High Inter-Rater Reliability for Armspan and Ulnar Length Measurements

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Disclosures

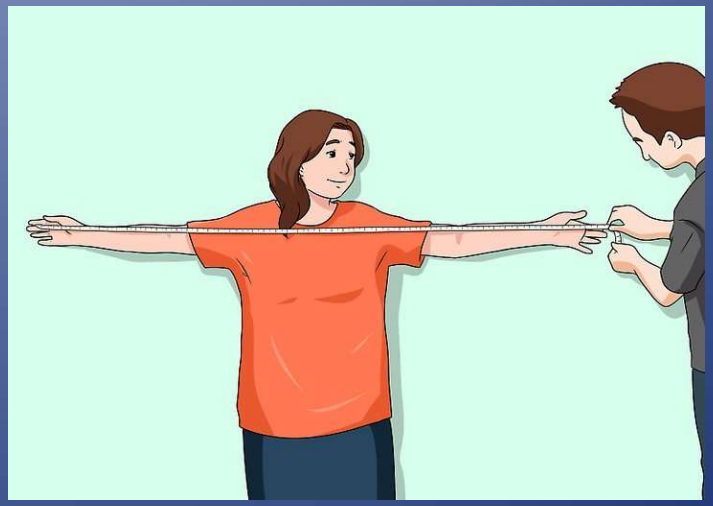
- Please see ICEOS program.
- Our authors have disclosures.

Background

- Armspan is routinely collected in prospective pediatric spine registries and used to provide values for % predicted PFTs
- Standing height may be reduced due to spinal deformity
- Also, standing height increases after surgery, resulting in worsening % for PFTs due to improved height.
- Little known about reliability in EOS patients

Concerns with Accuracy of Armspan

- Upper extremity contractures
- Non-cooperative children
- Non-standardized measurement protocols



Ulnar Length

- Used as a surrogate for armspan
- Contractures don't matter
- Can normalize for PFT results

Height prediction from ulna length

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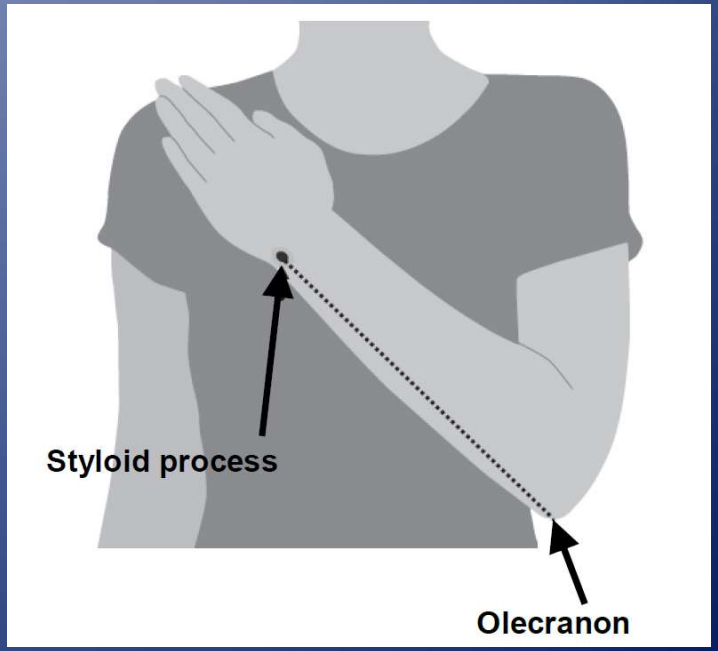
Developmental Medicine & Child Neurology 2004, 46: 475–480 475



Objective

- Evaluate inter-rater reliability for clinical measurements of armspan, sitting height, and ulnar length

Methods

Prospective Multicenter Study

- Armspan and ulnar length measured by 2 individuals on one occasion
- Compare results to:
  - Standing height and weight
  - Pelvic width
  - T1-T12 height
  - T1-S1 height

