

The Royal Blackburn Teaching Hospitals NHS Trust

Critical Care Unit

Information about Procedures and Treatments.



The Royal Blackburn Teaching Hospitals NHS Trust

Critical Care Unit.

Contents.

Medical and Nursing Procedures on Critical Care	3
• Arctic Sun	4
• Art Line	5
• Balloon Pump	6
• BiPAP	7
• Bronchoscopy	8
• Chest Drain	9
• CPAP	10
• CVC	11
• Endoscopy	12
• Epidural	13
• Filter	14
• Flexiseal	15
• Inotropes	16
• Intravenous Cannula	17
• Intubation	18
• Lumbar Puncture	19
• NG Feed	20
• Proning	21
• TOE	22
• TPN	23
• Tracheostomy	24
• Transfusion	25
• Urinary Catheter	26
• Vascath	27
• Ventilator	28
• Acknowledgements	29



The Royal Blackburn Teaching Hospitals NHS Trust

Critical Care Unit

Medical and Nursing procedures on Critical Care

Critical Care treatment is complex and often involves specialised treatments and procedures not available on general medical or surgical wards. All of the procedures involve some risk to the patient.

The procedures and treatments are only undertaken when the benefits are thought to outweigh the risks.

In general, all medical procedures have the potential to cause complications. This is particularly so where a medical device is inserted into the body. The complication may happen at the time of insertion or may develop after the device has been in place for some time

These complications can include:

- Bleeding
- Misplacement of the device
- Infection
- Discomfort
- Perforation or damage to parts of the body next to the device.

We take all possible precautions to minimise these risks including education, checklists and following, where applicable, best practice guidelines. We only do procedures when and where we think the benefit outweighs the risks.

The following pages detail some of the more common procedures that may be undertaken during Critical Care admission and some of the potential problems that may be associated with them.



Arctic Sun

Also known as:

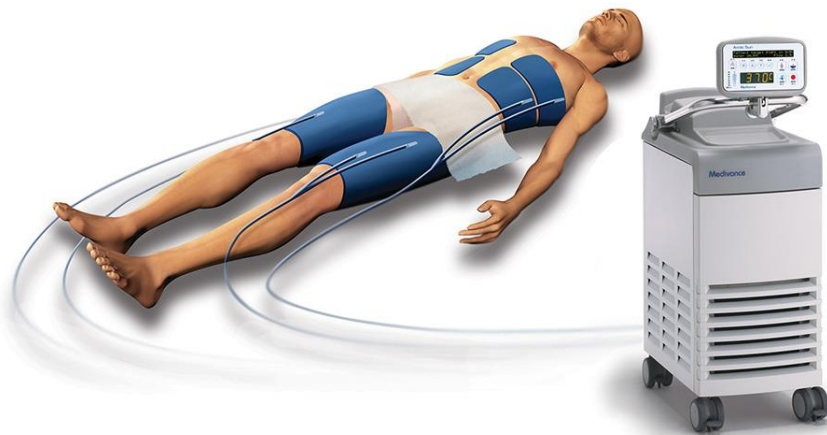
Cooling, targeted temperature management

What is the Arctic Sun and why is it used?

The Arctic Sun is a body temperature controlling device, which enables a patient's body temperature to be controlled within a specific range. It is often used in patients following a cardiac arrest to control their temperature. It has been shown that keeping a patient's body temperature normal after a cardiac arrest improves the chance of their brain recovering. The Arctic Sun has gel pads which stick to a patient's body. The device circulates water through the pads at a temperature between 4–42 °C. By controlling the temperature of the water running through the gel pads, the Arctic Sun can help control a patient's body temperature.

Are there any risks?

There are generally no risks associated with using the arctic sun,



Art Line

Also known as:

Arterial Line or intra-arterial catheter

What is an Art Line?

An art line is a thin plastic tube inserted into an artery to continuously measure the blood pressure. Regular blood tests are taken from it – most commonly to measure the levels of oxygen, carbon dioxide and acid within the blood.

How is it put in?

