TIPS FOR AUTHORS

Writing the Basic Science Research Report

by Nellie Kremenak, PhD
Manuscript Editor, and
Stephen C. Bayne, MS, PhD;
Michael S. McCracken, DDS, PhD; and
Galen B. Schneider, DDS, PhD,
Basic Science Research Section Editors
Journal of Prosthodontics

What does "basic science research" mean in the context of the scholarly literature of the discipline of Prosthodontics? Should your study be submitted as a basic science research report? Most researchers, in any scientific discipline, understand the term *basic science* to mean studies involving the most fundamental level that is accessible to that discipline, the foundation of knowledge on which everything else is constructed. Two separate arguments are possible here. First, some scholars hold that only research in the disciplines of physics and/or chemistry can be classified as "basic." These individuals would argue, for example, that although prosthodontics involves both physics and chemistry (not to mention biology), these disciplines intersect with dentistry at the applied rather than the basic level.

The second and more interesting argument holds that the clinical experience and clinical research is the most basic arena in any discipline of dentistry, the foundation on which all else is constructed. Many prosthodontists, along with most of the rest of the dental profession, would argue (correctly in my view) that clinical research is equally fundamental to the discipline and perhaps more "basic" to it than is laboratory research.

Although interesting to consider, resolving either of these arguments is not necessary for the researcher who is striving to prepare his or her report for submission to the *Journal of Prosthodontics* and pondering the question, "is my research basic or clinical?" Fortunately, the answer is clear cut for this journal. In the *JP*, clinical research reports describe studies involving human subjects. Basic science research reports, on the other hand, report studies that do not involve human subjects. Such reports usually describe laboratory studies, often involving prosthodontic materials or animal models. A basic science report might also report research in cellular or molecular biology, immunology or biochemistry in which the findings have relevance to the practice of Prosthodontics.

Equally fortunately, although the subject areas differ, the guidelines for both types of report are quite similar. Thus, much of the following brief discussion of guidelines for the research report is applicable to either the basic science or the clinical research report.[1]

Clarity should be your guiding principle as you write your report. Make a clear path for your reader to follow from the beginning to the end. Why did you initiate this study – what unanswered questions does it address? How did you organize and implement the study? What were your findings? What are their implications for prosthodontic treatment? What remains to be learned in future studies?

Introduction. Begin your report with a statement of the problem addressed by your project in terms of its relevance to clinical prosthodontic practice. Support your attention to this problem with a brief review of relevant literature, including recognition of the extent to which the relevant literature does not provide a solution to the problem you raise. Although you may have read more widely in developing your research design, your report should include only studies that bear directly on the problem.

Materials and methods. Describe your research material (e.g., extracted teeth, several cement systems, etc.), measuring systems (e.g., SEM, Instron), and the design or plan of your study including outcome measures, time factors, and statistical methodology and software. After reading your report, readers should be able to duplicate your study in their own laboratories.

Results. Describe the outcome of your study. Tables are a useful way of presenting findings in detail. Be sure the title and column and row headings can be clearly understood by your readers. Avoid obscure abbreviations that readers can only understand if they refer back to the text. In the text, summarize findings that you have presented in the tables but do not repeat them in the same detail. Assess the validity of your findings in terms of statistical tests used.

Discussion. Briefly discuss the implications of your findings and their relationship to prosthodontic practice. Compare your findings to those of relevant previously published reports, in particular, those you cited in your Introduction. Note the limitations of your study. Could a different design have produced more useful results? Suggest directions for future studies that could further understanding of the problem you have addressed.

Conclusion. Briefly restate your findings.

The goal of research is to find answers to questions of interest and the goal of your report is to set out any answers you have found for the attention and use of your colleagues. As you write and revise your report, remember to stay on message. Remember that most of your readers will be reading your paper because they share an interest in the problem you have addressed. Keep those readers in mind as you write; make sure that your report is clear and focused.

Reference

1. For a broader, more general discussion of manuscript preparation for submission to dental journals, see Bayne SC, McGivney GP and Mazer SC, Scientific composition and review of manuscripts for publication in peer-reviewed dental journals, *Journal of Prosthetic Dentistry* 89(2): 201-218, Feb 2003.