HIGH DESERT HEALTH SYSTEM
AMBULATORY SURGICAL CENTER

SUBJECT: VI-113 A.T.S. AUTOMATIC TOURNIQUET SYSTEM	**POLICY #**: 1150 **VERSION:** 1
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PURPOSE: To establish guidelines for the safe use of the A.T.S. Automatic Tourniquet System in the Operating Room.

POLICY: The A.T.S. Automatic Tourniquet System is to be tested before use, maintained in working order, applied, to patient, and operated as described in the following procedure.

PROCEDURE:

A. APPLICATION AND USE:

1. The A.T.S. Automatic Tourniquet System is to be tested prior to each use.

2. The extremity for tourniquet use will be properly identified and the appropriate size tourniquet will be selected. The tourniquet cuff selected should be as wide as possible. The cuff should be wider than half the limb's diameter and allowed to overlap about 3-6 inches (7.6-15 cm).

3. When placing the tourniquet on the upper extremity, the tourniquet will be placed as far proximal as possible. When applying to the lower extremity, tourniquet will be placed on the proximal third of the thigh. The tourniquet should be applied snugly to prevent shifting.

4. Skin under the tourniquet will be protected from mechanical injury by applying wrinkle-free padding, wrapped smoothly around the limb as high on the extremity as possible.

5. The tourniquet cuff is not to be adjusted to a new position after inflation.

6. The tourniquet must never be applied to elbow or knee or over any bony prominence.

7. The tourniquet is to be secured by Velcro straps and tied.

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8. Exsanguinate the extremity either by elevation of the limb for 1-2 minutes prior to inflation of the tourniquet or by tissue compression, accomplished by wrapping elastic bandage (Esmarch) from distal to proximal around the limb prior to tourniquet inflation.

9. Remove the elastic bandage after inflation.

10. The operating surgeon or anesthesia provider will determine the proper inflation pressure (recommended pressures are: 75 mmHg greater than systolic pressure for upper extremity and 100 mmHg greater than systolic pressure for lower extremity). The Recommended Tourniquet Pressure (RTP) determined by the A.T.S. 3000 Automatic Tourniquet System may also be used to determine cuff pressure.

11. When the cuff is inflated, the pressure display must be clearly visible to anesthesia provider and the RN Circulator.

12. Notify the surgeon when tourniquet time is at 1 hour, and every 15 minutes thereafter, not to exceed 2 hours.

13. Protection will be provided to keep fluid from collecting under the tourniquet cuff.

14. Single-use cuffs should be used if available and are to be disposed of after each use. If a non-disposable cuff is used, it should be washed with an enzymatic detergent and dried thoroughly if it comes in contact with blood or other body fluids.

15. When using a single bladder cuff, either the main (red) or second (blue) tourniquet system can be used since they function independent of each other. The corresponding buttons and display is for that cuff only.

B. SAFETY MEASURES

Safety measures to prevent injury are:

1. Ensure proper fit of cuff on the extremity.
2. Monitor tourniquet inflation time.
3. Monitor pressure display to ensure that it accurately reflects the pressure within the cuff bladder.

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4. Use only the minimal effective pressure required to suppress arterial circulation.
5. Follow manufacturer's written instruction.

C. DOCUMENTATION

Documentation in the medical record, during the use of the A.T.S. 3000 Automatic Tourniquet System will include:

1. Location of the cuff (Nursing and Anesthesia).
2. Time of inflation & deflation (Nursing & Anesthesia).
3. Identification of the person who applied the cuff (Nursing).
4. Pressure the tourniquet cuff is inflated to in mmHg (Nursing & Anesthesia).
5. Skin and tissue integrity under the cuff before and after use of the A.T.S. 3000 Automatic Tourniquet System (Nursing)

D. OPERATION OF ZIMMER A.T.S 3000 AUTOMATIC TOURNIQUET SYSTEM

1. <u>Functional and Calibration Check</u>
    a. Connect the unit to a grounded power source and observe that the green AC indicator illuminates.
    b. Turn the unit on by pressing the ON/STANDBY button.
    c. Each time the unit is powered up, a self-test will be performed. Following the self-test, "0" is displayed in the PRESSURE and TIME display areas. If a number other than "0" appears in the PRESSURE display, the unit should be calibrated by the Biomed Department.
    d. Test the PRESSURE set point system
        i. Press either PRESSURE button to display the pressure set point, which will be displayed and indicated by an asterisk to the left of the number.
        ii. The set point can be adjusted (50 to 475 mmHg) by rotating the shuttle knob within 2 seconds of pressing the PRESSURE button.
        iii. Repeat steps 1 and 2 for the other pressure set point.

