


Robert B. Taylor



Medical Writing
A Guide for Clinicians,
Educators,
and Researchers

Third Edition

 Springer

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and Researchers

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For Francesca, Masha, Jack, and Annie

Preface

This book is intended to make you a better medical writer. This is true whether you are a clinician in a busy practice, an educator teaching students in the health professions, or a researcher who conducts and reports randomized clinical trials. It is for the physician, physician assistant, or nurse practitioner who sees patients and who also wants to contribute to the medical literature. It is for the medical educator writing articles and book chapters to share new information and, incidentally, to attain promotion and tenure. And it is for the investigator whose career success depends, in large measure, on critical skills in developing research protocols, preparing grant applications, and writing articles describing the eventual research findings.

It has been 6 years since publication of the second edition of this book. The landscape of medical writing has changed in many ways, and I will cover much of the new territory in this third edition. But the aim of the book remains unchanged: to improve your writing skills, whether you are a clinician, educator, or medical researcher.

So what exactly has happened in the past 6 years? Although there had been some early rumblings when the second edition was written, the intervening years have seen the evolution of pay-to-publish open access journals, predatory publishers, highjacked journals, and bogus book reviews. The International Committee of Medical Journal Editors has changed its *Uniform Requirements for Manuscripts* to an updated version: *Recommendations for the Conduct*,

Reporting, Editing, and Publication of Scholarly Work in Medical Journals. In this third edition, I cover these topics, as well as add new sections on altmetrics, parachute studies, bacronymic article titles, peer review fraud, how to find permission-free illustrations for your work, and ways to avoid common mistakes in writing and submitting a research report.

Medical writing is different from composing a short story or a novel. Although all authors should strive for accuracy, clarity, and simplicity, medical writing has certain rules—some unwritten and others found in the *Instructions to Authors* that seem to differ just a little from journal to journal—that seem to encourage complexity rather than a pleasing flow of words. Yet, despite the need to be precise and often to include p-values, confidence intervals, and other foes of an elegant literary style, medical writing can still be readable and sometimes even *natural*.

If you are new to medical writing or even if you have been the author of some articles or book chapters and seek to improve your abilities, this book can help you. Who am I that I can make this assertion and write this book, both fairly presumptuous acts? Here's my reasoning. As a practicing physician and medical educator, writing has been my avocation. Over 14 years in private practice and 39 years in academic medicine, I have written using all the major models described in this book: review articles, case reports, editorials, letters to the editor, book reviews, book chapters, edited books, authored books, research protocols, applications for grant support, and reports of clinical research studies. Most items submitted for publication have been published. Not all. Perhaps my most noteworthy qualification is not that I have managed to produce a lengthy curriculum vitae. In my opinion, what is more important for you, the reader, is that I have made all the errors. That's right, the mistakes. Over the years, I have jumbled spelling, mixed metaphors, tangled syntax, wandered away from my own outline, written on unimportant topics, submitted grant requests that seemed to befuddle reviewers, and offered articles to the wrong journals. But

along the way, I have published 33 medical books and added several hundred papers and book chapters to the literature. This book is written to share what I have learned—what works and what doesn't in medical writing.

This book aims to help clinicians, educators, and researchers translate their practice observations, pedagogical innovations, wise thoughts, and investigational data into written form and eventually into print. In striving to achieve this purpose and as (I hope) a good educator, I have written the book with four learning objectives in mind. Upon completion of this book, the reader should:

- Understand more about the art of medical writing, including motivation, conceptualization, composition, and frustrations
- Know how to use different models of medical writing, such as the review article, report of clinical research, and more
- Recognize how to get a manuscript published
- Realize that writing can be fun

The book's content is a blend of personal experience and research on the Web and in printed sources. Throughout all chapters, I have attempted to follow the time-honored principle of supporting theory with examples, some from actual published materials and some simply created to help illustrate the ideas presented. Most of the examples presented are “good examples”; a few are illustrations of what not to do.

