Education Research

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You are reading, and maybe even holding in your hands, the journal *Aerospace Medicine and Human Performance*. I'd like to highlight this month what the Journal means to our Association, and a new direction that will soon be added to our arsenal in the continued expansion of our knowledge base, and thereby the continued expansion of the envelope for human performance.

Aerospace medicine and human performance are complex endeavors, dependent upon the knowledge and activities of multiple professions. Even for the experts, it is difficult to separate evidence-based practices from practices which are entrenched by usage, or urged by intuition. For example, during the 2016 Annual Scientific Meeting, Dr. Frank Butler in the Reinartz Lecture spoke of "The Top 10 Lifesaving Advances in Aeromedical Evacuation from 14 Years of Conflict." One of these was the humble, and ancient, tourniquet, backed by battlefield evidence and made more broadly effective by modern controls for the ischemia-reperfusion damage that used to be an argument against tourniquet use. Many left the lecture with a new understanding of how to use this simple tool. During the 2017 Bauer Lecture, astronaut Michael Barratt dispelled the common wisdom of microgravity-induced diuresis. Although our earthbound models of microgravity exposure induce diuresis, the real thing does not. These examples point out that common wisdom can be wrong (microgravity-induced diuresis), or become wrong as the circumstances change (the caution against using tourniquets for fear of ischemia-reperfusion damage).

The problem is that in the midst of how very much there is to know, we don't know what we don't know. This is compounded by, as Mark Twain put it, "what we know that ain't so." Given the abundant availability of questionable and unfounded medical advice, and the continuing advances of knowledge, practice, and human endeavor, that change the practice environment, how are we to proceed? What are the tools we have, and how do we best employ them?

First, there is research, and always, there is education. The knowledge base is created by research, and propagated by education. AsMA is a central repository for both. *Aerospace Medicine and Human Performance* is our peer-reviewed journal, dedicated to this community and its specific challenges. The journal's archives are a trove of knowledge, and support practice guidelines and position statements endorsed by our membership. The small, dedicated staff produces this high-quality product every month, and the role of volunteer peer reviewers cannot be overstated. This journal is a defining activity for our community, a tool for communicating research, enlarging the knowledge base, and supporting education. The AsMA Annual Scientific Meeting is our other defining activity, a premiere educational activity, dedicated to updating the knowledge base for attendees and inspiring the next round of research. The abstracts are published in this Journal, and many of the presentations later make their way into the Journal for publication to a world-wide readership. I know the researchers in our community are the backbone of the Journal, and will continue to expand the frontiers of our knowledge.

However, as **Fig. 1** suggests, designing research, conducting research, and enlarging the knowledge base, are not enough. There are some critical steps missing. Steps 4 and 5 are needed to manage an extensive, mature body of knowledge.

Dr. Eilis Boudreau has been advocating the Association pursue research gap analysis as a service to our members. Such analyses would provide both evidence-based practice guidelines in areas where the knowledge base is sufficient, and documented areas in which research is needed, supporting the efforts of researchers to compete for scarce research dollars. Methods for doing research gap analysis based on the Cochrane review

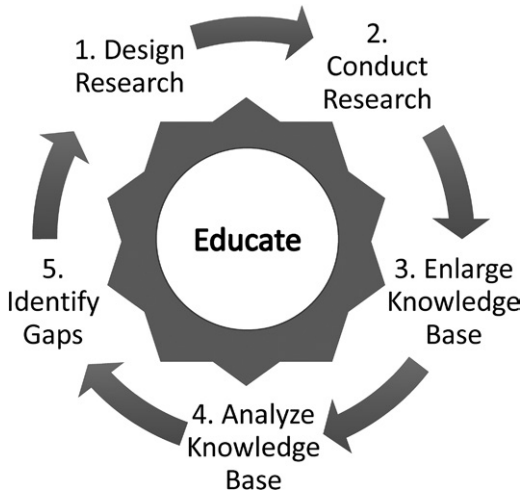

Fig. 1. Advancing Knowledge: A Virtuous Cycle.

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AEROSPACE MEDICINE HISTORY, *continued*

process (see http://www.cochranelibrary.com) have reached a high level of sophistication, with methods for reducing bias, estimating the reliability and reproducibility of research findings, and evaluating the confidence level of conclusions reached. These valuable tools are a new endeavor for AsMA, which will support continued improvement of our many specialties and continued support to our supported communities: aircrew, astronauts, and all who pursue high performance in demanding environments.

I hope I have made the case for the value of these analyses, and perhaps you will take part in one in your area of expertise — there is a lot of work to do! Stay tuned for information on how you might contribute. The results, when available, will be published in this Journal and available on our website. I wish to thank everyone who works in research, in education, in publishing, and soon in research gap analysis. You are the field of Aerospace Medicine and Human Performance.

Keep up the good work.