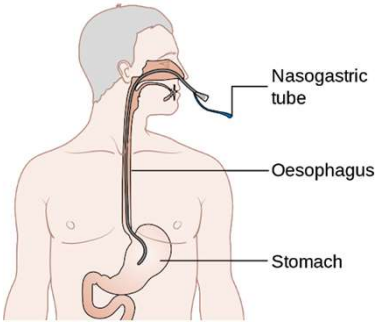
GASTROURINARY DEVICES | FEEDING TUBES

- Nasogastric tube (NG-tube)
  - ✓ Through nose into stomach
- Gastrostomy tube (G-tube)
  - ✓ Through abdominal wall into stomach
  - ✓ Longer-term nutrient delivery





COPYRIGHT © MISSIONCIT, LLC 2020-2021 ALL RIGHTS RESERVED | EMS CARE™ CHAPTER 30 | CARE FOR PATIENTS WITH SPECIAL CHALLENGES

So, continuing with Part B of Advanced Medical equipment, we now discuss Gastrourinary, Dialysis and Neurological devices.

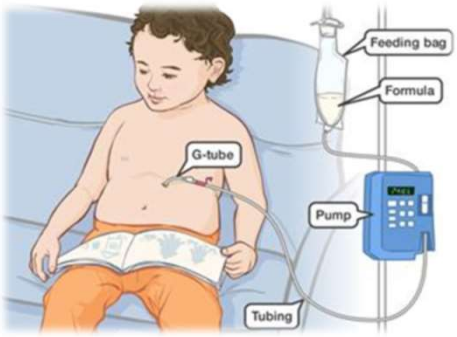
We begin with Feeding tubes that are used in patients who cannot feed themselves or who cannot swallow. They may be used short-term during recovery from surgery or for chronic conditions.

A nasogastric tube is a long tube inserted through the nose into the stomach that can be used to deliver nutrients.

A gastrostomy tube is a feeding tube surgically implanted through the abdominal wall into the stomach.
Sometimes referred to as gastric tubes, they are used for patients who cannot ingest fluids, food, or medication by mouth

Feeding Tubes | Care Considerations

- Common problems include dislodgement, infection, and clog
- When clogged, Immediately stop the flow of any fluids and assess for signs or symptoms of bleeding into the stomach
- Secure tube to patient's body with tape prior to transport
- Keep nutrients higher than tube
- Put protective cap in place to prevent leakage



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

Common problems with feeding tubes include dislodgement, infection, and clog.

When clogged, immediately stop the flow of fluids and assess for signs or symptoms of bleeding into the stomach. The caregiver should know how to flush the tube.

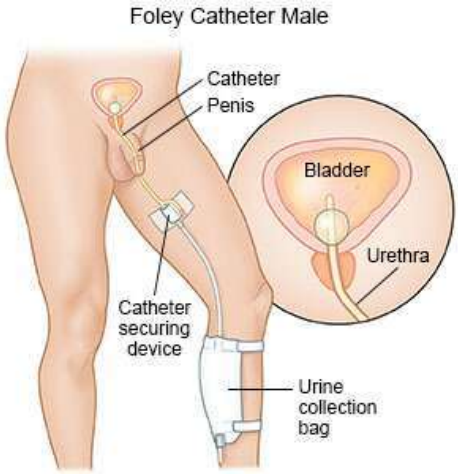
If the situation requires transport, Secure the tube to the patient's body with tape prior to transport

Be sure to Keep the nutrients bag higher than the tube.

And put the protective cap in place to prevent leakage.

