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The Illusion of Certainty and the Certainty of Illusion: A Case Study of Misunderstandings in Scientific Articles

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**WHAT IS HEALTH ECONOMICS AND OUTCOMES RESEARCH?**
**A PRIMER FOR MEDICAL WRITERS***

*By Caitlin Rothermel, MA, MPHc
Principal, MedLitera, Seattle, WA*

**ABSTRACT**
Increasingly, medical writers are being asked to work with health economics and outcomes research (HEOR) information. HEOR uses data from both economic and clinical research to assess the clinical and economic value of new treatments. Many medical writers have the underlying skills required to incorporate HEOR concepts into their work but need more background to do this comfortably. This article provides an introduction to health economics study design, key terms, and commonly used outcomes research approaches. It also describes how health economics writing resembles and differs from traditional medical writing. It briefly explores the present and future role of HEOR in US health policy.

Fundamentally, health economics and outcomes research (HEOR) consists of two areas: analyses that attempt to estimate the economic effect of a specific intervention before it is implemented, and outcomes research or tools used to assess the economic and/or quality-of-life value of an ongoing or anticipated intervention. Health economists evaluate the economic and clinical aspects of health and health care provision, with a focus on the costs (otherwise known as inputs) and the consequences (outcomes) of health care interventions. Outcomes research evaluates the effect of health care interventions on patient-related clinical, humanistic, and economic outcomes. Pharmacoeconomics, a subdiscipline of health economics, is used to estimate the value of pharmacy costs and services.1,2

Many organizations use health economics data. For example, private insurance plans use health economics information to determine which drugs will be covered, under what circumstances, and at what price level. Health care purchasing agents (for example, in hospital settings) may use health economics data to guide durable equipment purchase choices.2 National health care systems in many European nations have long used health economics information when determining whether treatments are eligible for coverage. The United States, on the other hand, has only more recently started to acknowledge the role of health economics.2,3

Because of the progressive rise of health care expenditures, HEOR analyses are being given closer attention in the United States. For some time, health care costs have been rising at more than the average rate of inflation, and it has been estimated that US health care costs will continue to rise at an annual rate of more than 6% between now and 2020.4 These rising expenditures are driven, in part, by increased rates of chronic disease, as well as a heightened volume of care (in which new treatments are introduced, expanding the spectrum of care but without replacing existing treatments).5

**TYPES OF HEALTH ECONOMICS RESEARCH**
At the most basic level, health economics analyses assess the cost differences between two alternative treatments. Table 1 lists and briefly describes some of the most common types of health economics analyses. It is important to understand how cost estimates are categorized. The common categories are direct medical costs, direct nonmedical costs, indirect costs, and intangible costs (Table 2). Box 1 defines two common concepts used in cost-effectiveness analyses (CEAs) and cost-utility analyses (CUAs): the incremental cost-effectiveness ratio (ICER), and the quality-adjusted life-year (QALY). The most common format for presenting HEOR results is the retrospective database analysis. These analyses evaluate health care utilization as it occurs in routine clinical care. Typically, these studies obtain information from patient databases (maintained by payers and other organizations). In this way, these studies can track a large number of patients over time. It is a relatively inexpensive way to evaluate the effect of treatment at the population level.1,2

There are two other concepts to keep in mind when reading and evaluating health economics literature: discounting and sensitivity analyses. “Discounting” is a method to adjust...
future costs and benefits (in particular, those occurring over periods longer than 1 year) to their present economic value. Discounting is a common practice in multiyear economic analyses. Typically, future costs are discounted between 3% and 5% annually. Discounting should not be confused with upward price adjustment for inflation, which is also commonly performed in retrospective studies lasting more than 1 year.1,2

Additionally, sensitivity analyses are often incorporated into HEOR evaluations. A sensitivity analysis assesses the effect of uncertainty on an economic analysis or decision. It is a widely accepted way to verify the strength of the results. In a sensitivity analysis, selected assumptions underlying the analysis are altered to see how this affects overall results. For example, if the initial study protocol assumed a mortality rate of 3% with a particular treatment, investigators might rerun the analysis with mortality rates of 1% and 5%.1,2 Other variables that might be subject to sensitivity analysis include drug costs, length of hospital stay, or treatment duration.

One final requirement of a successful health economics analysis is the a priori identification of the study’s perspective. In HEOR, the term perspective refers to exactly which costs, or “whose costs,” will be measured based on the purpose of the study. For example, if the perspective is that of the payer (an insurance company or national health care system), the analysis is likely to consider direct medical costs that accrue to the health plan over the short or long term. If the analysis is assessing costs to a hospital, an institutional perspective would be appropriate. In this case, evaluation would typically be limited to the direct costs associated with treatment and/or costs due to preventable readmissions.

<table>
<thead>
<tr>
<th>Table 1. The Most Common Types of Health Economic Analyses1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost-consequences analysis (CCA)</strong></td>
</tr>
<tr>
<td><strong>Example:</strong> A CCA could be used to compare two drugs to prevent transplant organ rejection in a hospital setting. To accomplish this, the study must determine costs associated with key inputs (eg, drugs, rejection treatment, graft survival/dialysis), as well as the probability of consequences associated with both treatment approaches (eg, rejection).</td>
</tr>
<tr>
<td><strong>Cost-minimization analysis (CMA)</strong></td>
</tr>
<tr>
<td><strong>Example:</strong> A CMA could be used to compare the hospital costs associated with inpatient versus outpatient care of pregnant women following the administration of prostaglandin E2 gel to stimulate labor. This analysis assumes that patients have the same outcomes, regardless of treatment, and direct cost comparison is the primary goal.</td>
</tr>
<tr>
<td><strong>Cost-effectiveness analysis (CEA)</strong></td>
</tr>
<tr>
<td><strong>Example:</strong> A CEA could be used to compare three different ulcer treatments, each with varying annual costs and projected healing rates. To make the study results meaningful for clinicians, outcome units unique to the study (eg, gastrointestinal symptom–free days) are often applied.</td>
</tr>
<tr>
<td><strong>Cost-utility analysis (CUA)</strong></td>
</tr>
<tr>
<td><strong>Example:</strong> Two oncology drugs could be evaluated by using a CUA to determine how their cost, associated months/years of life gained, and/or effect on patient quality of life interact. By taking patient outcomes and preferences into account, a CUA provides a more comprehensive, but still cost-based, understanding of the drugs’ effects.</td>
</tr>
<tr>
<td><strong>Cost-benefit analysis (CBA)</strong></td>
</tr>
<tr>
<td><strong>Example:</strong> A health authority could use a CBA to project whether a vaccination program is likely to lead to an improved cost-benefit outcome versus not implementing the program.</td>
</tr>
<tr>
<td><strong>Budget impact analysis (BIA)</strong></td>
</tr>
<tr>
<td><strong>Example:</strong> A health plan might use a BIA to assess how much it will cost to treat multiple myeloma patients with Drug A compared with Drug B. The study would measure the net cumulative direct costs of treatment for a given number of patients in a specific population.</td>
</tr>
</tbody>
</table>
It is also important to mention the societal perspective. This approach is considered the most comprehensive method to evaluate a program from a health economics viewpoint, although it is most applicable where health care is nationalized. The societal perspective is not widely applied in US studies. This perspective incorporates all the cost considerations discussed above but also considers the direct and indirect treatment-related costs that patients and society must bear, such as copayments and financial losses due to decreased productivity.

**THE ROLE OF MODELING IN HEOR ANALYSES**

Health economics research is heavily dependent on modeling techniques. Some modeling approaches require a computer and dedicated software, whereas others are more straightforward. The creation of a decision tree is a common first step in model design (Figure 1). A decision tree provides a framework to systematically compare different decision options and subsequent potential patient outcomes.

In this example, Figure 1 compares two treatment options for pressure ulcer (Treatment A and Treatment B). Immediately after treatment application, three disease states are possible (epithelialized, proliferative, or necrotic wound). Over time, three outcomes are possible (closure, granulation, or an ongoing chronic wound). In a more detailed decision tree, probability data for the three final outcomes would also be displayed on the tree branches. This image depicts a straightforward decision tree and represents a situation in which treatment options, duration of therapy, and timeframe under consideration are limited. The condition of the wound and the outcomes of treatment can be easily classified into a manageable number of states.

However, this type of model would not be feasible in situations in which multiple treatment options and multiple patient outcomes are possible (for example, when assessing the effect

---

**Table 2. Cost Categories**

<table>
<thead>
<tr>
<th>Cost Category Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct medical costs</td>
<td>• Medications</td>
</tr>
<tr>
<td></td>
<td>• Medication monitoring</td>
</tr>
<tr>
<td></td>
<td>• Medication administration</td>
</tr>
<tr>
<td></td>
<td>• Patient counseling and consultation</td>
</tr>
<tr>
<td></td>
<td>• Diagnostic tests</td>
</tr>
<tr>
<td></td>
<td>• Hospitalizations</td>
</tr>
<tr>
<td></td>
<td>• Clinic visits</td>
</tr>
<tr>
<td></td>
<td>• Emergency department visits</td>
</tr>
<tr>
<td></td>
<td>• Home medical visits</td>
</tr>
<tr>
<td></td>
<td>• Ambulance services</td>
</tr>
<tr>
<td></td>
<td>• Nursing services</td>
</tr>
<tr>
<td>Direct nonmedical costs</td>
<td>• Travel costs to receive health care (bus, gas, taxi)</td>
</tr>
<tr>
<td></td>
<td>• Nonmedical assistance related to condition (eg, Meals on Wheels, homemaking services)</td>
</tr>
<tr>
<td></td>
<td>• Hotel stays for patient or family for out-of-town care</td>
</tr>
<tr>
<td></td>
<td>• Child care services for children of patients</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>• Lost productivity for patient</td>
</tr>
<tr>
<td></td>
<td>• Lost productivity for unpaid caregiver (eg, family member, neighbor, friend)</td>
</tr>
<tr>
<td></td>
<td>• Lost productivity because of premature mortality</td>
</tr>
<tr>
<td>Intangible costs</td>
<td>• Pain and suffering</td>
</tr>
<tr>
<td></td>
<td>• Fatigue</td>
</tr>
<tr>
<td></td>
<td>• Anxiety</td>
</tr>
</tbody>
</table>

**Box 1. Key Concepts: the ICER and the QALY**

<table>
<thead>
<tr>
<th>ICER: Incremental Cost-Effectiveness Ratio</th>
<th>QALY: Quality-Adjusted Life Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ICERs can be used in cost-effective analyses and cost-utility analyses.</td>
<td>• QALYs are typically used in cost-utility analyses.</td>
</tr>
<tr>
<td>• The ICER is the ratio of the difference in cost, divided by the difference in outcomes.</td>
<td>• A QALY combines in a single measure gains or losses to both quantity of life (ie, mortality) and quality of life, for each treatment option.</td>
</tr>
<tr>
<td>• It answers the question, “How does one treatment compare with another in terms of costs and outcomes?”</td>
<td>• The QALY equation assumes that 1 year of life lived in perfect health is worth 1 QALY.</td>
</tr>
<tr>
<td>• If the ICER calculation leads to a negative number, one treatment is “dominant” (ie, more effective and less expensive) compared with the other. If the ICER is positive, other factors must be taken into consideration to determine which treatment is preferable in which circumstances.</td>
<td>• The use of this single, common measure enables comparisons of outcomes across multiple studies, and even multiple disease states (for example, for resource allocation decisions).</td>
</tr>
<tr>
<td>• QALYs are most applicable to research or population-based decision-making; they do not translate very well for day-to-day or individual patient decisions.</td>
<td>• QALYs are most applicable to research or population-based decision-making; they do not translate very well for day-to-day or individual patient decisions.</td>
</tr>
</tbody>
</table>
of different treatments over time in patients with type 2 diabetes). In such cases, a more sophisticated approach, such as a Markov model of disease progression, is more appropriate. Markov models are useful in situations in which patient risk is ongoing over time, multiple outcomes are possible, event timing must be considered or cannot be predicted, and disease-related events (e.g., a myocardial infarction) may occur more than once.

Markov models are programmed using a theoretical patient cohort; these data are often obtained from clinical trials. Within the model, it is assumed that a patient is always in one of a finite number of discrete health states. Patient “events” take place when a transition occurs from one state to another, and the model typically concludes for all patients in death or some other predetermined endpoint.\(^7\) Figure 2 shows a basic representation of a Markov model, in which patients can move from asymptomatic disease to disease progression to death—or can transition back and forth between asymptomatic and progressive disease.

### DATA SOURCES FOR HEALTH ECONOMICS ANALYSES

The accuracy of any health economics analysis is dependent on the quality and applicability of study data. The primary inputs used in HEOR analyses are clinical outcomes, their associated costs, and patient preference information.

Often, clinical outcomes and cost data are obtained from clinical trials of the treatment in question. Economic evaluations may be conducted simultaneously with clinical trials. However, when this is not feasible, investigators must rely on the published literature, existing databases, and even expert opinion (in cases in which limited evidence is available) to identify appropriate inputs. One of the greatest challenges in identifying appropriate cost data is determining whether the information available is generalizable to the patient population being evaluated.\(^7\)

Data sources can include clinical trials conducted by other investigators, medical records, or reimbursement claims.\(^8\) Costs can also be estimated by using standard reimbursement information, such as that available from the Centers for Medicaid and Medicare Services for diagnosis-related groups (DRGs), or via databases that track hospital charges and costs.\(^2\) One such database is the Agency for Health Quality and Research’s Healthcare Cost and Utilization Project (HCUP). HCUPnet, at [http://hcupnet.ahrq.gov](http://hcupnet.ahrq.gov), is a free, online query system that provides diagnosis- or procedure-specific data for US hospital inpatient and emergency departments, as well as associated hospital charges and costs.\(^9\)

Health economics cost-utility analyses also use data points know as utilities. A utility is a measure that assesses patients’ or other stakeholders’ preferences for an outcome. Typically, it is expressed as a value between 0 (representing death) and 1 (representing perfect health). As an example of the utility concept, patients facing dual lower-extremity amputation might rank their utility at 0.2. On the other hand, patients with moderate seasonal allergies might assign a utility of 0.9 to their condition. Utilities may also be calculated from another perspective in cases in which input from another source (such as the treating physician) is relevant. In essence, utility measures provide a way to quantify qualitative input to provide summary scores that
consider both the positive and negative aspects of treatment on health and quality-of-life outcomes.11

Utilities often overlap with patient-reported outcomes (PROs), although the terms are not synonyms. PRO is an umbrella term for input provided directly by patients regarding their treatment preferences. Typically, PRO instruments rely heavily on qualitative input for development, but are subsequently translated into a validated numeric scoring system.12 Information sources for PROs can include assessment tools that capture information on patients’ global impressions, functional status, well-being, symptoms, treatment satisfaction, health-related quality of life (HRQoL), and treatment adherence. PROs are increasingly common in economic and clinical research, with multiple instruments (both disease-specific and designed to assess general health) being developed and validated.13 Because patient preferences can substantially influence whether a treatment is properly used or adhered to, payers and regulators are recognizing the value of PROs in drug development. Likewise, drug developers are recognizing the potential for PRO information to improve their products’ competitive profiles and likelihood of formulary acceptance.14 In acknowledgment of the increased relevance of PRO data in clinical research, the US Food and Drug Administration published guidelines in 2009 for the use of PROs in medical product development.15

THE ROLE OF THE MEDICAL WRITER IN HEOR

The HEOR field has visibly expanded in the United States in recent years. Numerous journals devoted to the health economics literature have emerged, targeted to managed care plan executives, pharmacy benefit and formulary managers, government officials, and other key decision-makers. Examples of journals in the field include Health Economics, Journal of Health Economics, Journal of Managed Care Pharmacy, and Value in Health. It is also becoming common for pharmaceutical and device companies, as well as health insurance companies, to have internal HEOR departments. Typically, however, a substantial proportion of the writing and other professional HEOR work of these organizations is outsourced.16 Academia generates a huge number of HEOR analyses, most often through programs affiliated with pharmacy and/or public health.

