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## **Nuclear Magnetic Resonance Terminology**

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## Nuclear Magnetic Resonance Terminology

In the spring of 1972, Godfrey Hounsfield and James Ambrose reported on a "new" technology which they called "computerized axial tomography" (CAT). It represented a new way to apply the roentgen ray to generate images by means of: (1) a scanning beam, (2) scintillation detectors that moved together with the scanning beam, and (3) a computer to solve the numerous equations required to assign attenuation numbers to an image matrix that was then  $64 \times 64$  pixels.

Interest in this technology was instant and with great celerity not only did radiologists and others interested in medical imaging try to gain knowledge of it, but more than a dozen manufacturers of imaging equipment decided to embark on research and development programs to produce their own CAT scanners.

By 1974, the nomenclature of the technology began to be discussed. When Dr. Romeo Ethier of the Neurological Institute of Montreal organized what might be called the first international symposium on computerized axial tomography, the conferees thought the name should be changed from "computerized" to "computed" axial tomography. Also, because of research then underway at Massachusetts General Hospital and elsewhere that showed the potential for coronal, sagittal, and scans in other planes, it was suggested that the word axial be dropped from the phrase. Thus, from that meeting, the term computed tomography (CT) evolved. While some continue to refer to computed tomography as CAT scanning, CT is now the standard term and the usage of CAT scanning continues to decline.

Shortly after the 1972 meeting, and based on the same type of computer algorithms employed to calculate the gray scale values in CT scanning, the possibility of generating cross-sectional images by emission tomography was dem-

onstrated. Because positron emitters were used for the purpose, the term PET (positron emission tomography) was created.

Most recently we began to deal with the technology known since its discovery by Bloch and Purcell in the late 1940s as nuclear magnetic resonance (NMR). It is rapidly becoming clear that magnetic resonance imaging will have extensive clinical application in the future.

Thus, because we are faced with a growing number of methods using the computer to generate images, it seems appropriate to suggest uniform terminology that will encompass the entire field. I propose the following:

1. X-ray computed tomography (XCT or simply CT).
2. Emission computed tomography (ECT). PECT (positron emission computed tomography) when positrons are employed.
3. Magnetic resonance computed tomography (MRCT or simply MR).

I urge that the word "nuclear" be removed from the technology now called nuclear magnetic resonance imaging. The elements that generate the signals may not always be nuclear; possibly electron spin resonance may prove appropriate in the future. Also, in the minds of the lay public, the term *nuclear* often has undesirable implications. In addition, the term *magnetic resonance* (MR) can be used for such nonimaging applications as magnetic resonance spectroscopy (MRS) and topical magnetic resonance (TMR).

It is my hope that this general approach to identifying the new imaging technologies will be accepted.

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