



Analysis of Percentile Weight Changes in Failure To Thrive Children undergoing Growing Rod Insertion.

ICEOS 2012

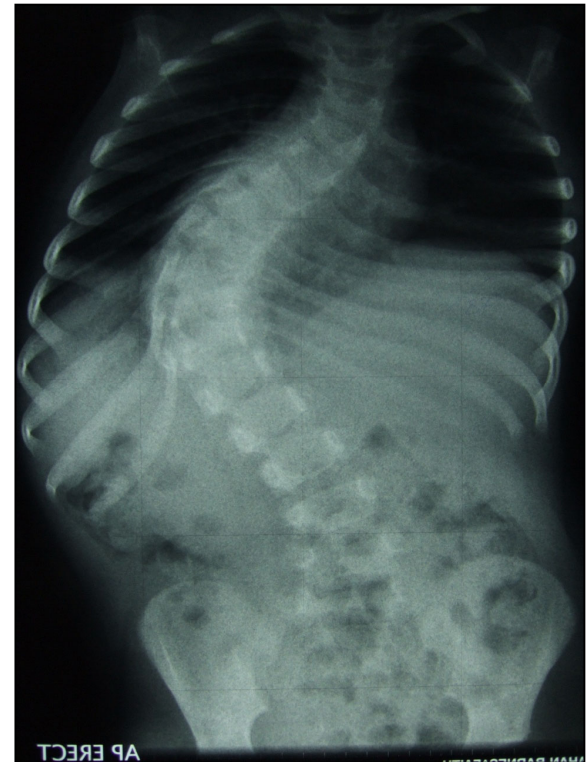
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Introduction

- Traditionally classified by subtype:
 - Neuromuscular
 - Congenital
 - Idiopathic
- Early Onset Scoliosis
 - Dickson et al
 - 0-5y
- Heterogenous group



Issues in Early Onset Scoliosis

- Thoracic Insufficiency Syndrome
 - Coined by Campbell et al
 - Pulmonary Function continues to develop until the age of 8y
 - Role of chest wall and spine are combined in development of child
- Failure to thrive
 - Poor nutritional status due to an increased energy expenditure
 - <5th Weight Percentile
- Characteristically poor nutritional status¹

1 DL Skaggs, WN Sankar, J Albrektson, TAL Wren, RM. Campbell, **Weight Gain Following Vertical Expandable Prosthetic Titanium Ribs Surgery in Children With Thoracic Insufficiency Syndrome** SPINE Volume 34, Number 23, pp 2530–2533

Objectives of Treatment

- First Line Treatment: Body Cast and Bracing
- Surgical:
 - Early Fusion vs Growing Rods?
- Modern techniques aim to stabilise spine without hindering growth
- Growing Rods
 - Spinal Rods (multiple types)
 - Vertical Expandable Prosthetic Titanium Rib (VEPTR)
- Aim to reach maturity and plan elective Spinal Fusion



Objective of study

- To Evaluate the percentile weight changes of patients pre and post insertion of the growing spinal instrumentation
- Focus on Children with Failure To Thrive (<5th Percentile)