Figure 3 illustrates the growth in HEOR-related medical writing over the past 20 years. This image is based on a PubMed search conducted to track the number of published studies with the term “cost-effectiveness” in the title (search term 1992:2012/pdat AND cost-effectiveness/title). Growth has been quite steady, with only 139 publications in 1992 and 1,045 for 2012.

Health economics writers almost always bring value beyond writing skills to an HEOR project. Beyond medical writing capabilities, there are some additional skills an HEOR writer should possess. These observations are based on my 7 years of work in this field. First and most important is a willingness to work directly with numbers. Health economics writers are often presented with raw data or data that must be reviewed closely, double-checked, and formatted before any writing begins. Second, it is not unusual for an HEOR writer to have to fully understand the primary study data. This is because, compared with analyses of clinical trials, health economics analyses are likely to have fewer authors who comprehend the mathematical aspects of the work. Third, a concise writing style is also important, because an additional, documented challenge to preparing HEOR analyses for publication is the need to report cost-related items (that would not be required in a purely clinical study) in the methods section of a document.17

HOW HEALTH ECONOMICS INFORMATION IS USED IN THE UNITED STATES

The 2009 American Recovery and Reinvestment Act provided funding to set priorities for comparative effectiveness research (CER) in the United States. The Patient Protection and Affordable Care Act (PPACA), passed in 2010, created the Patient-Centered Outcomes Research Institute (PCORI). PCORI’s mission is to commission evidence-based research that enables patients and providers to make informed decisions about the range of available preventive and treatment options for any condition.18,19 However,
a stipulation in the Affordable Care Act specifies that PCORI could not develop or employ any instrument with a dollar per QALY approach to set a threshold on which interventions are considered to be cost-effective. This only applies to the federally funded PCORI program; private insurers are free to adopt their own standards or approaches.

Peter Neumann, ScD, a professor of medicine at Tufts University, wrote in a 2012 article that the current health care conversation in the United States “allows little space for cost concerns. It ignores resource constraints and has an unreal, wishful quality to it, as though skydivers could defy gravity by cleverly talking their way around it.” He noted that no key stakeholders have yet been willing to acknowledge that getting a handle on cost growth will require uncomfortable trade-offs.

Why is there so much resistance to the use of health economics data in the United States? Perceptions have long existed that US health care resources are not really constrained, although this outlook is changing. There is also substantial political resistance to the use of HEOR in decision-making. Additionally, a lack of trust between payers (insurers) and manufacturers (pharmaceutical/device companies) is a concern. It has also been noted that an overemphasis on health economics requirements might harm innovation or affect the development of new medical technology (where a higher price typically goes hand-in-hand with advancement). Last, there are genuine concerns that health economic information is not currently being developed in a timely and transparent way, and that many key decision-makers lack the expertise to prepare, review, communicate, or fully understand findings from health economics research. These discussions are ongoing, with multiple stakeholders trying to determine the best way to make HEOR communications more straightforward.

A step toward optimizing the reporting of HEOR publications was recently taken by the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) with the publication of their Consolidated Health Economic Evaluation Reporting Standards (CHEERS). This document consolidates input from multiple prior publications (timeframe 1996 to 2011) into a single standard and provides detailed recommendations and a checklist for the appropriate reporting of HEOR data for publication.

CONCLUSION
Each health care decision made by an individual or institution has clinical and resource implications. Health economics research helps health care purchasers and consumers understand not only the clinical efficacy and safety of treatments, but their overall value in terms of cost and patient preferences. In this way, health economics is broadening our concept of evidence-based medicine and guiding us toward improved decision-making. HEOR analyses are an increasingly common component of clinical research and an emerging area of specialization in medical writing. It is likely that most medical writers will be exposed to HEOR concepts as part of their professional work; therefore, it is important for them to be familiar with HEOR concepts and terminology.

– For readers interested in learning more about HEOR concepts and practices, references 1, 2, 3, 9, 12, and 17 are highly recommended as additional reading.

Author disclosure: The author notes that she has no commercial associations that may pose a conflict of interest in relation to this article.

Author contact: rothermel@me.com

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**THE ILLUSION OF CERTAINTY AND THE CERTAINTY OF ILLUSION: A CASE STUDY OF MISUNDERSTANDINGS IN SCIENTIFIC ARTICLES**

By Tom Lang, MA

Tom Lang Communications and Training International, Kirkland, WA

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**ABSTRACT**

Critical thinking is necessary to properly edit a scientific article. However, in addition to questions about the language, we can also question the assumptions, documentation, and implications of the research in a process I call “analytical editing.” A text with unverified assumptions, missing documentation, and unconsidered implications can lull readers into believing that they understand an article when they do not, creating the “illusion of certainty.” Here, I present an example of the analyses needed to understand a single sentence—a case study, if you will, of analytical editing. A close look at the sentence raises several important questions about meaning, measurement, statistical analyses, presentation of data, and interpretation of results. Analytical editing requires a knowledge of several topics: the principles of measurement; research designs and activities; statistical reporting and interpretation; sources of error, confounding, and bias; and specialized forms of data display, such as receiving operating characteristics curves, Kaplan-Meier curves, and life tables. Substantive editors who can add analytical editing to their services—the learning curve is not that steep—can greatly increase both their professional skills and their value to authors.

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**“The single biggest problem in communication is the illusion that it has taken place.”**

– George Bernard Shaw

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Science is based on writing. Only writing allows science to be recorded, evaluated, and reproduced and enables it to be systematic, cumulative, and public—the characteristics that distinguish science from authority, intuition, and tradition as a way of establishing “truth.” Publication—the final stage of research—depends on writing, as does evidence-based medicine, which is literature-based medicine.

Given the importance of writing in understanding and advancing science, one would think that physicians and researchers would be given full support in preparing publications. However, at least in clinical medicine, such support is often inadequate, even in the United States, and especially in developing countries. Researchers are not expected to do their own literature searches and so are given access to librarians. They are not expected to do their own data analysis and so are given access to statisticians. They are not expected to render their own graphs and drawings and so are given access to medical illustrators. But for some reason, we expect them to do their own writing—to communicate technical information accurately, completely, clearly, and economically, in words, numbers, and images—without specific training and often without the support of professional medical writers and editors. Thus, we shouldn’t be surprised that a large portion of the scientific literature is not immediately, accurately, and completely understandable.

One of the most important lessons I have learned in almost 40 years of editing is that the certainty we believe we have about understanding even a simple, straightforward sentence is often illusory. The sense of certainty is so strong that we don't even think to question our assumptions about what such a sentence means. Only on closer examination does the illusion become apparent. Furthermore, such sentences are found in most scientific articles, which is to say, these illusions are also a certainty in the scientific literature.

I encountered a good example of a sentence in which the actual meaning differs remarkably from its apparent one. In this article, I pose some questions that should be answered if this sentence is to be understood correctly. These questions are part of what I call “analytical editing,” or editing to ensure that research designs and activities are documented appropriately and explained adequately. Analytical editing seeks to meet the needs of evidence-based medicine by making sure the evidence itself is completely and clearly reported. Analytical editing does not require us to know medicine. It does require that we know how medical research is conducted—or at least what questions to ask about the research—as well as the standards to which this research should be documented. A task often left to peer reviewers, analytical editing can be done by trained editors and, in conjunction with traditional substantive editing, can increase the professional skills of editors and provide added value to authors.
THE EXAMPLE
This sentence was in the results section of a poorly written abstract: “One group of patients was significantly less depressed than the other.” The sentence seemed straightforward, but the more I analyzed it, the more questions I had.

THE QUESTIONS
Question 1: What is the context of the sentence?
The sentence was the second in the results section of the abstract. Taken by itself, the sentence could have been a description of the patients at baseline, an incidental finding that might confound the results, or a result itself. Given the context of the article—a study of a new antidepressant—it was probably the result of the study.

Meaning is a product of message and context, in the same way that the meaning of a picture is a product of image and background (Figure 1). Change the context, and the same message has a different meaning. “The wall was built to scale” means something different to an architect than it does to a climber. For this reason, the context of every scientific article needs to be clear to rule out other interpretations made possible by different contexts. One function of a good introduction is to put the research in the proper context.

Question 2: Who was studied?
The article stated that the participants were female outpatients with moderate-to-severe depression being treated at a university hospital. The two groups mentioned in the sentence were the treatment and control groups of the study, so the sentence could have said, “Patients in the treatment group were significantly less depressed than were patients in the control group.” We also need to know the ages and diagnoses of the patients, how they were selected for the study (the sampling method and eligibility criteria), other health conditions, and so on.

How the sample size was determined also needs to be explained. Especially in randomized trials, sample size should be determined with a power calculation. Basically, a power calculation tells investigators how many patients they must enroll in a study to have, say, an 80% chance of detecting a difference of a given size if such a difference actually exists in the population from which the sample was taken. Investigators rarely get a chance to study an entire population. Instead, they have to study a sample of that population. However, there is a chance that the sample won’t include people who express the difference of interest, a problem called “sampling error.” The power calculation estimates the size of the sample likely to be large enough to include patients that express the difference at a degree of uncertainty acceptable to investigators.

In “underpowered” studies—studies that did not enroll enough people to detect the desired difference—the lack of a statistically significant difference doesn’t mean the groups are similar; it means the study was inconclusive. As the saying goes: “Absence of proof is not proof of absence.” The difference of interest is usually the smallest considered to be clinically important, so we have to determine this difference and whether the study enrolled enough patients to have a reasonable chance (often 80% or 90%) of detecting it.

Question 3: What was studied?
Depression can be treated in several ways, so the treatment needs to be described in detail. If the treatment is a drug (as it was in this example), we need to know the generic name, manufacturer, dosage, and route of administration, and perhaps the indications, possible side effects, and the degree to which each group took the medication as planned. The rate of protocol adherence is usually higher in inpatient studies than in outpatient studies, for example.

Question 4: How was depression measured?
All study variables must be defined in objective, measurable terms. In this case, we need to know how depression was measured. Was it based on a physician’s judgment, a self-report questionnaire, or some other way? The text said that all patients completed the Beck Depression Inventory before and after treatment. The Beck Depression Inventory is a common, validated instrument for measuring depression. This information was encouraging. Many authors do not say how they measured their variables, often because “my readers will know.” Right.

Question 5: What type of comparison is being made?
In a study with two groups in which both pre- and post-treatment values are measured, two comparisons are possible. The within-group comparison looks at the changes between pre- and post-test values for each group, whereas the between-group comparison looks at the differences between groups at the beginning or end of the study. In a study like this one, both

Figure 1. The “figure-ground” effect that becomes apparent from trying to make sense of this image is similar to what happens when we interpret a written message in different contexts. The context determines the meaning to some extent.
comparisons are likely. However, the sentence in question says that one group was less depressed than the other, so we have to ask whether the statement refers to a between-group comparison—at the end of the study, mean depression scores in one group were lower than the mean of those of the other (and presumably the baseline scores were similar)—or a within-group comparison—the change in depression scores during the study was greater in one group than in the other (and the baseline scores were not necessarily similar).

**Question 6: How large was the difference between groups?**
The authors reported “the mean depression score of the treatment group was 38% lower than that of the control group.” Fine, but results expressed only as percentages are always suspect. Numerators and denominators should always be available for all percentages.

There is an old laboratory joke about how 33% of the rats lived, 33% died, and the last one got away. It is also usually true that a 50% reduction from 2 to 1 is not the same as a reduction from 2,000 to 1,000. Hence, the need to provide numerators and denominators when reporting and interpreting percentages.

Mean values can also be a problem. If Bill Gates walks into a room, the average income of people in the room skyrocket, but nobody makes any more money. Here, it is possible that the lower mean depression scores represent not an overall decrease in the severity of depression but rather an effect caused by a few patients who responded unusually well to treatment (Figure 2).

**Question 7: What does the author mean by “significantly”?**
In medical writing, significant should be reserved for its statistical meaning, but the term is still often used to mean markedly or substantially. An accompanying P value or a 95% confidence interval usually indicates that the term is used for its statistical meaning, but not always. In the present example, significant was used in its statistical sense.

The most common reporting error in medical articles is confusing statistical significance with clinical importance. Relying on P values to interpret results is often easier than considering whether a result is clinically important. However, even when used appropriately, P values themselves must be reported correctly. We need to know the actual P value (P = 0.03, not P < 0.05); the alpha level (usually 0.05) that defines the threshold of statistical significance; the statistical test used to calculate the P value; whether the assumptions of the test have been met by the data (eg, whether the data are normally distributed); whether the test was 1- or 2-tailed; and the statistical software program used in the analysis (to establish its validity). Returning to the manuscript at hand, had the authors said something like “One group was less depressed than the other (P = 0.02),” we would have known that “significant” was used in its statistical meaning.

**Question 8: How precise is this estimate of the difference?**
The results of most biomedical studies are, in fact, “estimated effect sizes,” and estimates require a measure of precision. In medicine, this measure is usually the 95% confidence interval. I think of the interval as being the range in which the mean difference is expected to occur in 95 of 100 similar studies and in which the difference would be outside the range in the remaining 5 of the 100.

Confidence intervals are useful because they keep the interpretation focused on the effect size and therefore on the medicine, not the P value. Confidence intervals that contain both clinically important and clinically unimportant values (“heterogeneous” intervals) suggest that, even if the difference in means is statistically significant for the current trial, the estimate is probably not precise enough to conclude that the treatment will likely be effective in 95 of 100 similar trials. In other words, the result is clinically inconclusive.

Typically, larger samples provide a more precise estimate (a narrower confidence interval). What is important is not the width of the confidence interval, however, but its “homogeneity.” When the confidence interval contains only clinically important values, or only clinically unimportant values, then we have a more definitive answer to the research question.

Ideally, the authors would have written something like: “The difference between means was 3 points (95% confidence interval, 1.5 to 4.5 points).” But they didn’t.

**Question 9: What is the measurement scale for depression?**
The Beck Depression Inventory is a scale that runs from 0 to 63 (Figure 3). Scores of 0 to 10 indicate normal or no depression; 11 to 20, mild depression; 20 to 28, moderate depression, and 30 to 63, severe depression. So, the

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**Figure 2.** The results of a study can appear quite different depending on whether the outcome is reported as a change in group means or as the number of patients in whom change occurred. Here, the large change in patient A has had a disproportionate effect on the group mean. Thus, the data can be reported either as the fact that the mean decreased by 14%, from 11.6 to 10, or that 67% of the patients had increased values. (Of course, the 67% is only 2 of 3, but it’s still 67%.)
3-point difference between means, and its 95% confidence interval, has to be interpreted accordingly.

