Tube Chart

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Venous Blood Collection Tubes

Cap Colors	Additive	Number of Inversions	Testing Disciplines
	No Additive*	5-10	Discard Tube Transport/Storage Immunohematology Viral Markers
	Sodium Citrate 3.2% (0.109 M)*	4	Coagulation
	Clot Activator*	5-10	Chemistry Immunochemistry Immunohematology Viral Markers
	Clot Activator w/Gel	5-10	Chemistry Immunochemistry TDMs
	Lithium Heparin* Lithium Heparin w/Gel Sodium Heparin*	5-10	Chemistry Immunochemistry
	K_3 EDTA* K_2 EDTA*	8-10	Hematology Immunohematology Molecular Diagnostics Viral Markers

* Also available in pediatric or low draw volumes of 2mL or less.

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over for additional tubes

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Tube Chart

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Venous Blood Collection Tubes

Cap Colors	Additive	Number of Inversions	Testing Disciplines
	K_2 EDTA Gel	8-10	Molecular Diagnostics
	Potassium Oxalate / Sodium Fluoride*	5-10	Glycolytic Inhibitor Glucose and Lactate
	Sodium Heparin No Additive	5-10	Trace Elements

* Also available in pediatric or low draw volumes of 2mL or less.

yellow Gel Separation

black Standard Draw

green Sodium Heparin

white Pediatric Draw

CENTRIFUGATION RECOMMENDATIONS

tube type	g-force	minute
VACUETTE® Serum Tubes (Clot Activator, No Additive)	Min. 1500 g	10
VACUETTE® Serum Clot Activator w/ Gel Tubes	1800 g	10
VACUETTE® K_2EDTA w/ Gel Tubes	1800 - 2200 g	10
VACUETTE® Plasma Tubes (Lithium or Sodium Heparin, PO/NaF)	2000 - 3000 g	15
VACUETTE® Lithium Heparin w/ Gel Tubes	1800 - 2200 g	10-15
VACUETTE® Coagulation Tubes (Sodium Citrate)		
Platelet tests (PRP)	150 g	5
Routine tests (PPP)	1500 - 2000 g	10
Preparation for deep freeze plasma (PFP)	2500 - 3000 g	20

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Order of Draw

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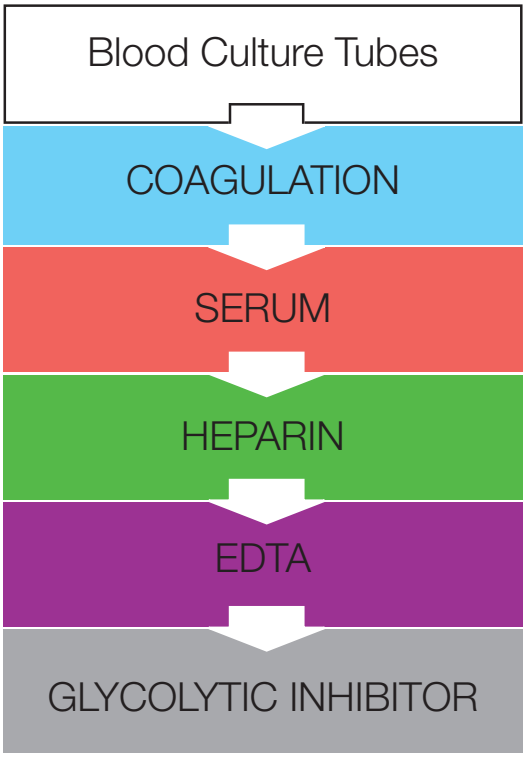
CLSI Recommended*



NOTE: Follow your facility's protocol for Order of Draw.

If a winged blood collection set is used, the first tube in the series will be underfilled. Therefore, if a coagulation specimen is drawn first, a discard tube (a no additive or coagulation tube) is recommended to be drawn prior to this tube to ensure the proper anticoagulant-to-blood ratio.

