LOG BOOK

Updating Clinical Skills

Good Intern Skills Programme (Phase II)

2022

Name: Dr.

Hospital:

Personal Details :

Name : ……

Contact Details:

Address: …….. ……. ……
……
……

Phone No(Tele/Mobile): ……

Email Address ……

Name of Consultant Anesthetist : ……

Name of Consultant Physician :……

(To be filled by the Pre-intern Doctor)

Name of the Pre Intern Doctor …….
(Should write in the block capitals; this name will appear in your certificate)

Name of the Consultant Anesthetist: ……..

Name of the Institution : …….

Signature: ……..

Date :

And/or

Name of the Consultant Physician: ……

Name of the Institution : ……

Signature: ……..

Date :

Skills needed	Desirability	Competency	Signature	Designation
Cannulation	Essential	1/2/3/4		
NG tube insertion	Essential	1/2/3/4		
Catheterization	Essential	1/2/3/4		
Setting up an IV drip	Essential	1/2/3/4		
Infusion pump setup	Essential	1/2/3/4		
Blood and blood products Transfusion	Essential	1/2/3/4		
Venepuncture	Essential	1/2/3/4		
Venepuncture for blood culture	Essential	1/2/3/4		
Pleural tap	Essential	1/2/3/4		
Peritoneal Tap	Essential	1/2/3/4		
Removal of an Intercostal Tube	Essential	1/2/3/4		
Injections-SC/IM	Essential	1/2/3/4		
Lumbar Puncture	Essential	1/2/3/4		
GCS monitoring	Essential	1/2/3/4		
CPR	Essential	1/2/3/4		
Defibrillation	Desirable	1/2/3/4		

Arterial puncture and ABG	Essential	1/2/3/4		
Wound dressing	Essential	1/2/3/4		
Suturing	Essential	1/2/3/4		
Suture removal	Essential	1/2/3/4		
Bandaging	Essential	1/2/3/4		
Venous cut down	Desirable	1/2/3/4		
Glucometer	Essential	1/2/3/4		
Nebulization	Essential	1/2/3/4		
Connecting to a ECGmonitor	Essential	1/2/3/4		
Intubation	Desirable	1/2/3/4		
Airway maneuvers	Essential	1/2/3/4		
CVP line insertion	Desirable	1/2/3/4		
IC tube insertion	Desirable	1/2/3/4		

Level of competence	Level of competence abbreviation
Performs skill competently without supervision	**1**
Performs skill competently with supervision	**2**
Not able to perform skill but has observed skill in this period	**3**
Not able to perform skill and not observed skill in this period	**4**

Name of the Pre Intern Doctor …….
(Should write in the block capitals; this name will appear in your certificate)

Name of the Consultant Anesthetist: ……..
Name of the Institution : ……
Signature: ……..
Date :

And/or

Name of the Consultant Physician: ……
Name of the Institution : ……
Signature: ……..
Date :

Intravenous Cannulation

There are different colours of cannulas. Different cannulas have different flow rates. Therefore the usage of cannula depends on the type of the disease, as the condition of the patient.

In normal circumstances we use 22G cannulas for adults and 24G cannula to cannulation for children
IV cannulation should be done under absolute sterile condition otherwise it can leads to sepsis.

	Cannula Specifications						
Gauge	14	16	17	18	20	22	24
Colour	Orange	Grey	White	Green	Pink	Blue	Yellow
Length (mm)	45	45	45	45	32	25	19
Flow rate	240	180	142	90	60	36	20

Steps of IV cannulation

Introduce yourself to the patient and clarify the patient's identity. Explain the procedure to the patient and gain informed consent to continue. It is also worth explaining that cannulation may cause some discomfort but that it will be short lived.

-  Introduce yourself to the patient

 Ensure that you have all of your equipment ready as follows:

- alcohol gel
- gloves
- an alcohol wipe
- a disposable tourniquet
- an IV cannula
- a suitable plaster
- a syringe
- saline
- a sharps bin (not pictured)

 Sanitise your hands using alcohol cleanser.

- Sanitise your hands using alcohol cleanser

 Position the arm so that it is comfortable for the patient and identify a vein.

 Apply the tourniquet and re-check the vein.


Apply the tourniquet


Re-check the vein

 Put on your gloves, clean the patient's skin with the alcohol wipe and let it dry.

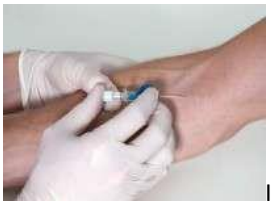
 Clean the patients skin with the alcohol wipe

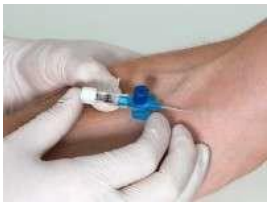
 Remove the cannula from its packaging and remove the needle cover ensuring not to touch the needle.

 Remove the needle cover

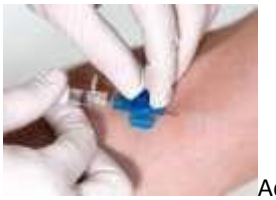
 Stretch the skin distally and tell the patient to expect a sharp scratch.

 Insert the needle, bevel upwards at about 30 degrees. Advance the needle until a flashback of blood is seen in the hub at the back of the cannula

 Insert the needle, bevel upwards at about 30 degrees

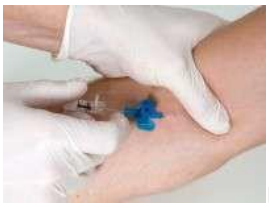
 Flashback of blood is seen in the hub

 Once this is seen, progress the entire cannula a further 2mm, then fix the needle, advancing the rest of the cannula into the vein.

 Advance the rest of the cannula into the vein

 Release the tourniquet, apply pressure to the vein at the tip of the cannula and remove the needle fully. Remove the cap from the needle and put this on the end of the cannula.

 Release the tourniquet

 Remove the needle

 Carefully dispose of the needle into the sharps box.

 Apply the dressing to the cannula to fix it in place and ensure that the date sticker has been completed and applied.

 Apply the plaster to the cannula

 Check that the use-by date on the saline has not passed. If the date is ok, fill the syringe with saline and flush it through the cannula to check for patency. If there is any resistance, if it causes any pain, or you notice any localised tissue swelling; immediately stop flushing, remove the cannula and start again.

 Dispose of your gloves and equipment in the clinical waste bin, ensure the patient is comfortable and thank them

Complications of IV cannulation

Serious complications related to peripheral IV canulations are uncommon, but problems can occur with prolong use. Therefore there are guidelines different hospitals about the recommended duration for a peripheral IV that should be place.
Every ward round you should observe the cannula site and look for early detection of cannula site problems.
The complications are as below.

Phlebitis
In phlebitis the inflammation causes localized redness and warmth at cannula site a short distance along the course of the vein in which the IV has been placed. Most times, phlebitis is *no more than a minor inconvenience*.

Thrombophlebitis
Addition to the inflammation there is a activation of clotting mechanism which causes thrombus formation in the cannula tip area. You can feel a hardened area in the vein corresponding to the clot

Treatment - Treatment of phlebitis and thrombophlebitis is to relief of the symptoms including: pain, or local heat.

Septic Thrombophlebitis

In more serious cases the vein can become infected. This is a rare condition, known as septic phlebitis or septic thrombophlebitis, which can spread infection throughout the body via the bloodstream.
One sign of infection is the presence of enlarged lymph nodes under the arm on the affected side. This can occur with simple phlebitis but should cause you to seek medical attention, especially if you have a fever and feel generally unwell.
Treatment - If you suspect an infected vein hospitalization may be needed and antibiotics will be used to control the bacterial infection.

Local Infection

In any case where there is an open wound on the body, disrupting the protective lining of skin, an infection can occur. A microscopic organism may use the tiny hole in the skin created by the IV catheter to find its way into the body, and cause an infection. Common signs of local infection ("abscess") include a large lump that is painful and hot to touch.

Treatment - If you suspect an infection, Antibiotics may be used to control the bacterial infection.

Infiltration

This occurs when the catheter unintentionally enters the tissue surrounding the blood vessel. In this case the IV fluid and associated medications will go into the tissues and there will be a lump where the IV has been inserted. It would be cool to touch (this differentiates it from inflammation due to infection, which is warm to the touch).

Treatment -Infiltrated IVs are not a big problem usually unless the medication being administered is very irritant, such as certain chemotherapy and circulatory medicines. The intravenous infusion must be stopped, obviously, to avoid putting any more fluid or medication into the tissues. Another IV may need to be started elsewhere.

Hematoma

A hematoma is a collection of blood caused by internal bleeding. This happens when the catheter punctures through the vein and causes a hematoma. Hematomas generally occur with unsuccessful IV insertion but can also happen when an IV is taken out. This is why pressure must be applied to the insertion site, to try to make the hematoma as small as possible. A hematoma may appear as a visible bruise or a lump.

Treatment - A hematoma normally recovers over time (a few hours or days) without treatment.

Nerve Damage

It is also possible for the IV needle to penetrate and injure a nerve, and for bruising and bleeding to irritate a nerve. If you feel a sudden sharp pain radiating along the arm as the IV is inserted, it may be a sign of canula contact with a nerve.

Treatment - Nerve damage tends to repair itself in a few weeks to a few months. If you suspect a nerve injury contact your doctor. In rare instances (such as persistent weakness) specific treatment, even surgery, may become necessary

(Article from Gareth S Kantor, MD Assistant Professor of Anesthesiology School of Medicine Case Western Reserve University)

Perform Intravenous Cannulation

Date:

Place:

Portfolio writing.