GASTROURINARY DEVICES | URINARY CATHETERS

- Flexible tube used to empty the bladder and collect urine in a drainage bag.
- Indications:
  - ✓ Obstruction, Bladder Weakness
  - ✓ Incontinence, Medication delivery
- Types:
  - ✓ Intermittent
  - ✓ Indwelling (Foley)



COPYRIGHT © MISSIONCIT, LLC 2020-2021 ALL RIGHTS RESERVED | EMS CARE™ CHAPTER 30 | CARE FOR PATIENTS WITH SPECIAL CHALLENGES

A urinary catheter is a flexible tube used to empty the bladder and collect urine in a drainage bag. A urethral catheter is inserted through the tube that carries urine out of the bladder. A suprapubic catheter is inserted in a small opening made in the lower belly.

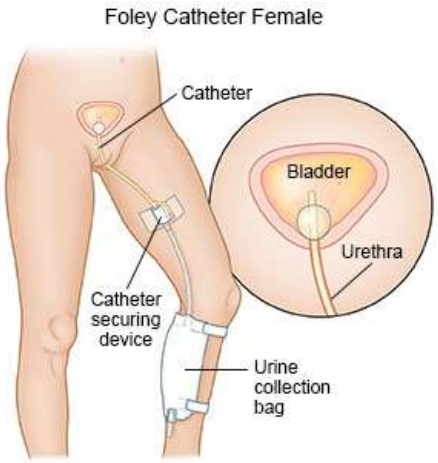
Specific reasons a urinary catheter may be used include bladder weakness and enabling urine to drain from an obstruction in the urethra. Also, it may be used for urinary incontinence and nerve damage. In addition, a catheter may be used for the delivery of medicine directly into the bladder.

There are 2 main types of urinary catheters. First - intermittent catheters – these are temporarily inserted into the bladder and removed once the bladder is empty. The other type is indwelling catheters – these remain in place for many days or weeks, and are held in position by an inflated balloon in the bladder.

Most commonly seen catheters are in-dwelling Foley catheters. The external tube is connected to a collection bag. The bag may be strapped to the patient's leg, or a large drainage bag may hang on the side of the patient's bed.

URINARY CATHETERS | CARE CONSIDERATIONS

- Common problems are infection, blockages, discoloration of urine, and dislodgement of the catheter
- During transport, keep catheter bag lower than patient (not on floor)
- Document any urine discoloration or odor
- Empty bag if one-third to one-half full
- Document amount emptied



COPYRIGHT © MISSIONCIT, LLC 2020-2021 ALL RIGHTS RESERVED | EMS CARE™ CHAPTER 30 | CARE FOR PATIENTS WITH SPECIAL CHALLENGES

Common problems are infection, blockages, discoloration of urine, and dislodgement of the catheter.

During transport, keep the catheter bag lower than the patient, but not on the floor.

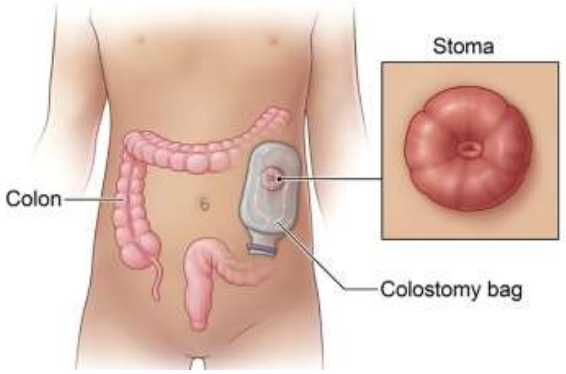
Document any urine discoloration or odor.

Before transport, empty the bag if one-third to one-half full.

And remember to document the amount emptied.

GASTROURINARY DEVICES | OSTOMY BAGS

- Ostomy Surgeries:
  - ✓ Colostomy
  - ✓ Ileostomy
  - ✓ Urostomy
- Prosthetic device → pouch or bag:
  - ✓ Worn over the stoma
  - ✓ Not visible through clothing



COPYRIGHT © MISSIONCIT, LLC 2020-2021 ALL RIGHTS RESERVED | EMS CARE™ CHAPTER 30 | CARE FOR PATIENTS WITH SPECIAL CHALLENGES

With ostomy surgeries, bodily waste is rerouted from its usual path because of malfunctioning parts of the urinary or digestive system. An ostomy can be temporary or permanent. This allows for the elimination of waste products into an external bag or pouch, which is emptied or changed frequently

A stoma is the opening created by ostomy surgery. It is located on the abdomen and is dark pink in color. For most ostomies, a pouch is worn over the stoma to collect stool or urine. However, there may be an internal surgically created pouch in some cases.

