PODIUM PRESENTATION ABSTRACTS

83. The More You Use the Brace, the Better the Results: the Dose-Response Curves Between 18 and 23 Hours/day Brace-Wearing in 687 Braist-Matched Children §

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Hypothesis
A dose-response curve exists also for brace wear >18 hours/day (h/d)

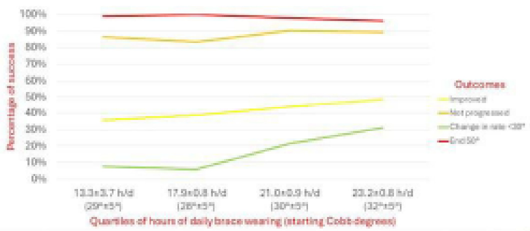
Design
Secondary analysis of a retrospective study from a prospective database

Introduction
The Brace Adolescent Idiopathic Scoliosis Trial (BrAIST) dose-response curve (outcome: end-of-treatment [EoT] <50°) drives many to prescribe braces no more than 18 h/d. The SOSORT Guidelines add three other outcomes: improvement >5°, no progression >5° and EoT <30° (to avoid health issues in adulthood)

Methods
The cohort was prospectively recruited in 15 years, with patients using thermal sensors in the last 10. The braces (SOSORT-SRS-POSNA classification) included: 1) anterior closure 3D push-up TLSO, monocot rigid or bivalve highly-rigid; 2) for thoracolumbar and lumbar curves, the LSO version, or a ventral closure fronto-transverse plane detorsion monocot rigid LSO. Our protocols prescribe increasing brace rigidity and h/d (range 18-24) with a worsening prognosis. We subgrouped for brace rigidity and h/d prescribed, reported or recorded. We developed four dose-response curves for the SOSORT outcomes using BrAIST methods. We checked baseline differences among h/d quartiles (ANOVA), and calculated the percentage (95% confidence intervals) of participants for each outcome (chi2 test). For the outcome EoT<30°, we considered the rate change of participants <30° between start and EoT

Results
We included 670 consecutive patients (413 with thermosensors), 30±6 °Cobb, 83% females, age 13.0±1.3, Risser 1±1. The highest h/d quartiles showed the best °Cobb results even if they included (in agreement with our protocols) statistically significantly worse patients for °Cobb, ATR, and TRACE. The dose-response curves were statistically significant for EoT<30° and improvement outcomes. EoT<50° and no progression outcomes showed a high success rate (98% and 87%, respectively) and no dose-response effect

Conclusion
In a BrAIST-matched population with brace prescription >18 h/d, we found a dose-response effect for the most ambitious outcomes (improvement and EoT<30°), even if the higher h/d quartiles included the most demanding scoliosis. The high success rate for no progression and EoT<50° in this population reduces/abolishes the clinical importance of the dose-response curve. Our results support changing the 18 h/d brace prescription paradigm



	Patients	Wearing time	TRACE	ATR	Cobb start	Compliance	Change °Cobb	Improved	Not progressed	Change in rate <30°	End <50°	Legends differences
	number	hours/daily	N	degrees	degrees	%	degrees	%	%	%	%	
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
First quartile	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Second quartile	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100%	[illegible]
Third quartile	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fourth quartile	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Data and curves in the thermosensors subgroup

§ = Hibbs Award Nominee – Best Clinical Paper