



## PNEUMATIC TOURNIQUET

- II.f.1. Based on the preoperative patient assessment, the perioperative nurse should identify medication allergies, especially sensitivities to local anesthetics, and communicate with the anesthesia professional to clarify the plan for intravenous regional anesthesia before the tourniquet is applied.
- II.f.2. The perioperative RN should confirm that
- a dual-bladder tourniquet cuff and extra connective tubing will be used,
  - the planned location on the extremity is wide enough to accommodate the additional width of the dual-bladder tourniquet cuff, and
  - a higher pressure is planned to compensate for the narrow size of each cuff bladder.<sup>17</sup>
- Although intravenous regional anesthesia is more common in upper extremities, dual tourniquet cuffs and injection of local anesthetics have been used for lower extremities.<sup>72</sup> Variation in cuff sizes and the need for dual cuffs versus two separate cuffs will depend on the size of the patient's extremity and the location planned for the regional block.
- II.f.3. Members of the perioperative team should clearly communicate with each other about the inflation-deflation sequence when using a dual-bladder cuff and when using two single-bladder cuffs together for intravenous regional anesthesia.
- II.f.4. The proximal and distal cuffs and the respective tubing should be clearly identified.

### Recommendation III

**Patient safety should be the primary consideration when using a pneumatic tourniquet and its accessories.**

Patient injury related to pneumatic tourniquet use has been reported. For example, one case report found that if the cuff that is applied to a patient's extremity has a bladder that is bent, folded, or crushed, adequate pressure may be compromised, resulting in bleeding at the surgical site.<sup>73</sup> Excessive pressure from the tourniquet may cause limb redness, bruising, swelling, or nerve injury.<sup>6</sup>

- III.a. The tourniquet's tubing and connectors should be incompatible with other tubing (eg, intravenous) or labeled to clearly identify that they are part of the tourniquet system.<sup>70,71</sup> [3: Limited Evidence]
- Although reports of misconnections involving tourniquet tubing are not common, misconnections of other types of tubing and connectors (eg, blood pressure tubing, Luer connections) have been reported.<sup>70,71</sup>
- III.b. Before each use, the perioperative nurse should verify that the entire tourniquet system is com-

plete, clean, and functioning according to the manufacturer's instructions for use.

- The pneumatic tourniquet regulator should be compatible with all associated components, and the connections should be secure.<sup>17</sup>
- The cuff, tubing, connectors, and o-rings should be inspected for cracks, leaks, and other damage.<sup>17</sup>
- The tourniquet should be tested for integrity and function.<sup>17</sup>
- The integrity of the hook-and-loop fasteners and tie ribbons should be inspected.<sup>17</sup>
- A full battery power charge should be confirmed, if applicable.<sup>17</sup>

[3: Limited Evidence]

Ensuring that the tourniquet functions properly before a procedure reduces the risk of pressure loss and patient injury.<sup>17</sup>

Unintentional pressure loss can result from loose tubing connectors, deteriorated tubing, or cuff bladder leaks and may result in patient injury.

- III.c. A pneumatic tourniquet that is not working properly or is damaged should be removed from service immediately, along with all its accessories, and reported to the designated individual responsible for equipment maintenance (eg, biomedical engineering personnel).<sup>74</sup> [2: Moderate Evidence]
- III.d. The perioperative RN should verify the correct surgical site before application of the tourniquet cuff and verify the tourniquet inflation pressure during the time-out process.<sup>75</sup> [2: Moderate Evidence]

Placing a tourniquet on the wrong limb may result in a cascade of events leading to wrong site surgery. Confirmation of the location of the tourniquet and its pressure setting during the time-out process increases communication and consistent documentation and reduces the likelihood of error.

- III.e. Safety practices should be implemented when applying tourniquet cuffs to the verified operative extremity. [2: Moderate Evidence]
- When the tourniquet cuff is inflated, nerves and blood vessels are compressed. This poses a potential risk to superficial nerves that are in unprotected areas during cuff placement.<sup>4,23</sup>
- Proper application of the cuff decreases the risk for injury or pressure variances.<sup>5,17,76-80</sup> For example, a loose fitting cuff may shift after placement, causing a friction burn on the skin.<sup>5</sup> Higher pressures also may be needed if the cuff is applied too loosely.<sup>17</sup> Patients who are obese or others who have loose skin and adipose tissue at the site of the tourniquet cuff are at risk for the skin folding or puckering beneath the tourniquet cuff. This increases the risk for uneven pressure on vessels and skin injury.<sup>17</sup>