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Is the Juice Worth the Squeeze: Additional Spine Length with Shorter Distraction Interval, but at What Cost?

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DISCLOSURES

- **Patrick J. Cahill**
  - Consultant: Biogen, Inc.
- **All other authors have nothing to disclose**

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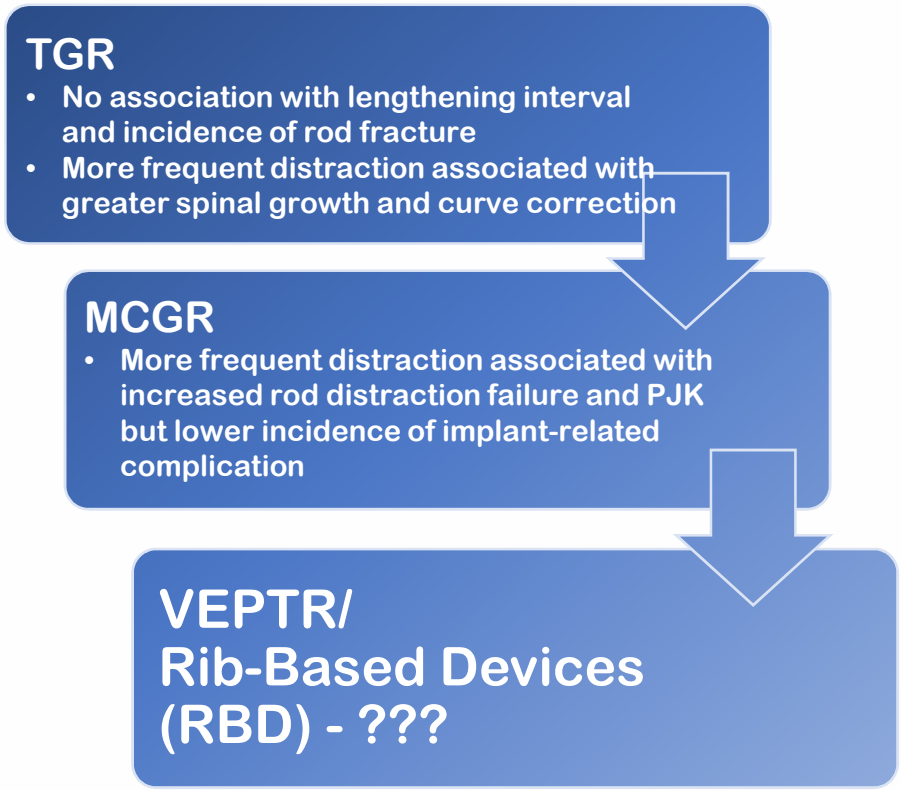
BACKGROUND

- Striano, 2018: **How Often Do You Lengthen? A Physician Survey on Lengthening Practice for Prosthetic Rib Devices**

- **Time** is major factor in determining interval between lengthenings with **every 6 months** most common



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Striano, 2018; Hosseini, 2016; Akbarnia, 2008; Akbarnia, 2016

WE ASK…

- How do the clinical outcomes compare between RBD patients who are expanded more vs. less frequently?

WE HYPOTHESIZE…

- There will be **an increase** in **T1-S1 spine height and improved curve correction** associated with **average shorter interval** as well as **no increase** in risk for **complications**.