Using local anaesthetic, the doctor inserts a needle and then the art line into the artery. The needle is removed. It is secured in place with a stitch. Although usually placed in the wrist, an art line may be positioned at the elbow, groin or foot. They commonly stay in place for several weeks. You may notice the fluid within the art line pulsating slightly. This is normal and is due to pulsations within the artery.

Are there any risks?

Art lines are generally very safe, although they may occasionally require multiple attempts for insertion. They may damage the artery or cause clots to form in the artery; either of these can temporarily impair blood supply. Very rarely, this lack of blood supply may cause the death of downstream tissue.



Balloon Pump.

Also known as:

Intra-Aortic Balloon (Counterpulsation) Pump or IABP

What is a Balloon Pump?

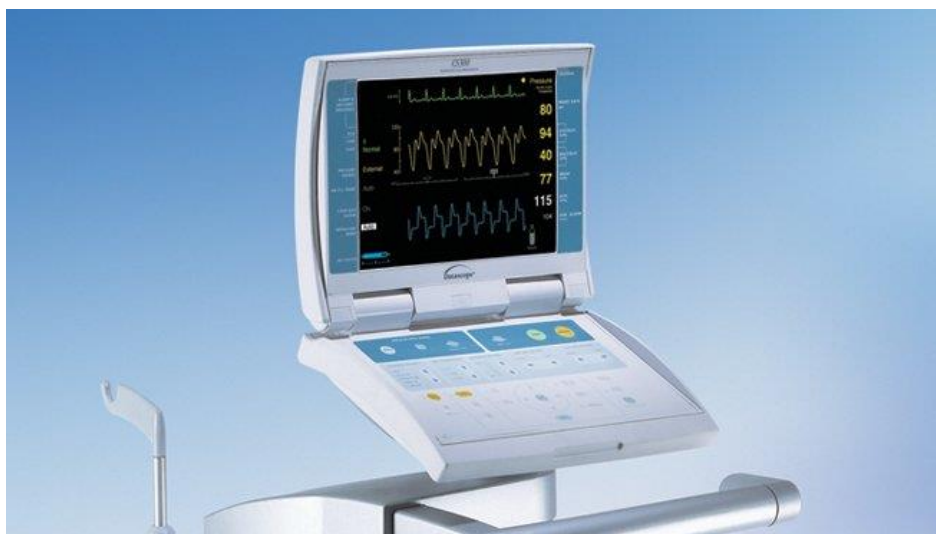
A balloon pump is a long inflatable tube positioned in the aorta, the main blood vessel which runs out from the heart. It beats in time with the heart and aids the pumping of blood to the rest of the body. It also helps supply additional blood and oxygen to the heart itself.

How is it put in?

A doctor inserts the balloon via a blood vessel in the groin. It is attached to a console which sits at the end of the bed. Helium gas is used to inflate the balloon in time with the heart.

Are there any risks?

A balloon pump may damage the aorta or the vessel into which it was inserted or impair blood supply to other parts of the body such as the leg or intestines. There is also a small risk of blood clot formation and gas leakage. A balloon pump is only used when absolutely necessary and is constantly monitored for complications.



BiPAP.

Also known as:

Bilevel Positive Airways Pressure
Non-invasive ventilation or NIV

Related & similar therapies are:

Continuous Positive Airways Pressure or CPAP

What is BiPAP and why is it used?

When patients cannot breathe adequately, a BiPAP machine may provide additional oxygen and assistance with breathing. This may reduce the need to insert an ET tube (intubate). BiPAP is usually applied using a tight fitting mask to the face or nose. BiPAP is used within Critical Care and sometimes elsewhere within the hospital.

Are there any risks?

The most common problem with BiPAP is that some find it too uncomfortable and cannot tolerate it. The mask can cause pressure areas on the face. As with ventilation via an ET tube there is a risk of chest infection. Despite using BiPAP some patients deteriorate and need to be intubated. Patients on BiPAP are closely monitored for complications or any signs of deterioration.



Bronchoscopy.

Also known as:

A Bronch.

What is a Bronchoscopy?