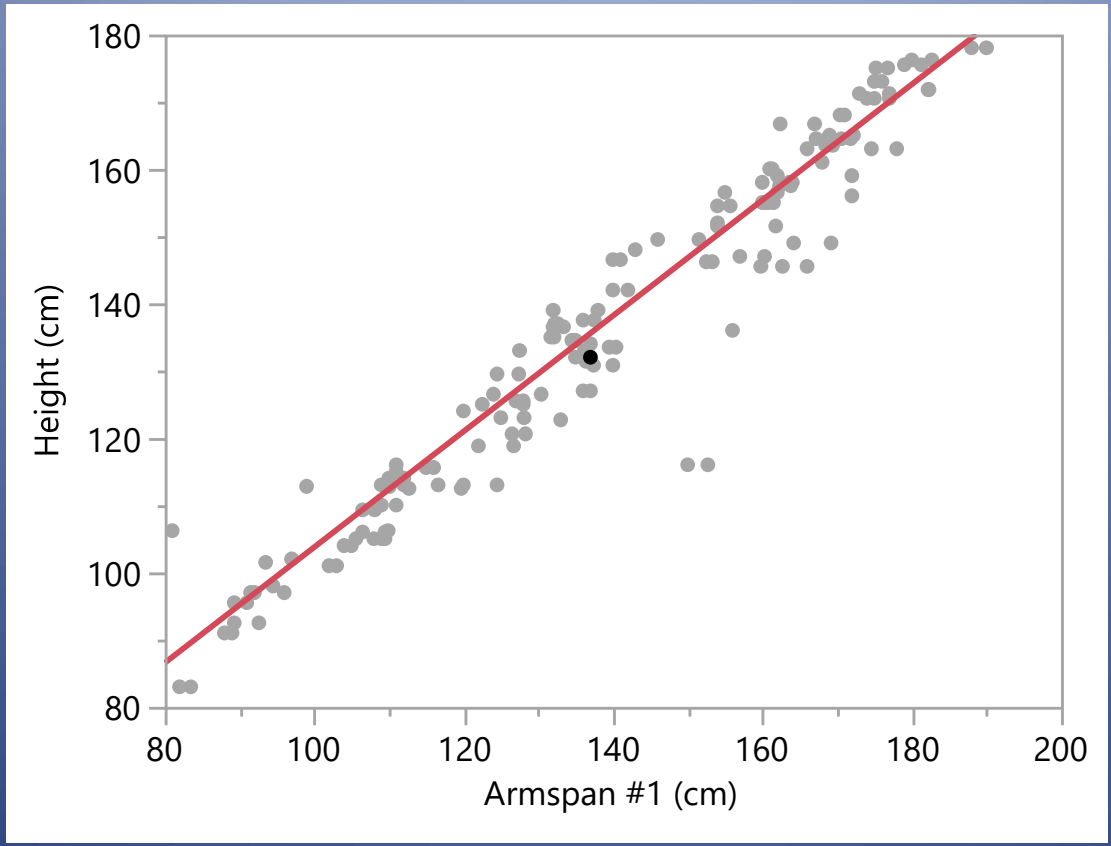
Demographics
n=97 patients with EOS

Mean Age	10 (1.6-20 yrs)
Mean Standing Ht	135 cm
Mean Weight	37 kg
% Spinal Implants	64%
Idiopathic	32%
Congenital	32%
Other	33%

Results

	Interclass Correlation (1=perfect agreement)	# of Pairs Measured	Interclass Correlation Children <10	# of Pairs Measured
Right Ulna	0.94	97	0.87	44
Left Ulna	0.95	84	0.87	39
Armspan	0.97	93	0.92	42
Sitting Height	0.95	80	0.90	34

Standing Height Correlated Well with Armspan ($p<0.001$, Rsquare 0.94)



Conclusions

- Acceptable inter-rater reliability for armspan, sitting height, and ulnar length (better for children > 10 than ≤ 10 years).
- Armspan correlated well with standing height (R square 0.94), as did ulnar length (R square 0.89)
- PSSG and other registries should continue to collect armspan for normative PFT values