Objection 2:

- **"We use disposable, dedicated patient disposables"**
- **"We use high-quality, dedicated patient disposables"**

Refutation:

Both high-quality and disposable, dedicated patient stethoscopes are susceptible to infection, and can spread infection among staff.[1]

Moreover, regarding disposable stethoscopes, studies reveal that misdiagnosis rates resulting from use of disposable stethoscopes are between 11% and 31%, given a number of harm between 3 to 10.[2, 3]

If there is ever litigation around the use of disposables, due to either a doctor getting sick or a patient receiving a misdiagnosis due to the use a of a disposable stethoscope, it will be indefensible.

Disk covers are acoustically invisible and superior to disposable stethoscopes.[3] In 800 high fidelity stethoscope auscultations using a SimMan:

- No diagnostic accuracy difference with (n=400) or without (n=400) a disk cover barrier (p=1.0)[3]
- No differences in digital acoustic output tracing amplitude (p=1.0)[3]

Citations:

1. Whittington AM. Bacterial contamination of stethoscopes on the intensive care unit. Anaesthesia, 2009, 64: 620–624.
2. Mehmood M. Comparing the auscultatory accuracy of health care professionals using three different brands of stethoscopes on a simulator. Medical Devices: Evidence and Research 2014:7 273–281.
3. Kalra, S. 2021 Jan;96(1):263-264. doi: 10.1016/j.mayocp.2020.10.029.

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Bacterial contamination of stethoscopes on the intensive care unit

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Summary

We assessed how often bedside stethoscopes in our intensive care unit were cleaned and whether they became colonised with potentially pathogenic bacteria. On two separate days the 12 nurses attending the bedspaces were questioned about frequency of stethoscope cleaning on the unit and the bedside stethoscopes were swabbed before and after cleaning to identify colonising organisms. Twenty-two health care providers entering the unit were asked the same questions and had their personal stethoscopes swabbed. All 32 non-medical staff cleaned their stethoscopes at least every day; however only three out of the 12 medical staff cleaned this often. Out of 24 intensive care unit bedside stethoscopes tested, two diaphragms and five earpieces were colonised with pathogenic bacteria. MRSA cultured from one earpiece persisted after cleaning. Three out of the 22 personal stethoscope diaphragms and five earpieces were colonised with pathogens. After cleaning, two diaphragms and two earpieces were still colonised, demonstrating the importance of regular cleaning.

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Stethoscopes were first identified as potential vectors for bacterial infection over 30 years ago [1]. Both the diaphragm and earpieces of physician's personal stethoscopes and bedside stethoscopes are frequently colonised with a variety of pathogenic organisms including methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE) which cause significant morbidity and mortality on the intensive care unit (ICU) [2–5]. Cleaning stethoscopes with isopropyl alcohol dramatically reduces the number of bacterial colonies on the diaphragm by 94–100% [2, 3], however regular cleaning has little impact on the colonisation of the earpieces [4]. How often a stethoscope must be cleaned to limit contamination is not well established although there is a correlation between degree of contamination and frequency of cleaning [4].

As is usual practice in critical care, patients on our 12-bed mixed medical and surgical ICU are strictly barrier nursed, with visiting physicians requested to use the bedside stethoscopes, and not their personal equipment. Our unit's infection control guidelines advise that the bedside stethoscopes should be cleaned at the start of every shift. Our study aimed to answer the following questions:

What was the current stethoscope cleaning practice on our unit?

