial puncture
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| **Equipment required:*** Ultrasound and sterile ultrasound sheath
* Sterile trolley
* Sterile field, gloves, gown and mask
* Seldinger central line kit
* Saline flush
* Chlorhexidine
* Lignocaine
* Suture
* Scalpel
* Sterile dressing
* Pressure bag to attach to monitoring
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| **Contraindications to procedure:*** Coagulopathy
* Local infection
* Avoid in raised intracranial pressure- aim for a femoral approach if required
* Patient non compliance
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| **Pre Procedure:*** Consent patient if conscious otherwise document why the procedure is in the patients best interests
* Consent should include:
	+ Infection, bleeding (arterial puncture, haematoma, haemothorax), pain, failure, damage to surrounding structres (including pneumothorax), thrombosis.
* Set up sterile trolley
* Position patient with head down if they can tolerate it, with head facing away from side of insertion
	+ This ensures maximum venous filling
* Ultrasound area to define anatomy
* Having a nurse or assistant is helpful
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| **The Procedure:*** Wash hands and don sterile gown and gloves
* Clean the area and apply sterile field
* Apply sterile sheath to the ultrasound probe
* Confirm anatomy
* Under ultrasound guidance insert lignocaine cutaneously, subcutaneously and around internal jugular.
* Whilst lignocaine has time to work flush all lumens of the line and then clamp all lumens except the Seldinger port
* Ensure caps are available for the lumens
* Under ultrasound guidance take Seldinger needle attached to syringe and insert into the internal jugular vein.
* When blood is freely aspirated remove syringe and inset Seldinger wire. This should pass easily.
* Use scalpel to make an incision in the skin
* Pass the dilator over the wire and gently but firmly dilate a tract through to the internal jugular.
* Remove the dilator and pass the central line over the Seldinger wire, do not advance the line until you have hold of the end of the wire.
* Remove the wire
* Aspirate and flush all lumens and re clamp and apply lumen caps
* Suture the line to allow 4 points of fixation
* Dress with a clear dressing so the insertion point can be clearly seen
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| **Post Procedure:*** Attach central line to pressure bag to allow CVP monitoring
	+ Nursing staff can show you how to do this or will do it for you
* Run a blood gas to ensure a venous sample
* Chest x-ray to confirm placement and to check for pneumothorax
* Clear documentation of date of insertion and monitor for infection
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| **In the event of failure:*** Stop procedure
* Seek senior help
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| **Top Tips for central line insertion:*** Central lines can have multiple lumens. Most commonly 3,4 and 5 lumen lines are inserted. Confirm what the line will be used for and how many infusions a patient has to aid your selection of the line with the correct amount of lumens
* Always ensure you are happy with your anatomy before commencing the procedure
* Ensure your sterile trolley is well set up with the kit lined up in the order you will use things and a clear area for sharps. This will make your life easier.
* NEVER LET GO OF THE SELDINGER WIRE!
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N.B. The Seldinger central line kit should contain the line, Seldinger wire, dilator, Seldinger needle and syringe, scalpel and suture point fixation.