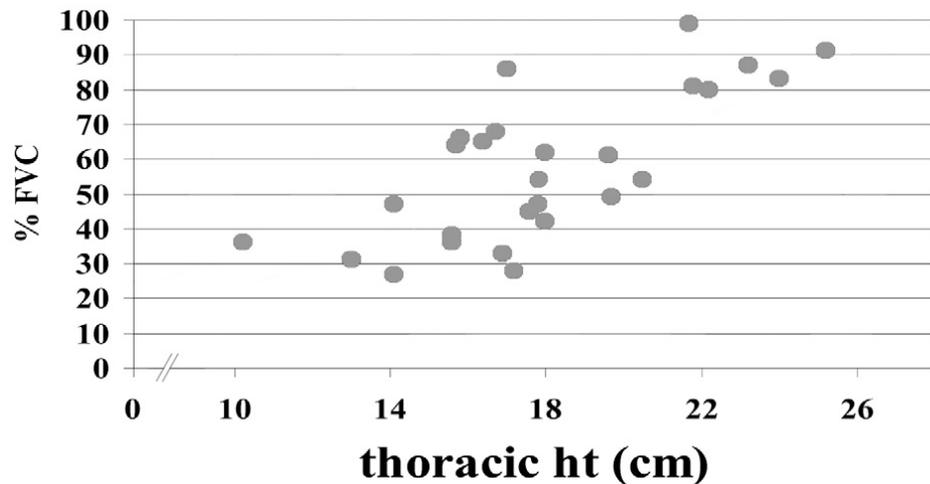


# Can Distraction–Based Surgeries Achieve Minimum 18 cm Thoracic Height for Patients with Early Onset Scoliosis?

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# Background



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## Pulmonary Function Following Early Thoracic Fusion in Non-Neuromuscular Scoliosis

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# Introduction

- ▶ It has been proven in previous studies that thoracic height has a strong correlation with pulmonary function.
- ▶ Karol et al. introduced the concept that 18 cm thoracic height is the critical point where a patient could maintain adequate pulmonary function.

# Purpose

- ▶ To determine if distraction-based surgeries will increase thoracic spine height to at least 18 cm in patients with EOS.

# Hypothesis

- ▶ Distraction-based surgeries will increase thoracic spine height to a minimum of 18 cm in patients with EOS; although there may be differences between etiologies.

# Design & Methods

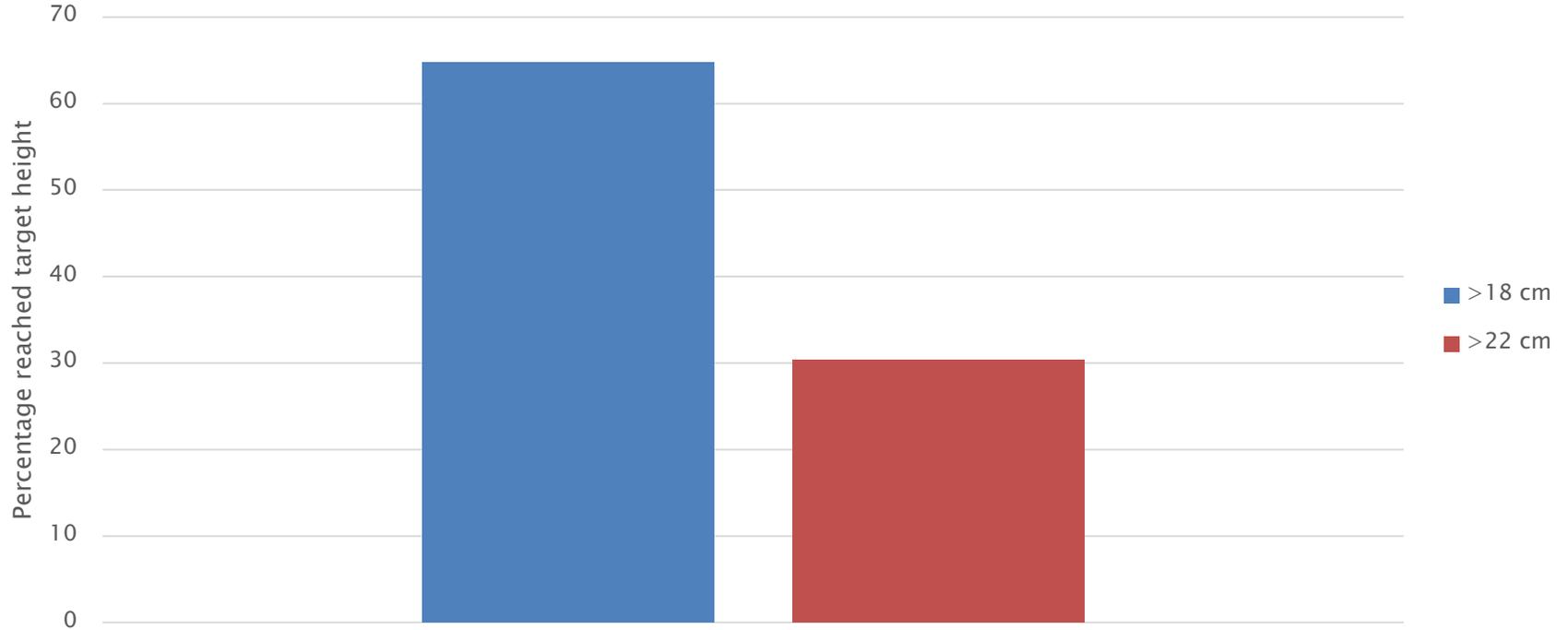
- ▶ Retrospective, comparative multi-center, review of patients with EOS treated with distraction-based systems.
  - ▶ Minimum 5 years follow-up and 5 lengthenings.
  - ▶ Primary outcome was thoracic height (T1–T12) at the last lengthening procedure.
- 

