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**Conducting Research in Anaesthesia and Intensive Care Medicine.** By Alex M. Zbinden, Dick Thomson. Springfield, Illinois, Charles C. Thomas, Publisher, Ltd., 2001. Pages: 242. Price: \$58.95.

While there is no specific introduction to *Conducting Research in Anaesthesia and Intensive Care Medicine*, in the foreword, Dr. Saidman, the former Editor-in-Chief of ANESTHESIOLOGY, states that the “noble objectives” of the book are to assist the inexperienced young investigator, who may not have access to mentoring by experienced clinically mature scientists. Although there is no substitute for good mentoring, the goals of the authors as presented in the foreword have been somewhat successfully met. This book will assist the investigator in gaining the experiences that can lead to a successful experimental design and manuscript presentation that can then be competitive for peer review publication. In this regard, important practical information is present in all 20 chapters, making this a particularly valuable text for the target reading population. However, like many multiauthored texts, there is a significant amount of redundancy among the chapters. Furthermore, the quality with regard to readability and depth of the subject matter varies from chapter to chapter. Finally, while not a major concern, and at the risk of injecting personal preferences and biases into this review, it is this reviewer's opinion that the chapters could be a little better organized. For example, the chapters on how to measure different parameters and analyze the data are presented after the chapters that cover how to write a manuscript. Fortunately, the book is laid out well and the reader has the option of going to the appropriate chapter and then scanning the outline at the beginning in order to address a specific question.

The first two chapters cover the important preparatory work involved in conducting a study after the problem has been identified. The first chapter covers a brief introduction on how to perform a search in the biomedical literature. While the information covered is clearly helpful, the presentation is somewhat complex and may be difficult to follow by an investigator not knowledgeable of the subject. However, there is good documentation provided for further exploration of the subject. A narrative on the subject of research and newer electronic communication methods, primarily the Internet, has also been reviewed. The second chapter is clearly written and presents a straightforward, albeit short treatment on the subject of assessing medical journals. There is much information that should be of interest to the aspiring scientist or author. Information that is germane to understanding the types and quality of journals and how these properties are assessed, the classification of different types of studies, a listing and examples of biases, and an important discussion regarding the appropriateness of judging the impact ratings of journals is presented. The authors raise a number of important questions particularly those relating to bias. While many of these are important considerations, a number are not without controversy and paradoxically the authors interject their bias as well (*i.e.*, relationship of the owner of the journal to the editor, negative studies, what the results section should contain).

The next two chapters cover two important issues to consider when conducting research: namely who is funding it and how to conduct research in an ethical manner. Several mechanisms for obtaining support in order to pay the cost of carrying out research are presented. This is an outstanding albeit brief introduction to the subject. The author very clearly and succinctly presents pearls for the aspiring investigator. His knowledge of the subject and his excellent advice make this chapter “a must” to read. The only minor criticism is that the section on National Institutes of Health (NIH) funding is very short. This is unfortunate in that both clinical proposals and nonhypothesis-driven technical submissions have been getting more attention by this funding agency.

The ethical issues involved in performing research on humans (and, briefly, animals) are well examined. Critical information is relayed, and the presentation has good subject depth for an introductory text. Any investigator who masters this material will have an important understanding of the concerns that need to be considered prior to undertaking clinical research. Finally, and most likely in an effort to reinforce critical topics, there is some repetition of the material presented throughout the chapter.

The next series of chapters cover the actual experimental design of projects, including the design and organization of clinical trials, as well as statistical considerations. In addition, chapter 13 on utilizing the principles of evidence-based medicine, chapter 18 on performing animal studies, and chapter 19 on volunteer studies should be considered in this section, as they directly present important information on how to approach developing a strong experimental plan.

Chapter 5 on how to design clinical trials is loaded with useful information for the new investigator. Of particular interest are the definitions and an explanation of a number of terms that have crept up in the culture of the investigators performing these types of studies. In this regard, the terminology list in the appendix is quite useful as is the design and analysis checklists. Of some concern is the author's extensive use of abbreviations and cryptic jargon. This tends to interrupt the flow when reading and can make the chapter a bit tedious to work through. In addition, not all the terms are carefully defined, making the comprehension of information presented on clinical design somewhat difficult for the new investigator in a few places.

