

The need for a robust 24/7 subspecialty “clearing house” response for telementored trauma care

Maj Andrew W. Kirkpatrick, MD
 Douglas Hamilton, MD
 Maj Andrew Beckett, MD
 Anthony LaPorta, MD
 Susan Brien MD, MEd
 Col Elon Glassberg, MD, MHA
 Chad G. Ball, MD, MSc
 Derek J. Roberts, MD, MSc
 Col Homer Tien, MD

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Correspondence to:
 A.W. Kirkpatrick
 1403 29 Street NW
 Calgary AB T2N 2T9
 andrew.kirkpatrick@albertahealthservices.ca

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SUMMARY

Traumatic injury is increasing in importance in all settings and environments worldwide. Many preventable deaths are from conditions that are common and treatable. However, as potentially lethal injuries often induce progressive and frequently irreversible physiologic decline, the timing of interventions is critical. Invasive treatments may need to be offered by prehospital care providers who lack extensive training and practice. Telementoring allows experienced experts to guide less experienced providers remotely using information technology (IT). Early experience has shown that these techniques are practical and considered valuable. Their translation to regular practice, however, will require the immediate availability of appropriately trained remote experts willing to serve as mentors. Acute care trauma specialists are acclimatized to responding to out-of-hospital consultations and assuming overall responsibility for critical physiology and transport and may serve as the backbone of such a national/international call response initiative.

Traumatic injury remains a scourge that is only increasing in importance in all settings and environments worldwide — military and civilian alike. It is the leading cause of preventable years of life lost in the western world and is increasing dramatically in incidence in the developing world as mechanization progresses.¹ Not surprisingly, traumatic death haunts all battlefields, conflict zones and humanitarian crises as well as extreme sporting events and expeditions. In all these settings, many deaths are from conditions that are both predictably common and potentially treatable if basic therapies and interventions are available. Such therapies range from simple direct pressure for hemorrhage control to airway management to percutaneous interventions for pneumothoraces to full intracavitary surgery.

A critical distinction between traumatic injury and other medical conditions is that the former is extremely time-critical. The same initial interventions, such as drainage of a hemothorax, intubation or external hemorrhage control, that may completely manage a situation early may be futile if applied in a delayed fashion to a physiologically exhausted, dying patient. Trauma care also has to have a practical side, such that in mass casualty or austere situations psychologically burdensome decisions regarding futility or excessively resource-consumptive situations can be shared between first responders and remote specialists. To provide advanced care, however, the key ingredients to facilitate such interventions are appropriate equipment and supplies as well as appropriately trained caregivers. Realistically, it is often far easier logistically to have equipment available than it is to have providers to use it properly, especially if the equipment is as basic as a needle or pack of gauze. Practically, equipment that is increasingly likely to be present in any austere environment is communication technology with Internet access.²

Linked to informatic connectivity is the potential for telemedical support. Telementoring is a practice in which experienced experts guide less experienced providers remotely using information technology (IT) techniques.²

Early experience has shown that these techniques are practical and considered valuable by involved providers. Translation to regular practice, however, will require the immediate availability of appropriately trained remote experts willing to serve as mentors.³

While being a content expert in a pertinent discipline is necessary to telementor remote providers to address a particular clinical problem, this expertise in and of itself is not wholly sufficient to designate someone a telementoring specialist. The ability to telementor effectively requires communication skills flexible enough to enable the remote on-site provider to perform to the best of their ability. Thus, it becomes critical that the mentor understand whether they are dealing with a trained physician, naive bystander, adult or child, or even whether the on-site provider is using their native tongue.⁴ Understanding “how it is out there” is crucial. Otherwise the results will be the right advice for the wrong situation. It is also critical that a functional working relationship be established, even if the setting is a just-in-time one in which the telementor and on-site provider have never met. Formal studies on the technical or educational requirements for telementoring are limited, but our anecdotal experience is that adaptability, congeniality, flexibility and mutual respect are crucial. Much scientific study is required to understand the details of with whom, how and with what equipment the best mentoring of critical interventions can occur. We also perceive that the discipline of telementoring will need to become a recognized subspecialty — one in which many other traditional specialties will need to train after learning the core clinical knowledge — in order to effectively reach out and provide such specialty care over a regional, national or international network.⁴ Although telementoring may not ever be a subspecialty in itself, there may be multiple reasons why the fundamentals of how to receive telementoring might become part of the basic curriculum of medical and paramedical personnel deploying to remote or austere locations.