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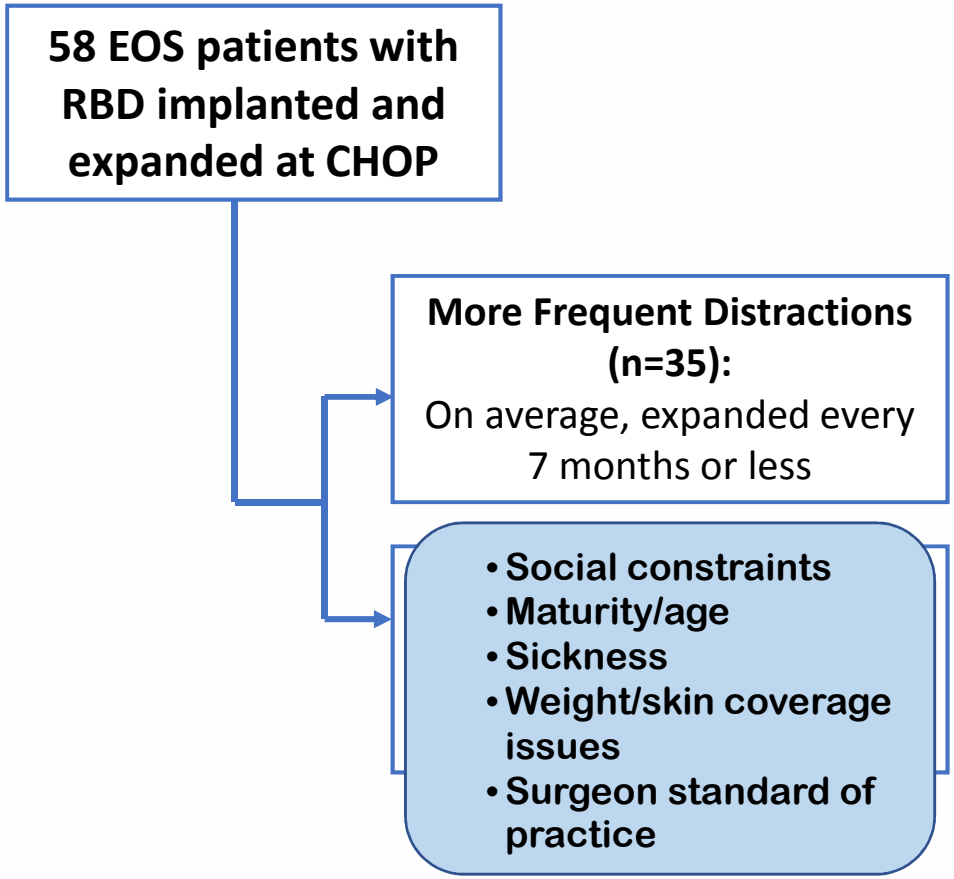
METHODS



- Retrospective review
- Exclusion criteria:
  - RBD implanted and/or expanded at outside institution
  - Inconsistent or short follow-up (less than 3 lengthenings; less than 2 yr follow-up)
  - Skeletal dyplasia in which skeletal growth is abnormal
- Outcomes
  - Cobb angle
  - Coronal T1-S1 height
  - % Expected T1-S1 Growth
  - Space Available for Lung (SAL)
  - Complications

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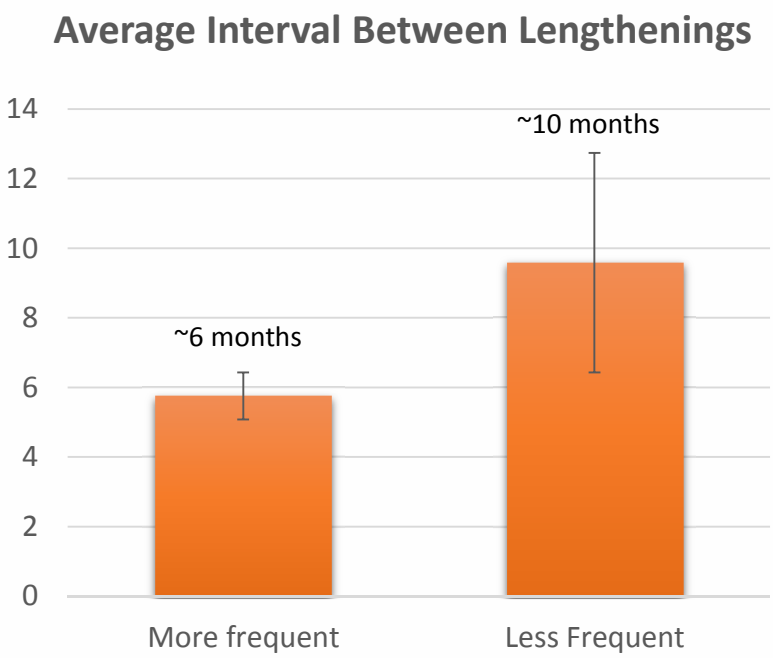
DEMOGRAPHICS – *No difference between cohorts*

