Five to Sixteen-Year Results of 201 Growing Rod Patients: *Is There a Difference Between Etiologies?*

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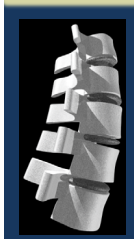

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Growing Spine Study Group	Growing Spine Foundation (GSF)

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Vitale Classification of EOS (C-EOS)

Etiology	Cobb Angle	Kyphosis	APR Modifier
Congenital/ Structural	**1**: <20°	**(-)**: <20°	**P⁰**: <10°/yr
Neuromuscular	**2**: 21-50°	**N**: 21-50°	**P¹**: 10-20°/yr
Syndromic	**3**: 51-90°	**(+)**: >50°	**P²**: >20°/yr
Idiopathic	**4**: >90°		

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Purpose

Etiology

- **C**ongenital/ Structural
- **N**euromuscular
- **S**yndromic
- **I**diopathic

Purpose:

To compare long-term results of growing rod treatment between different etiologies in a large Series of patients

Methods

- **Review of a multicenter EOS database**
  - **574 growing rod patients were reviewed**
  - **201 patients met the inclusion criteria:**
    - Minimum 5-year follow-up
    - Data available for analysis
- Patients were grouped based on C-EOS classification
- Latest follow-up was defined as most recent visit prior to final fusion

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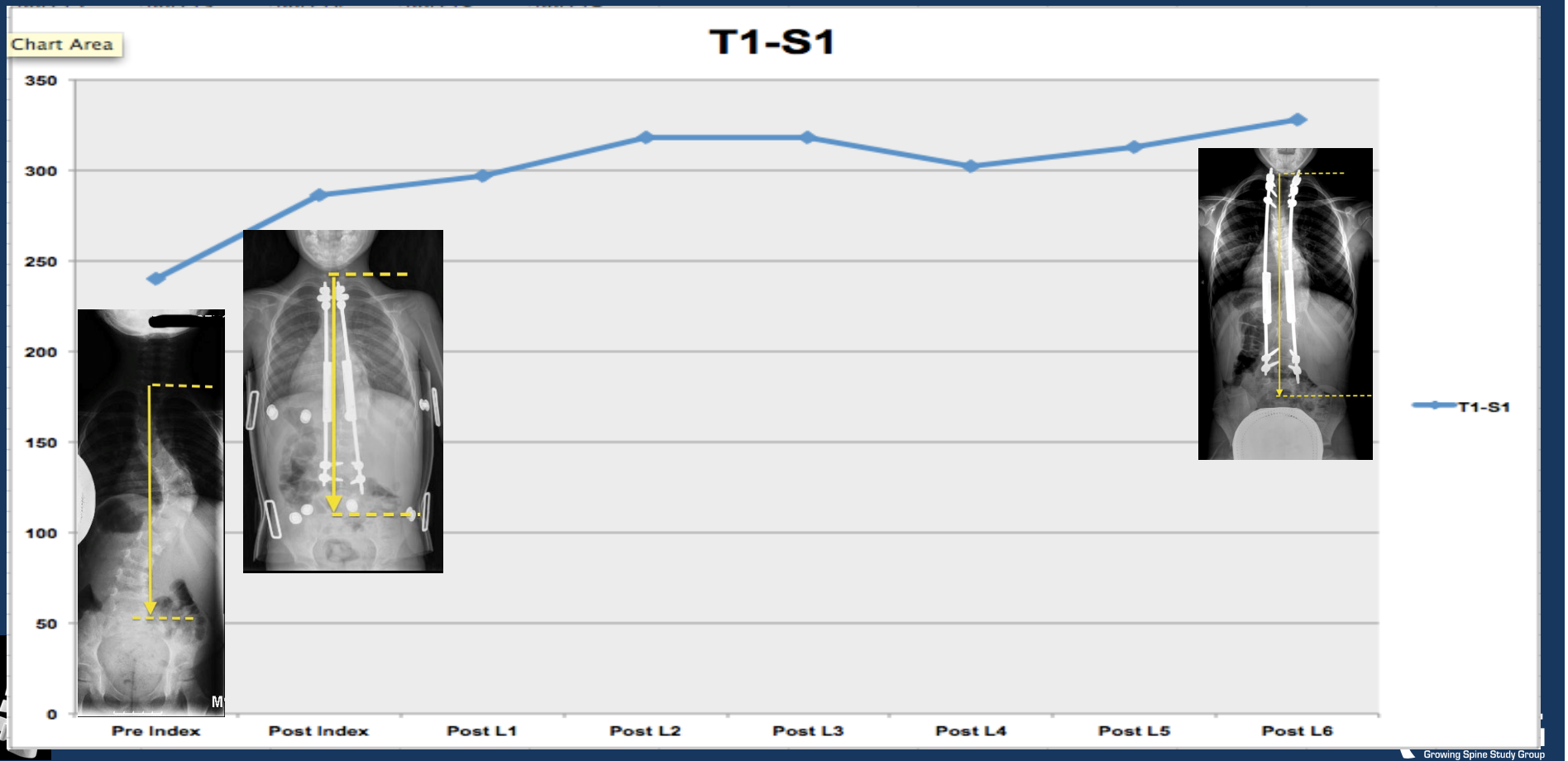
Methods

