in the United States to identify the tourniquet pressures surgeons routinely used and whether the surgeons based their decision on findings from the literature. There was a response rate of 57% (n = 199), which was further divided into responses for lower extremity (n = 151) or upper extremity (n = 141). For the lower extremity, the mean and the median pressures were 300 mm Hg (range 145 mm Hg to 400 mm Hg). Thirty surgeons (20.5%) reported being able to cite evidence to support the decision. For the upper extremity, the mean tourniquet pressure was 242 mm Hg and the median was 250 mm Hg (range 150 mm Hg to 300 mm Hg). Twenty-five surgeons (17.7%) reported being able to cite evidence to support the decision. The researchers recommended increasing surgeons' awareness through training and daily practice to encourage them to use lower pressures and base their practice on findings in the literature.[93]

In another study of surgeon's practice, 253 surveys were mailed to members of the American Orthopaedic Foot and Ankle Society. The response rate was 55%, with 140 surgeons returning completed surveys. Nine percent of the respondents based their pressure settings on limb occlusion pressure (LOP); however, 73% of the respondents evaluated the patient's blood pressure as a factor to determine the cuff pressure, 65% evaluated the patient's limb size, and 43% evaluated both blood pressure and limb size in their determinations of pressure. Of the responding surgeons, 49% said they applied tourniquet cuffs to the thigh and reported their most common pressures to be 301 mm Hg to 350 mm Hg. For procedures in which a calf or ankle tourniquet cuff was applied, 52% of the surgeons who used calf cuffs and 66% of those who used ankle cuffs reported their most common pressures to be above 201 mm Hg to 250 mm Hg. However, 41% of the surgeons who used calf cuffs and 19% of those who used ankle cuffs reported they often used pressure above 250 mm Hg. The researchers concluded that more surgeons might adopt lower pressures and base their determinations on LOP if there were more explicit recommendations for using LOP.[101]

Research studies have shown that occlusion can be achieved using a lower pressure when an LOP method is used in conjunction with a wide tourniquet cuff in adult patients.[65,67,91,95,98,100] The same was found when studying pediatric patients.[18] Some tourniquet systems are designed to determine LOP automatically and add a safety margin to allow for fluctuations in blood pressure intraoperatively.

When using a wide contoured thigh cuff for patients older than 18 years, the cuff pressure setting researchers have suggested is determined by adding a safety margin to the LOP as follows:

- add 40 mm Hg to 50 mm Hg for LOP less than 130 mm Hg,
- add 60 mm Hg to 75 mm Hg for LOP between 131 mm Hg and 190 mm Hg, and
- add 80 mm Hg to 100 mm Hg for LOP greater than 190 mm Hg.[65,100]

For pediatric patients, the cuff pressure setting should be adjusted by adding 50 mm Hg to the LOP.[19]

IV.b.1. The baseline systolic blood pressure or LOP measurement should be taken when the patient's blood pressure is stabilized to the level expected during surgery and may be taken before or after induction of anesthesia.

IV.b.2. Before inflating the cuff, members of the perioperative team should confirm the setting to be used.

IV.c. Members of the perioperative team should confirm the positioning of the patient's extremity before inflating the tourniquet. *[3: Limited Evidence]*

For a lower extremity, if the invasive procedure is related to the quadriceps muscles, the surgeon may want the knee in a flexed position when inflating the tourniquet to avoid "tethering" of the underlying structures. The surgeon may prefer the knee extended if the invasive procedure involves the hamstring muscles.[102] In a comparative study of 30 patients to determine whether the position of the knee at the time of tourniquet inflation had a correlation with postoperative knee range of motion, researchers found a statistically significant difference in the range of motion between the two groups (ie, knee flexed at the time of inflation, knee extended at the time of inflation) but they did not find the statistical difference to be clinically significant.[102]

IV.d. Pneumatic tourniquets should be inflated under the direction of the surgeon and the anesthesia professional. *[2: Moderate Evidence]*

Inflation of the tourniquet cuff may be associated with hemodynamic changes (eg, hypertension, complications related to increased blood volume after exsanguination).[4,5]

IV.e. Activation indicators and pressure displays should be visible and audible alarms should be sufficiently loud to be heard above other sounds in the OR.[103] *[2: Moderate Evidence]*

Equipment alarms alert personnel to a change in pressure, equipment failure, or lapse of a designated duration of inflation time.

When the pressure gauge or digital display is clearly visible while the tourniquet cuff is inflated, the perioperative team can monitor for excessive fluctuation.