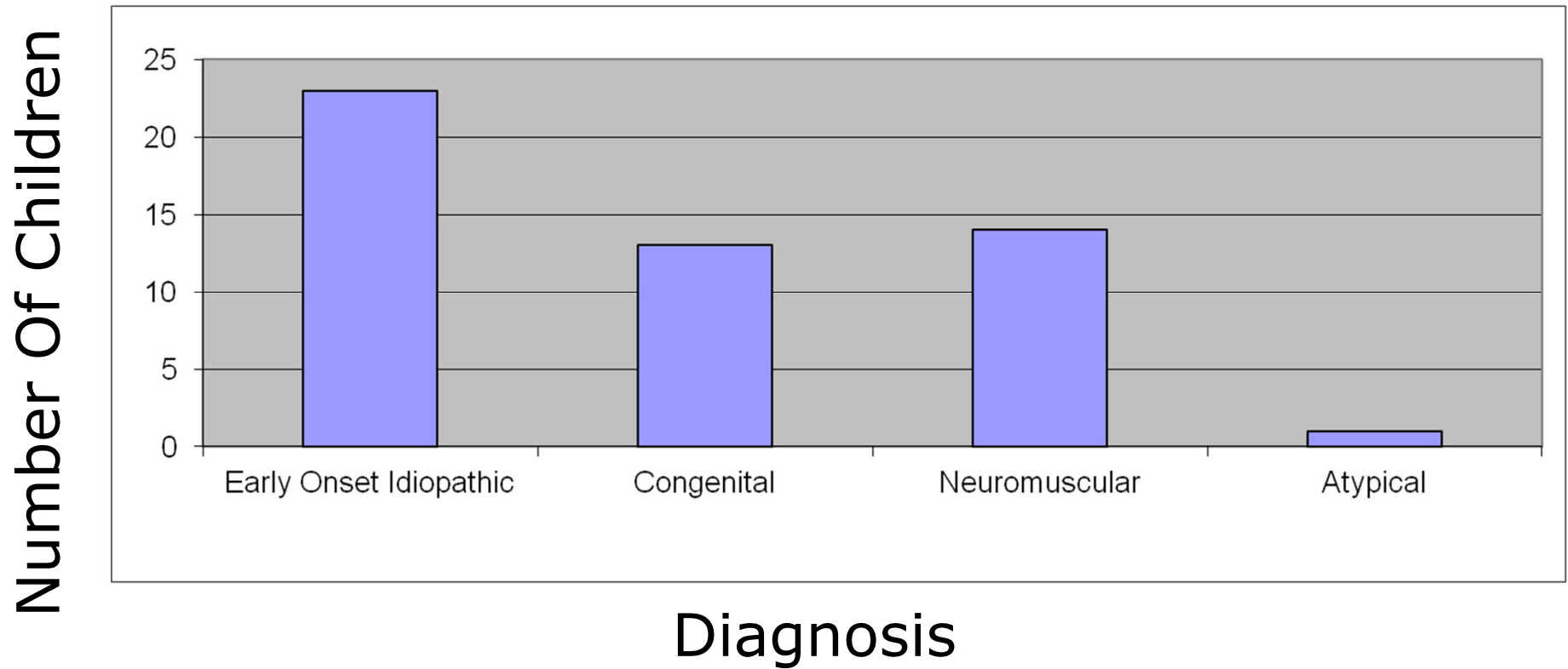
Methods

- Retrospective chart review 2007-2012
- 51 Patients
- Pre- and post- operative percentile weights were calculated:
 - Online paediatric centile calculator
 - *Centers for Disease Control and Prevention: BMI Percentile Calculator for Child and Teen English Version*. BMI Percentile Calculator for Child and Teen English Version]. Available from: <http://apps.nccd.cdc.gov/dnpabmi/>. Weight of instrumentation was subtracted from weight gain observed (Average Equipment Weight – 0.1kg)
- Cobb Angles
- Operative morbidity
- Statistical Analysis by SPS 16.0 (IBM)