The chapter on how clinical trials are organized is presented very well. Although there is some new information regarding the actual administrative organization that needs to be considered when developing single and multicentered trials, there is considerable overlap with this chapter and the previous one. Fortunately, this chapter has much less jargon and abbreviations, making the reading more expedient. Furthermore, there is also a nice section on the history of the development of clinical trials. Therefore, a case can be made for having this chapter appear before the preceding chapter.

As previously suggested, chapters 13 and 19 should have also been placed in this section together with the other chapters involving experimental design. Chapter 13 examines the principles of evidence-based medicine and a discussion on how to use data derived from clinical trials. The authors use some very nice relevant examples as to how to apply these principles. This is a well-written introduction to the subject and good reading material for anyone not familiar with evidence-based medicine. Chapter 19 covers the subject of using volunteers instead of patients in clinical studies. As with many of the chapters in this book, this one is also very clearly written and the information presented is very useful to the new investigator, who needs to know how to go about recruiting volunteers. Unfortunately, there is also quite a bit of redundancy among this chapter and chapters 4, 5, and 6. Furthermore, there are probably only a couple of pages of new and important information.

While the major focus of the book is patient-oriented research, chapter 18 discusses how to perform animal experiments from two very experienced scientists in the field and should probably be included in the section on experimental design. Although not germane to patient trials, this chapter presents important considerations in developing an experimental strategy when performing translational animal studies. This is an outstanding treatment of the subject. Animal modeling is a real art form, and these authors have gone to great lengths to discuss this process and rational selection of different animal species based on the needs of the study. This is an excellent introduction for the new investigator, who wants to extend clinical observations in more rigorously controlled systems or to perform studies that could not be ethically carried out in patients.

The chapter on performing a statistical analysis provides important useful information in designing, as well as analyzing, the data. The strategy used by the authors to answer questions of physicians with a basic grounding in statistics is a strong approach to presenting the subject and there is much useful information in that regard. However, the authors have not been entirely successful in eliminating or clearly describing the statistical jargon. Unfortunately, the use of this terminology many times presents a problem when trying to learn statistical analysis. The use of jargon combined with the somewhat descriptive nature of the presentation makes reading the chapter somewhat tedious. However, the approach used by the authors to try to present the investigator with explanations of commonly used statistical terms and how they are used is to be praised. There is much information in this chapter that can help the new investigator in getting a handle on the important issues regarding the use of statistics in planning and evaluating a study.

The next group of chapters discusses the actual writing and formal presentation of the findings of one's experiments and includes steps involved in writing a manuscript, the use of text processors, proper English usage, presenting findings at formal meetings, and the peer review process. In addition, chapter 14 discusses the use of modern communication tools, which should also be included in this section. The chapter on how to actually go about writing a publication is extremely well written and contains much useful information. Reading this chapter is highly recommended for an author attempting his or her first manuscript. There is also some repetition of the information on statistics, ethics, and research design that have been presented in previous chapters. The checklist tables are quite useful as are the definitions of important terms used in the publishing process. A short, clearly written, and very easy to follow presentation of the use of text processors follows this chapter. There are a number of pearls in this chapter that are quite useful in writing a manuscript. Invaluable shortcuts are described by the authors, which make this chapter interesting reading.

Chapter 10 is a short presentation that covers important information on the appropriate use of scientific English. The areas covered include style, punctuation, and other usage rules, as well as areas that continually cause trouble (*i.e.*, articles, tenses, word order, and frequently misused words). In addition, there is a short section on avoiding gender-biased language for the politically correct. This is a clearly written chapter that is easy to read and has useful information. This chapter is also quite easy to use as a quick reference when a style question occurs. This material clearly could have been presented in more depth, as writing is a major concern and barrier to many aspiring scientists.