NG TUBE INSERTION

Indications

There are 2 indications for NG intubation one is for diagnostic purposes and the other ones is for therapeutic indications

Diagnostic indications for NG intubation:

- To aspiration of gastric fluid content
- To Identification of the esophagus and stomach on a chest radiograph
- To Administration of radiographic contrast to the GI tract
- To evaluation of upper gastrointestinal (GI) bleeding

Therapeutic indications for NG intubation

- For bowel resting
- To Aspirate gastric contents after ingestion of toxic substances
- Gastric decompression, including maintenance of a decompressed state after ET tube insertion, often via the oropharynx
- Releif symptoms due to small bowl obstruction
- For feeding
- For administer drugs
- For Bowel irrigation
- To present aspiration

Contraindications
There are some absolute and relative contraindications for NG intubation

Absolute contraindications:

- Resent nasal operation
- Severe trauma to face and throat

Relative contraindications

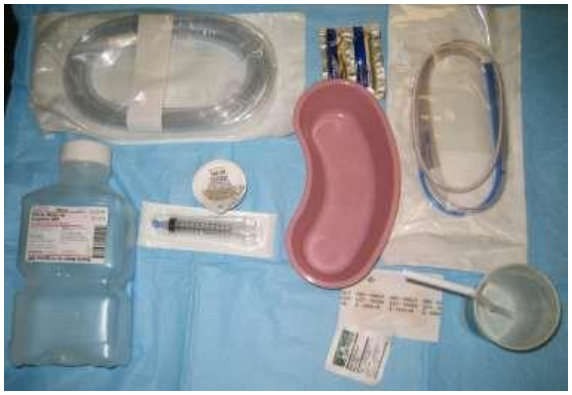
- Bleeding manifestations
- Alkaline ingestion
- Esophageal varices or stricture
- Recent banding or cautery of esophageal varices

Instruments
Equipment

The following equipment is needed for NG intubation (see the image below):

- NG tube (for adult patients) - 16-18 French
- NG tube (for pediatric patients) - In pediatric patients, the correct tube size varies with the patient's age; to find the correct size (in French), add 16 to the patient's age in years and then divide by 2, so that for an 8-year-old child, for example, the correct size is 12 French ([8 + 16]/2 = 12)
- Viscous lidocaine 2%
- Oral analgesic spray (benzocaine spray or other)
- Syringe, 10 mL
- Glass of water with a straw

- Water-based lubricant
- Toomey syringe, 60 mL
- Tape
- Emesis basin or plastic bag
- Wall suction, set to low intermittent suction
- Suction tubing and containerEquipment for nasogastric intubation.



Technique

Explain the procedure, benefits, risks, complications, and alternatives to the patient or the patient's representative.

Examine the patient's nostril for septal deviation. To determine which nostril is more patent, ask the patient to occlude each nostril and breathe through the other.

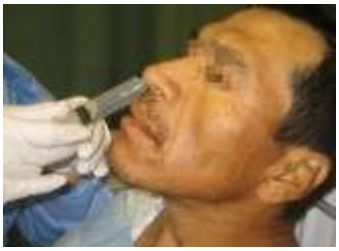
Instill 10 mL of viscous lidocaine 2% (for oral use) down the more patent nostril with the head tilted backwards (see the images below), and ask the patient to sniff and swallow to anesthetize the nasal and oropharyngeal mucosa. In pediatric patients, do not exceed 4 mg/kg of lidocaine. Wait 5-10 minutes to ensure adequate anesthetic effect.

Aspiration of viscous lidocaine into a syringe.Instillation of viscous lidocaine 2%.

Estimate the length of insertion by measuring the distance from the tip of the nose, around the ear, and down to just below the left costal margin. This point can be marked with a piece of tape on the tube. When using the Salem sump nasogastric (NG) tube (Kendall, Mansfield, Mass) in adults, the estimated length usually falls between the second and third preprinted black lines on the tube (see the image below).

Estimation of nasogastric tube length from nostril to stomach.

Position the patient sitting upright with the neck partially flexed. Ask the patient to hold the cup of water in his or her hand and put the straw in his or her mouth. Lubricate the distal tip of the NG tube (see the image below).



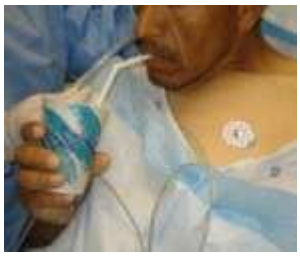
Nasogastric tube lubrication with water-based lubricant.

Gently insert the NG tube along the floor of the nose, and advance it parallel to the nasal floor (ie, directly perpendicular to the patient's head, not angled up into the nose) until it reaches the back of the nasopharynx, where resistance will be met (10-20 cm). At this time, ask the patient to sip on the water through the straw and start to swallow (see the image below). Continue to advance the NG tube until the distance of the previously estimated length is reached (see the video below).

Patient flexing his neck and drinking water while a nasogastric tube is inserted.

Nasogastric tube insertion.

Stop advancing the tube and completely withdraw it if, at any time, the patient experiences respiratory distress, is unable to speak, has significant nasal hemorrhage, or if the tube meets significant resistance.

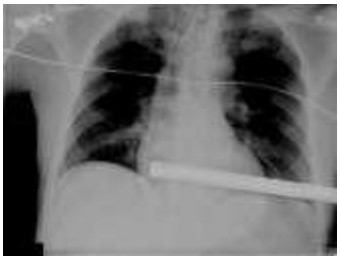


Verify proper placement of the NG tube by auscultating a rush of air over the stomach using the 60 mL Toomey syringe (see the first image below) or by aspirating gastric content. The authors recommend always obtaining a chest radiograph (see the second image below) in order to verify correct placement, especially if the NG tube is to be used for medication or food administration.

Auscultation over the stomach.

Nasogastric tube in lung.

Apply benzoin or another skin preparation solution to the nose bridge. Tape the NG tube to the nose to secure it in place (see the image below). If clinically indicated, attach the tube to wall suction after verification of correct placement.



Portfolio writing on Insertion of NG tube

Date

Catheterization

Indications for indwelling catheters

- *Acute urinary retention*: e.g., due to medication (anesthesia, opioids, paralytics), or nerve injury
- *Acute bladder outlet obstruction*: e.g., due to severe prostate enlargement, blood clots, or urethral compression
- Need for *accurate measurements of urinary output in the critically ill*
- To assist in healing of *open sacral or perineal wounds in incontinent patients*
- *To improve comfort for end of life*, if needed
- *Patient requires strict prolonged immobilization* (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fracture)
- Selected peri-operative needs:
    - Urologic surgery or other surgery on contiguous (adjacent) structures of the genitourinary tract
    - Anticipated prolonged duration of surgery (Note: catheters placed for this reason should be removed in PACU)
    - Large volume infusions or diuretics anticipated during surgery
    - Need for intraoperative monitoring of urinary output

Contra Indicaitons for Urinary catheterization

urethral trauma.. (If one finds blood at the meatus of the urethra, a scrotal hematoma, a pelvic fracture, or a high riding prostate then a high suspicion of urethral tear is present.)

Indwelling catheterization is an invasive procedure . therefore it should be when only when it is indicated. Never use indwelling catheter to prevent the patient from mobilizing and never use for urinary incontinence. For urinary incontinence can use a condemn catheter.

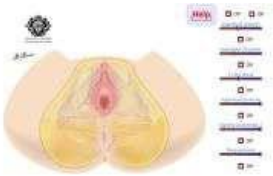
Equipment for indwelling catheterization

Sterile gloves - consider Universal Precautions
Sterile drapes
Cleansing solution e.g. Savlon
Cotton swabs
Forceps
Sterile water (usually 10 cc)
Foley catheter (usually 16-18 French)
Syringe (usually 10 cc)
Lubricant (water based jelly or xylocaine jelly)
Collection bag and tubing

Procedure

Insertion of an urinary catheter
in a female

Insertion of an urinary catheter
in a male



Review the female anatomy
in more detail

Review the male anatomy
in more detail

1. Explain procedure to the patient
2. Assist patient into supine position with legs spread and feet together
3. Open catheterization kit and catheter
4. Prepare sterile field, apply sterile gloves
5. Check balloon for patency.
6. Generously coat the distal portion (2-5 cm) of the catheter with lubricant
7. Apply sterile drape

8. If female, separate labia using non-dominant hand. If male, hold the penis with the non-dominant hand. Maintain hand position until preparing to inflate balloon.
9. Using dominant hand to handle forceps, cleanse peri-urethral mucosa with cleansing solution. Cleanse anterior to posterior, inner to outer, one swipe per swab, discard swab away from sterile field.

10. Pick up catheter with gloved (and still sterile) dominant hand. Hold end of catheter loosely coiled in palm of dominant hand.
11. In the male, lift the penis to a position perpendicular to patient's body and apply light upward traction (with non-dominant hand)
12. Identify the urinary meatus and gently insert until 1 to 2 inches beyond where urine is noted
13. Inflate balloon, using correct amount of sterile liquid (usually 10 cc but check actual balloon size)
14. Gently pull catheter until inflation balloon is snug against bladder neck
15. Connect catheter to drainage system
16. Secure catheter to abdomen or thigh, without tension on tubing
17. Place drainage bag below level of bladder
18. Evaluate catheter function and amount, color, odor, and quality of urine
19. Remove gloves, dispose of equipment appropriately, wash hands
20. Document size of catheter inserted, amount of water in balloon, patient's response to procedure, and assessment of urine

Complications

- tissue trauma and infection.
  (After 48 hours of catheterization, most catheters are colonized with bacteria, thus leading to possible bacteruria and its complications)
- renal inflammation, nephro-cysto-lithiasis, and pyelonephritis if left in for prolonged periods.
- The most common short term complications are inability to insert catheter,
- causation of tissue trauma during the insertion.

The alternatives to urethral catheterization include suprapubic catheterization and external condom catherization

Short note on Catheterization of a Patient

Signature **……..**

Rubber stamp

Designation **Physician/Consultant Anesthetist/Medical officer incharge**

Setting up a IV drip

1. Collection of appropriate equipment
2. Drug chart
3. fluid balance chart patient notes Fluid bag – as on drug chart Giving set –
4. correct one to support the fluid Alcohol wipe Saline flush Drip stand Pair of gloves Plastic tray for equipment
5. Bowl (collects fluid when priming line)
6. Washes hands Introduction:
7. Introduces themselves to patient Explains procedure Gains consent
8. Checks patient identity Checks for allergies
9. Puts on gloves Checking bag of fluid-
10. Checks it is the same fluid and quantity as prescribed on drug chart (and that prescribed properly) Checks it is being given for the right reason and review risk of fluid overload with administration e.g. heart failure
11. Checks if any additives required Checks bag in date Checks bag has not been tampered with / no leaks Checks for bag contaminants
12. Connecting fluid to giving set:
13. Removes fluid bag from its outer casing
14. Removes giving set from bag – checks in date and closes valve Removes cap from fluid bag and inserts giving set spike
15. while maintaining aseptic technique Places fluid bag on drip stand
16. Squeezes giving set chamber until filled halfway with fluid
17. Primes the line by slowly opening valve to allow fluid to fill the line and drip into a bowl.
18. Checks no bubbles in line.
19. Preparing cannula port:
20. Wipes port with alcohol wipe
21. Flushes port with saline
22. Connects line to cannula and opens line valve Sets correct drip rate
23. Removes gloves, disposes equipment in clinical waste, washes hands
24. Documents date, start of infusion and batch number on drug chart and fluid chart and comments in patient notes
25. Advises patient to inform them should the infusion begin to cause pain or discomfort and asks if any questions.

