

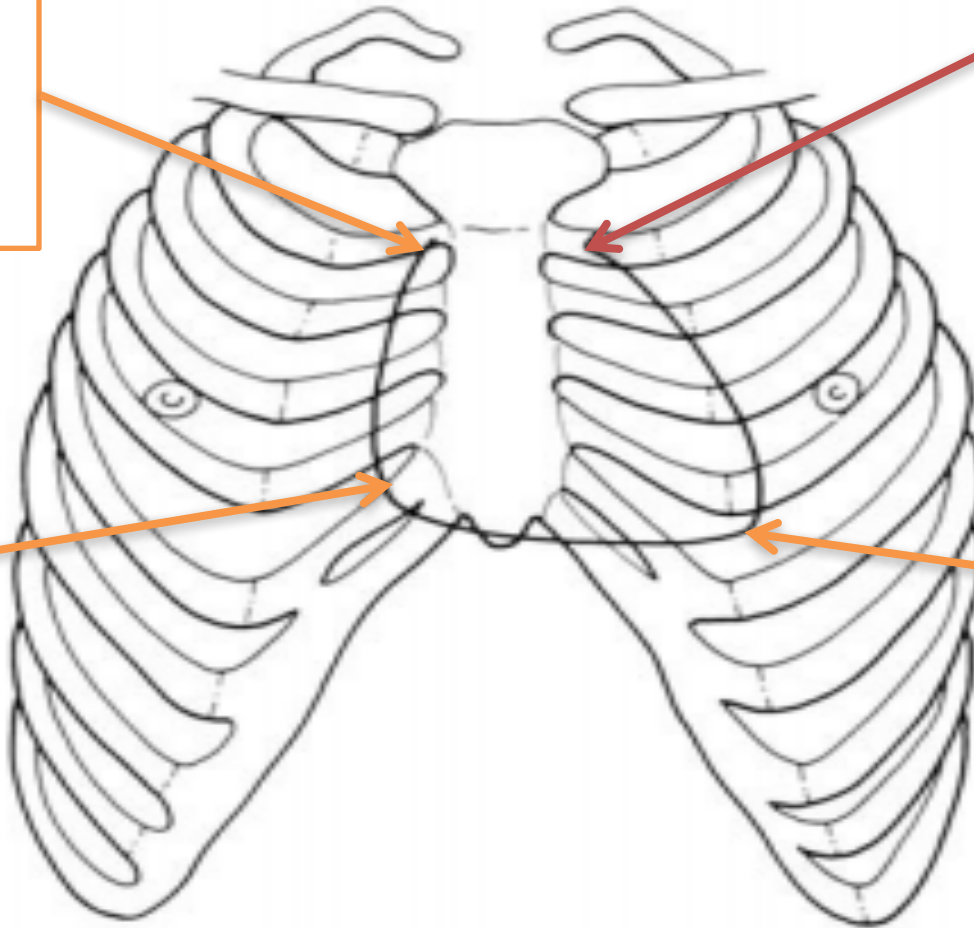
The heart The outline of the heart can be represented on the surface by the irregular quadrangle bounded by the following four points

2-The 3rd right
costal cartilage
0.5in (12mm)
from the sternal
edge

1-The 2nd left
costal cartilage
0.5in (12mm)
from the edge
of the sternum

3-The 6th
right costal
cartilage 0.5in
(12mm) from
the sternum

4-The 5th left
intercostal space
3.5in (9cm)
from the midline
(corresponding
to the apex beat)