The ostomy bag is worn over the stoma, and usually not visible through the patient's clothing.

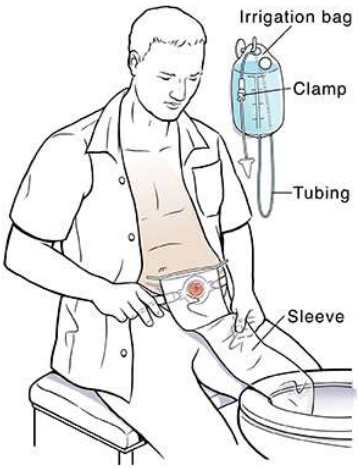
A colostomy is the surgically created opening of the large intestine which results in a stoma.

An ileostomy is a surgically created opening from the ileum, the lowest part of the small intestine.

A urostomy is a general term for a surgical procedure that diverts urine away from a diseased or defective bladder.

Ostomy bags | Care Considerations

- Common problems
- Infection at stoma site, blockage, or dislodgement
- Use care when transporting patient
- Prevent breakage or dislodgement of bag



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

During the secondary assessment when treating patients with ostomy bags, check for signs and symptoms of dehydration if the patient has been complaining of diarrhea or vomiting.

Note that the area around the stoma is prone to infection.

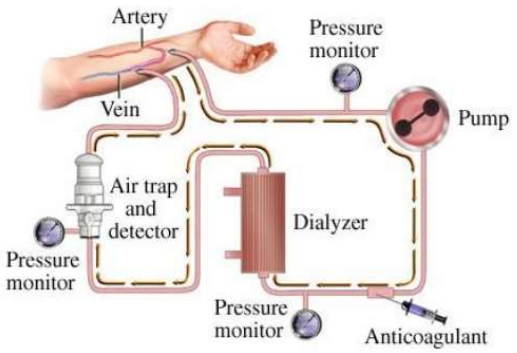
Use care to prevent breakage or dislodgement of the bag when transporting a patient.

Finally, be sure to follow local protocols for the care of a patient with an ostomy bag, and consider contacting

medical control for support.

GASTROURINARY DEVICES | DIALYSIS

- Patient has renal failure
- Dialysis replaces functions of kidney
- Waste removal and fluid removal



COPYRIGHT © MISSIONCIT, LLC 2020-2021 ALL RIGHTS RESERVED | EMS CARE™ CHAPTER 30 | CARE FOR PATIENTS WITH SPECIAL CHALLENGES

As we discussed earlier in chapter 3a, Dialysis is a procedure to remove waste products, and excess fluid from the blood when the kidneys stop working properly.

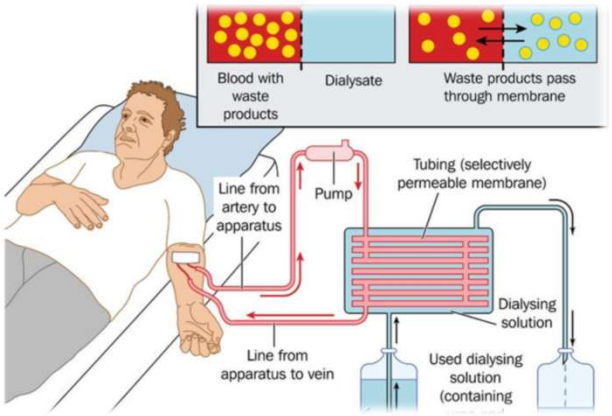
Normally, the kidneys filter the blood, removing harmful waste products and excess fluid, and turning these into urine to be passed out of the body.

