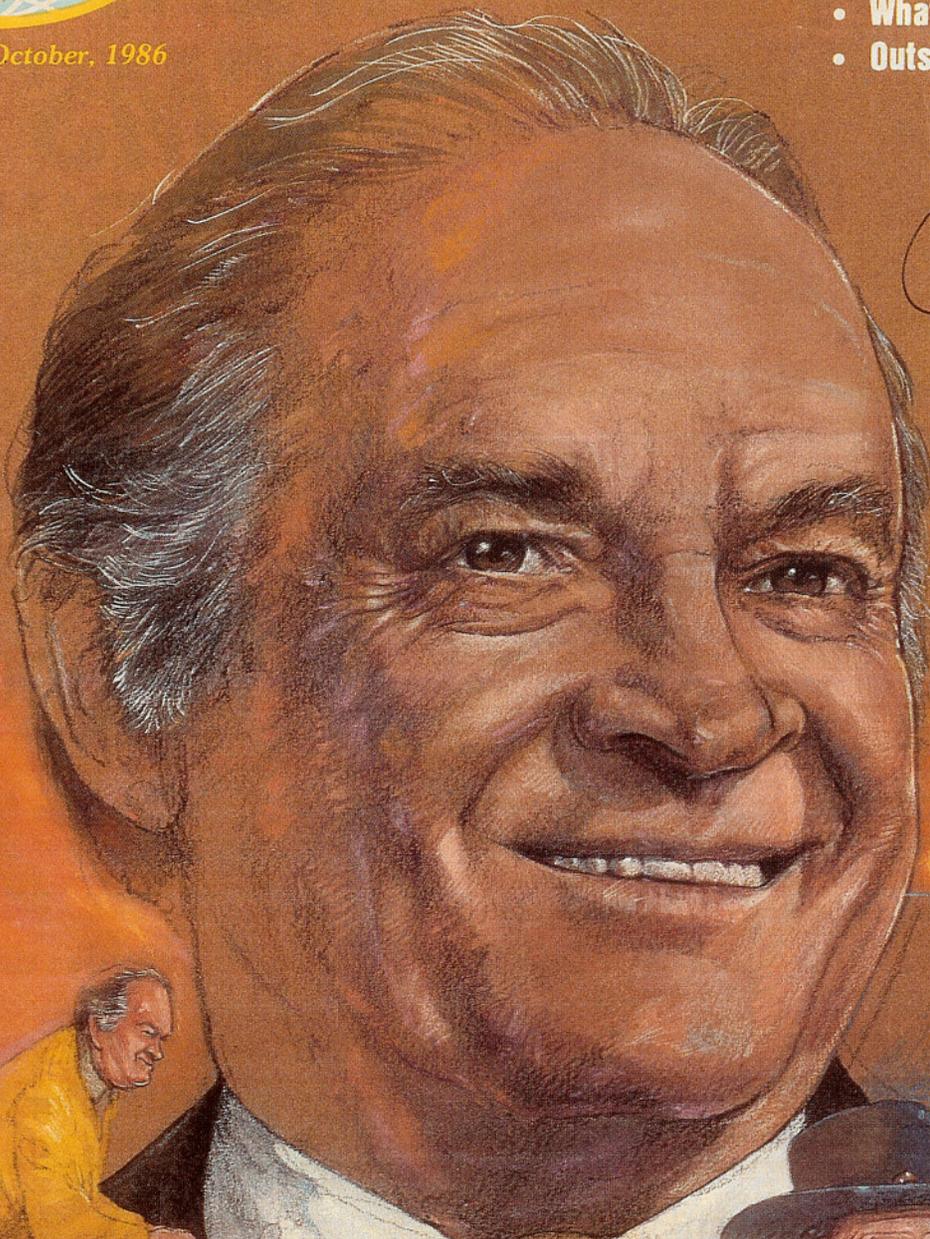




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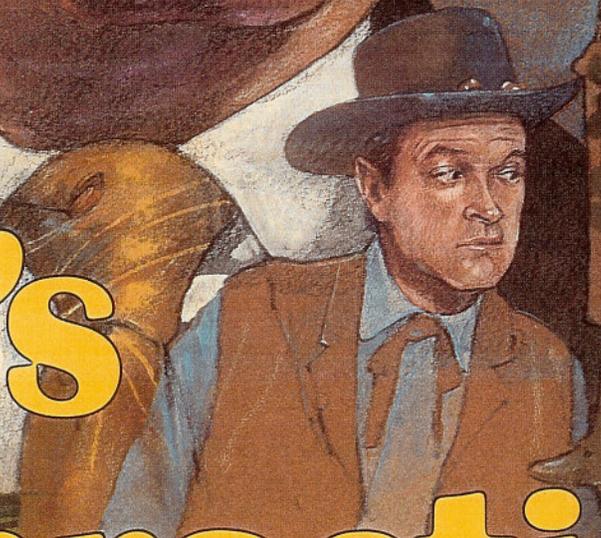
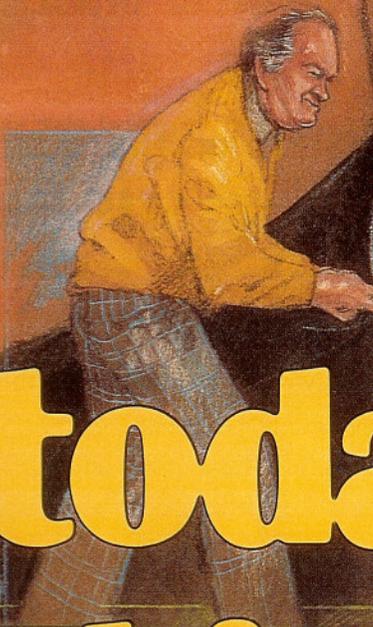
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# Atlas-Axis Body Relationship

By Roy W. Sweat, D.C.



*The axis body will always be misaligned to the lateral side opposite the laterality of the lower angle. The axis body should never be disrelated to the same lateral side that the lower cervical spine is laterally misaligned.*

**I**n the nasium dimension there is a relationship of the atlas-axis body that corresponds to the lateral movement of the lower cervical spine. The atlas-axis body medial to lateral movement will be neutral in the relationships of the odontoid to the internal lateral mass spaces under normal anatomical and neutral lower cervical spine positioning. (Fig. 1)

The articulation of atlas and axis comprises three synovial joints – one on each side between the inferior facet of the lateral mass of the atlas and the superior facet of the axis, and the other medial, between the dens and the anterior arch and transverse ligament of the atlas. The lateral atlanto-axial joints are classified as plane joints but the articular surfaces involved are both slightly convex in their long axes. The median atlanto-axial joint is a pivot joint between the dens of the axis and the ring formed by the anterior arch and the trans-

verse ligament of the atlas.

The bodies of the vertebrae in the cervical area are arcuated, and the joints of Luschka in the cervical area maintain a continuity of directional movement. When one of the cervical vertebrae moves laterally, the interosseous locking of the vertebral bodies causes the vertebra above to move laterally in the same direction. The bodies from seventh cervical through the axis body will follow the movement. The inferior atlas facets and the superior axis facets have no interosseous locks and are synovial joints; consequently, the atlas can sublunate right or left of the axis body.

## Ligaments

Eight strong ligaments help maintain the atlas and axis body in a neutral or juxtaposition. Ligaments permit safe and smooth movement but help prevent and check trauma.