Surface Anatomy of the Heart Valves

THE TRICUSPID VALVE

lies behind

The right half

of the sternum opposite

The fourth intercostal space

THE MITRAL VALVE

lies behind

The left half

of the sternum opposite

The fourth costal cartilage

THE PULMONARY VALVE

lies behind the medial end of

the third left costal cartilage

and the adjoining part of the
sternum

THE AORTIC VALVE

lies behind the left half of the
sternum opposite the third
intercostal space

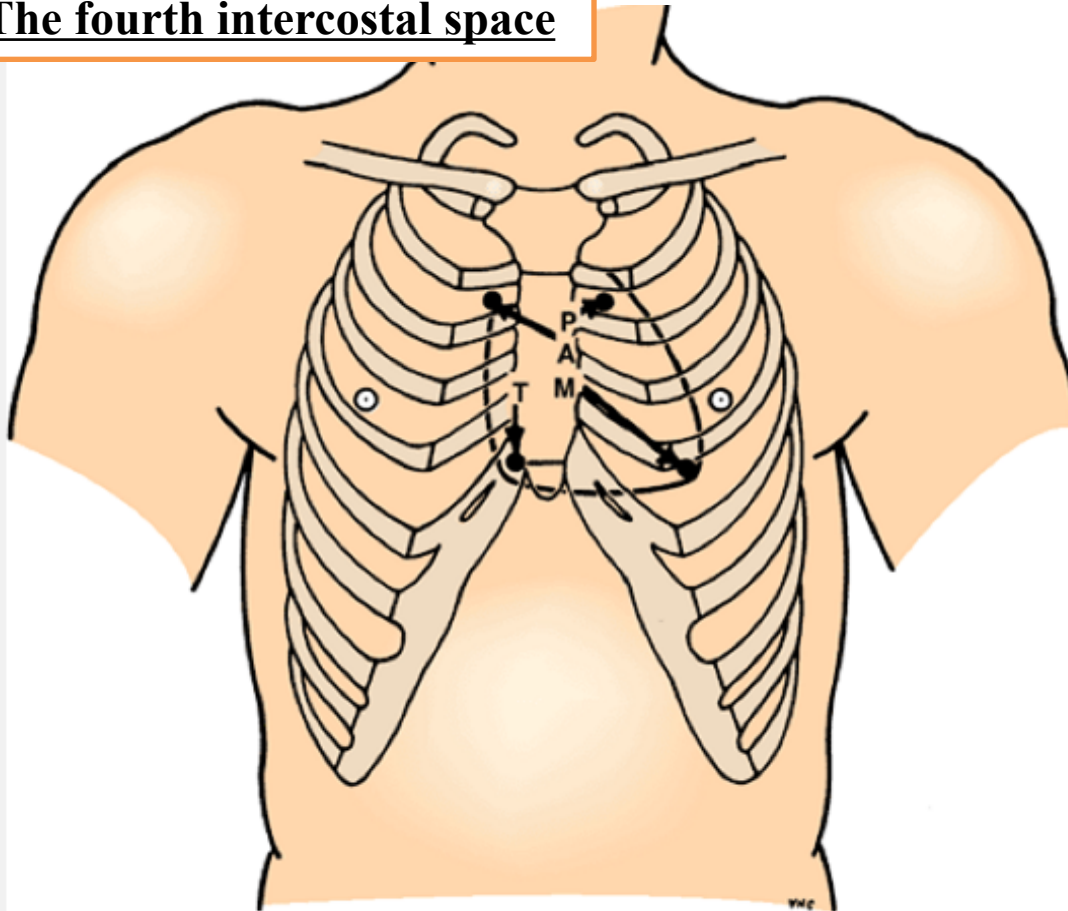


Figure 3-15 Position of the heart valves. P, pulmonary valve; A, aortic valve; M, mitral valve; T, tricuspid valve. Arrows indicate position where valves may be heard with least interference.

