

Copper and MRSA – How scientists work

Investigation report – Clinical evaluation of copper

Selly Oak Hospital, Birmingham

Aim

To sample and compare the number of micro-organisms on copper-containing toilet seats (approx 70% Cu), tap handles (60% Cu) and door push-plates (70% Cu) with plastic, chrome and aluminium surfaces respectively, on a busy medical ward.

Method

- 1 Samples were collected from the items listed above on one day each week for 10 weeks, at 7 am and 5 pm, to compare the numbers of micro-organisms present following quiet and busy time periods.
- 2 Each item was sampled twice at each time point, selecting adjacent areas so that no area was sampled twice in any one day.
- 3 For each toilet seat and door push-plate sample, a moist sterile swab was firmly applied 15 times horizontally and 15 times vertically over a 5 cm × 5 cm area using a sterile plastic template.
- 4 The same method was applied to the tap handles, over a 5 cm × 2 cm area.
- 5 Each swab was immediately transferred to 3 cm³ of sterile broth. The broth containing the swabs was shaken for 1 minute, before spreading onto agar plates.
- 6 After incubation at 37 °C for 48 hours, the numbers of colonies per plate were counted.
- 7 Five weeks into sampling, the copper-containing and non-copper-containing items were swapped round, to exclude any effects due to preferential use of an item based on location.

Results

The table shows the median number of bacterial colonies on copper-containing items compared to controls.

Item	and time of sampling	Median number of colonies per control area	(range)	Median number of colonies per copper area	(range)
top of toilet seat	7 am	2190	(225–6660)	5	(0–960)
top of toilet seat	5 pm	1613	(705–6360)	30	(0–585)
underside of toilet seat	7 am	270	(0–2535)	0	(0–105)
underside of toilet seat	5 pm	38	(0–3045)	0	(0–105)
push-plate	7 am	45	(0–195)	0	(0–6)
push-plate	5 pm	15	(0–84)	0	(0–30)
hot tap handle	7 am	66	(0–5040)	0	(0–30)
hot tap handle	5 pm	30	(0–360)	0	(0–390)
cold tap handle	7 am	75	(0–870)	0	(0–30)
cold tap handle	5 pm	45	(0–510)	0	(0–30)