Clinical, telemedical support networks need to be created and supported. In the big picture of global health, these networks should be both synchronous and asynchronous, potentially populated with “apps” and other popular tools for social media as vehicles for global consultation or just-in-time learning. For trauma care, however, functionally immediate 24/7 response times with a virtual but engaged expert will be required, as any other response defeats the purpose of minimizing unnecessary trauma deaths. Acute care trauma specialists are, by training and practice, acclimatized to responding to out-of-hospital consultations and assuming overall responsibility for critical physiology and transport; these specialists might be the backbone of such a national/international call response, but they would need to be supplemented by other disciplines. Trade-offs will be required between the practicality of call schedules and providing a full range of subspecialty expertise requiring more involved personnel. One of the myriad of administrative decisions to be

made would involve whether such a network is permanent or convened on an ad hoc basis in response to a perceived mission or anticipated event. Another is whether the network would simply focus on providing trauma care or whether it would address all anticipated emergency medical concerns, such as during disaster response. Yet another decision is whether all remote care would be provided, including care for acute and chronic conditions and for all age groups and both sexes. Major logistical questions include the eligibility criteria for telemedical support, both in terms of the remote on-site providers and the intended patient population.

Wootton and colleagues⁵⁻⁷ recently reviewed the potential mechanisms for sharing expertise among experts involved in separate long-standing telemedicine networks delivering humanitarian services using predominantly asynchronous (store-and-forward) methods. The conclusions of their review and tabletop exercises was that a combined database of all willing and able relevant specialists could be stored in a combined clearing house-style database and accessed through a secure Internet browser with email as the suggested point of initial contact.⁵

Such a network might comprise Canadian Forces (CF) physicians and physicians currently providing call services within their regular schedules in Canadian hospitals. For a World Health Organization-sponsored mission, perhaps the remote expert mentors might include every known specialty from an international cadre supported by the United Nations. Recognizing the need for an immediate response for trauma and critical illness-type problems, the smartphone would be the suggested initial point of access for those on call being contacted by a central clearing house centre sometimes a continent away. Initial experiences have shown that smartphones are incredibly powerful and might enable global telemedical outreach on an unprecedented scale.⁸

Traditionally, Canadians have welcomed a presence in international security missions, and this presence has often been heavily weighted to emphasize medical support in multinational military collaborations. Providing the backbone for a temporary or better permanent telementoring network infrastructure might conceivably be a deliverable that would fit well with Canada's geopolitical resources and philosophies and a task that might further justify the existence of subspecialist physicians with the CF. At present we are aware of no such network in existence that functions in real time, and there are multiple legislative, medicolegal and professional credentialing concerns to be addressed, although these are all theoretical rather than absolute, as the technical solution exists.

Telementoring of many complex procedures has been proven feasible and enables remote patients to receive tremendous care in locations where such interventions would be unthinkable. Such a response, however, relies on the right expert picking up the (smart)phone or logging in when called and having the right answer based on the right experience and expertise.

Affiliations: From the Regional Trauma Services, Calgary, Alta. (Kirkpatrick, Ball, Roberts); Department of Surgery, University of Calgary, Calgary, Alta. (Kirkpatrick, Ball, Roberts); Canadian Forces Health Services (Kirkpatrick, Tien); Department of Medicine, University of Calgary, Calgary, Alta. (Hamilton); the 1 Canadian Field Hospital, Petawawa, Ont. (Beckett, Tien); Trauma Program, McGill University Health Centre, Montréal, Que. (Beckett); Rocky Vista School of Osteopathic Medicine, Parker, Colo. (LaPorta); Royal College of Physicians and Surgeons of Canada, Ottawa, Ont. (Brien); The Trauma & Combat Medicine Branch, Surgeon General's HQ, Israel Defense Forces, Ramat Gan, Israel (Glassberg); Trauma Services and the Department of Surgery, Sunnybrook Medical Centre, Toronto, Ont. (Tien).

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