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Canadian Association of Radiologists Journal xx (2017) 1–6

 CANADIAN
ASSOCIATION OF
RADIOLOGISTS
JOURNAL

www.carjonline.org

Health Policy and Practice / Santé: politique et pratique médicale

Disinfection of the Radiologist Workstation and Radiologist Hand Hygiene: A Single Institution Practice Quality Improvement Project

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Abstract

Purpose: The purpose of this study was to evaluate the workstation disinfection rates and hand hygiene of radiologists and trainees at shared departmental workstations and assess the impact of education and reminder placards on daily habits.

Methods: A 10-question survey was administered to all staff radiologists, fellows, and residents at our institution. The questions pertained to workstation disinfection, hand hygiene habits, and accessibility to disinfectant wipes and hand sanitizer stations. Subsequently, a short educational PowerPoint presentation was emailed to the department and small reminder placards were placed at each workstation. A follow-up survey was administered. Chi-square and Wilcoxon signed-rank tests were used to analyse the results.

Results: The percentage of participants who disinfect their workstations 1-2 times/week, 3-4 times/week or everyday increased from 53.4% (45 of 84 participants) to 74.3% (55 of 74 participants; $P = .01$), while the number who disinfect their workstation <1 time/week or never decreased from 46.4% (39 of 84 participants) to 25.7% (19 of 74 participants; $P = .01$). Hand washing before working at the workstation increased from 41.6% (35 of 84 participants) to 48.7% (36 of 74 participants; $P = .76$) and hand washing after working at the workstation increased from 50.0% (42 of 84 participants) to 56.8% (42 of 74 participants; $P = .49$).

Conclusions: At our institution, the implementation of daily reminder placards at each workstation and the administration of an educational PowerPoint presentation improved the rate of radiologist workstation disinfection.

Résumé

Objet : L'étude visait à évaluer les taux de désinfection des postes de travail et l'hygiène des mains des radiologistes et des résidents aux postes de travail partagés dans les services ainsi qu'à déterminer l'incidence de la sensibilisation et des aide-mémoire sur les habitudes quotidiennes.

Méthodes : Nous avons distribué un sondage de 10 questions à tous les radiologistes en titre, boursiers et résidents de notre établissement. Celles-ci portaient sur la désinfection des postes de travail, les habitudes relatives à l'hygiène des mains et l'accès à des postes offrant des lingettes désinfectantes ou du désinfectant pour les mains. Ensuite, nous avons envoyé une courte présentation PowerPoint éducative au service par courriel et affiché de petits aide-mémoire à chaque poste de travail. Nous avons finalement effectué un sondage de suivi. Les tests de chi carré et des rangs de Wilcoxon ont servi à analyser les résultats.

Résultats : Le pourcentage de participants qui désinfectent leur poste de travail une ou deux fois par semaine, trois ou quatre fois par semaine ou chaque jour est passé de 53,4 % (45 participants sur 84) à 74,3 % (55 participants sur 74; $P = 0,01$), tandis que le nombre de répondants qui ne désinfectent jamais leur poste de travail ou le font moins d'une fois par semaine est passé de 46,4 % (39 participants sur 84) à 25,7 % (19 participants sur 74; $P = 0,01$). Un total de 48,7 % (36 participants sur 74; $P = 0,76$) des répondants se lavent les mains avant de travailler à leur poste, contre 41,6 % (35 participants sur 84) auparavant, tandis que le pourcentage de répondants qui se lavent les mains après avoir travaillé à leur poste est passé de 50,0 % (42 participants sur 84) à 56,8 % (42 participants sur 74; $P = 0,49$).

Conclusions : Dans notre établissement, l'installation d'aide-mémoire quotidiens à chaque poste de travail et l'envoi d'une présentation PowerPoint éducative ont augmenté le taux de désinfection des postes de travail des radiologistes.

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Key Words: Bacterial contamination; Disinfection; Hand hygiene; Physician workplace safety; Radiologist workstation

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For decades, hand washing and disinfection of medical equipment have been a primary defense in preventing the spread of infection within hospitals [1]. Multiple studies have shown the potential for pathogen transmission via physician clothing, hospital scrubs, laboratory coats, pagers, stethoscopes, and otoscopes [2–5]. With widespread use of electronics in the health care setting, there is increasing recognition that these devices provide new vectors for microbial transfer. Bacterial contamination rates as high as 100% have been shown on computer keyboards, iPads, and mobile phones [6–9]. This is concerning for hospitals in terms of preventing spread of infection from patient to patient, but also in limiting infection of health care workers and their families [8].

