# POINT/COUNTERPOINT

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## Medical physicists should seek patent protection for new ideas before publishing articles about them

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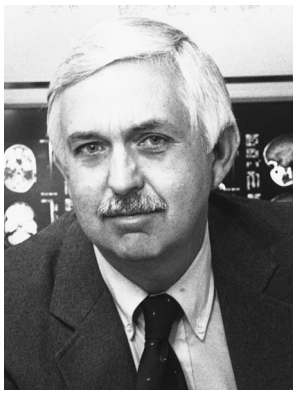
### OVERVIEW

Knowledge about a subject grows as research results accumulate about the subject. Some scientists believe they should publish results quickly in order to stimulate the growth of new knowledge. In their view, rapid publication of results is an obligation, especially when the results are from research supported by public funds. Other scientists feel they should protect their results by patent applications, even though filing such applications delays publication of results. They claim that they deserve to share in profits from the fruits of their labors, and also that society benefits because companies will invest in results only when they are protected by patents. The controversy is becoming increasingly polarized as science becomes more secular and as scientists, including medical physicists, struggle to identify ways to support research. In this issue of Point/Counterpoint, two experienced medical physicists explore this polarization.

Arguing for the Proposition is Larry E. Antonuk, Ph.D. Dr. Antonuk, a Canadian citizen, received his B.Sc. (Physics, 1975) from the University of Calgary and his Ph.D. (Nuclear Physics, 1981) from the University of Alberta, having worked at TRIUMF in Vancouver. From 1981–1984 he was a Research Fellow for the University of South Carolina working at the Université de Neuchatel, Switzerland and at the S.I.N. accelerator. From 1984–1987 he was a Research Associate for the University of Alberta working at the Laboratoire National Saturne accelerator in Saclay, France. He joined the Department of Radiation Oncology at the University of Michigan in 1987 where he is presently an Associate Professor of Radiation Physics and heads the active matrix flat-panel imaging group.



Arguing against the Proposition is Perry Sprawls, Ph.D. Dr. Sprawls received his Ph.D. degree from Clemson University in 1968 after joining the Emory University faculty in 1960. He is Professor of Radiology and Radiation Oncology at Emory and served as Director of the Division of Radiological Sciences. He is on the faculty of several other international universities and is a Director of the College of Medical Physics, International Center for Theoretical Physics, Trieste, Italy. He is certified by the American Board of Radiology in diagnostic physics, the American Board of Medical Physics in diagnostic imaging physics and magnetic resonance imaging and has served as an examiner for both boards. He is author of a series of textbooks on the physics of medical imaging.

### FOR THE PROPOSITION: L. E. Antonuk, Ph.D

#### Opening Statement

The rapid and thorough dissemination of new knowledge is widely regarded as among the highest objectives of those involved in the pursuit of scientific discovery. It is also generally recognized that the successful translation of laboratory findings into practical application is of critical importance to

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society at large, especially in light of the heavy dependence on federal funding of basic research in the U.S. Accomplishing this second goal often requires the involvement of commercial interests that are willing and able to invest the necessary resources to transform scientific discoveries or inventions into useful products. However, bringing a new technology to market is frequently a high-risk endeavor that is unlikely to bring substantial returns for many years. For this reason, the availability of patent protection through licensing can be of pivotal importance in the decision of a company to pursue the development of a new technology. This is especially true for small companies whose success may vitally depend on some degree of temporary relief from competitive pressures as afforded through licensing of patents. Moreover, small companies are often considerably more inclined to assume the higher risks and relatively lower short and medium-term rewards associated with bringing a new technology to market. Thus, seeking patent protection for new ideas prior to publishing may well be the determining factor in whether the results of research ultimately benefit society. At the very least, the existence of patents for a promising new technology often accelerates the process of making that technology available to benefit the public by providing the necessary economic incentives.

Recognition of the importance of the patent process in achieving successful application of new inventions is the fundamental principle of the patent system and is a central feature of the laws governing federally sponsored research in the U.S. For example, the Bayh-Dole act of the U.S. Congress, which became effective in 1981, gives universities and small businesses the right to claim ownership of patentable inventions that result from federally funded research. As a direct result of the incentives created by this progressive legislation, there has been an explosive growth in the patenting and licensing of university-based research results with several thousand administrative support staff assisting these efforts across the United States. In turn, this has led to the creation of numerous start-up companies, often involving university research staff. In an era when funding from government sources is increasingly uncertain, the revenues returned to universities through licensing of intellectual property contribute toward maintaining a strong and healthy climate for applied, as well as for pure, research. Moreover, royalty revenues used to support research generally allow greater discretion and flexibility compared to the more commonly available directed research funds. Finally, given that a patent application can be drafted and filed in the period between submission of a manuscript and the publication of the paper, delay in the reporting of results may entirely be avoided. In summary, the need to publish, and the need for patent protection (which will always remain a secondary objective in an academic environment), are both crucial to society's interests and need not entail compromise.