Annual T1-S1 Growth (mm/year) = $\frac{\Delta \text{ in T1-S1 from post index to latest F/U}}{\text{Length of follow-up}}$



Results

	Congenital	Neuro-muscular	Syndromic	Idiopathic
# of Patients	47 (24%)	49 (24%)	62 (31%)	43 (21%)
Age at Index Surgery	4.7 y	6.1 y	4.9 y	5.8 y
Mean Length of F/U	7 y	7.2 y	7 y	7.2 y
Mean # of Lengthenings	5.1	4.6	6.2	5
Mean # of Revisions	3.1	2.6	2.1	1.4

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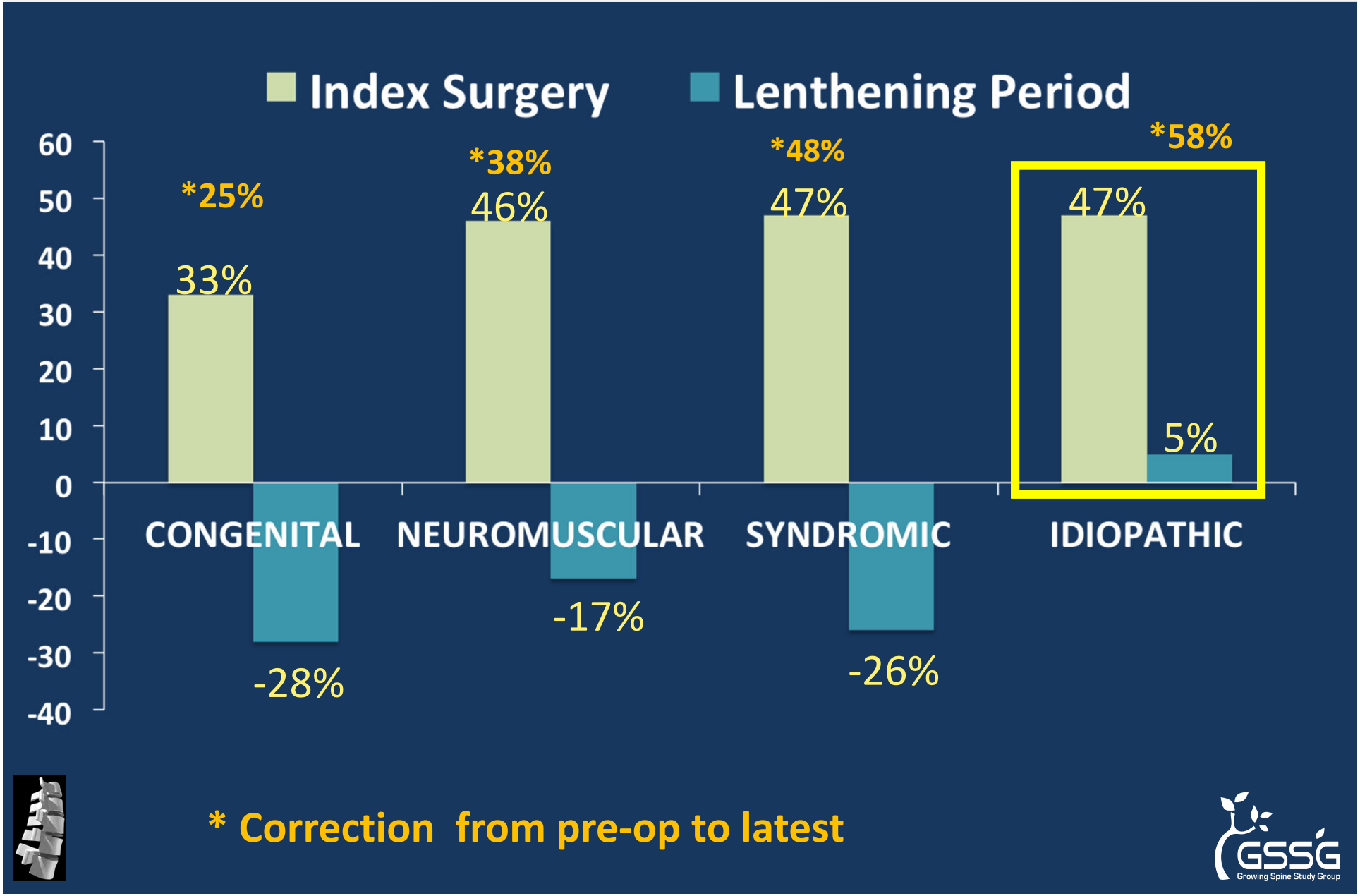
Results: Cobb Angle Correction