In Chap. 1, I challenge authors to consider three questions before beginning work on an article or book: *So what? Who cares? Where will it be published?* As the author, I believe that I should answer the three questions in regard to this book. The “So what?” question asks what is new and different, and I think that the answer lies in the fact that I address medical writing knowledge and skills from the viewpoint of the clinician and medical educator, not that of the journal editor or professor of English literature. The “Who cares?” issue concerns the potential reader; for this book, that is the reader who aspires to write for publication in the medical literature. This is, in fact, a surprisingly large number of per-

sons—all competing for limited space in print. In regard to the “Where will it be published?” question, I am pleased that this book is published by Springer Publishers, the world’s leading publisher of scientific books and journals, with whom I have had an author–publisher relationship since 1976.

As a clinician and/or perhaps a medical educator or clinical investigator, you have a tremendous source for writing ideas—the patients, students, or research subjects you see each day. Think about the possible significance of a cluster of uncommon problems you have observed recently, the unlikely manifestation of a common disease, your curricular innovation that others could implement, or the extraordinary courage displayed by one of your patients or study participants. Perhaps you have found a new way to use an old remedy, have your own thoughts about a recently published study, or even have a pile of data from a clinical investigation you recently completed. This book is about helping you recognize the reportable idea, organize your information, and *write it up*.

Happy writing!

Virginia Beach, VA

Robert B. Taylor

About This Book

*True ease in writing comes from art, not chance,
As those move easiest who have learn'd to dance.
English Poet Alexander Pope (1688–1744)*

Together we are embarking on a journey through the ins and outs of writing in general and of medical writing in particular, with all its idiosyncrasies. This short introduction tells a little about the book's organization and its own peculiarities, including word use, reference styles, and the examples and allusions you will encounter. In the end, our common goal is to find some true ease in writing, through consideration of both current theory and samples from the literature and by looking at what constitutes excellent and not-so-good writing.

The book progresses from the theoretical to the practical. It begins with basic writing topics and skills. Next comes a consideration of the various models for medical writing, from the review article to the report of a research study. There are chapters on writing a research protocol, how to get grant funding for your research (or other project), and how to write a report of a research study. The final chapter discusses how to get your work into print, longer in this third edition because of the recent emergence of new models of publication and perils for the author. The appendix has some handy tools that may help you along the way, including a glossary of medical writing terms, proofreaders' marks, commonly used abbreviations that you may use in your own writing, and definitions of methodological and statistical terms used in research reports.

In the early chapters on basic writing skills, I use the word *article*, even though later in the book the principles of authorship described will also apply to editorials, letters to the editor, research protocols, grant proposals, and research reports.

Within chapters, you will also note some shorthand reference citations, presented in parentheses. These identify articles and books used as examples to illustrate enviable (and sometimes deplorable) titles, organizational structure, and prose. Although I believe few readers would actually want to consult these writings, I have provided abbreviated citations, just in case. With the information provided, you could find most of the articles on the Web. This third edition presents some newer examples of good and bad medical writing and also retains a few classic gems.

At the end of each chapter are references to sources pertinent to ideas described in the text. These are presented in the style of the “Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals,” a very useful guide that will be discussed in later chapters. Using this reference style for the book models the way you will generally prepare citations for your medical articles.

I have done my best to make this book a pleasure to read. This includes using short, strong words and, at times, colorful images. I have included allusions to medical history, classical writing, mystery novels, opera, sports figures, comics, and a few very odd creatures. We will visit Hippocrates and Frau Roentgen, Shakespeare and Hemingway, Princess Turandot and Pogo, and zombies and clones. As you read along, you will also learn some medical information, such as whether or not the use of probiotics can reduce crying episodes in infant colic and the relationship between the exposure to aircraft noise and cardiovascular mortality. All the examples in the book help illustrate points about medical writing that I consider important.

I hope that what follows will help you master the art of writing, to “move easiest” by learning—not really new dance

steps—but some guidance on how to walk the path from idea to print. I wish that I could promise that having read this book, your next writing effort will be so inspired and luminous that everything else in print will seem drab by comparison. In fact, this is unlikely to occur. But I do earnestly believe that, as stated in the Preface, using the principles and tips presented here will make you a better medical writer.

