


Writing Pens as Fomites in Hospital

Dear Editor,

Healthcare-associated infections persist as a major problem in many hospitals. These infections are usually caused by multidrug resistant bacteria that are associated with much morbidity, mortality, and excess healthcare cost.^[1] Although microorganisms are most commonly transmitted by the hands of healthcare personnel, materials and articles used in the hospitals could also carry microorganisms.^[2,3] We systematically studied bacterial contamination of pens used by healthcare personnel in intensive care units of a hospital and studied the duration of bacterial survival on pens.

Seventy-five writing pens used by doctors and nurses in intensive care units were collected aseptically and studied. Each pen was swabbed using a sterile cotton swab moistened with saline. The swab was then inoculated on blood agar and Mac Conkeys's agar plates and incubated at 37 °C for 24–48 hours. The plates were examined for bacterial growth. The bacteria were identified using standard methods.^[4] Antibiotic susceptibility of the bacteria was

tested using Kirby–Bauer disk diffusion method. Methicillin resistance in *Staphylococcus aureus* was detected by agar screen method using Mueller–Hinton agar containing 6 µg oxacillin/mL and 4% NaCl.

We also studied the extent of survival of *S. aureus* on three kinds of new pens – all metal pens, all plastic pens, and pens with rubber grip. Saline suspension of a clinical isolate of *S. aureus* adjusted to Mc Farland 0.5 standard (bacterial count 1.5×10^8 colony forming units/ml) was prepared and 0.01 ml of the suspension was smeared on the pens (five pens for each experiment). The inoculated pens were kept at 25 °C and examined for surviving bacteria at different time intervals. The pens were swabbed using sterile cotton swab moistened with saline. The swabs were inoculated on blood agar plate and incubated at 37 °C for 24 hours and colony count determined.

Out of 75 pens studied, 26 (34.6%) were contaminated with bacteria (Table 1). *Staphylococcus epidermidis* was isolated from 16 pens. *S. aureus* was isolated from six pens, of which two were methicillin resistant. New pens

Table 1: Bacteria isolated from used pens

Bacteria isolated	No. of pens contaminated	Rate of contamination (%)
<i>Staphylococcus epidermidis</i>	16	21.3
<i>Staphylococcus aureus</i>	6	7.9
<i>Bacillus spp</i>	4	5.3
<i>Diphtheroids</i>	2	2.7
<i>Micrococcus spp.</i>	1	1.3
<i>S. epidermidis</i> and <i>Micrococcus spp.</i>	1	1.3

were deliberately contaminated with *S. aureus* to determine the extent of survival of bacteria. *S. aureus* survived up to 48 hours on rubber grip pens, whereas the minimum duration of survival was observed on plastic pens and pens with metal body (24 hours and 18 hours, respectively).

Our findings indicate that the pens used by healthcare personnel in intensive care units can be contaminated with bacteria. This is in agreement with the findings of a previous study.^[5] However, another group of workers could not show bacterial contamination of pens.^[6] Several factors such as duration of usage, type of pen, number of persons using the pen may influence the rate of contamination of pens. We showed that *S. aureus* survives longer on rubber grips of the pens. Isolation of methicillin resistant *S. aureus* is a matter of concern. One critical aspect of bacterial transmission from person or from environment to a person is the ability of the microbe to survive on environmental surface. Careful

use of pens and handwashing will help prevent transmission of bacteria from contaminated pens. Usage of pens with metal body may be encouraged in hospitals.

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References

1. Nathens AB, Chu PT, Marshall JC. Nosocomial infection in the surgical intensive care unit. *Infect Dis Clin North Am* 1992;6:657-775.
2. Wong D, Nye K, Hollis P. Microbial flora on doctors' white coats. *BMJ* 1991;303:1602-4.
3. Chacko L, Jose S, Isac A, Bhat GK. Survival of nosocomial bacteria on hospital fabrics. *Indian J Med Microbiol* 2003;21:291.
4. Collee JG, Marmion BP, Fraser AG. Tests for the identification of bacteria. Mackie and Mc Cartney Practical Medical Microbiology. 14thed. Churchill Livingstone; 1996. p. 131-50.
5. Datz C, Jungwirth A, Dusch H, Galvan G, Weiger T. What's on a doctor's ball point pen? *Lancet* 1997;350:1824.
6. Banerjee D, Fraise A, Chana K. Writing pens are an unlikely vector of cross-infection with methicillin resistant *Staphylococcus aureus* (MRSA). *J Hosp Infect* 1999;43:73-5.

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