When we know the scale, we can also infer something about the baseline values. Remember, the text said “All patients completed the Beck Depression Inventory before and after treatment.” It is reasonable to conclude, then, that all women had Beck scores of at least 20 at baseline, and we hope the text will confirm this fact. The results are reported as the means of the posttreatment Beck scores, but it would be nice to know the mean baseline values of both groups. In some studies, if mean baseline values are close to normal, even the best treatment may show little effect because the range over which the means can drop is limited.

**Question 10: What is the smallest clinically meaningful difference?**

When reporting and interpreting results, the effect size (say, the differences between means) is usually more important than the $P$ value. The effect size can be interpreted clinically, whereas a $P$ value cannot.

The authors revealed that after the intervention, the difference between the means of the treatment and control groups was 3 points. However, “a difference, to be a difference, must make a difference.” The “critical effect size” (the minimum clinically important difference) for the Beck Inventory was not given. (It appears to be about 5 points. More on this later.)

What are we to make of this 3-point difference? Does it matter whether the difference crosses one of the threshold scores that define a different degree of depression? Does it matter whether the difference occurs at the low end or high end of the scale? Pain measured on a 10-point scale may be nonlinear; that is, a reduction from 9 to 8 may be greater than a reduction from 4 to 3. We don’t have to know whether the scale reflects a linear relationship among scores—we just have to ask authors if it is (Figure 3). Don’t be surprised if they don’t know.

**Question 11: What were the actual mean values of both groups?**

Now the illusion became apparent. A table showed that the mean score was 5 in the treatment group and 8 in the control group. These values are consistent with the 3-point difference between means and with the 38% lower score of the treatment group ($8 - 5)/8 = 0.38$). However, both means are in the normal range (scores less than 13; Figure 4), so describing the result as “one group is less depressed than the other” is incorrect and misleading. The scores also differ by less than 5 points, so the difference is probably not clinically important. The authors seemed to have based their interpretation solely on a significant $P$ value, without considering the clinical implications of the results. Remember, confusing statistical significance with clinical importance is the most common error of statistical interpretation in the literature.

**Question 12: What was the proportion of patients in each group who were still depressed after treatment?**

The example compared the means of two groups. However, a common error in clinical research is to report changes or differences in means rather than indicating how many patients got better or worse (Figure 4). It would have been helpful to know how many patients were no longer depressed (that is, had scores of 13 or less) by the end of the study.

The issue here is the “unit of observation.” I once edited a manuscript describing a study of 25 eyes, but it never said how many patients were involved. The unit of observation was eyes, not patients. The primary outcome of interest—the unit of observation—is in the protocol, but, as in the example, how patients responded is often and surprisingly not given.

**Question 13: Is the drug likely to be generally effective?**

Determining the effectiveness of the drug was the purpose of the study. The authors’ claim that “one group of patients was significantly less depressed than the other” was supposed to mean that the drug was effective. These numbers are made up, but they should have written something like: “After treatment, 72% (38 of 53) of the treated patients and 49% (27 of 55) of the control patients scored 13 or below on the Beck Depression Inventory (95% CI for the 23% differ-

![Figure 3. Measurement scales may or may not be linear. A) If the scale is linear, a 3-point change at the high end can mean the same thing as a 3-point change on the low end: The distance between the dotted lines is the same in both rectangles. B) If the scale is not linear, where the distance between the dotted lines in the two rectangles is different, the importance of a 3-point change depends on where that change occurs on the scale. Some scales, like the depression scale in the example here, also have threshold values that have different meanings. In this case, where a score appears can affect its interpretation.](image-url)
ence, 2% to 41%,” but they didn’t. So, given the small effect size (3 points on the Beck scale in which 5 points is the smallest important difference), the lack of a confidence interval for the effect size, the fact that the means of both groups had dropped to the healthy range, and not knowing how many patients were well at the end of the study, it does not seem reasonable to agree with the authors that the drug was effective.

However, we also can’t conclude that the drug was ineffective. The difference was statistically significant, if clinically irrelevant. The drug did reduce the mean of the treatment group from well above 20 to 5, which supports the claim of efficacy, but the mean in the control group may have been reduced to a similar degree. All we can say is that the study was not well conducted, not well reported, or both. But we can now ask the author several important questions—questions that form the basis of analytical editing.

CONCLUSIONS
Not all sentences are this involved, but many are and require analyses as detailed as the example presented here. Analytical editing can take time—and skill, training, and experience. What makes good writing and editing valuable is that they reduce readers’ time, effort, and uncertainty about the meaning of a text, and they prevent the illusion of understanding. The problem is that many scientific articles are poorly written and poorly edited. Worldwide, authors are generally not skilled in communicating technical information and do not receive adequate editorial support, and most journals provide only copyediting. This situation pretty much ensures that readers of the scientific literature will regularly encounter the “illusion of certainty” and therefore must be prepared to accept the “certainty of illusion.”

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References
By now you know that Columbus is the place to be this November, with the AMWA Annual Conference offering an outstanding program that addresses the diverse needs of medical communicators. Even though medical communicators are “word people,” it’s interesting to look at the Columbus conference by the numbers.

81
You can make substantial steps toward completing an AMWA certificate at this year’s conference, which features 79 credit workshops. Two noncredit workshops are also available. Like last year, you can register for as many as four credit workshops. New this year, workshops begin on Wednesday, offering you more opportunity to earn workshop credits while giving you more time to participate in open sessions. Remember that you don’t have to be enrolled in a certificate program to take advantage of the exceptional educational value of AMWA workshops. At least one of these 81 workshops is sure to enhance your knowledge or skills in your specific work setting.

72
With 72 open sessions, AMWA hits a record number of annual conference sessions. And talk about variety! From topics such as health care reform to patient education to safety regulations to cultivating your freelance business, there is a session for everyone. The sessions have been categorized according to subject tracks and the conference schedule planned to enable you to participate in as many sessions in your preferred area as possible. The track with the most sessions is writing/editing (14), followed closely by technology (10), and freelancing and other skills (nine each). Be sure to bring your laptop or computer tablet to participate in the Hands-on Demonstrations! As always, all open sessions are included in the cost of registration.

Two new session types feature informal small-group discussions. With one of these sessions, Round Robin Table Talk, you can choose from four discussion topics and participate in one or two of them within the 90-minute session. See page 64 of the registration brochure for the topics.

The other session, What’s Your Problem? Problem Solving Discussions, is a forum for attendees to ask their most burning question on regulatory writing, freelancing, writing, or editing. Bring your question and let a veteran medical communicator and a small group help brainstorm a solution.

62
Roundtable discussions are popular, and 30 will be held over breakfast on Thursday and 32 over lunch on Friday. Because the roundtable format limits the number who can participate in each topic, many people have been shut out of their preferred choices in the past. This year, 10 roundtables will be repeated, giving more attendees a chance to participate in their first choice of discussion.

12
The number of Annual Conference Committee members, all of whom should be thanked for their tireless efforts to plan an innovative and high-quality program for this year’s conference (see sidebar).

16
October 16 is the last day to register before rates go up! After this date, registration will only be available onsite in Columbus. If you are still on the fence about attending, take a minute to review the materials on the AMWA website that describe the value of the conference as a business decision for freelances or as justification for your employer.

9
Nine posters were accepted for display at the conference. You can preview the posters by reading their abstracts beginning on page 112.
The AMWA Annual Conference is always a great networking opportunity, and this year, you can network in five events that feature free food! Be sure to bring a stack of business cards for the networking receptions on Wednesday and Thursday evenings, the networking lunch on Thursday, the networking breakfast on Friday, and the Annual Business Meeting lunch on Saturday.

The Annual Conference expands to include Wednesday afternoon, giving you a program over 3.5 days. More conference time for your money!

Among the new session types is the Intensive Seminar, which provides in-depth coverage of a topic in an extended time slot (2 hours 45 minutes). Three Intensive Seminars are offered at this year’s conference: Create Visibility and Influence to Fast Track Your Career, The P.A.T.H. from Writer to Consultant, and Seek and Find: NLM PubMed is Only the Beginning.

AMWA is honored to recognize two leading contributors to the medical communication field with the Alvarez and McGovern awards. Gregory D. Curfman, MD, executive editor, New England Journal of Medicine, will deliver the Alvarez Award lecture on Thursday, and Cynthia Baur, PhD, senior advisor for health literacy, Office of the Associate Director for Communication, Centers of Disease Control and Prevention, will present her McGovern Award address on Saturday morning. Both award presentations are sure to be compelling.

Plan some time for fun and enjoy one of two tours on Sunday. Take a trip to the world-famous Columbus Zoo and Aquarium or head out for a walking tour of the vibrant Short North neighborhood (the “art and soul” of Columbus), complete with stops at several restaurants for tastings. Read more about these tours on page 65 of the registration brochure.

All of this adds up to the one professional meeting you don’t want to miss! We’re counting on you to expand your horizons in Columbus!

2013 AMWA Annual Conference Committee
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Attention Chapters
The Greet & Go is back by popular demand! Meet your chapter members at 6:15 PM on Thursday before heading out for dinner. Many great restaurants surround the Columbus Convention Center, but make a reservation to ensure that your chapter can be accommodated. Start your search for a restaurant on the Greater Columbus Convention Center website at www.columbusconventions.com/thearea.php. You can even download an app with restaurant listings, maps, and points of interest.

If you’re looking to meet with your chapter members beyond dinner, reserve space in the Chapter Resource Room at the conference. AMWA has secured this space specifically for informal chapter get-togethers. Gather your chapter colleagues and have a business meeting, an event planning meeting, or a cross-chapter discussion about common issues. The Chapter Resource Room will be open on Thursday, 7:30-8:45 AM; Friday, 12:15-1:45 PM; and Saturday, 10:45 AM-12:00 PM. Space is limited, so you must reserve a time at annual_conference@amwa.org.

Creative Readings Returns
This popular open forum provides an opportunity for AMWA members who dabble in creative writing to share their poems, essays, short stories, song parodies, excerpts from novels, and creative nonfiction with their fellow AMWA members. The purpose is to share and appreciate—not evaluate or criticize—in a comfortable nontaxing environment. This session, scheduled for Saturday, 3:30 to 5:00 PM, is a perfect way to unwind after a busy 3 days of conference activities.

No reservations are required to attend. If you would like to sign up to be a presenter or would like more information about this special event, please send an e-mail message to Creative Readings Host Donna Miceli at dmiceli@comcast.net.
POSTERS ON DISPLAY AT THE
2013 AMWA ANNUAL CONFERENCE

Nine posters were accepted for display at the annual conference. These posters will be on display in the Exhibit Hall area throughout the conference. Conference attendees can discuss posters with their authors during Visit with the Poster Presenters, on Friday, November 8, 7:30-9:00 AM.

Editor’s note: To maintain version control, the abstracts are published exactly as they were submitted; they have not been changed during the copyediting or proofreading processes of the Journal.

CREATIVE TOOLS FOR COLLABORATIVE EDITING
Sara Moreno, Quality Assurance Editor, Red Nucleus, Hamilton, NJ

Introduction: As an editorial department in a small-to-mid-size company focused on creating training materials for the life sciences industry, we faced an editorial challenge across a team-based organizational model and all delivered materials (print, e-learning, mobile learning): ensuring that our editorial process allowed for successful content review for factual accuracy and grammatical consistency.

Methods: The editorial department met to discuss how to best modify the established work procedures to enhance accuracy and consistency across projects. Several workflow models were proposed, but one common thread ran through them all: instituting collaborative editing on projects when possible.

Results: Editorial Notes provide documentation for all of the editorial decisions made during the course of the project. Client style and preferences are captured as well as design decisions. Document sharing and defining editorial terms also helped us to meet this need.

Conclusion: The Editorial Notes for each project allow us to be more organized, efficient, and streamlined. These tools would be helpful to editors working in an agency setting as well as freelancers.

EVALUATION OF INDIANA HEALTH INDUSTRY FOR USE OF MEDICAL WRITERS
Laura Oberthur Johnson, PhD, Medical Writer, OptumInsight, Sheridan, IN

Introduction: Indiana AMWA membership is derived from a diverse health industry. The extent of people involved in medical writing-associated activities in the Indiana health industry is unknown. We conducted a survey or Indiana companies, service groups, and organizations to identify if medical writing activities were used.

Methods: We obtained a list of Indiana health industry members from the Indiana Health Industry Forum. Volunteers from the chapter collected surveys from the health industry members. This cross-sectional survey contains questions regarding various medical writing activities. Chapter volunteers collected the data and analyzed the results.

Results: This study is currently being conducted and results will be presented.

IDENTIFYING THE TYPES AND SEVERITY OF PROBLEMS IN BIOMEDICAL RESEARCH MANUSCRIPTS USING A 14-ITEM SCALE
Jill Delsigne, PhD, Associate Scientific Editor, Department of Scientific Publications, The University of Texas MD Anderson Cancer Center, Houston, TX

Introduction: Assessing the type and severity of errors in manuscripts can help editors set fees, develop training and educational tools, and demonstrate the importance of their work. To the best of our knowledge, no effective instrument exists to evaluate biomedical manuscripts. Our purpose was to develop and validate such an instrument.

Methods: We determined scale items by polling the 20 biomedical editors in our department. Using this information, we created, tested, and subsequently adjusted a prototype scale.

Results: Validation testing of the scale among all editors in our department began in March 2013.

Conclusion: We believe that our scale will be a valid instrument for identifying the types and severity of problems encountered in biomedical writing.
LATE-PHASE CLINICAL STUDIES: TIME TO PASS THE NEW TEMPLATES AND ALIGN WITH THE GUIDELINES
Laura Oberthur Johnson, PhD, Medical Writer, OptumInsight, Sheridan, IN

Introduction: The implementation of revised European Union pharmacovigilance legislation in July 2012 resulted in new European Medical Agency (EMA) post-authorization safety studies (PASS) guidelines, which described protocols and clinical study reports (CSRs). Our objective was to develop enhanced PASS protocol and CSR templates that included additional language to reflect typical study designs used to evaluate safety and other outcomes in real-world settings.

Methods: We reviewed published literature and design-specific documents, including various regulatory and manuscript guidelines for interventional trials and non-interventional studies. Results: Potential text was identified and evaluated for template inclusion. Selected text was associated with corresponding study designs and marked for instructional, required, or optional text.

Conclusion: By aligning PASS guidelines with design-specific text, template quality was improved for regulatory submissions. Furthermore, the publication guideline-associated text in CSR templates enabled authors to identify important content when writing peer-reviewed publications.

LETTING THE PATIENT SPEAK: BEST PRACTICES IN DEVELOPING SHARED DECISION-MAKING COMMUNICATION TOOLS FOR PATIENTS
Lora Arduser, PhD, Assistant Professor, and Mark Eckman, MD, Professor of Medicine; University of Cincinnati, Cincinnati, OH

Introduction: The use of shared decision-making (SDM) tools can educate, activate, and engage patients in their care. This poster describes a SDM tool we are developing for patients with atrial fibrillation (AF).