* Correction from pre-op to latest

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Results: T1-S1 Length

T1-S1 Increase at Index Surgery:

- **Neuromuscular patients**
  - Largest T1-S1 increase at index surgery
- **Congenital patients**
  - Smallest T1-S1 increase at index surgery

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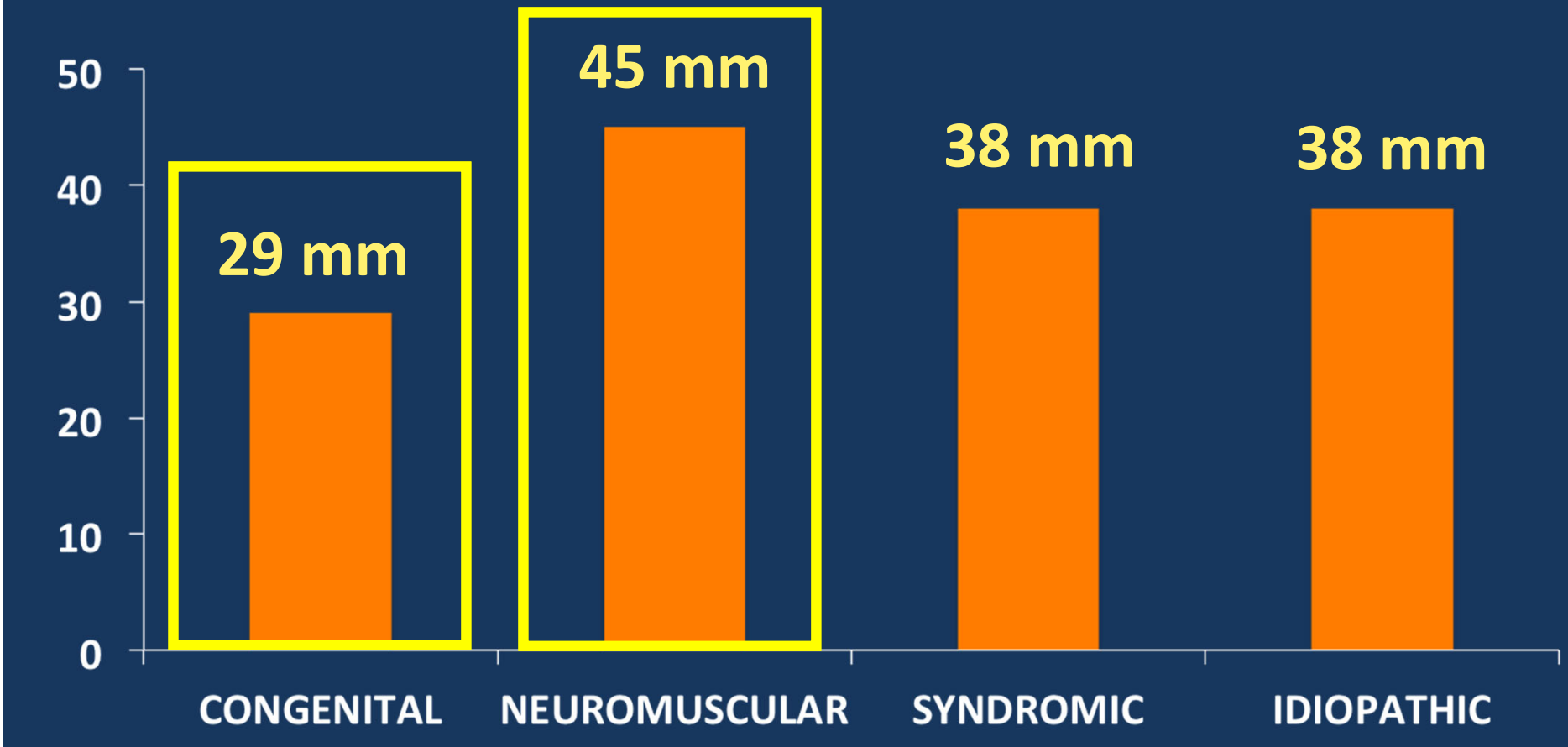
Results: T1-S1 Length

T1-S1 Increase at Index Surgery:



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Results: T1-S1 Length

Annual T1-S1 Growth:

- **Neuromuscular patients** had the lowest annual T1-S1 growth
- However, annual T1-S1 growth was **comparable** between all etiologies (8-10 mm/year)

