

Developmental Outcomes for Children with Reduced Ankle Dorsiflexion at 2 Years of Age After Extreme Prematurity



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Introduction

- Reduced passive ankle dorsiflexion (RDF) is a common exam finding in children born extremely premature
- This study compares developmental outcomes of children with RDF and a normal gait, RDF with an abnormal gait, and children with normal neurologic exams.

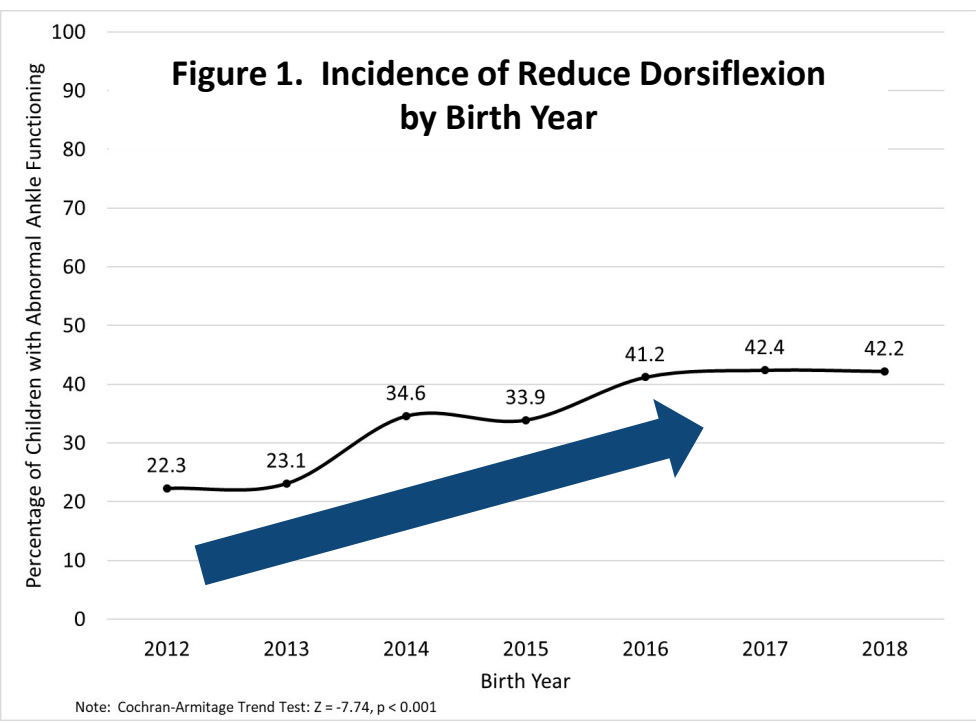
Eligibility Criteria

- Infants born at 22-26 6/7 weeks gestational age between 7/1/2012- 12/31/2018 at Neonatal Research Network sites
- Ambulatory at follow-up visit at 22-26 months corrected age

Methods

- Retrospective cohort study
- In-person follow-up visit with standardized neurologic exam, Bayley Scales of Infant Development 3rd Edition (Bayley-III), and Child Behavioral Checklist (CBCL)
- Reduced dorsiflexion is defined as unilateral or bilateral resistance to slow passive ankle dorsiflexion with knee in extension, range of motion < 30 degrees