	More Frequent (n=35)	Less Frequent (n=23)	*P*-value
Sex			0.79
M	57%	52%	
Age at implant (yr)	4.1 ± 1.3	5.5 ± 1.6	0.16
Diagnosis			0.18
Congenital	63%	44%	
Neuromuscular	26%	39%	
Syndromic	6%	17%	
Idiopathic	6%	0%	
Type of implant			0.58
Unilateral	31%	39%	
Bilateral	69%	61%	
Average time between lengthenings (days)	175.1 ± 7.0	291.7 ± 40.2	**<0.001***



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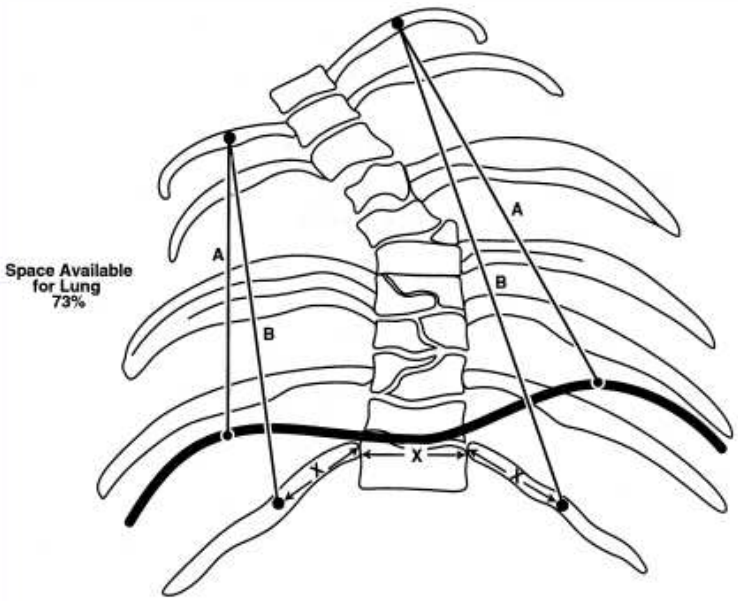
RESULTS – *No difference in curve or SAL*

	More Frequent (n=35)	Less Frequent (n=23)	*P*-value
Total expansion surgeries	9.8 ± 1.4	7.0 ± 1.4	**0.01***
Follow-up (years)	4.7 ± 0.6	5.8 ± 1.1	0.10
Cobb angle pre-op (degrees)	67.2 ± 11.1	65.3 ± 11.4	0.81
Cobb angle final (degrees)	53.5 ± 9.0	55.5 ± 12.2	0.80
Cobb angle correction (degrees)	13.7 ± 6.7	9.7 ± 8.8	0.49
SAL pre-op (%)	81.1 ± 26.9	78.7 ± 32.2	0.70
SAL final (%)	89.9 ± 4.0	80.9 ± 10.1	0.12
SAL change (%)	8.8 ± 4.5	2.2 ± 6.6	0.11



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RESULTS – *Growth increase, no difference in complications*

	More Frequent (n=35)	Less Frequent (n=23)	*P*-value
Spinal height pre-op (mm)	212.6 ± 17.9	235.3 ± 23.2	0.14
Spinal height final (mm)	274.4 ± 21.3	279.6 ± 24.5	0.75
Spinal height change (mm)	61.8 ± 10.8	44.3 ± 9.6	**0.02***
Spinal height change per year (mm)	15.2 ± 3.7	9.9 ± 3.5	**<0.05***
% Expected growth	96.2 ± 0.2	60.4 ± 20.9	**0.03***

Complications			
Skin-related	21 (60%)	10 (43%)	0.22
Device-related	17 (49%)	11 (48%)	0.96
Implant Removals	10 (29%)	4 (17%)	0.33

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SUMMARY

- Frequent lengthenings = ↑ Overall spinal height gain,
  ↑ % Expected growth
- Lengthening interval ≠ Change in Cobb angle or SAL
- Frequent lengthenings ≠ Higher incidences of complications

→ Future research and development of rib-based devices

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THANK YOU!

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