Cap Color	Tube Type	No. of Inversions
Blue	Coagulation	4
Red	Serum	5 - 10
Green	Heparin	5 - 10
Pink/Lavender	EDTA	8 - 10
Grey	Glycolytic Inhibitor	5 - 10

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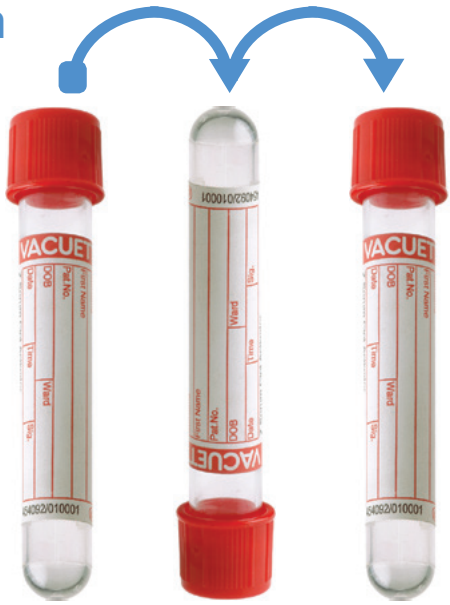
To achieve the proper mix of additive and blood, each tube must be gently inverted as it is removed from the holder.

One complete inversion

- Turn the filled tube upside down and return it to an upright position
- Repeat required number of times for each tube type
  (see reverse for # of inversions)



1 Inversion

Importance of Mixing

- Insufficient or delayed mixing of serum tubes may result in delayed clotting.
- Inadequate mixing of anticoagulant tubes may result in platelet clumping, clotting or incorrect test results.

Coagulation Draw Volume Guide

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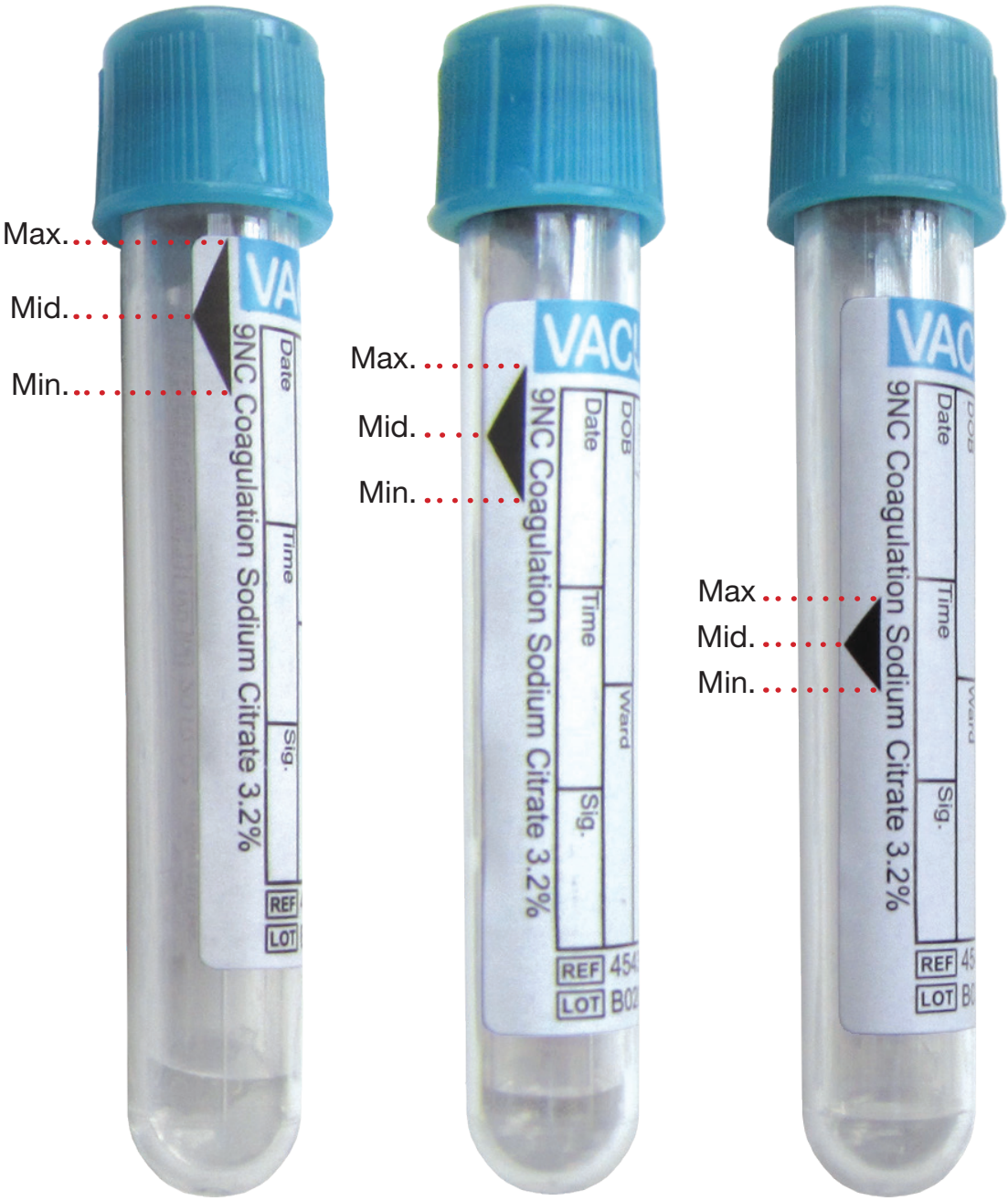
Take the Guesswork Out of It

