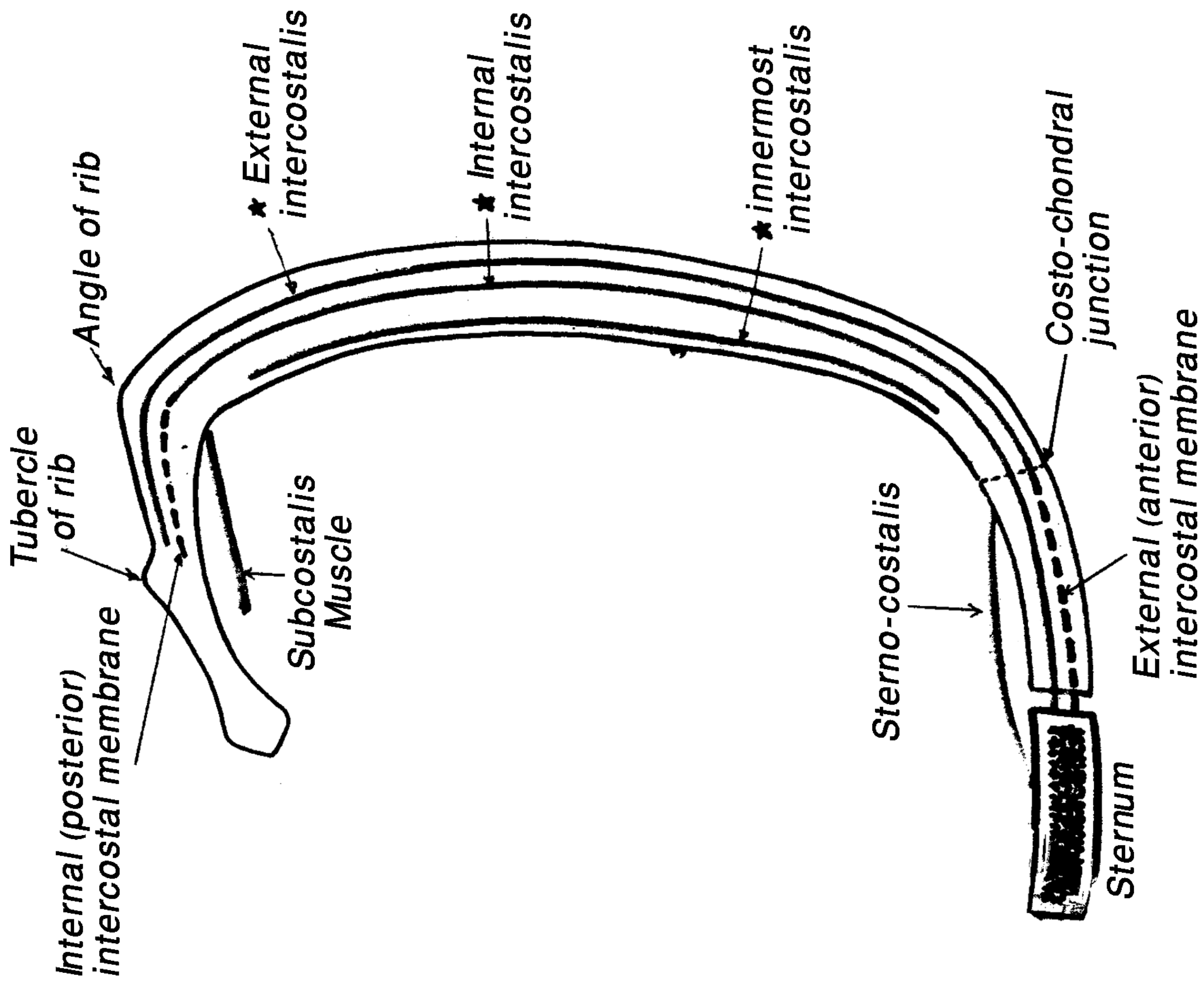


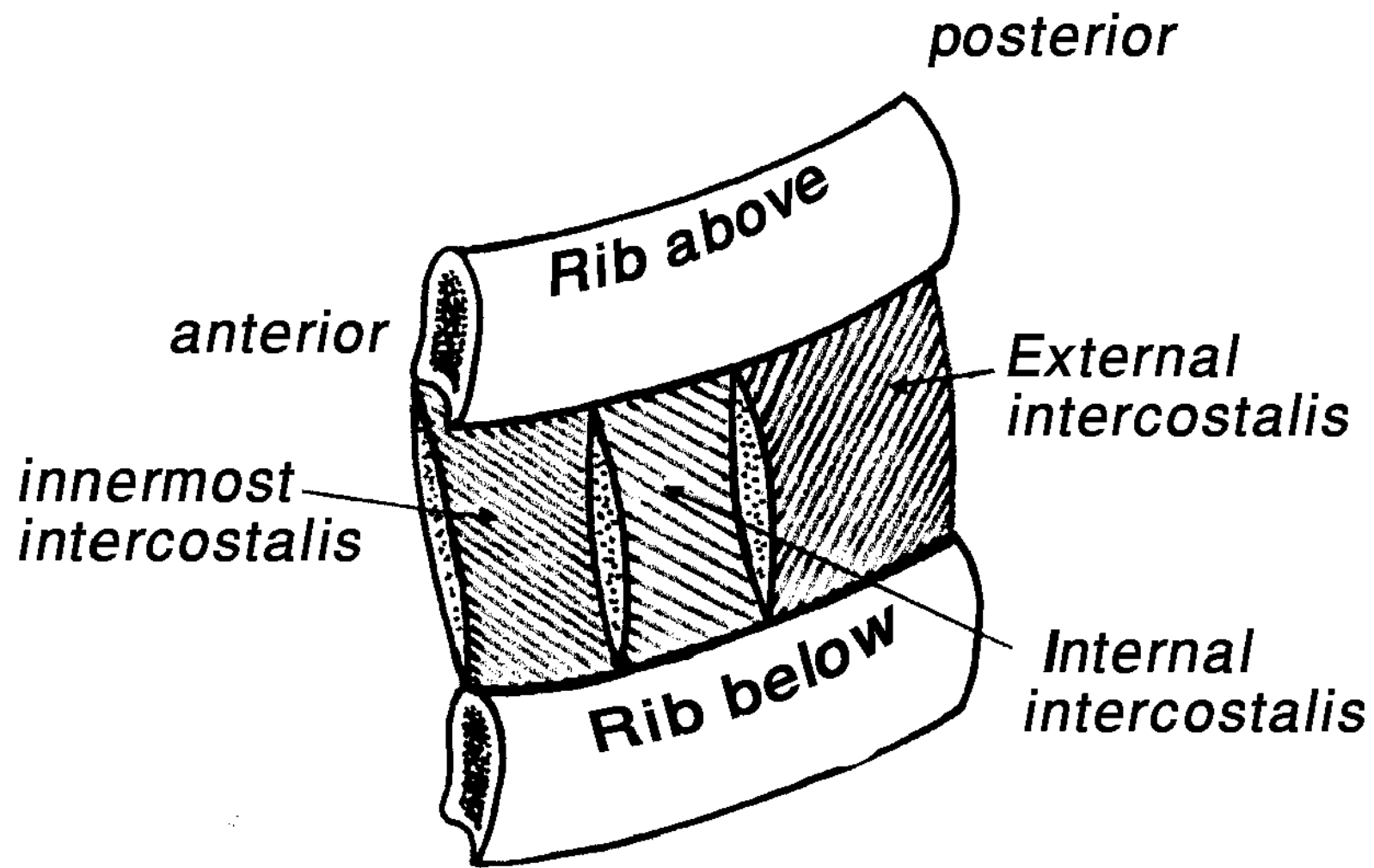
## Thoracic cage

## Muscles