Hospital hand hygiene audits tend to focus on high-traffic areas such as the intensive care unit (ICU) and Emergency Department, while less busy areas such as the Radiology Department often receive little attention. One previous study examined bacterial contamination of portable chest radiographic plates and showed that multiresistant bacteria were frequently transferred from patients to the radiograph machine when improperly disinfected [10]. A separate study found that typical dermal bacteria frequently contaminate computed tomography power injector syringes after multiple uses and therefore only single-use syringes should be utilised [11]. Duszak et al [12] showed that radiologist workstations had bacterial colonization counts significantly greater than nearby restroom toilet seats and doorknobs. They also demonstrated that using inexpensive disinfection wipes nearly completely eradicated bacterial contamination [12].

The degree of bacterial contamination of the radiologist workstation is potentially significant given that radiologists spend nearly the entire day at the workstation. Radiologists may encounter potential pathogens from a number of sources, such as elevators, door handles, washrooms, or the cafeteria, and may unknowingly contaminate their workstation. Anecdotally, we know that many radiologists regularly eat and drink at the workstation, and some use the dictaphone in very close proximity to their mouth. Radiology reporting stations are also commonly shared. These factors may increase the risk of microbial transfer from the workstation to the radiologist.

At our institution, the workstations are shared on a day-to-day basis, and there is no current protocol mandating workstation disinfection. It lies at the personal discretion of the radiologist or trainee to decide whether any disinfection occurs. In this single-institution practice quality improvement project, we aimed to investigate the workstation disinfection rates and hand hygiene habits of both radiologists and trainees at shared departmental workstations, and to assess the impact of an education campaign and use of reminder placards at workstations on daily habits.

Materials and Methods

Ethics approval was obtained from our institutional review board. In January 2014, an e-mail was sent to all

radiology staff, fellows, and residents at our hospital (a tertiary-care, academic institution) containing a brief explanation of the study and a hyperlink to a 10-question internet-based survey. Participation was entirely voluntary. Responses were recorded over a 2-week interval with a single reminder e-mail sent at the 1-week point. All results were anonymous aside from the level training of the participant (ie, staff, fellow, or resident). The survey was designed to assess if radiologists were regularly eating or drinking at their workstation (which would suggest an increased risk for hand or mouth interaction), ascertain the initial frequency of workstation disinfection and hand hygiene habits, and also to assess the accessibility to disinfectant wipes and hand sanitizer stations. Table 1 depicts all questions and possible answers in the first survey.

Subsequently, after the first survey polling was complete, a short educational PowerPoint presentation (Microsoft Corporation, Redmond, WA) describing the risk of bacterial contamination of the radiologist workstation and impact of hand hygiene habits on spread of nosocomial infections was presented to the radiologists, fellows, and residents. The presentation encouraged the use of hand sanitizer before and

Table 1
First online survey questions and possible responses

Question	Possible answers
1. Please indicate your current position.	A. Staff radiologist B. Fellow C. Resident
2. In the last 4 weeks, approximately how often have you disinfected your radiology workstation?	A. Everyday B. 3-4 times/week C. 1-2 times/week D. Less than once per week E. Never
3. Which of the following did you include during workstation disinfection? (Select all that apply)	A. Keyboard B. Mouse C. Desk surface D. Dictaphone E. Telephone
4. Are disinfectant wipes readily available near your workstation?	A. Always B. Often C. Sometimes D. Never
5. Do you regularly wash your hands BEFORE working at the radiology workstation?	A. Yes B. No
6. Do you regularly wash your hands AFTER working at the radiology workstation?	A. Yes B. No
7. Which of the following do you do at the workstation regularly? (Select all that apply)	A. Drink coffee/tea/other B. Eat a snack C. Eat lunch
8. Are you more likely to disinfect your workstation during cold/flu season?	A. Yes B. No
9. Are hand sanitizer stations readily available near your workstation?	A. Always B. Often C. Sometimes D. Never
10. Have you received instruction on how to properly disinfect that radiologist workstation?	A. Yes B. No

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