

# Serial Measures of Lung and Inspiratory Muscle Function in Children with Early Onset Scoliosis

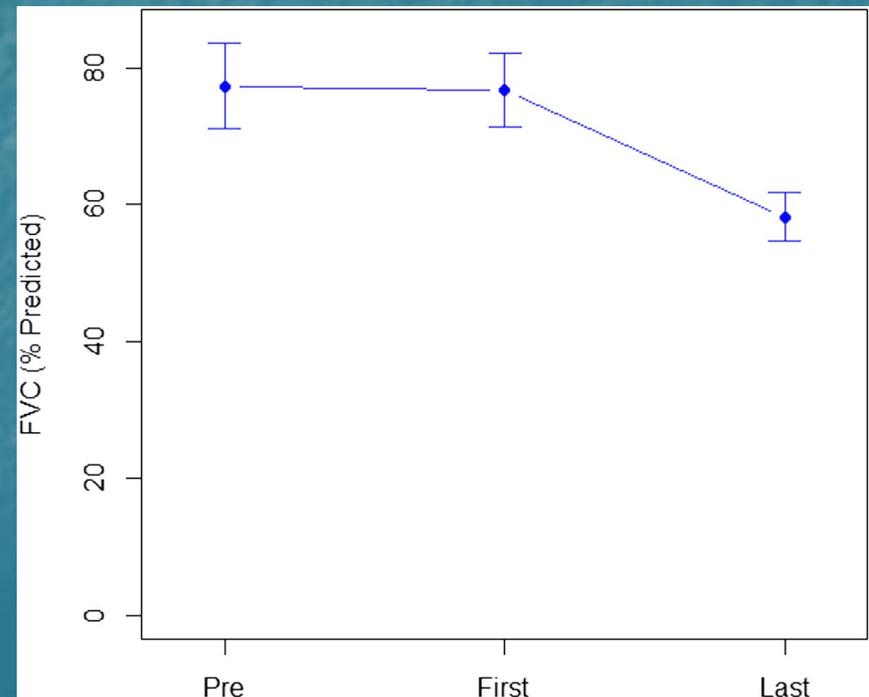
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# Lung Function Decline after Surgical Treatment of EOS

- Previous serial measures of Vital Capacity in children with EOS show a reduction in lung function over 2.5 and 6 years follow-up using passive inflation/deflation methods in the OR.

These techniques do not include active use of respiratory muscles by patients.