of the thorax

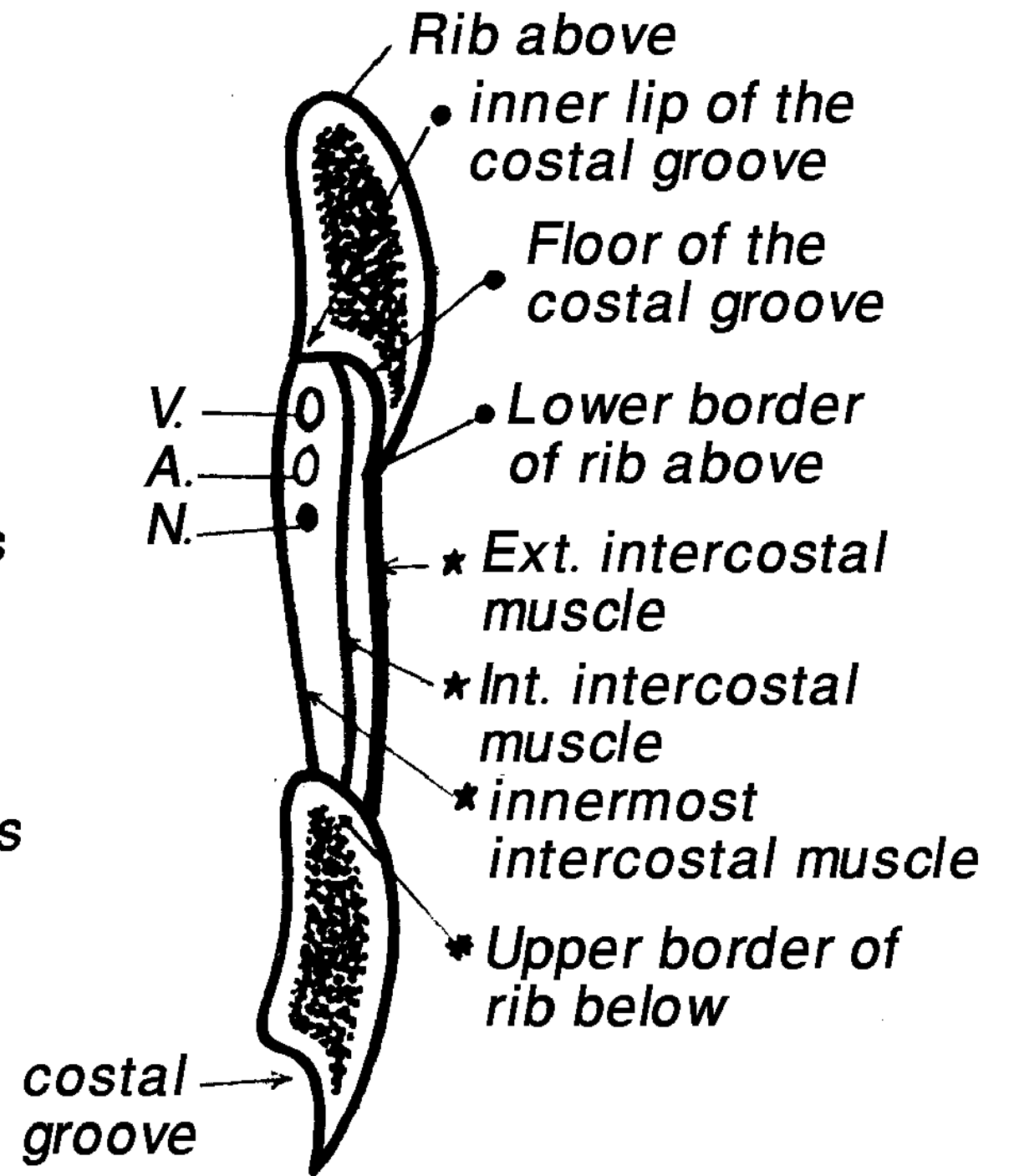
\* All muscles are supplied by **intercostal nerves**.

