HEALTH BASICS

Central venous line - infants

A central venous line is a thin tube used to give an infant treatment through a large vein.

WHAT IT IS
A thin tube ending in a large vein near the heart

WHERE IT COMES UP
Neonatal intensive care, surgery, or prolonged intravenous treatment

WHY IT MATTERS
Reliable treatment access with infection and clot risks

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
Neonatal, pediatric, or vascular access team

HOW IT IS CHECKED
Imaging, tip-location methods, and external line measurements

Overview

A central venous line is a long, thin, flexible tube placed into a vein. It is also called a central venous catheter or central line. The tip sits in a large vein near the heart, where blood flow can quickly dilute medicines and fluids.

A central venous line is not a disease or diagnosis. It is a medical device used when an infant needs reliable access to the bloodstream.

Central lines may be used in a neonatal intensive care unit, during surgery, or while an infant needs longer-term treatment. They can deliver fluids, medicines, blood products, or intravenous nutrition. Intravenous nutrition provides nutrients directly into the blood when feeding through the stomach is not possible or is not yet enough.

Several kinds of central line may be used:

The appropriate type depends on the treatment, how long access may be needed, the infant's size and condition, and which veins can be used.

- A PICC , or peripherally inserted central catheter, enters through a vein in an arm, leg, or sometimes the scalp
- A non-tunneled central line usually enters through a larger vein in the neck, chest, or groin

- An umbilical venous catheter enters through the umbilical cord shortly after birth
- A tunneled line passes under the skin before entering a vein
- An implanted port sits fully under the skin and is accessed with a special needle

How it works

The line creates a route from outside the body into the bloodstream. One end remains accessible for connecting sterile tubing, syringes, or an infusion pump. The other end rests in a central vein.

A trained clinical team inserts the line using sterile equipment. Sterile means taking careful steps to prevent germs from entering the line or insertion site. Ultrasound may help locate a vein. Pain relief, comfort measures, or sedation may be used according to the procedure and the infant's condition.

The tip must be in an appropriate position. Depending on the line, clinicians may check this with an X-ray, ultrasound, an electrical tip-location method, or a combination of methods. They also record how much tubing is visible outside the body. A line may not be used for some treatments until its position has been confirmed.

A sterile dressing protects the insertion site. Staff clean connection points before access and use sterile or aseptic technique when changing tubing or dressings. "Aseptic" means avoiding contact that could introduce harmful germs.

The line may have one or more channels, called lumens. Separate lumens can allow different treatments to run at the same time, although some medicines cannot safely share the same line.

Clinicians regularly assess whether the line is still needed. Removing it when it is no longer required avoids continued exposure to line-related risks.

Why it matters for your health

Infants may have very small or delicate veins. Repeatedly placing short intravenous cannulas can be difficult and uncomfortable. A central line can provide more dependable access and may reduce repeated needle procedures.

Some fluids and medicines can irritate small veins. A central vein has faster blood flow, which dilutes these treatments more quickly. Central access is especially useful for intravenous nutrition, certain concentrated fluids, and medicines that must be given continuously.

Blood samples can sometimes be collected through a central line. Whether this is appropriate depends on the line, the test, and local practice.

A central line also needs close care. Because it leads into a large vein, germs entering through the tubing or insertion site can reach the bloodstream. The line can also become blocked, move out of position, or contribute to a blood clot.

These risks do not mean that a complication will occur. The clinical team balances them against the need for treatment and checks the line throughout its use.

What can go wrong

A central line-associated bloodstream infection , often shortened to CLABSI, is a bloodstream infection identified in someone who has a central line. A local infection may instead affect the skin around the insertion site. Possible signs include redness, warmth, swelling, tenderness, or drainage. In infants, infection may also cause a fever, an unusually low temperature, reduced feeding, unusual sleepiness, irritability, or changes in breathing.

A blood clot , or thrombosis, can form in the vein around the catheter. This may cause swelling or a color change in an arm, leg, neck, or face. Some clots cause no visible signs and are found with an ultrasound.

An occlusion means the line is partly or fully blocked. The infusion pump may alarm, fluid may not run normally, or staff may be unable to draw blood through the line. A trained clinician must assess this. The line should never be forcefully flushed.

A line can move out of position , become partly pulled out, leak, crack, or disconnect. A displaced tip may stop the line from working safely. Fluid can sometimes leak into nearby tissue instead of entering the bloodstream. This is called infiltration or extravasation.

Problems during insertion can include bleeding, accidental entry into an artery, or injury to nearby structures. When a line is inserted in the upper chest or neck, air can rarely collect around a lung. This is called a pneumothorax.

A tip placed too close to or within the heart can irritate the heart rhythm. Rarely, fluid can collect in the sac around the heart and affect how it pumps. These are serious complications, but teams check tip position and monitor infants to reduce the risk.

Umbilical venous catheters can enter the wrong blood vessel or sit near the liver if they are not correctly positioned. Imaging helps identify this before certain infusions are given.

What you can do

Most central-line care is performed by trained staff. You are not expected to clean, flush, reconnect, or adjust an infant's line unless a home-care team has specifically trained you.

You can ask:

Clean your hands before touching or holding the infant. Avoid touching the dressing, tubing connections, or pump controls. Tell staff if the dressing becomes wet, loose, dirty, or lifted at the edges. Also report leaking fluid, new swelling, redness, or a change in the visible length of the line.

Routine follow-up includes checks of the insertion site, dressing, tubing, line function, and continuing need for the catheter. A line that remains necessary may stay in place while these checks continue.

Contact the infant's neonatal, pediatric, or home-infusion team urgently if there is a fever or unusually low temperature, new redness or drainage, swelling of a limb or the face, repeated pump alarms, leaking, a damaged line, or concern that the line has moved. Follow the specific temperature and contact instructions provided at discharge. An unwell infant with a central line needs prompt clinical assessment even when the insertion site looks normal.

Call emergency services for severe trouble breathing, blue or grey coloring, collapse, difficulty waking the infant, uncontrolled bleeding, or sudden major deterioration. If a line breaks or comes out, do not push it back in. Follow any emergency steps you were taught and seek immediate help.

- What type of line is this, and where is its tip?
- How was its position confirmed?
- What treatments are being given through it?
- Is the line still needed each day?
- Which changes should I report immediately?
- If the infant goes home with the line, who should be contacted day or night?

Common questions

Does a central line hurt?

Insertion can cause pain or discomfort, so the team plans suitable pain relief and comfort measures. Once secured, the line should not usually cause ongoing pain. Report persistent crying with line use, tenderness, swelling, or other signs of discomfort.

Is a PICC the same as a central line?

A PICC is one type of central line. It enters through a smaller vein away from the chest, but its tip travels to a large central vein.

Can I hold or feed an infant who has a central line?

Often, yes. Staff can help arrange the tubing and pumps so the line is not pulled or kinked. Feeding and skin-to-skin care depend on the infant's overall condition rather than the central line alone.

Can an infant have a bath?

The dressing and connections must stay clean and dry. Bathing instructions depend on the line and care setting. Ask the team to show you what is safe before bathing an infant with a line.

How long can the line stay in?

There is no single time limit for every central line. Duration depends on the line type, whether it works properly, whether complications develop, and how long treatment is needed. The team should reassess the need regularly.

Can every line-related infection be prevented?

Careful hand hygiene, sterile insertion, cleaning connection points, proper dressing care, and removing an unnecessary line reduce the risk. They cannot make the risk zero.

Sources

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