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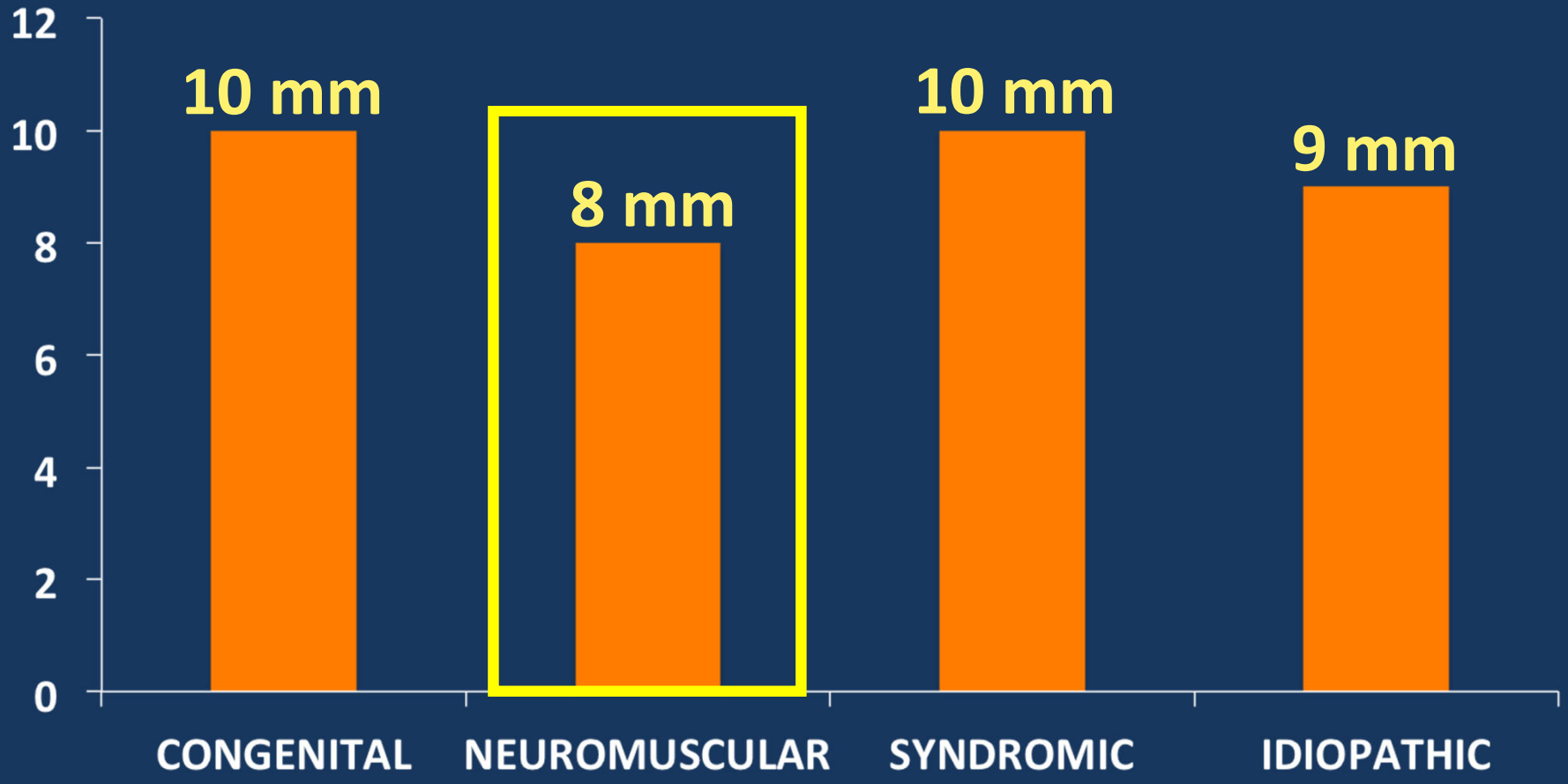
Results: T1-S1 Length

Annual T1-S1 Growth:



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Conclusions: Cobb Angle

- Comparable initial improvement (33-47%) at index surgery for all etiologies
- Variable overall improvement (25-58%) from pre-op to latest follow-up for all etiologies

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Conclusions: Cobb Angle

- Idiopathic patients had the most curve correction and maintained curve correction
- However, all non-idiopathic patients lost some correction during the lengthening period, with congenital patients having the least overall correction

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Conclusions: T1-S1 Length

- Annual T1-S1 growth was similar (8-10 mm per year) during lengthenings for all four etiologies

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Dervish with a snake-headed staff

Thank You

Courtesy of Ladan Akbarnia, PhD
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