PURPOSE:

1. To achieve adequate blood access for hemodialysis through venipuncture.
2. To promote adequate rotation and healing of puncture sites.

POLICY:

1. Nurses in Hemodialysis who have demonstrated competency to the renal educator or delegate shall perform venipuncture of fistula/grafts.
2. Initial puncturing of new/revised fistula/graft is based on nursing assessment of maturation of access.
3. A native fistula will not be punctured for 10 weeks unless otherwise ordered by Vascular Surgeon or Nephrologist.
4. Buttonhole technique should only be established per physicians order.
5. A prosthetic graft will be punctured according to manufacturer’s recommendations and/or once swelling has subsided sufficiently to palpate course of the graft unless otherwise ordered by Vascular Surgeon.
6. Fistula failing to mature after 10 weeks should be reviewed by the vascular access team and/or nephrologist.

EQUIPMENT:

Venipuncture:
- Clean drape
- Clean disposable gloves
- 1 single use tourniquet
- 2 packages 2% Chlorhexidine (CHG) with 70% Alcohol prep pad or swab stick
- 2- insulin or tuberculin syringes with 25 g needles or 28 g needles (optional) for administration of Lidocaine 1% without epi PRN
- 2- fistula needles
- Tape/securement device
- 2- pkg sterile occlusive dressings
- 2- 10 mL syringes with 0.9% NaCl
- 1- syringe with heparin (physician ordered dose unless using delivery system to deliver heparin bolus)
- 2- pkg gauze (optional)

Removal of Needles:
- 1 – 10 mL syringe with 0.9% NaCl
- 2 pkg sterile gauze or hemostatic dressings
- 1 pair clean disposable gloves (nurse)
- 1 clean disposable glove (patient)
PROCEDURE:

Prepare Patient:

- Wash or have patient wash access site with soap and water. Dry with single use paper towel.

Prepare Equipment:

- Perform hand hygiene.
- Prepare syringe with heparin prime as required.

Optional:

- Prepare 2 syringes, each with 0.1 – 0.3 mL of 1% lidocaine without epinephrine.

Venipuncture:

- Position clean limb on clean drape.

KEY POINTS:

- For a fistula being punctured for the first time in the presence of a tunneled catheter, and unless specifically ordered by a physician, the following steps can be used to avoid trauma to a new fistula. Refer to Dialysis Unit practice.
  
  o For patients with a central line, it is preferable to perform only one puncture (using a teflon/angio needle) for three consecutive treatments. Use the fistula as arterial to assess blood supply or use as venous return to assist development of fistula. Use the central line for opposite blood line.

  o If no difficulties with the above step, puncture fistula for both the venous blood return and the arterial blood supply for three more consecutive treatments.

  o If there are no difficulties with puncturing fistula during these six consecutive treatments, obtain order for removal of non-tunnelled central line (refer to procedure 30.20.07 Removal of Non-Tunnelled CVC).

  o Once fistula has been successfully cannulated with 2 needles x 6 treatments, convert to steel needles where possible.

  o If patient does not have a central line, the fistula must be accessed per policy.

- For puncturing a graft, steel fistula needles are required.

- Do not puncture the fistula/graft and notify the physician in the following situations:
  
  o pulse, thrill or bruit is absent
  o new aneurysm

- If signs of infection present, notify Nephrologist. Do not puncture infected area.
PROCEDURE:

- Confirm direction of blood flow in loop graft. If unable to confirm the direction of flow by asking patient, or by documentation in chart, assess the flow direction as follows:
  - Compress the access near its midpoint.
  - Check pulse/thrill on both sides of point of compression.

- Select sites. If patient has a buttonhole, refer to procedure 30.20.03 Establishing and Maintaining Buttonhole Venipuncture Sites

- Scrub selected sites with 2% CHG with 70% alcohol solution using a back and forth rubbing motion for 30 seconds. Allow to dry completely.
  - Do not blot solution.
  - If the patient has documented allergy to CHG/alcohol, use aqueous CHG.
  - If the patient has documented allergy to aqueous CHG, use povidone iodine.

Optional:

- Administer Lidocaine without epinephrine intradermally.

- Perform first venipuncture.
  - Apply single-use tourniquet to fistula.
  - Stabilize access.

KEY POINTS:

- The side where the strongest pulse/thrill is felt is the arterial.

- Ropeladder rotation is the recommended method of cannulation.

- Always direct venous needle antegrade. The arterial needle can be placed antegrade or retrograde.

- Arterial and venous needle bevels should be 5 cm apart.

- Needle sites should not be within 2.5 cm of an anastomosis, obstruction or anatomical flexure.

- The site selected should be at least 0.6 – 1.2 cm away from previous puncture.

- Sites should be rotated from one treatment to the next by using entire graft or fistula. Ideally, equal halves of the access will be dedicated to arterial and venous needles.