The transverse ligament of the atlas is a thick, strong band which attaches from the internal lateral masses, arches around the posterior dens and retains the dens in contact with the anterior arch. As it crosses the dens a longitudinal band is prolonged upward and attaches to the basilar part of the occipital bone. A lower band prolongs downward and attaches to the posterior surface of the axis body. It is then known as the cruciform ligament. The tectorial (ligament) membrane is the upward continuation of the posterior longitudinal ligament. It is fan-shaped, broad and strong and stretches from the basilar groove of the occipital bone downward over the posterior surfaces of the vertebral bodies. It covers the odontoid process, giving added strength to the transverse ligament of the atlas.

This ligament has also an accessory (deep) portion with fibers more laterally placed and stretches from the lateral margins of the anterior foramen

magnum to the upper postero-lateral portions of the body of the axis. The alar ligaments extend from the dens to the lateral margins of the foramen magnum. These strong, short, rounded cords, which are almost as thick as pencils, check lateral rotation and side-to-side movements of the head and attach the skull to the axis. The articular capsule joins the posterior articular surfaces of the axis with the margins of the lateral masses of the atlas. The accessory ligament is a reinforcement of the posterior medial margin. It attaches below to the body of the axis near the base of the dens, and above to the lateral mass of the atlas near the transverse ligament.

The atlanto (axial)-epistropheic ligament is a strong fibrous band extending from the anterior arch of the atlas to the front of the body of the axis. The apical ligament extends from the tip of the dens to the internal surface of the occipital bone. The anterior longitudinal ligament is a strong narrow band of fibrous tissue extending from the base of the skull down to the anterior midportion of the vertebral bodies to the sacrum.

## Axis Body-Lower Cervical Spine Relationship

When the lower cervical spine has moved laterally one to five degrees, the relationship of the atlas-axis body will be neutral. The atlas laterality listings and the axis body listings will be the same. There is some small degree of lateral movement of the lower cervical spine before the atlas-axis body relationship is disrupted.

When the lower cervical spine has moved laterally five to 10 degrees, the axis body will be disrupted one degree, based on a three-inch conular circle, in its relationship to the atlas. When the lower cervical spine is 10 to 15 degrees, the axis body will be disrupted two degrees in