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Editorial

The importance of research in austere and tactical medicine

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"It is impossible for a person to begin to learn that which he thinks he already knows." Epictetus

The *Journal of High Threat and Austere Medicine*, the official journal of the Australian Tactical Medicine Association aims to improve research and its dissemination to healthcare workers and policy makers. It is critical to our patients that the evidence that is used to produce guidelines and individual patient decisions is of high quality and reliability. Without evidence, individual decisions are based on first principles or "it seemed like a good idea at the time"!

Archie Cochrane, after whom the Cochrane Controlled Trials Register and the Cochrane Library (https://www.cochrane.org/) is named, was an early supporter of evidence-based medicine. In his book, *Effectiveness and Efficiency: Random Reflections on Health Services*,[1] he called for an international register of randomised controlled trials, and for explicit quality criteria for appraising published research.

He set up a trial comparing new coronary care units with care at home. The cardiologists were loath to subject such self-evidently effective treatment to this kind of scrutiny.

Cochrane[1] wrote: "The results at that stage showed a slight numerical advantage for those who had been treated at home. It was of course completely insignificant statistically. I rather wickedly compiled two reports, one reversing the numbers of deaths on the two sides of the trial. As we were going into committee, in the anteroom, I showed some cardiologists the results. They were vociferous in their abuse: `Archie', they said, `we always thought you were unethical. You must stop the trial at once ..." I let them have their say for some time and then apologised and gave them the true results, challenging them to say, as vehemently, that coronary care units should be stopped immediately. There was dead silence and I felt rather sick because they were, after all, my medical colleagues."

There is an acknowledged hierarchy for different types of research and evidence, each of which brings different forms of data and analysis. The lowest level is anecdotal reports or expert opinion, often based on experience or first principles. There may be little scientific rigour.

The next level includes case control or cohort studies, followed by non-randomised controlled trials.

A randomised controlled trial aims to reduce bias and the effects of variations between the subjects. These variations may include age range, comorbidities and gender. As the name suggests, subjects are randomly assigned to one of two (or more) treatment groups.

The highest level includes systematic review and meta-analysis. The former aims to collect all available evidence on a specific question, although this is often limited to English language and to formal publications, excluding conference abstracts or proceedings. A meta-analysis statistically examines the combined results of many studies, again often limited to English.

Scientific studies involving humans (and animals) require some form of ethics approval and/or oversight. Patient consent is often required, although with appropriate safeguards in place and the potential for significant benefits for the public and specific groups who are unable to provide consent, an ethics committee may agree that this could be assumed. This may be more likely in severe situations, such as austere and high threat circumstances.

Although their injury mechanisms and patterns or types of environmental or toxic exposure may be common, patients in austere and high threat environments are often in unique or unusual circumstances. Difficulties in obtaining sufficient numbers of similar patients may limit the ability to perform research with sufficient power to find statistically different outcomes between treatments. This hinders the ability to achieve some of the higher levels of evidence.

"As soon as a tourniquet is seen in an ambulance it should be taken away," or so wrote Tuffier[2] in 1915.

The more routine use of tourniquets to control extremity haemorrhage became 'evidence-based' after analysis of data from the Joint Theatre Trauma System during the wars in Afghanistan and Iraq. This encouraged commercial development of better devices and issuing clinical practice guidelines. There will never be such a large dataset in austere or tactical medicine.

The Journal acknowledges that the attainment of high levels of evidence in these environments is difficult. It also recognises the value of collecting, analysing and sharing data which contribute to lower levels of evidence. Different outcomes in different jurisdictions or over different time frames is not definitive with respect to cause and effect, but does invite an examination of why these differences may have occurred.

Collecting data, analysing it and then sharing it encourages questioning of current approaches and can lead to changes in practice, even with low levels of evidence. The Australian Tactical Medical Conference (ATMC) is one method by which research of various levels can be presented. Where permission has been granted, The Journal intends to publish abstracts of meeting presentations in the November issues.

Those involved in the provision of care in austere and high threat environments come from a variety of backgrounds. Some of these are not primarily clinical, so 'medical' research may seem foreign or overwhelming. Over the coming editions, there will be articles and tools to facilitate the research process.

In austere and high threat environments, are some of our treatments self-evident? Which of these could benefit from an analysis of data, within or across organisations and jurisdictions. While encouraging the performance of the highest levels of research achievable, the Journal recognises the barriers to this. As such, the Journal is also interested in publishing research from lower levels, which may be the best, current, evidence available.

References

1. Cochrane A. *Effectiveness and Efficiency.* CRC Press;1972.
2. Tuffier M. Contemporary French Surgery. *British Journal of Surgery.* 1915;*3*:100–112.