Muscle	Origin	Insertion	Features	Action
<b>1) External intercostal muscle</b>	<ul style="list-style-type: none"> <li>The <b>lower border</b> of the rib above.</li> </ul>	<ul style="list-style-type: none"> <li><b>Upper border</b> of the rib below.</li> </ul>	<ul style="list-style-type: none"> <li>The fibers extend from the <b>tubercle</b> of rib till the <b>costochondral</b> junction, where the muscle fibers become aponeurotic and extend to the sternum as <b>anterior intercostal membrane</b>.</li> <li><b>Direction</b> of fibers downwards and forwards.</li> </ul>	<ul style="list-style-type: none"> <li><b>Elevate</b> ribs during forced inspiration.</li> </ul>
<b>2) Internal intercostal muscle</b>	<ul style="list-style-type: none"> <li>The floor of the <b>costal groove</b> of the rib above.</li> </ul>		<ul style="list-style-type: none"> <li>It extends from the <b>sternum</b> (anteriorly) to the <b>angle</b> of the ribe (posterior), where it continues as the <b>posterior intercostal membrane</b>.</li> <li><b>Direction</b> of the fibers: downwards and backwards.</li> </ul>	<ul style="list-style-type: none"> <li>During <b>forced respiration</b>:                             <ol style="list-style-type: none"> <li><b>Interosseous</b> part: <b>depress</b> the ribs during expiration.</li> <li><b>Interchondral</b> part <b>elevate</b> the ribs during inspiration.</li> </ol> </li> <li>The <b>tone</b> of the 3 muscles prevent the intercostal spaces from <b>paradoxical movements</b> during respiration.</li> <li>The 3 intercostal muscle <b>protect</b> under lying viscera.</li> </ul>
<b>3) Innermost intercostal muscle</b>	<ul style="list-style-type: none"> <li>The <b>inner lip</b> of the costal groove of the rib above.</li> </ul>		<ul style="list-style-type: none"> <li>It lies in the <b>middle 2/4</b> of the intercostal space.</li> <li><b>Direction</b> of fibers: as internal intercostal muscle.</li> <li>The intercostal vessels and nerves run in the <b>neurovascular plane</b> between internal and innermost intercostal muscles.</li> </ul>	
<b>4) Transversus thoracis (Sternocostalis)</b>	<ul style="list-style-type: none"> <li>Lower 1/3 of <b>back of sternum</b></li> </ul>	<ul style="list-style-type: none"> <li>Inner surface of 2-6 costal cartilages</li> </ul>	<ul style="list-style-type: none"> <li>The muscle is formed of <b>oblique slips continuous</b> inferiorly with transversus abdominis muscle.</li> <li>It <b>separates</b> the internal thoracic vessels and intercostal nerves <b>from the pleura</b>.</li> </ul>	<ul style="list-style-type: none"> <li>Weak expiratory function.</li> </ul>
<b>5) Subcostalis</b>	<ul style="list-style-type: none"> <li>The inner surface of <b>angle</b> above</li> </ul>	<ul style="list-style-type: none"> <li>In the <b>upper border</b> of 2<sup>nd</sup> or 3<sup>rd</sup>. rib below.</li> </ul>	<ul style="list-style-type: none"> <li>These are several muscle slips on the inner surface of lower ribs.</li> </ul>	<ul style="list-style-type: none"> <li>Pull the lower ribs upwards during forced respiration.</li> </ul>