Observed the Procedure

Signature of Pre intern **…….**

GUIDELINES ON CLINICAL USE OF BLOOD AND BLOOD COMPONENTS

RED CELL TRANSFUSION

(a) GENERAL RECOMMENDATIONS

Transfusion Triggers

- Haemoglobin 7.0 g//dl for patients without additional risks.
- Haemoglobin 8.0 – 9.0 g//dl for patients over 65 years or with heart/ lung disease
- none of the above but the patient is symptomatic

Dose

Maintain the haemoglobin at the lowest level at which the patient is asymptomatic. In a stable patient with a normal-size spleen, transfusing one *unit of red cells will bring about a 0.7-0.8 g/dL increment in hemoglobin.*

.

(b) SPECIAL RECOMMENDATIONS

1. Anaemia correctable by haematinics *(Iron, B12, Erythropoietin) 20*

Do not transfuse unless significant clinical symptoms of anaemia are present, or if immediate correction is necessary. 20-13

2. Autoimmune haemolytic anaemia

Discuss selection of red cells with the Consultant transfusion physician

3. Thalassaemia/ Sickle Cell Disease

Discuss selection of red cells with the Consultant transfusion physician

4. Intrauterine Transfusions

All units for intrauterine transfusions must be irradiated. Crossmatched against maternal blood sample taken within 48 hours prior to IUT.

5. Neonatal Transfusions

Exchange transfusion - Do not use blood older than 5 days and more than 24h after irradiation. Irradiation is recommended if feasible.

"Top-up" transfusions - Aliquots of blood from the same donor should be used whenever possible.

Irradiate if:

a) Intrauterine transfusions had previously been given

b) The blood was collected from a relative

c) The infant weighs less than 1,500 g if irradiation is feasible.

(c) USE OF O RhD-Negative BLOOD

1. Idealy,

- O Neg patients with anti-D
- O Neg premenopausal women (including pre-pubertal girls)
- O Neg patients who are or are likely to become transfusion dependent

In case of non availability get the advice from CTP

2. Other Indications

Discuss with the Consultant transfusion physician

Use of O Rh D positive blood for O Rh D negative patients: acceptable in emergencies.

Indications for Specialised Blood Components

(a)Leukocyte reduced blood products

Definition: At least 85% of original RBCs < 5 x 106WBCs in 95% of units tested

Indications

1)Prevention of febrile non-hemolytic transfusion reactions (FNHTR)

2)Prevention of alloimmunization to donor HLA antigens

3) Prevention of CMV transmission-CMV virus reside within WBC; leukoreduction reduces risks Transfusion transmitted CMV and Considered equivalent to products collected from CMV seronegative donors ("CMV-safe")

4) Prevention of Transfusion Related immune Modulation(TRIM)-controversial

(b) Washed red blood cells

This is a suspension of RBCs from which most of the plasma, leucocytes and platelets have been removed by washing a unit of red cell concentrate with isotonic saline at + 4 °C. The Htc can vary according to clinical needs, but should remain between 65 and 75%. The product must be stored at + 4 °C (± 2 °C) for as short a period as possible, and transfused within 6 hrs of preparation, when it is produced using the open system.

Indications

1.Patients with IgA deficiency .

2.Prevention of allergic transfusion reactions.

3.Prevention of post-transfusion febrile reactions, present even when leucoreduced RBCs are used.

(c)IRRADIATED BLOOD COMPONENTS

Transfusion-associated graft-versus-host disease (TA-GvHD) is a very rare but usually fatal complication following transfusion of lymphocyte-containing blood components. The risk associated with an individual transfusion depends on the number and viability of contaminating lymphocytes, susceptibility of the recipient's immune system to their engraftment and degree of immunological (HLA) disparity between donor and patient. The minimum number of transfused lymphocytes necessary to provoke a GvHD reaction is unknown and may vary by clinical settings. Until recently, gamma irradiation of cellular blood components has been the mainstay of TA-GvHDprevention.

Indications

1.All recipients of allogeneic haemopoietic stem cell transplantation (SCT) must receive irradiated blood components from the time of initiation of conditioning chemoradiotherapy.

2.Irradiated components should be continued while the patient continues to receive graft-versus-host disease (GvHD) prophylaxis, i.e. usually for 6 months post transplant, or until lymphocytes are >1x109/l. If chronic GvHD is present or if continued immunosuppressive treatment is required, irradiated blood components should be given indefinitely.

3.Allogeneic blood transfused to bone marrow and peripheral blood stem cell donors 7 days prior to or during the harvest should also be irradiated.

4.Patients undergoing bone marrow or peripheral blood stem cell 'harvesting' for future autologous re-infusion should receive irradiated cellular blood components during and for 7 days before the bone marrow/stem cell harvest.

5.All patients undergoing autologous bone marrow transplant or peripheral blood stem cell transplant should receive irradiated cellular blood components from initiation of conditioning chemo/radiotherapy until 3 months post-transplant.

Copy right from Ceylon college of Transfusion physicians srilanka.

Venepuncture

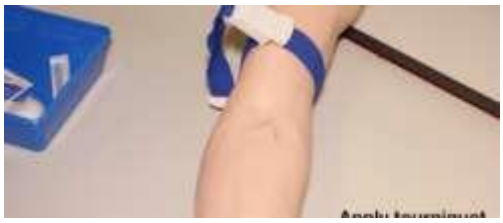
Equipments

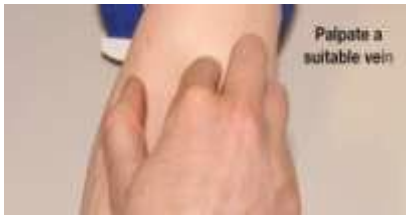
- Needle
- Barrel
- Vacutainer bottles
- Tourniquet
- Alcohol swab
- Cotton wool
- Tape

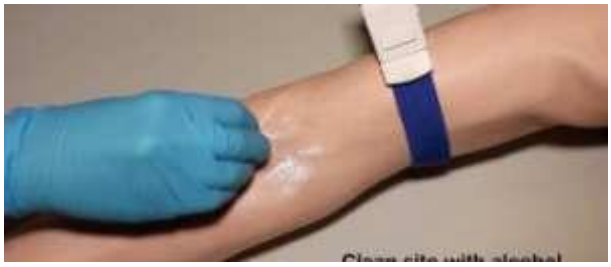
Preparation

Ensure the patient is lying or sitting comfortably- place a pillow under the arm if possible

1. Wash hands
2. Apply tourniquet – *avoid nipping the patients skin*
3. Palpate a vein:
    - The antecubital fossa is usually the best place to go
    - Go for a straight vein you can feel – *ideally it should have a "springy" feel*
    - Avoid areas where veins are joining together – *valves present*
4. Put on gloves
5. Clean the area with an alcohol swab in a circular motion – *30 seconds*
6. Screw the needle into the barrel







Insertion of the needle

7. Unsheathe the needle
8. Anchor the vein from below with your non-dominant hand
9. Warn the patient of a sharp scratch
10. Insert the needle through the skin at 20-40 degrees– *ensure bevel is upwards*
11. You should feel a slight give as the needle enters the vein
12. Lower the needle & anchor the barrel firmly to the skin
13. Attach the required amount of vacutainer bottles
14. It's essential to keep the barrel held firm & still whilst changing bottles!
15. Remove the tourniquet -this is very easy to forget, make sure you don't!
16. Remove the needle carefully & place immediately into a sharps bin
17. Once the needle is out press down on the site with some cotton wool
18. Tape a dressing to the patients arm (*cotton wool / gauze*)
19. Dispose of the equipment into the clinical waste bin

Perform the procedure venepuncture.

Portfolio writing on venepuncture with reflection.

Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Venepuncture for Blood culture

- Wash hands using soap and water Introduce self
- Check name with patient and on name band
- Ask permission to take blood sample to check for any bacteria in the blood
- Don gloves• Gather and set up equipment (in a tray washed from inside-out first)
- o Blood culture bottles - aerobic and anaerobic make sure these are in date
- note the optimal blood volume recommended on the side of the bottle
- (usually 8-10mls) - you should be aiming for adding this amount of blood to the bottle
- Chlorhexidine swabs o Barrel o Needle/Butterfly (depending on Medical School/Hospital Trust policy)
- o Tourniquet o Gloves o Cotton wool/gauze o Tape Return to patient
- Reposition patient's forearm with palm facing upwards
- Apply tourniquet and find suitable vein
- Wash hands and don new pair of gloves
- Wipe vein with alcohol swab - slowly and only once
- Take top off of both culture bottles and wipe the top of each one with separate wipes
- Wait for the tops of the culture bottles to dry (~30 seconds)
- Warn patient of a sharp scratch and insert needle
- If you are in the vein, insert the ends of the bottles into the barrel
- o Aerobic bottle first (as there will be spare gas in the needle or Butterfly) Remove the tourniquet
- Take out the needle and dispose of in sharps bin
- Apply cotton wool and tape
- Thank patient, tidy area and wash hands
- Record that sample taken in the patient's notes. Note down on the microbiology
- blood form: the differential diagnosis and any current antibiotics being given.

Procedure Observed. – Venepuncture for blood culture

Write a short note and reflection writing on Venepuncture for blood culture

Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

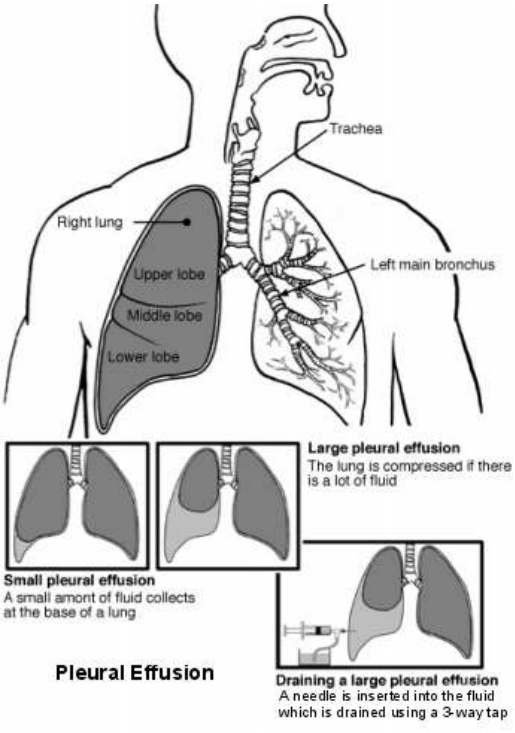
Pleural Fluid Aspiration

Indications
Percutaneous pleural effusion aspiration is carried out:

- To investigate the cause of pleural effusion: - unilateral exudative pleural effusions.
- As symptom relief for breathlessness:
  - Urgent decompression of the pleural space may be required to alleviate respiratory distress.
  - Repeated 'tapping' of fluid in management of patient with palliative care.