There is an extremely well-written and comprehensive chapter on how to present scientific results at meetings. It is enjoyable to read and full of useful information. Presentation of the approach of other historically notable speakers (*i.e.*, Cicero and Churchill) is very informative, as well as entertaining. Both the sections on visual aids and nonverbal communication are full of important material and quite helpful. The section on video beamers is the first that I have seen on the subject. The section on dealing with questions from the audience following the presentation is priceless!

Finally, the difficult process of interacting with a journal and reviewers to get a paper accepted for publication is also presented. The authors of this chapter are former editors of anesthesiology journals and their experience and expertise is readily apparent. While the information may be quite useful to the beginning author, those who have participated in the process before will find it somewhat simplistic.

The next series of sections delve into the actual methods used in the collection of data. A series of small chapters or treatises on the methods and safety involved in measuring different parameters needed to perform clinical trials are presented as one large chapter. These subjects include electrical safety, analysis of gas mixtures, drug concentration determinations, pain assessment, and electroencephalographic analysis. The measurements are, in many ways, unique to anesthesiology and critical care medicine. In general, the chapters are well written and present a good introduction to the subject. In fact, some provide

quite an in-depth presentation of the subject. In addition, the bibliography presented on most of these methods is extensive, providing a very useful start for the individual who wants to explore a specific type of clinical measurement.

The book also presents very useful technical advice on how to acquire and process data using digital computing. This is well worth reading early to begin the process of developing the specific systems that one may need to facilitate data storage. The text and figures are easy to understand and quite helpful. For example, the author explains Fourier transformation in terms that can be readily understood by most new investigators. The importance of having data acquisition and processing set up to be performed electronically can save time and make experimentation more efficient. Furthermore, these methods also tend to result in a more accurate transfer of information and allow for extensive bioinformatic interactions.

Chapter 17 provides a brief introduction to clinical pharmacology and how it relates to research in anesthesiology and intensive care medicine. This chapter is well organized and offers insight from study initiation to data analyses. Different pharmacokinetic models are thoroughly discussed and the appropriateness of each model is emphasized. The use of simulated data is effective in making the concepts more concrete. However, because of the numerous mathematic equations presented, an inexperienced researcher may feel overwhelmed by the amount of detail. A table of key principles and frequently used equations would have been helpful to researchers trying to navigate the different models. The authors should be credited for the in-depth presentation; however, a more thorough discussion on critically evaluating drug effects and adverse drug reactions would have provided a better overall appreciation of clinical pharmacology in research.

The final chapter in the book covers the subject of using gene expression to perform studies in cells and *in vitro*. While this section is very well written and provides a nice introduction to the subject, the presentation of this type of method in this particular book appears to be somewhat out of place. Gene expression is a very important subject and, along with applications involving proteomics, will be involved in the next big breakthroughs in medicine. However, this section is not in keeping with the stated objective of the book. Clearly, no one is going to perform these types of experiments without extensive additional laboratory training. However, the use of transient gene expression *in vivo* in experimental animals, and eventually in patients, may be an application of this field of research that the new physician scientist may wish to become involved. Unfortunately, this chapter did not cover the topic of how to perform studies using gene expression in animals or humans.

In summary, the book is very well written, is easily understandable, and contains a large amount of very useful information for new investigators. Overall, the individual chapters are outlined such that the reader can review the contents to determine whether the information presented can address a specific issue. While most of the information provided in this text could be helpful to any investigator, there is clearly subject material that is specific to the anesthesiologist-intensivist physician-scientist. The quality of each chapter varies and the organization of the chapters in the text could be improved, but there is valuable information contained in all. There is also some overlap from chapter to chapter. However, these are not major issues, and the authors have accomplished the goal of providing a text that will expose the inexperienced young investigator to information in lieu of mentoring that can lead to a successful experimental design and peer review-quality manuscript preparation. For these reasons, using a copy of this book is recommended for the academic physician wanting to become involved in performing clinical or transformational research related to the practices of the clinical specialties of anesthesiology and intensive care.

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