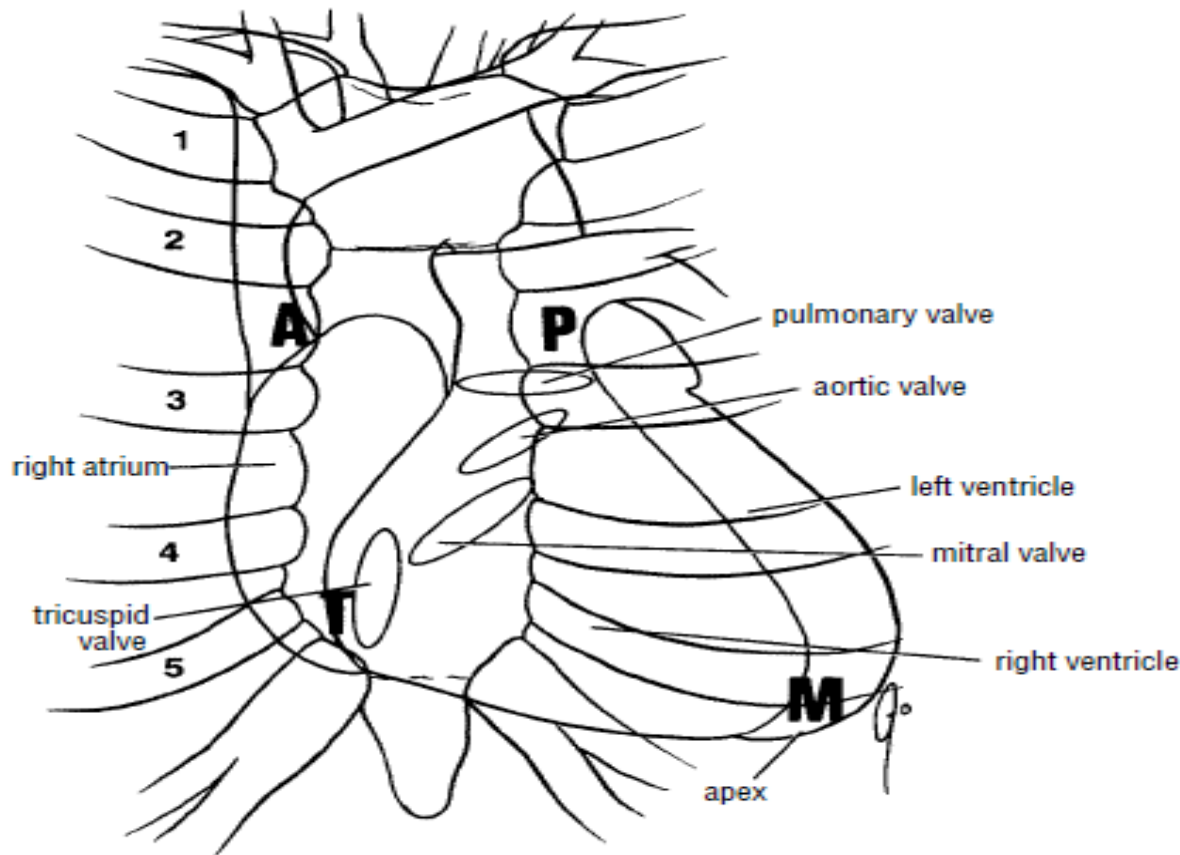
Auscultation of the Heart Valves

The **tricuspid valve** is best heard over the right half of the lower end of the body of the sternum

The **mitral valve** is best heard over the apex beat (at the level of the fifth left intercostal space, 3.5 in. (9 cm) from the midline)

The **pulmonary valve** is heard over the medial end of the second *left* intercostal space

The **aortic valve** is best heard over the medial end of the second *right* intercostal space

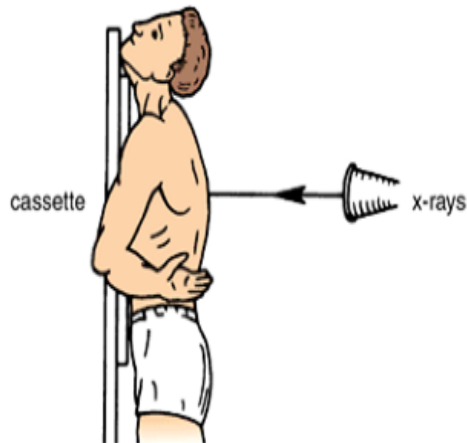


CD Figure 4-2 Surface anatomy of the heart and great blood vessels. Note the position of the heart valves relative to the chest wall. The bold letters indicate positions where valves may be heard with least interference. A = aortic valve, M = mitral valve, P = pulmonary valve, T = tricuspid valve.