Relative contra-indications to pleural effusion aspiration

- Very small volume of fluid
- Bleeding diathesis
- Anticoagulant therapy
- Mechanical ventilation (increased likelihood of tension pneumothorax or bronchopleural fistula if the lung is punctured)
- Cutaneous disease over the proposed skin puncture site



Procedure
This can be performed in the clinic or by the bedside.

- Radiological guidance (eg, ultrasound) is sometimes needed for smaller effusions.
- Sit the patient as upright as possible. A pillow can be used to support arms and head on an adjustable table or couch. If the patient leans forward too much it increases the risk of liver/spleen injury.
- Use an aseptic technique throughout the procedure.
- Use percussion to determine the upper level of fluid.
- The conventional site for aspiration is posteriorly, approximately 10 cm lateral to the spine (mid-scapular line) and 1-2 intercostal spaces below the upper level of the fluid.
- Mark the spot and clean the area using antiseptic.
- Use local anaesthetic (5-10 ml of 1% lidocaine) to infiltrate the skin and underlying tissues. A 25G needle can be used for this.
- Avoid the intercostal nerves and vessels that run immediately beneath the rib by inserting the needle just above the upper border of the rib, below your mark.
- You can confirm the correct location for pleural aspiration by aspirating a small amount of fluid through this smaller needle.
- Attach a 21G needle to a 50 ml syringe.
- Again, avoid the intercostal nerves and vessels by inserting the needle just above the upper border of the rib below your mark. Aspirate while you are advancing the needle.
- 50-100 ml of fluid is usually adequate for diagnostic purposes.
- Look at the fluid obtained and note any odour: purulent fluid suggests empyema; milky, opalescent fluid suggests chylothorax; grossly bloody fluid suggests haemothorax; anaerobic infection has a pungent odour.
- Separate the pleural fluid into different sterile pots to be sent for biochemistry, microbiology, cytology ± immunology. Some fluid should also be added to blood culture bottles.

- A post-procedure CXR to look for pneumothorax is not generally needed provided the patient is asymptomatic and the procedure was uncomplicated.

If the procedure is being carried out to relieve breathlessness, a greater volume of fluid usually needs to be drained**: Use a 14G intravenous cannula instead of the 21G needle**.
Administer oxygen and use pulse oximetry throughout the procedure.

- Follow the same steps as above.
- When the cannula is inserted, remove the stylet and connect a closed pleural aspiration kit.
- The fluid should still be sent for analysis.
- It is best to remove fluid slowly.
- Monitor for chest pressure or pain during fluid removal. This can be a sign of lung entrapment due to extensive pleural involvement or endobronchial obstruction which will prevent re-expansion of the lung when the fluid is removed. If this occurs, stop the procedure.
- Rarely, if more than 1.5 litres of fluid is drained off, fluid shifts can cause haemodynamic instability or pulmonary oedema. The recommended fluid drainage limit is 1-1.5 litres.

A chest drain can also be inserted for pleural fluid drainage.

Investigations to be requested on the pleural fluid & suggests the following initial investigations:

- Microbiology:
  - ✓ Send one pot for Gram stain, acid-alcohol fast bacilli (AAFB) stain, microscopy, culture and sensitivity.
  - ✓ Send some fluid in blood culture bottles (increases yield, especially for anaerobic organisms).
- Biochemistry:
  - Send one pot for protein, lactate dehydrogenase (LDH) and pH.
- Cytology:
  - ✓ Send a 20 ml sample in a sterile pot for cytological examination. Some cytologists prefer samples to be sent in a citrate bottle to prevent clots (discuss with laboratory).
  - ✓ The sample needs to be fresh.
  - ✓ Malignant effusions can be diagnosed by pleural fluid cytology alone in 60% of cases. A second sample can increase diagnostic yield.

Additional investigations should be requested under specific circumstances:

- If empyema is suspected send some fluid for centrifuge to differentiate from chylothorax.
- If chylothorax is suspected send some fluid for centrifuge, cholesterol and triglyceride levels and investigation for the presence of cholesterol crystals and chylomicrons.
- If haemothorax is suspected, or the pleural fluid is grossly bloody, send some fluid for haematocrit level.
- If rheumatoid disease is suspected send some fluid for glucose and complement levels.
- If pancreatitis is suspected send some fluid for amylase level.

Complications

- Pain during and after the procedure at the puncture site.
- Pneumothorax complicates 12-30% of pleural aspirations but chest drain treatment is required in <5% of these.
- Bleeding (may be cutaneous or internal).
- Empyema.
- Inadvertent liver/spleen puncture.

Observation of Pleural aspiration and reflection writing on pleural aspiration

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Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Peritoneal Aspiration

Diagnostic tap is used for the following:

- ✓ New-onset ascites - Fluid evaluation helps to determine etiology, differentiate transudate versus exudate, detect the presence of cancerous cells, or address other considerations
- ✓ Suspected spontaneous or secondary bacterial peritonitis
- ✓ Therapeutic tap is used for the following:
- ✓ Respiratory compromise secondary to ascites
- ✓ Abdominal pain or pressure secondary to ascites (including abdominal compartment syndrome)

Contraindications

- An acute abdomen that requires surgery is an absolute contraindication.
- Severe thrombocytopenia (platelet count < $20 \times 10^3/\mu L$) and coagulopathy (international normalized ratio [INR] > 2.0) are relative contraindications.
  - Patients with an *INR greater than 2.0* should receive fresh frozen plasma (FFP) prior to the procedure. One strategy is to infuse one unit of fresh frozen plasma before the procedure and then perform the procedure while the second unit is infusing.
  - Patients with a platelet count lower than $20 \times 10^3/\mu L$ should receive an infusion of platelets before the procedure.

In patients without clinical evidence of active bleeding, routine laboratory tests such as prothrombin time (PT), activated partial thromboplastin time (aPTT), and platelet counts may not be needed before the procedure.

Other relative contraindications include the following:

- Pregnancy
- Distended urinary bladder
- Abdominal wall cellulitis
- Distended bowel
- Intra-abdominal adhesions

Procedure

Preparation for the procedure:

Briefly explain to the patient

- ➢ The patient should lie on his back in a slightly recumbent position toward the site of paracentesis. Percuss the area of dullness to ensure that is correspond well the the ultrasound marking. Insertion site is inferior to umbilicus and at the level of percussed dullness, usually 2-3 fingerbreadths below the umbilicus.
- ➢ Clean the area with betadine in a circular fashion from the center out. Apply the sterile drapes. You will place the opened parts of the kit on the drape.
- ➢ Open the 16 G needle and syringe place them on the sterile drapes. Place the 1-L vacuum bottles nearby. From this point on, you have to wear sterile gloves, so please ensure that you have everything you need in the sterile area. It is time-consuming to have to reach for, let's say additional tubing in the non-sterile area and then to remove the soiled sterile gloves and to put new ones.
- ➢ Make sure that you have everything you need for the procedure in the sterile area.

Procedure technique:

If the marked site is in the RLQ, pull the skin down and go in with the Angiocath, then release the skin (this is called Z-technique which creates a skin track to stop ascitic fluid from leaking out after the procedure). Aspirate as you go in. Once you reach fluid in the needle, advance the needle just a little, then thread in the plastic part while withdrawing the needle. Aspirate again to make sure that the plastic catheter is still inside the fluid collection. If you get fluid in the syringe, everything is fine, unscrew the syringe and connect the tubing to the 1-L vacuum bottle.
If you cannot get fluid after withdrawing the needle, try to reposition the catheter. If still there is no fluid, you can try to pull out and reintroduce the needle (if kept sterile). Do not push hard or deeper than the midpoint of the collection as seen on the ultrasound scan.
If you are unsuccessful in obtaining ascitic fluid, you can ask for an ultrasound-guided paracentesis.
After the procedure, ask the patient to lie in his bed for 4 hours and the nurse to check vital signs q 1 hr for 4 hours to avoid hypotension.
It is generally recommended to give 25 cc of albumin (25% solution) for every 2 liters of ascitic fluid removed. For example, if the patient had a 4-liter paracentesis, he should receive 50 cc of albumin IV (25% solution) over 2 hours. The rationale for giving albumin is to avoid intravascular fluid shift and renal failure after a large-volume paracentesis. Instead of Albiumin we can use group specific FFP too.

Complications

Persistent leak from the puncture site
Abdominal wall hematoma
Perforation of bowel
Introduction of infection
Hypotension after a large-volume paracentesis
Dilutional hyponatremia
Hepatorenal syndrome Major
blood vessel laceration
Catheter fragment left in the abdominal wall or cavity

Observe Peritoneal Tap Aspiration and reflection writing on peritoneal tap aspiration.

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Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp

ABG and Arterial blood gas puncture

Wash your hands, introduce yourself to the patient and clarify their identity. Explain what you would like to do and obtain consent. This is a slightly uncomfortable procedure so you should let the patient know this

- 23 G needle
- 2ml syringe with heparin
- Cap of the syringe
- Plastic bung
- Local Anaesthetic
- Alcohol Gel
- Gauze
- Gloves
- Sharp bin

- Position the patient wrist extended
- Locate the artery with your index and middle fingers
- Put gloves and attach the needle to the heraprinized syringe
- Also prepare your local anaesthetic and give a small amount over the palpable radial artery
- Take the cap off the needle, flush the heparin through the syringe and again locate the *radial artery* using your non-dominant hand.
- Remove the cap from the needle
- Insert the needle at 30 degrees to the skin at the point of maximum pulsation of the *radial artery*. Advance the needle until arterial blood flushes into the syringe. The arterial pressure will cause the blood to fill the syringe
- Remove the needle/syringe placing the needle into the bung. Press firmly over the puncture site with the gauze to halt the bleeding. Remain pressed for 5 min

-  Prepare to insert the needle
-  Remove the needle

-  Place the needle into the bung
-  Remove the needle from the syringe
-  Safetly discard the needle into the sharps bin

Cap the syringe, push out any air within it, and send immediately for analysis ensuring that the sample is packed in ice.