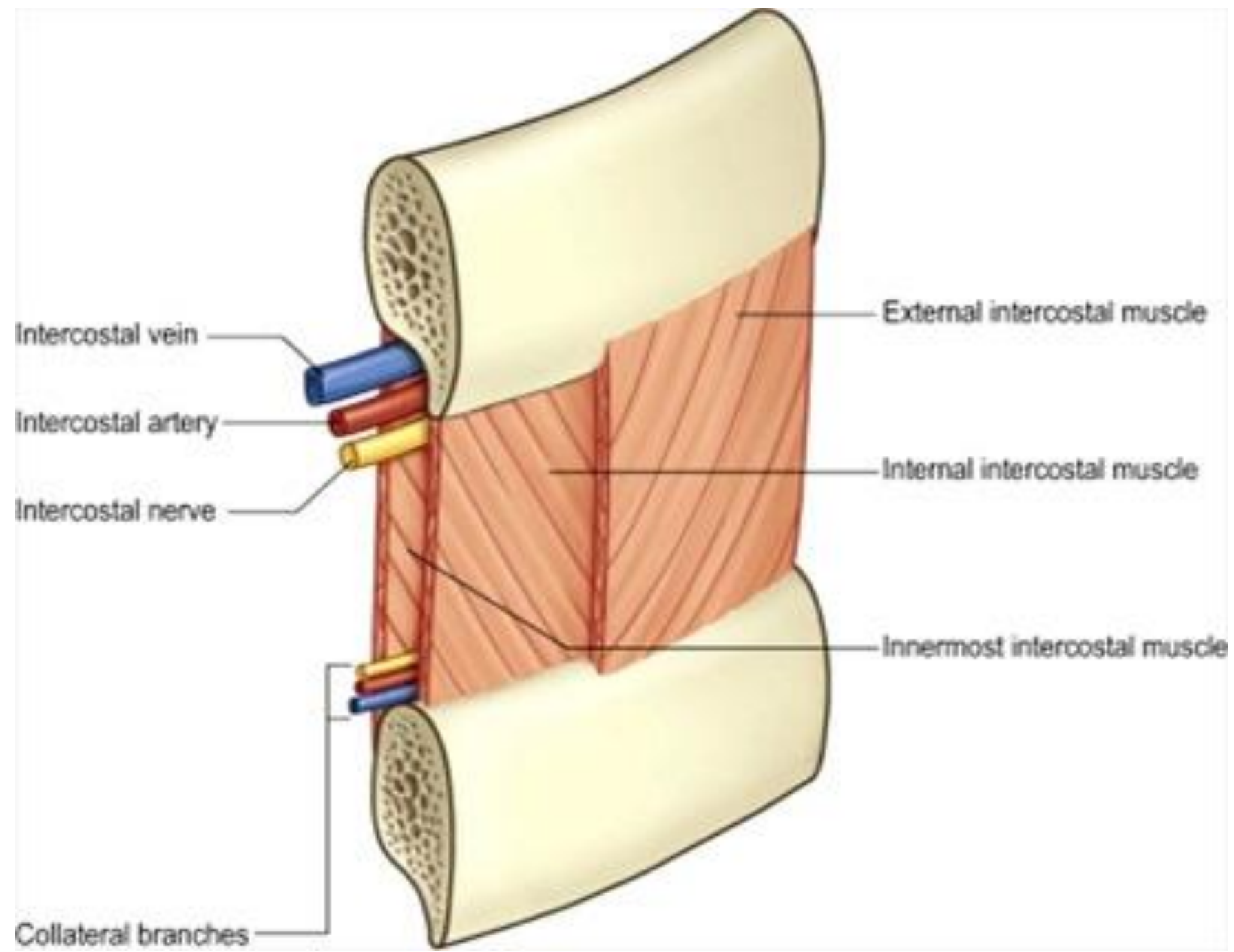




**A segment of 2 succeeding ribs**

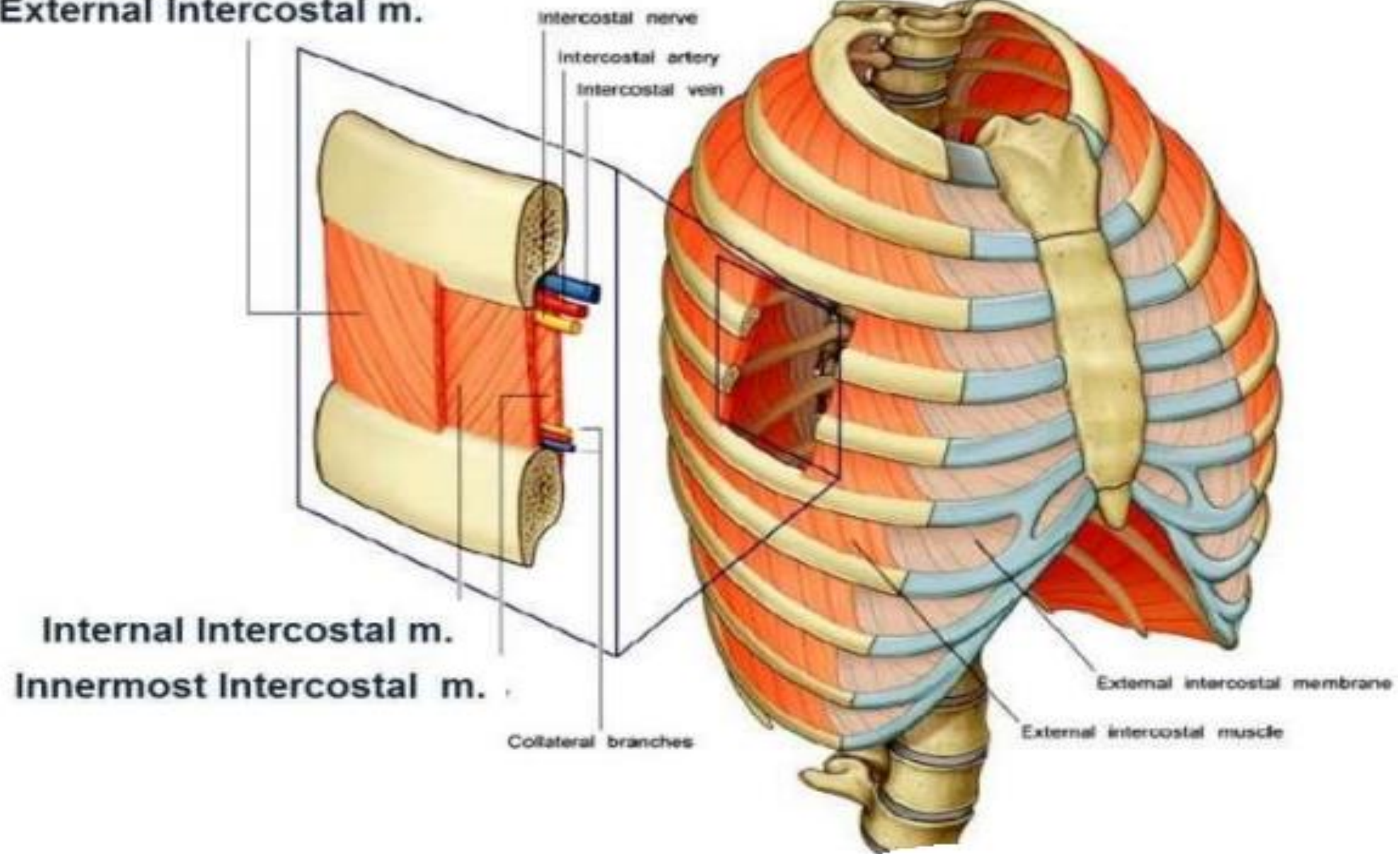


