

## Letter to the Editor

### The Stethoscope As a Potential Source of Transmission of Bacteria

#### To the Editor:

Contamination of stethoscopes by skin flora has been described previously.<sup>1</sup> The predominant organisms recovered from stethoscope diaphragms were *Staphylococcus epidermidis* and *Staphylococcus aureus*. Previous studies documented the status of contamination of the stethoscope diaphragm with microorganisms only once, and no repeat sampling was performed.<sup>1</sup> The dynamic of contamination of the stethoscope by microorganisms was investigated in this study, which describes the serial recovery of microorganisms from the author's stethoscope, after examining 10 patients in the outpatient clinic and 10 patients in the hospital ward.

#### METHODS

The author examined 10 consecutive pediatric patients in the outpatient clinic and 10 in the hospital ward using a pediatric Littmann (M-3 Products, Oakdale, MN) stethoscope. The ages of the patients examined in the clinic were 4 months to 5 years, 9 months (average 3 years, 2 months), and in the ward was 2 years to 14 years, 4 months (average 6 years, 6 months). The stethoscope was used to perform a routine physical examination that included auscultation of the heart, anterior and posterior chest, and anterior abdomen. The author used fresh, sterile rubber gloves between patients.

Prior to examining the first patient, and between each examination, the surface of the stethoscope diaphragm was cleansed with an alcohol swab that was allowed to dry for 3

minutes. The sterility of the diaphragm was assured by swabbing the surface afterwards. After each examination, the entire surface of the stethoscope diaphragm was swabbed vigorously with a sterile cotton swab that previously was moisturized in sterile saline. The swab then was placed immediately in a sterile tub containing 1 mL of pre-reduced sterile saline that was agitated vigorously for 2 minutes, and the content of the tub was cultured quantitatively by serial culture for aerobic and anaerobic bacteria. Aerobic and anaerobic bacteria were identified by conventional methods.<sup>2,3</sup>

#### RESULTS

Organisms were isolated from 18 of the 20 specimens. Twenty-seven isolates were recovered: *S epidermidis* (11 isolates), *Propionibacterium acnes* (4), *S aureus* (3), *Escherichia coli* (3), *Enterococcus faecalis* (2), *Peptostreptococcus* species,  $\alpha$ -hemolytic *Streptococcus*, *Bacillus* species, and *Klebsiella pneumoniae* (1 each). The number of colonies per diaphragm ranged from 6 to 120. Different bacteria were isolated from the samples, and they varied in all instances.

#### DISCUSSION

This study demonstrates the contamination of the stethoscope diaphragm by a variety of aerobic and anaerobic organisms, immediately after using the stethoscope for physical examination. The isolates may represent different skin flora in each of the examined patients; many of the isolates are known skin colonizers.<sup>4</sup> Staphylococcal and streptococcal species, *P acnes*, and *Peptostreptococcus* species are known as part of the skin flora.<sup>4</sup> The recovery of aerobic gram-negative bacilli from hospital specimens is not surprising, as these

members of the gastrointestinal flora can colonize the skin in hospitalized patients.<sup>4</sup>

Aerobic gram-negative cocci were recovered from stethoscopes in previous studies.<sup>1</sup> *P acnes* and *Peptostreptococcus* species that were not previously reported as recovered from stethoscopes<sup>1</sup> were recovered in this study, probably due to use of methods adequate for the isolation of anaerobic bacteria.

The growing resistance to antimicrobials observed in many aerobic gram-negative bacilli (eg, *Enterobacter* species), as well as aerobic cocci (*Staphylococcus* and *Enterococcus* species)<sup>5</sup> warrants the use of cleaning methods of stethoscopes between patients, in an attempt to reduce the risk of transmission of microorganisms. This may be of particular importance in some settings such as critical-care, surgical, and hematology-oncology units.

#### REFERENCES

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