

Creating a Process of Research in Respiratory Care

Research into the practice of respiratory care is essential. Evidence from research determines best clinical practices, can guide the selection of appropriate equipment, and informs respiratory therapists on cost-effective, value-based interventions.¹ Evidence-based practice is the basis for, and charts the future of, the profession. *RESPIRATORY CARE* is the official publication of the American Association for Respiratory Care (AARC), and it is dedicated to publishing scientifically valid, peer-reviewed literature regarding the care of patients with acute and chronic cardiorespiratory disease. The Journal covets research by respiratory therapists.

Despite the importance of research to the profession, conducting research in respiratory care faces a host of challenges. Chief among these is the educational level at entry to the profession.² Research processes and training are primarily taught at the graduate level. The volume of material that respiratory therapy students must assimilate in 2-y or 4-y programs, including physiology and technology, limits the opportunities for training in research methods, statistics, and scientific writing. Undergraduate programs should, however, introduce the scientific method to train students to be informed consumers of the scientific literature. As part of this endeavor, students also should be introduced to the basic principles of logic and epistemology. The ability to reason correctly, recognize illogic (in oneself and others), and discern knowledge from belief are the fundamental characteristics upon which scientific methodology is based.

A long-term solution is, of course, graduate and advanced practice training for respiratory therapists who demonstrate an interest in scientific inquiry. Certainly, there are some respiratory therapists in the community who have made research a life-long vocation and have published hundreds of manuscripts. Many of these individuals have pursued advanced degrees and often moved into part-time or full-time faculty positions in medical colleges. Given the large

number of practicing therapists, however, this is still a very small number.

What to do? In this issue of the Journal, Miller and colleagues describe the creation of a formal research committee within the department to facilitate research and

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publications.³ Specifically, their goal was to increase the number of papers published on the basis of abstracts presented at the AARC OPEN FORUM. Of note, following creation of the committee, the number of abstracts submitted fell, while the number of papers published rose. The authors attribute these outcomes to more focused thought in research planning and consequently improved science and a higher likelihood of publication. But it also suggested that more strenuous cognitive demands and discipline imposed by the committee structure likely winnowed out those who possessed only a passing interest. We agree. A curriculum vitae with far more abstracts than publications is a symptom of incomplete preparation or demonstrates the authors lack the courage of their convictions, or the ardor necessary to pursue them.

While creation of the committee included a number of steps, a crucial aspect of research success requires mentorship. Mentorship can come from a single individual with research expertise or, in this case, group mentorship. Finding a mentor with the time and interest to aid in research can be difficult, but it is worth the effort. This communal effort by Miller et al³ provides a framework for success. In their system, all projects were discussed and approved by the committee, required a written proposal, paired researchers with a mentor, and required regular updates to the committee.³ We would be remiss at this point if we did not point out the importance of statistical consultation. Many young investigators plan a project, collect data, and then seek statistical expertise, which is fundamentally backwards in its approach. It exemplifies the problem arising from a lack of familiarity with scientific research that the research committee addressed directly.

From our experience there are a number of other common mistakes made by fledgling researchers:

1. Taking on too large a project. Your first trial is unlikely to be a randomized, controlled, double-blind study. Start small.

Mr Branson has disclosed relationships with Mallinckrodt Pharmaceuticals, Pfizer, Ventec Life Systems, and Zoll Medical. He is Editor-in-Chief of *RESPIRATORY CARE*. Mr Kallet has disclosed relationships with Nihon Kohden and ContinuumED.

Correspondence: Richard D Branson MSc RRT FAARC, Department of Surgery, Division of Trauma & Critical Care, University of Cincinnati, 231 Albert Sabin Way, Cincinnati, OH 45267. E-mail: richard.branson@uc.edu.

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2. Failure to conduct a power analysis. Cousin to this problem is failure to appreciate the number of patients who can be recruited from a single site. Inability to meet the desired number of subjects does not constitute a “pilot” study.
3. Losing track of the project. As noted by Miller et al,³ regular updates on progress are essential. These meetings can lead to changes in strategy for subject recruitment or refinement of measurements in a bench trial. Once a research protocol is executed, unanticipated issues invariably arise and require small or substantial iterations to the study design, and in some cases its abandonment altogether.
4. Inexperienced database management. Maintaining the confidentiality of data, particularly data with patient identifiers, is a HIPAA requirement. Databases such as RedCap can simplify data entry, enhance data reliability, allow for data auditing, and can easily provide output to common statistical programs.
5. Failure to undertake a complete search of the literature. Researchers should be familiar with the work already completed in the area of interest. If you want to be a good writer, be a voracious reader.

Much of the practice of respiratory care rests on a historical and often flimsy evidence base.¹ The future of the

profession and what therapy provides value to the patient and health care system rests on research currently being planned. The group from Duke University has created a template for success that should be congratulated and emulated. We look forward to your manuscripts.

Richard D Branson

Department of Surgery, Division of Trauma &
Critical Care
University of Cincinnati
Cincinnati, Ohio

Editor-in-Chief
RESPIRATORY CARE

Richard H Kallet

Department of Anesthesia and Perioperative Care
University of California, San Francisco, at Zuckerberg
San Francisco General Hospital
San Francisco, California

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