**Transverse section of 2 succeeding ribs**





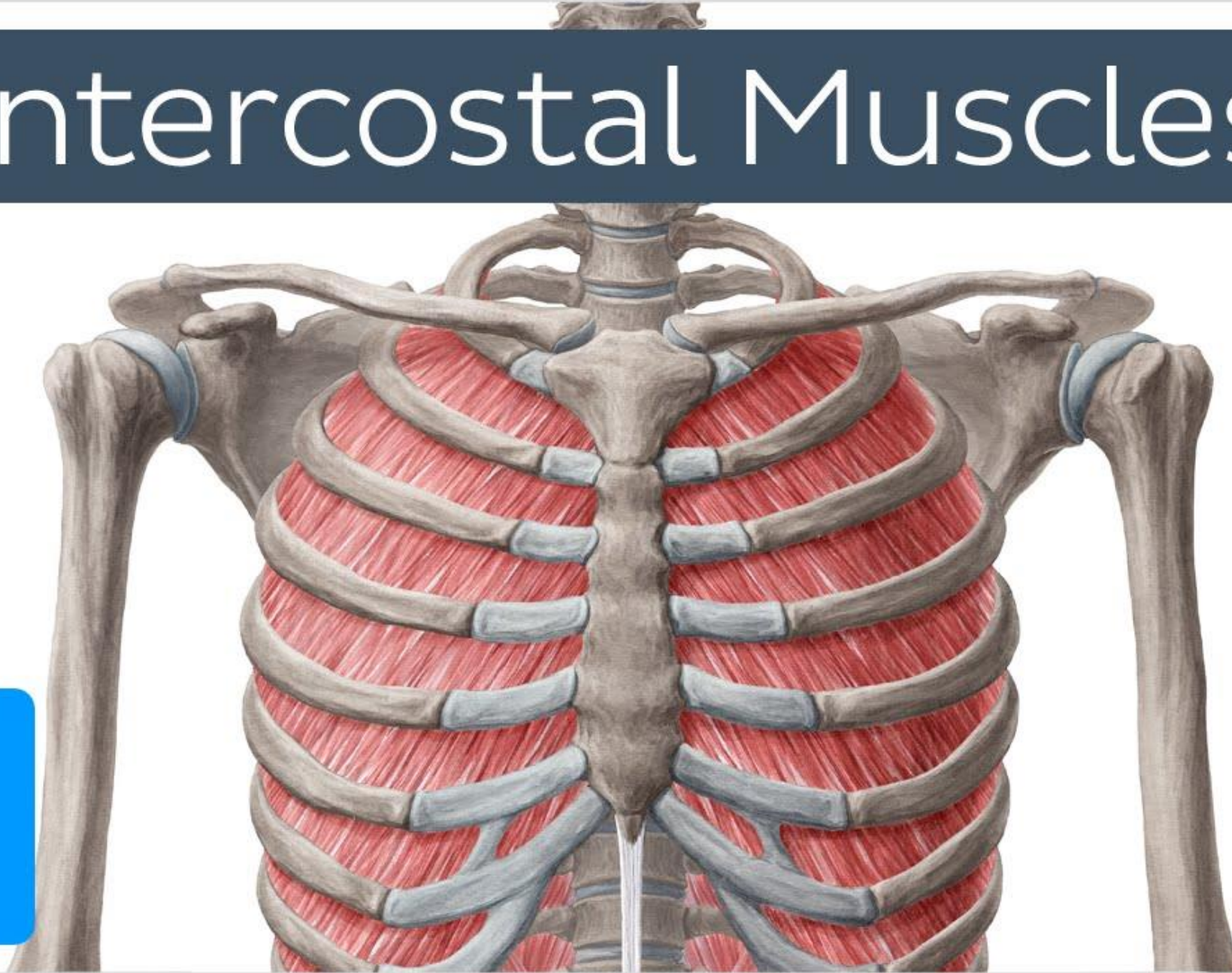
**External Intercostal m.