Ensure that the correct blood-to-additive ratio is met by checking the draw volume against the nominal fill mark on the tube or by holding tube up to this guide.



3.5 mL 3 mL 2 mL

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Coagulation Draw Volume Guide

Collection Tips

for Coagulation Testing

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- **CLSI** recommends 3.2% (0.109M) of buffered citrate for coagulation assays.

- If a **winged blood collection set** is used, the first tube drawn in the series will be under-filled. Therefore, if a coagulation specimen is drawn first, a discard tube (a no additive or coagulation tube) is recommended to be drawn prior to this tube to ensure the proper anticoagulant-to-blood ratio.

- The following **order-of-draw** is recommended when drawing several specimens during a single venipuncture, and is used to avoid possible test result error due to cross contamination from tube additives: (1) Blood culture tube (2) Coagulation tube (3) Serum tube with or without clot activator or gel separator (4) Heparin tube with or without gel separator (5) EDTA and (6) Glycolytic inhibitor. Always follow your facility's protocol for order of draw.

- Application of the **tourniquet** for preliminary vein selection should not exceed one minute of time. The tourniquet should be released as soon as possible after the blood flows. Removing the tourniquet in a timely manner also reduces bleeding at the venipuncture site after a specimen is obtained.

- For **hematocrit values** greater than 55%, adjust the volume of sodium citrate in the tube. Use the following formula to calculate the correct volume of sodium citrate used in the tube: C = (100-Hct) / (595-Hct) x V; C = volume of sodium citrate required for that volume of blood, Hct = patient's hematocrit and V = volume of blood required in the blood collection tube.

- **Invert** each tube four times to ensure that the blood and anticoagulant are thoroughly mixed.

- Maintain the **9:1 blood to anticoagulant ratio** by filling the tube to the proper level or nominal fill line as indicated on the VACUETTE® tube. Inadequate filling of the tube will decrease this ratio and may cause inaccurate test results.

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Collection Tips

Proper Alignment

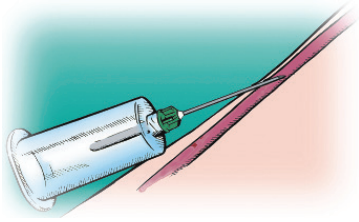
Tube in Holder

Push the tube into the holder and onto the non-patient end of needle to puncture the rubber cap.

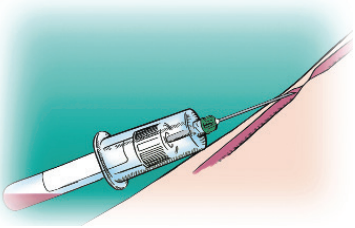
Center the tube in the holder when penetrating the cap to prevent sidewall penetration and premature vacuum loss.

