



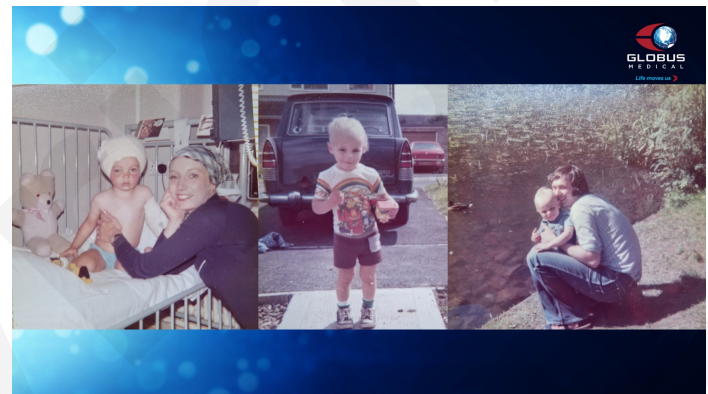
9th Globus Fellows Course

June 2026 Philadelphia

Chairs:
Prof M J H McCarthy and Dr G Borden

Faculty:
Prof O Alves, Dr Federico Pecoraro, Miss Maggie Lee,
Dr M Damilano and Mr Robin Gordon





House Keeping

- No "planned" fire drills
- Wi-Fi Network: GMED-GUEST Wi-Fi Password: GLOBOT
- Bathroom location: make a right out of the door - located on left hand side
- Lab location: make a left out of the door, on the left hand-side
- Scrubs: located outside of locker-room; please take a key for a locker
- Product room location: make a right out of the door - on the right hand-side
- No personal photography / videography
- Follow the rules in the wet lab – if in doubt ask!
- Don't miss the shuttle bus / your flights!



Course Started in 2015



First Rule of Globus Spine Club



Real Purpose of Surgery



The Chairs – Met 2018

Gerd Borden



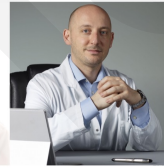
Mike McCarthy



The Faculty



Oscar



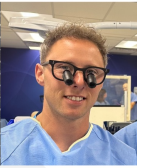
Federico



Maggie



Marco



Robin



The Obligatory Icebreaker



The Course

- Breakouts then Bioskills
- ACDF / Corpectomy / Posterior Cervical Fixation
- Robotic single position LLIF + MIS TLIF
- LLIF / ALIF

• **THERE'S A PRIZE!**



Consideration and Strategies: Case Review Cervical

Prof M J H McCarthy
Consultant Spinal Surgeon
Spinal Fellows Cadaveric Program Training Program
June 2026 Philadelphia



Indications for Surgery - DRS

- Decompression
 - Spinal cord / nerve roots
- Realignment
 - Correct deformity
- Stabilisation
 - Prevent / Treat
 - Neurological deficit / deformity / pain
 - (Non fusion technology form of "stabilisation")

Require Instrumentation
All may require fusion
Instrumentation increases Fusion



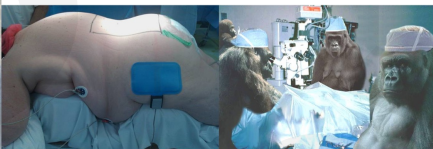
Indications for Surgery

- What are you trying to achieve?
 - Non-maleficence - "first, do no harm" (primum non nocere).
- Do the appropriate operation for the patient and their pathology and your skill / ability

Don't Forget The Ps

- Proper
- Planning and
- Preparation
- Prevents
- P
- Poor
- Performance

- Personality - Patient
- Personality - Pathology
- Personality - Practitioner



Have A Strategy

- What does the patient want?
- What is most appropriate for your patient?
- Surgical factors to consider - ABC Approach:
 - Age Alignment Anatomy Access (high / low)
 - Bone Quality
 - Compression (anterior / posterior / both) Calcification Cord Signal
 - Disc Height / Degeneration / Deformity / Dura
 - Evaluate Stability – supine / erect / dynamic
 - Facet Gap
 - (Globus kit!!!)
- How many levels and how many operations? Halo