EMS providers may encounter two types of dialysis. The most common is hemodialysis, which is generally conducted in a specialized medical setting, but maybe done at home.

The other type—peritoneal dialysis— involves placing dialysate directly into the patient's peritoneal cavity. Peritoneal dialysis can be accomplished at home, but it requires the active participation of the patient or caregiver.

Dialysis | Hemodialysis

- Performed by attaching patient to external machine (dialyzer)
- Usually at dialysis center
- Large needles and tubing remove and return blood
- Devices: A/V Shunts, Fistulas, Grafts



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

Hemodialysis is a procedure where a dialysis machine and a special filter called an artificial kidney, or a dialyzer, are used to clean the patient's blood.

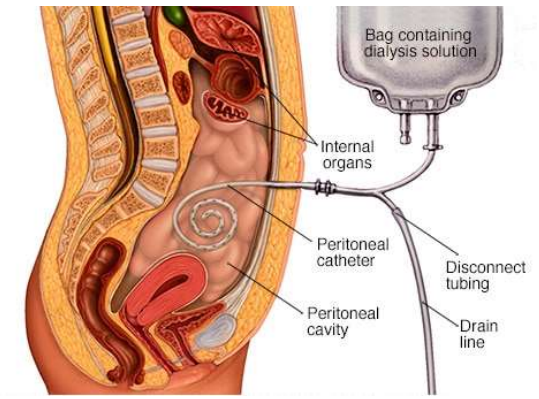
For hemodialysis, the required blood flow is greater than a peripheral vein can handle. This increased demand requires that a line be used to access large blood vessels. Hence, the patient may have either Shunts, Fistulas or Grafts to accommodate the dialysis. A medical procedure is done, usually in the arm, to enable access for the volume of blood flow necessary to go through the dialyzer.

Due to the increased vascular pressure where an A-V shunt has been created, EMS providers should avoid that area when starting an IV or measuring blood pressure. Other devices you may see include:

- A fistula that is formed by surgically connecting the walls of an artery to the walls of a vein. Fistulas are usually created in a patient's upper extremities. Or
- A graft that connects an artery and vein with a synthetic tube. Grafts are also usually placed in a patient's upper extremities.

Dialysis | Peritoneal dialysis

- Permanent catheter implanted through abdominal wall into peritoneal cavity
- Dialysis solution runs into abdominal cavity and ultimately drained back into dialysis bag to be discarded



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

Peritoneal dialysis uses the peritoneum in a person's abdomen, as the membrane through which fluid and dissolved substances are exchanged with the blood. It is used to remove excess fluid, correct electrolyte problems, and remove toxins in those with kidney failure.

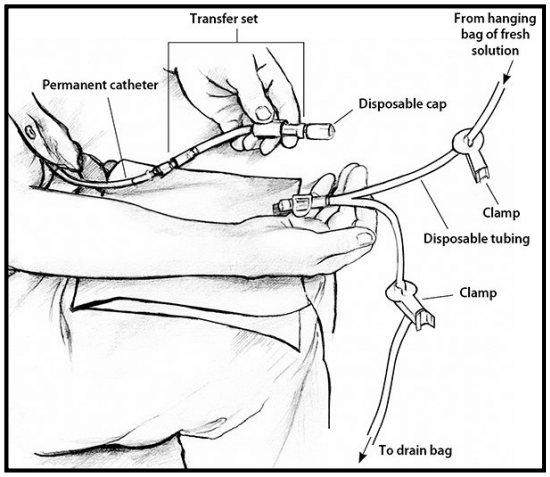
During peritoneal dialysis, a cleansing fluid flows through a catheter into the abdomen. The peritoneum acts as a filter and removes the waste products from the blood. After a set period, the fluid with the filtered waste products flows out of the patient's abdomen and is discarded.