Correct tube placement in holder

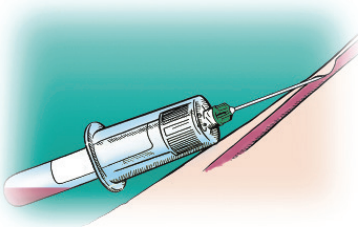
Incorrect tube placement in holder



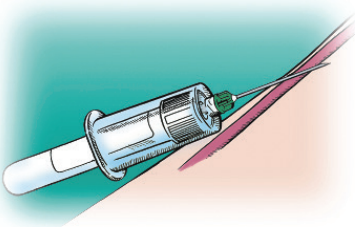
optimum



collapsed vein



needle bevel stuck onto vein wall



needle penetrates through both vein walls

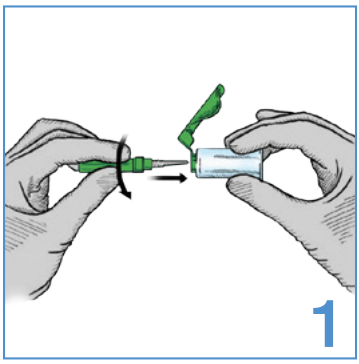
If blood doesn't flow after optimum needle penetration:

- Adjust the needle position:
  - Pull the needle back if it penetrated too far into the vein.
  - Advance the needle farther if it has not penetrated far enough.
  - Rotate the needle slightly if needle is occluded.
- Try another tube - vacuum within the tube may be exhausted.

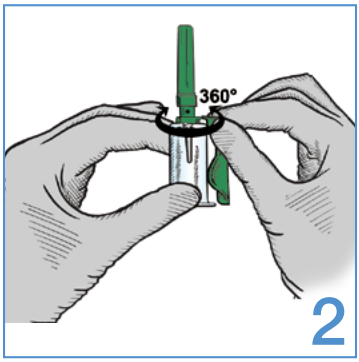
QUICKSHIELD Safety Tube Holder

greiner bio-one

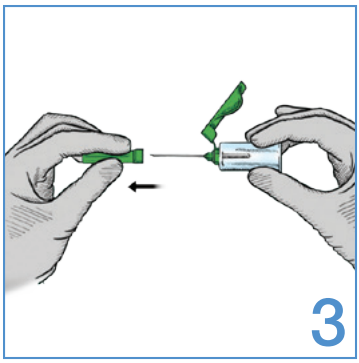
Instructions for Use



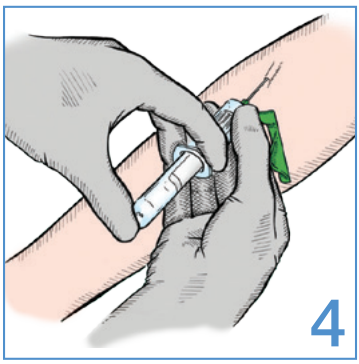
Remove the cover from the valve section of the needle. Thread the needle into the QUICKSHIELD Holder. Ensure the needle is firmly seated.



The dot on the needle cap indicates the location of the bevel. The shield can be rotated to the preferred position on the holder where it remains stable during venipuncture.



Place the patient's arm in a downward position. Remove the needle cap. Perform the venipuncture, with the patient's arm downward and the tube cap upper-most.



Push the tube into the QUICKSHIELD Holder and onto the needle valve puncturing the rubber diaphragm. Center tubes in the QUICKSHIELD Holder when penetrating the cap to prevent sidewall penetration and subsequent premature vacuum loss.

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Instructions continued on other side

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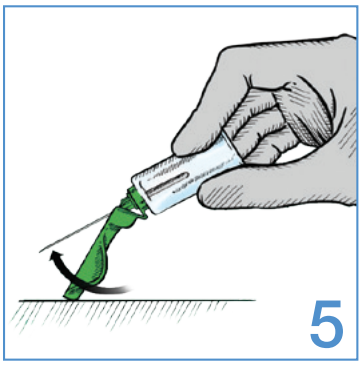
Sharps Safety

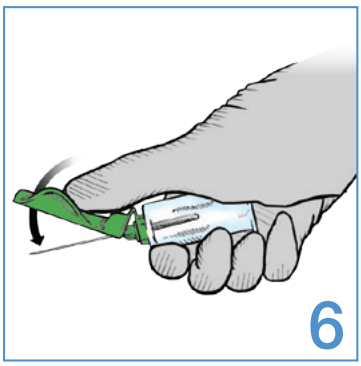
QUICKSHIELD Safety Tube Holder

greiner bio-one

Instructions for Use (begins on reverse side)



Activate the safety shield by gently pressing the shield towards the needle on a stable surface.