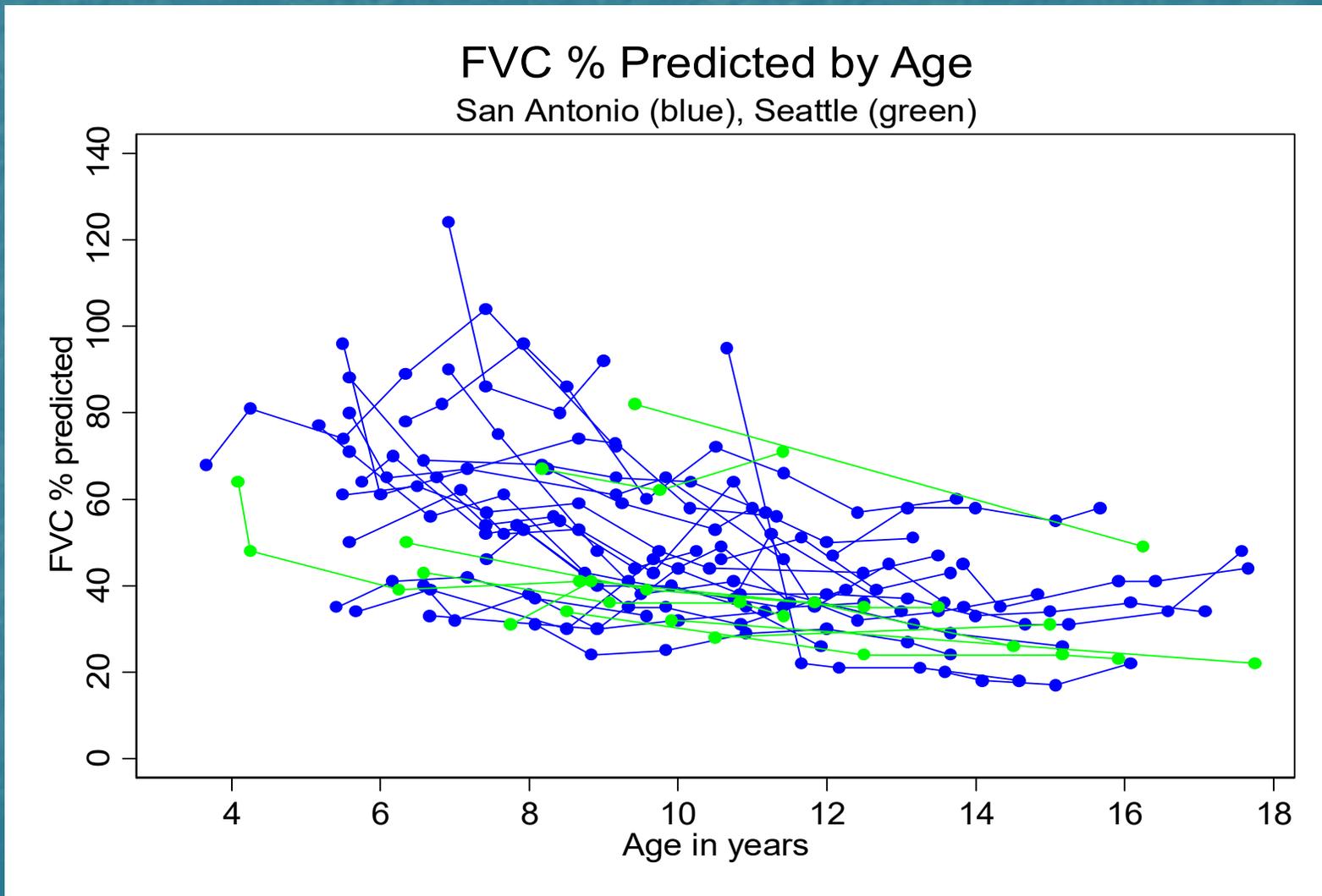
# Methods

- Group 1: 38 children with EOS performed outpatient serial measures of FVC over 27-96 months from 2 centers. Surgical interventions during each interval between PFTs were recorded.
- Group 2: 12 children with EOS performed both outpatient FVC and MIP measures over 7-41 months.