Methods: We developed decision analytic models to generate patient-specific decision support templates. We then 1) personalized these templates for patients based upon their calculated risk of stroke and major bleeding in order to gather patient’s patients’ personal values for the relevant health states (ie, stroke and gastrointestinal bleeding), and 2) pilot tested with experts in anticoagulation therapy and health literacy to improved the materials. We obtained patient feedback through interviews and focus groups to iteratively make additional improvements.

Results: The results will be presented on the onsite poster.

Conclusion: Our conclusions and final SDM tools will be based on patient meetings that occurred in the spring. We will also include a discussion of benefits and barriers in conducting patient-centered research when creating patient-tailored decision-making tools.

A QUESTION OF STYLE: HOW MEDICINE, SCIENCE, AND SOCIAL SCIENCE STYLE GUIDES DIFFER
Emily Mahan, MFA, Associate Editor, and Sandra Ripley Distelhorst, ELS, Senior Editor; Northwest Health Communications, Vashon, WA

Introduction: Many medical writers also write for science or social science publications. Understanding the key similarities and differences between the style guides of different disciplines can help medical writers move easily from one discipline style to another.

Methods: We compared the most current manuals of 4 commonly used styles (AMA, CSE, APA, and Chicago), identifying which material is common to all, and which is discipline-specific. Using their tables of contents, we quantified the amount of material each style guide devoted to a subject, and then did a side-by-side analysis of their style and ethics sections.

Results: All style guides assume a basic understanding of grammar, and have similar sections on style mechanics (eg, punctuation, capitalizations, abbreviations, spelling), and similar basic ethics information (eg, avoiding plagiarism, copyright). Styles differ with regards to the format of personal and place names, numbers, mathematical expression, statistics, and data display, and vary in their scope and focus with regards to ethics issues, in a way that reflects the most prominent research and publication concerns of the given discipline. AMA’s “ethical and legal” section is far more extensive than that of APA (175/1020 pages and 10/270 pages, respectively), though APA covers issues such as participant rights and researchers’ obligation to publish within other sections. CSE has a “Publication policy and copyright” section, and covers data integrity and author/editor ethical responsibilities within other sections. Chicago has a “Rights, permissions and copyright” section that provides a detailed primer on copyright laws, permissions, and publishing agreements.

Conclusion: Medical writers can use the AMA Manual of Style as their primary style guide for general language, publication, and ethics issues, when writing across disciplines, keeping in mind a few key, manageable differences between style guides. For the more discipline-specific questions (eg, format for nomenclature or data display), one can refer to that point in the relevant discipline’s style guide, without needing to consult it extensively.
Strategies to Address Vaccination and Prenatal Concerns

Heidi Y. Lawrence, PhD, Assistant Professor of Professional and Technical Writing, George Mason University, Fairfax, VA

Introduction: Vaccinations are the cornerstone of efforts to control and protect public health, particularly against childhood diseases. Yet they also garner significant public controversy. From the debunked link between MMR vaccine and autism, to annual questions about seasonal flu vaccine, physicians communicate constantly with patients concerned about vaccination. Pediatricians, in particular, often must persuade hesitant parents to vaccinate children against a wide range of diseases with different health consequences. This poster reports on analyses of interview and textual data conducted to determine the rhetorical tactics used by doctors in controversial medical situations, such as those surrounding vaccination.

Methods: Data include qualitative interviews with physicians and professional publications available in the American Academy of Pediatrics database. Data are analyzed using rhetorical methods, including analysis of rhetorical situation, ethos (credibility), pathos (emotion), and logos (facts).

Results: Analysis of persuasive tactics shows how forms of evidence, value systems, and definitions of health shape persuasiveness of standard medical recommendations. Rhetorical appeals, as demonstrated in the data set, show how doctors communicate about vaccines based on particular notions of risk, benefit, and family/community responsibilities that may not correspond with or account for differences in parent concerns.

Conclusion: This study shows how the methods of rhetoric—or the study of persuasion in public contexts—can be used to examine the arguments doctors and patients produce about controversial issues, with an eye toward remediating controversies and skepticism. Rhetorical analysis demonstrates how medical controversy can be addressed through a deeper understanding of how, why, and under what circumstances scientific appeals fail to be persuasive among certain lay audiences.

UX Design Lessons for Medical Writers

Kristen Hines, Research Author, Canadian Medical Protective Association, Ottawa, ON

Introduction: The field of user experience design (UX) emerged in the late 20th century to help guide product development in a complex and ever-expanding technological landscape. It uses a multidisciplinary approach to address all aspects of a person’s experience with a product or service, and uses a variety of methods and techniques to create an optimal experience for the end-user.

Key Points: As skilled technical communicators, marketers, authors and editors, we already implement many UX design theories, without necessarily recognizing it. Techniques like experience mapping, effective use of voice and tone, and personalization can further help us create targeted and unified experiences for our clients.

Conclusion: Medical writers can benefit from learning more about the principles and strategies of UX design and how these can help us reach our professional goals.
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Q - Have you found there to be an ideal number of regular clients for a freelance? In balancing regular client work with the occasional project, what is the mix that you aim for?

A - There is no magic number of clients for a freelance. I recommend that about 75% of your business be from regular, long-term clients. It's better if this arrangement involves a few regular clients rather than many, because you will build deeper working relationships, and it will be easier to juggle the assignments (e.g., Client A will not want to wait while you complete a project for Client B, but Client A will have to prioritize assignments if you are working on several projects). Setting aside some time for interesting projects with new clients who may or may not turn into long-term clients lets you expand your capabilities and portfolio, whereas spending most of your time working for regular clients keeps your business strong financially.

—Lori De Milto

A - Most of our projects are long-term (i.e., 1 month or more for a journal supplement with multiple articles or a large sales-training project), so our client numbers are different from many freelances who take on less-involved, shorter-term projects. We aim at least eight to 10 regular clients. Some give us four or five projects each year; others contract with us only once or twice per year for a major meeting report and additional communications (a newsletter of highlights from 3 days of sessions, for example).

Each year we add other projects to the mix from new or old clients as requested. Often, one or two of these clients will find us in the AMWA Freelance Directory when they have a special need. Most of the time, they become one-time-only clients, but sometimes they develop into clients who give us regularly scheduled projects.

Needless to say, we are always looking for new business, especially in recent years, as clients retire, expand in-house staff, change directions, merge with other companies, or simply disappear.

We never turn down assignments from either a regular client or a new one, which can result in a temporary work overload, necessitating working nights and weekends. But that is the life of a freelance, and because there are two of us in the business, we can always deliver on time during those occasional overcommitted periods.

—Elizabeth Smith

A - When I launched my freelance business, my goal was to gain as many clients as possible. Having none when I quit my day job, I figured the more, the merrier. Now, 24 years later, I remain convinced there is no ideal number of regular clients.

Work ebbs and flows. Demand in any particular therapeutic area, for any particular audience, and for any particular type of writing, changes continuously. What’s hot today is probably not going to be hot tomorrow. So as freelances, we must be ready for anything. The more regular clients we have, the more protected we are against the vagaries of our industry.

Wanting to be a successful freelance, I knew I needed to achieve a critical mass of regular clients. Merriam-Webster defines critical mass as the size, number, or amount large enough to produce a particular result. The result I wanted was continuous business without having to look for it. It took a few years until one day I realized opportunities were coming in almost daily via phone and e-mail. That’s when I knew I had reached my critical mass.

Of course, critical mass isn’t stable. Sometimes I’m working regularly with five or six clients, and sometimes with only two or three. The point of critical mass isn’t the number of clients, but the amount of work you’re doing. It’s not a good idea to be kept busy by just one client for very long, but sometimes that happens, too.

Although my freelance business achieved critical mass many years ago, I have never stopped marketing. That’s probably why I’ve been able to maintain that critical mass for so long. No matter who you are, no matter how great a job you do, clients come and go all the time. I keep marketing to bring in new clients—the ones for whom I do the occasional project. They’re the clients who, once they experience what a great job I do and realize the value I bring to the table, become the regular clients I cherish.

—Brian Bass
Freelance Rate Debate: Project Fees or Hourly Rates?

How best to charge for freelance services is a hot subject. Many freelance AMWA members espouse the use of hourly rates for projects, but many others favor charging a project rate for assignments. Some do a bit of both, depending on the project and the client. Elizabeth L. Smith, a past president of AMWA, and Brian Bass, AMWA’s president-elect, are experienced freelance medical writers who will debate this important issue during the AMWA Annual Conference in Columbus, Ohio, on November 8, 2013 (Open Session 32). As a warm-up for that discussion, Elizabeth, Brian, and forum member Donna Miceli give their perspectives and detail what they have learned from other AMWA members.

Estimating Project Hours is Crucial

Everyone agreed that estimating time spent on any project is crucial for the writer or editor. Shaler said, “It’s the unexpected hours that can bite you!” She described her process for estimating time to edit a 200-page user guide. She begins with a list of the various tasks involved. “Start with the elements of the book: each chapter, considering its contents (tables, graphs, text headings); the front matter; and the back matter (which might be further broken down into index, endnotes, etc, if it’s lengthy). Then add the peripheral elements such as telephone and e-mail time, reading review comments, etc. Add in any other time you might need to spend: research, for example, or checking references. Carefully estimate the time you believe you will spend on each element and add them up. Now add 30% if really new at estimating or maybe 10% or 15% if you’ve been at this for a while. That’s the number you present to the client as the project estimate.”

When a client submits all the necessary information to construct an estimate, all is well. But, as Tokay pointed out, “If the client can’t supply the information because some of the particulars aren’t known in advance (eg, the number of references to be used for a review article, which will be determined by a literature search and subsequent approval of reference list), then I resort to [setting] ranges. I also supply a list of assumptions used to generate the estimate as well as a list of deliverables with the estimate. I add a statement about how I will make adjustments to the estimate should the assumptions or deliverables change.”

Evans also advocates providing clients with ranges, which include hourly rate and a range of total time. Then, if the client has a problem with the quote, she suggests that they establish a cost ceiling and will advise the client when she has done about 75% of the estimated work to let them know if she will have to go above the ceiling to complete the assignment.

Flora Krasnoshtein also estimates the range of hours involved in a project. “This way,” she wrote, “the clients know what to expect and are not surprised when they receive an invoice.” She prefers to work based on an hourly

Hourly Rates for Regulatory Writing

“Although there are no hard-and-fast rules, regulatory writing is often done on an hourly basis while medical communication [assignments] are more likely done on a project basis,” Tokay wrote. Others agreed. Kathleen Sims charges hourly for regulatory writing and can’t imagine doing anything else: “Every [regulatory] project is so vastly different. A safety summary for one project might be 50 pages, while for the next 500 pages. Adding the agency responses on top of any [regulatory] submission, the project fee [approach] would turn out to be a logistical nightmare.”

Tokay added that “because of the complexity of these documents and the number of reviewers (internal and external), an hourly rate makes good sense. It is often difficult to know exactly what is entailed before you begin, because these documents are heavily dependent on data and data analyses, and sometimes errors are found in both pretty late in the game.” Cathryn Evans, a past AMWA president, concurred, stating that “it is almost impossible to estimate a fixed fee in the face of so many variables which are out of [the writer’s] control.”
rate, noting that she has seldom benefited from project-based fees. "But usually I end up with too many hours that are not covered by the project fee, which results in less than my hourly rate."

Shawn Radcliffe uses both hourly and project rates. He applies the project rate fee to those projects that he has done before (eg, short articles, website copy, e-mail marketing), so he has a good idea of the length of time the assignment will take. He also uses project fees for new or more complex projects that he can plan out in detail. He reserves the hourly rate approach for those clients who do not know what they want (vague projects with high likelihood of changes in scope) or when ongoing support is needed (eg, updating website content regularly or searching for newly published research on an ongoing basis).

What Can Go Wrong with Estimating Writing Fees?
All responders to the query on hourly rates versus project fees commented on those instances in which the fee quoted can be off base. Kris Quart tends to work on a project fee but always with a caveat for additional payment if there is a significant change in scope. "It used to be that, in the long run, the times I made more than my hourly fee by using the project rate balanced out the times I made less."

She described, however, a recent circumstance in which the initial client project manager was replaced and no longer involved. The new project manager had a different idea of how the information should be presented. "I think that at the end of that project, I made close to minimum wage," she wrote.

Advocating for Using Both Approaches
Many medical writers have been victims of "project creep," changes in focus, or project delays caused by clients or authors not meeting established timelines. For these and other reasons, my business partner, Richard, and I use both systems. For our established clients, we continue to use project rates. We outline the assumptions that went into a rate and identify factors that would cause the quoted fee to be increased. This approach works best when the relationship between the writer and the client is well established, when we know and trust each other, and we have a true partners-in-the-project relationship. Things can go off-kilter at times, but when the relationship is strong, we can easily resolve these matters to everyone's advantage.

With newer, unfamiliar clients, I now lean toward applying the hourly fee compensation rate, especially when there is uncertainty on the client side or a lack of initial direction, or when I simply have a "gut feeling" about what would work best. I admit that I have been "burned" by a few clients in recent years, and I have learned my lesson about the challenges of project pricing. For me, the most frustrating aspect of projects can be if there is constant tinkering from the medical education company client before the ultimate client (pharmaceutical, biotech, or medical device company) has input. This is especially problematic when working with people who do not have in-depth experience. Also, it can be time-consuming to educate the client about what can or cannot be done in certain types of projects such as continuing medical education. With the insight gained from those freelance members who responded to my query on this issue, I now see a definite advantage in certain situations to hourly fee arrangements.

BRIAN BASS
To me, the age-old debate of hourly versus project fees is no debate at all. There is certainly a time and place for hourly fees; for example, when you are just getting started in the business (for a short time until you gain experience), or when you are working onsite with a client and the number of hours you are working is obvious to the person buying your services. Otherwise, charging an hourly rate punishes the proficient and rewards the inefficient.

The reasons are simple: (1) There is a maximum hourly rate that companies are willing to pay; (2) most people get better and faster the more they work in a chosen field; and (3) the bottom-line cost is what matters most to the company hiring the freelance writer.

Consider this comparison:

Hourly Rate
A writer starting out may charge $85 an hour and take 50 hours to complete a project, for a total of $4,250, which is acceptable to the client. As the writer gets better, he or she increases the hourly rate to $100, completes the same project in just 30 hours, and earns only $3,000—a 30% cut for being a better writer. In time, the writer becomes even more proficient and increases his or her hourly rate to $125. The same project is now completed in just 20 hours, and the writer earns only $2,500—41% less than when the writer started out and was charging 32% less per hour.

In this scenario, the better you get at what you do, the more you are financially punished, and the harder you have to work to earn the same pay as when you were a less-proficient writer. The client gets a better project, but the writer receives less money for delivering it.
**Project Rate**

A writer starting out charges $4,250 for a project, a rate that is acceptable to the client. He or she takes 50 hours to complete the project, earning the equivalent of $85 per hour. As the writer becomes more proficient, he or she charges $4,250 for the same project, but now completes it in 30 hours. He or she has just earned about $142 per hour, a 67% rate increase. In time, the writer becomes even more proficient. Charging $4,250 again for the same project, he or she now completes it in just 20 hours, earning the equivalent of about $213 per hour! That’s a 150% increase in earnings over when the writer started out, and does not even take into account the increasing value of the project to the client over time, which should enable the writer to increase the project rate and earn even more.

