

CERVICAL SPINE ANGLE

Normal/Control

E.D.S.

Neutral

17.1°

17.7°

Flexion

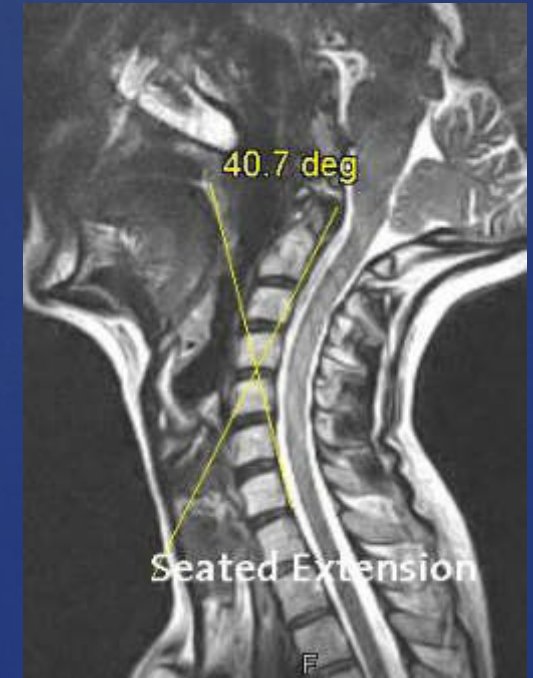
11.5°

18.1°

Extension

32.1°

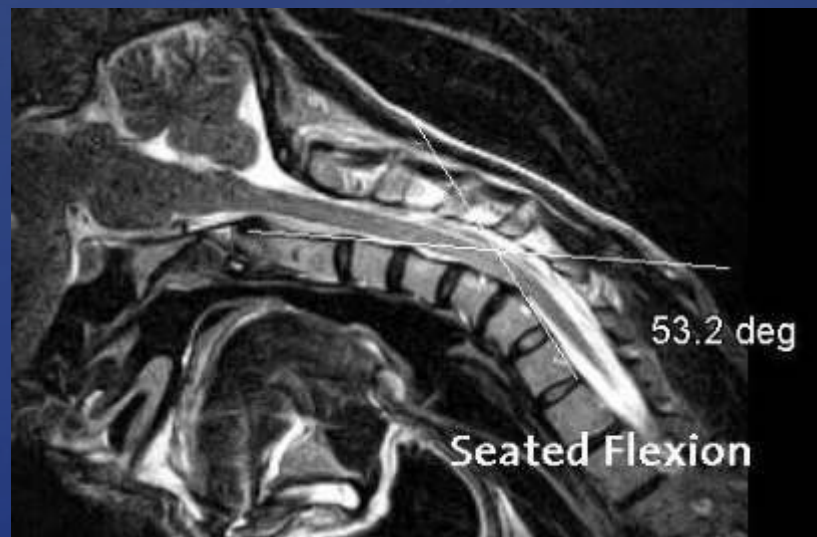
50.1°



Excessive extension



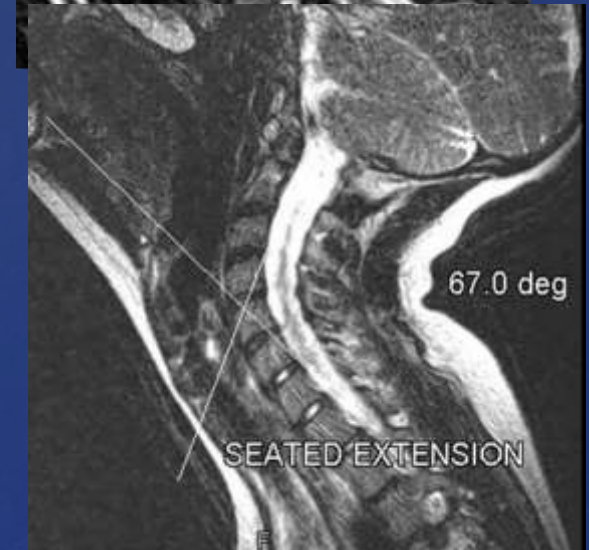
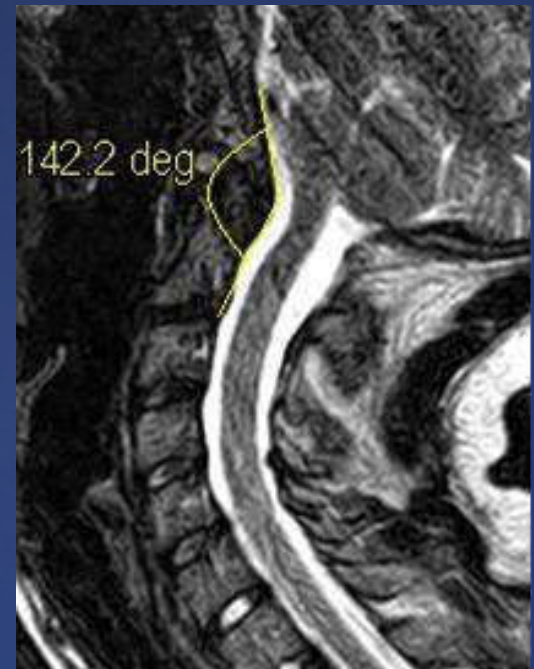
Ligament Laxity in flexion