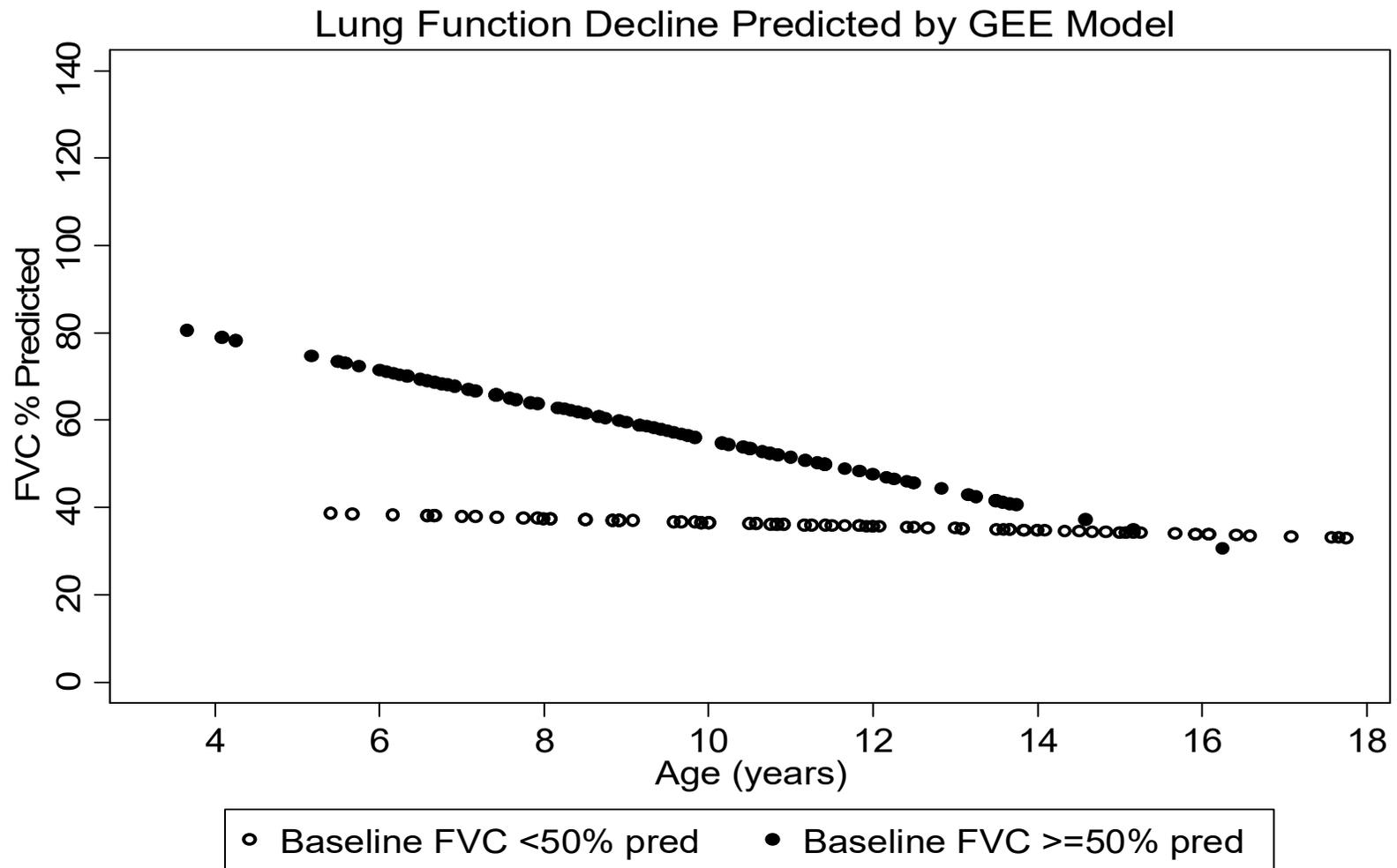
# Population Features

- Group 1 n=38 (19 San Antonio; 9 Seattle)
  - Age at 1st lung function: 7.9 yrs (range 5.2-14.5 yrs)
  - Interval of serial studies: 6 years (27-98 mo)
  - Diagnoses: 23 congenital, 5 idiopathic, and 4 syndromic scoliosis
  - # surgical procedures per patient: mean = 6 (range 0-13)

# Serial FVC Over Time by Center



# Decline rate in relation to initial FVC and Age



# Variables Associated with a Decline in FVC Over Time

<u>Predictor</u>	<u>Coefficient</u>	<u>95% CI</u>	<u>p</u>
# Surgeries			
since previous PFT	-1.68	-2.6,-.75	<.001
Time since			
previous PFT	0.35	-1.2,1.83	0.64
Age at current PFT	-2.03	-2.97,-1.1	<.001
Baseline FVC%	0.34	0.14, 0.53	.001

# MIP and FVC Measurements

- Group 2: n=12 (Seattle only)

- Age at first measure: 8.9 +/- 2.6 yrs
- Time interval between measures: 18 mo (range = 7-41 mo)

	<u>Time 1</u>	<u>Time 2</u>
• FVC % pred	45+/-11%	42+/-5%
• MIP % pred	48+/-14%	47+/-22%

# Conclusions

- FVC as a % predicted value (based on arm span) declines more over longer periods of time .
- FVC declines more in young children EOS and in children with initial FVC > 50% (more than those with < 50% values).
- FVC declines more with more surgical procedures per time interval.
- Respiratory muscle weakness persists in stable patients over 18 months.