### Rebuttal

I find myself in agreement with several points discussed so eloquently by Dr. Sprawls in his opening position. In particular, he concisely and accurately summarizes the importance, to individual researchers and to society at large, of prompt presentation and publication of scientific findings. Moreover, his statement, ''The U.S. patent application process does not deter timely publication of results if appropriate steps are taken for documenting research results.'', directly supports a central theme of my position that delay in the publishing of results due to the drafting and filing of a patent application may be entirely avoided.

However, the ''conflict between publishing and concealing research findings,'' mentioned in Dr. Sprawls' opening position, is not something that normally enters into considerations of whether to seek patent protection for new ideas before publishing articles about them, which is the proposition to be addressed in this debate. The reason is that, in order to obtain protection for a new idea through the filing of a patent, patent law requires the complete disclosure of the concept—that is, nothing withheld from a patent application can be protected by a patent. Therefore, ''withholding valuable research findings from publication'' would serve no purpose *vis-à-vis* obtaining patent protection since those findings would necessarily need to be disclosed in the patent filing, which, if filed outside the United States or issued in the U.S. or elsewhere, would become a public document. Of course, a researcher or his institution could decide to protect an idea by choosing never to disclose it (which would also necessitate never filing for patent coverage), thereby potentially creating a trade secret. In an academic environment, however, obtaining trade secret protection would normally be inconsistent with the primary objective of publication.

## AGAINST THE PROPOSITION: Perry Sprawls, Ph.D.

### Opening Statement

Virtually all mankind benefits today from the many advances in medicine and healthcare that have occurred during the recent decades. This is especially true where physicists, other scientists, and engineers have contributed to the development of imaging methods that lead to more effective diagnosis and therapeutic procedures that reduce mortality and increase the quality of life.

This has not come from a few researchers working in relative seclusion but from many in the academic and industrial communities pursuing research and development projects.

Generally the objective of research is to extend the boundary of knowledge beyond what has been established by other investigators. Without a comprehensive knowledge of prior research results it is difficult to plan and execute effective research projects. Without this knowledge, extensive research efforts are wasted on repeating investigations that have already been conducted but not published by others. In many fields of research, scientists are quick to present and publish results not only to enhance the global academic process but also to establish priority and recognition for their research efforts. The additional value to the researcher who publishes includes participation in scientific meetings, academic promotion, and access to funding.

Today, with much research directed to technology and process development, another issue arises when the R and D results have financial value in the marketplace. This is the conflict between publishing and concealing research results. While individuals and their organizations have a right to financially benefit from their research efforts, this should not prevent timely publication. The purpose of the patent process in our country is to protect the intellectual property of an individual from unfair commercialization by others. It is not to be considered as a method of protecting knowledge and research findings. The U.S. patent application process does not deter timely publication of results if appropriate steps are taken for documenting research results.

There are many factors that should be considered by a researcher who is considering withholding valuable research findings from publication:

- How will this information best serve humankind?
- Will the benefits of publication to me outweigh a remote possibility of financial gain through the patent process?
- Is it even possible to get a patent on this?
- Does it really have a significant commercial value that should be protected by a patent?
- Am I or my organization willing to devote the resources (money, time, etc.) to the patent process?

The conclusion is that research results should be published in a timely manner and not delayed because of patent considerations.

## Rebuttal

To publish or patent (and perish in the academic arena?), that is the question. Or is it the question that should be debated here?

Dr. Antonuk and I both recognize the value of the patent process and also the opportunity for academic recognition and the advancement of science and technology through the presentation and publication of research findings.

In his opening statement he has clearly shown how patent protection contributes to the total research and development process and can generate funding for on-going investigation. In many cases this can be consistent with academic publication.

The real question to be considered is not so much publish or patent but how to publish and patent so that neither is seriously compromised.

In response to Dr. Antonuk's thorough and compelling statement of support for the patent process I remind us of the need for prompt publication. This not only serves the academic aspirations of the individual scientist; it is one of the foundations of the total academic research process.