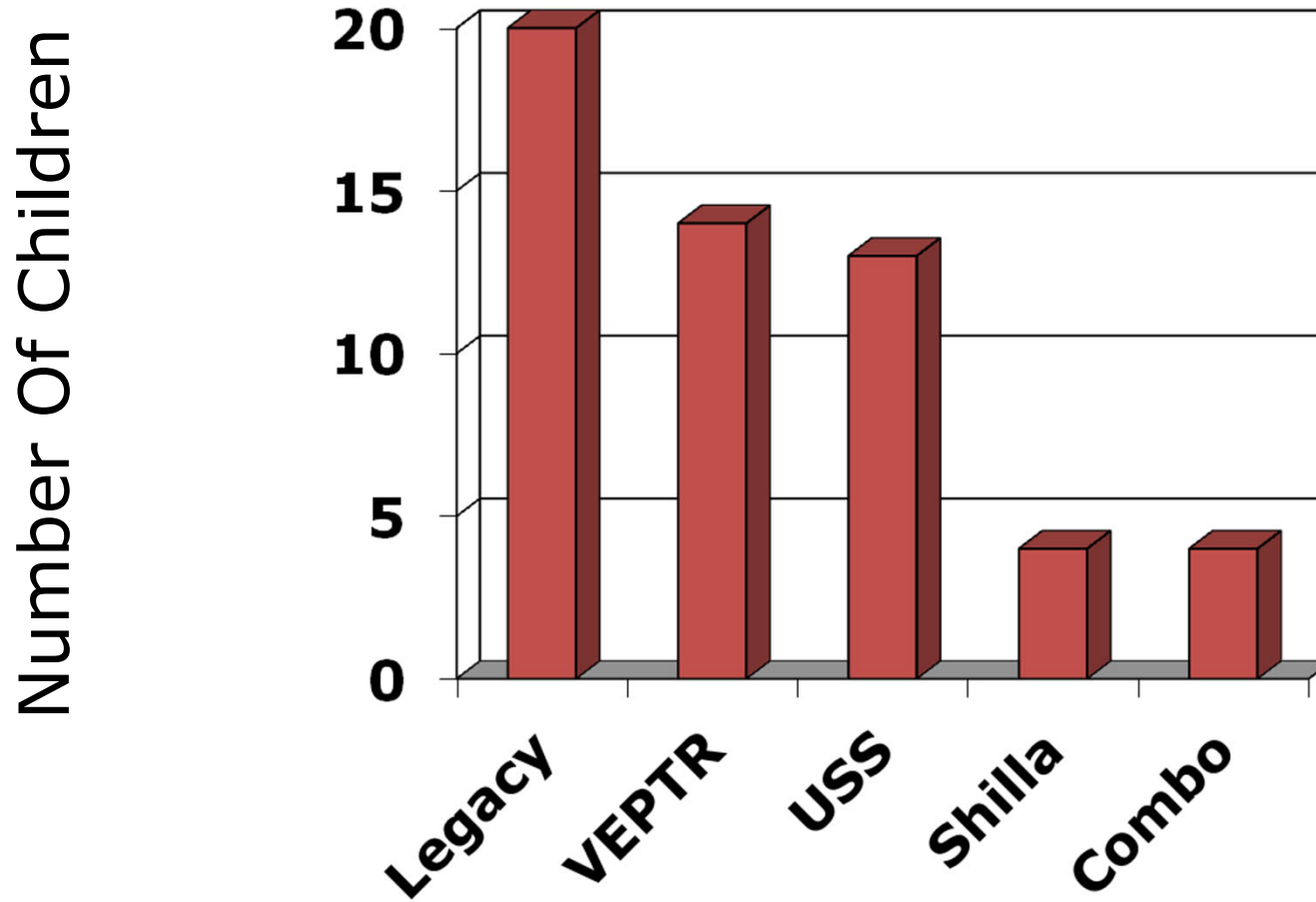
Results

- 21 male; 30 female
- Avg Age 8.62 (Range= 3-15)
- 84% Complete data (43 of 51)
- Average follow up was 19 months (range 6-48 months)