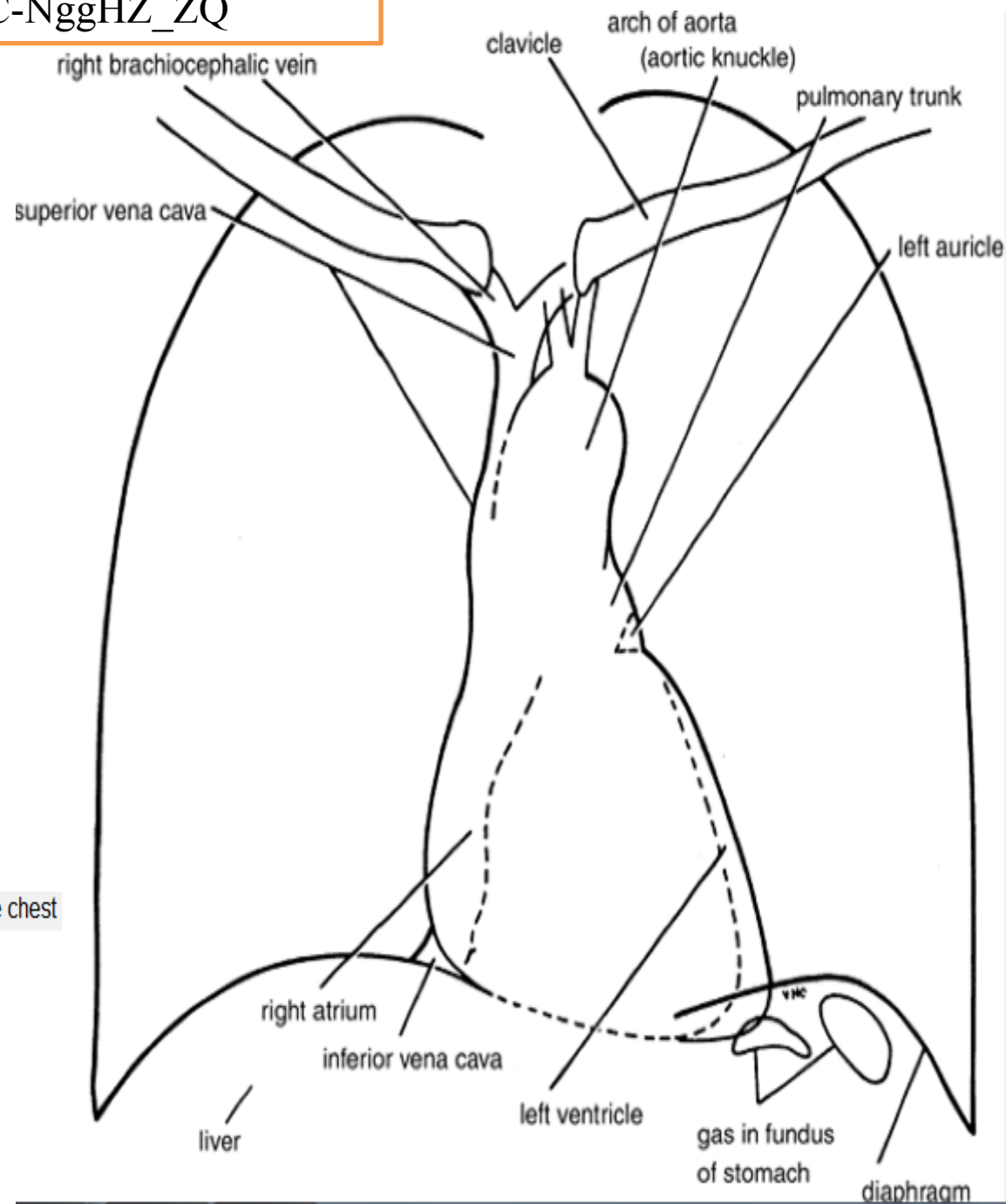
Valvular Heart Murmurs

Apart from the **sounds of the valves closing**, the blood passes through the normal heart silently.

Should the valve orifices become narrowed or the valve cusps distorted and shrunken by disease, however, a rippling effect would be set up, leading to turbulence and vibrations that are heard as heart murmurs



Main features observable in the posteroanterior radiograph of the chest



THE RIGHT CONTOUR OF THE CARDIAC X-RAY

The upper half of the right contour is formed by the superior vena cava (SVC)

