

Catheter Gauge Selection

Select the device with the shortest length and the smallest diameter that allows for proper administration of the prescribed therapy.

Key Points To Consider

- Type of solution or medication to be infused
- Type of therapy to be delivered
- Patient activity level
- Patient age
- Patient diagnosis, history of IV therapy
- Condition of veins

16 GAUGE AND LARGER

- Uses**
- High-risk, major surgical procedures
 - Trauma
 - Rapid infusions of fluid and/or blood
 - Transplantation procedures
- Considerations**
- Large gauge catheters increase likelihood for painful insertion
 - Depending on location, larger catheter sizes can create increased mechanical irritation to vein wall
 - Vessel should be large enough to accommodate catheter and provide adequate hemodilution

20 GAUGE

- Uses**
- Minor trauma
 - Suitable for most routine infusions
 - Minor surgical procedures, routine outpatient procedures requiring IV access
 - Appropriate for delivery of blood components, when rapid rates are not required
- Considerations**
- Versatile in use
 - Frequently selected gauge size

22 GAUGE

- Uses**
- Children
 - General infusions
 - May be used for blood administration
 - Transfusion of plasma and platelets
 - Recommended for small and/or fragile veins
- Considerations**
- Easier to insert into small, thin, fragile veins
 - Easily accommodates routine administration of antibiotics and hydration therapies
 - May be difficult to insert into tough skin

24, 26 GAUGE

- Uses**
- Extremely small veins
 - Children and neonates
 - Patients with fragile veins
- Considerations**
- Suitable for most infusions, with slower flow rates
 - May be difficult to insert into tough skin

References

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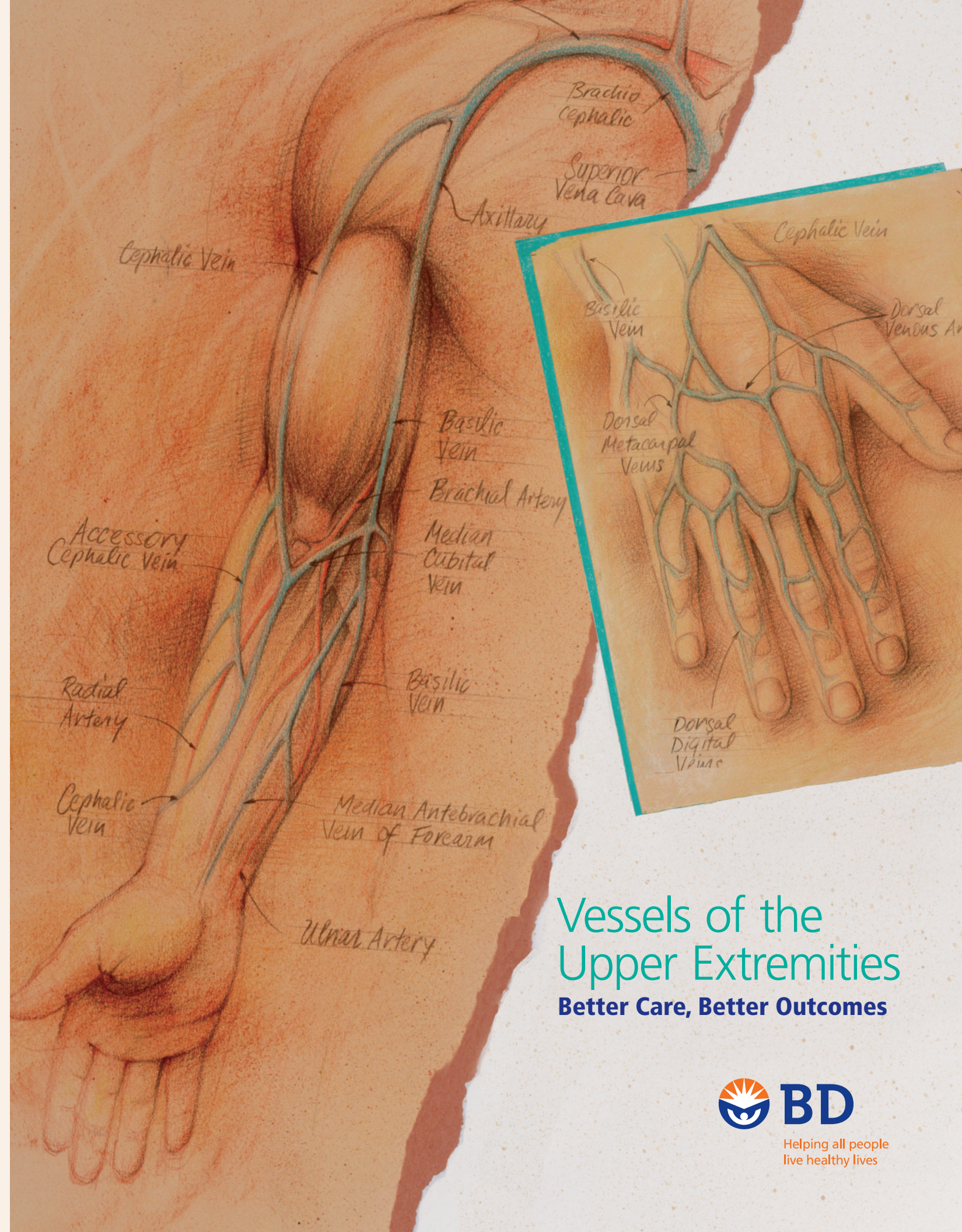
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Vessel Specifics

