

## Disposable mobile sleeves – a protective barrier in dental clinics

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### Abstract

**Aim:** To evaluate the presence of microorganisms on mobile phones in dental clinics, as a possible nidus for infection and to suggest the use of disposable sleeves to reduce the level of microorganisms in the dental clinics.

**Materials and Method:** An observational study was conducted, on two groups, study group (group I) and control group (group II), having 25 mobile phones. Before entering the dental clinics, the mobile phones were cleaned with an alcohol based disinfectant under aseptic conditions. Then, the mobile phones in group I were covered with an autoclaved disposable sleeve having a chemical indicator and group II were left uncovered. After five hours, swabs were obtained from the surfaces of mobile phones of both group I and group II. The swabs were cultured and incubated on blood agar for twenty four hours and evaluated for their microbial load.

**Results:** The sample taken from the sleeve showed growth of microorganisms whereas, there was no growth on mobile surface of group I. On the contrary, the mobile surface of group II showed significant microbial load.

**Conclusion:** Mobile phones can act as a fomite in dental setup and the use of disposable sleeves can effectively curtail any cross contamination of microorganisms, thereby, serving as a protective barrier. Therefore, these sleeves act as yet another protective barrier in dental clinics.

**Keywords:** Mobile Surface, Disposable Sleeves, Microbial Load

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### Introduction

The mobile phones are used routinely all day long both inside and outside the hospital, playing a plausible role in spreading infections. They act as a prime breeding ground for all sorts of microorganisms. It is discovered that an average mobile phone is dirtier than either a toilet seat or the bottom of the shoe.<sup>1</sup> A study reported that 40% of the mobile phones of 266 medical staff members and students were culture positive.<sup>1</sup> The mobile phones used inside the hospitals especially in clinically sensitive areas are controversial, as their usage can improve the quality of healthcare but they transmit various infections.

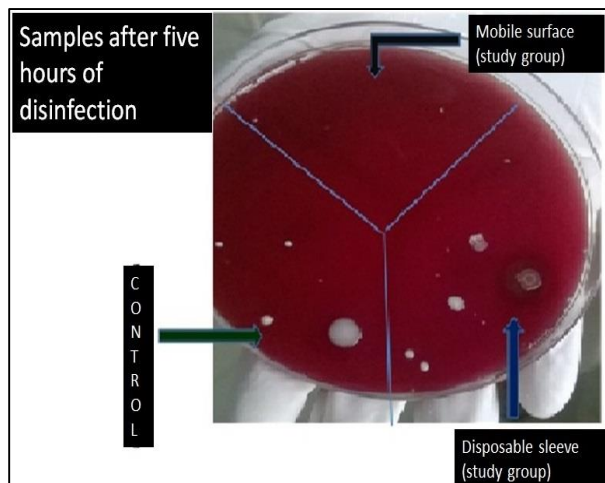
Healthcare Associated Infections (HAI) are increasing day by day causing significant rate of morbidity and mortality.<sup>2</sup> The hands of healthcare workers (HCW), thermometers, stethoscopes, any inanimate object in a hospital can be contaminated with different pathogens and infections can spread through them.<sup>2</sup> The mobile phones are used in hospital halls, dental clinics, laboratories, intensive care units and operating rooms by the HCW.<sup>2</sup> The strongly contaminated human body areas establish a close contact with the mobile phones during every phone call.

The mobile phones act as a perfect habitat for microbes to breed, especially in high temperature and humid conditions. Therefore, HCW's mobile phones may serve as reservoirs of microorganisms.<sup>2</sup> These could be easily transmitted from the mobile phones to the HCW's hands facilitating the spread of bacterial isolates, from one patient to another.<sup>2</sup> When we enter a dental clinic everything is well protected and sterilized. This includes the dental chair, the dentist's stool, dental lights and the instruments. All these equipment's are protected by sterilized sleeves which are changed for every patient. Even the dentist is draped in protective clothing. The only thing which is not protected is the dentist's mobile phone. This study was conducted to determine the potential of mobile phones to harbour microorganisms in dental clinics and to evaluate its role in spread of infection.