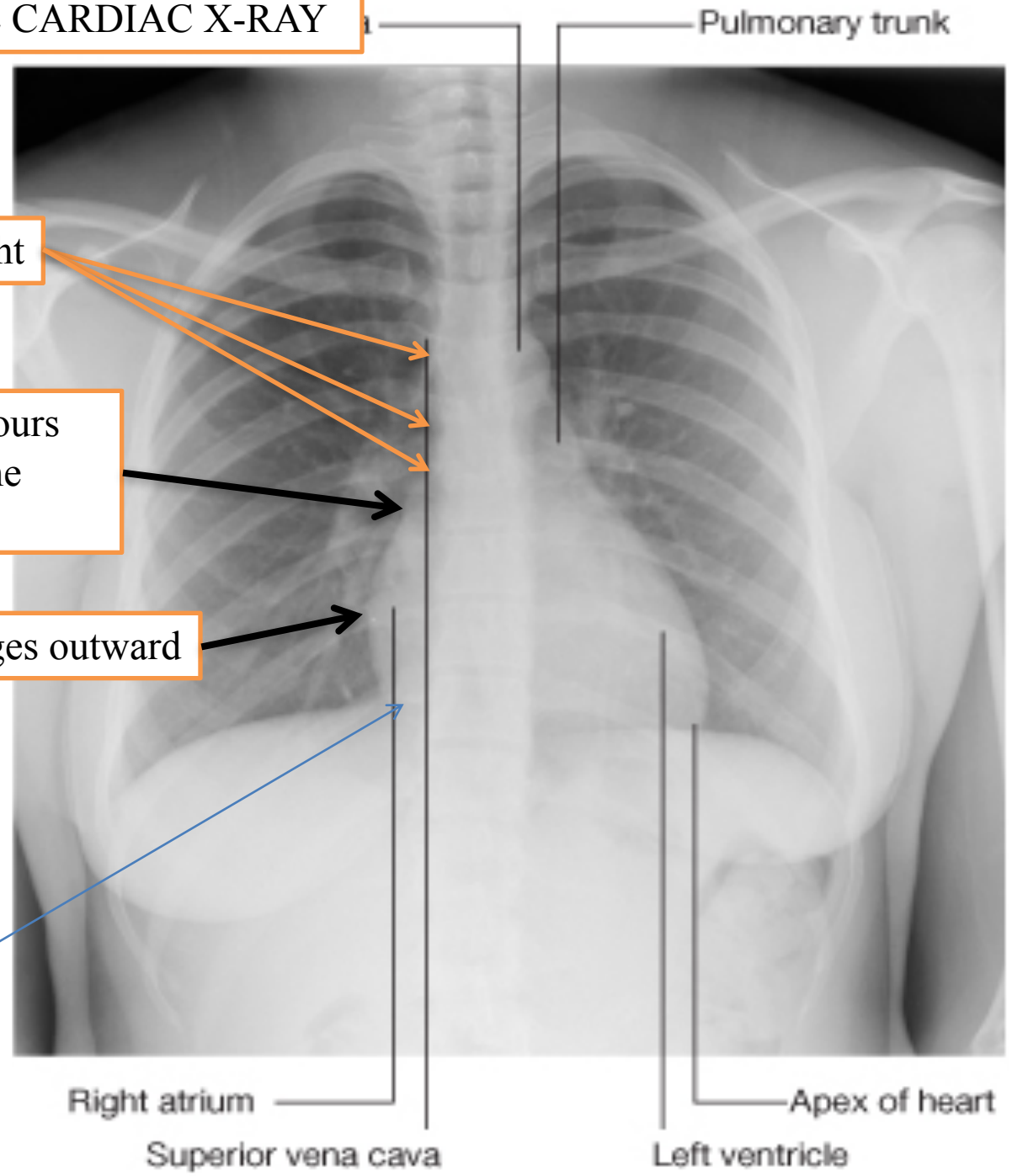
is straight

The angle between these two contours represents the superior aspect of the right atrium

the lower half by the lateral wall of the right atrium

bulges outward

If the patient takes a deep inspiration, an indentation on the right border of the heart can be seen just above the diaphragm, identifying the junction of the inferior vena cava (IVC) and right atrium





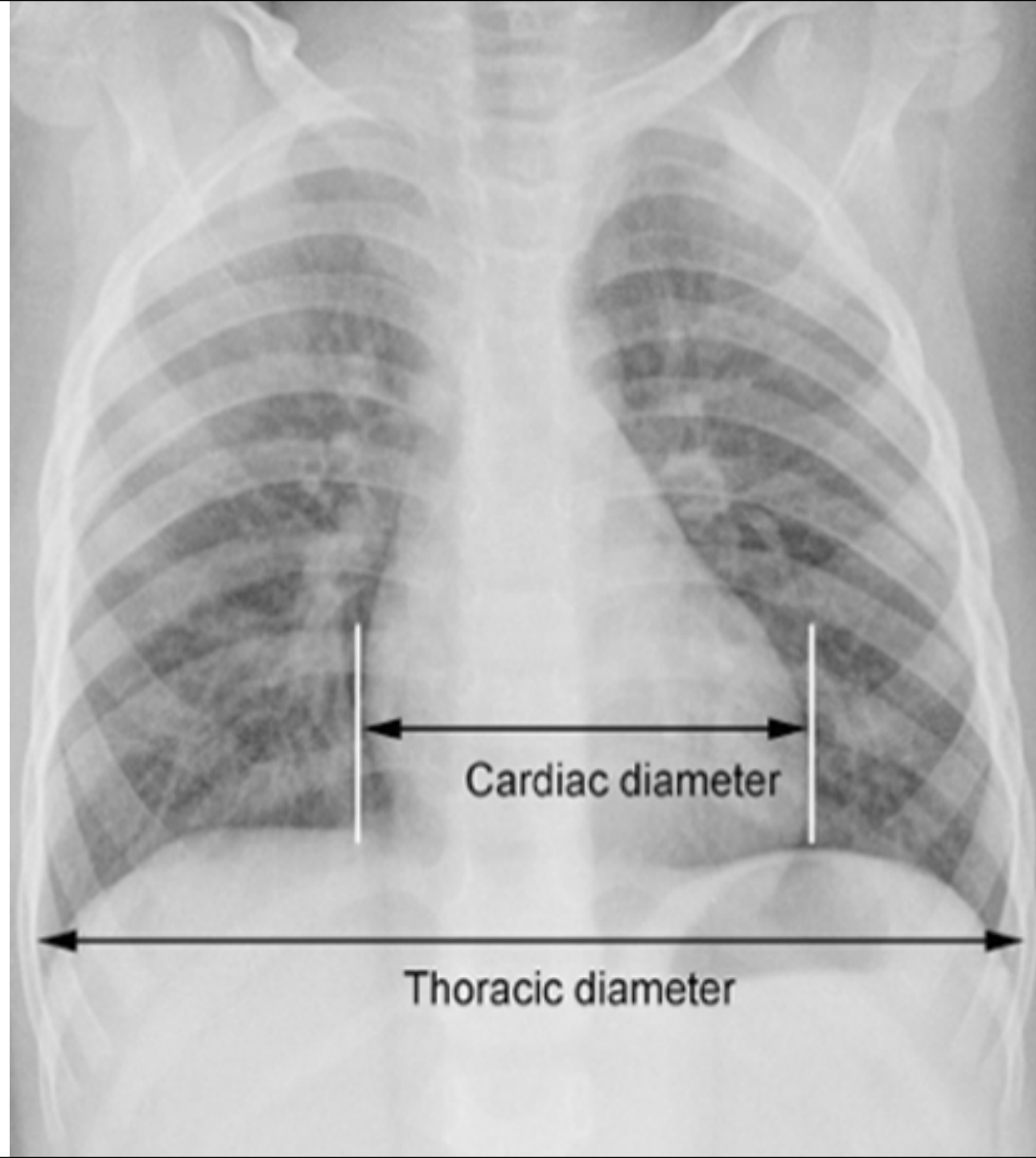
On the left side, the uppermost part of the cardiovascular is formed by the distal arch of the aorta as it curves posteriorly and inferiorly to become the descending thoracic aorta. This is seen as a localized bulge extending from the left side of the mediastinum above the right tracheobronchial angle.