These treatments can be done at home, at work, or while traveling. Peritoneal dialysis requires manual dexterity and the ability to care for oneself at home, or having a reliable caregiver.

Devices include a permanent catheter implanted through the abdominal wall into the peritoneal cavity. The Dialysis solution runs into the abdominal cavity through the catheter and, is ultimately drained back into a dialysis bag to be discarded.

Dialysis | Care Considerations

- Complications: Bleeding from A-V fistula, Dislodging of catheter, infection (peritonitis)
- Do not take blood pressure on any arm with A-V shunt, fistula, or graft
- Rupture of shunt, fistula, or graft causes fast, significant blood loss
- Direct pressure to control bleeding
- Treat for shock
- Transport



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

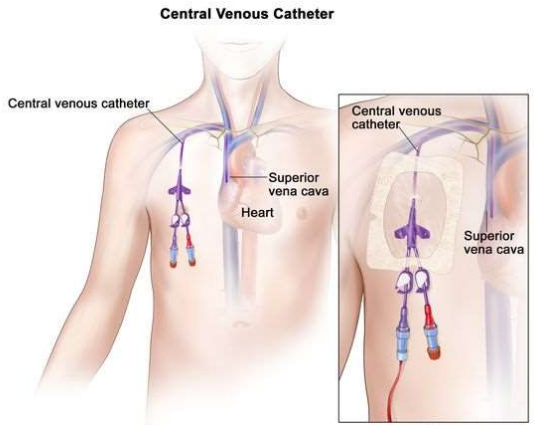
Common complications for renal patients include bleeding from an A-V fistula, dislodging of a catheter, infection, or peritonitis. Be sure not to take blood pressure on any arm with an A-V shunt, fistula, or graft.

Be hyperaware that the rupture of a shunt, fistula, or graft will cause critically fast and significant blood loss. Use direct pressure to control bleeding and treat for shock.

Consider contacting ALS or medical control as conditions warrant, and transport to an appropriate facility.

Gastrourinary Devices | Central IV catheters

- Surgically inserted for long-term delivery of medications or fluids
  - ✓ IV chemotherapy, parenteral nutrition
- Peripherally inserted central catheter (PICC)
- Central venous line



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

11

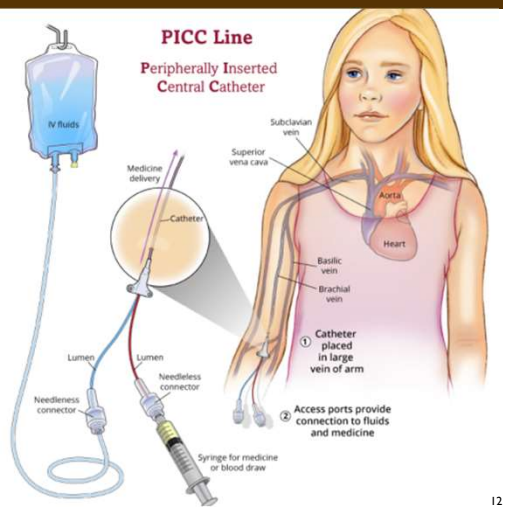
A central venous catheter (CVC), is a catheter placed into a large vein for more reliable vascular access. These catheters are commonly placed in veins in the neck, chest, groin, or through veins in the arms. They are also known as a PICC line, or peripherally inserted central catheters.

Placement of larger catheters in more centrally located veins is often needed in critically ill patients, or in those requiring prolonged intravenous therapies. The CVC is used for many types of home care patients receiving chemotherapy, long-term antibiotic drug therapy, pain

management, total parenteral nutrition, and Hemodialysis.