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Chapter 1

Getting Started in Medical Writing

*[W]ords are things, and a small drop of ink,
Falling like dew, upon a thought, produces
That which makes thousands, perhaps millions, think*

British poet Lord Byron (1788–1824), Don Juan

Does being a clinician or holding a faculty appointment make you or me a capable medical writer? No, it doesn't, any more than being a physician or even an inspiring educator qualifies me to be a good stock picker, business manager, or even vacation planner. It only means that I have medical knowledge and skills and am trained to care for patients or perhaps have some gift for teaching or research. On the other hand, just because you are a clinician who sees patients daily or a researcher concerned with protocols and statistical significance does not mean that you cannot become a capable, even great, writer. And, yes, even the classroom or bedside teacher can learn to write well. Being that great writer requires knowledge, practice, experience, the capacity to endure rejection, and a strong will to succeed.

The knowledge part includes both medical and “writing” knowledge. Let us assume that, by virtue of your clinical practice, you have the medical knowledge. Then what you must master are the body of information and the technical skills that can help you become a great writer. You must know how to assemble and use basic writing resources. You also need to understand key issues in medical writing such as how to get started and how to get finished, the various models of medical writing, how to prepare a manuscript, and how to get your work published. Acquiring this knowledge is no small task, but it can be done.

Writing for the medical literature has its own special considerations. Composing vibrant prose is not usually the key issue and at times may appear to be disadvantageous. By that I mean that editors of scientific journals tend to favor densely written articles that put specificity ahead of clarity. Rew has written, “A fog has settled on scientific English. Well-written English effortlessly communicates the writer’s intent to the reader. Unfortunately, far too often, science is written in a form that renders the content hard to understand, and which makes unreasonable demands on the reader” [1]. It seems that many medical articles, notably reports of clinical research studies, are written chiefly to be published and cited, and readability is a minor consideration. I hope that you and I can aspire to a level of literacy acceptable to your editors and that readers will appreciate the enhanced readability of our work.

The ability to endure rejection is a must. I began medical writing in the early 1970s while in a small-town private practice. I had some early success in conducting clinical studies and seeing the results in print in respected journals. I also wrote some articles for controlled circulation, advertiser-supported journals, such as *Medical Economics*. Not everything I wrote was published. I also began writing health books for nonmedical people, what the editors call the “lay audience.” Here I collected so many rejection letters that I could have wallpapered a room with them. Only when I began writing and editing medical books did my acceptance rate become favorable. However, after 40 years of medical

writing experience, I still receive rejections for clinical papers, editorials, and book proposals. And, yes, it still hurts.

If you aspire to be a medical writer, you will need determination. Being a writer takes a lot of effort, and you really need to want to see your work in print. But if you develop the itch to write, it can only be relieved by the scratch of the pen—or today by the click of the computer keyboard. If you begin to see yourself as a writer working on a project, as I am working on this book today, then you will think about the project whenever you have a spare moment, and as ideas occur, you will capture them on a scrap of paper, index card, or smartphone. There is tale, perhaps apocryphal, that Scottish poet Sir Walter Scott (1771–1832), while once struggling with a sentence, went hunting. The ideal wording popped into head. Scott quickly shot a crow, plucked a feather, and used the bird's blood to record the prose before it faded. Some of my best thoughts have been scribbled on paper napkins. You will log the concept or phrase when and where you can, just so it doesn't get away, because that is what writers do.

Why We Write

For years I have periodically conducted writing workshops for clinicians and medical educators. Presenting writing workshops, of course, guarantees an audience that is self-selected to be more interested in writing than those in competing workshops on how to perform a no-scalpel vasectomy or ways to code office visits to receive maximum reimbursement. Generally, most of the participants are previously published medical authors, at least to some degree. Each of these workshops begins with the same question: Why do we write? The answers, while diverse, tend to be the same in each workshop and are listed in Table 1.1. I am going to discuss a few of these.