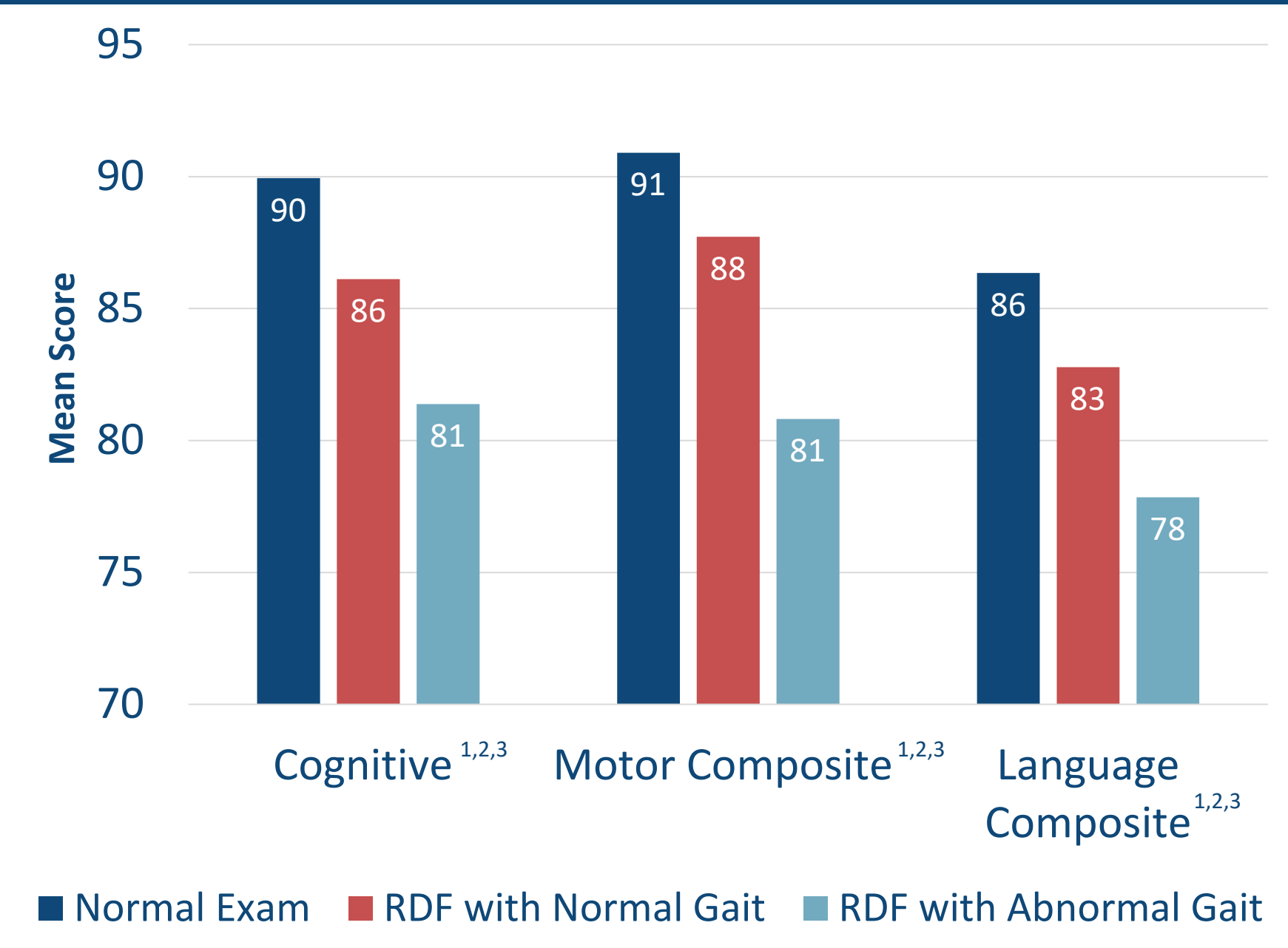
Results



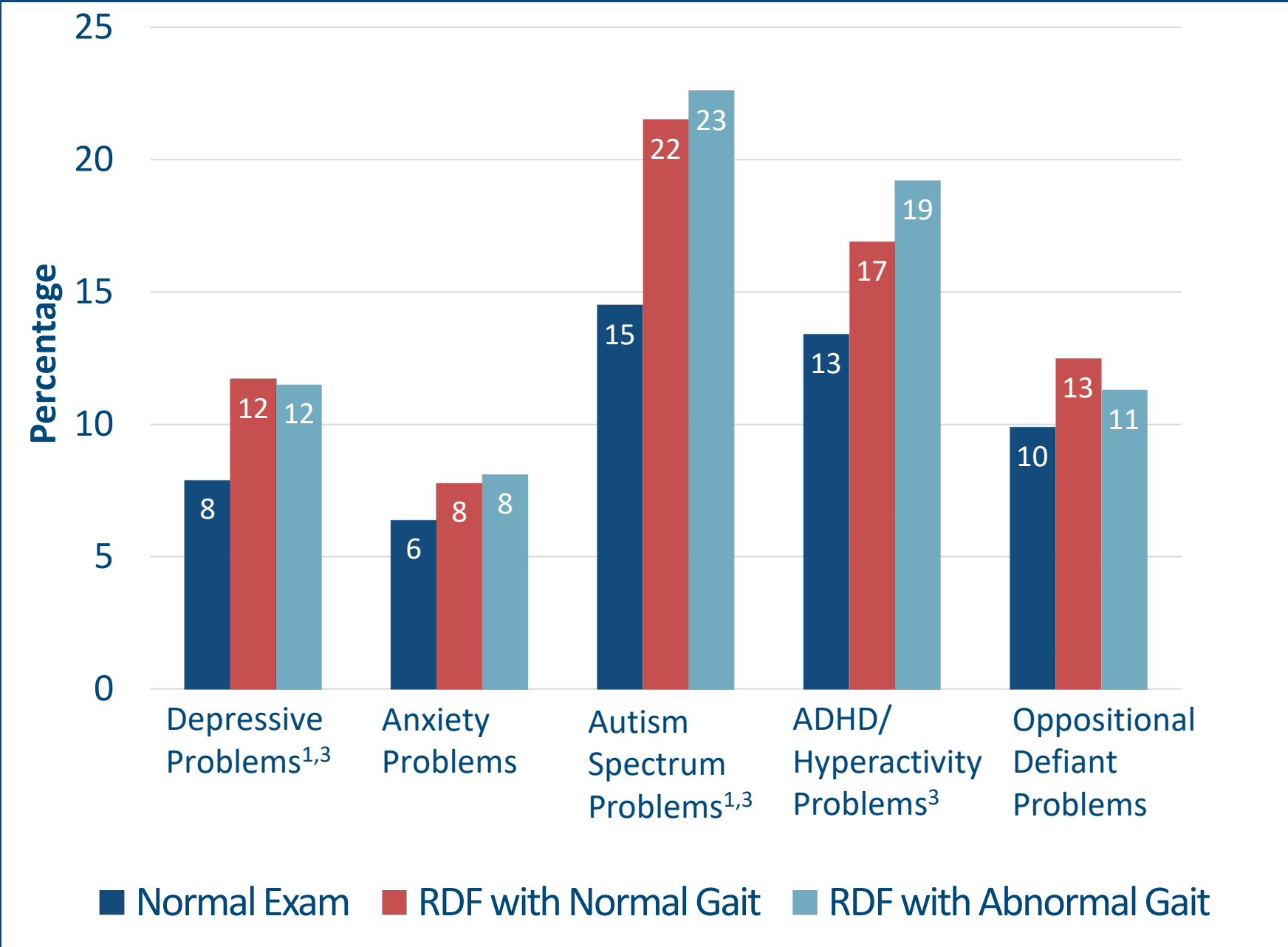
Tight ankles are associated with lower motor, language, and cognitive scores and an elevated rate of behavior issues, even when not accompanied by gait abnormalities.