**



**External intercostal muscle**

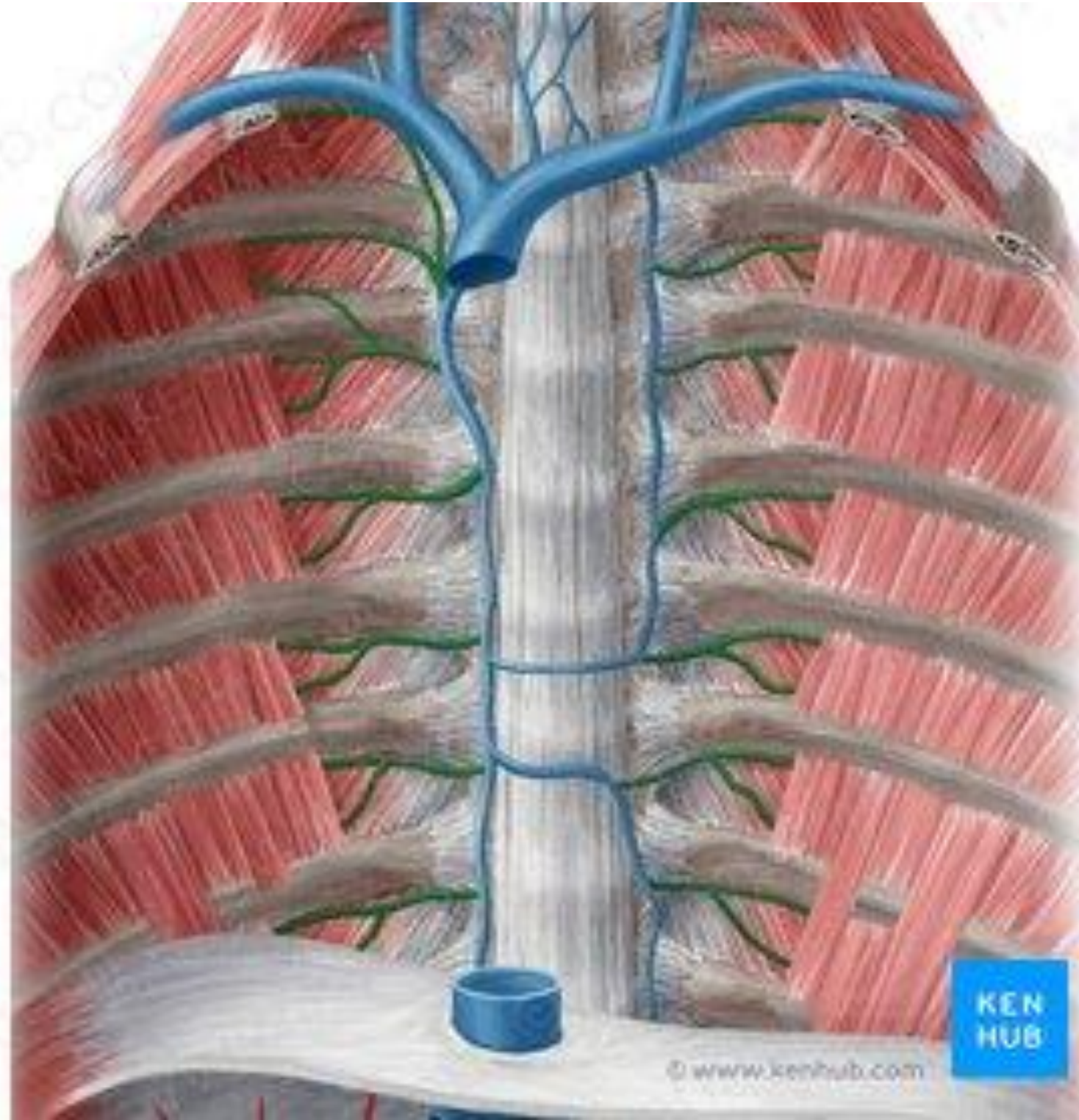
# Intercostal Muscles