Thumb activation is also possible, whereby the thumb should remain behind the shield at all times.

An audible click is made ensuring the user the safety shield has been properly and fully activated. The risk of a needlestick injury is thus virtually eliminated. Dispose of the used needle with holder in an appropriate disposal device.

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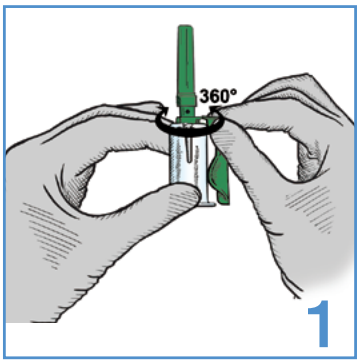
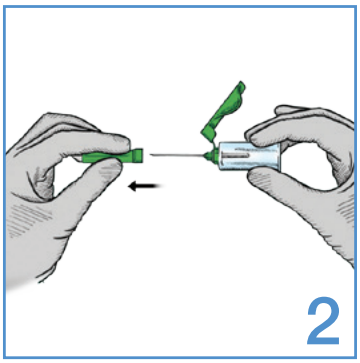
QUICKSHIELD Complete PLUS

greiner bio-one

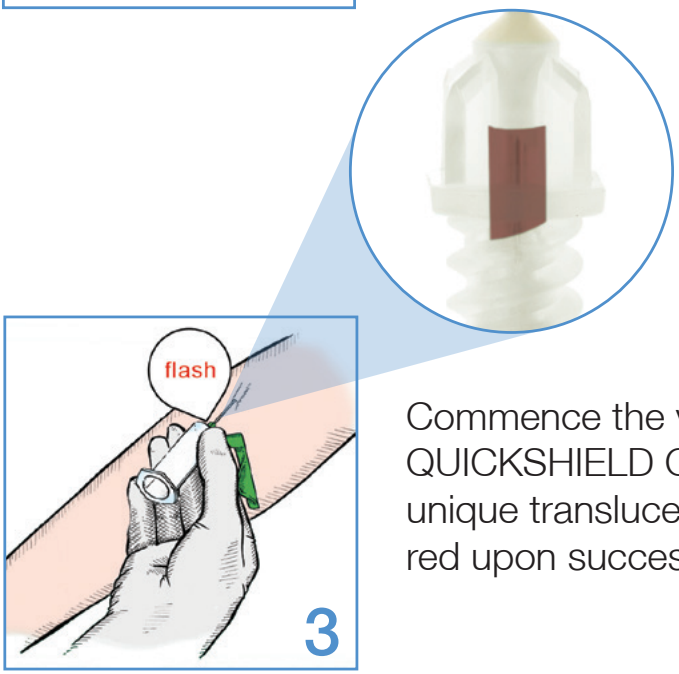
Instructions for Use



The dot on the needle cap indicates the location of the bevel. The shield can be rotated to the preferred position on the holder where it remains stable during venipuncture.



Place the patient's arm in a downward position. Remove the needle cap. Perform the venipuncture, with the patient's arm downward and the tube cap upper-most.



Commence the venipuncture. QUICKSHIELD Complete Plus has a unique translucent hub that flashes red upon successful venipuncture.