In this scenario, you are rewarded for getting better at what you do, earning a rate I dare say few clients would be willing to pay. You can then choose to either work less for the same income or continue working hard and earn a lot more money.

I believe project pricing is the smartest way to work from a business standpoint, but it is much easier to give your client an hourly rate and let them worry about the budget. In this respect, I use project pricing as a marketing tool. I tell my clients I will stand behind my project estimate no matter how efficient I am, as long as no project conditions change. This instantly erases one of the most important concerns clients have when hiring freelances—their budget. As a result, my clients see me as a partner rather than as merely a vendor, or worse yet, as an expense.

Of course, the challenge of project pricing is calculating the estimate. I start by preparing several estimates for the project using a variety of factors:

- my assumption about what colleagues might charge;
- my experience with similar projects and what I charged for those projects;
- my estimate of the amount of time I expect the project will take;
- and my assessment of how valuable the client will consider the deliverable.

I ask a lot of questions up front to define the scope of the deliverable and identify my client’s expectations. I define the limitations myself if the client doesn’t provide all of the information I need. Everything gets documented in my estimate, so if any part is incorrect, the client will let me know. If the project goes out of scope, I can revise my estimate based on the new specifications. My estimate is usually so buttoned down that my clients incorporate my wording into our contract.

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**DONNA MICELI**

Over the years, I have found that most of my clients have preferred to negotiate a project price for budgeting purposes, particularly with more complex projects, such as book manuscripts, journal articles, white papers, monographs, etc. Obviously, the potential for project scope creep can make this a tricky proposition, especially when you are new to freelancing, or if it is a type of project you have never handled before. There may be no foolproof way to avoid the effects of project scope creep, but there are steps you can take to protect yourself.

You need to find out everything you can about the scope of the project by asking the right questions, beginning with: What is your budget, and what is your deadline? Other important questions you should ask include: Will I be required to attend meetings or participate in phone conferences? If so, how many and will it involve travel? Will I be able to communicate directly with the person who has contracted the project, or will I be getting the information from an intermediary, such as an advertising agency or medical communications company? Will the client provide an outline and the reference materials, or will that be my responsibility? What are the client’s requirements for marking up the references? Will I be responsible for managing the revisions from multiple reviewers? How many revisions should be required? Does the client have samples of similar projects that I can review?

In a perfect world, you would be able to get the answers to all these questions (and others you may think of) before revealing your project price. Unfortunately, that is highly unlikely, especially if you are dealing with an intermediary. You may be pressured to provide a price estimate before you have answers to all of the pertinent questions. Nonetheless, you can protect yourself from project scope creep by providing a written estimate that specifies what services are and are not included in that price quote. For example, you could specify that your price estimate does not include preparing an outline or doing the research. In addition, you should specify the number of revisions and client meetings included. It is important to make it clear that your project price includes only the items listed and that any additional work will either be charged at your regular hourly rate or will require renegotiation of the project price. When clients accept your estimate, be sure they either sign your written document or include the specifics from your document in the contract they provide.
Educational advancement is a central component of AMWAs mission. It is AMWAs educational program that attracted so many of us to the organization, and it is a major factor in why we continue being members. Given this interest in learning, some AMWA members may also be considering university-based programs to deepen their knowledge of communications and further improve their skills. Universities across the country provide offerings that range from certificates to doctorates in both traditional and online formats. Now a few years into my medical writing career, I have found myself back in school while working full time.

Stephen Palmer, PhD, ELS, a fellow AMWA member and current secretary, once described the path to a career in medical writing by comparing us to super heroes. Like Superman and Wonder Woman, we each have unique “origin” stories. This kernel of wisdom has stuck with me ever since. AMWA members join the medical writing community from journalism, communications, or scientific, medical, or health care backgrounds, bringing with them a diverse range of knowledge and experiences. Personally, I received my undergraduate training in biochemistry and my master’s in cell biology. In graduate school, I quickly noticed that—unlike my classmates—I enjoyed mining the literature, presenting papers at conferences, and writing proposals. Soon after graduation, I landed my first job at MD Anderson Cancer Center as a scientific communicator in a basic science research department. What an amazing epiphany I soon had: There was a single career that could combine my two passions—the excitement of discovery inherent in biomedical research and the challenge of communicating complicated ideas in an understandable manner.

After a few years in this role, I found myself wanting to obtain a scholarly foundation in communications theory and strategy. Looking to remedy this knowledge gap, I sought out a doctoral program that would allow me to continue to work full time while pursuing my studies. There are many master’s programs in scientific and health communications, but far fewer doctoral programs (Table 1 on page 122). To my knowledge, there is one doctoral program in communications that is delivered via an online format. It is based out of Texas Tech University.

I know that many are skeptical of the quality that an online graduate program can provide. For certain disciplines, such as the biomedical sciences, I acknowledge that it would be impossible to create a substantially similar experience for on-site and online students because some educational programs require major equipment, supplies, or hands-on learning. In contrast, when reading, thinking, writing, and discussing are the core components of an educational experience, it is possible to match the rigor of an on-site program in an online environment, thanks to the currently available technology.

I am enrolled in the Technical Communication and Rhetoric doctoral program at Texas Tech. It requires 60 hours of graduate coursework, as well as the production and successful defense of a dissertation. The program has five emphasis areas, one of which is called the “Rhetorics of Science and Healthcare.” Although the program does not solely focus on biomedical communication, I find that the diversity in the interests of fellow students provides a unique opportunity to learn about and incorporate theories and practices that are commonplace in other disciplines, such as rhetoric, technical communications, new media, visual design, user experience, public discourse, and culture studies.

The program offers courses that address both the theoretical and practical aspects of communications. Courses of possible interest to AMWA members include:

- Grants and Proposals
- Technical Editing
- Document Design
- Rhetoric of Scientific Literature
- Theory and Research in the Written Discourses of Health and Medicine
- Empirical Research Methods in Technical Communication and Rhetoric
- Writing for Publication

The complete list is available at: [www.depts.ttu.edu/english/tcr/Grad_Courses/grad_courses.php](http://www.depts.ttu.edu/english/tcr/Grad_Courses/grad_courses.php).

Students attend class weekly online via Skype, GoToMeeting or Lync. Additionally, there is a mandatory 2-week intensive seminar course every May, which gives students the opportunity meet the faculty in person and get
to know each other, attend lectures by leading scholars, and work on team-based projects that employ cutting-edge technologies, such as eye-tracking.

Before formally entering the program, I took two courses via graduate temporary status, which provides the opportunity to enroll in courses without a program affiliation. This would be a great option for those who are not interested in earning a degree or for those who are interested in trying out coursework before applying for admission.

The program has connected me with academic leaders of disciplines that overlap with medical writing. For example, Amy Koerber, PhD, my dissertation adviser, recently published a book, *Breast or Bottle? Contemporary Controversies in Infant-Feeding Policy and Practice*,¹ which is the first scholarly examination in the shifting recommendations surrounding breastfeeding during the last half century. A former student of hers, Lora Arduser, PhD, is a faculty member at the University of Cincinnati who will be presenting a poster and moderating an open session at this year’s AMWA Annual Conference. Her poster, “Letting the Patient Speak: Best Practices in Developing Shared Decision-Making Communication Tools for Patients,” is described on page 113 of this issue. The open session is called “Communicating Health Messages: From Narrative to Emotional Appeals to Visuals.”

Now to specific details such as time and financial commitments, which may help you decide if a program such as this one is right for you. Most master’s programs require 30 credits of coursework (10 classes), and doctoral programs require 60 credits (20 classes). Transfer credits from previous graduate degrees may be applied and result in reduced course requirements. I was able to transfer 15 credits from my master’s degree, leaving me 45 credits (15 classes) to complete. In my experience in the program, most students who are working full time can only handle one or two classes at a time. I expect to finish course work in a total of 3 years, taking one class during the long semesters and two during the summer semesters. Outside of class each week, from the beginning through the middle of the semester, I spend approximately 8 hours reading and 2 hours writing. Toward the end of the semester, with the final project due (typically a 5,000 word paper intended for scholarly publication), I may spend more than 30 hours per week researching and writing.

Cost is clearly an important factor in selecting a program. When compiling information for Table 1, I found tuition to be highly variable and contingent on factors such as residency status. At Texas Tech, each 3-credit course costs approximately $1,300 for an in-state student and $2,350 for an out-of-state student. In contrast, each course at University of the Sciences is approximately $4,300 regardless of residency status, and at Johns Hopkins, the course fee is about $3,500.

You may wonder what value an advanced degree in communications will provide if you are already working in the field. Although many of us have graduate degrees in the biomedical sciences and were likely adept communicators before we transitioned away from the bench, few of us—including English majors—have had formal training regarding why certain rhetorical constructs are most effective or are commonplace in the genres of writing that we often produce. Exposure to scholarly articles that use a rhetorical lens to examine biomedical communications has transformed my approach to writing because I have gained an increased understanding of rhetorical theory and strategy.

Several articles have been especially eye-opening for me. Abdullahi Tambul El Malik and Hilary Nesi compare, at the word level, the differential use of two rhetorical strategies (hedging and nominalization) by British authors whose first language is English and Sudanese authors for whom English is a second language.² The study found that the Sudanese authors included less speculative language and persuasive tactics than the British authors, with most of the language of the Sudanese authors focused on evidential claims. Many of us work with authors whose first language is not English; understanding specific variations in writing strategy and construction is therefore valuable.

Celeste Condit examines the rhetoric of race-based medicine used by scientists and clinicians.³ Although she finds the geneticists amenable to using geographic versus race-based language, physicians were adamantly against her rhetorical interventions; they argued that the color-blind approach equates to the whitewashing of medicine and places the blame for health inequities on people and places, not unalterable genetic differences. As writers and editors, we have the ability and responsibility to select the language used in the biomedical literature, which shapes conversations and influences culture at large.

We know from experience that press releases and scientific articles with the IMRAD form (introduction, methods, results, and discussion) are constructed in inherently different manners, but the specific strategies that vary may not be so apparent. Susan MacDonald examines at the word, sentence, and paragraph level how biomedical articles become sensationalized in the media.⁴ MacDonald finds that in press releases, concrete nouns are used at a higher frequency and verbs are enlisted to further the narrative trajectory, which results in a more personalized and interesting article for the reader.

Many AMWA members currently hold advanced degrees, yet many of us continue to seek additional educational opportunities to advance in our current career or to transition into a different discipline. Or, we may simply be lifelong learners. I hope this article detailing my personal experiences studying rhetoric at Texas Tech provides a window into the enlightening and empowering opportunities that graduate education in communications can provide.
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References

Table 1. Programs in Health and Science Communication

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Sources: Coalition for Health Communication [www.healthcommunication.net/CHC/gradprograms/grad%20programs.htm](http://www.healthcommunication.net/CHC/gradprograms/grad%20programs.htm) and Directory of Science Communication Courses and Programs [http://dsc.journalism.wisc.edu/grads.php](http://dsc.journalism.wisc.edu/grads.php). Google searches with the following terms were performed: graduate, program, MA, MS, PhD, science, writing, journalism, health, communications.
OK, so you are a medical writer. You sit down to do a crossword puzzle. Therein is a problem.

The clue given is *dope*. Now, you’re stumped. You could reflexively say *narcotic* or maybe *morphine* or one of several other drugs. But your writing side takes hold, and you think, “But maybe the answer relates to information or a substance added to printing ink?”

Obviously, you decide to skip this one temporarily. You go further. The next clue you see is *kill*. Your medical-legal vocabulary tells you *murder*, but your journalistic side recommends *eliminate* or *cancel*.

Your facility in two languages has gotten in the way. Actually, those of us in the medical field who write or publish have facility in three languages. First, at least in the United States, is English. Second is medical terminology—and those of you who struggled with it when you started out will admit it is a separate language that you had to conquer. Initially, you had to learn *proximal, distal, superior, inferior*, and the like. Then it was *retroperitoneal, tibia*, and maybe *rhabdomyosarcoma* and *cirrhosis*. And if your training and experience in writing and editing did not precede your medical training, you needed to learn another whole vocabulary—such as *bone* (flat piece of bone for folding paper), *bite* (acceptance by a publication of an offering by a publicist, or major quotation or excerpt from an interview), and *bromide* (trite remark).

Now you are competent in three languages, which sometimes get mixed up in your mind. (It does in mine!) And my sympathy goes out to those of you who also know French, Spanish, or another language.

Let’s take a look at some of the words that appear in both medicalese and in communications jargon—just a few to add fuel to the fire. Of course, I need not give the medical definitions.

**Angle of vision**—The angle from which an audience views a film or television screen

**Armpit**—A narrow headline under a wide headline

**Backbone**—The spine of a book

**Bleed**—Printed text that overruns the usual dimensions of a page

**Cell**—A small sample, used in marketing research or a single image in a film

**Cold**—A presentation with little or no introduction or preparation, or a color lacking warmth

**Diaper**—A small, diamond-shaped design, as in bookbinding

**Face**—Appearance or general look of a publication or the surface of a piece of type

**Foley**—Not the catheter (invented by Frederic Foley, MD) but a sound-effects term (named after Jack Foley of Universal Studios) that means adding or replacing a sound

**Head**—The top of a page, or a headline, or the beginning of anything printed

**Lip**—In printing, an edge or margin

**Spine**—The backbone of a hardcover book, or, in typography, the main arcs of the letter S

**Toenails**—Printer’s slang for parentheses

**Treatment**—Tone of an article or advertisement, a story outline, or the method by which a book is turned into a script

Would you like to try a few on your own? How about *cut*? *Brace*? *Ear*? *Doctor*? How did you do?

I tried to leave out confusing ones from radio and television, such as *breathing, gag, optical*, and *gurney*. I even eliminated some that sound like they might be medical, like *bad break, busted head, bump*, and *adhesive binding*.

This exercise may not have added anything important to your education—except that now you know (and can brag) that you are trilingual. Unless, of course, you don’t speak English!

**Acknowledgment**

I am indebted to Richard Weiner, who first introduced me to this concept. He is the author of a fascinating book *Webster’s New World Dictionary of Media and Communications*, from which I derived several of the definitions.

**Author contact:** melnick5050@comcast.net
For years, people measured the influence of scholarly research articles by looking at the number of times they were cited in other articles, or in books or patents. In the absence of other available measurements, the vaunted Impact Factor became the gold standard by which a journal—and the articles within it—were evaluated. Although this method is still heavily used, especially within academic institutions, it is rooted in traditional journal publishing and has important limitations. The Impact Factor and citation counts do not track how an article is discussed, used, and cited within blogs, presentation slides, datasets, or social media. As more and more scientific output is distributed and discussed online, scholarly publishing needs a method to track article and research influence in the online world.