Immediately below the aortic bulge, the main pulmonary trunk and left main pulmonary artery are border forming.

A small segment of the left cardiac silhouette below the pulmonary artery is formed by the left atrial appendage. This segment normally is flat or slightly convex and is continuous with the curve of the left ventricle, which forms the largest part of the left border of the cardiac contour.

The cardiothoracic ratio (CTR) aids in the detection of enlargement of the heart which is most commonly from cardiomegaly but can be due to other processes such as **Pericardial effusion**

is the ratio of maximal horizontal cardiac diameter to maximal horizontal thoracic diameter (inner edge of ribs / edge of pleura). A normal measurement should be <0.5 .



ON the CT scans

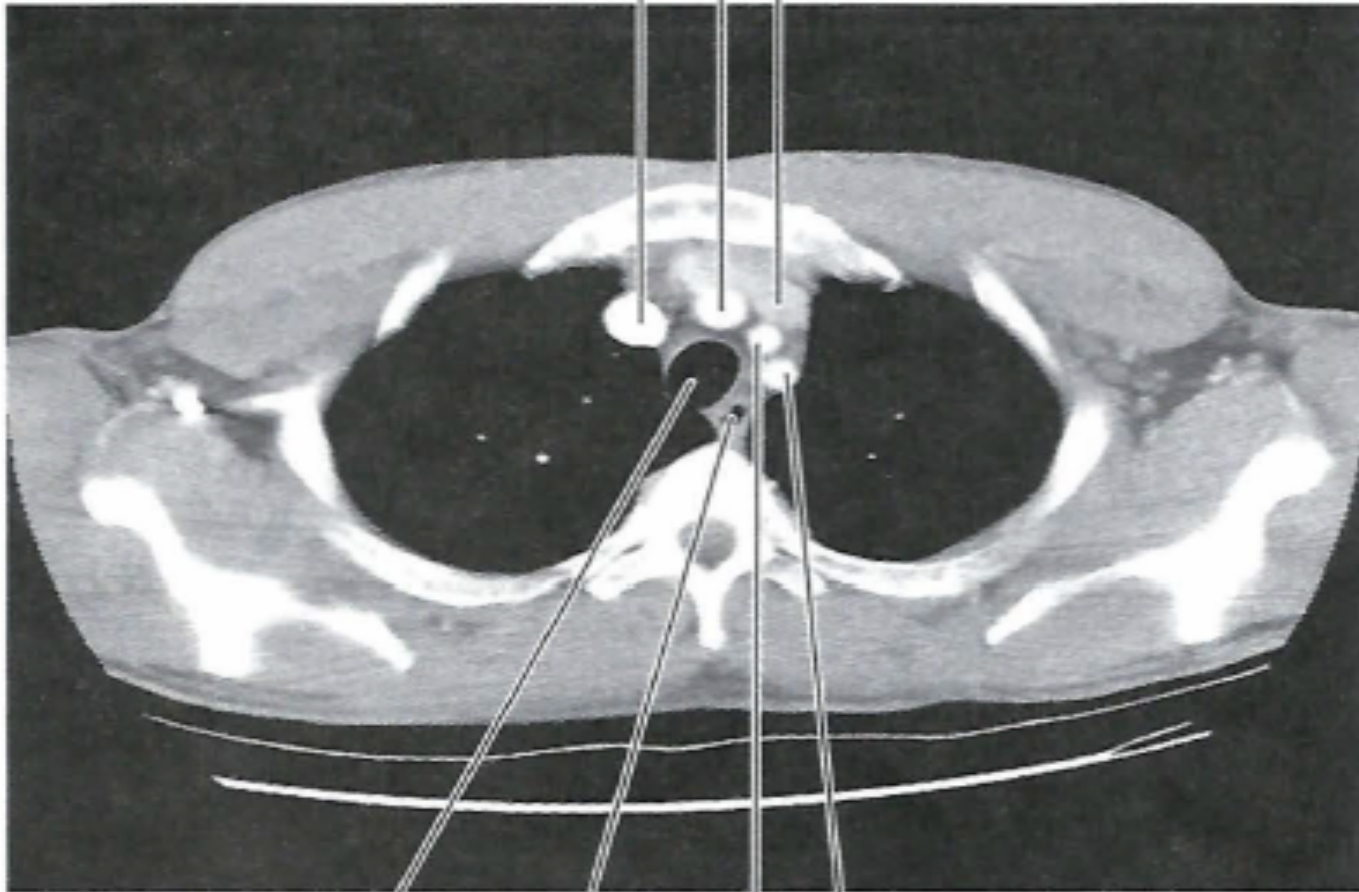
You should appreciate the fact that we are evaluating the inferior part of the section (not the superior), therefore, it should be noted right side will be actually on the left side on the scan and vice versa.