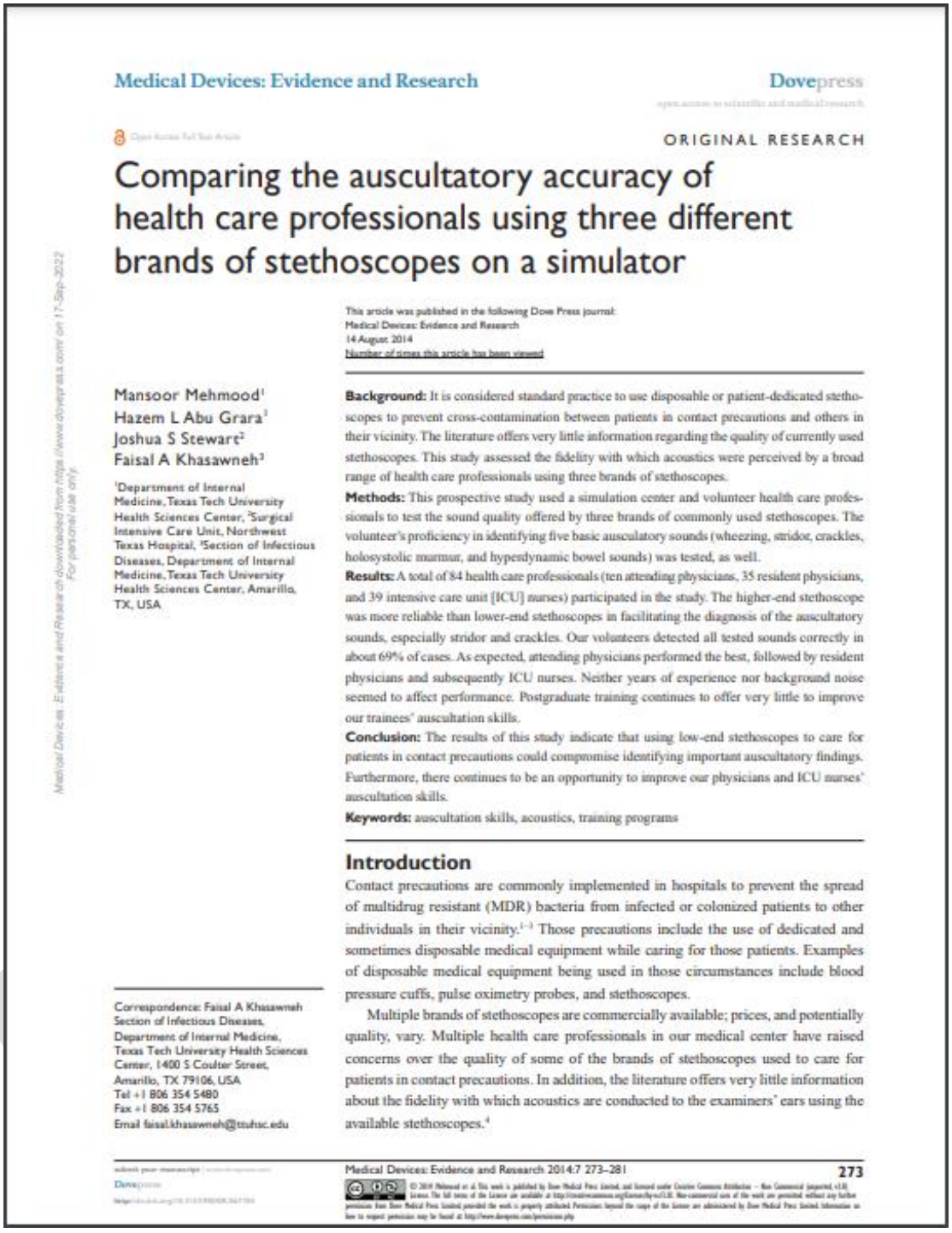
What was the level of bacterial contamination of stethoscopes?

What was the impact of current user decontamination practice on such contamination?

Methods

The Chairman of our local Research Ethics Committee reviewed the protocol and confirmed that formal ethical committee approval was not required. The study was performed on two separate days, 3 months apart, to ensure that the bedside stethoscopes had been frequently used between study days. On each study day, the 12 nursing staff attending each bed space were asked to complete an anonymous questionnaire asking how often they cleaned the bedside stethoscopes and what method they used. The diaphragm and bell of the stethoscopes were then swabbed with a sterile cotton bud, moistened

Whittington AM. Bacterial contamination of stethoscopes on the intensive care unit. Anaesthesia, 2009, 64: 620–624.



Medical Devices: Evidence and Research

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ORIGINAL RESEARCH

Comparing the auscultatory accuracy of health care professionals using three different brands of stethoscopes on a simulator

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Background: It is considered standard practice to use disposable or patient-dedicated stethoscopes to prevent cross-contamination between patients in contact precautions and others in their vicinity. The literature offers very little information regarding the quality of currently used stethoscopes. This study assessed the fidelity with which acoustics were perceived by a broad range of health care professionals using three brands of stethoscopes.

Methods: This prospective study used a simulation center and volunteer health care professionals to test the sound quality offered by three brands of commonly used stethoscopes. The volunteer's proficiency in identifying five basic auscultatory sounds (wheezing, stridor, crackles, holosystolic murmur, and hyperdynamic bowel sounds) was tested, as well.

Results: A total of 84 health care professionals (ten attending physicians, 35 resident physicians, and 39 intensive care unit [ICU] nurses) participated in the study. The higher-end stethoscope was more reliable than lower-end stethoscopes in facilitating the diagnosis of the auscultatory sounds, especially stridor and crackles. Our volunteers detected all tested sounds correctly in about 69% of cases. As expected, attending physicians performed the best, followed by resident physicians and subsequently ICU nurses. Neither years of experience nor background noise seemed to affect performance. Postgraduate training continues to offer very little to improve our trainees' auscultation skills.