First, let's consider and dismiss the final entry on the list—earn income. Medical writing is not lucrative. Advertiser-supported publications (more about them later) often pay a

TABLE 1.1 Reasons why we write

Gain intellectual stimulation
Share ideas
Report research
Express an opinion
Generate discussion
Advance one's discipline
Assert "ownership" of a topic
Attain promotion/tenure
Report a case
Enhance one's personal reputation
Achieve some small measure of immortality by publishing our ideas
Earn income

few hundred dollars for an article. Book royalties are generally meager compared to what a health professional earns in his or her "day job." Book chapters, editorials, and research reports pay little or nothing and are written for reasons other than financial gain. If your goal is wealth, you should add more clinical hours to your schedule or buy stocks that go up—something other than medical writing.

What about the other reasons we write? For those in academic medicine, promotion and tenure are very important, and publications are the key to success. As medical schools become increasingly dependent on clinicians seeing patients for economic survival, it would seem that this clinical effort would be rewarded with the carrots of career achievement—promotion to the next rank and, where applicable, tenured faculty positions. This, however, is not the case. In 1988, a study at Johns Hopkins Medical School reported, "Those who were promoted had had about twice as many articles published in peer-reviewed journals as those who were not promoted" [2]. I have not seen a recent similar study, but I don't believe that anything has changed, and an academic faculty member who bets his or her career on advancement without publications is taking a dangerous path.

I tell young faculty members that, as a broad generalization, it takes at least two publications a year to be considered

as “satisfactory” in scholarly activity when it comes time for promotion. Some can be clinical reviews or case reports, but others must be research reports published in refereed journals. Also, you must be the first author on your share of the papers, not always second or third author. Faculty members who chiefly see patients often do not get this message. Beasley and Wright surveyed faculty in 80 medical schools in 35 states. They differentiated between clinician investigators (the research faculty) and clinician educators (the patient care faculty) and concluded, “Clinician educators are less familiar with promotion guidelines, meet less often with superiors for performance review, and have less protected time than clinician investigator colleagues” [3].

Another benefit of medical writing is the in-depth knowledge it brings. Think of it as a self-education program. If you or I plan to conduct research (which requires various phases of writing such as the research protocol, grant application, and ultimately the research report) or develop a clinical review or book chapter on a topic such as hyperthyroidism or ovarian cancer, then we will necessarily learn a lot about the topic during the process. In academic medicine, the way to really get to know a field is to contribute to it, and those who contribute by means of publication need current, evidence-based knowledge if their writing is to be credible.

In my opinion the most enduring reason to be a medical writer is the intellectual stimulation. Medical writers have a lot of fun learning about their topics, rummaging in their imaginations for the best way to present material and finding just the right words to say what is important. And what you write can stimulate discussion. For example, I published an article on leadership with the premise that leadership skills can be learned. A reader disagreed, stating that my article had “missed the mark” and that the top leaders have inherited abilities and character traits. I had an enjoyable time composing my reply.

There is also the pleasant side effect of getting known. As an editor of a number of medical reference books, I have had the heartwarming experience of visiting clinics in Asia,

Europe, and South America and having young doctors exclaim, “Doctor Taylor, I have read your book.” On a practical level, if you are a referral physician who specializes in, for example, refractive surgery of the eye or the management of Parkinson’s disease, publishing articles on these topics helps assure referrals.

In the end, however, when the going gets tough and your paper has been rejected again, what will sustain you is not the discussion with readers, the occasional recognition, or the clinical referrals. It is the simple joy of writing.

Why We Don’t Write

If writing is such a joy, why don’t we write? And for those in academic medicine and whose career advancement depends on publications, isn’t it curious that so many resist writing?

In my workshops on medical writing, the second discussion question is “Why don’t we write?” Table 1.2 lists some of the answers received over the years.

