III.e.1. Tourniquet cuffs should be applied snugly to the verified operative extremity[50] and in a position on the extremity that creates a minimal amount of ischemia.[27]

In one quasi-experimental study of 50 patients undergoing surgery for carpal tunnel syndrome under local anesthesia, researchers recommended placement of the tourniquet on the upper arm. They reported that there were not significant differences for patients tolerating tourniquets placed on the upper arm versus the forearm when the tourniquet time was shorter than 20 minutes. In addition, the patient's fingers may curl up and the tourniquet cuff may interfere with the surgical incision when it is placed at the forearm.[81] Researchers have found that patients undergoing foot surgery with local anesthesia have less pain when the cuff is placed at the ankle.[82-84]

III.e.2. When applying the tourniquet cuff to the small limb of a child where space is limited, the perioperative RN should evaluate the size, shape, and fit of the tourniquet to avoid its movement during the procedure. Sterile tourniquets should be considered for use if the tourniquet must be positioned close to the surgical site.[76]

Children's extremities can present unique challenges related to the size of the limb (eg, no space for the tourniquet, acute taper of a young child's thigh). If the tourniquet is not the right shape or is not applied tightly enough, it may slide toward the surgical wound, risking loss of compression or interference at the surgical site.[76]

III.e.3. The cuff should be applied in its final position. If at any time a cuff position change is necessary, the cuff should be removed and reapplied.

Moving a cuff after placement may cause shearing of underlying tissues and subsequent injury.

III.e.4. A low-lint, soft padding (eg, limb protection sleeve, two layers of stockinette) should be placed around the limb according to the cuff manufacturer's instructions for use. The padding should be wrinkle-free and should not pinch the skin.

In two clinical trials, the overall skin complication rate was lower when padding was used.[77,78] However, higher pressures may be needed if a cuff is applied over a thick layer of loose padding.[17]

Avoiding padding materials that may shed fibers (eg, cotton cast padding, sheet padding) will decrease linting. When lint from padding materials becomes embedded in the hook-and-loop fasteners of a tourniquet, it may reduce the effectiveness of the fasteners and potentially lead to an unexpected release of the cuff during a procedure.

III.e.5. The patient's skin under the tourniquet cuff should be protected to prevent fluid accumulation (eg, skin prep solutions, irrigation) under the cuff.

Underpadding and tourniquet cuffs can harbor moisture, resulting in skin breakdown if protective interventions are not taken. Two cases have been reported in which patients had to undergo burn wound excision and skin grafting because of chemical burns caused by pooling of the prep solution under a tourniquet.[80]

III.e.6. Reusable tourniquet cuffs should be protected from contamination by fluid, blood, and other potentially infectious material during surgery. Tourniquet protectors (eg, U-shaped drapes, adhesive drapes, tourniquet covers) should be used to minimize soiling.

Reusable tourniquet cuffs that are not protected from fluid, blood, and other potentially infectious material can be a source of cross contamination.

III.e.7. The cuff tubing should be positioned on or near the lateral aspect of the extremity.

Lateral placement of the cuff tubing may help avoid pressure on nerves of the extremity and prevent kinking of the tubing.

III.f. Procedures involving pneumatic tourniquet control on two extremities should have the tourniquet tubing labeled to clearly identify which tubing belongs to which cuff and which is associated with which components of the tourniquet system(s). The perioperative RN, surgical team members, and anesthesia professionals should confirm the respective placement of the tourniquets and plans for inflation during the time-out process.[75] *[2: Moderate Evidence]*

The risk for complications and the systemic effects of tourniquet use may increase when ischemia and reperfusion occur in two extremities. However, in one published expert opinion, the authors suggested that the delay between the sequential deflation of the first cuff and inflation of the second cuff allows time for caregivers to assess the systemic response and accommodate for the lactic acid released from the first procedure before the second cuff is inflated. If the patient does not tolerate the reperfusion or if complications occur in the first procedure, the option of aborting the second procedure may be a better choice than performing simultaneous bilateral procedures.[85]

The use of two tourniquet cuffs increases the number of tubings and connections which can increase the opportunity for errors of misconnections or inflation or deflation of the wrong cuff. Labeling the tubing to each cuff