

Pediatric Vascular Access Devices

Catheter Type	Description	Placement	Indications	Comments	Special Considerations
Peripheral catheters (PIV)	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Percutaneous insertion • Insertion sites: Superficial veins of the hand, forearm, feet or scalp 	<ul style="list-style-type: none"> • Intravenous fluids, intravenous drugs, PPN, blood, blood products 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Polyurethane or silastic catheters 3"-8" in length 	<ul style="list-style-type: none"> • Percutaneous insertion • Insertion sites: Medial cubital, cephalic, basilic, brachial veins at or above the antecubital space. • Tip location: Cephalic, basilic, brachial or axillary vein 	<ul style="list-style-type: none"> • Intravenous fluids, intravenous drugs of isotonic or near isotonic admixtures for up to 4 weeks 	<p>Not recommended for administration of parenteral nutrition due to risk of upper extremity thrombosis</p>	

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Catheter Type	Description	Placement	Indications	Comments	Special Considerations
Peripherally inserted central catheter (PICC)	<ul style="list-style-type: none"> • Polyurethane or silicone catheter • Single or double lumen • 20 cm or longer depending on patient size 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • All IV drugs, solutions, blood or blood products • Short-term IV therapy (<30 days) or long-term therapy (>30 days) • Acute, alternate or home care settings 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Lowest insertion complication risk of CVCs • Lowest infection risk of CVCs
Non-tunneled central venous catheter	<ul style="list-style-type: none"> • Polyurethane or silicone catheter • Single, double, triple lumen • Antibiotic or antiseptic coated catheter available • 8 cm or longer depending on patient size 	<ul style="list-style-type: none"> • Percutaneous insertion • Insertion sites: Subclavian, internal jugular or femoral vein. • Tip location: Distal SVC or above the diaphragm in the IVC 	<ul style="list-style-type: none"> • All IV drugs, solutions, blood or blood products • Short-term IV therapy (<30 days) • Acute care settings 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Antibiotic or antiseptic coated catheter recommended • Higher risk of insertion complication than PICC • Highest infection risk of CVCs

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Catheter Type	Description	Placement	Indications	Comments	Special Considerations
Tunneled central venous catheter	<ul style="list-style-type: none"> • Silicone catheter • Single and double lumen 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • All IV drugs, solutions, blood or blood products • Long-term IV therapy (>30 days) • Acute, alternate or home care settings 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Long-term IV therapies • Acute care or home care setting 	<ul style="list-style-type: none"> • Placed in special procedure room, operating room, or interventional radiology suite • No external segment for breakage • Requires minor surgical procedure for removal 	<ul style="list-style-type: none"> • 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

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For Further Reading

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