Common Subaxial Operations

- ACDF alone
 - Fixable cage vs cage and plate
- ACDF + Posterior
- Corpectomy alone
- Corpectomy + Posterior
- Posterior decompression alone (incl. laminoplasty)
- Posterior decompression fusion
 - LM vs pedicle screws



Cervical Parameters

Parameter	Measurement methods	Study
T1 sagittal angle	The angle between a horizontal line and the T1UEP	East et al. (2000) ⁷
Dens angle	The angle of the dens in the sagittal plane	
Dens-Chopier angle	The angle of the dens in relation to the occiput	
Cervical tilt	The angle formed between the vertical line from the center of T1UEP and the line from the center of T1UEP to the tip of the dens	Lee et al. (2003) ¹²
Cervical tilt	The angle formed between the line from the center of the T1UEP to the dens and the line from the T1UEP	
Neck tilt	The angle formed by a line drawn to the upper end of the sternum and a line connecting the center of the T1UEP	
T1 slope	The angle formed between the horizontal plane and the T1UEP	
Thomas side angle	The angle formed by a line from the center of the T1UEP vertical to the T1UEP and a line connecting the center of the T1UEP and the upper end of the sternum	
Cervical incidence	The angle between the center of the line perpendicular to the McGregor line and the line that joins the middle of the McGregor line to the sella turcica	Le Huec et al. (2003) ¹⁸
Cervical slope	The angle between the horizontal line and the McGregor line	
Cervical tilt	The angle between the vertical line and the line joining the center of the McGregor line and the sella turcica	
Spino-crani angle	The angle between the C7 slope and the straight line joining the middle of the C7 end plate and the middle of the sella turcica	
C2 pelvic angle	The angle of a line from C2 extended to the H1 and a line from the H1 to the middle of the S1 endplate	Pratsopoulos et al. (2007) ¹⁹
Cervicothoracic pelvic angle	The angle of a line from center of C2 to H1 and a line from H1 to center of T1	Pratsopoulos et al. (2007) ¹⁹
Cervicothoracic angle	The angle of the line from the center of C7 to the posterior corner of the hard palate and McGregor's line	Pratsopoulos et al. (2007) ¹⁹
Occiput-inclination	The angle formed by a line connecting McGregor's line and the posterior border of the C4 vertebral body	Teo et al. (2007) ²⁰
Clinical angle	The angle subtended by lines drawn parallel to the dorsal surface of the dens and dens	Radwan et al. (2008) ²¹
K line tilt	The angle between the K line and a line perpendicular to the posterior	Kim et al. (2008) ²²
C2 incidence angle	The angle between a line from the center of the H1 through the midpoint of the sacral superior endplate and an assumed line perpendicular to C2 inferior endplate	Choi et al. (2008) ²³
C2 slope	The angle between the lower endplate of C2 and the horizontal plane	Pratsopoulos et al. (2008) ²⁴
UEP upper endplate H1, forward head		

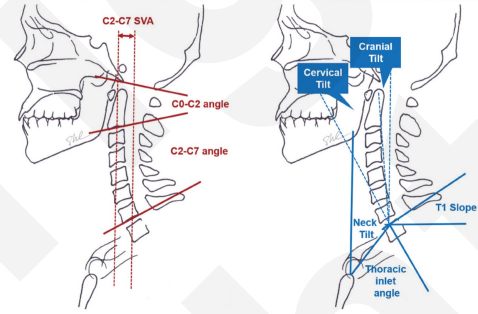


Normal Cervical Alignment Values

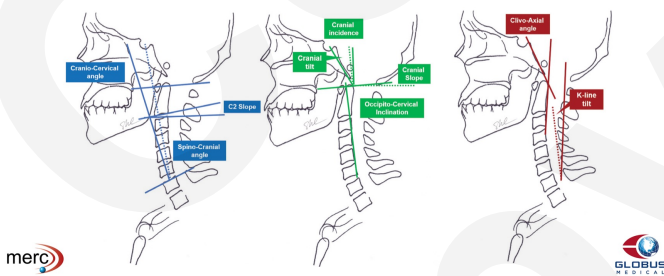
Table 1. Normal cervical alignment values in the asymptomatic column in the literature. In the published work.