# Patients

- 135 patients;
  - 25 Idiopathic, 59 congenital, 32 syndromic, 19 neuromuscular.
- Average number of lengthenings was 11.

Mean values	Pre-operative	Final lengthening
Age	4.7 years	11 years
Scoliosis	74°	55°
Kyphosis	44°	55°

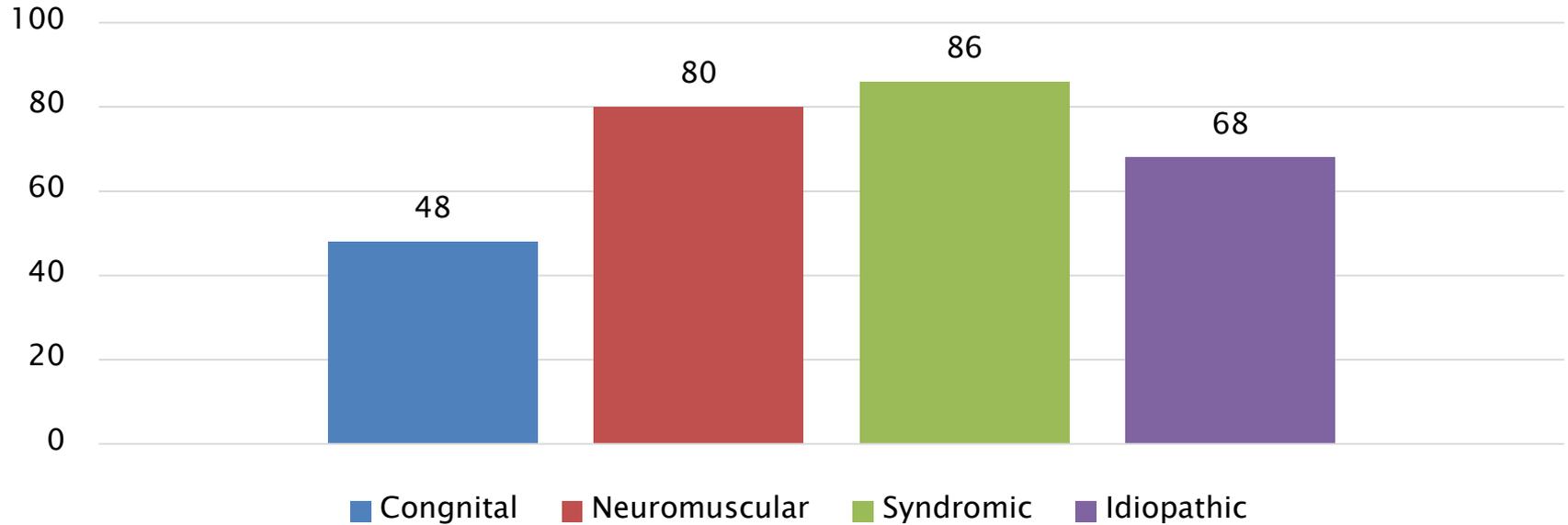
# Results



Final thoracic height was  $> 18\text{cm}$  in 65% (n=87) and was  $> 22\text{cm}$  in 30% (n=41) of patients.

# Results

Percentage of patients that reached 18 cm



# Results

The spine height gain was closely related to the percentage of scoliosis correction achieved for each etiology.

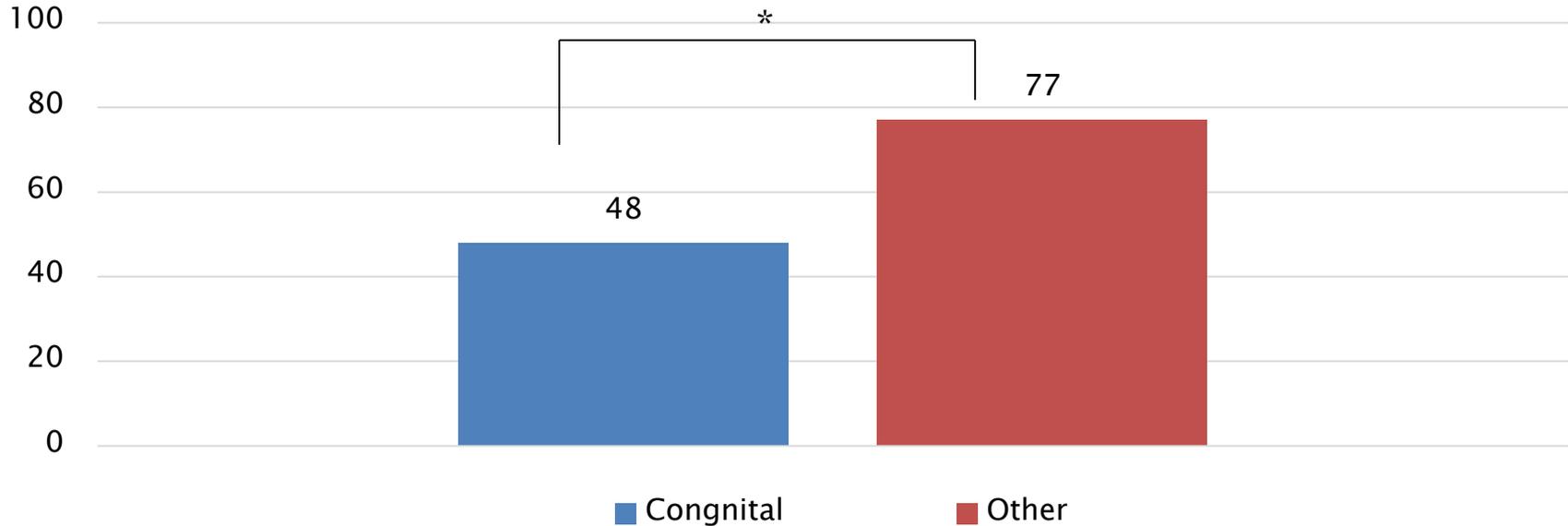
\*p<0.05

	< 18cm		18-22 cm		>22 cm	
	n	Mean % Correction	n	Mean % Correction	n	Mean % Correction
Congenital	31	3*	22	18*	6	22*
Neuromuscular	4	-4.5	4	44.5	11	44
Syndromic	5	18	12	37	15	53
Idiopathic	8	3	8	34.5	9	42

# Results

\*p<0.05

## Comparing Congenital to other etiologies



Percentage of patients that reached 18 cm thoracic height.

# Conclusion

- ▶ At minimum 5 year follow up, distraction-based surgeries increased thoracic spine height for patients with EOS to greater than 18cm in 65% of patients; however, only 48% of congenital patients reached this thoracic spine height threshold.

# Thank You