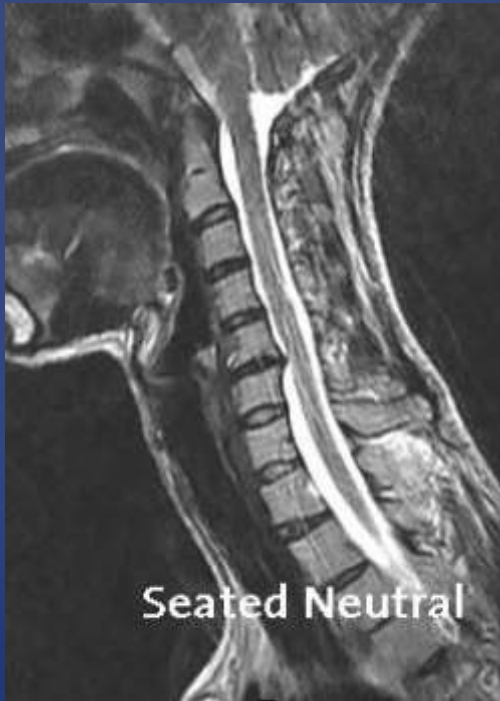
CLIVO-AXIAL ANGLE

Clivo-axial angle.	Normal	E.D.S.
Neutral	154°	146°
Flexion	148°	143°
Extension	160°	158 °

Basilar invagination

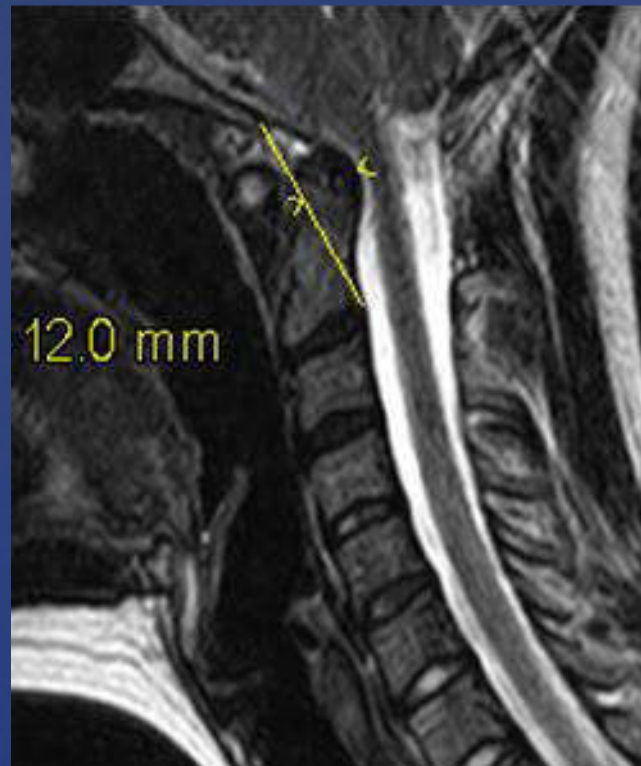


Ligament laxity



Grabb-Oakes Interval

(The Grabb-Oakes measurement is the perpendicular distance from the BpC2 line [Basion to posterior inferior C2 body] to the dura. A value greater than or equal to 9 mm indicates ventral brainstem compression)

