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Orientation of NMR Images: ACR Subcommittee's Reasoning

Drs. Bryan and Haaga agree with the ACR's suggested orientation of NMR images of transverse and coronal sections but question the suggested presentation of sagittal images because it does not follow the standard display convention for sonography. Some of the considerations that went into the selection of orientations by the ACR Subcommittee on NMR Nomenclature and Phantom Development may be of interest.

Transverse NMR images do not have any close analog in traditional radiography, but there is a clear precedent in both sonography and CT to display transverse section images as viewed from below, with the patient's right to the left side of the image. This is indeed what essentially all publications on NMR imaging to date have done, and it was logical to propose this as a suggested standard orientation.

As Drs. Bryan and Haaga imply, coronal images correspond closely to frontal views in traditional radiography and are conventionally presented with the long axis of the patient vertical, as if erect and facing the viewer, with the patient's right to the left side of the image. Anatomy books also generally follow this convention. Coronal images are less commonly made with sonography than transverse images, but the American Institute of Ultrasound in Medicine has suggested they be presented with this same orientation, as if the patient were erect and facing the viewer. Coronal CT images can also be made. At least one journal explicitly requires display of coronal section CT images in this "erect" mode, and it is generally followed elsewhere as well. Again, essentially all publications to date on NMR imaging have followed this orientation, and it was logical to propose this as the standard for presentation of coronal NMR images.

Sagittal images correspond closely to lateral views in traditional radiography (e.g., of the head, chest, or spine), which are conventionally presented with the long axis of the patient vertical, as if erect, and generally as if facing to the viewer's left. Anatomy books also generally follow a similar convention. Presentation of sagittal sonograms follows a different convention, with the long axis of the patient horizontal, as if supine,

with the patient's head to the viewer's left. Sagittal CT images can also be created by reformatting. Although there seems to be no "official" standard for the presentation of such sagittal CT images, most publications have displayed them with the traditional orientation, as if the patient were erect, rather than following the sonographic convention. Also, almost all publications to date on NMR imaging that have included sagittal images have presented them in the traditional "erect" orientation, rather than following the sonographic convention. Thus, there are two, mutually exclusive, precedents for the presentation of sagittal images.

In the head, chest, and spine, where applications of sonography have been limited, the familiarity of lateral images displayed as if the patient were erect argues for maintaining a similar convention for display of sagittal images. In the abdomen and the pelvis, where sonography is often used, lateral radiographs are also used, but the sonographic convention for presentation of sagittal images usually is not followed for these lateral radiographs.

It is clearly impractical to use two sets of display conventions for different parts of the body. Thus, it was somewhat arbitrarily decided to follow the precedents that had been set in anatomy texts, general radiography practice, and by the existing NMR-imaging literature for standard presentation of sagittal NMR images. As the orientation is immediately apparent on viewing such an image, this is not likely to lead to any significant confusion in interpretation, as sometimes happened with left-right uncertainty in the early days of CT. If this becomes more of a problem than anticipated as more applications of NMR imaging to abdominal and pelvic disease are developed, a suitable revision will be considered for the next edition of the ACR's suggested NMR standards.

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