



### Post PCI Sheath Removal Protocol

Inappropriate sheath removal after a PCI can lead to adverse events for the patient, including vascular complications and additional surgical procedures. The following protocol can be used in a hospital setting to address this.

Adapted with permission from the Blue Cross Blue Shield of Michigan Cardiovascular Collaborative (BMC2) Best practice protocols available at <https://bmc2.org/system/files/private/best-practice-protocols-5-20-14.pdf>.

**A dedicated sheath pulling team that has met competency requirements may be the best organizational structure to minimize vascular complications.**

#### 1. Confirm with recovery RN that:

- a. Patient is ready for sheath pull.
- b. Atropine available for vaso vagal response.
- c. Pertinent history: special considerations (i.e. previous groin complications).

Catheter/Sheath Type	Special Instructions
Femoral gortex graft access site.	Manual hold only, no clamp.
New iliac stent (same side approach) or less than 6 months old.	Manual hold only, no clamp.
New iliac stent (opposite side approach)	None
Old iliac stent (more than 6 months old)	Manual hold only, no clamp.
Antegrade approach	Manual hold only, no clamp.
Cardiac biopsy sheath	Must be removed in lab.
Brachial sheath	Monitor with pulse oximeter.
Radial sheath	Use of mechanical compression may be adjusted and/or removed on unit (see mechanical compression policy).
Markedly obese	None. Manual hold preferred.
Aortic insufficiency	Will require longer hold time. If need longer hold, consider Compression Assist Device.
SBP > 180 mm Hg	Must be treated prior to removal.

#### 2. Assess the patient for sheath pull.

- a. BP greater than 160 systolic and greater than 100 diastolic, contact attending or fellow.
- b. BP less than 90 systolic and heart rate less than 45 bpm (contact attending or fellow if BP is high or low).
- c. Patient’s receiving Heparin confirm that the ACT is less than 180 seconds when measured on the Hemochron Junior Signature.
- d. Active chest pain.
- e. Visualize and assess the sheath insertion site (look for any existing bruising, hematoma or anything unusual).



### 3. Gather appropriate supplies.

- a. Blue pad
- b. 11 blade or scissors if needed for suture removal.
- c. 4 x 4's
- d. PPE (personal protective equipment)
- e. 5 cc syringe
- f. adhesive band aid

### 4. Educate patient on sheath pull procedure (using procedure below as a guide).

### 5. Procedure

- a. Place the call light within reach.
- b. Assess baseline vital signs.
- c. PPE in place prior to start of the procedure.
- d. Remove sheath site dressing.
- e. Remove the stitches using the blade.
- f. Pull off 5cc of waste blood to check for clots. (If clot present, aspirate into the 5 cc syringe and discard syringe in red container.)
- g. Palpate pulse at the site.
- h. Apply firm pressure to the site using three fingers positioned sequentially up (toward the head) the artery beginning at the skin puncture. (The staff member pulling the sheath will stand on the same side as the patient's puncture site. If the patient's puncture site is on the right side, the staff member holds pressure with their left hand, if the patient's puncture site is on the left side; the staff member holds pressure with their right hand.)
- i. Pull sheath.
- j. Continuous firm pressure should be held at the site to obliterate the distal pulse for 3-5 minutes. After the initial 3-5 minutes pressure must be reduced enough for healthcare provider to obtain a distal pulse.
  - General recommendation is 4 minutes per French
  - Hold pressure for at least 15-20 minutes for a diagnostic procedure.
  - Hold pressure for at least 30 minutes for an interventional procedure.
  - Hold pressure for at least 45 minutes for the removal of a balloon pump or larger bore sheaths.
- k. Continually assess the site for bleeding, hematoma and bruising. Have the healthcare provider notify the attending immediately if any of these (or other) complications occur.
- l. If a venous sheath and arterial sheath are both present, the venous sheath should be pulled during the last 5 minutes of the arterial hold (using the time guidelines listed in item j.) Assess the site, remove stitches, pull sheath and hold pressure directly on the puncture site (one finger on the site, one finger above and one finger below the puncture site) for a minimum of 5 minutes.
- m. If bleeding occurs at the puncture site after initial hemostasis, re-apply pressure immediately and have the healthcare provider contact the attending physician.

- n. Instruct the patient to:
  - 1. “If you feel anything wet, warm or sticky near the bandage, call for help immediately.”
  - 2. “If you have to sneeze, cough or laugh, hold pressure on the bandage.”
  - 3. “Keep your head on the pillow and keep your leg straight.”
- o. Give report to the nurse so that the nurse can document the procedure on the flow sheet

**Note: The removal of these sheaths is very important and if done improperly can cause the patient great harm and the need for corrective surgery. It can often take longer to control hemostasis than it took to perform the cardiac catheterization. Patience is a must; possible complications include the following:**

- 1. Hematoma: A large, firm collection of blood under the SQ tissue. Possibly caused by inadequate pressure to the puncture site.
- 2. Arterial Thrombus
- 3. Venous Thrombus
- 4. Distal Embolization
- 5. Pseudoaneurysm: An injury to the vessel wall in which blood is retained in the surrounding tissue.
- 6. Vasovagal response: Upon removal of lines, pallor, bradycardia, hypotension or emesis may occur. Treatment may include: increasing IV fluids, elevating the foot of the bed 10 to 12 inches, and possibly administration of atropine and or an anti-emetic.
- 7. Infection
- 8. AV Fistula

If any of the above occurs, notify the physician immediately.