PROCEDURE

Midline venous catheters - infants

A midline venous catheter is a longer IV tube placed in an infant's limb vein to give medicines or fluids.

PURPOSE
To provide reliable vein access for medicines or fluids

PROCEDURE TYPE
Therapeutic; minimally invasive bedside vein access

WHERE IT IS DONE
At the bedside, often in neonatal or pediatric care

ANAESTHESIA
Local anaesthesia, often with comfort measures; sedation uncommon

HOW LONG IT TAKES
About 20-60 minutes, including positioning and dressing

PREPARATION
Usually no fasting; follow the treating facility's instructions

RECOVERY
Immediate; feeding and usual activity can often continue

MAIN RISKS
Infiltration, blockage, infection, and thrombosis

RESULTS
Line position and function checked immediately after placement

Overview

A midline venous catheter is a thin, flexible tube placed into a vein in an infant's arm or leg. It is longer than a standard peripheral intravenous line, or IV. Its tip stays in a peripheral vein rather than reaching the large central veins near the heart.

The part outside the skin connects to IV tubing. It can be used to give compatible medicines, fluids, or sometimes blood products. Blood cannot always be drawn reliably from a midline.

A midline may remain usable longer than a standard IV, reducing the need for repeated needle punctures. It still needs regular checks and careful dressing and line care.

Why the procedure is performed

A midline may be offered when your infant needs IV treatment for more than a short period but does not need a central venous catheter.

It may be considered when:

Only medicines and fluids suitable for peripheral veins should be given through a midline. Some treatments can irritate smaller veins and require a catheter whose tip sits in a large central vein.

- Standard IVs have been difficult to place or keep working
- Several days of IV fluids or compatible medicines are expected
- Repeated IV replacement would cause added discomfort
- A stable vein-access route would support care in hospital or at home

Who should and should not have it

A midline may suit an infant who needs ongoing peripheral IV treatment and has a suitable vein. The healthcare team considers the planned treatment, expected duration, vein condition, and your infant's size and medical needs.

A midline is not the right choice when treatment must enter a central vein. Examples can include some forms of intravenous nutrition, highly concentrated solutions, and medicines that can severely damage tissue if they leak from the vein.

Placement may be avoided or delayed if there is:

In urgent situations, another type of vascular access may be safer or faster. The team should explain why a midline was selected and whether a different catheter may be needed later.

- Infection, broken skin, a burn, or significant swelling near the proposed site
- A known or suspected blood clot in that limb
- Poor blood flow to the limb
- An injured or abnormal vein
- A bleeding problem requiring further assessment
- No suitable vein that can be reached safely

How to prepare

The treating facility's own instructions take priority because preparation reflects your infant's condition and whether any other procedure is planned.

Most infants do not need to fast for midline placement because general anaesthesia and sedation are uncommon. Do not stop feeds unless the treating team tells you to do so.

Tell the team about your infant's allergies, previous problems with IV lines, bleeding conditions, skin problems, and current medicines. Do not stop any prescribed medicine unless instructed.

The team may use swaddling, a pacifier, skin-to-skin contact, breastfeeding, or a small amount of a sweet solution to reduce distress. A local anaesthetic cream or injection may numb the skin. Ask what comfort measures are planned and whether you can remain nearby.

What happens during the procedure

Your infant is positioned so the selected arm or leg can be kept still. Heart rate, breathing, and oxygen levels may be monitored, especially in premature or medically unwell infants.

The clinician examines the veins and may use ultrasound to find one. The skin is cleaned with an antiseptic and allowed to dry. Sterile gloves and other barriers help reduce infection risk.

A small needle is inserted into the vein. Depending on the device, a guidewire may be passed through the needle before the soft catheter is advanced. The needle and guidewire are then removed, leaving the catheter in the vein.

The line is flushed with sterile fluid to check that it works. The team assesses the catheter's length and tip location. Ultrasound or an X-ray may be used if the position is uncertain or local policy requires imaging.

The catheter is secured to reduce movement and covered with a clear sterile dressing. The team records how much catheter remains outside the skin so later movement can be noticed.

Recovery and what to expect afterward

There may be brief tenderness or a small bruise where the catheter entered the skin. Your infant should not have ongoing significant pain. Crying or guarding the limb during an infusion should be reported because it can be a sign of irritation or leakage.

Feeding can usually continue normally unless another condition or procedure limits feeds.

Normal gentle movement is often allowed, but the catheter and tubing need protection from pulling, bending, and getting wet. Follow the team's guidance about clothing, holding, tummy time, bathing, and sleep positioning. Do not submerge the dressing.