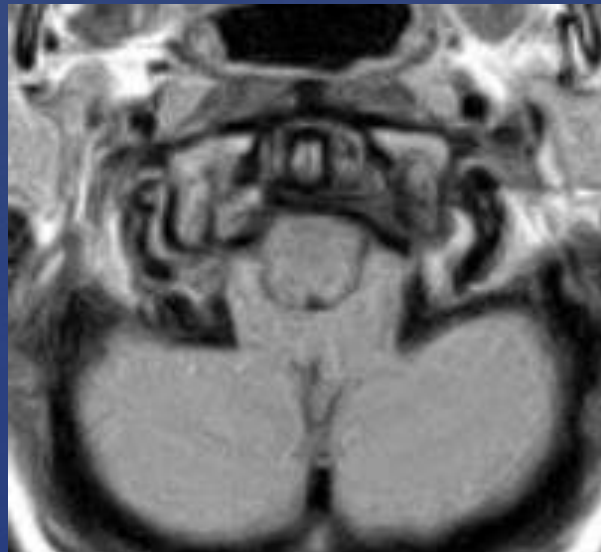
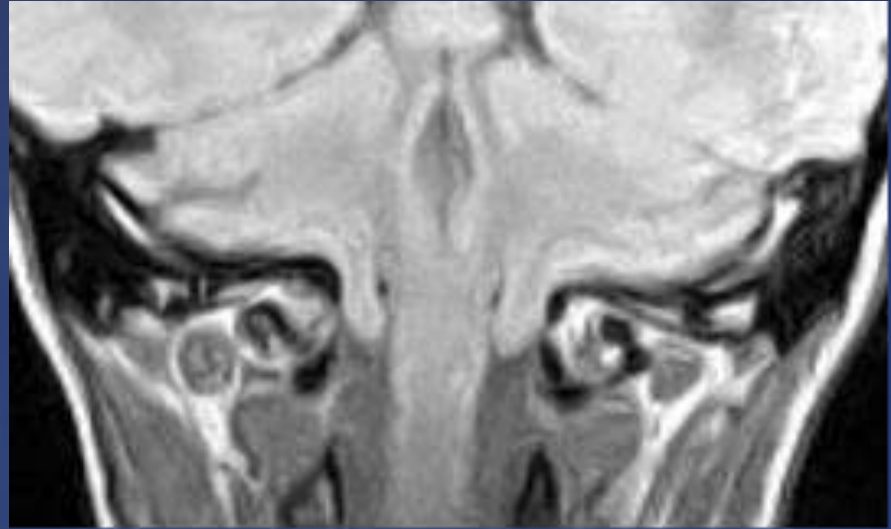
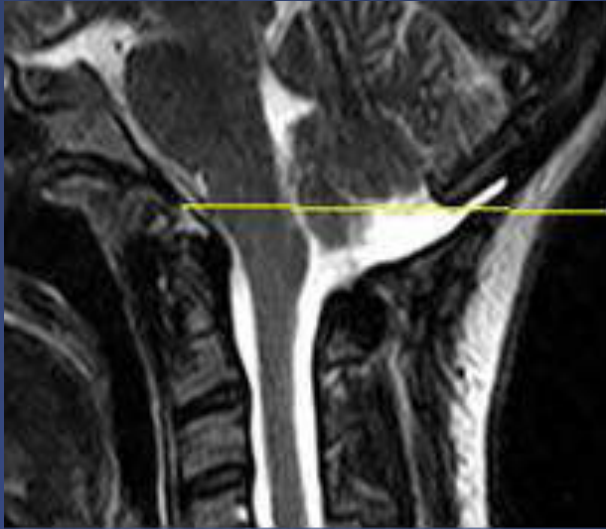


