

# Standardization of Cardiac Tomographic Imaging

From the Committee on Advanced Cardiac Imaging and Technology,  
Council on Clinical Cardiology, American Heart Association; Cardiovascular Imaging Committee,  
American College of Cardiology; American Heart Association; and Board of Directors,  
Cardiovascular Council, Society of Nuclear Medicine

To facilitate the interpretation and comparison of cardiac tomographic images, the Society of Nuclear Medicine, the American Heart Association, and the American College of Cardiology jointly recommend that a standardized nomenclature and display of these images should be adopted by all centers performing single-photon emission computed tomography (SPECT), positron emission tomography (PET), magnetic resonance imaging (MRI) and cine computed tomography (CT) imaging.

## SPECT Images

### Nomenclature

1. The view comprising oblique tomographic cuts generated by slicing along the short-axis perpendicular to the long-axis of the left ventricle will be called the short-axis view.
2. The view comprising long-axis tomograms generated by slicing in the vertical plane through the short-axis perspective will be called the vertical long-axis view.
3. The other long-axis view, generated by slicing along the horizontal plane through the short-axis perspective, will be called the horizontal long-axis view.

### Display

The images will be displayed in a left-to-right (preferred) or top-to-bottom format (Fig. 1).

1. The short-axis tomograms will be displayed with the apical slices always shown first, then progressing serially toward the cardiac base. The orientation will be as if the viewer were observing the heart from the cardiac apex, with the left ventricle to the viewer's right and the right ventricle to the viewer's left. The superior surface is at the top and the inferior surface at the bottom.
2. The vertical long-axis will be displayed with serial slices

beginning at the septum and progressing to the lateral wall of the left ventricle. This view will be displayed with the heart in a horizontal position, the cardiac apex to the viewer's right, similar to the orientation of a right anterior oblique left ventriculogram. This orientation views the heart from the right ventricle to the left ventricle.

3. The horizontal long-axis will be displayed with serial slices beginning at the inferior surface of the heart and progressing toward the superior surface. This view will be displayed with the cardiac apex at the top and the cardiac base at the bottom, with the left ventricle to the viewer's right and the right ventricle to the viewer's left. This orientation is similar to that of the transthoracic two-dimensional echocardiographic apical four-chamber view as displayed with the apex up. This orientation views the heart from the inferior surface looking toward the superior surface.

### Other Recommendations

1. For purposes of interpretation and comparison, it is essential that a series of tomographic images be analyzed rather than a single tomographic slice.
2. It is also recommended for interpretation and comparison that serial studies in the same patient (such as an exercise thallium study followed by a redistribution study) be displayed simultaneously as a series of images either one above the other (preferred) or one next to the other.

## PET, MRI and CT Images

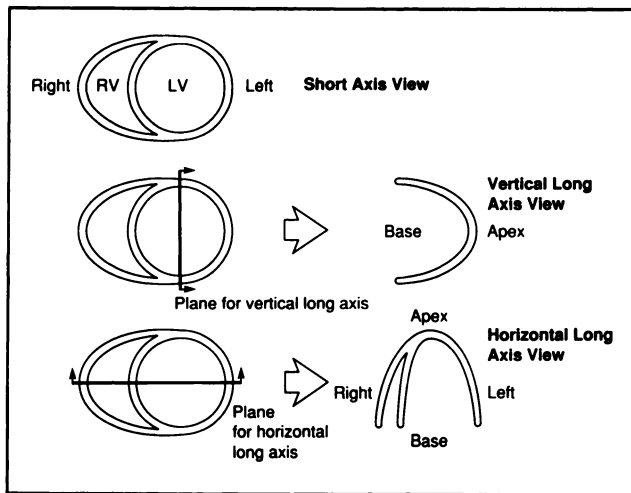
### Nomenclature

1. Whenever possible, it is recommended that the tomographic images obtained from PET, MRI and cardiac CT be displayed in the same short-axis and long-axis orthogonal planes as described above. In this case, the nomenclature and display will be identical to those used for SPECT.
2. If transverse images perpendicular to the long-axis of the body (but oblique to the heart) are shown, this orientation will be called the transaxial view.
3. If images are parallel to the long-axis of the body and parallel to the antero-posterior midline plane, this view will be called the sagittal view. (This view should be used principally in patients with noncardiac thoracic structures.)

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**FIGURE 1.** Display for SPECT images.

- If images are parallel to the long-axis of the body and perpendicular to the antero-posterior midline plane, this orientation will be called the coronal view. (This view should be used principally for patients with congenital heart disease or to image noncardiac thoracic structures.)

#### **Display**

- The transaxial images will be displayed beginning at the superior surface of the heart (or great vessels if they are also displayed) and progressing toward the diaphragmatic surface. The orientation will be with the viewer observing the heart from below, with the anterior chest wall at the top, the heart to the viewer's right, and the right lung to the viewer's left. In this orientation, the left ventricle will appear to the right of the right ventricle.
- Sagittal images will be displayed beginning with the patient's

right side, progressing to the left side.

- Coronal images will be displayed beginning with the anterior chest wall, progressing to the posterior chest wall.

#### **Appendix**

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