CORRESPONDENCE

Dissemination of Information on Legislative Mandates and Consensus-Based Programs Addressing Payment of the Costs of Routine Care in Clinical Trials through the World Wide Web

I read with interest Kelahan's article[1] which examined online information regarding payment for cancer clinical trials. His broad survey of Internet sites was impressive, and his finding of an extremely limited amount of online information regarding health plan payments for cancer clinical trials highlights an important area for future improvement. Recent research[2] conducted in my laboratory suggests that many aspects of online cancer clinical trial information are limited and are in need of improvement.

We examined the World Wide Web sites of hospitals designated as comprehensive cancer centers by the National Cancer Institute. Given their meritorious status, we expected that these 39 sites would offer visitors comprehensive information concerning available clinical trials. We examined four categories of variables: 1) navigation, 2) search capabilities, 3) information content, and 4) readability. We found that although many of these World Wide Web sites included visible "Clinical Trials" links on their home pages and provided search features with which to locate trials by cancer type, the actual clinical trial information was either quite shallow or was presented at an advanced reading level. Only 6 information items (of a possible 41 items) appeared on greater than half of these sites, namely the scientific title of the study, the protocol identification number, the contact phone number, the E-mail contact address, the name of the principal investigator, and the trial eligibility requirements. Only 38% of the trial descriptions listed the purpose of the study and only 16% were found to list the treatment details. When content was provided, the average reading grade level of the material was at or above a 12th-grade level (which is well above the estimated average 8th–9th-grade reading level of the U.S. adult population).[3] These findings suggest that patients and caregivers visiting these sites may have very little success in locating useful cancer clinical trial information.

I fully support Dr. Kelahan's call for institutions and organizations to provide "prominent, complete, and up-to-date information concerning clinical trials." In addition, I would amend that call to urge institutions and organizations to conduct usability testing[4] of their clinical trials material as well. The framework for such testing would involve having representative cancer patients and caregivers think aloud as they attempt to search for and understand the clinical trial information presented on a particular World Wide Web site. This straightforward type of testing generally reveals important shortcomings of the user experience and can allow an organization to develop

World Wide Web pages that will be both useful and usable for the intended audience.

REFERENCES

1. Kelahan AM. Dissemination of information on legislative mandates and consensus-based programs addressing payment of the costs of routine care in clinical trials through the World Wide Web. *Cancer*. 2004;100:1238–1245.
2. Monaco V, Krills SK. Online information about cancer clinical trials: evaluating the Web sites of comprehensive cancer centers. *Proc AMIA Symp*. 2003;470–474.
3. Doak CC, Doak LG, Root JH. Teaching patients with low literacy skills. 2nd edition. Philadelphia: J. B. Lippincott Company, 1996.
4. Nielsen J. Usability engineering. San Diego: Academic Press, 1993.

Valerie Monaco, Ph.D., M.H.C.I.
Benedum Oncology Informatics Center
University of Pittsburgh
Pittsburgh, Pennsylvania
DOI 10.1002/cncr.20630
Published online 20 September 2004 in Wiley InterScience (www.interscience.wiley.com).

Author Reply

I appreciate Dr. Monaco's comments regarding my recent study of clinical trial resources on World Wide Web ("the Web") sites.[1] I appreciate even more—and applaud—the analysis regarding the accessibility and readability of clinical trial information that she and her colleagues have completed and to which she refers in her comments. Completing such studies are pivotal to maximizing the use of the Web as a platform for the exchange of information. I very much look forward to seeing the full report.

The data concerning comprehensive cancer centers summarized by Dr. Monaco reinforces the perspective that, in general, the state of clinical trial information published on the World Wide Web is sorely lacking. The study by Dr. Monaco and her colleagues adds to the growing body of evidence indicating that even if a visitor can locate clinical trial information on an institution's Web site, it is more likely than not that the information will be incomplete or not understandable by the average reader.

Therefore, what steps might be taken to correct the problems that have been identified with regard to the presentation of clinical trial information on Web sites? The following are three of the more obvious solutions: 1) involve more patients, more actively in writing and reviewing website content; 2) incorporate research staff earlier and more actively in the process of developing and maintaining site content; and 3) define a minimum data set for clinical trial information (e.g., phase, sponsor, patient category, etc) that must be included in any Web site information regardless of the trial sponsor and site sponsor.

Centralized clinical trial databases are an obvious and available way with which to improve the presentation of information. A major advantage of the centralized database approach is the economies of scale they offer. In an era of ever tighter resources it appears a bit absurd that hundreds of institutions around the country are programming and maintaining much of the same Web infrastructure and trial information (and often in a substandard manner) when they could pay less money to utilize a clinical trial site that offers comprehensive, readable and up-to-date information. Another advantage is that most of these systems now utilize automated processes to download trial information, enter data, and perform database maintenance.

When the goal is enrolling more patients in better trials, researchers and institutions should be willing to do whatever is necessary to aid that process, either by taking all necessary steps to improve their Web site content or outsourcing the process if that represents the best solution.

REFERENCES

1. Kelahan AM. Dissemination of information on legislative mandates and consensus-based programs addressing payment of the costs of routine care in clinical trials through the World Wide Web. *Cancer*. 2004;100:1238–1245.

Andrew M. Kelahan, Ph.D.
KDB Consulting and
Management Services, LLC
Philadelphia, Pennsylvania.
DOI 10.1002/cncr.20632
Published online 20 September 2004 in Wiley InterScience (www.interscience.wiley.com).