T2 LEVEL

Brachiocephalic trunk

Right brachiocephalic vein

Left brachiocephalic vein



Trachea

Esophagus

Left subclavian artery

Left common carotid artery

Figure III-2-39. Chest: CT, T2

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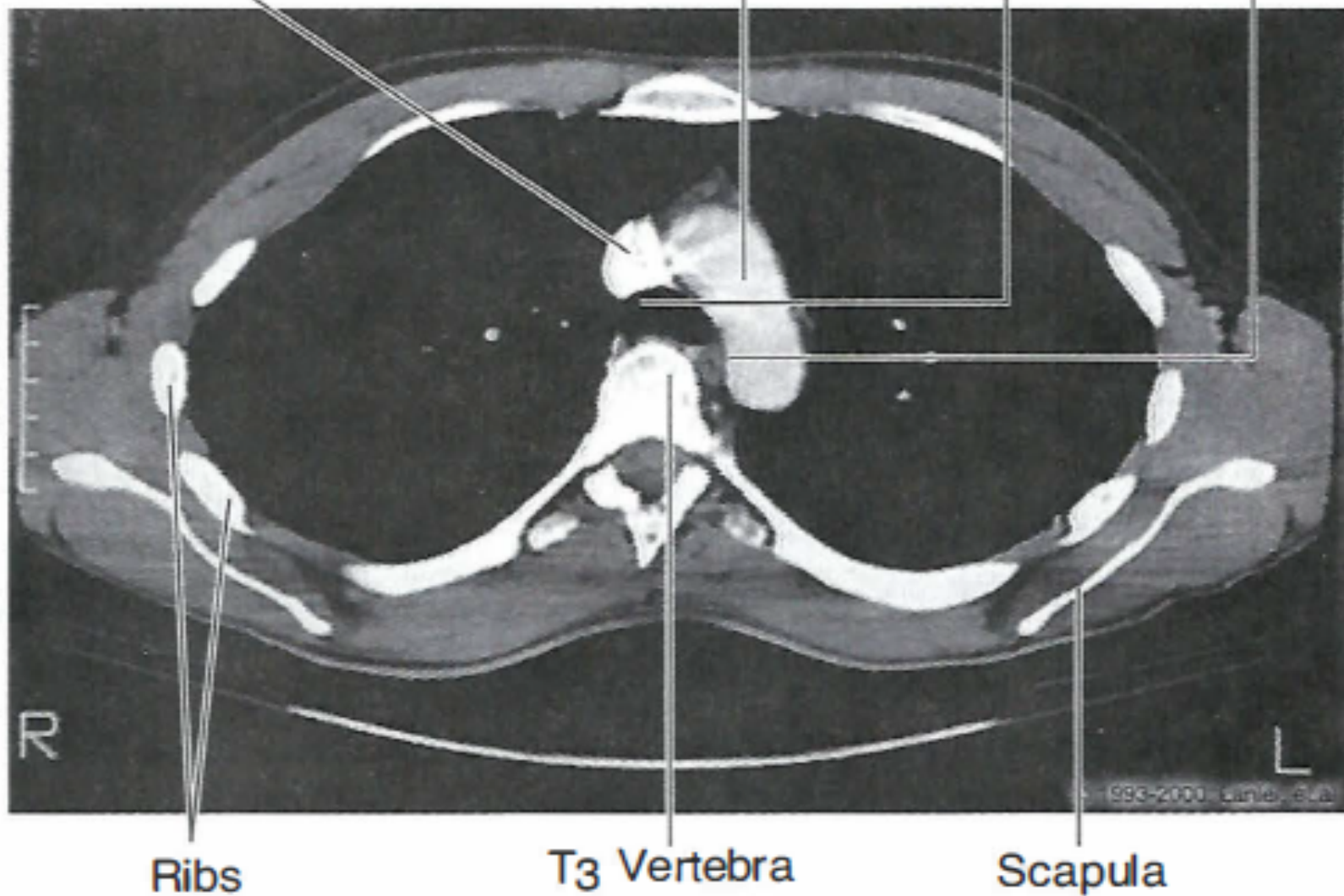
T3 LEVEL

