Quo vadis: Where is medical imaging heading?

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The German psychiatrist Emil Krapelin (1856-1926) is credited as being the founder of modern scientific psychiatry, as well as psychopharmacology and psychiatric genetics. His theories dominated the field of psychiatry at the beginning of the 1900s and have done so, in essence, since the end of the 20th century.

Krapelin opposed the methods of Sigmund Freud, who regarded psychiatric disorders as if they were caused by psychological factors and treated them as such. Krapelin's publications had neither the literary quality nor the paradigmatic power of Freud's. Today, however, published literature in the field of psychiatry is overwhelmingly biological and genetic in its orientation.

Krapelin and Freud are both long dead. Will psychiatry remain a medical discipline in its own right, or will it become part of neuroscience?

Wilhelm Conrad Rontgen is dead, too. A similar question could be asked about radiology. Will it remain as a discipline in its own right? Is it a discipline of its own?

What is radiology? According to the U.K. Royal College of Radiologists, the term is defined as "the branch of medicine originating from the use of x-rays for diagnosis." The RCR notes that this is now called "clinical radiology," and it is performed by clinical radiologists.

The key word here is "clinical."

We are not nuclear physicians, radiation physicists, radiation biologists, radiation chemists, radiotherapists, sonographers, molecular engineers, computer technicians, archivists, secretaries, or hospital administrators.

Pediatricians deal with children. We deal with images. Pediatricians do not generally have the knowledge to develop medicines for children, investigate molecular genetics, or develop computer programs. A similar approach holds for radiologists.

The job of a clinical radiologist is to make a diagnosis based on images created by a medical imaging modality. It is not the equipment that makes the diagnosis but your knowledge in interpreting the images. Knowledge is not created by computers. Computers organize and manipulate information. You cannot delegate thinking to a computer.

When people talk about the future of radiology, they usually talk about machines. Patients are regarded as objects to be studied. The focus is on innovation, using complex equipment and complicated techniques. The future has to be more complicated than the past. Nobody, however, gives you the proof that this approach works.

We are forever being told that we live in the age of information and the age of knowledge. Yes, we have more information now than we did previously. But what about knowledge? If knowledge is processed information, then this is something that we don't necessarily have. We have, instead, undigested information that can create fear: fear of the future, fear of pain, fear of diseases, fear of not being able to find a diagnosis from our pictures.

We are told that we need higher spatial resolution, faster imaging, more slices, a different contrast agent. We live in fear that if we don't use the latest development, we may overlook a patient's disease. But nobody proves that all this results in a positive outcome for the patient. We have simply done whatever was technologically possible.

Knowledge is our main asset. Not information obtained from the Internet or data stored in a laptop. But knowledge alone is not sufficient. It is equally important that we use this knowledge critically.

In spring 2007, I attended a meeting on essential health technologies arranged by the World Health Organization in Geneva. A wide range of people from all over the world had been invited. When I asked the representative of an industry lobby group operating out of Brussels why companies he represented would not agree to outcome studies measuring the impact of their products, he...
responded, "That's impossible. The lifespan of most products is only two years."
These very same products would increase productivity, one of the central themes favored by commercial salespeople and hospital managers. "We have to take image management to the next level of performance," they say. But do we? Or is this just another empty cliche and a completely wrong approach to radiology?
People who are able to use the tools and interpret the results bring with them the solution. Wherever you have weak leaders and dependents who are lacking in knowledge, then people from the outside (in this case, industry representatives and health administrators) will become more influential and finally take over decision-making.
The future of radiology is not in machines or techniques that hardly anybody understands any more. It is in the brains of radiologists. If radiologists do not realize this, then it will harm them and their discipline.

**It has already caused harm.**

Have you ever considered the sanity of developing the kind of machines that you find in today's hospitals? Have you ever thought about calling into question the equipment that you use or are offered by companies?
Are you able to program your video recorder at home? Do you understand the programs your digital camera offers? Have you ever felt like a stranger in your own world?
Remember: Radiologists are expected to be at the forefront of high-tech medicine. But if you don't understand the techniques you apply, your position in medicine has to be called into question.

Discussions on the future of radiological departments can attract an opinion from just about everybody; from the cleaning lady to the cardiologist, the ophthalmologist to the hospital administrator, local hospital planners, and teachers-turned-politicians.... Medicine-radiology included-has been removed from the control of the knowledgeable. It is now in the hands of lay people, amateurs, dilettantes, moneymakers. An MBA or a degree in public health or architecture does not qualify you to plan radiological departments or hospitals.

We should have a logical, rational approach. Medicine, however, is not rational or logical but somewhere between science and witchcraft. It lies somewhere between ego, money, and idealism, somewhere between stupidity and cleverness, run by doctors, nurses, politicians, managers, patients, and patients' relatives. This is the reason that a rational approach will not happen.

It's a rat race. Many people believe that they have to participate in this race, but they do not realize that they are not rats. They are mice. A rat race for mice is an unequal race. The mice will lose, whatever they do.

Radiological studies will, in many cases, result in an overdiagnosis that brings no benefit to the patient. The logical approach to the future of radiology should be an assessment of the state of the art, personal or general. Such an assessment would consolidate technical development.
Please understand what I am saying. I do not say that the end of radiologists is imminent. I do not want to say that you and I are idiots. I do not want to say that commercial companies are cheats per se. We need hospital administrators, we need politicians. We are administrators, we are politicians. I know how other people like to twist words after somebody has spoken.

Quo vadis? Where are you heading to? Quo ibimus hinc? Where do we go from here?
Vade mecum. Come with me. I will try to shape the future. (Not with me...with yourself.) And don't forget:
"There is at the bottom only one genuinely scientific treatment for all diseases, and that is to stimulate the phagocytes." [Shaw GB. The Doctor's Dilemma. New York: Penguin, 1946. (www.gutenberg.org:80/etex/5070)]

This column is based on the Holger Pettersson Lecture given by Prof. Rinck at the Nordic Congress of Radiology in Malmo, Sweden, May 2007.

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**Disclosures:**

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