Results from traditional citation and impact analyses do not appear quickly. Citations can take months to begin to emerge, and then, if an article is influential, to build over time. The delay is not surprising: Consider the time that must elapse between a researcher noticing a paper, then including a citation to it in his or her own scholarly writing. It can therefore take a year or two before an important article starts to attract a substantial number of citations. In addition, a traditional journal article may only be cited within scholarly articles within its academic niche. Nonetheless, it may influence specialties beyond. Methods to track the cross-pollination of an article in other subjects have been inadequate.

A journal’s Impact Factor is a calculation of an average (Box 1), so on its own, it does not reveal whether any specific article within a journal has been cited (although such data are available). The underlying formula for determining the journal Impact Factor remains constant, but there can be inconsistencies in how Thompson Reuters, the company that issues the rankings each year, applies that formula—even within a single journal from one year to the next.\(^1\)

The field of alternative metrics, or “altmetrics,” has emerged as a way to measure influence in online communication. Altmetrics tools can determine the number of times an article has been bookmarked (via Digg, CiteULike, Mendeley, etc), cited in a blog post, tweeted, or shared online. Instead of waiting years for citations to appear, altmetrics tools can show the influence of an article or other online communication within hours or days of publication. Altmetrics can track the dissemination of an article across a variety and breadth of online communication methods and readership. The term *going viral* refers to a digital item, such as an article, video, or blog post, rapidly crossing multiple spheres of interest and spreading to seemingly unrelated areas, thereby directly influencing subsequent online discussion and dissemination. Altmetrics can better show the viral nature of research. Will a scientific or medical article ever reach the viral impact of a baby dancing to Beyonce? Who knows, but online research communications do reach

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### About the Impact Factor for Journals

Thompson Reuters issues Impact Factors each June.

The numerator (N) for the calculation is the number of times a journal’s articles from the two previous calendar years were cited in the current year. So, for example, the numerator for calculating a journal’s 2012 Impact Factor is based on citations that appeared in 2012 to articles that were published in the cited journal in 2010 and 2011.

The denominator (D) is the number of substantive articles in the cited journal during the two previous calendar years (eg, 2010 and 2011).

\[ \frac{N}{D} = \text{The journal’s Impact Factor.} \]
Altmetrics can provide information on an article’s reach to the general public; the Impact Factor was never designed to do that.

Other players in altmetrics include Academia.edu (www.academia.edu), which offers a free service for individuals; Altmetric (www.altmetric.com), a British company that offers plans and pricing for individuals, groups, and institutions; and ImpactStory (http://impactstory.org), an open source product, which is intended for individuals, groups, and institutional repositories.

There is no indication that altmetrics will soon replace the traditional Impact Factor. Several people are studying the correlation between altmetrics and traditional impact methods. Priem and colleagues found moderate correlations between Mendeley and Web of Science citations but found other altmetric indicators to be unrelated to citation impact. They also discovered that articles “cluster” into impact patterns. For example, one cluster of articles may be heavily read and saved by scholars but not cited often, whereas another cluster may be heavily read and cited but not shared extensively. Their findings suggest that altmetrics can be useful in capturing different types of impact.

Although the correlation between altmetrics and citation impact depends on the online product, altmetrics can be used to provide a snapshot of the impact and its reach immediately within the medical and science field and beyond that field. As Galligan and Dyas-Correia note, “Many fields, but particularly the sciences, are increasingly pressured to demonstrate how research is relevant to the general public.” Altmetrics can provide information on an article’s reach to the general public; the Impact Factor was never designed to do that.

Altmetrics are still in their infancy, and as online publishing continues to grow, so do the tools we use to measure its reach. Although the Impact Factor is still the gold standard by which we measure an article or research impact, the Impact Factor has its limitations. It fails to measure online communication methods, which researchers, writers, and scientists have demonstrated to be an important method of exchanging important professional information. “New metrics are useful as alternatives to citation-based measure for some purposes,” Priem and colleagues wrote. “They are by no means a replacement. Instead, they should be deployed alongside one another, complementing each other’s strengths.” Using both web analytics and traditional citation factors provides a more rounded view of the writer’s or researcher’s body of work as a whole.

There are, of course, challenges ahead for altmetrics. At his Scholarly Open Access blog, librarian-author Jeffrey Beall warned that “any system designed to measure impact at the article level will be gamed, rendering the metrics useless and invalid.” Two recent newspaper articles capture issues that underscore the challenges. In the Guardian, an article describes “click farms” of low-wage workers who are paid to generate social media likes. In the New York Times, an article describes “socialbots”—automated programs designed to interact online and appear to represent the actions and communication of real people.

The subject of altmetrics is a hotly debated and interesting area to watch. For a wealth of information on altmetrics and its use in medical and scientific writing and research, go to the altmetric Mendeley group, at www.mendeley.com/groups/586171/altmetrics/papers.

Author disclosure: The author notes that she has no commercial associations that may pose a conflict of interest in relation to this article.

Author contact: kraftm@ccf.org

References
Sentence adverbs are a smooth and somewhat sneaky way to inject your opinions into your writing. Editors and readers who can recognize sentence adverbs are thus better equipped to sort fact from opinion.

To understand how sentence adverbs work, you need to understand the difference between an adjunct and a disjunct. In general, an adjunct is something added to another thing but not structurally part of it. In grammar, an adjunct is an adverb or adverbial phrase that is attached to a verb, especially to express a relation of time, place, frequency, degree, or manner. In contrast, a disjunct is an adverb or adverbial phrase that is loosely connected to a clause or sentence and conveys the speaker's or writer's comment on its content, truth, or manner. In short, an adjunct modifies a particular verb, whereas a disjunct provides commentary about a clause or sentence.

Suddenly, it began to rain. (Suddenly is an adjunct modifying the main verb, began.)

Fortunately, it began to rain. (Fortunately is a disjunct expressing the writer's opinion about the change in the weather.)

If you know how to use sentence adverbs, you can omit a lot of needless words. Often, a clumsy expletive construction can be collapsed into a single sentence adverb:

I feel that it is unfortunate that potato chips are fattening.

Unfortunately, potato chips are fattening.

As the table shows, sentence adverbs can help you express many kinds of opinions:

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The sentence adverb is much more concise than the construction that it replaced. However, the loss of the personal pronoun may obscure the fact that the sentence adverb is expressing the writer's or speaker's opinion.

Some people object to the use of the word hopefully as a sentence adverb, presumably because they think that hopefully is dangling. A dangling modifier is a modifier, such as a participial phrase, that is intended to modify something that was left out of the sentence. In the following example, the subject of the present participle walking is missing from the sentence. Notice that I can fix the dangling participial phrase by supplying the participle's subject plus an auxiliary verb:

While walking to school today, my book fell into the mud.

While I was walking to school today, my book fell into the mud.

When hopefully is being used as a sentence adverb, it does not dangle. It is not modifying something that is missing from the sentence. Instead, it expresses the writer or speaker's feelings about what the sentence is saying. Curiously, the people who object to the use of hopefully as a sentence adverb don't seem to object to the use of any other sentence adverbs, such as obviously, curiously, evidently, and thankfully.

Some people feel that it is better to say "one hopes that" instead of using hopefully as a sentence adverb. But when hopefully is used as a sentence adverb, it really means "I hope that," not "one hopes that." If you are going to express your opinions, you might as well take ownership of them.

As far as word order and punctuation go, sentence adverbs and adjunctive adverbs get the same treatment. In the following examples, obviously is a sentence adverb because it expresses the writer's opinion. Quickly is an adjunctive adverb because it modifies the verb in a way that expresses timing. Either one should be set off with a comma if it appears at the beginning of a clause or sentence:

Obviously, he has spent all of his money.

Quickly, he spent all of his money.

Neither would be set off with a comma if it appears in the middle of a sentence.

He has obviously spent all of his money.

He quickly spent all of his money.

Although a sentence adverb modifies the clause or sentence as a whole, it follows the same rules for word order as an adjunct that modifies the main verb. You can put an adjunct between the auxiliary and the stem of the verb it modifies. You can also put a disjunct between the auxiliary and the stem of the main verb in the clause or sentence.

In the Service of Good Writing

Editorialize with Sentence Adverbs

By Laurie Endicott Thomas, MA, ELS

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Quickly, he spent all of his money.

Neither would be set off with a comma if it appears in the middle of a sentence.

He has obviously spent all of his money.

He quickly spent all of his money.

Although a sentence adverb modifies the clause or sentence as a whole, it follows the same rules for word order as an adjunct that modifies the main verb. You can put an adjunct between the auxiliary and the stem of the verb it modifies. You can also put a disjunct between the auxiliary and the stem of the main verb in the clause or sentence.
Some adverbs can serve as adjuncts or disjuncts, depending on the context:

- It is better to travel hopefully than to arrive. (Here, hopefully is an adjunct expressing the feelings of the traveler)
- Hopefully, they will arrive before nightfall. (Here, hopefully is a disjunct expressing the feelings of the speaker or writer.)

When you use sentence adverbs in your own writing, keep in mind that they express your personal opinions, which might not be widely shared. When you use words like evidently, certainly, or obviously, you are saying that the evidence impresses you, that you are certain, or that some fact or conclusion is obvious to you. When you use words like fortunately or ideally, you are expressing your feeling that something is fortunate or would be ideal, from your perspective. Of course, what seems obvious to you might not be obvious to other people. It might not even be true. Something that would represent good fortune for you might be unfortunate for someone else.

Laurie Endicott Thomas is the author of Not Trivial: How Studying the Traditional Liberal Arts Can Set You Free.

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**Microsoft Word 2010 for Medical and Technical Writers**
Peter G. Aitken PhD and Maxine M. Okazaki PhD

*Written by medical writers, for medical writers*

Learn how to use Word for long, complex documents

The 2nd edition of this popular book is now available, completely updated to cover Microsoft Word 2010

Learn best practices and avoid pitfalls with Word options, styles, templates, tables of contents, headers and footers, tables, automatic numbering, and more

The book is available in a print edition as well as several e-publishing formats. Please visit [www.tech-word.com](http://www.tech-word.com) for more information.
I am sure we can all agree that digital communications have changed forever the ways in which we interact with one another. No longer must we wait days for a written letter to reach a mailbox so the recipient knows what’s going on in our personal or professional life. We don’t even have to wait until we’re at our desk to check our e-mail or social-media accounts. Nowadays, with a few swipes on our smartphone or tablet, we can respond to e-mail, share a photo, post an update on a social-media platform, and comment on a news article or blog post.

At the risk of seeming like a dinosaur, I must admit that I haven’t decided yet whether such nearly instantaneous digital communication is good or bad. Certainly, being able to interact quickly with clients and colleagues makes my job easier and allows me to work more efficiently. Likewise, social-media marketing has proved an effective way to expand my freelance business. On the flip side, social media have enabled a new and very different level of communication, one that, in my opinion, challenges us to set different boundaries and establish new kinds of etiquette.

Most of us go online and join social-media communities to communicate, to be heard, and to hear the ideas of others. We are searching for shared experiences and collegial places where we can grow and learn. But once enmeshed in these communities, we feel free to say things online that we would never say in polite face-to-face discourse. I have watched, at times with horror, the lack of etiquette and downright hostility that occur in digital communications, perhaps because we wrongly associate a certain level of anonymity with the medium. With so many ways to make our opinions known quickly, it seems as though some people have forgotten their manners. We judge, we give unwanted advice, we are rude, we attack people with our written words. Too many of us fire off comments in haste with little regard to the repercussions until it’s too late.

As social media have become more prevalent in my day-to-day life, I have refined my notions of online etiquette and personal boundaries. Here are some thoughts to consider.

- People who use social media have made the decision to open up a part of their lives—whether personal or professional—to others. That they have not done so should not be considered an invitation for judgment or disrespect.
- Treat your social-media accounts as your digital homes, which you have opened up to the public. As you would do in your brick-and-mortar home, create boundaries in your digital home. Don’t allow people to stay who are rude, cruel, or mean.
- Similarly, act as a guest when you visit others’ digital homes. That means being civil, thoughtful, and kind. Don’t leave behind a mess they will have to clean up once you have gone, that is, inappropriate, insulting, or hurtful comments they will have to remove.
- Civil disagreement is acceptable and healthy when presented in a mindful and respectful manner. Hostility and insensitivity are not.
- Make your digital interactions productive and useful to others. Mindless comments fired off in anger or with the purpose of attacking someone are simply a form of cyber bullying. They reflect poorly on your online reputation and, ultimately, may not lead to the result you were looking for.
LinkedIn and AMWA Forums: Keeping Current and Connected

By Mali Schantz-Feld, MA
Freelance Medical Writer, Seminole, FL

AMWA’s LinkedIn group (www.linkedin.com/groups?gid=55526&trk=myg_ugrp_ovr) is still growing and communicative. As of early August, the group had more than 2,700 members.

A lively and helpful discussion on reference management software resulted in 20 comments, with members recommending their favorites, including EndNote, Bookends, Reference Manager, and RefWorks. If your work involves heavy referencing, check out this thread and join the conversation.

Another recent discussion revolved around an interesting article in the New York Times about etiquette in the digital age.1 With evolving forms of digital communications, it seems that rudeness and politeness are defined differently depending on the generation of the writer. The author of the article noted, “The anthropologist Margaret Mead once said that in traditional societies, the young learn from the old. But in modern societies, the old can also learn from the young.” Questions arise: Are thank you e-mail messages outmoded? Are voice-mail messages unnecessary and time consuming? Is it rude to ask for directions when Google Maps is a click away? Are text messages the most efficient way to communicate? Join in this thread to weigh in.

The newest way to have a conversation with fellow AMWA members is through the Online Forums (www.amwa.org/forum.asp) on the recently redesigned AMWA website. Forums have been created to encompass the needs and interests of AMWA members. The broad forum subjects include: tools and resources, education and academics, medical device writing, health literacy, and research. Participants can start or participate in a conversation on any topic, and can choose to have messages on selected topics sent to them by e-mail. Twenty-two people have posted in the popular grammar and usage forum to offer interesting definitions and word origins, or to ask questions about proper usage. Freelance, with 11 topics and 26 posts, is another active forum. Fellow freelances have asked and answered questions about insurance and discussed various freelance opportunities.

If you need to take a break from work, you can visit the watercooler forum. Here, a member in Australia posted her congratulations to Cindy Hamilton for winning AMWA’s Harold Swanberg Distinguished Service Award. The award will be presented at the annual conference. Some forums have not yet received any posts, so check out the topics, and see if you can start a stimulating conversation!

Until next time, looking forward to connecting with you on LinkedIn and our new AMWA forums!

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References


Keep in mind that anything you say online becomes part of your digital footprint, for which only you are responsible. You can’t unring a bell. Before you post something online, you should consider the effect your words might have on people with differing opinions and how the words you write today could affect you—and your professional image—in the future.

Don’t assume that current or prospective employers or clients won’t examine your online image and develop an impression of you on the basis of what they find. A 2012 survey conducted by Harris Interactive on behalf of CareerBuilder found that 37% of companies used social-networking sites to conduct background research on job candidates. The nationwide survey included more than 2,000 hiring managers and human-resource professionals across multiple industries and company sizes. The results showed that hiring managers use social media to glean information about candidates’ character and personality outside of the traditional interview process. Interestingly, 12% of hiring managers stated that they purposefully used social media to look for reasons not to hire a candidate, and 34% of hiring managers reported that because of certain social-media discoveries, they decided not to offer a job to a candidate. If hiring managers are doing it for prospective employees, you can bet they also are using social media to research freelances online.