- Avoid aneurysms, areas of hematoma and areas of skin breakdown.

- CHG/Alcohol cleansing is at least 30 seconds friction rub. Allow to dry completely. Will no longer appear shiny.

- If using Aqueous CHG, allow to dry at least 2 minutes (it may take longer).

- If using povidone, perform the friction rub for 30 seconds. Allow site to air dry for 2 – 3 minutes. Excess povidone that pools on the skin may be removed with sterile gauze by wicking, not wiping.

- **Do not touch site after cleansing.** If palpation is necessary, scrub clean fingers with antiseptic agent using friction rub for 30 seconds and allow to air dry for 2-3 min.

- Aspirate plunger of syringe to verify that vein has not been entered. Do not inject Lidocaine into blood stream. If blood return is confirmed, remove syringe and perform a second intradermal injection.

- Tourniquet is not required on grafts.

- Puncture should occur over as firm an anatomical base as possible. Avoid needling near the anastomosis (2.5 cm).
PROCEDURE:

- Insert needle bevel up at 20° to 45°
- Advance needle to hub.
- Secure needle with dressing and tape/securement device.
- Infuse heparin prime or 0.9% NaCl at this time.
- Perform second venipuncture and secure as per the above process.
- Remove PPE according to Routine Practices and perform hand hygiene.
- Establish hemodialysis.
- Instruct patient to keep fistula arm exposed.

Removal of Needles:

- Perform hand hygiene. Don PPE according to Routine Practices.
- If patient is holding own sites, have him/her perform hand hygiene and wear one glove to non-fistula hand for holding.
- Remove the venous needle first.
  - With gauze or hemostatic dressing in place, remove needle completely before applying pressure
- Remove only one needle at a time.
- Increased risk of bleeding exists from the arterial site if the venous site is held second.
- Do not apply pressure while removing the needles.
- Refer to patient care plan for specific instructions for venipuncture site care.

KEY POINTS:

- Degree of angle may change depending on depth and type of access.
- If using a teflon/angio needle follow separation technique.
- Following 2 unsuccessful attempts, the nurse must request assistance from a second nurse. There will be a maximum of 5 punctures per treatment, unless specific physicians order is obtained. If 5 punctures or more were required, notify charge nurse and vascular access team. If unable to use for hemodialysis draw/send stat electrolytes and notify physician.
- If using Teflon needle NEVER REINSERT STEEL DIRECTOR back into cathlon once separation of needles has begun.
- Refer to patient care plan for specific instructions for securing needles.
- Blood sampling, if required, should be done prior to infusing heparin prime/saline.
- Ensure patency of needle by infusing 0.9% NaCl in a 10 mL syringe.
- Recommendation: If giving heparin prime, do so after both needles are established to reduce risk of bleeding in the event of infiltration or needling difficulties.
- For new fistulas/grafts; initial treatment blood flow should be 200-250 mL/min. maximum, increase each treatment by 50 mL/min.
- Once dialysis is established ensure needle sites are exposed for monitoring during the treatment.
**PROCEDURE:**

- Maintain constant two finger manual pressure to site for a minimum of 10 minutes or longer, until bleeding stops.

- Cover puncture sites with sterile dressing per patient’s care plan.

**KEY POINTS:**

- Two finger pressure allows for sealing of internal and external puncture sites.

- Palpate vessel proximally to ensure there is a pulse (vessel not occluded).

- If excessive bleeding, notify Vascular Access Team for investigation.

- Remove dressings per manufacturer’s recommendations post hemodialysis treatment.

- Hemostatic vs Non-hemostatic – Recommended to remove dressings 4 – 6 hours after treatment. Maximum of 24 hours.

- If using hemostatic dressings consult the vascular nurse.

- Definitions:
  - Hemostatic
    - Dressings that contain hemostatic agents.
    - Hemostatic agents improve hemostasis by multiple mechanisms that include improving primary hemostasis, stimulating thrombin generation and/or fibrin formation or inhibiting fibrinolysis. ie. Surgifoam®, Surgicel®, etc.
  - Non-hemostatic
    - Dressings that do not contain any type of hemostatic agent. ie. Gauze, Bandaids, Sovans®, Sureseals®, etc.

- Remove PPE according to Routine Practices and perform hand hygiene.

- Ensure the patient's sitting and standing blood pressures are stable prior to removal of arterial needle.

- Repeat Steps 1-5 for the arterial needle.

- Remove PPE according to Routine Practices, perform hand hygiene and have the patient do the same.

**DOCUMENTATION:**

- MRP Chart
  - Hemodialysis Treatment Record
  - Integrated Progress Notes
  - Vascular Access Record
  - Renal Patient Kardex: diagram, comments

- In-Patient Chart:
  - Integrated Progress Notes
REFERENCES:


