# Pediatric Vascular Access Devices

<table>
<thead>
<tr>
<th>Catheter Type</th>
<th>Description</th>
<th>Placement</th>
<th>Indications</th>
<th>Comments</th>
<th>Special Considerations</th>
</tr>
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</table>
| **Peripheral catheters (PIV)** | • Teflon or polyurethane catheters 3/4”-1.5” in length  
• Pediatric gauge sizes:  
Small infant: 24, 26 gauge  
Large infant or school age child: 22, 24 gauge  
Adolescent: 20, 22, 24 gauge | • Percutaneous insertion  
• Insertion sites: Superficial veins of the hand, forearm, feet or scalp | • Intravenous fluids, intravenous drugs, PPN, blood, blood products | • Mean dwell time to complication: ≥ 48 hours  
• Change site at first sign of phlebitis or infiltration  
• Consider CVC if IV therapy is required for >1 week, especially for administration of hypertonic drug solutions i.e. >600 mOsm/L or vesicant drugs | • Select catheter diameter size smaller than selected vein:  
• Consider use of topical anesthetic to reduce insertion pain and anxiety  
• Determine best location for insertion (i.e. patient’s room or treatment room) dependent on patient/family considerations |
| **Midline catheter** | • Polyurethane or silastic catheters 3”-8” in length | • Percutaneous insertion  
• Insertion sites: Medial cubital, cephalic, basilic, brachial veins at or above the antecubital space.  
• Tip location: Cephalic, basilic, brachial or axillary vein | • Intravenous fluids, intravenous drugs of isotonic or near isotonic admixtures for up to 4 weeks | **Not recommended for administration of parenteral nutrition due to risk of upper extremity thrombosis** |

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<tr>
<td>Peripherally inserted central catheter (PICC)</td>
<td>• Polyurethane or silicone catheter • Single or double lumen • 20 cm or longer depending on patient size</td>
<td>• Percutaneous insertion • Insertion sites: Medial cubital, cephalic, basilic, brachial veins at or above the antecubital space, external jugular or saphenous vein. • Tip location: Distal SVC or above the diaphragm in the IVC</td>
<td>• All IV drugs, solutions, blood or blood products • Short-term IV therapy (&lt;30 days) or long-term therapy (&gt;30 days) • Acute, alternate or home care settings</td>
<td>• Placed at bedside, special procedure room, operating room, or interventional radiology suite • Requires local anesthesia or conscious sedation • X-ray confirmation of appropriate tip position required before use</td>
<td>• Lowest insertion complication risk of CVCs • Lowest infection risk of CVCs</td>
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<tr>
<td>Non-tunneled central venous catheter</td>
<td>• Polyurethane or silicone catheter • Single, double, triple lumen • Antibiotic or antiseptic coated catheter available • 8 cm or longer depending on patient size</td>
<td>• Percutaneous insertion • Insertion sites: Subclavian, internal jugular or femoral vein. • Tip location: Distal SVC or above the diaphragm in the IVC</td>
<td>• All IV drugs, solutions, blood or blood products • Short-term IV therapy (&lt;30 days) • Acute care settings</td>
<td>• Placed in special procedure room, operating room, or interventional radiology suite • Requires local anesthesia or conscious sedation • X-ray confirmation of appropriate tip position required before use</td>
<td>• Antibiotic or antiseptic coated catheter recommended • Higher risk of insertion complication than PICC • Highest infection risk of CVCs</td>
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| Tunneled central venous catheter    | • Silicone catheter  
• Single and double lumen                          | • Surgically implanted  
• Insertion site: Percutaneous insertion into the subclavian, internal jugular, or femoral vein. Extended catheter segment tunneled subcutaneously with dacron cuff positioned within ≈ 2 cm of the exit site  
• Tip location: Distal SVC or above the diaphragm in the IVC | • All IV drugs, solutions, blood or blood products  
• Long-term IV therapy (>30 days)  
• Acute, alternate or home care settings | • Placed in special procedure room, operating room, or interventional radiology suite  
• Subcutaneous cuff secures catheter in place and inhibits migration of organisms when ingrown  
• Fibrotic tissue growth around cuff complete after ≈2 weeks  
• Repairable  
• Requires minor surgical procedure for removal | • Sterile dressing changes recommended until cuff is ingrown to reduce risk of tunnel infection  
• Higher risk of insertion complication than PICC  
• Lower rate of infection than non-tunneled CVC |
| Implanted port                      | • Metal or plastic reservoir with self-sealing septum implanted into subcutaneous pocket on upper torso or arm  
• Single and double lumen  
• Accessed by needle through intact skin | • Insertion site: Percutaneous insertion into the subclavian, internal jugular, antecubital or brachial vein  
• Septum placed over rib or muscle in arm so that septum can be stabilized for needle access  
• Tip location: Distal SVC or above the diaphragm in the IVC | • Long-term IV therapies  
• Acute care or home care setting | • Placed in special procedure room, operating room, or interventional radiology suite  
• No external segment for breakage  
• Requires minor surgical procedure for removal | • Non-coring needle required for access  
• May not be appropriate for long term PN access due to needle access requirement  
• Higher risk of insertion complication than PICC  
• Lower rate of infection than non-tunneled CVC or tunneled catheter |

For Further Reading


