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Infection control protocols: Is it time to clean up our act?

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Commentary

Infection control protocols: Is it time to clean up our act?

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Abstract

While paramedics in Australia respond to many call-outs daily, little is known of the risks of infectious disease transmission that may arise from contamination of vehicles, equipment, personnel and/or patients. We examine what is currently known of the current risks in Australia posed by contamination of emergency service vehicles by antimicrobial-resistant microorganisms.

Keywords:

Australia; paramedic; emergency service care; ambulance; contamination; bacteria; *Staphylococcus aureus*; MRSA; infection control; policy; guidelines; best practice

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Paramedics in Australia respond to over 3 million call-outs per year (1). The community depends on these health care professionals to respond to medical emergencies and to be prepared for disaster events (2,3). However, little is known of the risks of infectious disease transmission that may arise from contamination of vehicles, equipment, personnel and/or patients.

Infectious diseases, caused by pathogens, can be transmitted in several ways, via:

- airborne, such as through coughing and sneezing
- touch, such as coming into contact with a contaminated object, surface or person
- the faecal-oral route, ie. inadvertently transferring faecal matter to the mouth
- contact with wounds, abrasions and bodily fluids.

While these have a measure of overlap, a common theme is some form of direct physical contact, either with another person or an inanimate object (known as a vector). Recent studies have detected microbial and body fluid contamination on emergency service vehicles. They have also demonstrated that ambulances (4–7), helicopters (8) and light aircraft (9) can be vectors for infectious organisms. Equipment used by emergency medical service personnel, and by paramedics themselves, may be at particular risk of causing infection, with high rates of contamination observed (7).

Although anecdotal evidence suggests that many ambulance agencies have infection control guidelines in place, these vary by organisation and transport type; we found there to be no universally adhered-to procedures in Australia. In addition, in emergency situations where patient survival is an immediate priority, the current procedures may be impractical and, understandably, therefore overlooked. Furthermore, vehicles and equipment may not be disinfected between every call-out and staff may work when sick and potentially infectious. Similarly, staff often take home their uniforms to wash, potentially bringing infectious agents into the household (10). All of these behaviours may place staff, patients and household members at risk of contracting dangerous infectious diseases. This risk is especially concerning for microorganisms that pose an increased threat due to their resistance to known antimicrobials.

Antimicrobial-resistant microorganisms are recognised as a major and growing threat to human health, and routinely cause a substantial proportion of health care associated infections (HAIs) (11). Many of these are bacteria, such as methicillin-resistant and multi-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci and carbapenem-resistant enterobacteria. Although there is evidence that paramedics have a higher prevalence of MRSA colonisation than does the

general population (12), there is insufficient information on the risk of pathogenic microorganisms to patients and providers in pre-hospital emergency care.

We have previously found high numbers of potentially harmful bacteria in emergency service vehicles (8). Brown et al reported that 49% of rural ambulances tested positive in at least one area for contamination with MRSA (13). Moreover, emergency equipment also had high rates of contamination (14). Lee et al swabbed patient-ready trauma equipment at six United Kingdom hospitals and three regional ambulance services; they found 57% tested positive for blood contamination (15). The available information supports the contention that these pathogens pose a risk to providers and that their presence should be recognised as an occupational hazard.

In response to recent studies, the UK National Health Service implemented detailed guidelines for the cleaning of emergency service vehicles and stations (16). A key recommendation is that this is performed by dedicated and specialist cleaning staff rather than by emergency service personnel. The report goes on to recommend that most items of equipment should be cleaned after every patient use rather than only at the end of each shift (16).

The UK guidelines represent exemplary practice in infection control. While there may be examples of a similarly high standard by individual providers in Australia, currently there are no guidelines (at either state or federal level) that are specific to emergency service agencies. Australia is also lacking in research into the effects of workplace practices on infectious disease transmission.

Research is clearly needed to determine the current risks in Australia posed by contamination of emergency service vehicles by antimicrobial-resistant microorganisms and to determine the outcome of specific disinfecting procedures. Such investigation may lead to the development of best practices that could reduce risks, both on a daily basis and during large scale emergencies such as a pandemic, bioterrorism or other disease outbreaks. Reducing the contamination in emergency service vehicles will result in a reduced risk of infectious diseases for ambulance patients, paramedics, hospital staff and the general public.

Developing best practices for disinfecting standards will ensure a cleaner pre-hospital care environment. An investment in closing the identified knowledge gap can enhance the paramedic sector's national standing and support its mission to save lives, speed recovery and serve the community by helping to provide the highest standards of safe, effective and reliable emergency care.

Conflict of interest

The authors declare no competing interests. The authors of this paper have completed the ICMJE conflict of Interest statement.

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