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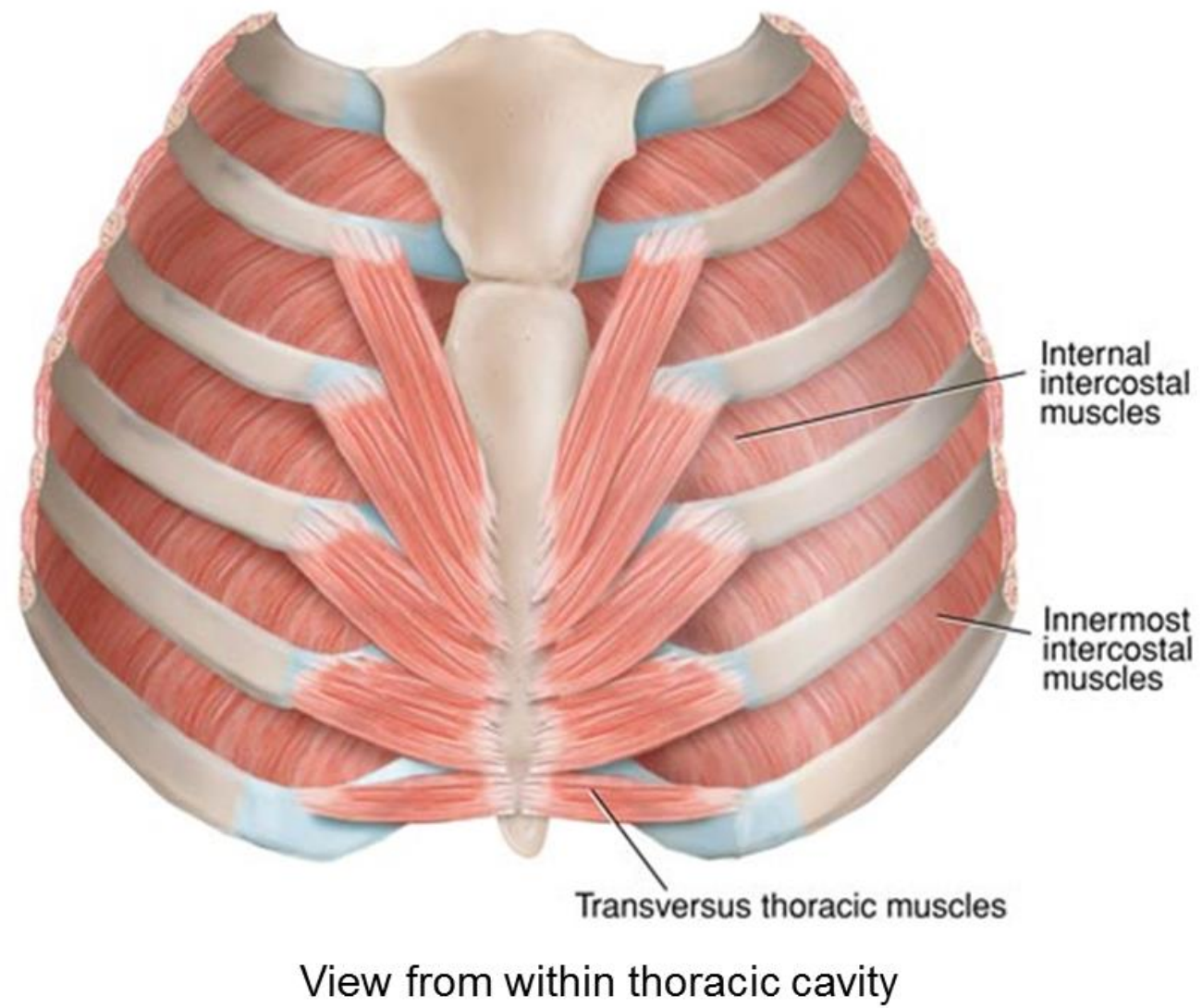
**Internal intercostal muscle**