Recall and Detection Rates in Screening Mammography

In their article, Gur et al.[1] caution against recommendations that set guidelines or goals for reduction of high recall rates. Brem,[2] in her editorial, states that the Gur et al. study is based on solid evidence and that the benefit yielded by higher recall rates (specifically, improved detection of breast carcinoma) is worth the associated cost. We would like to call attention to some problems with the methods and analysis that

make it difficult to draw definitive conclusions from the results reported by Gur and colleagues. We are also concerned about the strong endorsement of these results by Brem, which we believe is disproportionate to the strength of the design and results.

First, it is unfortunate that the patient population is not described. This information is important because screening recall and cancer detection rates are related to age, breast density, family breast carcinoma history, symptoms, and other patient characteristics. None of these were controlled for in the analysis.

Second, the authors did not examine specificity, sensitivity, or positive predictive value (PPV). As Yankaskas et al.[3] demonstrated, the cancer detection rate increases with recall rate overall, but at some level of recall (5% in their study), the gain in sensitivity is slight, whereas PPV continues to decrease. Increasing recall beyond that level may detect a very small number of additional cancers, but at the high cost of a considerable number of extra workups and needless biopsies. A mammographer can maximize his or her cancer detection rate by recalling all women. However, the detection rate is ultimately limited by the intrinsic sensitivity of mammography.

Third, the linear least-square fit to relate the recall and cancer detection rates to each other represents a statistically crude analysis, and the claim by Gur et al. that the increase in the cancer detection rate was evident over the full range of recall rates examined was completely dependent on that linearity assumption. Their data could as easily support a threshold effect starting at the approximately 12% recall rate. A more robust approach would have been to use a flexible model to test the linear assumption.

Based on the problems cited, we believe the results should be considered with caution. We do not agree with Dr. Brem's suggestion that a recall rate of 17% is justified by this article without considering sensitivity and PPV.

REFERENCES

1. Gur D, Sumkin JH, Hardesty LA, et al. Recall and detection rates in screening mammography. *Cancer*. 2004;100:1590–1594.
2. Brem RF. The never-ending controversies of screening mammography. *Cancer*. 2004;100:1549–1551.
3. Yankaskas BC, Cleveland RJ, Schell MJ, Kozar R. Association of recall rates with sensitivity and positive predictive values of screening mammography. *AJR Am J Roentgenol*. 2001;177:543–549.

Bonnie C. Yankaskas, Ph.D
Department of Radiology
University of North Carolina—Chapel Hill
Chapel Hill, North Carolina

Michael J. Schell, Ph.D.
Lineberger Cancer Center
University of North Carolina—Chapel Hill
Chapel Hill, North Carolina
Diana L Miglioretti, Ph.D.
Center for Health Studies
Group Health Cooperative
Seattle, Washington;
Department of Biostatistics
University of Washington
Seattle, Washington

DOI 10.1002/cncr.20683
Published online 21 October 2004 in Wiley InterScience (www.interscience.wiley.com).

Author Reply

We thank Drs. Yankaskas, Schell, and Miglioretti for their comments. First, as to the closing statement in their communication, neither we nor Dr. Brem recommended anywhere in our article (or the accompanying editorial) a 17% recall rate as the 'optimal' operating point for screening mammography, and thus we do not understand how Yankaskas and colleagues came to the conclusion that we actually did.[1]

Second, our study was a relative comparison, and consequently, none of the possible sources of bias mentioned in their letter are relevant. A potential source of bias was one that they did not mention—namely, the possibility that only some of the radiologists selectively reviewed subsets of our screened population (e.g., younger women, high-risk women). Nonetheless, this was not the case in our study. Thus, although the population itself may have been a potential source for bias in their own study,[2] their argument is not relevant to ours.

Third, we agree that ultimately, mammography is limited by the technology itself, but a large number of studies clearly show that 30–70% of all cancers have some mammographic signs (potential abnormalities) depicted on previous examinations ($\geq$ 1 year before the actual detection). Thus, cancer detection rates can improve substantially, primarily at the cost of increasing recall rates before the fundamental limit of the technology itself is reached. This is one of the primary underlying justifications for, and driving forces behind, computer-aided detection (CAD).

Fourth, optimizing positive predictive value 1 alone is not necessarily the best way to optimize all screening practices.

Finally, when there are 10 operating points (1 for each radiologist), a curve can be fit in many ways, al-

though linear fitting is performed most commonly. Fitting these data using other nonlinear models does not necessarily place us any closer to the truth (primarily due to the large amount of variability among individual readers and the limited number of points being analyzed). This is the case in our study and also in the study conducted by Yankaskas et al.[2] In that study, breaking the curve resulted in minor improvements in the quality of the fit for the ensemble of sites and, in particular, for the higher-volume sites (i.e., those for which there were $>$ 3000 cases). Because we are not limited by the technology itself, there is no compelling justification for Yankaskas and colleagues to analyze our data (or, for that matter, theirs) in similar fashion or to select any other nonlinear mathematical model.

REFERENCES

1. Gur D, Sumkin JH, Hardesty LA, et al. Recall and detection rates in screening mammography. *Cancer*. 2004;100:1590–1594.
2. Yankaskas BC, Cleveland RJ, Schell MJ, Kozar R. Association of recall rates with sensitivity and positive predictive values of screening mammography. *AJR Am J Roentgenol*. 2001;177:543–549.

David Gur, Sc.D.
Department of Radiology
University of Pittsburgh
Pittsburgh, Pennsylvania
Jules H. Sumkin, D.O.
Lara A. Hardesty, M.D.
Department of Radiology
University of Pittsburgh
Pittsburgh, Pennsylvania;
Magee-Womens Hospital
Pittsburgh, Pennsylvania

DOI 10.1002/cncr.20685
Published online 21 October 2004 in Wiley InterScience (www.interscience.wiley.com).