Perform Arterial blood gas sampling and reflection writing on sampling of ABG(Arterial bold gas).

……

Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Lumbar Puncture

Lumbar puncture should be performed for the following indications:

- Suspicion of meningitis
- Suspicion of subarachnoid hemorrhage (SAH)
- Suspicion of central nervous system (CNS) diseases such as Guillain-Barré syndrome and carcinomatous meningitis
- Therapeutic relief of pseudotumor cerebri

Absolute contraindications for lumbar puncture are

- The presence of infected skin over the needle entry site
- and the presence of unequal pressures between the supratentorial and infratentorial compartments.

The latter is usually inferred from the following characteristic findings on computed tomography (CT) of the brain:

- ✓ Midline shift
- ✓ Loss of suprachiasmatic and basilar cisterns
- ✓ Posterior fossa mass
- ✓ Loss of the superior cerebellar cistern
- ✓ Loss of the quadrigeminal plate cistern

Relative contraindications

- Increased intracranial pressure (ICP)
- Coagulopathy
- Brain abscess

Indications for performing brain CT scanning before lumbar puncture in patients with suspected meningitis include the following

- Patients who are older than 60 years
- Patients who are immunocompromised
- Patients with known CNS lesions
- Patients who have had a seizure within 1 week of presentation
- Patients with an abnormal level of consciousness
- Patients with focal findings on neurologic examination
- Patients with papilledema seen on physical examination, with clinical suspicion of an elevated ICP

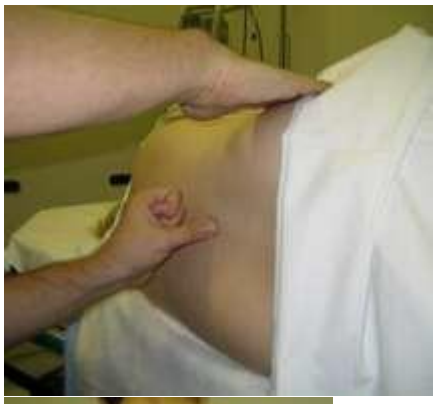
Cranial CT scanning should be obtained before lumbar puncture in all patients with suspected SAH in order to diagnose obvious intracranial bleeding or any significant intracranial mass effect that might be present in awake and alert SAH patients with a normal neurologic examination.[9, 10]

Equipments for Lumbar Puncture

- Sterile dressing
- Sterile gloves
- Sterile drape
- Antiseptic solution with skin swabs
- Lidocaine 1% without epinephrine
- Syringe, 3 mL
- Needles, 20 and 25 gauge
- Spinal needles, 20 and 22 gauge
- Three-way stopcock
- Manometer
- Four plastic test tubes, numbered 1-4, with caps
- Syringe, 10 mL (optional)

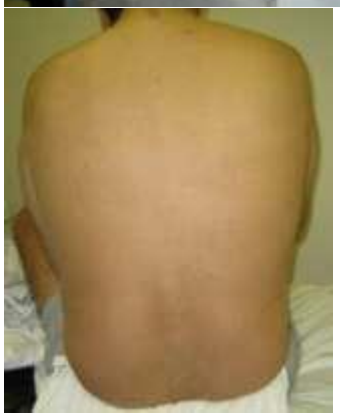
Procedure

The patient is placed in the lateral recumbent position (see the image below) with the hips, knees, and chin flexed toward the chest so as to open the interlaminar spaces. A pillow may be used to support the head. In a single-center prospective study, performance of lumbar puncture in the extended rather than the flexed lateral recumbent position yielded a statistically significant decrease in the cerebrospinal fluid (CSF) opening pressure, but the difference (mean, 0.6 ± 2.2 cm water) was small and of doubtful clinical significance.



Lumbar puncture lateral recumbent position.

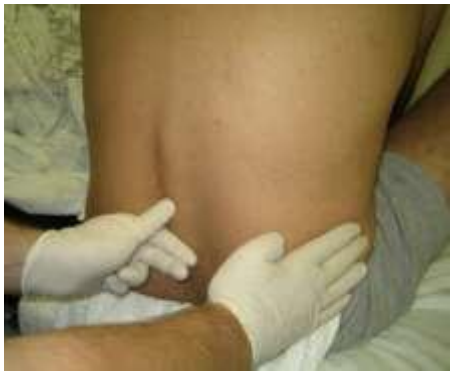
The sitting position (see the image below) may be a helpful alternative, especially in obese patients, because it makes it easier to confirm the midline. In order to open the interlaminar spaces, the patient should lean forward and be supported by a Mayo stand with a pillow on it, by the back of a stool, or by another person.



Lumbar puncture sitting position.

If the procedure is performed with the patient in the sitting position and an opening pressure is required (as in the case of pseudotumor cerebri), replace the stylet and have an assistant help the patient into the left lateral recumbent position. There are no data suggesting that a position change will increase the risk of spinal headache or transection of the spinal nerves. Take care, however, not to change the orientation of the spinal needle during this maneuver.

Wearing nonsterile gloves, locate the L3-L4 interspace by palpating the right and left posterior superior iliac crests and moving the fingers medially toward the spine (see the image below). Palpate that interspace (L3-L4), the interspace above (L2-L3), and the interspace below (L4-L5) to find the widest space. Mark the entry site with a thumbnail or a marker. To help open the interlaminar spaces, ask the patient to practice pushing the entry site area out toward the practitioner.



L3-L4 interspace palpation.

Open the spinal tray, change to sterile gloves, and prepare the equipment. Open the numbered plastic tubes, and place them upright (see the image below). Assemble the stopcock on the manometer, and draw the lidocaine into the 10-mL syringe.

CSF collection tubes.

Use the skin swabs and antiseptic solution to clean the skin in a circular fashion, starting at the L3-L4 interspace and moving outward to include at least 1 interspace above and 1 below (see the video below). Just before applying the skin swabs, warn the patient that the solution is very cold; application of an unexpectedly cold solution can be unnerving for the patient.

Skin preparation..

Place a sterile drape below the patient and a fenestrated drape on the patient (see the video below). Most spinal trays contain fenestrated drapes with an adhesive tape that keeps the drape in place.

Drape application

Use the 10-mL syringe to administer a local anesthetic (see the video below). Raise a skin wheal using the 25-gauge needle, then switch to the longer 20-gauge needle to anesthetize the deeper tissue. Insert the needle all the way to the hub, aspirate to confirm that the needle is not in a blood vessel, and then inject a small amount as the needle is withdrawn a few centimeters. Continue this process above, below, and to the sides very slightly (using the same puncture site).

This process anesthetizes the entire immediate area so that if redirection of the spinal needle is necessary, the area will still be anesthetized. For this reason, a 10-mL syringe may be more beneficial than the usual 3-mL syringe supplied with the standard lumbar puncture kit. The 20-gauge needle can also be used as a guide for the general direction of the spinal needle. In other words, the best direction in which to aim the spinal needle can be confirmed if the 20-gauge needle encounters bone in one direction but not in another.

Next, stabilize the 20- or 22-gauge needle with the index fingers, and advance it through the skin wheal using the thumbs (see the video below). Orient the bevel parallel to the longitudinal dural fibers to increase the chances that the needle will separate the fibers rather than cut them; in the lateral recumbent position, the bevel should face up, and in the sitting position, it should face to one side or the other.

Insert the needle at a slightly cephalad angle, directing it toward the umbilicus. Advance the needle slowly but smoothly. Occasionally, a characteristic “pop” is felt when the needle penetrates the dura. Otherwise, the stylet

should be withdrawn after approximately 4-5 cm and observed for fluid return. If no fluid is returned, replace the stylet, advance or withdraw the needle a few millimeters, and recheck for fluid return. Continue this process until fluid is successfully returned.

For measurement of the opening pressure, the patient must be in the lateral recumbent position. After fluid is returned from the needle, attach the manometer through the stopcock, and note the height of the fluid column. The patient's legs should be straightened during the measurement of the open pressure, or a falsely elevated pressure will be obtained (see the video below).

Opening pressure measurement.
Collect at least 10 drops of cerebrospinal fluid (CSF) in each of the 4 plastic tubes, starting with tube 1. If possible, the CSF that is in the manometer should be used for tube 1. If the CSF flow is too slow, ask the patient to cough or bear down (as in the Valsalva maneuver), or ask an assistant to press intermittently on the patient's abdomen to increase the flow. Alternatively, the needle can be rotated 90° so that the bevel faces cephalad.

Replace the stylet, and remove the needle (see the video below). Clean off the skin preparation solution. Apply a sterile dressing, and place the patient in the supine position.

CSF for Plastic Tubes

- Tube 1 - Protein and glucose levels
- Tube 2 - Gram stain, C&S
- Tube 3 - Cell count and differential
- Tube 4 – For Cytrology

Possible lumbar puncture–related complications include the following

- ✓ Post–spinal puncture headache
- ✓ Bloody tap
- ✓ Dry tap
- ✓ Infection
- ✓ Hemorrhage
- ✓ Dysesthesia
- ✓ Post–dural puncture cerebral herniation