Study	Subject	Values	Remarks
Harshbarger et al. ¹ (1986)	100 asymptomatic patients with no radiographic evidence of degenerative disease	C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15°	10°-15° sagittal angle group 10°-15° sagittal angle group 10°-15° sagittal angle group
Grubb et al. ² (1986)	200 asymptomatic patients	C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15°	10°-15° sagittal angle group 10°-15° sagittal angle group 10°-15° sagittal angle group
Harshbarger et al. ³ (1986)	100 asymptomatic patients	C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15°	10°-15° sagittal angle group 10°-15° sagittal angle group 10°-15° sagittal angle group
Harshbarger et al. ⁴ (1986)	100 asymptomatic patients	C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15°	10°-15° sagittal angle group 10°-15° sagittal angle group 10°-15° sagittal angle group
Harshbarger et al. ⁵ (1986)	100 asymptomatic patients	C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15° C2-C7 sagittal angle: 10°-15°	10°-15° sagittal angle group 10°-15° sagittal angle group 10°-15° sagittal angle group
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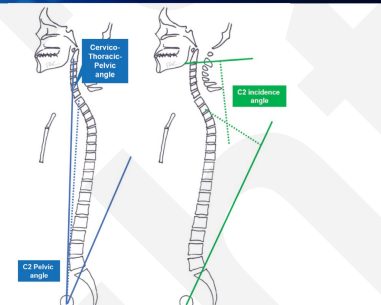
Cervical Parameters



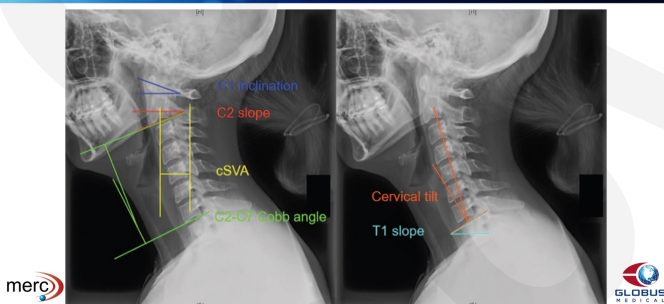
Cervical Parameters



Cervical Parameters



Cervical Parameters



K Line (OPLL)

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A New Concept for Making Decisions Regarding the Surgical Approach for Cervical Ossification of the Posterior Longitudinal Ligament
The K-Line

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Tomonori Endo, MD,* Takeo Furuya, MD,* Masao Koda, MD, PhD,*
Akiko Okawa, MD, PhD,* Kazuhisa Takahashi, MD, PhD,* and Hiroaki Konishi, MD, PhD

Key Points

- We proposed a new index, the K-line, which can evaluate cervical alignment and OPLL size in 1 parameter.
- Cervical OPLL patients who underwent posterior decompression surgery were classified into 2 groups: K-line (+) and K-line (-).
- Sufficient posterior shift of the spinal cord and neurologic improvement were not obtained after posterior decompression surgery in the K-line (-) group.
- The K-line is a simple and practical tool for making decisions regarding the surgical approach for cervical OPLL patients.