A doctor performs a bronchoscopy by passing a flexible telescope into the patient's windpipe (trachea). This may be needed when a patient has pneumonia, when there is a blockage in the airways or to aid the placement of other tubes (e.g. a tracheostomy) into the trachea. The doctor may take samples from the airways for analysis. Occasionally a small piece of lung tissue (biopsy) is taken. In Critical Care bronchoscopy is usually performed through a breathing tube (ET tube or tracheostomy). Sedation is given during the procedure.

Are there any risks?

A bronchoscopy may cause a deterioration in a patient's oxygen level or a small amount of bleeding in the airways. If a biopsy is taken there is a small risk of damage to the lung. There is a risk that a bronchoscopy may cause infection in the lung. There is a small risk of side effects to the medications used for sedation during the procedure.



Chest Drain.

Also known as:

Intercostal catheter
Pleural drain
Mediastinal / pericardial drain

What is a chest drain?

Patients who have had chest or heart surgery, or trauma may need a tube (a chest drain) inserted through the chest wall to drain fluid or air from around the lung (or heart). A chest drain may also be required to drain collections of fluid from the chest in other circumstances (such as pneumonia).

Are there any risks?

A chest drain may cause damage to the lung or other parts of the body during insertion. Chest X-rays are done after insertion to check that they are in an appropriate position. The chest drain can cause pain, and may occasionally become blocked. The chest drain and the patient are constantly monitored for complications. They are removed when they are no longer necessary.



CPAP.

Also known as:

CPAP Hood

Related & similar therapies are:

BiPAP

What is CPAP and why is it used?

When patients cannot breathe adequately, a CPAP machine may provide additional oxygen and assistance with breathing. This may reduce the need to insert an ET tube (intubate). CPAP is usually applied using a tight fitting mask to the face or via a hood.

Are there any risks?

The most common problem with CPAP is that some find it too uncomfortable and cannot tolerate it. The mask can cause pressure areas on the face. As with ventilation via an ET tube there is a risk of chest infection. Despite using CPAP some patients deteriorate and need to be intubated. Patients on CPAP are closely monitored for complications or any signs of deterioration.



CVC.

Also known as:

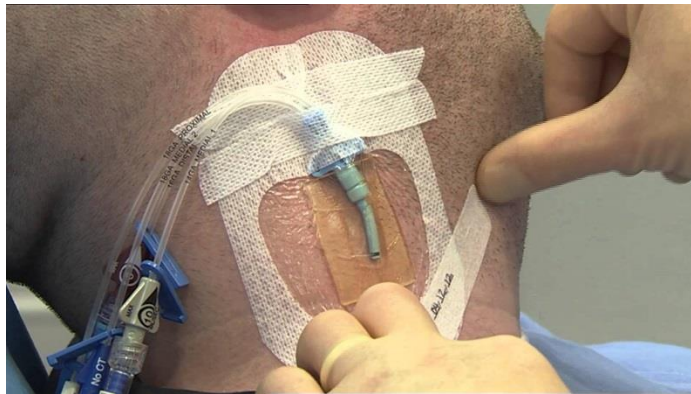
Central Venous Catheter
Central line or CVP line

What is a CVC and why is it put in?

A CVC is a thin plastic tube inserted in to a large vein for the administration of intravenous medications and to monitor pressures within the body. Under sterile conditions a doctor inserts the CVC using a needle into either the neck, beneath the collar bone or in the groin. The needle is removed after the line has been placed. The CVC may stay in place for several weeks but will be removed as soon as it is no longer required.

Are there any risks?

CVCs sometimes take multiple attempts to insert. The most common significant complication of CVCs is infection. During insertion, there is a risk of the needle damaging other structures such as arteries or nerves, and CVCs inserted in the neck or under the collar bone may also occasionally puncture the lung. CVCs used in this Critical Care unit are coated with antibiotics and special dressings are used to minimise the chance of infection.



Endoscopy.

