**SESSION TITLE:** Recommended Practices Update Part 1: Safe Environment of Care and Pneumatic Tourniquet  

**SPEAKER NAME:** Byron L. Burlingame, MS, BSN, RN, CNOR  
Bonnie G. Denholm, MS, BSN, RN, CNOR  

**SESSION NUMBER:** 9019 & 9109R  

**DATE/TIME:** Monday, March 4, 2013, 9:30-10:30am & 11am-12pm  

**CONTACT HOURS:** 1.0 CH  

**OVERVIEW:**  
The AORN Recommended Practices (RPs) are an indispensable guide to perioperative nurses for decision making in their practice. Each RP document consists of achievable recommendations based on the highest level of evidence available. An overview of the newly updated “Recommended Practices for a Safe Environment of Care” and “Recommended Practices for Use of the Pneumatic Tourniquet” will be presented. Attendees will be provided information related to new recommendations based on literature review of the published evidence.  

**OBJECTIVES**  
1. Identify changes in “Recommended Practices for a Safe Environment of Care” and “Recommended Practices for Use of the Pneumatic Tourniquet” in 2013.  
2. Describe the evidence review process used in the development of the Recommended Practices.  
3. Identify gaps in the evidence.  
4. Discuss how these recommendations are applied in the practice setting.  

**BIOGRAPHIES:**  
Byron L. Burlingame, MS, RN, CNOR, has been a perioperative nursing specialist in AORN's Nursing Department for over eight years. Byron serves as the lead author for various recommended practices (RPs), including the RP for Safe Environment of Care, and as the staff liaison to many committees. He has served as the lead editor for the RNFA Guide to Practice and currently serves in that role for the RNFA Core Curriculum. As an AORN representative, Byron serves on the Facilities Guidelines Committee and on the FDA Surgical Fires Group. Prior to coming to AORN, Byron worked in various roles in surgical services and the ICU.  

Bonnie G. Denholm, MS, BSN, RN, CNOR, began her career at AORN 1991 as a clinical editor. She then spent several years in Membership and is now in the Nursing Department, where she is a perioperative nursing specialist. She has served as clinical editor or author for several AORN documents, including the topics of malignant hyperthermia, positioning, perioperative standards, minimally invasive surgery, medication safety, and pneumatic tourniquets. Bonnie offers clinical information to members via the AORN Consult Line and contributes regularly to the Clinical Issues column in the AORN Journal. She serves as the staff liaison to the Joint Commission's Hospital Professional Technical Advisory Committee and as a member of the Board of Directors for two organizations: the American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF) and the Malignant Hyperthermia Association of the United States (MHAUS). Bonnie holds an MS degree in nursing administration from the University of Colorado, and a bachelor of science degree in nursing from the University of Northern Colorado. Bonnie's perioperative experience includes both management and staff positions in ambulatory surgery centers and the OR.
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FACULTY DISCLOSURE:
Byron Burlingame 7. No conflict.
Bonnie Denholm 7. No conflict.
Order of Presentation

Describe the evidence review process.

Pneumatic Tourniquet-Assisted Procedures: Safe Environment of Care

- Identify changes
- Identify gaps in the evidence.
- Discuss application in practice setting.

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- Identify gaps in the evidence.
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Evidence-rated RPs – The New Generation

- Johns Hopkins Nursing Evidence-Based Practice Model
- Oncology Nursing Society Putting Evidence Into Practice Model
Evidence Review Process

Evidence Review

- A medical librarian conducted a systematic literature search of the databases MEDLINE®, CINAHL®, Scopus®, and Cochrane Database......

