

The Dirty Secret of Cleaning Protocols for Stethoscopes

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Background: Although hand hygiene and the use of gloves have become routine in the prevention of cross contamination in the healthcare setting, we often overlook the obvious risk factors of cross contamination. Stethoscope diaphragms are a significant source of contagion in the healthcare setting. Healthcare workers are often non-compliant with stethoscope disinfection after patient examination.

Objectives: To determine if routine disinfection of stethoscope diaphragms reduces bacterial contamination between patient use and evaluate the effectiveness of a stethoscope protective cover.

Methodology: Prospective observational study. In phase 1, bacterial cultures were obtained from the stethoscope diaphragms of 50 participant stethoscopes immediately after patient examination. In phase 2, stethoscopes were disinfected in accordance to hospital disinfection protocols immediately after patient examination, and subsequently re-cultured to ascertain bacterial contamination levels. In phase 3, completely disinfected stethoscopes were utilized for patient examination with diaphragms covered by Coreshieldz barrier film, and subsequently cultured after removal of the protective film in order to determine bacterial contamination of the diaphragm.

Results:

Organisms isolated from diaphragms of stethoscopes in each study period

	Phase 1 (Pre- cleaning)	Phase 2 (Post- cleaning)	Phase 3 (Use of Coreshieldz)
Acinetobacter baumannii	2 (2)	1 (1)	0
Acinetobacter baumannii-R	2 (2)	2 (2)	0
Bacillus Sp.	29 (23)	21 (23)	0
Clostridium difficile	2 (2)	2 (2)	0
Diphtheroids	18 (14)	16 (18)	0
Escherichia coli	10 (8)	6 (7)	0
Escherichia coli-R	2 (2)	2 (2)	0
Enterococcus faecium	6 (5)	4 (4)	0
Enterococcus faecium-R	3 (2)	2 (2)	0
Enterobacter cloacae	1 (1)	0	0
Staphylococcus aureus	9 (7)	6 (7)	0
Staphylococcus aureus-R	11 (9)	8 (9)	0
Staphylococcus epidermidis	23 (18)	17 (19)	1 (1)
Staphylococcus epidermidis-R	7 (6)	3 (3)	0
Staphylococcus hominis	2 (2)	0	0
Staphylococcus hominis-R	0	0	0
TOTAL	127 (50)	90 (50)	1 (50)

Interval of Stethoscope Disinfection (Survey-After Each Use)

Position	Yes	No
Medical Doctor	8	3
Registered Nurse	10	7
Nurse Practitioner	5	2
Licensed Vocational Nurse	6	3
Respiratory Therapist	5	1
TOTAL	34	16

Stethoscope Contamination Risk Factors

Position	Path Y (Contaminated)	Path N (Not contaminated)
Medical Doctor	10 (91%)	1 (9%)
Registered Nurse	11 (65%)	6 (35%)
Nurse Practitioner	5 (60%)	2 (40%)
Licensed Vocational Nurse	5 (56%)	4 (44%)
Respiratory Therapist	3 (50%)	3 (50%)
TOTAL	68%	32%

Conclusion: Although stethoscopes play an important role in patient examination, the potential risks of bacterial contamination are very high. Routine disinfection of stethoscopes after each patient exam is not performed consistently. Bacterial cross-contamination or transfer via contaminated stethoscope diaphragms is very common. We found that bacterial contamination was evident on virtually all stethoscope diaphragms. Furthermore, even when adhering to hospital disinfection protocols, the elimination of pathogens was not as expected due to the various intricate surface details of the stethoscope diaphragm. Remarkably, the use of a novel barrier-film proved to be advantageous in reducing the risk of stethoscope contamination, as well as eliminating any pathogen exposure from bacteria that may not have been removed during disinfection practices.

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Coreshieldz Stethoscope Protector from RDI Systems Ltd

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