Also known as:

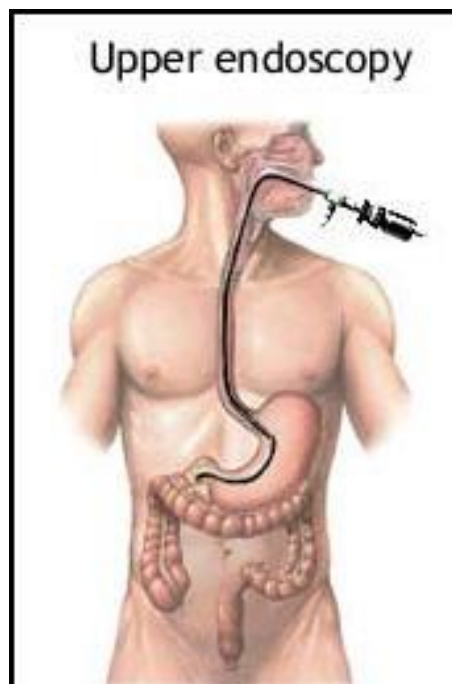
Upper GI endoscopy, gastroscopy

What is an Endoscopy?

An upper GI endoscopy is a procedure to look at the inside of your oesophagus (gullet), stomach and duodenum using a flexible telescope. This is undertaken to look for bleeding or other problems within the upper GI tract. The Endoscopist (the person doing the endoscopy) can perform biopsies or interventions to stop bleeding.

Are there any risks?

The healthcare team will try to make the procedure as safe as possible but complications can happen. Some of these can be serious and can even cause death (risk 1in 25,000). One of the more serious risks is making a hole in your oesophagus, stomach or duodenum (risk 1 in 2000) the risk is higher if there is an abnormal narrowing. Other complications include damage to teeth or dental work. This is reduced by using a protective mouth piece.



Epidural.

What is an Epidural?

An epidural involves injecting local anaesthetic and other painkillers into an area called the epidural space, near your spinal cord. This numbs your nerves to give pain relief in certain areas of the body. An epidural is used after an operation or procedure to give effective pain relief. It may also be used to provide pain relief from fractured ribs. Epidurals may be inserted awake, before an operation or for fractured ribs or on the Critical Care Unit after an operation. The epidural can be maintained by giving extra doses or by continuous low dose known as an infusion. The effect of the epidural can be varied by changing the type and amount of medication given. The more anaesthetic you are given the number you will be.

An epidural has three main effects; **pain relief** (although you may still feel touch or pull it should not hurt) **weakness** (the nerves supplying muscles may also be affected- this can make it difficult for you to move your legs) and **low blood pressure** (the nerves that help to control blood pressure are the most easily affected). Therefore, it may be necessary to use other drugs to maintain your blood pressure after an operation, until the epidural is no longer needed. An epidural gives good pain relief, but like other forms of pain relief, cannot guarantee that you will be pain free.

Are there any risks?

A serious complication happens in about 1 in 10,000 epidurals. There is a risk of significant permanent harm from an epidural (risk: 1 in 5750 to 1 in 12,200).

The possible complications are below:

Failure of the epidural – (risk: 1 in 20) Of those that don't initially work, half are adjusted and then work well. Epidurals still provide better pain relief than most other techniques.

Low blood pressure (risk: 1 in in 30)

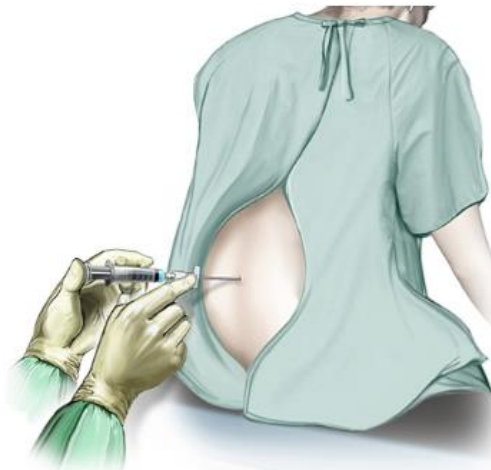
Headache - This is common after operations anyway, in this case it happens because the bag around your spinal cord is punctured (risk: 1 in 100) risk. This can be mild to severe but can be treated.

Itching – (risk: 1 in 10) this is common, especially if morphine or similar painkillers are given through the epidural. This can be easily treated.