Observed Lumbar Puncture and reflection writing on lumber puncture

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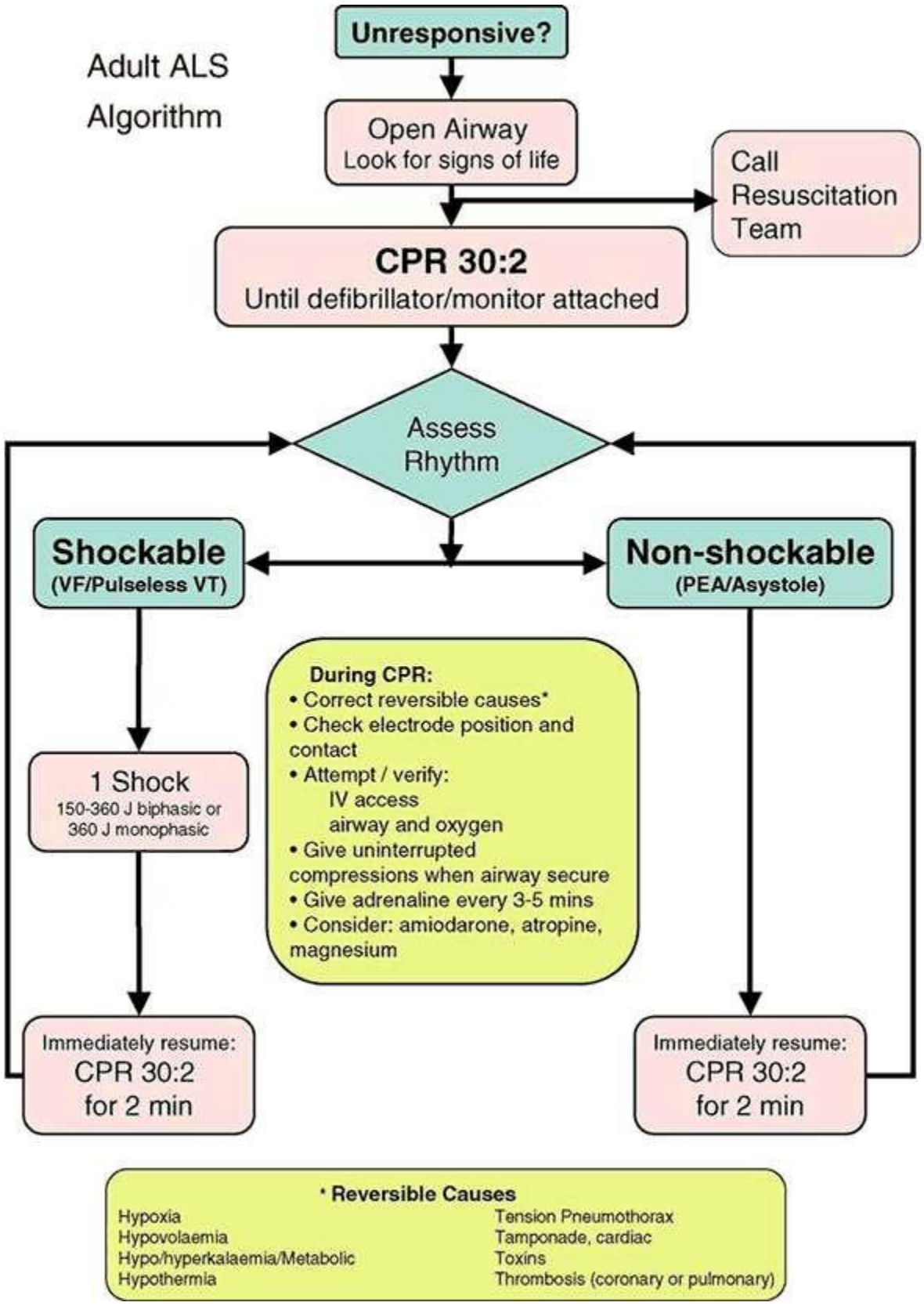
Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Cardio Pulmonary Resuscitation



Full, standard form, cardiopulmonary resuscitation (CPR) comprises 3 steps: chest compressions, airway, and breathing (CAB), to be performed in that order in accordance with the 2010 American Heart Association (AHA) guidelines.

Note that artificial respirations are no longer recommended for bystander rescuers; thus, lay rescuers should perform compression-only CPR (COCPR). Healthcare providers, however, should perform all 3 components of CPR (chest compressions, airway, and breathing).

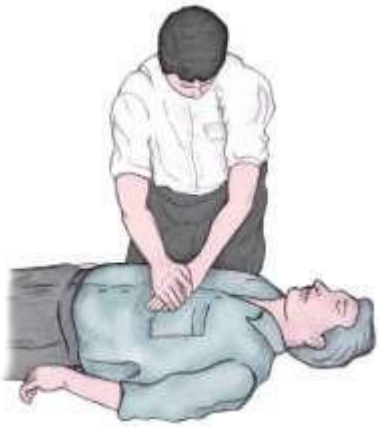
For an unconscious adult, CPR is initiated using 30 chest compressions. Perform the head-tilt chin-lift maneuver to open the airway and determine if the patient is breathing. Before beginning ventilations, rule out airway obstruction by looking in the patient's mouth for a foreign body blocking the patient's airway. CPR in the presence of an airway obstruction results in ineffective ventilation/oxygenation and may lead to worsening hypoxemia.

The techniques described here refer specifically to CPR as prescribed by the Basic Cardiac Life Support (BCLS) guidelines. In the in-hospital setting, or when a paramedic or other advanced provider is present in the out-of-hospital setting, Advanced Cardiac Life Support (ACLS) guidelines call for a more robust approach to treatment of cardiac arrest, including drug interventions, electrocardiographic (ECG) monitoring, defibrillation, and invasive airway procedures.

Attempting to perform CPR is better than doing nothing at all, even if the provider is unsure if he or she is doing it correctly. This especially applies to many people's aversion to providing mouth-to-mouth ventilations. If one does not feel comfortable giving ventilations, chest compressions alone are still better than doing nothing.

Chest compression

The heel of one hand is placed on the patient's sternum, and the other hand is placed on top of the first, fingers interlaced. The elbows are extended and the provider leans directly over the patient (see the image below). The provider presses down, compressing the chest at least 2 in. The chest is released and allowed to recoil completely



Delivery of chest compressions. Note the overlapping hands placed on the center of the sternum, with the rescuer's arms extended. Chest compressions are to be delivered at a rate of at least 100 compressions per minute.

With the hands kept in place, the compressions are repeated 30 times at a rate of 100/min. The key thing to keep in mind when doing chest compressions during CPR is to push fast and hard. Care should be taken to not lean on the patient between compressions, as this prevents chest recoil and worsens blood flow.

After 30 compressions, 2 breaths are given (see Ventilation). Of note, an intubated patient should receive continuous compressions while ventilations are given 8-10 times per minute. This entire process is repeated until a pulse returns or the patient is transferred to definitive care.

When done properly, CPR can be quite fatiguing for the provider. If possible, in order to give consistent, high-quality CPR and prevent provider fatigue or injury, new providers should intervene every 2-3 minutes (ie, providers should swap out, giving the chest compressor a rest while another rescuer continues CPR).

For COCPR (ie, CPR without rescue breaths), the provider delivers only the chest compression portion of care at a rate of 100/min to a depth of 38-51 mm (1-1.5 in.) without pause. This delivery of compressions continues until the arrival of medical professionals or until another rescuer is available to continue compressions.

Ventilation

If the patient is not breathing, 2 ventilations are given via the provider's mouth (see the image below) or a bag-valve-mask (BVM).

Delivery of mouth-to-mouth ventilations.

The mouth-to-mouth technique is performed as follows

The nostrils of the patient are pinched closed to assist with an airtight seal

- The provider puts his mouth completely over the patient's mouth
- The provider gives a breath for approximately 1 second with enough force to make the patient's chest rise

Effective mouth-to-mouth ventilation is determined by observation of chest rise during each exhalation. Failure to observe chest rise indicates an inadequate mouth seal or airway occlusion. As noted (see above), 2 such exhalations should be given in sequence after 30 compressions (the 30:2 cycle of CPR). When breaths are completed, compressions are restarted. If available, a barrier device (pocket mask or face shield) should be used.

More commonly, health care providers use a BVM, which forces air into the lungs when the bag is squeezed. Several adjunct devices may be used with a BVM, including oropharyngeal and nasopharyngeal airways.

The BVM or invasive airway technique is performed as follows:

- The provider ensures a tight seal between the mask and the patient's face.
- The bag is squeezed with one hand for approximately 1 second, forcing at least 500 mL of air into the patient's lungs.

Next, the provider checks for a carotid or femoral pulse. If the patient has no pulse, chest compressions are begun.

Observed and performed Cardiopulmonary Resuscitation

Write reflection on Cardio pulmonary Resuscitation

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Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Defibrillation

Overview on Defibrillation and Cardioversion

Defibrillation is nonsynchronized random administration of shock during a cardiac cycle. In 1956, alternating current (AC) defibrillation was first introduced to treat ventricular fibrillation in humans. Later in 1962, direct current (DC) defibrillation was introduced.

Cardioversion is a synchronized administration of shock during the R waves or QRS complex of a cardiac cycle.

During defibrillation and cardioversion, electrical current travels from the negative to the positive electrode by traversing myocardium. It causes all of the heart cells to contract simultaneously. This interrupts and terminates abnormal electrical rhythm. This, in turn, allows the sinus node to resume normal pacemaker activity.

Indications

Indications for defibrillation

- Pulseless ventricular tachycardia (VT)
- Ventricular fibrillation (VF)
- Cardiac arrest due to or resulting in VF

Indications for electrical cardioversion:

- Supraventricular tachycardia (atrioventricular nodal reentrant tachycardia [AVNRT] and atrioventricular reentrant tachycardia [AVRT])
- Atrial fibrillation
- Atrial flutter (types I and II)
- Ventricular tachycardia with pulse
- Any patient with reentrant tachycardia with narrow or wide QRS complex (ventricular rate >150 bpm) who is unstable (eg, ischemic chest pain, acutepulmonary edema, hypotension, acute altered mental status, signs of shock)

Contraindications

- Dysrhythmias due to enhanced automaticity, such as in digitalis toxicity and catecholamine-induced arrhythmia
- Multifocal atrial tachycardia

✓ Cardioversion is almost always performed under induction or sedation (short-acting agent such as midazolam). The only exceptions are if the patient is hemodynamically unstable or if cardiovascular collapse is imminent. Defibrillation is an emergency procedure and when necessary sedate the patient.

✓ **Monophasic versus biphasic waveforms**

✓ Defibrillators can deliver energy in various waveforms that are broadly characterized as monophasic or biphasic.

✓ Monophasic defibrillation delivers a charge in only one direction. Biphasic defibrillation delivers a charge in one direction for half of the shock and in the electrically opposite direction for the second half.

✓ Newer defibrillators deliver energy in biphasic waveforms. Biphasic waveform defibrillators deliver a more consistent magnitude of current. They tend to successfully terminate arrhythmias at lower energies than monophasic waveform defibrillators.

✓ Energy selection for defibrillation or cardioversion

In 2010, the American Heart Association issued guidelines for initial energy requirements for monophasic and biphasic waveforms.