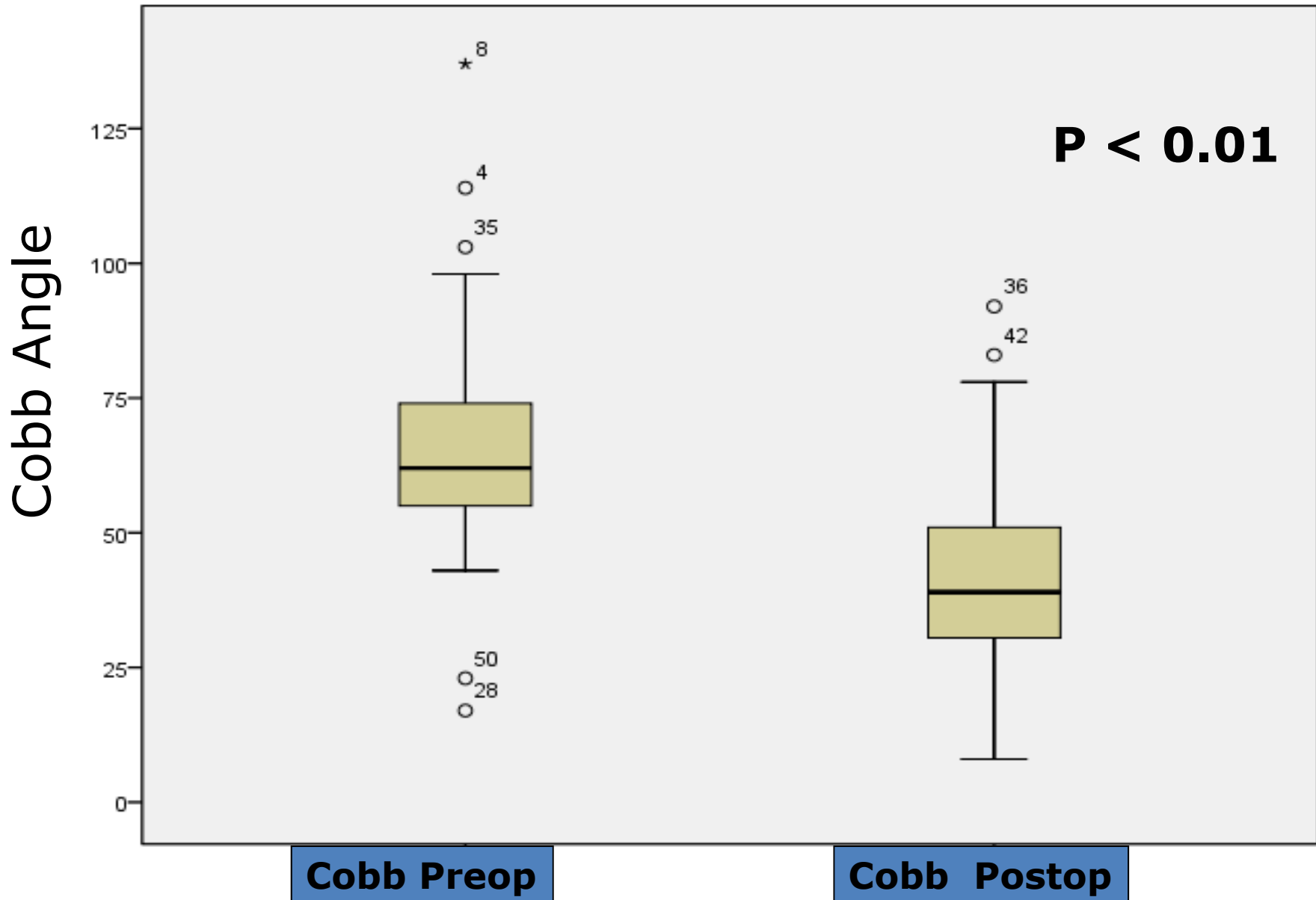
Aetiology



Instrumentation

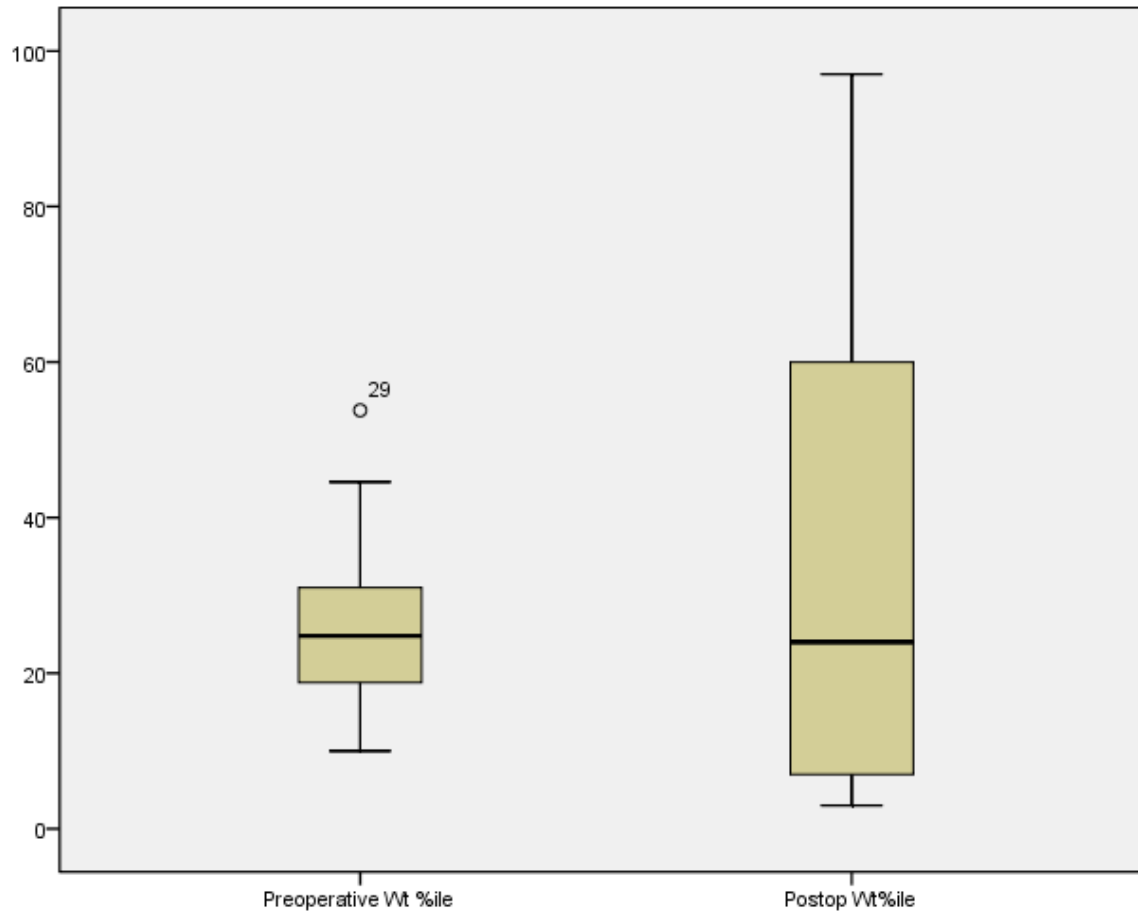


Cobb Angle



Centile Weight Change Box plot