Leg weakness - This common but very variable.

Backache - This is common after operations. It is common to have a bruised feeling in your back after an epidural but there is no evidence that epidurals causes long term backache.

Other rare but important risks include infection (risk: 1 in 30,000), Nerve damage (risk: 1 in 50,000-100,000), blood clots around your spine (risk: 1 in 20,000), paralysis or death (risk: 1 in 16,400 to 1 in 100,000).



Filter / Dialysis.

Also known as (and similar therapies):

Haemodialysis,
Haemofilter,
Haemofiltration,
Haemodiafiltration.
(Continuous) Renal Replacement Therapy
Continuous Veno-Venous Haemofiltration
CVVHD, CVVHF, CVVHDF, RRT or CRRT

What is the Filter and why is it used?

Patients often require a dialysis (filter) machine when there is kidney failure or abnormal levels of acid and salts within the blood. It is also occasionally used to treat some drug overdoses. A doctor inserts a Vascath (see Vascath) into a large vein in the neck or groin. Blood circulates through the dialysis machine, toxins are removed and the blood then returns to the body. As patients recover, the kidney function often improves and the dialysis machine can be stopped.

Are there any risks?

A patient's blood pressure may drop temporarily when dialysis is started. The dialysis machine may reduce the levels of some blood cells. It may also lead to a reduction in body temperature. The blood usually needs to be thinned to allow successful dialysis, and this too carries a small risk. Other complications are quite rare.



Flexiseal.

Also known as:

Faecal Management System (FMS)

What is a Flexiseal and why is it used?

The Flexi-Seal is used in patients with little or no bowel control and liquid or semi-liquid stool. It is a better alternative to traditional methods of managing faecal incontinence. A soft silicone catheter is inserted into the rectum and retained by a low-pressure balloon. A collection bag is connected at the other end.

Flexi-seal FMS is designed to reduce the risk of skin breakdown by effective faecal diversion and containment, protect wounds, surgical sites, and burns from faecal soiling. Minimise soiling of bed cloths and linens through effective faecal diversion and containment (thus avoids contamination of the general environment around the patient's bed).

Are there any risks?

Loss of anal sphincter tone could lead to temporary anal sphincter dysfunction. Risk of pressure necrosis of rectal or anal mucosa. Risk of infection. Bowel obstruction and perforation of the bowel.



Inotropes.

Also known as:

Vasopressors
Vaso-constrictors
Vaso-active drugs
Inoconstrictors and inodilators

What are Inotropes and why are they used?

Inotropes are drugs given to increase the blood pressure and support the function of the heart. They are given via a CVC (see CVC) into a large vein. Different types of inotrope (e.g. adrenaline, noradrenaline, milrinone) are used in various situations. Inotropes are commonly used in the Critical Care Unit.

Are there any risks?

Different inotropes have different effects and side effects. In high doses some may impair blood supply to fingers or toes. Other inotropes may cause irregular heart rhythms or increase the level of acid or sugar in the blood. They may cause the blood pressure to rise too high.



Intravenous Cannula.

Also known as:

IVC
IV Cannula
Drip

What are Intravenous Cannulas and why are they used?

An intravenous cannula is a small, soft piece of hollow tubing which is inserted into a vein, usually in the back of the hand or the arms, which is then used to administer intravenous medications and fluids. They are used as an alternative to CVC (see CVC) when the latter is not required.

Are there any risks?

Intravenous cannulas can take several attempts to insert. The main risk is infection, and they are routinely changed every few days to prevent this. They can cause inflammation or blood clots to form in the vein in which they are inserted. There may be bleeding when they are removed.



Intubation.

Also known as:

Insertion of a breathing tube (an Endo-Tracheal tube, ET-tube or ETT).

What is Intubation?

If a patient is unconscious or has severe breathing difficulty, then an ETT is placed into the windpipe (trachea). This is then connected to a ventilator. The ventilator provides assistance with breathing and additional oxygen.

How is it done?