Central IV catheters | Care Considerations

- Complications: Infection at site
- Use of central IV usually restricted to hospital personnel
- Be aware of type of catheter
- Avoid tugging
- Avoid contamination

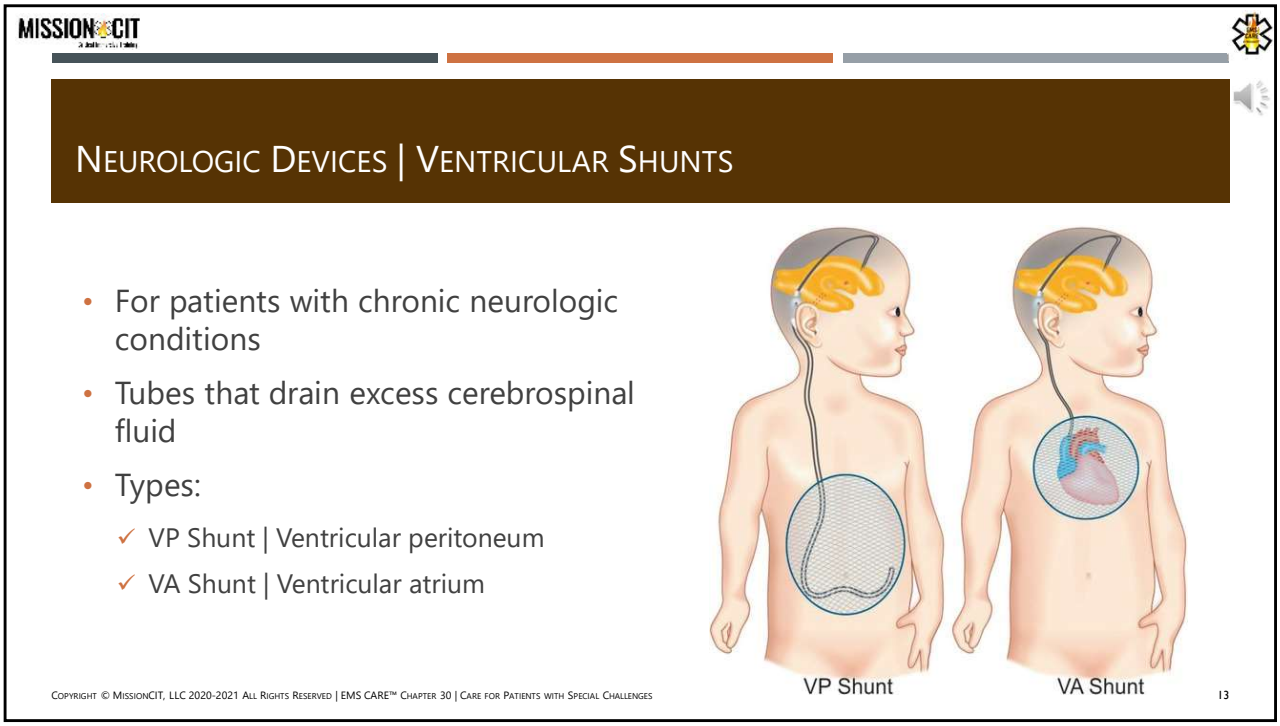


Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

So, the most common complication for a CVC is an Infection at the site.

Some helpful tips include being aware of the type of catheter and to avoid tugging or contamination.

Note that the use of a central IV is usually restricted to ALS or hospital personnel.



Ventricular shunts are used to drain cerebrospinal fluid into extra-cranial spaces. A shunt provides an alternative fluid pathway through which CSF bypasses an obstruction in the fluid compartments of the brain, and acts when CSF absorption is otherwise impaired. Such a bypass relieves the excess fluid buildup that is responsible for hydrocephalus and elevated intracranial pressure.

Ventriculo-atrial shunts are provided to transfer cerebrospinal fluid from the cerebral ventricle into the right atrium of the heart.