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Instructions continued on other side

Sharps Safety

QUICKSHIELD Complete PLUS

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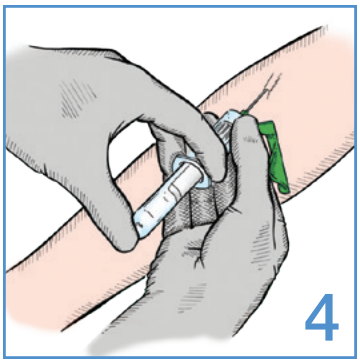
Instructions for Use (begins on reverse side)



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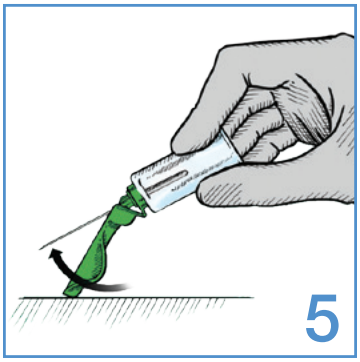

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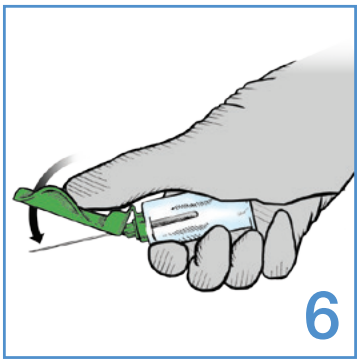

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Veins for Venipuncture

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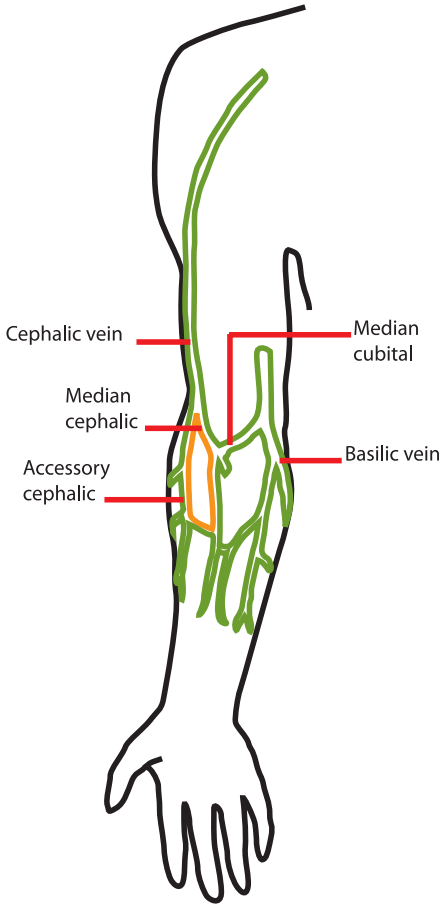
Visible, Palpable Veins



Antecubital Area

Median cubital vein: Located in the center of the antecubital area - close to the skin. Large vein - easy to anchor - remains stationary during venipuncture. Least risk of injury.

Cephalic vein: Located on the outer side of the antecubital area. Easier to anchor and less painful to puncture than the basilic vein.

Basilic vein: Located on the inner side (medial) of the antecubital area. Use only when the other veins of both arms are unacceptable for a venipuncture procedure.

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Veins for Venipuncture

Inappropriate Sites

for Venipuncture

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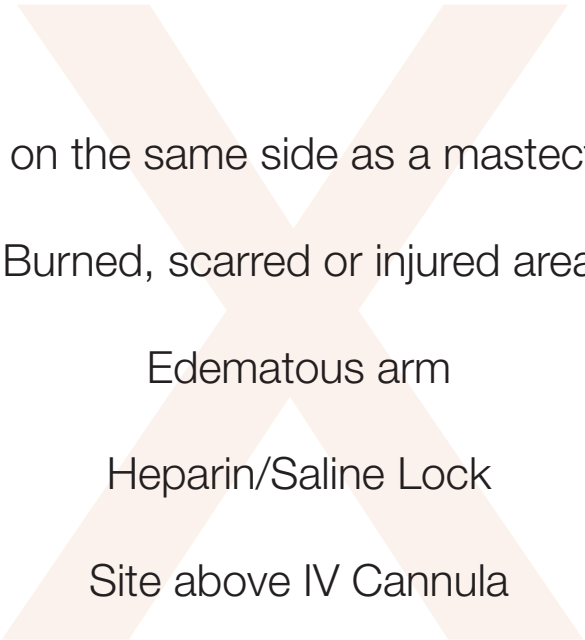
Avoid the following venipuncture sites:



Arm on the same side as a mastectomy

Burned, scarred or injured area

Edematous arm

Heparin/Saline Lock

Site above IV Cannula

Follow your facility's protocol

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