What about the resource issues cited in the list? Time to write is always mentioned early in the discussion. No one in private practice has revenue-generating time that is allocated to writing. Those in academic practice soon find that they don’t either. For academicians, time to do research and to

TABLE 1.2 Reasons given for not writing

Not enough time
Nothing to write about
No one to work with in writing
Shortage of secretarial support
Lack of knowledge as to how to research information
No mentor for writing activities
No motivation
No self-confidence
Don’t know how to start
“I hate writing!”

write must be “bought” by obtaining funding (which is why grant proposal writing is important). For the rest of us, writing time is going to be carved out of personal time. When I was in private solo practice, my writing time was in the early morning, before breakfast and when my family was asleep. For others, the time will be weekend mornings or late at night. In workshops, sometimes I have encountered vocal—sometimes even angry—disagreement with my “writing on your own time” beliefs, but most experienced medical writers and editors will tell you this is the way it is.

Whatever time you designate as writing time must be vigorously protected. In practice, patients will get sick and call; this is the virtue of writing in the early morning or late-night hours when the telephone is quiet. In academic medicine, you may need to close the door while writing or go to the library to prevent colleagues from coming to discuss problem residents, curriculum changes, or patient referrals—anything but writing.

How about the lack of ideas, lack of secretarial support, absence of like-minded colleagues, and so forth? Any clinician seeing 15–25 patients a day encounters a wide variety of clinical phenomena that could present the idea for an article: common causes of pelvic pain, ways to manage the patient with a low back strain, an unusual manifestation of lupus erythematosus, herbal therapy in the treatment of depression, and much more. The variety you see depends on your specialty. Your writing ideas will come from your clinical experience. This is as it should be, because it brings immediacy to your writing and provides the credibility you need to write on the topic. Later in the book, we will discuss how to develop clinical observations into writing topics, outlines, and articles.

In my opinion, laments about lack of secretarial help, collegial support, and research access are not as valid as they once were. Why? Because of the computer and the Internet. Not too many years ago, I was highly dependent on secretarial support; I dictated my articles and made corrections by hand to be changed on computer by my typist. Today I use the Microsoft Word program on my computer, doing the typing

myself; the computer's efficiency has led me to change my writing methods. With e-mail, coauthors are also readily available. In fact, I can pass documents back and forth with colleagues across the country by e-mail just as readily as with those down the hall.

The World Wide Web has revolutionized research, making information needed for writing readily available to anyone with a computer and Internet access. Because knowing how to use the available resources is so important to medical writers, we will shortly spend time learning about what is online and how to use it. Basically, you can learn just about anything you need to know while sitting at your desk, if only you learn how to do it.

The lack of self-confidence is quickly overcome after a few publications, which may also help to spark motivation.

Regarding the last entry on Table 1.2, I can't do much for those who really hate to write.

Random Thoughts About Medical Writing

Writing as History

In 1912 the citizens of the village of Caledonia, New York, placed a large boulder as a monument commemorating the historic treaty between Chief Ganaiodia, representing the Native Americans in the area, and the local villagers and farmers. As a civic leader, my grandmother had an idea. She dispatched my mother, then aged 9, to the grocery store to buy a tin of cookies. Yes, those were the days that cookies came in tin boxes, and one could safely send a 9-year-old child alone to the grocery store. When my mother returned, grandmother removed the cookies, which I am sure were put to good use. What she wanted was the metal box, into which she placed several items, including a copy of the village's weekly newspaper. The box was then buried beneath the boulder as a time capsule. I believe that it is still there beneath the boulder.

Your writing is a time capsule. It shows what you and your colleagues think today about important issues such as diagnosis, treatment, prevention, prognosis, clinical correlations, health policy, practice management, and much more. As readers, we use medical writing to look back in history.

