

# Clinical Research Supporting the Use of Disposable Blood Pressure Cuffs to Reduce the Spread of Healthcare Associated Infections

## Blood Pressure Cuffs: Friend or Foe?

Authors: N. Walker, R. Gupta, J. Cheesbrough  
*Journal of Hospital Infection* (2006); 63, 167-169

**Objective:** The purpose of this study was to examine the level of viable bacterial contamination and presence of nosocomial pathogenic organisms on blood pressure cuffs use in hospital wards.

**Setting:** Twenty-four blood pressure cuffs were examined from various medical and surgical wards at Royal Preston Hospital (United Kingdom).

### Results:

Potentially pathogenic organisms were isolated from 14 of the 24 cuffs (58.3%).

- A single pathogen was isolated from 11 cuffs:
  - 5 cuffs contained *MSSA*
  - 1 cuff contained *MRSA*
  - 5 cuffs contained *C. difficile*
- More than one pathogenic organism was isolated from 3 cuffs:
  - 1 cuff harbored *MSSA*, *MRSA* and *C. difficile*
  - 2 cuffs harbored both *MSSA* and *C. difficile*.

**Conclusion:** Disinfecting blood pressure cuffs alone will not eliminate all microbial life, particularly *C. difficile*, which is resistant to commonly used disinfectants. Educating nurses about disinfection procedures could be beneficial in decreasing infection rates, although there is little time for decontamination when equipment is going from patient to patient. Therefore, disposable blood pressure cuffs would be a viable option to reduce the risk of transmission of pathogens.

# Nondisposable Sphygmomanometer Cuffs Harbor Frequent Bacterial Colonization and Significant Contamination by Organic and Inorganic Matter

Author: V. Base-Smith

*American Association of Nurse Anesthetists Journal* (1996); 64(2), 141-145

**Objective:** The purpose of this study was to determine if significant bacterial colonization of organic and inorganic matter occurred on presumed “cleaned” blood pressure cuffs.

**Setting:** Over a 6 week period, 70 blood pressure cuff samples were selected from the Operating Room (OR), Medical Intensive Care Unit (MICU), Surgical Intensive Care Unit (SICU), Burn Special Intensive Care Unit (BSPICU), Cardiac Intensive Care Unit (CICU), Emergency Room (ER), Post Anesthesia Unit (PACU), and Neurosurgical Intensive Care Unit (NSICU) from a 707 bed tertiary care, level-one trauma center.

## Results:

- Bacterial colonization occurred on 57 (81%) of the blood pressure cuffs sampled.
- Bacterial colonization was discovered on 100% of the cuffs sampled from the OR, PACU, BSICU, and ER.
- Bacterial colonization was discovered on 90% of the cuffs sampled from the SICU.
- Bacterial colonization was discovered on 80% of the cuffs sampled from the MICU.
- Bacterial colonization was not discovered on cuffs sampled from the NSICU and CICU.
- 32 (45.7%) of the presumed “clean” cuffs were contaminated with organic and/or inorganic substances that should not have been present.
- The patient contact sides of the cuffs were contaminated twice as often as the nonpatient sides.

**Conclusion:** Even cuffs that were “presumed” clean showed frequent bacterial colonization and significant contamination by organic and inorganic matter. Therefore, the need for better sanitation and disinfection of the cuffs between patient use is evident.

# Blood Pressure Cuff as Potential Vector of Pathogenic Microorganisms: A Prospective Study in a Teaching Hospital

Author: C. de Gialluly, C., V. Morange, E. de Gialluly, J. Loulergue, N. van der Mee, R. Qeuntin  
*Infection Control and Hospital Epidemiology* (2006);27(9),940-943

**Objective:** The purpose of this study was to investigate the potential role that blood pressure cuffs have in the spread of bacterial infections in a hospital.

**Setting:** During a 3 month period, 203 blood pressure cuffs from sphygmomanometers were examined at 5 surgical units, 7 medical units, 2 intensive care units, 2 pediatric units, 1 emergency unit, and 1 operating room unit at a university teaching hospital.