- Search terms
- Span of years (usually 5 years back)

Appraisal Score: Johns Hopkins Appraisal Tools

### Evidence Appraisal Forms

#### Quality of Evidence

<table>
<thead>
<tr>
<th>Quality of Evidence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>High quality</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
</tr>
<tr>
<td>C</td>
<td>Low Quality or Major Flaws</td>
</tr>
</tbody>
</table>

#### Level of Evidence

- **Research (I, II, III)**
  - Experimental
  - Quasi-Experimental
  - Descriptive
  - Qualitative
  - Systematic reviews

- **NonResearch (IV, V)**
  - Clinical Practice Guideline
  - Consensus or Practice Stmt
  - Literature Review
  - Case Report

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AORN NON-RESEARCH EVIDENCE APPRAISAL TOOL

**Date:** 3/20/12

**PREPARED BY:** [Name]

**APPROVED BY:** [Name]

**Evidence Appraisal Criteria:***

- **Major Flaws:**
  - Clinical Practice Guideline
  - Consensus or Practice Statement
  - Literature Review
  - Case Report

- **NR:**
  - Systematic reviews

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Evidence Appraisal Forms

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Adapted with permission from Johns Hopkins Nursing Evidence-Based Practice Model and Guidelines.
Evidence Review Process

Appraisal Score:


Level I: Research
Randomized Controlled trial, Experimental Study or Systematic Review
Quality C
Low quality (eg, insufficient sample size, inconsistent results)

Evidence Review Process

Rating evidence:
Oncology Nurses Society Model

I.a. Risk-reduction strategies (ie, administrative, engineering, behavioral controls) for injury prevention should be identified, developed, and implemented.

[ Effectiveness Not Established ].
**Recommended Practices for the Use of the**

**Recommended Practices for Care of Patients Undergoing Pneumatic Tourniquet-Assisted Procedures**

*Posted for Public Review until March 10!*

**Pneumatic Tourniquets: Changes**

- Order of recommendations
- Focus on nursing interventions
  - Patient focus versus equipment focus
- Physiological response
**Pneumatic Tourniquet Changes**

**Purpose Statement**
- Complications

**(I) Assessing**
- Risks
- Contraindications

**(II) Planning**
- Antibiotics
- Preconditioning
- DVT
- Cuff (size, shape)
- Dual-bladder Cuffs
- Bier Block
- IV Regional Anesthesia

**(III) Implementing**
- Environmental Safety
- Gas Source
- Fire safety
- Double tourniquets
- Systemic Risks
- Correct Site Verification
- Cuff placement
- Skin protection

**(IV) Implementing**
- Exsanguination
- Inflation Pressure
- Limb Occlusion Pressure

**(V) Evaluating**
- Duration
- Inflation Time
- Reperfusion
- Tourniquet Pain
- Physiologic Changes
  - Temperature
  - Overheating

**(VI) Evaluating**
- Deflation
- Double tourniquets
- Systemic Risks

**(VII) Postoperative Evaluating**
- Transfer of Care
- Monitor for Blood Loss
- Monitor Systemic Response
# Pneumatic Tourniquet Changes

<table>
<thead>
<tr>
<th>(VIII) Implementing and Evaluating</th>
<th>(X) Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Disinfect Equipment</td>
<td></td>
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<tr>
<td>➢ Disinfect Reusable Cuffs</td>
<td></td>
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<tr>
<td>(IX) Competency</td>
<td>(XI) Policies &amp; Procedures</td>
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<tr>
<td>➢ Initial and Ongoing Education</td>
<td></td>
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<tr>
<td>➢ Understand physiologic responses</td>
<td></td>
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<tr>
<td>➢ Human Factors</td>
<td></td>
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<tr>
<td>(XII) Quality Assurance and Performance Improvement</td>
<td></td>
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</tbody>
</table>

## Gaps in Evidence

### Nursing literature
- Case reports
- Infection prevention
- Performance Improvement
- Assessment and evaluation

### Pediatrics
- Identifying “classics”
  (why are some footnotes old?)
Application in Practice Setting

Pre and post operative nursing assessments
Systemic responses to pneumatic tourniquets
- Oxidative stress
- Ischemia and reperfusion inflammatory response
- Tissue and muscle damage
  - Muscle weakness
  - Rhabdomyolysis
  - Compartment syndrome
- DVT and PE
- Pain

Application in practice setting

Safety considerations
Use according to manufacturer’s directions for use
- Tested for integrity and function
- Connected to appropriate power/gas source
- Alarms set and activated
- Remove equipment that is not properly functioning
- Report equipment failures (Safe Medical Devices Act)
Safety considerations

Cuffs
- Placement of cuffs
  - Forearm, Upper Arm, Thigh, Ankle
- Who places the cuff
- Size and Shape
- Padding underneath the cuff
- Dual cuffs – what they are, why they are used
- Reusable versus sterile (disposable) cuffs
  - Cleaning reusable cuffs