### Materials and Method

A sample of fifty mobile phones was evaluated, divided in two groups of twenty five each. Group I acted as a study group and group II as control. Before entering the dental clinics, the mobile phones were cleaned with an alcohol based disinfectant under aseptic conditions.<sup>3</sup> Then, the mobile phones in group I were covered with an autoclaved disposable sleeve having a chemical indicator and those in group II were left uncovered. After five working hours, swabs were obtained from the sleeve surface of group I and from the mobile surfaces of both the groups. The swabs were cultured and incubated on blood agar at 37°C, for twenty four hours and evaluated for any colony growth<sup>4</sup>

(Fig. 1). Later, Gram's staining was done on the cultured micro-organisms.

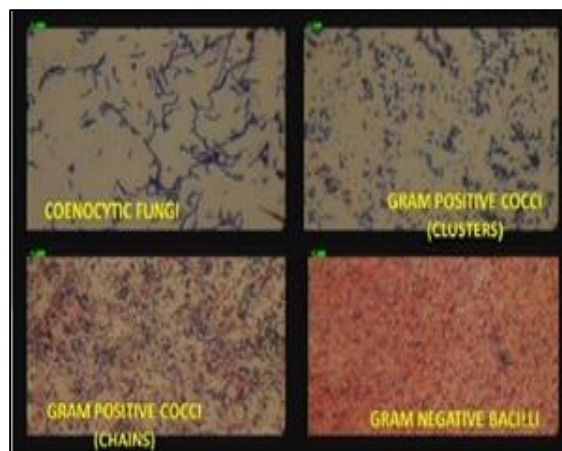
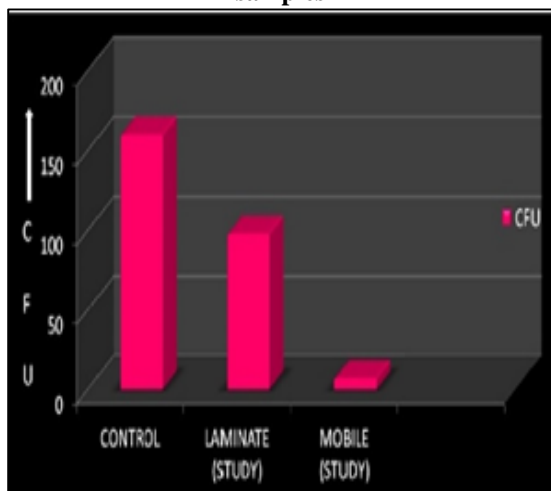


**Fig. 1: Microbial load on blood agar plate after five hours of disinfection**

## Result

Samples obtained from the sleeve surfaces of group I and the mobile surfaces of group II, after five hours, of disinfecting and usage, showed a great deal of microbial load. On the contrary, samples obtained from the mobile surfaces of group I showed minimalistic microbial growth (Graph 1). Covering the mobile phones with the sleeves showed a decrease of 95.6% in the microbial load. The various types of colonies found included coenocytic fungi, gram negative rods, gram positive cocci, staphylococcus and streptococcus (Fig. 2).

**Graph 1: Comparison of microbial load in different samples**



**Fig. 2: Different microorganisms seen on Gram's staining**

## Discussion

Currently, there are no rules and regulations restricting staff to carry mobiles into the sterile environment of the clinics.<sup>1</sup> Many infectious agents can survive for extended periods once they are deposited and the airborne microorganisms eventually settle on the surfaces in the environment. Given the volume of aerosols and spatter produced during dental treatment, the contamination of mobiles is of particular concern, as they become potential reservoirs for infections.<sup>5</sup> Various threatening diseases which can be caused commonly include skin and nail infections, boils, food poisoning, pharyngitis, scarlet fever, toxic shock syndrome, meningitis, infections of urinary tract and GIT. The i-pad sleeves are already available in the market which is classified as cover, barrier and a protective device (non-latex). When used with an I-pad that has been appropriately cleaned, this satisfies the requirements for its use in the operating room. The practical solution of the problem cannot be restriction of the mobile phones, which is an extensively used accessory during working hours. Therefore, we recommend a simple measure of using disposable sleeves by the clinicians to reduce the spread of hospital acquired infections. Even after following a whole spectrum of sterilization protocol, mobile phones prove as a pertinent area without asepsis in the working environment, which needs corrective measures to complete the lattice of a sterile environment. According to the biomedical waste management protocol, the used sleeves should be disposed in the red bin which is for the infected non-biodegradable waste.

## Conclusion

The use of mobile phones as a mode of cross contamination is widely established but no remedial action has ever been suggested. Therefore, a simple, economical and easily procurable mobile sleeve can make a pertinent difference in the clinics. Although, it was a novel idea, the sample size was limited to fifty.

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