Think about the historic figures in medicine. Who comes to mind? Hippocrates, Galen, Maimonides, Paracelsus, Vesalius, Harvey, Osler, and more (I am sure that, in choosing just a few to discuss briefly, I have omitted many favorites, but I am going to try to make a point). Three centuries before the Common Era (CE), the words of Hippocrates were recorded in *On Hemorrhoids*, *On Fractures*, *On Ulcers*, *On the Surgery*, *On the Sacred Disease*, and the *Book of Aphorisms*. Galen, writing in Rome during the second-century CE, compiled the medical knowledge of the day into an encyclopedic work that endured as an authoritative reference for centuries. Maimonides wrote on diet, reptile poisoning, and asthma during the twelfth-century CE. Later, during the Renaissance, Paracelsus described Meniere's disease and the treatment of syphilis with mercurials; he gave us the guiding principle of toxicology: "The dose makes the poison." We know this because Paracelsus *wrote* it. Vesalius produced drawings of the body that greatly advanced the study of anatomy. Harvey, in the 1600s, wrote describing the circulation of blood in the body, and later Sir William Osler's book *The Principles and Practice of Medicine* defined the practice of medicine in the late nineteenth century [4].

Do you notice the common theme above? Is my point becoming clear? While all were undoubtedly outstanding physicians of their day, they are remembered because they *wrote*. They recorded their observations and their thoughts. In doing so, they literally helped shape the history of healing. And by writing, they created the building blocks upon which today's house of medicine stands.

You and I can do a little of this, too. At this time, none of us is likely to become the "father of medicine" or the "father of anatomy." Hippocrates and Vesalius hold those titles. But we can add small twenty-first-century contributions to the

house of medicine while metaphorically tucking some of our work away in today's time capsule for someone in the future to ponder.

Writing and Reading

Reading goes with writing like ice cream goes with apple pie—one just makes the other better. All writers must read if they are to be any good at medical writing, and you should read diverse items and for various reasons: for information, for ideas, for structure, for style, and for a sense of history.

All clinicians need to read the medical literature regularly to stay up-to-date in their specialties; this is part of being a good healer (later, in Chap. 3, I will describe how clinicians read the literature). Educators and researchers must read constantly to know the latest advances in their areas of interest. Your journal reading will help build bridges to your own experience.

Writers also read to seek information. For example, when writing the section above, I needed to reread parts of Sebastian's excellent reference book *A Dictionary of the History of Medicine* [4] to learn about Hippocrates, Galen, and Harvey. No, I did not have all the information in my head. Right now I have promised to write a book on the great innovations in medicine, and as I revise this third edition of *Medical Writing*, I am searching for information on the next topic I will cover.

In addition, writers read to seek general knowledge and, perhaps, to troll for ideas. Some clinical interest topics I have encountered recently include the merits of vitamin D, atypical fractures with bisphosphonate therapy, the role of alternative medicine, and new drugs for diabetes.

There is also reading for structure. By this I mean considering articles analytically. When you read an article that you like—because of the writing, not the topic or statistics—go back and reread the article looking at how the author put it together. How was the title composed? How was the abstract

constructed? How did the writer organize the information so that it was clearly presented? What tables and illustrations were used, were they effective, and why were they effective? How many references were included, and what publications were cited? Reread this part of the book before going on to Chap. 2, and think about the questions I just asked as they apply to the Chap. 1 you are now reading. What are the good points and what could I have done better? In short, look at the craftsmanship of the article or book chapter, as well as the message.

Read also for style. Study examples of well-written medical literature. This may be a little hard to find, as refereed journals have increasingly become the repository for published, citable, but barely readable reports of research data. The writing in the *British Medical Journal* is better than most, and some of the best writing in US medical journals is found in editorials and opinion pieces, as described in Chap. 7.

Reading for style includes reading nonmedical books, vitally important to those who aspire to be serious writers. Here you can gain a sense of language, grammar, syntax, and the rhythm of words in good literature. I believe that a medical writer should always be reading a nonmedical book. Read some of the classics, such as the grand metaphoric prose of Herman Melville's *Moby Dick*; the powerful, yet spare journalistic style of Ernest Hemingway's *The Old Man and the Sea*; the subtle and complex style of Jane Austen's *Pride and Prejudice*; or the symbolism of Thomas Mann's *The Magic Mountain*. You might also include a Tom Clancy thriller or Patricia Cornwell medical mystery or a James Michener epic.