Safety considerations

Exsanguination and Pressure
- Limb occlusion pressure (LOP)
- Lowest pressure possible

Deflation
- Coordinate deflation with anesthesia provider
- Bilateral or sequential procedures
- Dual cuffs, risk of bolus of anesthetic
Recommended Practices for a Safe Environment of Care

The following Recommended Practices for a Safe Environment of Care have been adopted by the AORN Recommended Practice Advisory Board. They were presented as proposed recommendations for comments by members and others. They are effective December 5, 2012. These recommended practices are intended as achievable recommendations recognizing what is feasible to be done in an ideal operating room with regard to the safety of personnel and patients. The practices may include variations in practice settings and/or clinical situations that determine the degree to which the recommended practices can be implemented. AORN recognizes the various settings in which perioperative nurses practice, and as such, these recommended practices are intended as guidelines adaptable to various practice settings. These practice settings include traditional operating rooms (OR), ambulatory surgery centers (ASCs), interventional radiology suites, cardiac catheterization laboratories, neonatal intensive care units, emergency suites, radiology departments, and all other areas where surgery and other invasive procedures may be performed.

These recommended practices provide guidance for creating a safe environment of care related to patients and personnel and the equipment used in the perioperative environment. They include information on:
- Musculoskeletal injury
- Fire safety
- Chemicals and anesthetic gases
- Identification of illicit drugs
- Medical gas cylinders
- Waste anesthetic gases
- Latex
- Chemicals including methyl methacrylate bone cement
- Bloodborne pathogens

Topics Covered in EOC

- Musculoskeletal injury
- Fire safety
- Electrical equipment
- Clinical and alert alarms
- Warming cabinets
- Medical gas cylinders
- Waste anesthetic gases
- Latex
- Chemicals including methyl methacrylate bone cement
- Hazardous waste
Topics NOT Covered in EOC

- Exposure to bloodborne pathogens
- Radiation
- Surgical smoke
- Chemotherapeutic agents
- Incorrect tubing connections
- Requirements for heating, ventilation, and air conditioning

Question

What is the limit of the weight of instrument trays/panns

A. **25 lbs.**
B. 15 lbs.
C. 30 lbs.
D. There is no recommended weight
Musculoskeletal injury

Risk reduction strategies
• Administrative
• Engineering
• Behavioral controls

Question

Can extension cords be used in an operating room?
A. Yes
B. No
C. With certain restrictions
Use of electrical equipment

**Extension Cords**
- Power strips
- Changing the power cords

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**Question:**
The oxygen tank on the gurney is empty and you need to get a new one from the PACU.

Is it correct to carry an oxygen tank down the hall?

A. Yes  
B. **No**  
C. Yes, as long as you are not carrying anything else.
Compressed Medical Gases

• Storage
• Transporting

Question:
There is a fire on the patient in your operating room.

What is the first thing that should occur?
A. Grab the fire extinguisher.
B. Yell out FIRE.
C. Grab the saline on the back table.
D. Evacuate the room.
Fire Safety

- Prevention
- Communication
- Suppression
- No fire blankets
- Use of an extinguisher
- Evacuation
- Education

Alarms

- Clinical
- Alert
Question:
What are the temperature ranges for a warming cabinet?

A. **130 to 150 degrees F.**
B. Depends upon the contents
C. Depends if the cabinet has one or two compartments.
D. Depends if the cabinet has independent thermostats.
E. All of the above.

Warming Cabinets

- Storage conditions
- Number needed
- Separate Compartments
- Temperatures
- Blankets
- Solutions
- Skin preps
Waste Anesthesia Gases

- Air exchanges
- Intact systems
- Equipment checks

Latex

- Latex Sensitivity
- Latex Precautions
- Cleaning room
- Scheduling procedure
- Rubber stoppers
- Latex safe environment

EOC

- Competency
- Documentation
- Policies and Procedures
- Quality
Resources
1. Fire Safety Tool Kit at aorn.org.
8. Governmental Sources: NIOSH, OSHA, FDA, CDC, CMS: Conditions of Participation.

References
