Topographic Anatomy of the Back

The skin of the back is divided into six regions. The central vertebral region is the area of the skin overlying the vertebral column. The deltoid area lies over the shoulder joints. The scapular region encloses the scapula on both sides. The area of the skin beneath the scapula is called infra-scapular region. The area beneath the ribs and above the hip bone forms the lumbar region on both sides. The sacral region is the area of skin between the two hip bones.

Muscles of the Back

The major muscles of the back are divided into three groups:

<table>
<thead>
<tr>
<th>Extrinsic muscles</th>
<th>Trapezius</th>
<th>Latissimus dorsi</th>
<th>Rhomboid major and Rhomboid minor</th>
<th>Levator Scapulae</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Elevates and depresses the scapula</td>
<td>Responsible for adduction, internal rotation and extension of the shoulder joint</td>
<td>Keep the scapula pressed to the thoracic wall</td>
<td>Elevates the scapula</td>
</tr>
<tr>
<td>Intermediate muscles</td>
<td>Serratus posterior superior</td>
<td>Elevates the rib cage</td>
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<tr>
<td></td>
<td>Serratus posterior inferior</td>
<td>Depresses the rib cage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrinsic muscles</td>
<td>Spino transversale muscles (spleius capitus and spleius cervicus)</td>
<td>Responsible for extension of the neck</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Errector spinae muscles</td>
<td>Iliocostalis lies laterally, longissimus is in the middle and spinalis is the most medial one</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Transversospinalis</td>
<td>Semispinali lie superficially, multifidus in between the two sets of muscles and rotares are located the deepest</td>
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<td></td>
</tr>
</tbody>
</table>

**Bony Prominences of the Back**

![Image: “Deep Muscles of the back (posterior view)” by Phil Schatz. License: CC BY 4.0](image-url)
The following bony prominences constitute the surface anatomy of the back:

- The **spinous process** of the vertebra in thin lean individuals. The spinous process of **cervical vertebra 7**, is the most prominent.
- The **acromion** and the **spine of the scapula**.
- **Iliac crest** and **posterior superior iliac spine of the hip bones**.
- **Rib cage** in thin lean patients or in patients having a **barrel chest**.

**Triangles of the Back**

**Triangle of auscultation**
The triangle of auscultation is an area on the back, where the breathing sounds are best audible, due to relative thinning of musculature.

**The borders of the triangle are defined by:**

- Trapezius muscle superiorly and medially
- Latissimus dorsi inferiorly
- Medial border of the scapula

**Inferior lumbar triangle**

The inferior lumbar triangle, also known as the *petit triangle*, lies superficially. The *latissimus dorsi* forms the medial boundary, the *external oblique* forms the lateral boundary while the *iliac crest* forms the inferior boundary. The inferior lumbar triangle is the site of herniation of the abdominal viscera.

**Superior lumbar triangle**

This is also known as Grynfeltt-Lesshaft triangle and lies deep to the inferior lumbar triangle. The superior lumbar triangle is found in cadavers in a consistent fashion. It is also a common site of herniation of abdominal viscera. The *Quadratus lumborum muscle* lies medial to it, the *internal oblique* forms lateral margin and 12th *rib* lies superiorly.

**Lumbar Puncture**

*Lumbar puncture (LP)*, is an invasive procedure during which cerebrospinal fluid (CSF) is drained from the spinal canal. The CSF can then be analyzed for diagnostic purposes. CSF pressure can also be measured. LP is usually performed after a neurological examination is completed. LP occurs most commonly when there is concern for infection (such as meningitis) or idiopathic intracranial hypertension (pseudotumor cerebri).
During the LP, the patient is asked to lie in the left lateral position with knees and hips in the flexed position. The intercristal line, which is the line joining the superior parts of the iliac crest, is located and marked. This marks the region between \textbf{L4 and L5 lumbar vertebrae}. A small, non-cutting LP needle, is advanced between the spinous processes of these two vertebrae and CSF is collected and submitted for analysis. If the opening pressure is measured, this is done prior to CSF collection but requires some repositioning of the limbs for accurate measurement.

LP can also be performed in the seated position. One of the potential complications of LP, is post-LP headache. Using a small, non-cutting needle will lower the risk for post-LP headache, also known as “low pressure” headache. While there is less data to suggest that positioning helps minimize post-LP headache, it is still common to ask the patient to remain in the supine position for half an hour after completing the procedure.

\textbf{Projection of Viscera onto the Back}

It is important to know the surface anatomy of various organs and viscera and their projection onto the back. This is useful in various procedures as well as the clinical examination of various body systems.

- \textbf{Lungs and visceral pleura} roughly lie at \textbf{T10} while the parietal pleura at \textbf{T12}. This is helpful in \textbf{thoracocentesis} or \textbf{pleural tap}, during which excess fluid is drained from the pleural cavity for therapeutic and diagnostic purposes.
- \textbf{Kidneys} are retroperitoneal structures and therefore can be easily approached during surgical procedures.
- The pain of \textbf{aortic aneurysm} and \textbf{acute pancreatitis} radiates to the back. Similarly, the pain of \textbf{pancreatic cancer} may be referred to the back.

\textbf{References}


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