You and I can gain a sense of perspective by reading about our heroes and our language. To read a collection of time capsule items, try to find a copy of R. H. Major's *Classic Descriptions of Disease* [5]. To learn about the words we use, I humbly recommend my own book, *The Amazing Language of Medicine* [6]. And one should include a book on the history of our profession such as Roy Porter's *The Greatest Benefit to Mankind* [7].

Writing and You

Who Writes?

Is there a profile of the medical writer? There is no single “typical” person who chooses to write. However, there are degrees of “fit” between a person’s preferences and characteristics desirable for writing. It goes beyond mere technical skills. Writing may be an opportunity for you to use your talents and may give you great satisfaction, while others describe writing as “frustrating” and “stressful.” Most importantly, you need to be aware of your own preferences, strengths, and priorities. Psychological inventories, such as the Myers–Briggs Type Indicator (MBTI), have described personality types that tend to be most attracted to writing as being creative, adaptable, and eager to take on new challenges (INFP, ENFP, INTP, and ENTP, in MBTI terminology) [8].

Medical Writing as Storytelling

Who hears more stories than patient care clinicians? The patient relating a medical history is really telling his or her story. It is a narrative and often one that is rich in color, emotion, and drama. In fact, there is an appealing metaphor that characterizes the patient and the clinical narrative. It begins with the concept that the job of the healer is to help the patient manage his or her “story.” And—here is the metaphor—the patient comes to the clinician with the plea: “My story is broken and I hope that you can help me fix it” [9]. Certainly among all these stories—broken and fixed, with the clinician as both actor and observer—there are limitless topics for medical writing. Abraham Verghese states, “It may take years of practice for a physician to appreciate and accept his or her role as storyteller and storymaker” [10]. One good example of such narrative writing is Howard Brody’s *Stories of Sickness*, 2nd edition [11].

Writing as Creativity

Whether what you are writing is a compilation of data in a research report, an editorial about a topic that sparks your passions, or a new look at how to treat your favorite disease, your writing involves creativity. This means that you are producing something that comes from you, personally, and that did not exist before you made it. I find this both humbling and energizing. In writing this paragraph, I am putting 89 English words together in a way that no one ever did before. This is exciting.

This creativity is what can get the juices flowing. It helps focus your sense of purpose—that writing is important, especially what you are writing *now*. The creative process is more important than committees, television, the crabgrass in the lawn, and even football. Your rewards come when you have finished something and you can say, “This is great, and I created it,” and from others reading the results of your literary effort—and sometimes responding—even when they disagree.

Of course, creativity is also a solitary process. Note that of the great medical writers in history that we discussed earlier, none had a Boswell to record his thoughts (from your college courses, perhaps you recall James Boswell, the eighteenth-century writer best known for recording the words of Samuel Johnson). Nor do we find coauthors listed. And none had a team of administrative assistants, research assistants, or fact-checkers. Each did it alone with parchment and quill and paper and pen.

Be aware that your medical writing will require hours spent staring into the computer screen and rummaging in books and web sites—lonely endeavors, to be sure. American author Truman Capote once wrote, “Writers, at least those who take genuine risks, who are willing to bite the bullet and walk the plank, have a lot in common with another breed of lonely men—the guys who make a living shooting pool and dealing cards” [12]. The solitude of writing will mean overcoming the tendency to wander down the hall to yak with colleagues, go for coffee, or chat on the telephone—anything

to maintain contact with other humans. So be prepared for quiet time alone with your ideas. However, you may find that your ideas and your creativity are very good company.

Writing Topics and Your Career

If you are in private practice with no aspirations to an academic career or research grant funding, then you might skip this short section. However, if you are a faculty member seeking academic advancement (promotion and tenure) or a future in research, the following can be an important advice. Here it is: find your “career topic” early and stick with it as long as you can. The “career topic” will be what you write about, over and over. It will also be the subject of your research and perhaps why you receive patient referrals. For example, for years, I have written on migraine headaches. Clearly because of writing review articles and book chapters on this topic, I—as a family physician—became a leading headache referral physician in our academic medical center. In fact, I received more headache patient referrals than I really wanted, all because of writing on the topic.