A general anaesthetic is given and a doctor inserts an ETT into the trachea via the mouth (or occasionally nose). Sometimes the procedure is done under local anaesthetic using a flexible telescope (see Bronchoscopy). A small cuff is inflated to create a seal to stop air leaks and stop mouth secretions going into the lungs. Once the ETT is confirmed to be in the right place it is secured with a special holding device. Sedation is usually given for comfort while the ETT is in place.

Are there any risks?

There is a risk of reduced oxygen to the body during intubation that may very rarely cause death or severe disability. Intubation may occasionally damage the trachea, vocal cords, mouth and teeth. There may be a reaction to the drugs used for the general anaesthetic. It may be malpositioned into the oesophagus. There is a risk of chest infection whilst a patient is intubated. The ETT may be accidentally dislodged. We have clear protocols and guidelines for intubation, the latest equipment and regular training to minimise the risks. An ETT placed during intubation may stay in place for several weeks and occasionally longer. If a patient requires ventilator support for a long period of time we usually perform a tracheostomy (see Tracheostomy).



Lumbar Puncture.

Also known as:

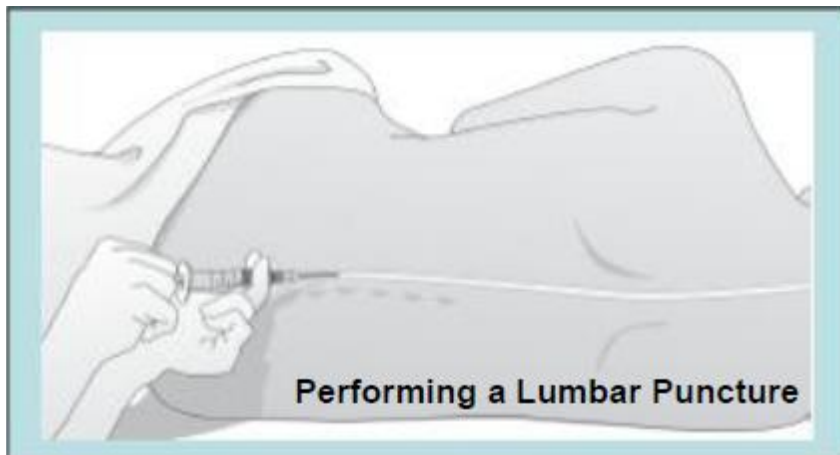
LP
Spinal tap

What is an LP and why is it performed?

An LP is performed to sample the fluid from around the spinal cord and brain. Under sterile conditions a doctor inserts a small needle through the lower part of the back and draws off a small amount of fluid. An LP may be done to measure the pressure inside the spine and brain or to check for conditions such as meningitis.

Are there any risks?

Occasionally an LP may cause a headache after the procedure. There is also a very small risk of damage to the spinal cord and brain from an LP, either directly or because of bleeding or infection at the site of the LP.



NG Feed.

Also known as:

Nasogastric Feeding
Orogastric or OG Feeding

What is NG feed and why is it used?

NG feed is a liquid form of nutrition which is passed into a patient's stomach via a plastic tube inserted into the nose (NG tube) or mouth (OG tube). Patients who are attached to ventilators are not able to eat food the normal way. Most Critical Care patients are fed in this way.

Are there any risks?

NG feeding rarely causes problems. However NG tubes may lead to sinus infection. There is a possibility of incorrect tube placement. NG feeding may increase the risk of vomiting, diarrhoea and possibly pneumonia (while on a ventilator). Some patients may not absorb enteral feeds; in this case, TPN may be used (see TPN).



Proning.

Also known as:

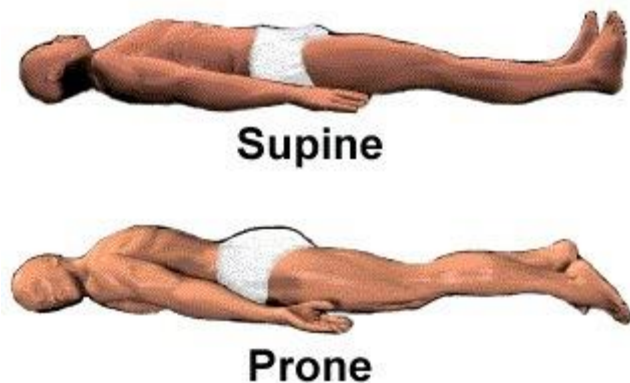
Prone positioning

What is Proning and why is it used?

