

# Acinetobacter Infections in Wounded Soldiers: Implications for Canadian Hospitals



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## Introduction

The Canadian Forces are currently conducting military operations in Afghanistan as part of the International Security Assistance Force (ISAF). Unfortunately, these combat operations have resulted in Canadian casualties, including many suffering from wounds. These

In January 2006, the authors were deployed to the Canadian-led Multinational Hospital in Kandahar, Afghanistan. During this deployment, it was noticed that casualties requiring mechanical ventilation frequently developed pneumonia. Although the hospital did not have microbiological testing capability, it was later found that many of the Canadian patients were either colonized or infected with *Acinetobacter*. The organism was grown from wound or from respiratory samples, either at Landstuhl Regional Medical Centre (a U.S. army hospital in Germany) or from their respective Canadian hospitals. Soil samples as well as swabs of the walls, air ducts, and ventilators were taken and were sent to the National Microbiology Laboratory in Winnipeg and to the microbiology laboratory at Sunnybrook Health Sciences Centre in Toronto for analysis. The labs were able to isolate *Acinetobacter* from several samples. This has led to continuing research into *Acinetobacter* infections in returning soldiers.

## Scope of the Problem

*Acinetobacter* wound infections have been recognized in "war wounds" since the Vietnam conflict.<sup>1</sup> Due to

"war wounds" may have been complicated by infection or colonization with *Acinetobacter baumannii*, a fairly ubiquitous organism that is also inherently resistant to many antibiotics. There is a potential for outbreaks of this organism in Canadian hospitals to which these injured soldiers are transferred.

improved battlefield pre-hospital techniques, the ratio of wounded casualties to fatal casualties has increased since the Korean, Vietnam and Persian Gulf conflicts. This increase in wounded casualties has led to a perceived increase in war-wound infections, especially infections caused by multi-drug-resistant (MDR) *Acinetobacter*.<sup>2</sup> Furthermore, the incidence of bacteremia due to *Acinetobacter* at military medical facilities in the U.S. has also increased.<sup>3</sup> With more injured soldiers returning to Canada, we would expect the same phenomenon to occur, albeit to a lesser scale, in Canada.

*Acinetobacter* is a well-known cause of nosocomial infections. Its ability to survive in dry environments increases the risk for nosocomial infections.<sup>4,5</sup> The organism has been known to cause pneumonia, bacteremia, meningitis and urinary tract, surgical wound, and soft tissue infections.<sup>4</sup> Although rare, the development of significant anti-microbial resistance has made treatment more difficult. It is, therefore, an emerging potential problem within hospitals.<sup>6</sup>

As previously mentioned, the emergence of MDR *Acinetobacter* has been a cause for concern. In a recent report on MDR *A. baumannii* infections in U.S. soldiers

treated at various military facilities, there was a four per cent resistance to all antibiotics and a 65 per cent resistance to imipenem.<sup>3</sup>

### Impact on Canadian Hospitals

Currently, wounded Canadian casualties are evacuated from the field to the Canadian-led NATO hospital at Kandahar Air Field (KAF). Damage-control surgery is initially performed at this facility. The casualties are then evacuated as quickly as possible out of "theatre" and into a tertiary care military medical facility in Landstuhl, Germany. From Landstuhl, the soldiers are transferred to a Canadian hospital closest to their place of residence.

Because the Canadian Forces do not have a central medical facility, it has to rely on the civilian medical system for continuation of treatment. As a result, Canadian hospitals across the country are receiving wounded soldiers with the potential for *Acinetobacter* colonization and/or infection.

Currently, the Canadian Forces, in conjunction with the Public Health Agency of Canada, has developed

infection-control guidelines that are being sent to every hospital that receives injured Canadian Forces members. These guidelines outline appropriate infection-control practices to minimize the risk of nosocomial transmission and provide resources and telephone contacts if questions about *Acinetobacter baumannii* arise. As well, Canadian Forces Health Services personnel brief all returning soldiers and their families about the nature of the infectious risk and warn them of the need to maintain contact isolation practice until surveillance cultures are finished. To date, there has been no nosocomial transmission of *Acinetobacter* infections from Canadian Forces members to Canadian civilians at Canadian hospitals.

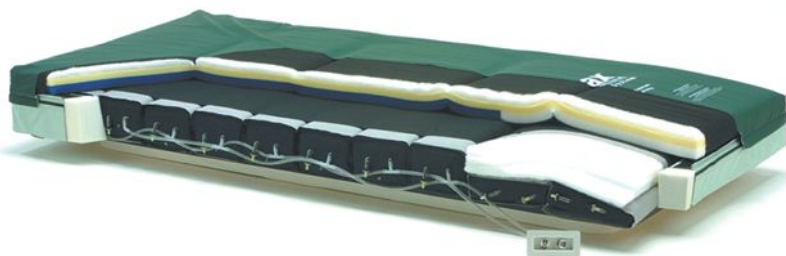
### Impact on Wound Care

Currently, there are no special precautions other than the normal procedures that must be taken when tending to the wounds of injured soldiers. Careful washing and debridement of the wounds with frequent dressing changes may be all that is needed. However, vigilance

*continued on page 18*

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These photos show wounds that are typical for troops in Afghanistan. (Figure 1) A complicated wound. (Figure 2) An infected wound on an Afghan soldier amputee without proper outpatient follow-up, which, unfortunately, is typical for Afghanistan. (Figure 3) Shrapnel wounds.

by the health-care team must be maintained to prevent incidences of contiguous osteomyelitis, or worse, bacteremia.

### Conclusion

*Acinetobacter* is an important nosocomial pathogen.<sup>6</sup> Wounded soldiers returning from Afghanistan usually have multiple wounds and may be colonized or infected by the organism. Strict infection-control practices must be maintained in order to prevent possible outbreaks within Canadian facilities. 

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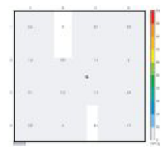
Using a 16-sensor, force sensing pad carefully affixed to the left heel of two subjects, pressure was "mapped" while the patients were lying supine and also with the knee flexed 30 degrees. Pressure mapping readings were done separately with the patient using various pressure reduction mattresses and numerous foot positioners, and heel protectors.

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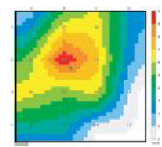
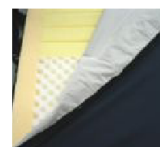
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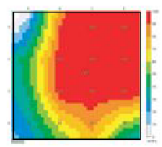
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