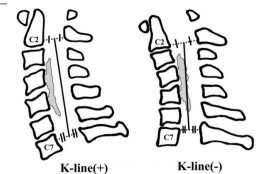
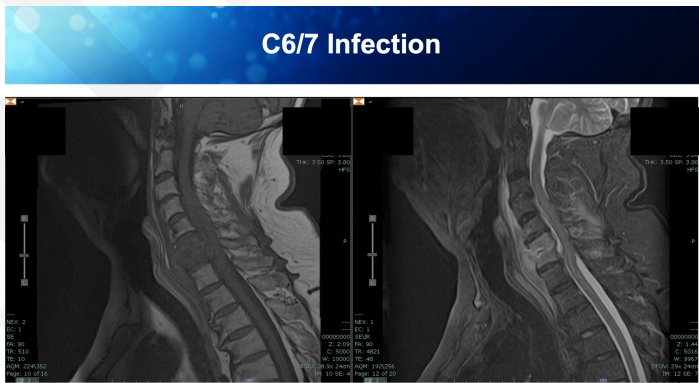
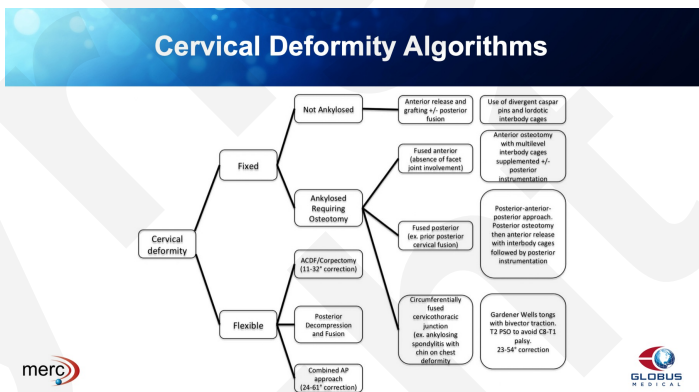
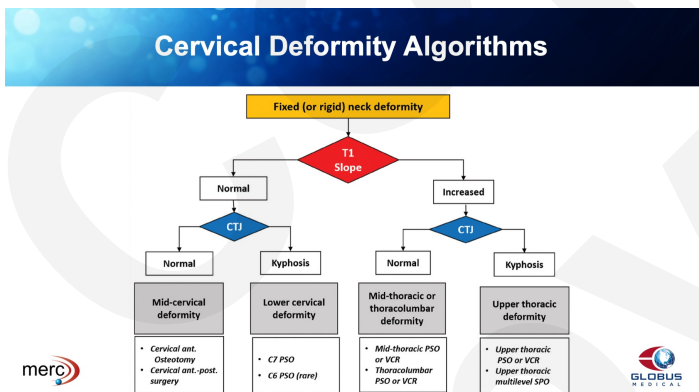
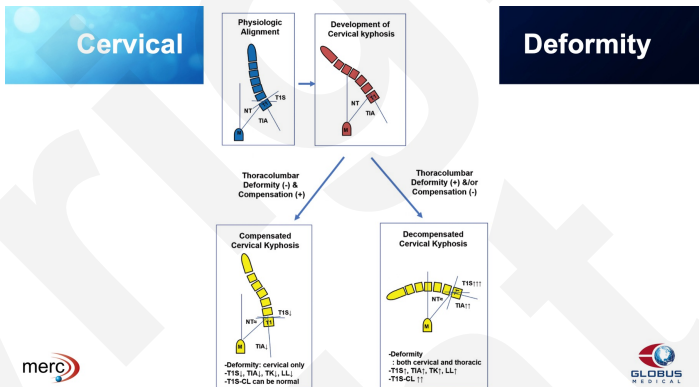
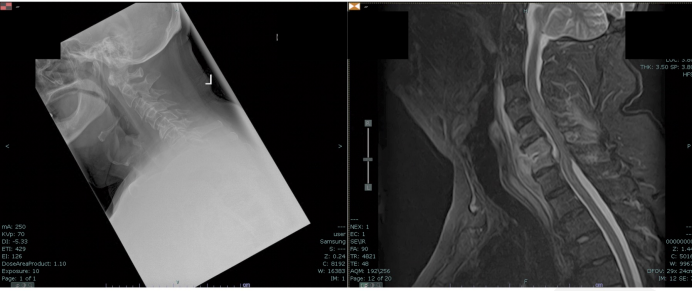


Figure 1. Schematic drawings of the "K-line." The K-line is a straight line that connects the midpoints of the spinal canal at C2 and C7 on the lateral cervical radiographs. Patients with cervical ossification of the posterior longitudinal ligament (OPLL) are divided into 2 groups according to the K-line. OPLL does not exceed the K-line in the K-line (+) group and does exceed it in the K-line (-) group.