Prone positioning, or “Proning” is a form of treatment sometimes used to support mechanically ventilated patients with lung disease who require high concentrations of oxygen. To initiate prone positioning medical staff turn a patient face down from his or her back (supine position). Thereafter, the patient may be turned from one position to the other until the requirement for a high concentration of oxygen resolves. Patients can be left prone for between 12 and 24 depending on their response to treatment.

Are there any risks?

Even with proper equipment, physically flipping over a critically ill patient has risks, particularly since the patient will be hooked up to many wires and tubes. Possible problems include unintended extubation (tubes coming out), airway obstruction, and difficulties coordinating the ventilator. Some patients may require increased sedation and muscle relaxants, may experience facial swelling, and may develop “pressure sores” on the weight-bearing parts of the body, such as the knees and chest. There is also a small risk of nerve damage due to pressure on nerves. We aim to minimise the risks associated with Proning as much as possible.



TOE.

Also known as:

Trans-Oesophageal Echo

What is a TOE?

A TOE is a specialised ultrasound examination of the heart. A doctor passes an echo probe through the mouth of a patient and into the oesophagus and then the stomach. This allows inspection of the heart and major blood vessels from inside the chest to see if there are any abnormalities. It also provides information on how well the heart is working. Sedation is given to the patient during the procedure.

Are there any risks?

A TOE may rarely damage the mouth or oesophagus. Patients may have a sore throat for a short time after the procedure. There is a very small risk of the TOE probe causing perforation of the oesophagus. The risk is increased if there is a history of a bleeding disorder, difficulty swallowing, or liver disease. All patients are carefully monitored before, during and after a TOE.



TPN.

Also known as:

Total Parenteral Nutrition
Intravenous Feeding

What is TPN and why is it used?

TPN involves introducing nutrition directly into a patient's vein. It is usually given via a CVC (see CVC). It is used when it is not possible to feed a patient via the stomach and gut. It is often possible to switch back to normal feeding via the gut as the patient's condition improves.

Are there any risks?

TPN may put a patient at increased risk of infection. It may also affect liver and immune function, and can cause high blood sugars requiring treatment. TPN is regularly assessed by nursing, medical and nutrition staff.



Tracheostomy.

Also known as:

Trache or Tracheotomy

What is a Tracheostomy?

When a patient is attached to a ventilator for a prolonged period, a tracheostomy is usually performed. This is a plastic tube which is placed directly into the windpipe (trachea) through the front of the neck. It is more comfortable than a breathing tube through the mouth and often allows better weaning from the ventilator.

How is it put in?

Under a general anaesthetic and with local anaesthetic and strict sterile precautions, a doctor performs a small operation to insert the tracheostomy. This is usually performed in the Critical Care unit. Speech and swallowing are sometimes possible when a patient has had a tracheostomy in for some time. The tracheostomy is almost always removed when the patient has recovered, leaving a small scar.

Are there any risks?

All tracheostomies are inserted under direct Critical Care Consultant supervision. There is a small risk of bleeding during the procedure. Rarely, the patient may need to go the operating theatre if the bleeding cannot be stopped. There is also a risk of low oxygen levels and difficulty with ventilation during the insertion of the tracheostomy or if it were to become blocked. Very rarely this may cause death or severe disability. There may be a reaction to the drugs used for the general anaesthetic. A tracheostomy may occasionally damage the trachea, needing long term followed up. All tracheostomies both in the Critical Care unit and in the general wards are carefully monitored for any complications.



Transfusion.

Different forms of Transfusion & related terms:

Blood Transfusion
Packed Red Blood Cells
Platelets
Fresh Frozen Plasma or FFP
Cryoprecipitate or Cryo
Immunoglobulins

When are Transfusions used?