Superior Vena Cava

Aortic Arch

Trachea

Esophagus



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Figure III-2-40. Chest: CT, T3

T4 LEVEL

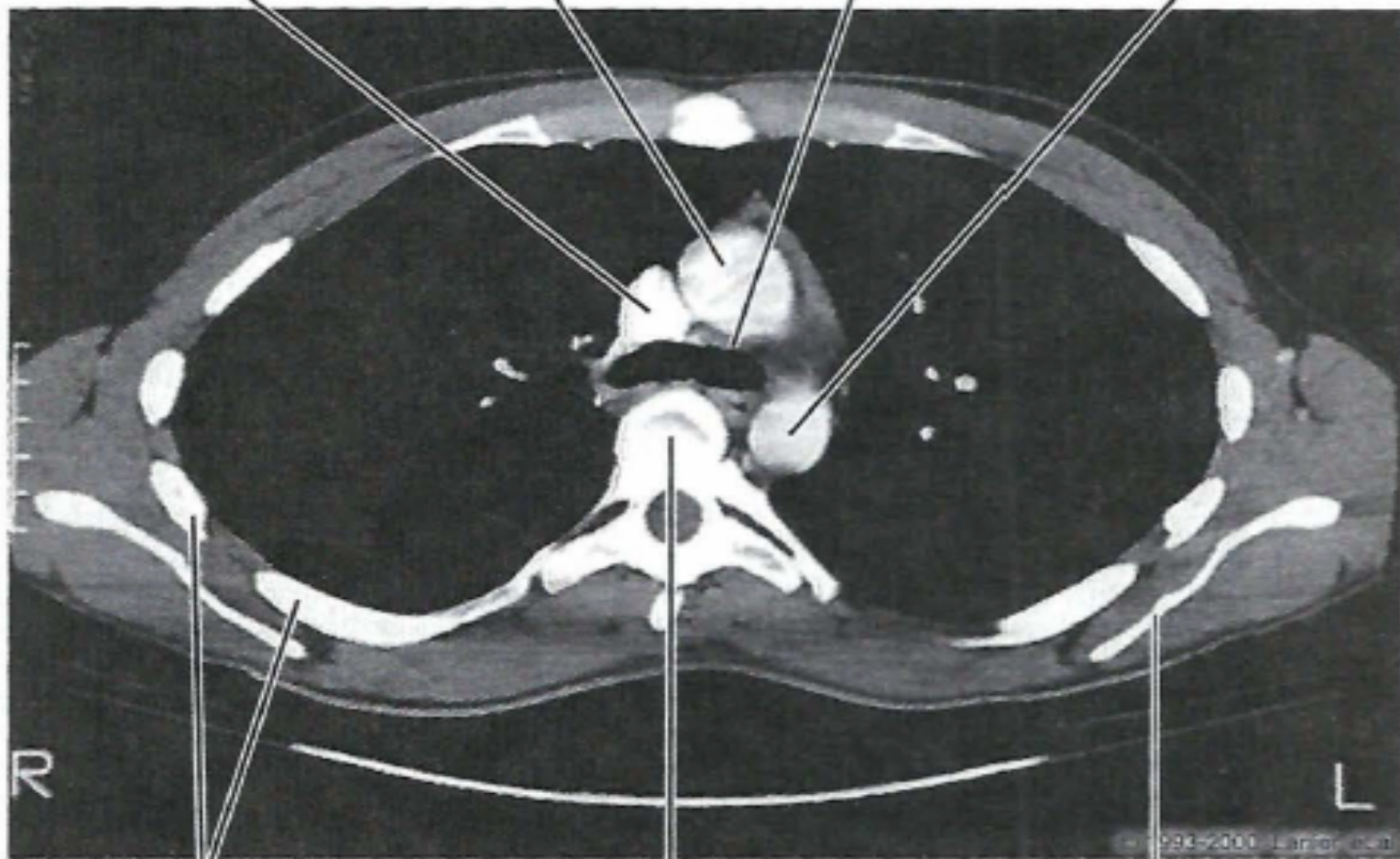
Superior
Vena Cava

Ascending
Aorta

Bifurcation of
Trachea

Descending
Aorta

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Ribs

T4 Vertebra

Scapula

Figure III-2-41. Chest: CT, T4