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>Elevates and depresses the scapula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Latissimus dorsi</td>
<td>Responsible for adduction, internal rotation, and extension of the shoulder joint</td>
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<tr>
<td></td>
<td>Rhomboid major and Rhomboid minor</td>
<td>Keep the scapula pressed to the thoracic wall</td>
</tr>
<tr>
<td></td>
<td>Levator Scapulae</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>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intrinsic muscles</th>
<th>Spino-transversale muscles (splenius capitus and splenius cervicus)</th>
<th>Responsible for extension of the neck</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Erector spinae muscles</td>
<td>Iliocostalis lies laterally, longissimus is in the middle and spinalis is the most medial one</td>
</tr>
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<td></td>
<td>Transversospinalis</td>
<td>Semispinalis lie superficially, multifidus in between the two sets of muscles, and rotatores are the deepest</td>
</tr>
</tbody>
</table>

Image: “Deep Muscles of the back (posterior view)” by Phil Schatz. License: [CC BY 4.0](https://creativecommons.org/licenses/by/4.0)

Bony Prominences of the Back
The following bony prominences constitute the surface anatomy of the back:

- The **spinal process** of the vertebra in thin, lean individuals. The spinal 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 most audible due to the 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 the lateral margin, and the 12th rib lies superiorly.

**Lumbar Puncture**

Lumbar puncture (LP) is an invasive procedure during which a small amount of cerebrospinal fluid (CSF) is removed from the spinal canal to be analyzed for diagnostic purposes. CSF pressure can also be measured. LP is usually performed after a neurological examination is completed. LP most commonly occurs when there is a concern about 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 L4 and L5 lumbar vertebrae. A small, non-cutting LP needle is advanced between the spinous processes of these two vertebrae, and the CSF is collected and submitted for analysis. If the opening pressure is measured, this is done before CSF collection but requires some limb repositioning for accurate measurement.

LP can also be performed in the seated position. One of the potential complications of LP is a post-LP headache. Using a small, non-cutting needle will reduce the risk of a post-LP headache, also known as “low pressure” headache. While there are fewer 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.

Projection of Viscera onto the Back

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

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

References


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