Blood transfusions are required to correct low blood counts (low haemoglobin, anaemia) or replace blood loss due to bleeding. Other blood products listed above are used to correct abnormal or low levels of clotting factors (if a patient is bleeding or is at risk of bleeding during a procedure) and antibodies.

Are there any risks?

Serious reactions against transfusions are fortunately rare. However all transfusions carry a small risk of infection. A recipient's body may also react against a transfusion. These reactions may range from a mild increase in temperature to severe multiple organ failure. The risk of a reaction is minimised by extensive checking procedures to ensure that a patient receives the safest blood product possible.



Urinary Catheter.

Also known as:

In-Dwelling Catheter (IDC)
Catheter

What is a Urinary Catheter and why is it used?

A Urinary Catheter (IDC) is a soft tube inserted into the bladder through the urethra. It drains urine from the bladder continuously, removing the need for a patient to empty the bladder as usual. A small balloon at the tip of the catheter holds it in place within the bladder. It is essential for patients who are heavily sedated, have an epidural catheter in place, or who have limited mobility and are therefore unable to walk to the toilet. It is also used to closely record urine output. The catheter is connected to a drainage bag which holds and records the amount of urine passed.

Are there any risks?

Urinary catheters can lead to infection within the bladder. There is a small risk of damaging the urethra when the catheter is inserted which can lead to bleeding and, extremely rarely, problems with passing urine after the catheter is removed. Some patients are temporarily unable to pass urine when the catheter first comes out – in this case, the catheter may need to be re-inserted for a short period of time.



Vascath.

Also known as:

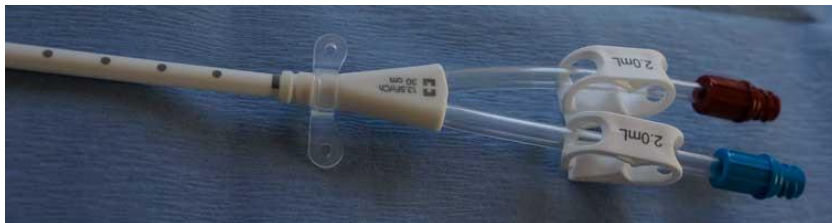
Dialysis line of Vascular Catheter

What is a Vascath and how is it put in?

A Vascath is a tube inserted into a large vein for dialysis (when there is kidney failure – see Filter) or for plasmapheresis (the removal of certain proteins from the blood). It is similar to a CVC. Under sterile conditions a doctor inserts a needle and then the Vascath into either the neck, beneath the collar bone or in the groin. The needle is removed and the Vascath is left in place for up to several weeks. The Vascath is removed when it is no longer needed.

Are there any risks?

Vascaths sometimes take multiple attempts to insert. The most common significant complications of Vascaths are infection and blockage. During insertion, there is a risk of the needle damaging other structures such as arteries or nerves, and Vascaths in the neck or under the collar bone may also occasionally damage the lung. Chest X- rays are done after insertion to check for any complications.



Ventilator.

Also known as:

Respirator
Breathing Machine
Invasive Ventilation

What is a Ventilator and why is it used?

When patients cannot breathe adequately, they may need to be attached to a ventilator (via an ET tube or tracheostomy – see Intubation and Tracheostomy). This is a common reason for admission to a Critical Care unit. The ventilator provides additional oxygen and assistance with breathing. Patients on ventilators via an ETT often require sedation. When a patient no longer needs ventilator support it is weaned and the ETT removed. If a patient requires ventilator support for a long period of time we usually perform a tracheostomy.

Are there any risks?

Patients who are on a ventilator are at risk of damage to the lung and infection. The risk of chest infection and pneumonia (although small) increases with the amount of time spent on a ventilator. Patients are constantly monitored for complications.



The Royal Blackburn Teaching Hospitals NHS Trust

Critical Care Unit

Acknowledgements.

The Medical and Nursing staff will be happy to discuss any concerns you may have about the Procedures and Treatments performed in Critical Care.

This information leaflet has been adapted from 'The Alfred Hospital Intensive Care Unit Information about Procedures and Treatments.'

Safe | Personal | Effective

