

**Antibacterial resistance and bacterial carriage of computer keyboards**  
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Previous work by the author has demonstrated that a variety of pathogenic and non-pathogenic bacteria can be isolated from computers within veterinary practices. The aim of this pilot study was to determine if these bacteria were resistant to antibacterial agents commonly used in veterinary practices in the UK and therefore could theoretically act as a source of resistance for more pathogenic bacteria

A total of 11 practices were recruited to the study from which a total of 24 consulting room keyboards were sampled. Samples were collected by gently wiping the surface of keys with a cotton tipped swab, previously soaked in sterile phosphate buffered saline. Only the surfaces which come in contact with hands were sampled. Swabs were then placed in a transport medium and sent to Glasgow University Veterinary School for culture and sensitivity.

A total of 40 bacterial isolates (19 different species) were detected from 22 keyboards. 2 swabs were negative on culture. Most of the bacteria isolated were considered non-pathogenic eg. *Acinetobacter lwoffii*. However, a potentially pathogenic bacteria *Enterococcus faecium* was detected on one computer.

Sensitivity to antibacterial agents commonly used in veterinary practice were tested, specifically ampicillin, amoxicillin / clavulanic acid combination, enrofloxacin, oxytetracycline and trimethoprim sulphamide. Out of 40 isolates, 4 were resistant to trimethoprim sulphamides, 3 resistant to ampicillin, 3 resistant to oxytetracycline, 2 resistant to enrofloxacin and 1 resistant to amoxicillin / clavulanic acid combination. *Enterococcus faecium* demonstrated resistance to oxytetracycline. Further information is given in Table 1.

Only 2 isolates demonstrated resistance to more than one antibacterial agent: *Pseudomonas putida* was resistant to both ampicillin and trimethoprim sulphamide, and *Staphylococcus epidermidis* was resistant to both ampicillin and oxytetracycline.

These results demonstrate that the computer keyboard within veterinary consulting rooms can act not only as a source of pathogenic bacteria, but could also allow the transmission of resistant organisms. This highlights the need for greater awareness of infection control procedures in the veterinary practice. However it was reassuring that MRSA was not detected from any of the keyboards sampled.

Table 1 Resistance shown by bacteria isolated from computer keyboards.

<b>Antibacterial drug</b>	<b>Bacteria which demonstrated resistance. 1 colony of each.</b>
Ampicillin	<i>Pasteurella / Moraxella spp</i> <i>Pseudomonas putida</i> <i>Staphylococcus epidermidis</i>
Amoxycillin / Clavulanic acid	<i>Acinetobacter lwoffii</i>
Enrofloxacin	<i>Cellulomonas / Microbacterium</i> <i>Vibrio parahaemolyticus</i>
Oxytetracycline	<i>Acinetobacter lwoffii</i> <i>Enterococcus faecium</i> <i>Staphylococcus epidermidis</i>
Trimethoprim / sulphonamide	<i>Methylbacterium mesophillicum</i> <i>Moraxella spp.</i> <i>Pseudomonas putida</i> <i>Pseudomonas stutzeri</i>