As human-resource professionals know, we can learn a lot about people from their online personas. Your social-media footprint is part of your personal brand. What does yours say about you?

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References

Microsoft Word 2010 for Medical and Technical Writers, 2nd ed
Peter G. Aitken, PhD, and Maxine M. Okazaki, PhD
Chapel Hill, NC: Piedmont Medical Writers LLC, 2013

Peter Aitkin and Maxine Okazaki have published the second edition of their Microsoft Word manual for medical writers. The first edition, for users of Word 2003, was the first Word manual or technical resource of any kind I know of that specifically addressed the tasks related to the development of long and complex technical documents.

The second edition incorporates changes made to Word 2010, the majority of which are revised instructions for calling up various tools, such as dialog boxes. That is to say, the new edition has not changed all that much; but, then, beyond the ribbon, neither has Word, at least in the way most medical writers are likely to use it. Once we learned how to access our favorite tools by using the ribbon, we found that basic tasks—editing, formatting text and tables, laying out pages, handling reviews and revisions, and building and managing templates—are performed mostly the same way in Word 2010 as they were in Word 2003.

The book, too, retains its best features: large-format pages with eminently readable type, a clearly rendered heading structure, and spiral binding. The original scope and flow has been maintained, along with the authors’ personal tone that makes it seem as if you are having a workday conversation with a couple of seasoned medical-writing colleagues.

The authors take a problem-solving and problem-avoiding approach to Word. They begin where they should: Chapter 1 is a detailed discussion of Word options with recommendations about how to set them optimally for building, editing, and managing complex documents. Chapter 2 deals with styles—mostly paragraph styles. Styles are the essence of Word, and any medical or technical writer must understand the style features to work effectively. The chapter gives working definitions of Word’s five style types and covers how to create and modify styles; it also explains why and how to stay away from the troublesome “normal” paragraph style.

Chapters 3 through 7 cover in some depth many of the frequently used capabilities of Word. The topics are grouped more or less logically: page breaks, section breaks, and page headers and footers in chapter 3; fields of various kinds in chapter 4; cross-references and numbering in chapter 5; tables in chapter 6; and templates in chapter 7. Chapter 8 deals with an assortment of topics, such as working with symbols and special characters, and inserting content from other applications. Chapter 9 starts with some dos and don’ts, continues with a little essay on backing up files, and ends with a list of keyboard shortcuts.

At 200 pages, this manual makes no claim or attempt to be comprehensive. The authors cover the features that they have found most important in their work and have included many clever tips that are especially helpful for medical and technical writers. Medical writers who take Word seriously will have their own thoughts on which features could have been left out of the book or received less emphasis, and which should have been included but were not. In my opinion, some of the elementary aspects of word processing could have been eliminated. Anyone employed as a medical writer knows about text wrapping, for example. The section on creating and managing a table of contents is overly long (15 pages), whereas working with tracked changes is given only 4 pages and doesn’t cover generating a comparison file. Outline view, an extremely useful and underused feature, is barely mentioned.

Nonetheless, Word users will find in this book a good explanation of at least one feature that has baffled them. Any single section of this book could justify the purchase price, all by itself. Even buying the paper book ($44.95), which is more expensive than the electronic formats, would cost roughly the same as a single technical-support session. I recommend purchasing the PDF version: at $9.99, it could be the best investment you have ever made in your own effectiveness and professional development.

— Maggie Norris, ELS

Maggie Norris is a medical writer in California. Maggie has been a member of AMWA Northern California since 1988 and, as “the Word Witch,” has led chapter programs on using Word since 2005.
With AMWA's 73rd Annual Conference just around the corner, this edition of Web Wanderings is devoted to helping you make the most of your experience, whether you are a first-time attendee or a conference veteran. Visiting the websites below can help you prepare for the workshops you will be attending and give you an edge in turning in a flawless homework assignment. But even if you cannot attend the conference or these sessions, these sites are worth visiting and bookmarking.

**Quizlet**
http://quizlet.com/subject/medical-terminology-elements/

If you are taking the *Elements of Medical Terminology* Workshop—or just interested in the topic—this website can get you started. There are many study sets from which to choose, including general medical terminology, specific body systems, or terms listed by letters of the alphabet. Sets can also be sorted by the most relevant or the most recent.

Medical terms are built upon a root word that refers to the primary meaning. Greek word roots build words that describe anatomical structures. Combining vowels are usually an *o* and sometimes an *i*. Prefixes are used to indicate a number, time, position, direction, or negation. Suffixes are used to indicate a procedure, condition, or disease. For instance, *ankylosing spondylitis* is an arthritic disease characterized by inflammation, stiffness, and pain of the joints in the spine. This is how the two words are built: *ankylo* (stiffness; bent, crooked) + *-osis* (abnormal condition); *spondylo* (vertebrae) + *-itis* (inflammation). Here are a couple of other examples:

- *cardio* (heart) + *myo* (muscle) + *pathy* (disease) = *cardiomyopathy*.
- *chondro* (cartilage) + *cyte* (cell) = *chondrocyte*.

Delve into the study sets at Quizlet, and you will be an A student at the workshop.

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**National Commission for Certification of CME Professionals Inc (NC-CME)**
www.ncme.org/index.aspx

If you are employed by a continuing medical education (CME) company or want to enter the field, you may have signed up for the workshop *Preparing CME Materials: Concepts, Strategies, and Ethical Issues*, and could benefit from some background information. The National Commission for Certification of CME Professionals Inc (NC-CME) is a nonprofit organization founded in 2006 by an independent group of peers within the CME community who thought the time was right to establish a definitive credential for CME professionals. It is the organization's mission to improve the quality of patient care by creating a standard of certification for men and women who create, deliver, or support educational programs for practicing physicians and other health care professionals. NC-CME established the Certified CME Professional (CCMEP) program, whose purpose is to provide an educational self-assessment experience to persons employed in the CME field while defining minimal competence for the profession. The CCMEP designation can be earned by passing a proctored 3-hour examination. AMWA members are eligible to apply for the CCMEP credential. However, it should be noted that the credential does not make one eligible to provide CME
credits. That capability is restricted to properly accredited institutions and organizations that are part of the Accreditation Council for Continuing Medical Education system.

On the NC-CME website, you’ll want to spend most of your time in the Content Outline section, available through a link from the left-hand menu bar. The section outlines the five domains of knowledge that the NC-CME deems relevant to CME competency—adult learning principles; educational interventions; relationships with stakeholders; leadership/administration and management; and knowledge of the CME environment. Test items on the exam are mapped to material within these domains. At the top of the NC-CME website, under Resources, are various links to other sites that can help you prepare for the exam, and then to the left, you can click “Take the CCMEP Practice Exam” or “Take the Sample Test” and see how well prepared you are. The Candidates Handbook, available through a link on the menu to the left, gives detailed information on the application and registration instructions for the CCMEP credential.

MedicinePPT

www.medicineppt.com

Interested in learning how to develop better slide show presentations? The workshop Making Effective Slides is devoted to the topic. The class is not a how-to on PowerPoint. If, however, that is your slide program of choice and you would like to add a little extra pizazz to the background by using creative templates, MedicinePPT may be the website for you.

Once on the website, visitors should scroll down the page to see sample images of free templates, and then farther down, click on More Free Medicine PowerPoint Templates to find subject-labeled links to 200 templates covering many aspects of medicine. These individual links lead you to PowerPoint template download pages. Each download is a zip file that includes a PowerPoint template file (file type .POT), which works in all versions of Microsoft PowerPoint. Template categories include anatomy, doctors, medical symbols, nurses, medicine pills, body systems, laboratory equipment, and diseases. On the home page, there is a link to more medical templates for purchase.

Author contact: barbwooldin@comcast.net
“Sedentary” describes the workday for most medical writers and editors, as they log countless hours almost immobile in front of computer monitors. Yet the very medical literature we read emphasizes the negative effects of sitting all day, linking it, for example, to increased risks for developing diabetes and cardiovascular disease, and earlier death from all causes.1

What is a medical communicator to do?

I recently queried AMWA members through the association listserv to discover which technologies they employ to incorporate more movement into their workdays. Replies fell into three broad categories: standing desks, treadmill (“walking”) desks, and activity monitors.

STANDING DESKS

Shifting from a sitting to a standing desk periodically during the day can help get you moving. The downside? Your legs and feet can get quite tired if you stand a lot. You will probably want a good antifatigue mat, which you can buy from an office supply store.

Try to avoid having to move your computer setup between desks. You can put two desks back-to-back and add a wireless keyboard and mouse, and a monitor stand with a movable arm. One member uses a second monitor on one desk to mirror the main monitor on the other desk. You could also opt for a fixed standing desk but add a tall stool for sitting or have one desk that allows you to change its height easily. The easier your setup is to use, the more likely you are to alternate standing and sitting during the day.

TREADMILL DESKS

Treadmill desks are another possibility, and yes, you can work while walking. (A quick search of YouTube will take you to videos of treadmill desks in use.) Our members with treadmill-desk experience suggest that you start with reading, simple typing, and making phone calls when you begin to use a treadmill desk; these tasks are easier to do than work that requires fine movements with a computer mouse. Walking speed is usually slower than a typical walk outdoors, in the range of 1 to 2 mph. You probably will not want to walk all day, but, rather, alternate sitting and walking.

You can make a treadmill desk from a used treadmill and either a standing desk or a platform that attaches to the treadmill arms. You can also buy treadmill/desk combinations that are specifically designed for office use. So many options exist now that large companies have begun to purchase these for office workers. Prices range from several hundred to a few thousand dollars for complete treadmill stations.

Questions to Consider Before Purchasing or Making a Treadmill Desk

Will it fit in my office?

For the most flexible arrangement, look for smaller treadmills that do not have arms and that fit under a desk. You do not need a treadmill that inclines. The point is to walk at a slow pace continuously, not to get an aerobic workout.

How well will it integrate with my usual computer setup?

As with standing desks, you are much more likely to regularly use a treadmill desk if you do not have to move your computer setup during the day. Select a desk that comfortably holds your usual work tools. Many desks that are sold to work with a treadmill can be raised and lowered easily, either by electric motor or mechanically.

How will I sit?

Some companies sell special chairs to fit the treadmills they sell. A regular office chair may be too wide or may damage the treadmill belt. Read the requirements for using the treadmill carefully, and, if necessary, query the manufacturer. One member places a balance ball on a yoga mat that protects the treadmill belt.

How noisy will it be?

If you want to walk while on the phone, check how quietly the treadmill operates. Some manufacturers post information on their websites indicating the treadmill’s decibel levels when operated at various speeds.
Medical Devices at Cyber Risk?
In June, the US Food and Drug Administration issued an unusual new safety communication aimed at medical device manufacturers and health care facilities. The issue? A growing concern about the possible use of cyber-attacks to reconfigure or disable computer-controlled medical devices while in use by patients. The FDA’s communication contains a summary of the problem, recommended actions for medical device manufacturers and health care facility information-technology departments, and links to further reading. View the communication at http://1.usa.gov/19uGNN4.

Fun with Filler-Text Generators
If you have ever helped develop brochures, websites, or other marketing materials, you have probably seen “lorem ipsum” used to hold the place of text while it’s being written. But this faux Latin was specifically designed to be nonsensical and therefore boring to read. If you want to have a little fun with your next project, consider these amusing, free alternatives.

Hipster Ipsum (http://hipsteripsum.me):
Filler text has never been so hip.
Sample: Freegan direct trade Pinterest umami before they sold out. Tofu meh flexitarian messenger bag occupy, letterpress. Jean shorts ethical ethnic YOLO fanny pack.

Lebowskipsum (www.lebowskipsum.com):
This site is for fans of the Dude in The Big Lebowski. Filler text is available with or without profanity.
Sample: We want that money, Lebowski. Dolor sit amet, consectetur adipiscing elit praesent ac magna. No, look. I do mind. The Dude minds. This will not stand, you know.

To find even more options, including Bacon or Vegan Ipsum, Samuel L. Ipsum, and yes, even Zombie Ipsum, see this article at WebResources Depot: http://bit.ly/zXEpmb.

JUST MOVE
Some of our members simply resolve to spend 5 or 10 minutes each hour getting up and moving; they may use a hula hoop, stretch, walk up and down stairs, or head outside for a brief walk. No technology required.

Whatever option you choose, try moving more and sitting less!

Acknowledgment
The author thanks Ann Winter-Vann, Jane Rollins, Kathleen LaPoint, Lola Cooley, and Cathryn Evans for their helpful suggestions.

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By Jeanne McAdara-Berkowitz, PhD
Principal, Biolexica LLC, Longmont, CO

TECH TIPS

Medical Devices at Cyber Risk?
In June, the US Food and Drug Administration issued an unusual new safety communication aimed at medical device manufacturers and health care facilities. The issue? A growing concern about the possible use of cyber-attacks to reconfigure or disable computer-controlled medical devices while in use by patients. The FDA’s communication contains a summary of the problem, recommended actions for medical device manufacturers and health care facility information-technology departments, and links to further reading. View the communication at http://1.usa.gov/19uGNN4.

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Hipster Ipsum (http://hipsteripsum.me):
Filler text has never been so hip.
Sample: Freegan direct trade Pinterest umami before they sold out. Tofu meh flexitarian messenger bag occupy, letterpress. Jean shorts ethical ethnic YOLO fanny pack.

Lebowskipsum (www.lebowskipsum.com):
This site is for fans of the Dude in The Big Lebowski. Filler text is available with or without profanity.
Sample: We want that money, Lebowski. Dolor sit amet, consectetur adipiscing elit praesent ac magna. No, look. I do mind. The Dude minds. This will not stand, you know.

To find even more options, including Bacon or Vegan Ipsum, Samuel L. Ipsum, and yes, even Zombie Ipsum, see this article at WebResources Depot: http://bit.ly/zXEpmb.

When Presenting, Put Your Best Desktop Forward
You have put a lot of time into creating a polished slide presentation or webinar—but as the lights dim and the show starts, will your audience get a glimpse of your computer’s cluttered desktop, and maybe even file names that reveal sensitive information? An easy way to enhance your professional brand as a public speaker is to temporarily consolidate all of your desktop files into a single folder. Add a desktop shortcut from which to quickly launch your presentation, and suddenly you have changed your first impression as a speaker from awkward and disorganized to smooth and professional.
If you have been keeping up with the communications coming from AMWA officers, governance bodies, and headquarters staff, you have probably been struck by the sheer variety of initiatives AMWA is undertaking in 2013. It may seem that after a long period of stasis, followed by measured and limited change, suddenly everything AMWA is in flux: a new website, new forums for member-to-member communication, projects undertaken with sister associations, changes in annual conference schedule and programming, and new ways to engage as an AMWA volunteer, to name only a few. Many members have asked me, other officers, and the headquarters staff about these changes, and even if you have not been asking these questions yourself, you may be wondering why AMWA is undertaking all these steps now. The short answer is that we must; to remain relevant to the medical writers of today and tomorrow, we have to meet them where they are, provide value, and retain them in our community.