Atrial fibrillation energy requirements

- 200 Joules for monophasic devices
- 120-200 Joules for biphasic devices

Atrial flutter energy requirements

- 100 Joules for monophasic devices
- 50-100 Joules for biphasic devices

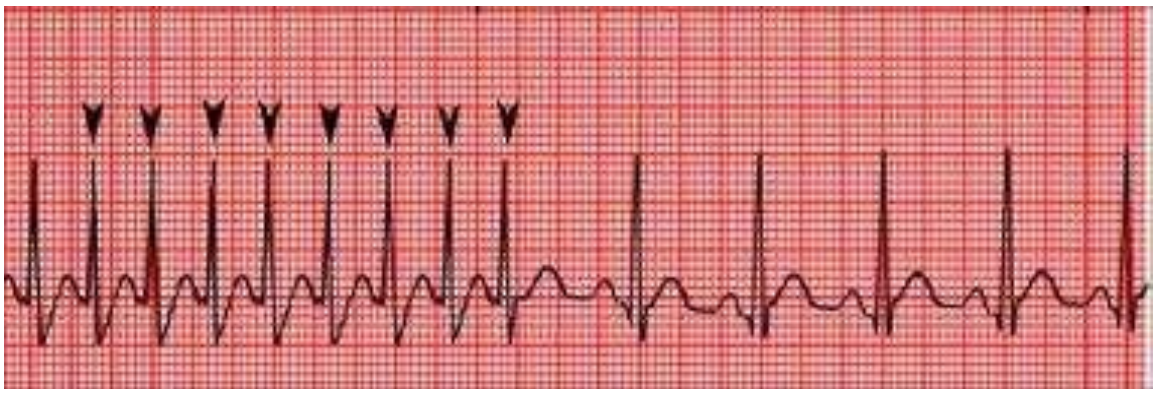
Ventricular tachycardia with pulse energy requirements

- 200 Joules for monophasic devices
- 100 Joules for biphasic devices

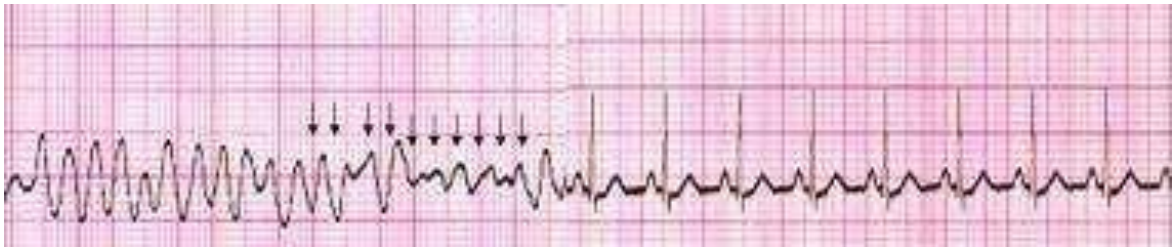
Ventricular fibrillation or pulseless ventricular tachycardia energy requirements

- 360 Joules for monomorphic devices
- 120-200 Joules for biphasic devices

See the images below.



ECG strip shows a atrial fibrillation terminated by a synchronized shock (synchronization marks [arrows] in the apex of the QRS complex) to normal sinus rhythm.



Ventricular fibrillation terminated by an unsynchronized shock (arrows) to normal sinus rhythm.

Observed or performed Cardioversion /Defibrillation

Write a reflection on Cardioversion /Defibrillation

……

Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Glassgow Coma Scale (GCS monitoring)

Adult			Pediatric	
Spontaneously	4	**Best Eye Opening**	Spontaneously	4
To verbal stimuli	3		To verbal stimuli	3
To painful stimuli	2		To painful stimuli	2
No eye opening	1		No eye opening	1
Oriented	5	**Best Verbal Response**	Appropriate coo & cry	5
Confused	4		Irritable cry	4
Inappropriate words	3		Inconsolable crying	3
Incomprehensible	2		Grunts	2
No verbal response	1		No verbal response	1
Obeys commands	6	**Best Motor Response**	Normal spontaneous	6
Localizes pain	5		Withdraws to touch	5
Withdraws to pain	4		Withdraws to pain	4
Flexion to pain	3		Flexion to pain	3
Extension to pain	2		Extension to pain	2
No motor response	1		No motor response	1

USES

- categorises severity of Traumatic Brain Injury (TBI) into mild (13-15), moderate (9-12) and severe (8 or less)
- used in BTF guidelines as part of the indications for ICP monitoring (e.g. GCS 8 or less and abnormal CT head)
- used for determining the need for CT head in TBI by validated tools such as the Canadian CT Head Rule
- Traditional ATLS mantra is “GCS 8, intubate”
- used in APACHE II
- originally described for monitoring depth of coma over time in a neurosurgical unit (never validated)

ADVANTAGES

- most widely recognised of all conscious level scoring systems in the world
- has face validity (looks like it should work)
- quick
- reproducible (this is controversial, in one study 38% of the cases the GCS scores were the same and in 33% of cases the scores varied with more than two points)
- skewed towards motor score, which is good since this is the most reliable measure of short-term prognosis in TBI
- the distinction between a motor score of 2, 3 and 4 is a very useful clinical indicator of the severity of TBI, and the area of brain function that has been affected
- correlates with adverse neurological outcomes such as brain injury, neurosurgical intervention, and mortality

DISADVANTAGES

Problems with the use of GCS

- not originally intended to be converted into a single score — the components (E4,V5, M6) are more important than the total score
- does not incorporate brain-stem reflexes
- M score does not factor in unilateral pathology
- unreliable in patients in the middle range of 9-12
- The same GCS score will predict different TBI mortality depending on the components
  — GCS of 4 with the components 1+1+2 (E+V+M) predicts a mortality rate of 48%
  — GCS of 4 with the components 2+1+1 (E+V+M) predicts a mortality rate of 19%
- grossly predictive but cannot accurately predict outcomes in individual patients (on par with weather presenters predicting rain or WBC predicting appendicitis!)

Problems with performing GCS

- designed as a tool for repeated bedside assessment of various neurological functions in patients in a neurosurgical ward, not for use in TBI
- It is difficult for untrained staff to apply properly, especially distinguishing between M= 3,4,5 (even neurosurgeons get it wrong ~50% of the time)
- Variation in scoring V in intubated patients
- subject to language barriers
- cannot be applied to small children
- may be affected by other factors influencing level of consciousness, e.g. drugs such as alcohol and sedatives
- GCS is often used in settings such as toxicology where it is unvalidated
- Debates within the literature as to when GCS can be first applied after TBI, i.e when is the first post-resuscitation GCS applicable

Problems with accuracy and validity of GCS

- Controversy in the literature
- There is poor inter-observer reliability
- Reproducibility is poor (only 50% in neurosurgeons!)
- There is little evidence demonstrating validity and reliability of the GCS
- Not proven to be better than unstructured clinical judgement
- There are numerous other neurological scoring systems that have demonstrated greater validity and reliability e.g. the FOUR score, AVPU in children
- GCS 8 does not reliably correlate with the presence or absence of airway reflexes

Write a reflection on monitoring of GCS of a Head injured patient in your hospital

……

Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Intubation

This is a general review of issues relevant to intubation.

While the hand skills neccessary for performing intubation do take a certain amount of practice, the decision of when to intubate and the choice of technique is of at least equal importance, and is often ignored. While you may not acquire significant hands on training in intubating non-neonates during your pediatric residency, you will have the opportunity to learn how to decide when someone should be intubated, as well as the potential complications and problems that may be encountered.

THIS KNOWLEDGE MAY BE LIFE-SAVING.

I. Indications for intubation--Thinking about the indications will help you decide on a technique.

A. Airway patency
B. Requirement for positive pressure ventilation due to pulmonary disease (ie, hypoxia or hypercarbia)
C. Significant cardiovascular compromise, shock
D.Neurologic-seizures, weakness, head injury

II. Techniques

A. Awake, without drugs
B. Sedated but not paralysed
C. Anesthetized-+/- rapid sequence induction

III. Considerations in determining technique used for intubation

Airway anatomy-if primary airway problem, ie, croup, epiglottitis, foreign body, abnormal anatomy, etc.,
DO NOT BURN BRIDGES.
<u>These patients should not be paralysed</u>.
Paralysis relaxes the pharyngeal muscles, which may obscure landmarks in the difficult airway, and may make bag-mask ventilation difficult.
Sedation, along with local anesthetics (ie, lidocaine spray) may be used to facilitate intubation.

Cardiovascular stability-hemodynamically unstable patients (ie, sepsis, toxic shock, certain ingestions) may become even more unstable when sedated, due to loss of sympathetic tone.
Any drugs used should be used in smaller doses and titrated to effect. Patients with primary cardiac disease, however, generally do not tolerate unsedated intubations, and carefully titrated anesthesia is warranted.

C. Cardiopulmonary arrest-there is no reason to use any pharmacologic intervention.
Bag-mask ventilation with cricoid pressure and intubation can generally be accomplished without difficulty.
D.Full stomach--risk of pulmonary aspiration. These patients should be intubated awake to preserve airway protective reflexes, or by *rapid sequence induction* with cricoid pressure.
1. Recent oral intake
2.Delayed gastric emptying from ascites, peritonitis, bowel obstruction
3. Swallowed blood from trauma
4. Increased intra-abdominal pressure from masses or ascites
5. Abnormal lower esophageal tone-pregnancy
6. Gastro-esophageal reflux
7. Altered level of consciousness
E. Head injury-laryngoscopy and intubation may lead to increased intracranial pressure in the unanesthetized patient with an evolving head injury.
Trauma victims are frequently hypovolemic. Drugs and doses used need to be carefully considered.

IV. The awake intubation

A. Indications (all relative)
1. Cardiopulmonary arrest
2. Airway anomolies, acute severe upper airway disease
3. Cervical spine injury
4. Facial Trauma
5. Significant hemodynamic instability
6. Any suspicion of difficulty intubating, for any reason.

B. Technique
1. Local anesthetic sprays can be used to topicalize the tongue and pharynx.. Nebulized lidocaine (2cc 1% lidocaine in nebulizer) will decrease the laryngospasm and bronchospasm with intubation.
2. Laryngoscopy and intubation should proceed firmly but gently, with attention to the teeth and tongue if the child is struggling

V. The sedated intubation

A.Indications
1. Potentially difficult airway
2. Lung disease with moderate to high O2 requirement (may desaturate during period of apnea neccessary for rapid sequence intubation)

B. Technique
1. Carefully titrated drugs, watching for hemodynamic as well as sedative effects.
If hemodynamics are stable, more drug can be given if neccessary.
a. Versed, 0.05-0.1 mg/kg. Use lower doses in the setting of hypovolemia, sepsis, or poor cardiac function.
b. Ketamine, 0.5-2.0 mg/kg. Indirect sympathomimetic, preserves cardiac output and systemic BP in acutely hypovolemic patients. Direct bronchodilatory properties. Potent sialogogue (premedicate with atropine or glycopyrrolate). Co-administration of a small dose of benzodiazepine will reduce emergence phenomena.
2. Monitor degree of sedation carefully. Watch for signs of impending vomiting or respiratory depression. Gentle ventilatory assisstance through cricoid pressure is sometimes neccessary in extremely hypoxic or unstable patients.