Digital Vein

Location: lateral and dorsal portion of fingers

Gauge/Length Recommendations:

- 22 gauge or smaller
- 3/4 inch or shorter

Considerations:

- Prone to complications due to location and poor hemodilution
- May be used when other veins aren't available
- Short-term therapies
- High risk of infiltration due to motion of the finger
- Catheter should be properly supported and securely taped (use a tongue blade/small armboard)
- Will impact patient's ability to use their hand
- Do not use if veins in dorsum of hand have been recently accessed

Metacarpal Veins

Location: dorsum of the hand

Gauge/Length Recommendations:

- 20 gauge or smaller

Considerations:

- May be first choice for venipuncture
- Usually easy to visualize and feel
- Initiate the venipuncture at the most distal point on the extremity; subsequent venipunctures can be made above the previous site
- Consider the distance from the insertion site to the prospective catheter tip site avoiding tip positioning in the wrist area (an armboard may be necessary if the catheter tip is near the wrist)
- Infiltrations and phlebitis may occur more easily due to smaller vessel size and hand/wrist movement
- Avoid administering irritating medications and solutions as infiltration can cause loss of use of the hand
- May not be appropriate for elderly patients; diminished skin turgor and loss of subcutaneous tissue provides poor support for the catheter

- May limit ability to use the hand; consider patients who require frequent use of their hands to support or change positions, use crutches or walkers, or have use of only one extremity

Cephalic Vein

Location: along the lateral side of the arm

Gauge/Length Recommendations:

- Use smallest gauge and shortest length appropriate for therapy
- 16 to 24 gauge

Considerations:

- Easy to access
- Larger veins provide hemodilution for hypertonic and irritating solutions
- Handles rapid infusions
- Arm bones act as a natural splint
- May access this vein from the wrist to the upper arm; always access the most appropriate distal region of the vein first
- May be obscured at the wrist by the tendons controlling the thumb
- Vein tends to roll during insertion
- Access in the wrist and the antecubital fossa can result in possible phlebitis and/or infiltration secondary to arm movement; an armboard may be necessary for these sites

Basilic Vein

Location: along the medial side of the arm

Gauge/Length Recommendations:

- Use smallest gauge and shortest length appropriate for therapy
- 16 to 24 gauge

Considerations:

- Large, usually prominent vein
- Larger and straighter in the upper arm than the cephalic vein
- Often not considered due to inconspicuous positioning on the ulnar side of the forearm
- May be accessed anywhere along its course, above as well as below the antecubital fossa
- Vein tends to roll during insertion
- Venipuncture and site maintenance may be awkward due to vessel position (to access this vessel in the forearm: place the patient's arm across their chest and stand on the opposite side of the bed to perform the venipuncture)

Median Antebrachial

Location: underside of forearm

Gauge/Length Recommendations:

- Use smallest gauge and shortest length appropriate for therapy
- 20 to 24 gauge appropriate, depending on access location

Considerations:

- Medium size vein
- May be difficult to palpate, but generally easy to visualize
- Easy to stabilize due to location on the flat inner aspect of the forearm
- Avoid use on underside of wrist due to close proximity of the nerve

Antecubital Veins

- Cephalic Vein: Located along the radial aspect
- Basilic Vein: Located along the ulnar aspect
- Median Cubital Vein: Branches from the cephalic to the basilic vein; located between the two vessels

Gauge/Length Recommendations:

- Use smallest gauge and shortest length appropriate for therapy
- All gauge sizes are appropriate

Considerations:

- Often used for emergency or short-term access
- Should be reserved for drawing blood
- Should be reserved for a peripherally inserted central catheter or midline catheter
- Veins may be hard if these sites have been accessed frequently
- Infiltration can occur easily secondary to arm movement
- Site may require immobilization with an armboard

Key Points to Site Selection

- Carefully examine both arms for the most appropriate vessels
- Most commonly used veins for placement of IV catheters are the metacarpal, cephalic and basilic veins

CONSIDER

Location and Condition of Vein:

- Straight, soft, elastic veins preferred
- Prominent veins may not always be your best choice, as they may be sclerotic or positioned in an unsuitable location
- Veins of the hand may not be appropriate for infusion of hypertonic and vesicant solutions and/or medications
- Veins of the forearm are suitable for most medications and solutions
- Accidental removal of catheters placed in the veins of the upper arm may be less likely to occur

Purpose and Type of Infusion:

- Medications and solutions with high osmolarities and high or low pH irritate vein walls

Duration of Therapy:

- Consider midline or peripherally inserted central catheter for therapy beyond 6 days
- Select most distal and appropriate vein first; if medication/solution has high potential for vein irritation, select the largest and most appropriate vessel to accommodate the infusion
- Perform venipuncture proximal to a previously cannulated site, injured vein, bruised area or site of a recent complication (infiltration, phlebitis, infection)
- Rotate access sites to opposite extremity, when possible

Catheter Material:

- Softer materials are less irritating to the intima of the vein

Catheter Size:

- Select smallest gauge appropriate to accommodate prescribed therapy

Patient:

- Diagnosis, prior surgeries, procedures and IV therapies
- Activity
- Preference, as possible

AVOID

- Joint regions
- Sclerotic or thrombosed veins
- Access near a site experiencing a recent complication (infiltration, phlebitis, infection, hematoma)
- Sites located under or adjacent to restraints
- Locations with impaired circulation, varicosities
- Legs, feet and ankles of adults
- Veins located on the underside of the wrist
- Veins located in the affected arm of a radical mastectomy patient
- Veins located in an arm with an arteriovenous shunt or fistula