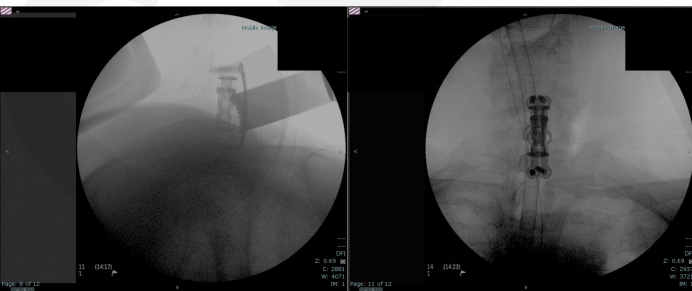
Pre Op Erect XR



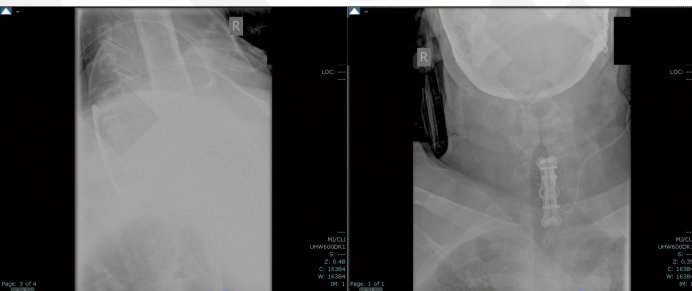
Options – What Would You Do?...



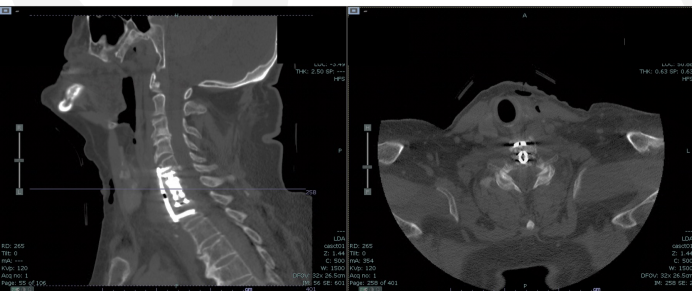
Intra Op Images



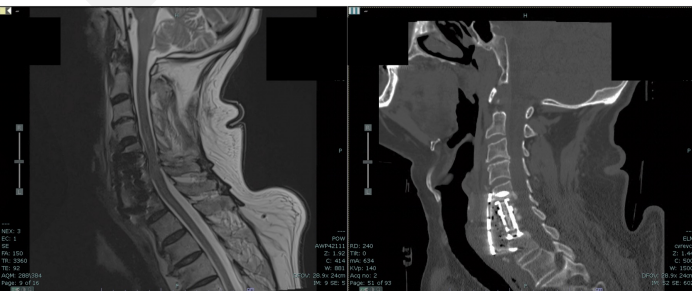
Post Op XR



Post Op CT



Deteriorates at 1 week...



Why?



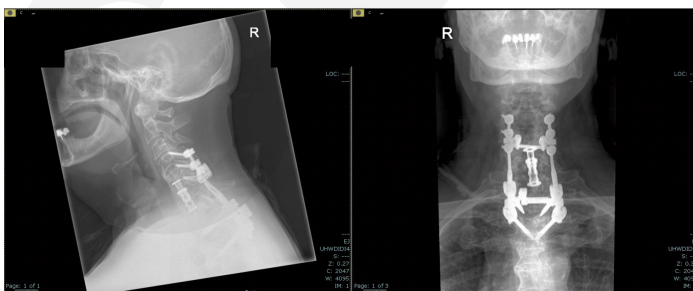
What Now?



merc

GLOBUS
MEDICAL

Posterior then Anterior Revision



Post Op CT



As With All Things...



Pay attention to the detail and
never let your guard down

merc

GLOBUS
MEDICAL

Thank You



Don't Forget This Slide...