Driving restrictions do not usually apply because infants are generally awake for placement. If your infant receives sedation, follow the facility's instructions about observation and travel home.

A caregiver's return to work is usually based on the infant's wider care needs. If your infant goes home with the midline, you may need training and time for scheduled infusions, dressing care, and follow-up visits.

Risks and possible complications

A midline can stop working even when it was inserted correctly. The team checks the site and line before and during use.

Possible complications include:

The catheter should not be forced or flushed against resistance. If you are caring for the line at home, use it only as you were trained.

- Infiltration or extravasation: Fluid or medicine leaks into surrounding tissue, causing swelling, coolness, color change, pain, or skin injury
- Phlebitis: The vein becomes irritated, with redness, warmth, tenderness, or a firm area along it
- Infection: Germs can enter at the skin or through the catheter connection
- Blockage: Blood or medicine residue prevents fluid from moving through the line
- Dislodgement: The catheter moves partly or completely out of the vein
- Thrombosis: A blood clot forms in the vein, sometimes causing limb swelling or color change
- Bleeding or bruising: Usually limited to the insertion area
- Nearby tissue injury: A nerve or artery can rarely be injured during insertion
- Catheter damage: Part of the catheter can split or break

Results and follow up

This procedure does not produce a diagnostic test result. The immediate result is whether the catheter is in an acceptable position, flushes normally, and can be used for the planned treatment.

The site, dressing, exposed catheter length, and limb are checked routinely. The team also

reviews whether each medicine remains suitable for a midline.

There is no single correct length of time for every infant to keep a midline. It should be removed when it is no longer needed, stops working, develops a complication, or is unsuitable for a new treatment plan. Removal is usually brief and does not require surgery.

Alternatives

The alternatives depend on what treatment your infant needs. Each option has trade-offs.

A standard peripheral IV is quicker and uses a shorter catheter. It is suitable for short treatment but may fail sooner and require more needle punctures.

A peripherally inserted central catheter , or PICC, reaches a large central vein. It can carry treatments that are unsuitable for a midline and may support longer therapy. Placement and tip confirmation are more involved, and central catheters have risks such as bloodstream infection, thrombosis, and tip-position problems.

An umbilical venous catheter can provide rapid central access through the umbilical cord shortly after birth. It is limited to newborn care and is generally used for a defined early period rather than as routine longer-term access.

Oral, feeding-tube, or injectable treatment may avoid an IV when the medicine and your infant's condition allow it. These routes may absorb differently or may not be suitable when reliable bloodstream delivery is required.

Intraosseous access , placed through bone into the marrow space, is mainly an emergency bridge when rapid vein access cannot be obtained. It is not a routine substitute for a midline.

When to call your healthcare team

Contact the healthcare team promptly if the dressing becomes wet, loose, dirty, or lifted, or if the catheter appears to have moved. Also report repeated pump alarms, trouble flushing, leaking, or blood visible in the tubing when it is not expected.

Ask for urgent assessment if your infant has swelling, increasing redness, warmth, a color change, blistering, drainage, or apparent pain around the catheter or limb. A new fever, unusual temperature instability, marked sleepiness, or poor feeding also needs prompt medical advice.

Stop using the line and alert the team immediately if it breaks, comes out, leaks during an infusion, or if fluid will not pass easily. Do not push it back in or force a flush.

Call emergency services for severe breathing difficulty, collapse or unresponsiveness, blue or

grey coloring, or bleeding that does not stop with gentle pressure.

Common questions

Will my baby be asleep?

Usually not. Most midlines are placed with local anaesthesia and comfort measures. Sedation may be considered in selected situations but is not routine.

Can I drive my baby home afterward?

If your infant is being discharged and did not receive sedation, the catheter itself does not prevent travel by car. If sedation was used, follow the facility's discharge and observation instructions.

How painful is it?

The needle puncture can cause brief pain or distress. Swaddling, feeding, a pacifier, sweet solution, and local anaesthetic can help. Ongoing pain during or after an infusion should be reported.

When will I know if it worked?

The team checks the catheter's position and function at the end of placement. You should usually know immediately whether it can be used.

How long can the midline stay in?

There is no fixed duration for every infant. It remains only while it is needed, working properly, and free from signs of complications.

Can my baby have a bath?

The dressing and catheter connections must stay clean and dry. Sponge bathing may be recommended. Follow the facility's instructions and do not submerge the line.

Sources

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