

Lack of Standards in Radiology: A Letter to the Editor

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ABSTRACT

This paper is proposing new standards for scanning machines in radiology departments around the world to become work-friendly. Implementing these standards will save money, time, and energy. The standards will result in resolving the confusions among the manufacturing company.

Key words: Standards; Designs; Radiology; Pulse Sequences; Imaging Machines

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LETTER TO THE EDITOR

One of the biggest issues in radiology, is the different designs of the imaging modalities in radiology departments worldwide. This issue has a huge impact on all the resources. Today, the differences in naming of pulse sequences is confusing to Radiographers and Radiologists^[1]. These pulse sequences which made by the manufacturing companies like General Electric, Siemens, Toshiba, Phillips, etc. A pulse sequence in an MRI machine made by General Electric is totally different from another one made by Siemens. Any button location, control panel design, system screen window layout, automatic injector construction, and pulse sequence name are totally different not just from one company to another, but even from a previous generation to a new generation of the same company are not the same. This will create the need for Radiographers to spend time on training to operate each machine and the health organization will still have to pay for them during their training on each new machine. Furthermore, the manufacturing company will have to send their staff to teach the Radiographers when they install a new machine in a hospital to know how to operate this machine which is money, time, and energy consuming. On the jobs websites, the Radiographers who seek an employment have to mention the generic names of the imaging modalities that they have experience with. As well as, the health organizations and hospitals who post vacante jobs requesting an experience with a specific machine (model and brand) in particular. Otherwise the applicant will not be accepted. In many conferences, Radiologists will mention a specific pulse sequence then they have to present a table of the similar pulse sequences, but with different names in different scanning machines made by different companies which may cause confusion.

The previous issue can be solved by making a standard design of the control panel, buttons location, system screen windows (locations of icons of different functions, but the colors or styles can stay different), common (agreeable) names for pulse sequence. The right to name will be given to the one who invented this pulse sequence or technology, automatic injectors design. This paper aims to propose a standard design of the important parts of the scanning machines, but allow at the same time those companies to show the uniqueness of their products. Implementing a different radiology protocols in every hospital is not a part of this proposal. The common standard design of imaging machines must involve the manufacturing companies,

the governmental sectors like FDA, and the accredited medical organizations like radiological societies.

Standardization can't be applied without a governmental request and an organizational intervention from the specialized organizations like; the American College of Radiology, British Institute of Radiology, Royal Society of Radiologist, Society of Radiographers, etc. As well, the companies need to agree on one common name for each pulse sequence with the right to name them is given to the inventing company. The names also need to become a standard simple name like T1 or T2 which nobody can be confused with. The companies should have regular meetings to discuss the updated names or any changes made. The companies must inform the scientific organizations to publish these changes and updates in their yearly manual.

The design of the control panel should be the same. Each button would be in the same place in every machine similar to the keyboards in personal computers are worldwide the same. Similarly, traffic signs are recognized worldwide and the illustrations in these signs are showing a specific meaning that is easy to understand upon seeing these signs. Another example is cellphones, where the green color button or icon means starting a phone call, while the red color button or icon means finishing the phone call. All the previous examples can be imitated in the standardization of scanners in radiology departments globally. The design of the registering the patient icon, searching the scans history option, sending scans to picture archiving and communication system (PACs) option, or any other function should be in a standard location on the screen. Any button in the control panel should have a common illustration of it's function (i.e. the tilting button in a CT scanner should have the same illustration in all CT scanner despite having different the manufactures company) and the tilting button should be in a specific location in all the CT scanner. For example; the emergency button should be red and the word "stop" on it and it must be in a specific location (i.e. the right upper corner of all the CT or the MRI machines' control panel).

Every company wants to make their scanning machine unique and work-friendly which is good. This proposal is not suggesting

to make all the scanning machines look like each other or destroy the companies' creativity and uniqueness. What we suggest is to make a common standard design in a specific parts of the machines like the control panel or a common name for a pulse sequence. The manufacturing companies can keep their uniqueness, special designs, colors, and characteristics in non-related parts. Every company that has a special technology that they use in their machines (which makes them unique), the company can keep their technology and improve it to compete with other companies. If a company wants to make their CT scanner in donate shape or box shape, they can do so. If another company wants to make their patient's couch to be able to bear any patient weight, it is not against the proposed standards. It could make this company has an advantage over the other companies (i.e. the proposed standards is not against these unique features from different companies).

The radiographers and Radiologists curriculums must involve these standard designs and pulse sequences names after that have been agreed on. After graduation, a Radiographer expected to know how to operate a machine immediately without the need for training. The yearly manual or updates by all medical organizations must cover all the new changes. The changes must not be huge changes that will lead to confusion. It must be within a minimal range. All machines will have the same control panel, system screen window, automatic injector, and pulse sequence names worldwide.

In the future, all the companies who produce scanners that do not fit with the common requirement of the standards, can't be used in radiology department (after they have been agreed on). By working with the FDA or ACR accreditations of radiology departments, or customs agency, these scanners can't be approved, accredited, or allowed to enter the country.

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