Weight Centile

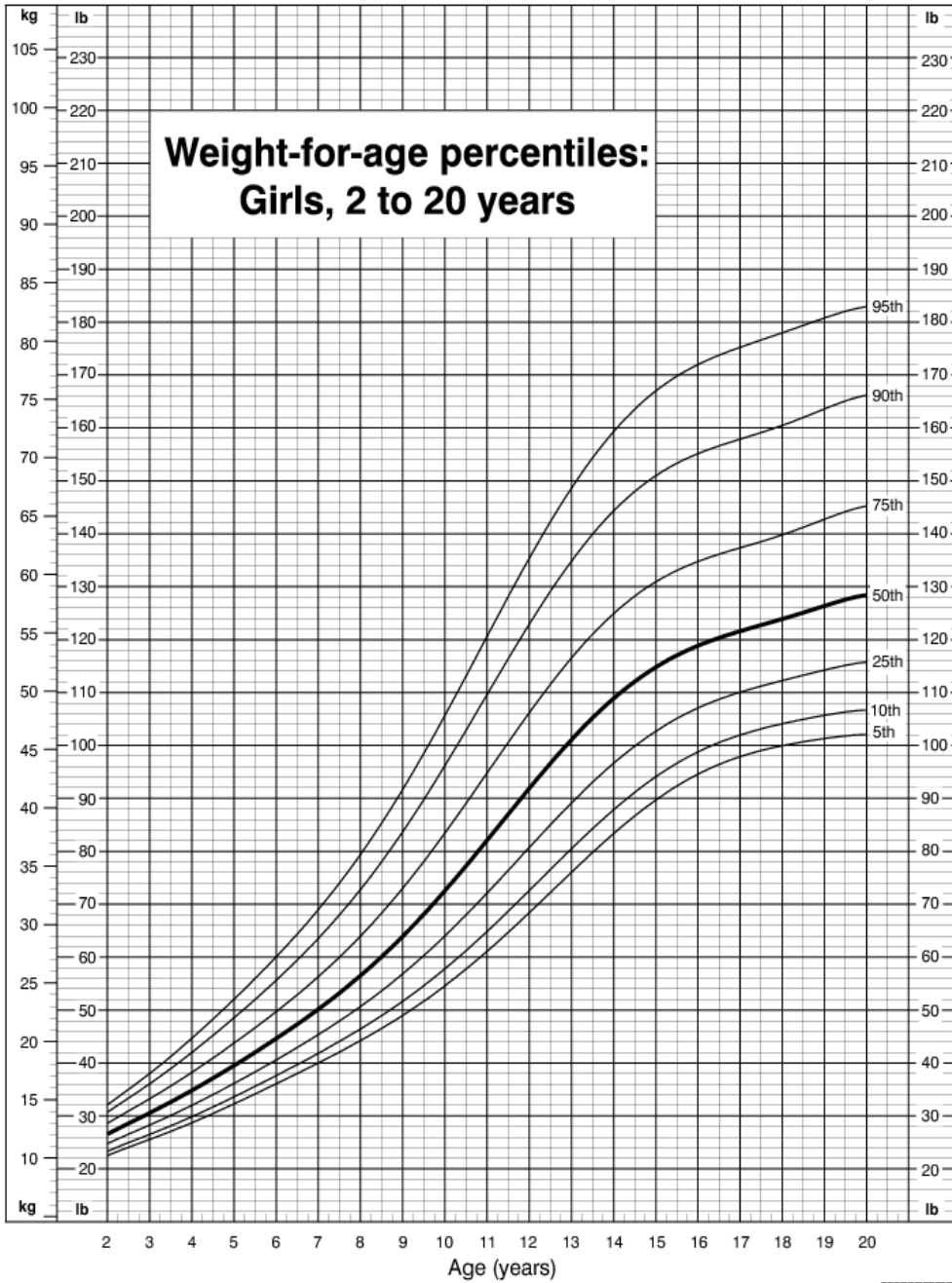


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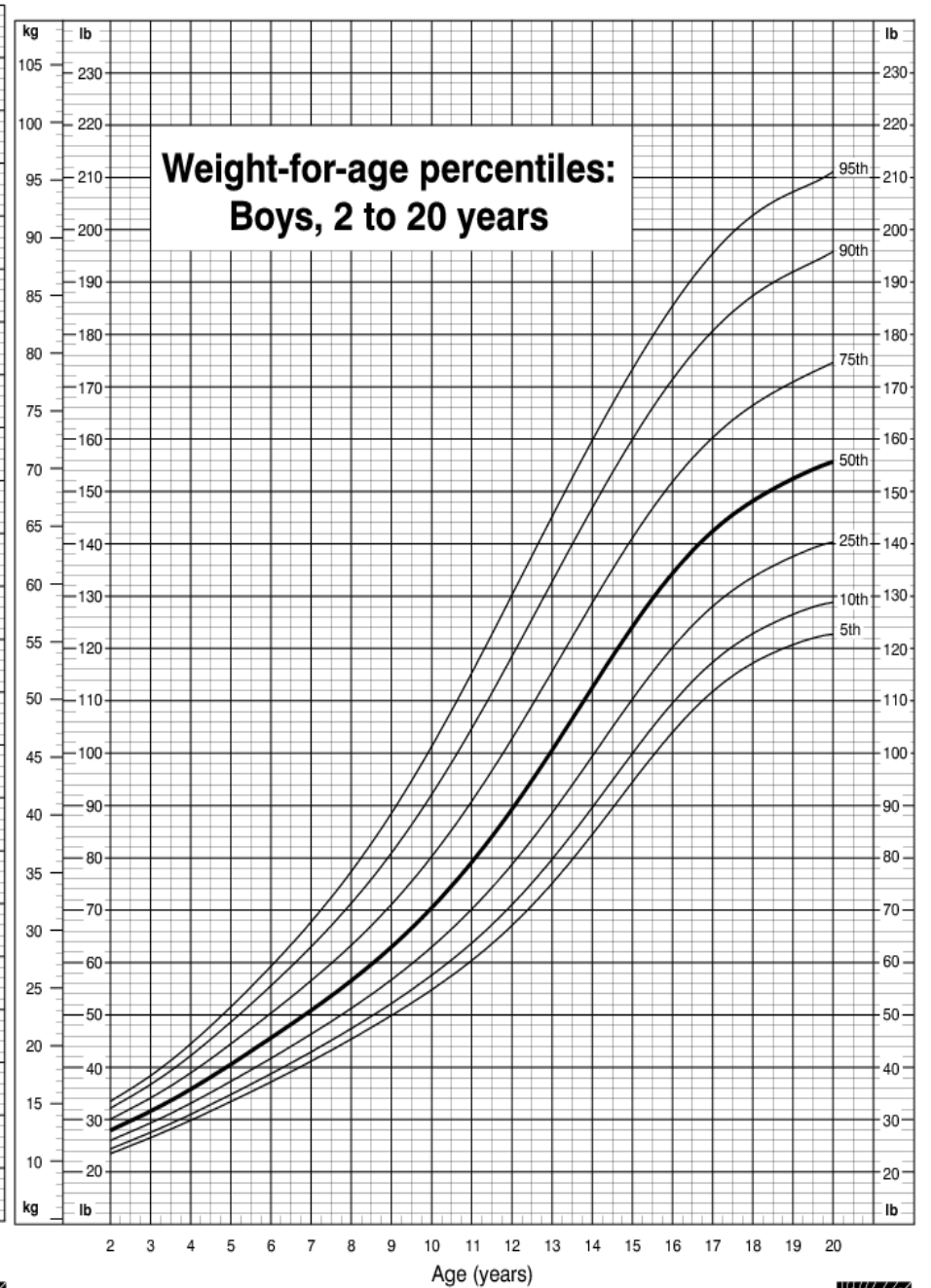
Weight %ile Preop

Weight %ile Postop

CDC Growth Charts: United States



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Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).