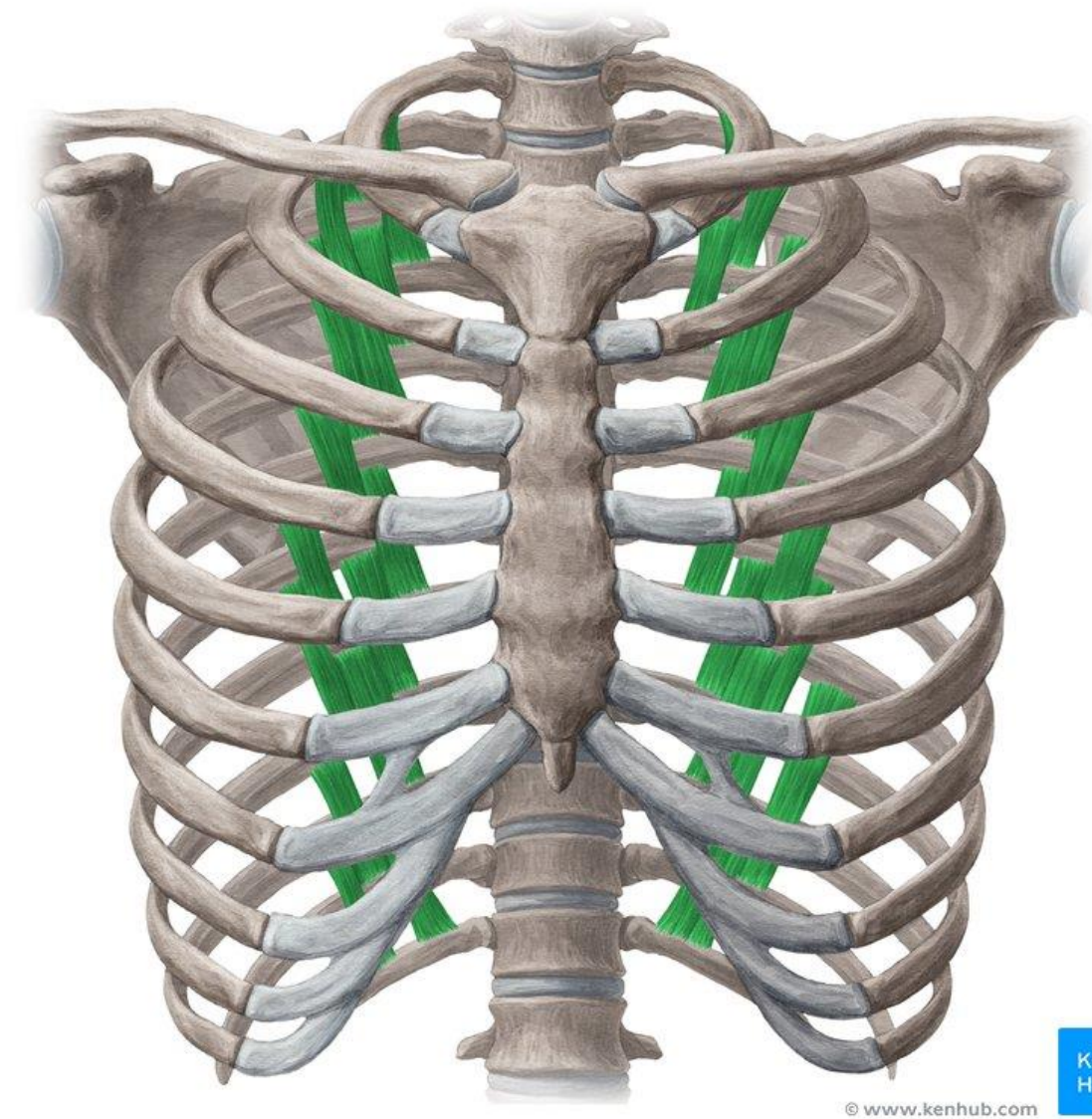


**Innermost intercostal muscle**



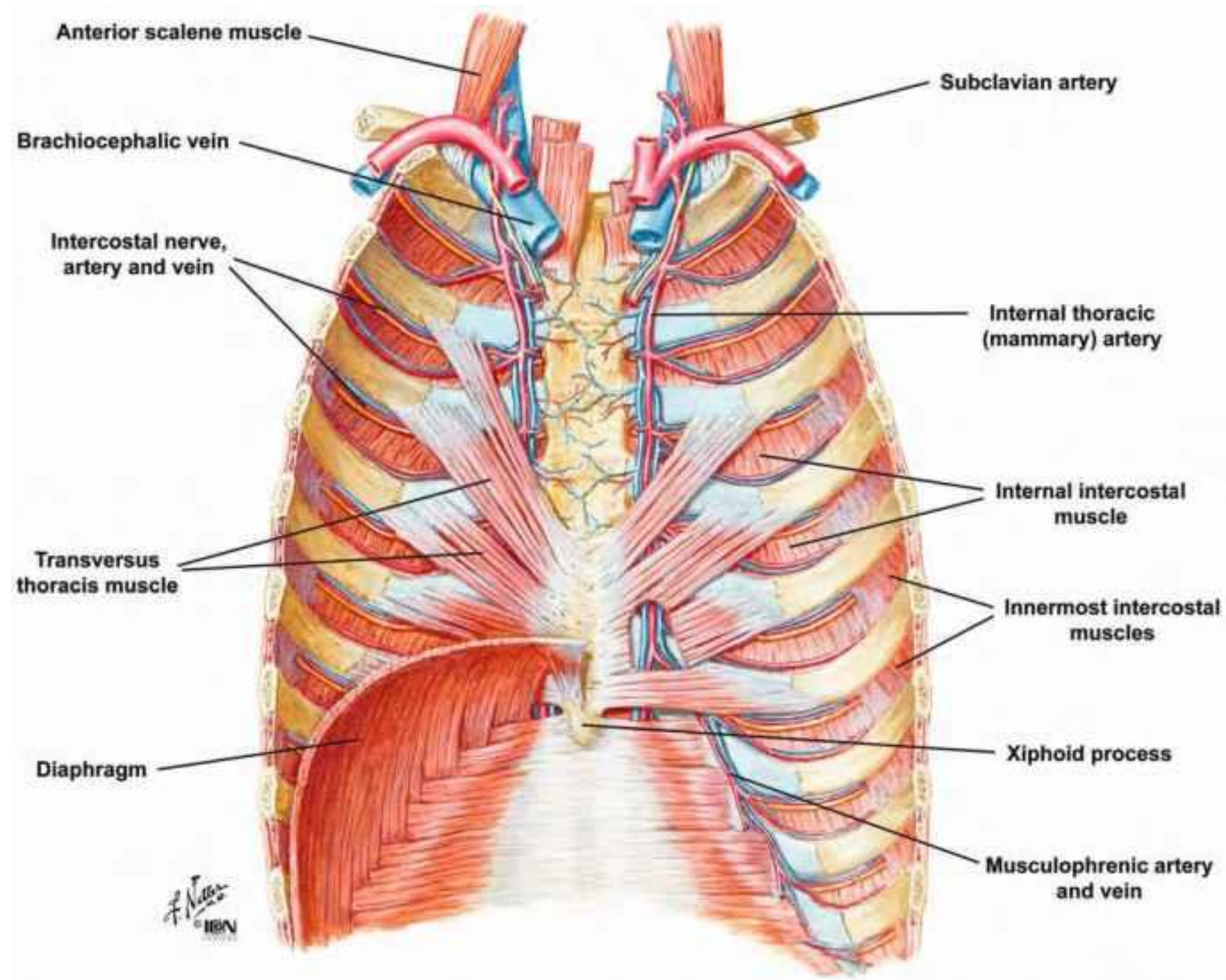


**Posterior surface of sternum  
(Transversus thoracis)**



**Subcostalis**





**Internal thoracic artery**