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e. Test the TIME set point system

i. Press either TIME button to display the time set point, indicated by an asterisk to the left of the number.

ii. The time set point will be displayed and can be adjusted (5 to 240 minutes) by rotating the SHUTTLE KNOB to within 2 seconds of pressing the TIME button.

iii. Repeat steps 1 and 2 for the other TIME set point.

Note: Set pressure and time will revert back to the default pressure (250 mmHg) and time (60 minutes) settings when placed in STANDBY. Default pressure and time can be displayed by pressing the PRESSURE and TIME buttons respectively for 2 seconds. The default value with be displayed with a D preceding the numerical value.

2. Limb Occlusion Pressure (LOP) Determination (Not for use in pediatric patients)

Note: LOP is the lowest pressure required to stop the flow of blood to the extremity. An adjusted value, the Recommended Tourniquet Pressure (RTP), is determined by the unit in anticipation of fluctuation in blood pressure during the case. The RTP is displayed at the end of the LOP determination and can be accepted or rejected as well as overridden at any time by changing the pressure set point,

3. Single Bladder Cuff LOP Measuring:

a. Press the ON/STANDBY button to turn the unit on.

b. Connect a dual port cuff to the unit at the Main Cuff or Second Cuff port connectors. If an LOP determination is performed on the Main Cuff, the readings and recommendations are for that cuff only and same applies to the secondary Cuff.

c. Connect the LOP pulse sensor to the LOP socket in the front of the unit.

d. Apply the tourniquet cuff evenly. Smooth the underlying padding so that no wrinkles are allowed to form. The cuff should be placed with its hose stem on the lateral side of the limb. Tie the tourniquet strings to secure the cuff. Attach the tourniquet cuff to the tourniquet tubing securely to prevent leakage.

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e. Attach the LOP pulse sensor to the patient's index finger or second toe on which the tourniquet cuff has been applied.

f. Press the corresponding LOP button to start the LOP determination. The unit will beep and display the LOP and RTP pressures in the lower display for that cuff. The RTP will be displayed in the cuff pressure display with an asterisk.

g. To accept the RTP and return to normal operation press the corresponding PRESSURE button. To reject the value and enter a different pressure, turn the Shuttle Knob to adjust the value.

h. Press the INFLATE button to inflate the cuff to the indicated pressure.

i. The pressure of the cuff can be further adjusted manually by pressing the PRESSURE button and rotating the Shuttle Knob to change the set point.

j. Once the LOP measurement is complete, remove the LOP sensor from the patient, unplug it from the A.T.S. 3000 Tourniquet and wipe clean with water or mild soap solution. The sensor can be disinfected by wiping it with isopropyl alcohol.

4. Single Cuff Operation

a. Press the ON/STANDBY button to power up the unit and perform the functional and calibration check.

b. To adjust the pressure set point, press the PRESSURE button. The pressure set point is indicated by an asterisk and can be adjusted (50 to 475 mmHg) by rotating the shuttle knob within 2 seconds of pressing the PRESSURE button.

c. To adjust the time set point, press the TIME button. The time set point is indicated by an asterisk to the left of the number and can be adjusted (5 to 240 minutes) by rotating the SHUTTLE KNOB to within 2 seconds of pressing the TIME button.

d. Connect a dual port cuff to the unit at the cuff connectors.

e. Apply the tourniquet cuff evenly. Smooth the underlying padding so that no wrinkles are allowed to form. The cuff should be placed with its hose stem on the lateral side of the limb. Tie the tourniquet strings to secure the cuff. Attach the tourniquet cuff to the tourniquet tubing securely to prevent leakage.

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f. Inflate the cuff by pressing the red Main Cuff INFLATE button. This will start the elapsed inflation time alarm clock. A leak alarm will sound if the unit is not able to pressurize the cuff to within 15 mmHg of the set point in < 30 seconds.

g. At the end of the procedure, deflate the cuff by pressing the corresponding cuff DEFLATE button for at least 2 seconds.

h. Remove the tourniquet cuff and any underlying padding immediately following final deflation

Note: During normal use, the unit should not be set to STANDBY if pressure is present in either cuff. When the cuff has been deflated, removed from the patient, and disconnected from the unit, it can be set to STANDBY.

REFERENCES:

AORN. (2014). Recommended practices for care of patients undergoing pneumatic tourniquet-assisted procedures. *Perioperative standards and recommended practices* (2014 ed.,). Denver, Colo.: AORN.

Zimmer Surgical, Inc. (2012). Operator and service manual: Zimmer A.T.S. 3000 Automatic tourniquet system (Rev. A). Dover, OH: Zimmer Surgical, Inc.

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