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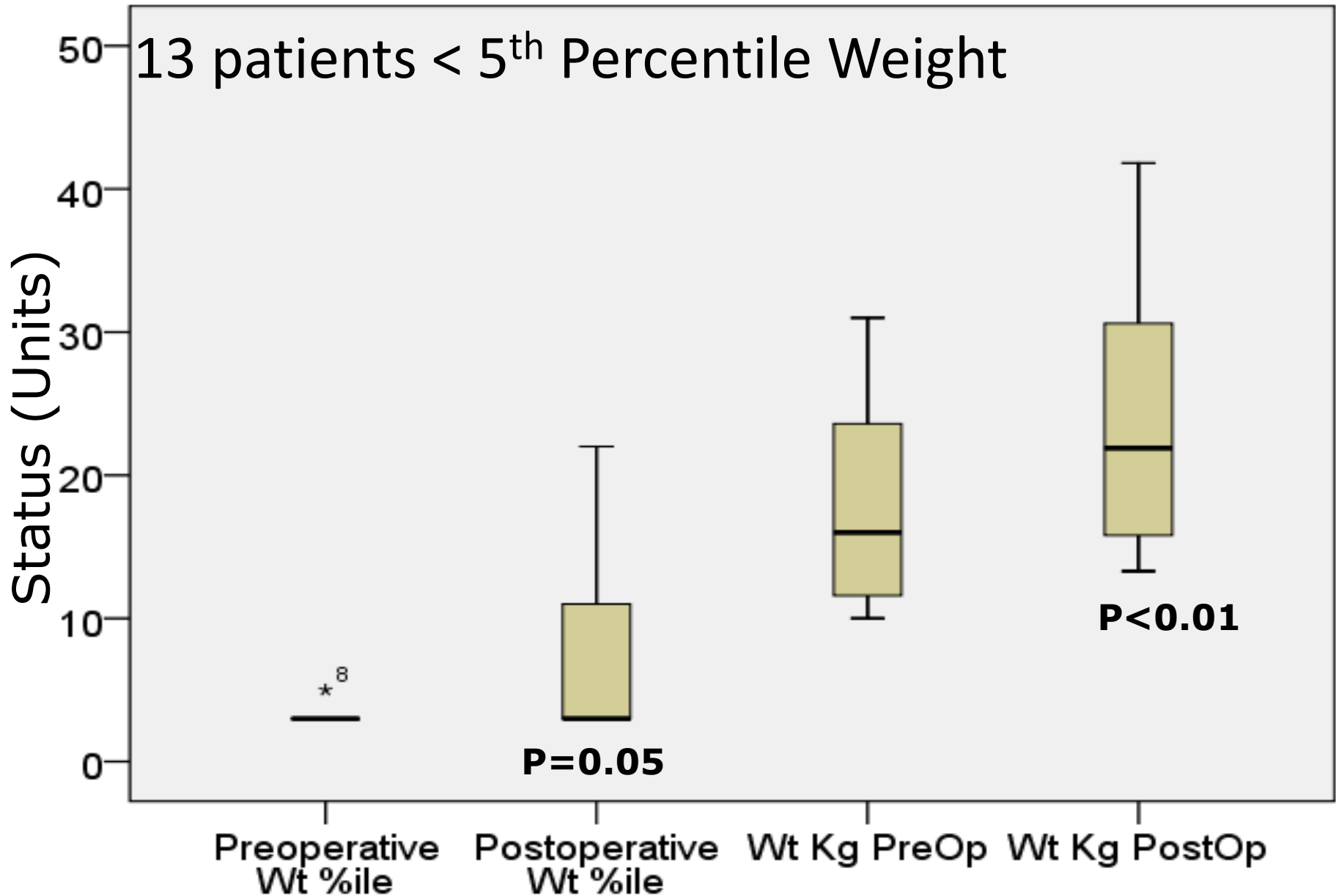
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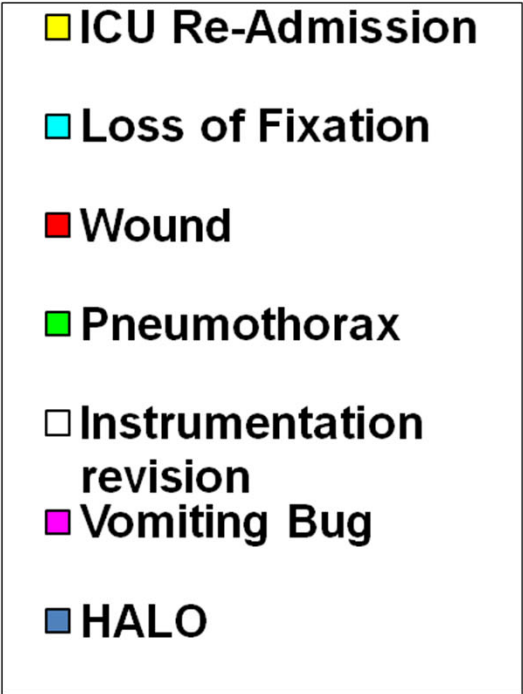
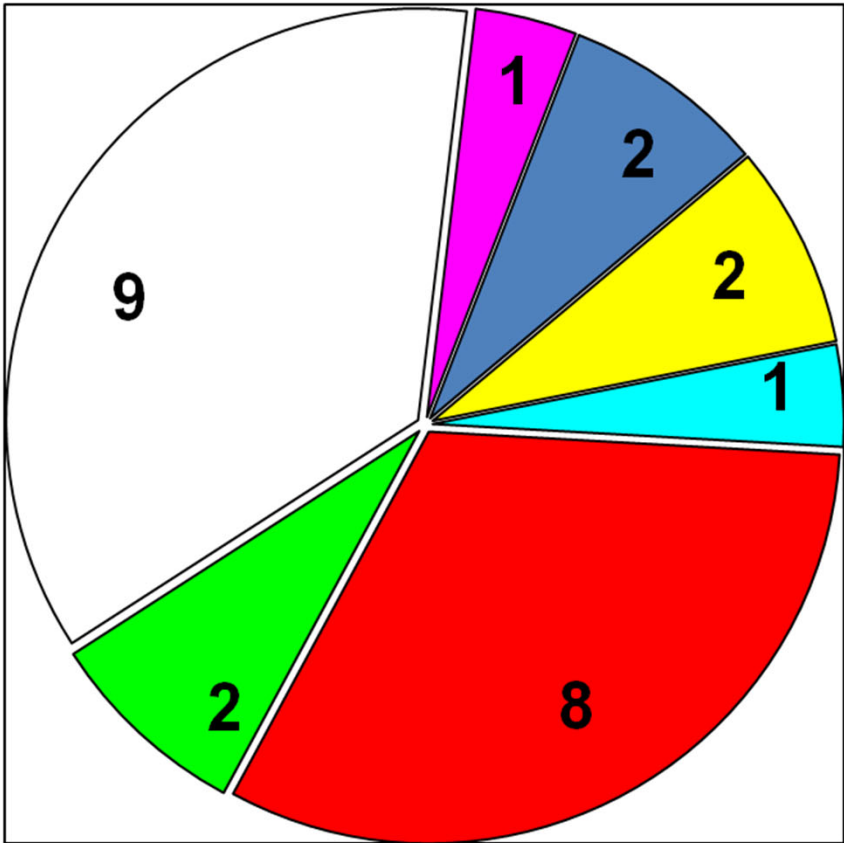


