

Microbial contamination of mobile phones used in operating theatres and the efficacy of disinfecting with alcohol swabs

Cilliers LJ, Spijkerman S, De Menezes HL

Department of Anaesthesiology, Faculty of Health Sciences, University of Pretoria

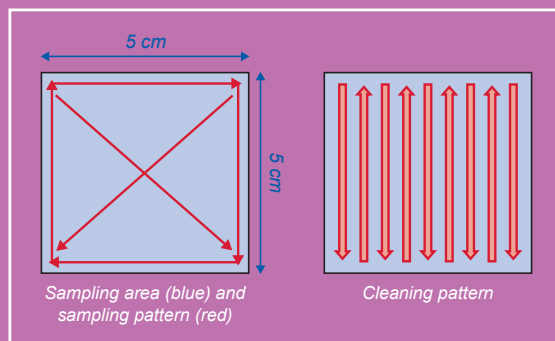
Introduction

South Africa does not prohibit cellphone use in hospitals and no recommended protocol exists for device cleaning. These devices are potential pathogen vectors which could result in hospital-acquired infections. We quantified microorganisms cultured from healthcare worker (HCW) cellphones in operating theatres and determined the efficacy of cleaning with a 70% isopropyl alcohol swab.



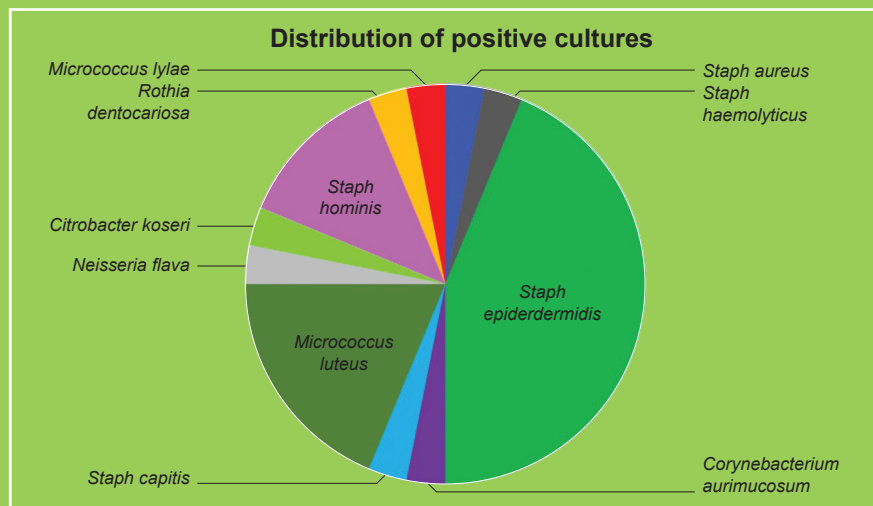
Methods

Following participant consent, two HCW cellphones per operating theatre (15 theatres) were assessed at an academic hospital on a single day. Each phone was swabbed on the frontal surface in a specific pattern (5 cm x 5 cm square outline with a cross pattern inside), cleaned with a 70% isopropyl alcohol swab (with up and down strokes), allowed to dry for 30 seconds and re-swabbed for culture of micro-organisms (total of 30 phones; 60 samples). Descriptive statistics reported organism counts and frequency and proportions reported categorical variables. Wilcoxon signed-rank test assessed the difference between organism levels before and after cleaning. $P \leq 0.05$ was considered statistically significant.



Results

Of the 30 swabs before cleaning, 23 had positive cultures (76.7% contamination rate). No fungi or gram-negative bacteria were cultured. Species from the Staphylococcus Genus were the most abundant (16 devices; 53.33%) with Staphylococcus epidermidis the predominant species (14 devices; 46.67%). Of the total colonies, 188 were Staphylococcus (37.74%). S. epidermidis, S. hominis, S. capitis, and S. haemolyticus (Coagulase-negative staphylococci) were the predominant isolates (63.3%). S. aureus (coagulase-positive) was cultured from one device (3.33%). The Micrococcus Genus was the second most common with M. luteus on 20% of devices and M. lylae on 3.3%. Species other than Staphylococcaceae and Micrococcaceae included Rothia dentocariosa, Neisseria flava and Corynebacterium aurimucosum (one device each). No organisms were cultured on any of the 30 phones after cleaning with a 70% isopropyl alcohol swab.



Discussion and conclusion

Many of the organisms cultured can cause nosocomial infections.

Micrococcus luteus causes a variety of systemic infections. Alcohol swabbing is sufficient to clean cellular phones. It is cheap, safe (approved by cellular manufacturers) and readily available in theatre. Healthcare workers should be educated to practice better device hygiene, should use their mobile devices only when necessary, not share mobile devices and clean devices after use and between patients. Institutions should have infection control protocols that include cellular phone hygiene. No fungi were cultured in our study and larger studies are necessary to conclude whether mobile devices are vectors for fungi in theatre.