The issue of how we look to potential members is important for many reasons, but I want to highlight two: (1) member numbers have remained flat over the past few years, and (2) information compiled by the headquarters staff shows we are continuing to attract new members but are sometimes having trouble retaining them. Various factors could be responsible for these trends, including the Great Recession, but I think it is important for AMWA to examine itself analytically and find out how it appears to a new medical writer, or someone not yet a member.

As many of you know, I recently retired from my primary career, that of English professor. (My secondary career, as a writer and editor, began when I joined AMWA in 1986, and it continues.) I started in 1971 as a graduate assistant at the University of Delaware and have been at Ferris State in Michigan since 1984. During my career, in four state universities, I have had every job title from tutor to assistant vice president. Whenever you have done something for a very long time, you begin to reflect on how your profession has changed during your career. I decided to retire a year ago, so I’ve been thinking about this issue a great deal. How was it different for me than it is for today’s novice professors?

Making allowances for grand oversimplifications, here are some areas of major change since 1971.

• Obtaining a tenure-track position requires more education and experience.
• Today’s faculty member has to teach a greater variety of more sophisticated courses, as well as meet institutional service and publication expectations.
• Greater professional development expectations now prevail but with less institutional support to pursue opportunities.
• The chalkboard-and-overhead-projector world of instructional technology has been replaced by an electronic and Internet-based environment, one that depends on the network being functioning and trouble-free.
• Higher education has more for-profit institutions, and now completely virtual institutions have also arisen.
• The percentage of faculty who are full-time tenured or tenure-track steadily declines, and the percentage of adjunct, contract, and visiting faculty steadily increases.

I have chosen this example because, as you can probably see, there are many parallels between the changing world of the professor and that of the medical writer. Let’s look at a few.

• Like professors, medical writers today need more education and experience to obtain a regular and permanent position.
• Increasingly, the medical writer is expected to bring multiple skills (editing, graphics, web) to writing tasks.
• Changes in employer practices mean there is less corporate support for professional development opportunities.
• The paper- and typewriter-based medical writing and editing environment has been eclipsed by the same electronic and Internet-based environment encountered by faculty, one that similarly depends on the network being functioning and trouble-free.
• Corporate writing and editing departments have not disappeared, but outsourcing of medical writing tasks to contract research organizations, contract workers, and freelances has increased.
• The number of temporary, freelance, and contract-based medical writing positions steadily increases.

What this means is that, like their counterparts in academia, new professionals in medical writing face an employment environment that requires them to bring more credentials to the job and expects them to be conversant with a wider variety of necessary skills, but offers them less professional development support once on the job and presents a less clear path to a secure career position. Obstacles notwithstanding, however, these new professionals want a medical writing career, and AMWA is uniquely positioned to help them reach their goal.

To return to my original point, then, AMWA’s goal must be to demonstrate its relevance to both current members and the rising generation of medical communicators. That’s why AMWA is making so many changes, changes that add value to membership, make professional networking easier and more satisfying, provide national, regional, and online learning experiences, and offer credentialing opportunities. We need to see the evolving relationship of today’s and tomorrow’s medical writers to career, employer, and professional development as an opportunity for AMWA to be relevant in their professional lives, and so live up to our mission of being the resource for medical writers.

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Find Yourself IN AMWA!

AMWA welcomes members with all levels of expertise and professionals from all general and specialty areas to help support AMWA’s ongoing development and growth.

Complete the Volunteer Interest Form at www.amwa.org today!
Quarterly Report from the Medical Writing Certification Commission

By Karen Potvin Klein, MA, ELS, GPC
2012–2013 Chair, AMWA Medical Writing Certification Commission

Upcoming Changes in Commission Leadership. Because I have had the honor to be nominated as AMWA’s next president-elect (with a term that would begin in November 2013), we have planned some changes for leadership of the AMWA Medical Writing Certification Commission. The commission workload suggests that having co-chairs (with staggered terms) would be ideal. Tom Gegeny has accepted the position of co-chair with a term of December 2013 to December 2014. Marianne Mallia has agreed to serve as the other co-chair, with a term of December 2013 to December 2015. I will remain on the commission until November 2014, and will continue to serve as the Executive Committee liaison for the commission until then.

Item-Writing (Exam Questions) Session. Our first item-writing training session with our vendor, Schroeder Measurement Technologies (SMT), took place May 8 to May 10, 2013. In-person sessions are held at SMT headquarters in Clearwater, FL, for logistic and test-security reasons. In addition to me, the participants (subject-matter experts) were Lori Alexander, Tom Gegeny, Bart Harvey, Nancy Katz, Kathleen Maguire (via phone), Marianne Mallia, Donna Miceli, Sharon Nancekivell, Victoria White, and Lauren Ero (AMWA staff).

The session was facilitated by a test development coordinator at SMT. The meeting began with training on best practices in exam-question writing. For now, our focus is on creating an exam of multiple-choice questions. We used the SMT secure online system to create, revise, and accept questions (based on consensus). Question topics were guided by the list of knowledge, skills, and abilities relevant to medical writing that was developed in 2012 by the first group of subject-matter experts. This group relied on results from the AMWA Job Analysis Survey. The survey results and the process for developing the knowledge, skills, and abilities list were described in an AMWA Journal article last year (Gegeny TP, Klein KP. AMWA’s Medical Writing Certification Initiative: Where Are We Now? AMWA J. 2012; 27[4]:184–187).

Conference Call with Commission Members. In a teleconference June 17, Tom Gegeny, Marianne Mallia, and I reported to the other commission members regarding the item-writing session. The group also reviewed and discussed the succession plan for commission leaders described above and discussed next steps (see below).

Second Item-Writing Session. A second item-writing session is scheduled for late September 2013. Five subject-matter experts who were part of the first session have agreed to participate again to provide continuity. We also plan to include participants who are new to the process.

Commission Updates at the Annual Conference. If you are interested in being considered as a potential question writer or want to learn more about certification activities in general, please sign up for my Breakfast Roundtable, on Thursday, November 7, at the Annual Conference in Columbus. If that table is full by the time you read this article, then be sure to attend our Open Session on Friday, November 8 (Open Session 30, 11 AM). We will update the membership on commission activities, describe where we are in the exam-planning timetable, and outline our next steps.

Opportunities for new subject-matter experts to contribute exam questions will continue, and it is critical that we continue to seek out new item-writers whose work reflects different aspects of our profession. Such contributors will help ensure that our exam questions reflect the breadth of the medical writing profession. If you are interested in being part of this activity, please contact Executive Director Susan Krug at skrug@amwa.org.

Author contact: kklein@wakehealth.edu
To the Editor

I was delighted to see AMWA undertaking a systematic assessment of medical writers’ professional development needs and eagerly took part in the online survey. However, I was dismayed by the question asking me which AMWA certificates I had earned or was in the process of earning. In recent years, I have earned two certificates from AMWA, the core certificate in 2008 and the science fundamentals certificate in 2011. This required paying for, and attending, 16 different 3-hour workshops at annual and chapter conferences over a period of 5 years. Yet neither of my certificates was mentioned in the survey! I’m beginning to question the value of my certificates if even AMWA’s leaders (those who drafted and approved the survey) don’t seem to know they exist.

Along these same lines, I recently had an unpleasant experience at a local university. I am currently investing heavily in my professional development as a medical writer by taking a variety of college-level life science courses such as microbiology, organic chemistry, and biostatistics. Before I went back to school, I had hoped that taking 16 credit-bearing workshops at AMWA, and earning two certificates, would be worth at least some college credit. They were not. When the program coordinator asked me what was involved in a credit-bearing AMWA workshop and I told her it required 3 hours of homework and 3 hours of attendance, she dismissed it as inadequate. Even 16 workshops, or 96 hours of instruction, could not be used for college credit because they did not all fall within a single subject area.

All this leaves me more convinced than ever that AMWA must move forward as soon as possible with our credentialing initiative, which has been described in recent issues of the journal. (I say “our” because, presumably, some of the money I spent on registration for those 16 workshops is included in the $200,000 set aside by the Board of Directors for certification.) I am ready, willing, and able to invest in my professional development as a medical writer, but there needs to be more meaningful payback at the end.

Don Harting, MA, ELS, CCMEP
Downingtown, PA

References

Letters to the Editor

On behalf of the Certification Commission, I appreciate the opportunity to revisit some of the reasons why AMWA is creating a certification examination. As Mr. Harting describes, 3-hour AMWA workshops cannot be considered in the same category as formal, credit-bearing coursework of much longer duration. The AMWA certificate program was not intended or represented to qualify for college credit; rather, it was developed to provide continuing professional development to medical communicators and has grown over the decades into the recognized cornerstone of this endeavor. AMWA workshops do introduce members to new concepts and refresh fundamental skills, but they will not suffice to confer evidence of competence in a given topic. A certification exam is one way of filling this void. Even though the certification exam will not be linked directly to AMWA’s workshop program, workshop attendance and completion of AMWA self-study modules certainly can aid in preparing for the exam.

The question in the survey to which Mr. Harting refers was intended to gauge the degree to which AMWA’s current workshop offerings mesh with the content of the certification exam being developed. No criticism or slight was intended regarding the value of AMWA’s workshops or certificate programs, which remain vibrant, highly useful professional educational tools for medical writers. Instead, we were asking whether survey respondents saw gaps in our workshop program that, if addressed, would allow potential exam takers to be better prepared.

AMWA’s educational offerings should always seek to meet the needs of the profession. This is why the Education Committee is now conducting a gap analysis of current educational offerings. The goal of this analysis is to further improve our opportunities for professional education and development, and ultimately to better serve current and future AWMA members.

Karen Potvin Klein, MA, ELS, GPC
Certification Commission Chair
Mr. Harting raises an interesting issue in his letter regarding academic credit for AMWA workshops. It should be noted that higher education institutions have a high level of autonomy in deciding what prior educational experiences may count for academic credit. The main reason for this is that when institutions grant academic credit, they are saying that they are confident in the value of the learning experience. It is easy to do this for the courses at one's own institution because one has access to both the faculty and the students. Institutions also are required to accept the relevant coursework of other regionally accredited institutions. On a practical level, it is impossible for them to assess the value of the multitude of professional education certificates and workshops currently available. This does not mean they are valueless; it means that an institution cannot be confident of their equivalence to academic coursework.

AMWA has made some efforts to build bridges between its educational offerings and academia. During the presidency of Cindy Hamilton several years ago, for example, I was part of a team that worked with faculty from Towson University in Baltimore to create a process by which AMWA workshops could fulfill the requirements of selected courses. We succeeded in doing so. But no student or AMWA member has taken advantage of the bridge we created, for reasons that have to do with the nationwide dispersal of the medical writing job market and the fact that university students tend to be place-bound. No mechanism for assuring the nationwide acceptance of AMWA workshops by higher education exists; agreements would have to be made with individual institutions or state university systems.

AMWA members with extensive workshop and certificate credit can, however, take advantage of the fact that many institutions have policies in place to give credit for prior learning. Such policies, which AMWA members would need to explore on a case-by-case basis, may potentially allow students with real-world or workshop/certificate-based learning experiences to apply them toward academic credit.

Douglas Haneline, PhD
2012–2013 AMWA President

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I applaud David Karhu and Michael Vanzieleghem for their article in the recent issue of the AMWA Journal, “The Significance of Digits in Scientific Research.” Their advice to question the last digit of a number is sound. In fact, we should question the last digit for several reasons.

**Statistical reasons to round.** Bedeian et al. assessed the statistical reproducibility of the digits in the first, second, and third decimal places of correlation coefficients. In simulations with different coefficients and sample sizes, they concluded that 2 digits are statistically meaningful only for samples of more than 500; 3 digits are meaningful only for samples of more than 100,000.

**Cognitive reasons to round.** We process numbers effectively when they have at most 2 significant digits. Thus, if a procedure costs $32,833, and this degree of precision is not necessary, rounding to $33,000 should improve comprehension and recall.

**Pragmatic reasons to round.** Rounding is often common sense. The mean age of a sample might be 32.81 years, but how long is eighty-one one-hundredths of a year? (It’s about 296 days, if you care.) How much does 0.81 of a year differ from 0.8 of a year? (It’s about 4 days.) Rounding to the nearest year makes more sense. This reasoning applies to many other demographic and clinical characteristics.

**Clinical reasons to round.** Reporting precision to less than the smallest meaningful difference on a measurement scale is uninformative. For example, on the 63-point Beck Depression scale, a 5-point difference is considered to be the smallest clinically important difference. Reporting a mean change of, say, 4.2 points, may be mathematically correct, but it isn’t helpful.

**Methodological reasons not to round.** Terminal digit bias is the tendency to round to the nearest 0, even number, or 5. Often reported in manual measurements of blood pressure (BP), this bias has also been reported in discharge times in emergency departments, birth weights, self-reported age among cancer patients from developing countries, and self-reported year of the onset of menopause. For example, among almost 29,000 women, the second digit was reported as 0 in 78% of BP measurements, as an even digit in 15%, as a 5 in 5%, and as odd digits other than 5 in only 2%. The bias in reporting BP values is important. In one study, changing the definition of hypertension from equal to or greater than 140 mm Hg to greater than 140 mm Hg...
reduced the prevalence of hypertension from 26% to 13% in the overall group, from 15% to 6% in the low-risk subgroup, and from 43% to 25% in the high-risk subgroup. In another, caregivers recorded lower diastolic pressures (88 to 89 mm Hg versus 90 to 99 mm) for patients they thought did not need treatment. This simple difference was accompanied by a relative risk for excess cardiovascular death of 2.6 (95% CI, 1.4 to 4.6).14

Thus, we should be asking lots of questions about the last digit of the numbers we see.

Tom Lang, MA
Tom Lang Communications and Training International, Kirkland, WA

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Regulatory Affairs Professionals Society  
September 28–October 2, 2013  
Boston, MA  
www.raps.org

Health Data Workshop (Association of Health Care Journalists)  
October 3–4, 2013  
Anaheim, CA  
www.healthjournalism.org

Council for Programs in Technical and Scientific Communication  
October 10–12, 2013  
Cincinnati, OH  
www.cptsc.org

Plain Language Association International  
October 10–13, 2013  
Vancouver, Canada  
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American College of Clinical Pharmacy  
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Albuquerque, NM  
www.accp.com/meetings/am13

Alliance for Continuing Education in the Health Professions  
October 15–18, 2013  
Baltimore, MD  
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Association for Business Communication  
October 23–26, 2013  
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Philadelphia, PA  
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Health Literacy Annual Research Conference  
October 28–29, 2013  
Washington, DC  
www.bumc.bu.edu/healthliteracyconference

National Association of Science Writers  
November 1–5, 2013  
Gainesville, FL  
www.sciencewriters2013.org

American Public Health Association  
November 2–6, 2013  
Boston, MA  
www.apha.org/meetings

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Chicago, IL  
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Raleigh, NC  
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American Pharmacists Association  
March 28–31, 2014  
Orlando, FL  
www.aphameeting.org
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