VI. The anesthetized intubation--rapid sequence induction

A.Indications
1. Full stomach
conditions
- Head injury
- Asthma
- Common theme-Desire to blunt undesirable physiologic response to intubation-hypertension, tachycardia, bronchospasm, increased intracranial pressure.

B. Contraindication-anticipated difficulty with securing airway, ie, anatomic abnormality or airway pathology. NEVER sacrifice airway safety for the sake of pharmacologic intervention.

C. Technique-rapid sequence refers to rapid infusion of medications, followed by a brief period where airway protective reflexes are lost, followed by ideal intubating conditions. During the period after medications are given, cricoid pressure is applied and positive pressure ventilation is avoided.
1. Preoxygenate with 100% O2
2. NG (if present) to suction. Have suction (LARGE Yankauer) available!!!
3. Medication sequence--<u>cricoid pressure</u> should be applied from the moment drugs are given until the ETT is confirmed to be in the proper position. No positive pressure ventilation.
a. Atropine if used
b. Sedation
c. Paralysis

4. When fully relaxed, intubate the trachea, remove the stylet, and attach bag.
5. If difffculty with intubation arises, or the patient had more lung disease than you anticipated and desaturates significantly without positive pressure ventilation, GENTLY BAG MASK VENTILATE the patient, get the saturations up, and try again.
6. Confirm ETT placement by breath sounds, mist in tube, ETCO2 device. Confirm correct placement with CXR.

D.Drugs to facilitate intubation

1. Atropine 0.02 mg/kg, minimum 0.1 mg (use if bradycardia is probable)
2. Sedation-selection depends on clinical circumstances
   a. Versed 0.05-0.1 mg/kg useful when titrating drugs in and giving CPAP or gentle positive pressure prior to intubation, as in the patient with VERY SICK lungs who will desaturate quickly
   b. Ketamine 0.5-2 mg/kgasthmatics
   c. Thiopental 2-6 mg/kg head injury with STABLE cardiovascular system. In the face of hypovolemia, thiopental will cause significant hypotension choose another drug or use much smaller dose.
   d. Etomidate0.2-0.3 mg/kg cardiovascular instability. Etomidate works quickly and is thus ideal for RSI (rapid sequence intubation)
   e. The most common combination of drugs used in the Doernbecher PICU is etomidate and rocuronium. If significant ICP elevation is suspected or known, thiopental is used instead of etomidate IF the patient is hemodynamically stable.
3. Paralysis
   a. Rocuronium 1.2 mg/kg, achieves intubating conditions in 60 seconds. Duration of paralysis 30-60 minutes. Should not be used if there is any anticipated difficulty achieving intubation.
   b. Succinylcholine 1-2 mg/kg, achieves intubating conditions in 45 seconds. Duration of paralysis 5-8 minutes. This is a long time if you cant get the airway or bag mask ventilate the patient. BE CAREFUL. Rarely used now that rocuronium is available

E. Untoward effects of succinylcholine

1. Cardiovascular-succinylcholine stimulates the vagus nerve and sympathetic ganglia leading to bradycardia, hypertension, or hypotension. Atropine prior to administration may prevent bradycardia.
2. Hyperkalemia-With depolarization there is opening of acetylcholine receptor channels, allowing efflux of potassium from the cell through receptors in the muscle end-plate and extra-junctional receptors. In normal patients, there is a rise in serum potassium of 0.5 meq with a dose of succinylcholine. In certain disease processes, there is an upregulation of acetylcholine receptors, and hence, a massive increase in serum potassium with the administration of succinylcholine. *These include*: burns (3 days to 6 months after injury), spinal cord injury (3 days to 1 year after injury), tetanus, severe intra-abdominal infections, Guillain-Barre syndrome, Duchennes Muscular Dystrophy, Myotonic Dystrophy, multiple sclerosis, many progressive neuromuscular diseases.
3. Malignant hyperthermia-Succinylcholine is one of the agents that trigger MH, a hypermetabolic response to a triggering agent characterized by fever, tachycardia, tachypnea, acidosis, hyperkalemia, ventricular dysrhythmias, and rhabdomyolysis. The mortality is high. Risk factors include positive family history, Duchenes Muscular Dystrophy, and certain myopathies.
4. Increased intraocular pressure
5. Rhabdomyolysis and myoglobinuria
6. Muscle pain-reduced if a defasciculating dose of pancuronium is used
7. Increased intragastric pressure
8. Increased intracranial pressure-blunted by pretreatment with adequate sedation and a defasciculating dose of pancuronium.

Equipment

For any and all intubations, have available:

Large suction catheter Yankauer and reliable suction.. 2 suction setups if bleeding. DO NOT use small suction catheters.
Bag and appropriate sized mask
Oxygen source
Endotracheal tubes--one up, one down from anticipated size needed
Laryngoscopes-at least 2, preferable 1 straight blade, one curved blade. CHECK LIGHTS
Stylet, with lubrication
Oropharyngeal airways
Tape
CO2 monitoring device
Ventilation system

Extubation

- Confirm that there is an airleak around the ETT. The airleak should occur at <20cm H20. If there is no leak, there may be increased risk of stridor and airway obstruction due to tracheal edema. Consider decadron (0.5-1.0 mg/kg/dose, 4 hours before extubation, generally continued for 3-4 doses q6.
- The patient should have been off feeds for 4-6 hours prior to extubation. EVERY EXTUBATION IS A PLANNED RE-INTUBATION.
- Confirm that patient is sufficiently awake and spontaneously breathing, oxyenation is adequate on PEEP </=5, and </=40% O2, and ventilation is adequate.
- Obtain all supplies at bedside for intubation. EVERY EXTUBATION IS A PLANNED RE-INTUBATION. If there is significant concern, have meds drawn up.
- Have epinephrine aerosol available if there is concern that the patient will have stridor
- Suction mouth well, suction trachea via ETT
- Untape ETT and remove
- Observe for ventilation and oxygenation, air movement, stridor or weakness.

A. Intubation observed /Not observed

B. How to decide the size of the ET tube for intubation?

C. How long can we wait ambu with oxygen without intubation?

D. What is bougie?. What is the use of it ?

E. What are the complications which can cause due to intubation

Suturing

Sutures are normally classified into two types, absorbable and non-absorbable sutures. They can also be classified based on their construction, either mono-filament or multi-filament and also whether they are made from natural or synthetic materials. Sutures can also be classified according to their usage e.g. cardiovascular sutures, ophthalmic sutures, general sutures, orthopaedic sutures etc.

Absorbable and non-absorbable sutures

Sutures can be divided into two types – those which are absorbable and will break down harmlessly in the body over time without intervention, and those which are non-absorbable and must be manually removed if they are not left indefinitely. The type of suture used varies on the operation, with the major criteria being the demands of the location and environment and depends on the discretion and professional experience of the Surgeons.

Sutures to be placed internally would require re-opening if they were to be removed. Sutures which lie on the exterior of the body can be removed within minutes, and without re-opening the wound. As a result, absorbable sutures are often used internally; non-absorbable externally.

Sutures to be placed in a stressful environment, for example the heart (constant pressure and movement) or the bladder (adverse chemical presence) may require specialized or stronger materials to perform their role; usually such sutures are either specially treated, or made of special materials, and are often non-absorbable to reduce the risk of degradation.

Absorbable sutures include :- Polyglycolic Acid sutures, Polyglactin 910 , Catgut, Poliglecaprone 25 and Polydioxanone sutures.
Non-Absorbable sutures include :- Polypropylene sutures, Nylon (poylamide), Polyester, PVDF, silk and stainless steel sutures.

Monofilament and Multifilament Sutures

Sutures can also be divided into two types on the basis of material structure i.e. monofilament sutures and multifilament or braided sutures. Braided sutures provide better knot security whereas monofilament sutures provide better passage through tissues. In general, Monofilament sutures elicit lower tissue reaction compared to braided sutures. Multifilament sutures are braided and often coated with various materials like silicon, wax, PTFE, polycaprolactone, calcium stearate etc.

Monofilament sutures include :- Polypropylene sutures, Catgut, Nylon, PVDF, Stainless steel, Poliglecaprone and Polydioxanone sutures.
Multifilament or braided sutures include :- PGA sutures, Polyglactin 910, silk and polyester sutures.

Synthetic and Natural Sutures

Surgical sutures can also be divided into two types on the basis of raw material origin i.e. natural and synthetic sutures.

Natural sutures include silk and catgut sutures whereas all other sutures are synthetic in nature.

Coated and Un-Coated Sutures

Some types of sutures are available with specialized coatings on the surface to enhance properties like knotting, easy passage through tissue and reduce tissue reaction. Normally, coating is applied to braided sutures rather than monofilament sutures. It is easier to coat braided sutures compared to monofilaments. Coating materials like chromium salt, silicon, wax, PTFE, polycaprolactone, calcium stearate. Polymeric coating materials are known to be more bio-compatible than conventional coating materials like chromium salts, beeswax, pafaffin, gelatin etc. There

are new functional coatings like antibacterial or antimicrobial coating given to both monofilament and multifilament sutures, stem cell coating for improving healing properties.

Coated sutures include :- PGA sutures, Catgut Chromic, Polyglactin 910, silk and polyester sutures, braided or twisted nylon, Poliglecaprone and Polydioxanone sutures.

Un-coated sutures include :- Monofilament Polypropylene sutures, monofilament Nylon, PVDF, Stainless steel.

Sutures Classification based on usage

Sutures are also classified into various types based on the usage or application. Sutures are normally classifed into general sutures, cardiovascular sutures, valve sutures, orthopaedic sutures, dental sutures, gynaec, veterinary sutures, cosmetic surgery sutures, ophthalmic sutures etc. A variety of suture materials may be used for a particular application based on the requirements. However, the suture sizes, length, needle profiles, etc., will be with a small change for a particular application.

Selecting the size of suture material depends on the place of the body

- ✓ Scalp 3/0,4/0
- ✓ Oral cavity 3/0,4/0
- ✓ Lip 4/0,5/0
- ✓ Face 5/0,6/0
- ✓ Eyelid 6/0

Observed or performed Suturing

Reflection writing on suturing which you performed/Observed

……

Consultant Anesthetist/ Consultant VP/ MO IC ICU/PCU/ETU/Ward

Name :

Stamp :

Notes