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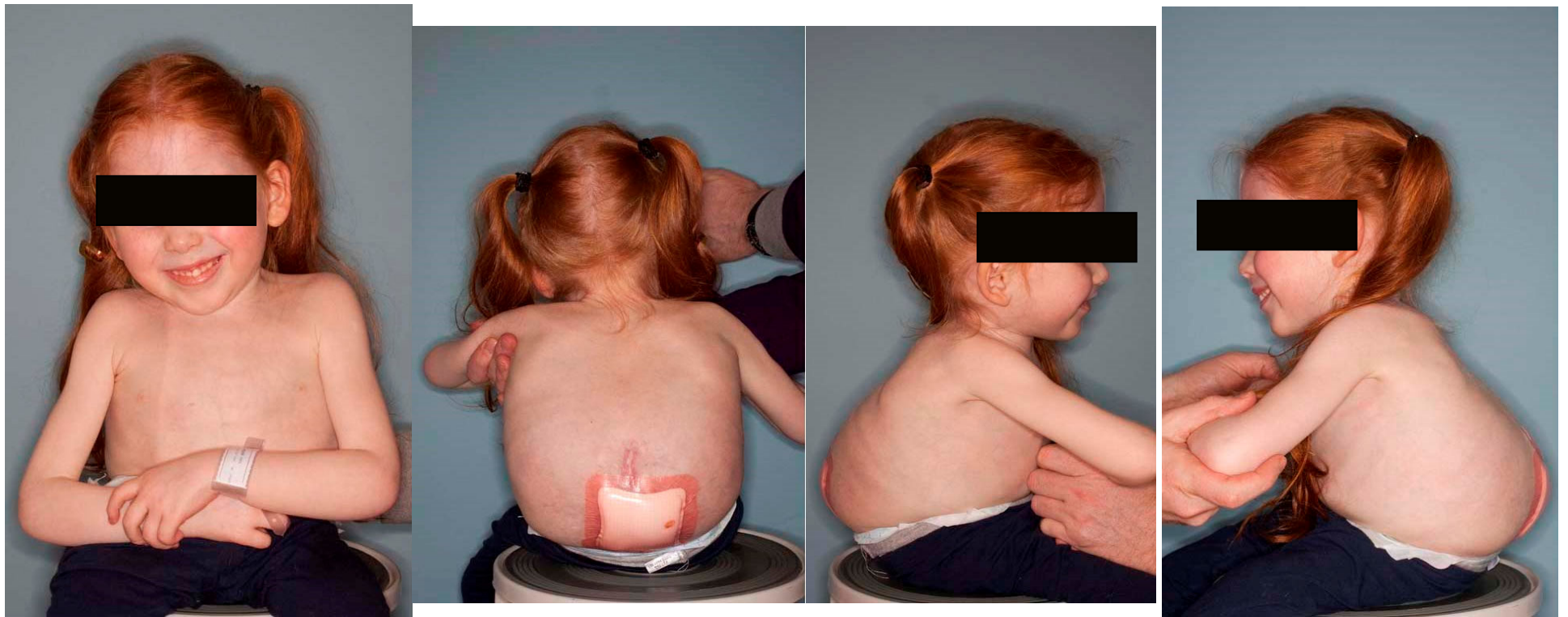
Subgroup: Failure To Thrive



Complications of Growing Rod Insertion



Case EM Spina Bifida



Case : Growing Rods



Sitting



Prone

Case : Growing rods



PREOP

Growing Rods: VEPTR



POSTOP

Discussion

How can we measure post operative outcome?

- Percentile Weight gain reflects a positive outcome after spinal growing rod insertion
 - In patients with TIS may reflect decreased energy expenditure assoc with cardiopulmonary function
- Limitations:
 - Failure to thrive (<5th Percentile) may not achieve a major percentile advancement

Conclusion

- Early Onset Scoliosis continues to pose significant surgical challenges
- Growing Rods allow continued development without fusion
- Significant Cobb Angle Improvement
- Significant Mean increase in Percentile Weight and Actual weight
- Significant Improvement from FTT