## Results:

- Highest rate of contamination occurred on the inner side of the blood pressure cuffs.
  - 20 out of 24 (83%) occurred in the Intensive Care Unit.
  - 27 out of 35 (77%) occurred on nurses' trolleys.
- Bacterial colonization occurred on 92 (45%) of the inner side and 46 (23%) of the outer side out of the 203 blood pressure cuffs sampled.
- 45% of contaminated cuffs contained MRSA.

**Conclusion:** There was extensive contamination of blood pressure cuffs in the hospital, regardless of which unit the cuffs were located (except for the operating room and pediatric units). These findings encourage the development of stringent disinfection procedures for blood pressure cuffs.

# Outbreak of Mupirocin-Resistant *Staphylococcus Aureus* on a Dermatology Ward Associated with an Environmental Reservoir

Author: M.C. Layton, M. Perez, P. Heald, J. E. Patterson  
*Infection Control and Hospital Epidemiology*(1993);14(7),369-375

**Objective:** The purpose of this study was to investigate the outbreak of Mupirocin-Resistant *Staphylococcus aureus* (MRSA) at a dermatology ward.

**Setting:** The dermatology ward at an 850-bed university hospital was examined for a 14 month period.

## Results:

- MRSA was found on 13 patients.
  - 11 (84.6%) of the patients were mupirocin-resistant
  - 9 (81.8%) isolates were present upon admission.
- Hand and nasal cultures were obtain from 36 staff members and found to be negative for MRSA.
- Blood pressure cuffs and patients' showers were found to be contaminated with MRSA.

**Conclusion:** When blood pressure cuffs were changed between patients, the cultures came back negative for MRSA.

# Sphygmomanometers as a Reservoir of Pathogenic Bacteria

Author: M.A. Beard, A. McIntyre, P.M. Roundtree

*Sphygmomanometers as a Reservoir of Pathogenic Bacteria* (1969); 2, 758-760

**Objective:** The purpose of this study was to identify the type and level of bacterial contamination of sphygmomanometers used in a hospital

**Setting:** During a 3 week evaluation period, samples were taken from common use sphygmomanometers (inner side of the cuff) from 48 clinical units at a hospital.

**Results:** Swabs were taken from a patient's arm before and after a blood pressure cuff was placed on the patient's arm. Staphylococci of the same type were identified from patients only after the cuff was placed on their arms. Furthermore, the same bacteria were also identified on the staff's hands after, but not before, handling the contaminated blood pressure cuff.

- *Staphylococcus aureus* was found on 92% of sphygmomanometers.
- *Pseudomonas aeruginosa* was isolated on 1 cuff (2%) at a surgical unit.

**Conclusion:** The blood pressure cuffs did not have adequate disinfection procedures, thus leading to a direct transfer of microorganism from the cuff to the patient and staff members.

## The Microbial Flora of In-Use Blood Pressure Cuffs

Authors: M.G.M. Cormican, D. L., Low, P. Flynn, D. O'Toole  
*Irish Journal of Medical Sciences* (1994): 4, 112-113

**Objective:** The purpose of this study was to determine the extent of microbial contamination on blood pressure cuffs used in a teaching hospital, since blood pressure cuffs seem to be an unrecognized source for spreading nosocomial infections.

**Setting:** New blood pressure cuffs were placed in 6 operating rooms and 1 recovery room for a period of 5 days. A defined area of the cuff was sampled before and after the cuff was placed on a patient. These cuffs were used for a period of 5 days.

### Results:

68 different microorganisms were isolated from the 42 sampled cuffs.

- 71% of the microorganisms were Staphylococci.
- One of the *Staphylococcus aureus* bacteria was found to be resistant to methicillin, gentamycin, and erythromycin (no patient known to have this pathogen had been in the operating room).
- Remaining 25 organisms were thought to be skin and environmental representatives that may pose a risk to certain groups of patients.

**Conclusion:** General use blood pressure cuffs are handled by many health care workers and patients and there are no procedures to disinfect the cuff since there are no visible signs of contamination. The potential for cross contamination magnifies on blood pressure cuffs since patients are generally not screened for antibiotic resistant pathogens.