

Research and Publication in Respiratory Care

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Introduction

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The evidence that informs respiratory care practice arises from research that generates facts based on the scientific method. A simple definition of research is that it is a method for finding answers to questions. The Common Rule establishes guidelines related to human subjects research, but there are many types of research not subject to the Common Rule. Although conducting research can elevate the stature of investigators, more importantly, it is an essential attribute of a profession to generate research to support clinical practice. *Key words: common rule; evidence-based medicine; methodology; publication; research; science.* [Respir Care 2023;68(8):1171–1173. © 2023 Daedalus Enterprises]

Introduction

Arguably, one of the most important influences on health-care delivery in the 21st century has been the evolution of evidence-based medicine.¹ It is no longer acceptable to base practice solely on experience and other low levels of evidence when higher-level evidence is available. Evidence is fact based, and, in the case of respiratory care practice, facts come from the use of the scientific method. The scientific method objectively establishes facts through testing and experimentation. A hypothesis is made; an

experiment is designed to test the hypothesis; data are collected and analyzed; and, based on the data, a decision is made to reject or concede (not reject) the hypothesis. The accumulated science (facts) determines the best evidence, and clinical practice guidelines are based on best evidence.

Research (Science) → Facts → Evidence → Guidelines

High-level practice demands decision making based on evidence rather than opinion. In the October 2004 issue of *RESPIRATORY CARE*, 18 articles about performing and publishing research were published.² These articles resulted from a symposium convened by the Journal's Editorial Board. In recognizing the need to update the 2004 papers, Journal staff in 2022 conducted symposia on the topics of research and publication. This is the first of a series of papers to be published in *RESPIRATORY CARE* related to the presentations from those symposia.

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What Is Research?

The Common Rule, also known as the Federal Policy for the Protection of Human Subjects, is overseen by the Office of Human Research Protections of the United States Department of Health and Human Services (<https://www.hhs.gov/ohrp/regulations-and-policy/regulations/45-cfr-46/revised-common-rule-regulatory-text/index.html>). Accessed February 17, 2023). According to the 2018 Common Rule, “research

means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge.” The Common Rule defines a human subject as a living individual about whom an investigator obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens.

The institutional review board (IRB) determines whether investigations meet the definitions of the Common Rule and thus requires IRB oversight. Studies that involve human subjects must be submitted to the IRB to determine whether the Common Rule applies. The IRB might decide that the study does not meet the definition of human subjects research, but it is important to understand that this determination is made by the IRB, not the investigator. A quality improvement project designed for internal use might be deemed as not generalizable and thus not human subjects research. However, the IRB might decide differently if the results are intended to be submitted for publication. If the research uses animals, oversight by the local institutional animal care and use committee is required.

A broader definition of research is, “studious inquiry or examination; the collecting of information about a particular subject; careful or diligent search.” (<https://www.merriam-webster.com/dictionary/research>. Accessed February 17, 2023). This broader definition of research includes bench studies, narrative and systematic reviews, and other inquiries that do not involve human subjects. In RESPIRATORY CARE, for example, we publish many bench studies that are not subject to IRB oversight. Simply put, research is a way of finding answers to questions. There are many specific types of research:

- Randomized controlled trials
- Observational studies
- Quality improvement studies
- Surveys
- Bench studies
- Animal studies
- Systematic reviews and meta-analysis

Each of these study designs can lead to manuscripts suitable for publication in RESPIRATORY CARE.

Why Is Research Important?

The most important outcome of clinical research is to improve patient care. Research findings contribute to the evidence that supports clinical practice. It is important that those practicing in a field such as respiratory care include individuals who are contributing to the science by investigating that practice. Just as physicians conduct research to advance the practice of medicine, respiratory therapists and others should conduct research to advance the practice of

Table 1. Application of the Scientific Method to Clinical Practice

Scientific Method	Clinical Practice
Make an observation	The patient is short of breath
Ask a question	Does the patient have bronchospasm?
Form a hypothesis	The patient has bronchospasm
Design an experiment to test the hypothesis	Assess breath sounds and peak flow, administer bronchodilator
Collect data	Peak flow before and after
Analyze data	Peak flow doubles
Reject or not reject (concede) the hypothesis	The patient had bronchospasm

Table 2. The Steps Involved in Conducting Research

Clinical Observations
Literature search
Develop the study idea/question
Consult an expert and/or mentor
Design the experiment
Write the protocol
Obtain permissions
Collect the data
Analyze the data
Publish the findings

respiratory care. This not only advances practice but it also elevates the reputation of the profession.

There are benefits for individuals conducting research and publishing research findings. Research and publication advance one’s reputation and career. For those with academic appointments, research and publication improve the likelihood for promotion. Persons conducting research are often invited to present their findings at local, national, and international meetings. Persons whose research establishes them as clinical experts are often asked to participate in activities such as writing of editorials, narrative reviews, and clinical practice guidelines. Those with positive reputations of research productivity are also more likely to attract research funding from both internal and external sources.

It is also important that consumers of published research, which should be all of us, are familiar with research methodology. An understanding of research methodology allows us to critically read and assess published research studies. This, in turn, allows us to base our practice on the highest-level evidence to improve outcomes for our patients. This also allows us to teach current best practice to students and colleagues, and to discuss published study findings with our colleagues. Those with a firm grip on the available evidence become clinical leaders. Finally, an understanding of

research methodology allows application of the scientific approach to patient care (Table 1).

Summary

Research and publication are integral to the practice and professional stature of respiratory care. Research principles should be appreciated whether one is an investigator or a consumer of the literature. Respiratory therapists and others who practice respiratory care should be contributing to the science in establishing the evidence for practice. In 2004, Dr David Pierson posed the question, “Where will the next generation of respiratory therapist researchers

come from?”² With the series of papers introduced here, I hope that we will be able to stimulate current and future investigators in respiratory care. In Table 2 are the steps in conducting research suggested by Chatburn.³ In the series of papers to follow, we will touch on these topics and more.

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