Atlanto-occipital and Atlantoaxial joints
Atlanto-occipital joint

- Variety - Synovial joint of Ellipsoid variety
- Articular surface -
- Above: convex occipital condyles
- Below: Concave superior articular facet of atlas
Ligaments:

1. Fibrous capsule:
   - surround the joint
   - Thick posterolaterally and anteromedially

2. Anterior atlanto-occipital membrane:
   - Anterior margin of foramen above to upper border of anterior arch of atlas below
   - Anteriorly strengthened by anterior longitudinal ligament
   - Laterally continuous with the anterior part of capsular ligament
Posteroatlanto-occipital membrane:

• Posterior margin of foramen magnum above
toupper border of posterior arch of atlas below

• Inferolateral free margin arches over the
vertebral artery and first cervical nerve

• Laterally continuous with the capsular ligament
Blood supply: Vertebral artery
Nerve supply: C1 nerve

**Movements:**

- Ellipsoid joint (biaxial joint)
- Flexion / extension (nodding)- transverse axis
- Lateral flexion- anteroposterior axis
### Muscles producing movements

<table>
<thead>
<tr>
<th>Movement</th>
<th>Muscles involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion</td>
<td>Longus capitis, Rectus capitis anterior</td>
</tr>
<tr>
<td>Extension</td>
<td>Rectus capitis posterior major and minor, oblique capitis superior, semispinalis capitis, splenius capitis, and trapezius</td>
</tr>
<tr>
<td>Lateral flexion</td>
<td>Rectus capitis Lateralis, semispinalis capitis, splenius capitis, sternomastoid and trapezius</td>
</tr>
</tbody>
</table>
Atlantoaxial joint

Comprise of

• 1. A pair of lateral atlantoaxial joints: (Plane joint) between inferior facets of atlas and superior facets of axis.

• A median atlantoaxial joint: (pivot joint) between the dens and anterior arch and transverse ligament of atlas.
• **Lateral atlantoaxial joint:**
  Ligaments:
  • **Capsule** all around
  • Lateral part of **anterior longitudinal ligament**
  • **Ligamentum flavum**
  • **Medial atlantoaxial joint:**
  • Loose **capsular ligament** anteriorly
  • Posterior part between dens and transverse ligament is continuous with one of the atlantooccipital joint
  • Main support is **transverse ligament** which forms part of the cruciform ligament
• *Transverse ligament*: attach on each side to medial surface of lateral mass of atlas
• In the median plane fibers extend upward to basi-occiput and downward to the body of axis to form cruciform ligament of atlas
Movements:

• All three joints produce rotatory movement around a vertical axis (No movement)
• Movement is limited by alar ligament
• Muscles producing movement are: Rectus capitis posterior major, obliquis capitis inferior, splenius capitis of one side along with sternomastoid of other side