Some topics I have seen young academicians developing recently include a national scorecard on women’s health services, health literacy of patients, the impact of high professional liability rates on physician retention, changes in the quality of health services when patients are forced to change doctors, the integration of complementary/alternative practices into allopathic medicine, the cost efficiency of various health screening methods, racial or gender disparities in health care, and a wide variety of clinical diagnoses. The list of potential topics is endless. Take ear infection, for example, which most would describe as a mundane topic. Yet in 2011 a team from Finland published an article in the *New England Journal of Medicine* (NEJM) describing a placebo-controlled trial of antimicrobial treatment of otitis media (Tähtinen PA et al. *N Engl J Med.* 2011;364:116). In 2016, the *Journal of the American Medical Association* (JAMA) described the effect of cranberry capsules on bacteria/pyuria among older women

in nursing homes (Juthani-Mehta M et al. JAMA. 2016;316:1879). I regret to report that cranberry capsules were no more effective than placebo.

What is important is to identify a topic that energizes you and that has the potential to endure. For example, one could write on a topic of, for example, treatment of Bartholin cyst or infant crib safety, but would soon run out of things to say and articles to write. It is much better to write on a topic of general interest, with evolving research and, if possible, high social relevance. Then, as you write on various facets of the topic in journals and books, you establish your national position as an authority in the field, which is a requirement for promotion to the rank of professor in academic medical centers.

What should you *not* write about? First of all, don't write on topics outside your area of clinical expertise. To use somewhat exaggerated examples, the psychiatrist probably shouldn't be writing about knee injuries, and the orthopedic surgeon should find a topic other than pancreatitis. Also, do not write on a clinical area in which you do not wish to receive referrals and perhaps become recognized locally as an expert. I once knew a general internist who wrote a few articles on alcoholism. He was interested in the topic because his father was an alcoholic. Before long his practice was dominated by alcoholic patients, both through referrals by colleagues and then by patients seeking out the local expert on the topic and by attorneys requesting expert testimony. This shift in practice emphasis was not at all what he had planned.

Assembling Your Resources

Because the topic of resources is so important, I am going to cover it early in the book. You must not try to write without assembling what you need to write. Without designating a writing area, acquiring books and computer resources, and learning to use key web sites, a premature foray into writing is likely to cause frustration.

Your Writing Space

What are your logistic requirements for writing? First of all, you will need a comfortable chair and desk surface. The chair must support your back and ideally will have a height adjustment that can change if your shoulders start to ache after a few hours of typing. The surface may be the kitchen table, as long as it is well lit and is large enough to accommodate papers, books, computer, and all the rest.

You will need a computer with high-speed Internet access. The days of submitting manuscripts on paper are gone. All my latest article submissions have been online, and paper was needed only for author attestations and signatures. My last six books were submitted online.

The point of the story is that you will need a computer for composition, revision, and submission. At home and work, I use both desktop and notebook computers. I find the desktop computer easier to use for long sessions of typing, chiefly because I have two large side-by-side screens. The notebook is more convenient when moving work from place to place and definitely if the computer must be taken into the shop for repair.

Other items to have handy are a telephone, notepad, pen or pencils, and a cup of your favorite beverage. Add your books, computer programs, and web sites, and you are good to go.

Books

If I were advising you a decade ago, this section would be much longer. On my bookshelf I have copies of *Dorland's Medical Dictionary* and *Stedman's Medical Dictionary*. For the most part, they are collecting dust. Almost everything I need I can find online (see below). Nevertheless, there are a few books that just might be helpful.

The *5-Minute Clinical Consult*, published by Williams & Wilkins (LWW), is a very useful reference for a wide variety of clinical conditions. Using an outline format, this “cookbook”