Harris measurements of the basion axial interval and the basion dental interval

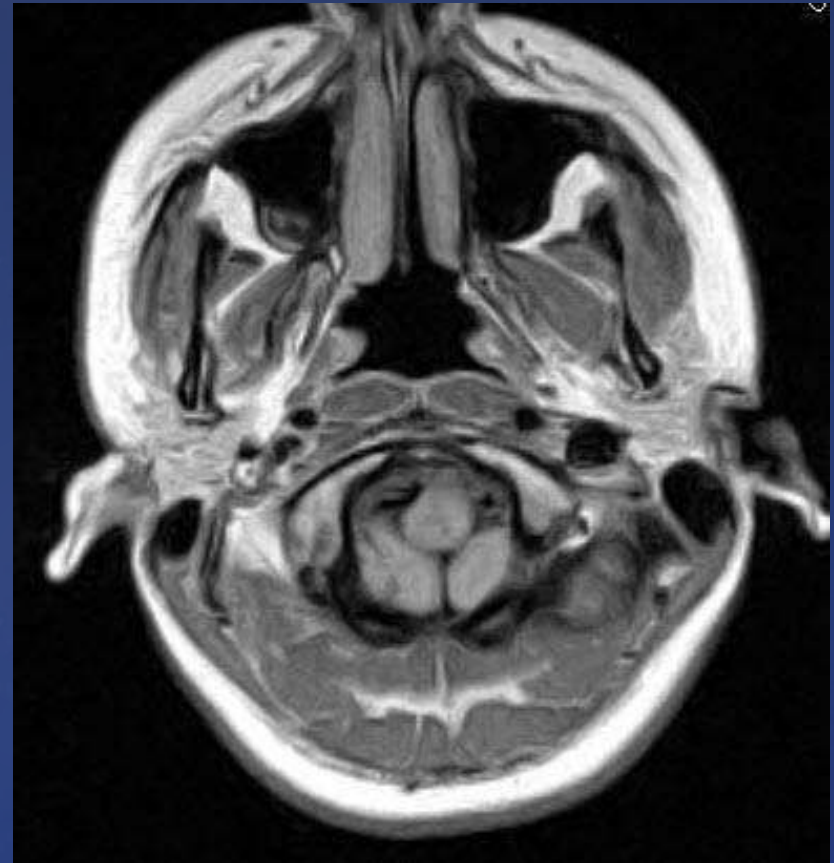
(The basion axial interval is the length of a line drawn between the tip of the basion and a line drawn along the posterior aspect of the odontoid peg. The basion dental interval is a distance measured between the tip of the basion and the tip of the dens. Both these measurements should be less than 12 mm. If they are greater than 12 mm, then occipito-atlantal disassociation has occurred. These measurements are often referred to as "The rule of 12")



Cerebellar Tonsillar Ectopia.



Post-traumatic ectopia of the cerebellar tonsils is best demonstrated when sitting

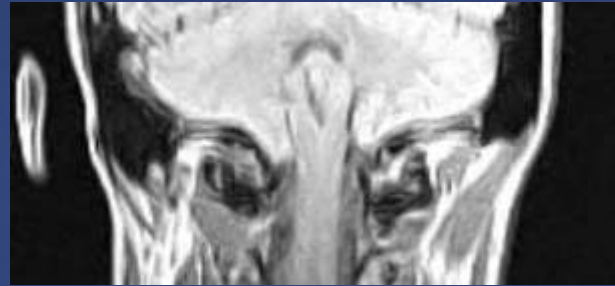


A case-control study of cerebellar tonsillar ectopia (Chiari) and cervical spine trauma.

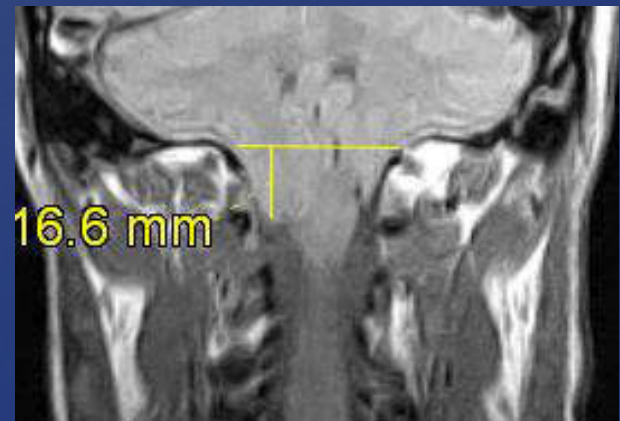
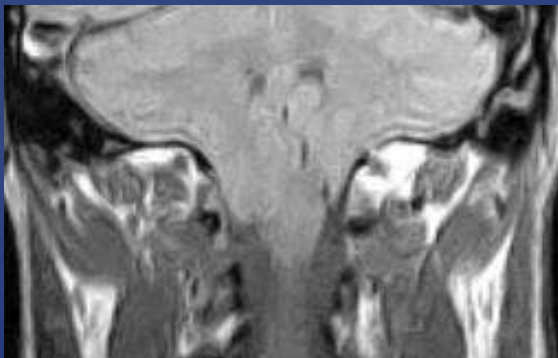
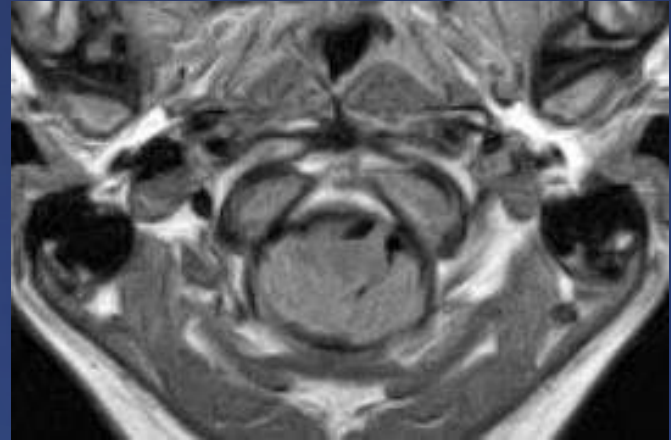
Freeman MD, Rosa S, Harshfield D, Smith FW Bennett R, Centano CJ, Kornel E, Nystrom A, Hefez DS, & Kohles SS