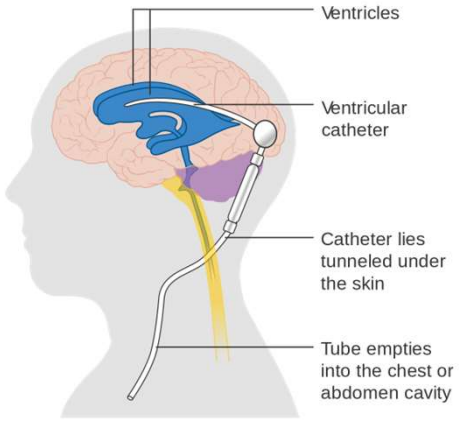
A ventriculoperitoneal shunt drains excess CSF from the ventricle through a tube that drains the fluid to the abdomen.

Shunts typically consist of three major components:

1. An inflow catheter, which drains CSF from the ventricles or the subarachnoid space.
2. A valve mechanism, which regulates differential pressure, or controls flow through the shunt tubing. And
3. An outflow catheter, which runs under the skin and directs CSF from the valve to the peritoneal cavity, heart, or another suitable drainage site.

Shunts | Care Considerations

- Palpation of a fluid reservoir behind the ear will alert you to the presence of a shunt
- Blocked/infected shunt may cause changes in mental status and respiratory arrest
- Infection may occur within 2 months of insertion
- Signs of distress



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

When CSF production and absorption are in balance, hydrocephalus is considered “compensated”. However, when out of balance, complications associated with elevated pressure or over drainage occur, causing the signs of a malfunctioning shunt.

During the assessment, you will likely feel the fluid reservoir beneath the skin on the side of the head, behind the ear. Routine complications are infection, obstruction, and over drainage.

Shunt malfunction is most commonly due to a blockage or some obstruction within the shunt system. If the

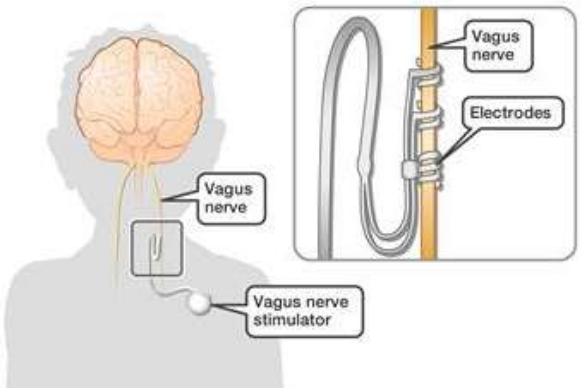
blockage is not corrected, symptoms of hydrocephalus will return. In some cases, shunt blockage may require surgery to replace the affected component.

Some malfunction indications include vomiting. lethargy, irritability, and swelling or redness along the shunt tract. Other distress symptoms would be from increased ICP.

Follow your secondary assessment and transport protocols for patients with ICP.

Vagus Nerve Stimulators

- Treatment for seizures not controlled with medication
- Stimulate the vagus nerve to prevent seizure activity
- Alternative treatment for seizures
- Located under the patient's skin
- About the size of a silver dollar



Copyright © MissionCIT, LLC 2020-2021 All Rights Reserved | EMS CARE™ Chapter 30 | Care for Patients with Special Challenges

Vagus nerve stimulation involves the use of a device to stimulate the vagus nerve with electrical impulses. An implantable vagus nerve stimulator is currently FDA-approved to treat epilepsy and depression. There is one vagus nerve on each side of the body, running from the brainstem, through the neck, and to the chest and abdomen.

It is used as a treatment for seizures not controlled with medication. The device is located under the patient's skin and is about the size of a silver dollar.

Some complications you may encounter from these

devices include infection, vocal cord paralysis, hematoma, stridor, facial muscle paresis, and arrhythmia. Follow your secondary assessment for the patient's symptoms and as indicated, advise medical control of the presence of this device.

So, this completes the lesson on Advanced Medical Devices. Up next is a review of the entire chapter. Following that is a quiz for which you must obtain a score of 75% or higher to receive credit.

Good Studying.