Conclusion: The results of this study indicate that using low-end stethoscopes to care for patients in contact precautions could compromise identifying important auscultatory findings. Furthermore, there continues to be an opportunity to improve our physicians and ICU nurses' auscultation skills.

Keywords: auscultation skills, acoustics, training programs

Introduction

Contact precautions are commonly implemented in hospitals to prevent the spread of multidrug resistant (MDR) bacteria from infected or colonized patients to other individuals in their vicinity.[1–3] Those precautions include the use of dedicated and sometimes disposable medical equipment while caring for those patients. Examples of disposable medical equipment being used in those circumstances include blood pressure cuffs, pulse oximetry probes, and stethoscopes.

Multiple brands of stethoscopes are commercially available; prices, and potentially quality, vary. Multiple health care professionals in our medical center have raised concerns over the quality of some of the brands of stethoscopes used to care for patients in contact precautions. In addition, the literature offers very little information about the fidelity with which acoustics are conducted to the examiners' ears using the available stethoscopes.[4]

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levels of physical activity have been consistently associated, in a dose-dependent manner, with reduced ASCVD events and mortality risks after adjustment for major ASCVD risk factors.[3,4] Although we agree with Dr Langland that the available evidence supports the view that a very highly active person with a CAC score ≥100 is at lower risk of ASCVD than a less active person with the same CAC score, the evidence regarding absolute risk for adverse cardiovascular outcomes in such patients is limited at present and should therefore be interpreted with caution. Statin therapy is associated with reduced incidence of ASCVD events across the spectrum of baseline risk, and, although risk may be lower in highly active individuals for a given level of CAC, it is uncertain whether risk of ASCVD events is low enough to justify withholding statin therapy in those with CAC scores ≥100.[2] Clinical judgment and a clinician–patient dialog is required regarding the potential benefits and risks of statin therapy in highly active patients with borderline or intermediate estimated 10-year risk and CAC scores ≥100.

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1. Grundy SM, Stone NJ, Bailey AL, et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA guideline on the management of blood cholesterol: a Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation. 2019;139(25):e1082-e1143.
2. Cholesterol Treatment Trialists' (CTT) Collaborators, Mihaylova B, Emberson J, et al. The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials. Lancet. 2012;380(9841):581-590.
3. Arnett DK, Blumenthal RS, Albert MA, et al. 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: Executive Summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol. 2019;74(10):1376-1414.
4. 2018 Physical Activity Guidelines Advisory Committee. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. Washington, DC: US Department of Health and Human Services; 2018. Available at: https://health.gov/paguidelines/secondedition/report. Accessed October 4, 2020.

https://doi.org/10.1016/j.mayocp.2020.10.025

Aseptic Disposable Stethoscope Barrier: Acoustically Invisible and Superior to Disposable Stethoscopes

To The Editor: Health care-associated infections (HAIs) occur in ~1.7 million patients annually, and 100,000 patients die, at a cost of $147 billion.[1] Overall, 85% of stethoscopes (the physician's third hand) are contaminated with the identical pathogens as found on the hands.[2] Although hand hygiene is emphasized, cleaning stethoscopes between patients occurs in as few as 10% of encounters.[3] Unfortunately, Centers for Disease Control and Prevention (CDC) guidelines rely on outdated strategies, instructing providers to clean their own stethoscopes, an intervention that has repeatedly been a dismal failure. Contemporary methods to decrease stethoscope-mediated transmission of pathogens include single-use disposable aseptic diaphragm barriers placed on high-fidelity stethoscopes[4] (Figure) or auscultation with a disposable single-use stethoscope. How these strategies affect the stethoscope's auscultory function has not been previously described. Our purpose was to evaluate the auscultation impact of a disposable aseptic barrier and the physician's preferences vs a disposable stethoscope.

We performed an institutional review board-exempt prospective evaluation assessing the sound transmission effects of an aseptic barrier (DiskCover, AseptiScope Inc, San Diego, California) placed on a stethoscope diaphragm. Using the Littmann 3200 recording stethoscope (3M, Maplewood, Minnesota) and a simulation mannequin (iSTAN, CAE, Sarasota, Florida), 28 physicians performed auscultations in prespecified locations, for 15 seconds of respiratory wheezes, normal heart sounds, systolic murmurs, and diastolic murmurs. Physicians were blinded to the barriers' presence and received sounds in random order. Digital audio files

FIGURE. Stethoscope barrier dispenser and stethoscope with barrier.

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