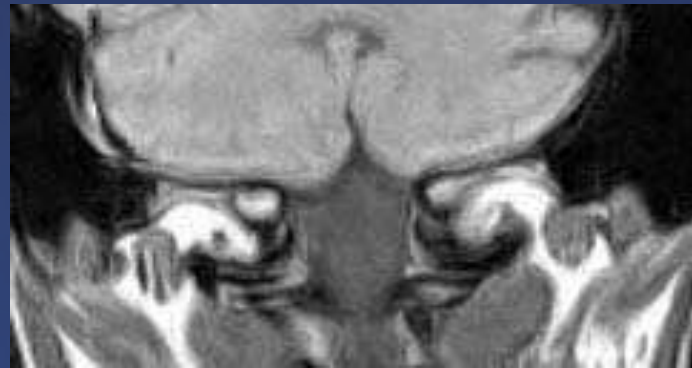
Brain Inj. 24 (7-8):988-94. 2010

Cerebellar Tonsillar Ectopia - E.D.S.

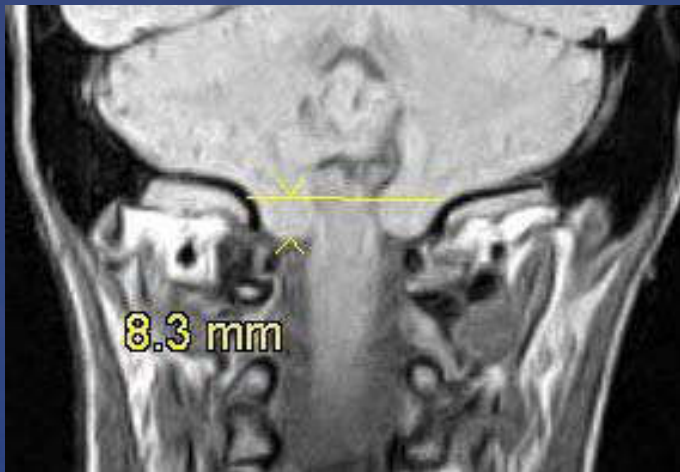


Cerebellar tonsillar ectopia – Chiari.

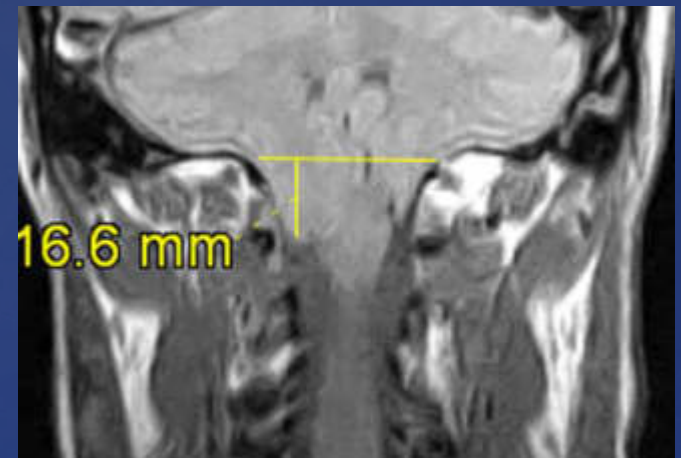




Normal



Ehlers – Danlos syndrome



Chiari



Atlanto-axial joint:

E.D.S.	49	average age	34.5yrs	(11 - 64)	42F	7M
Normal control	58	average age	58yrs	(22 – 78)	42 F	16 M

Stable joint	13/49	26%
Laxity of ligaments	25/49	51%
Dislocation	11/49	23%