Mean Bayley-III Scores by Ankle Functioning and Gait



Percentage of Children with CBCL Scores in the Borderline or Clinical Range



Bayley-III= Bayley Scales of Infant Development 3rd Edition, RDF= Reduced Ankle Dorsiflexion, CBCL= Child Behavior Checklist
Values are unadjusted means of Bayley-III scores or percentages of children in the borderline or clinical range on CBCL.

1 Significant difference (p < 0.05) between reduced dorsiflexion with normal gait group and normal exam group

2 Significant difference (p < 0.05) between reduced dorsiflexion with normal gait group and reduced dorsiflexion with abnormal gait group

3 Significant difference (p < 0.05) between normal exam group and reduced dorsiflexion with abnormal gait group

Table 1. Demographic Characteristics by Ankle Functioning and Gait

	Normal Exam (N=1,863)	Reduced Dorsiflexion with Normal Gait (N=539)	Reduced Dorsiflexion with Abnormal Gait (N=442)
Gestational Age (wk), Mean (SD) ^{1,2,3}	25.1 (1.0)	24.9 (1.1)	24.6 (1.2)
Birth weight (g), Mean (SD) ^{1,2,3}	785 (157)	748 (154)	716 (171)
Male, n/N (%)	969/1863 (52.0)	220/442 (49.8)	261/539 (48.4)
Maternal Race, n/N (%) ^{1,3}			
Black	768/1821 (42.2)	229/432 (53.0)	264/520 (50.8)
White	945/1821 (51.9)	187/432 (43.3)	239/520 (46.0)
Other	108/1821 (5.9)	16/432 (3.7)	17/520 (3.3)
Public Insurance Status, n/N (%) ^{1,3}	1460/1845 (79.1)	371/438 (84.7)	451/534 (84.5)
Multiple Gestation, n/N (%) ¹	484/1863 (26.0)	94/442 (21.3)	120/539 (22.3)

1 Significant difference (p < 0.05) between reduced dorsiflexion with normal gait group and normal exam group
2 Significant difference (p < 0.05) between reduced dorsiflexion with normal gait group and reduced dorsiflexion with abnormal gait group
3 Significant difference (p < 0.05) between normal exam group and reduced dorsiflexion with abnormal gait group

Table 2. Odds Ratios of Reduced Dorsiflexion by Neonatal Characteristics

	aOR (95% CI)	p-value
Maternal Race		
Black	1.27 (1.07, 1.51)	0.006
White	REF	
Other	0.70 (0.46, 1.06)	0.095
Maternal Hypertension	1.21 (1.00, 1.47)	0.051
Multiple Gestation	0.83 (0.68, 1.01)	0.060
Birth weight (kg)	0.22 (0.12, 0.40)	< 0.001
PDA	0.84 (0.71, 1.00)	0.044
Early onset sepsis	1.71 (0.98, 2.98)	0.0600
Days of Mechanical Ventilation	1.01 (1.01, 1.01)	< 0.001
IVH grade		
None	REF	
Grade I/II	1.15 (0.98, 1.43)	0.194
Grade III/IV	1.82 (1.40, 2.38)	< 0.001
Cystic PVL/porencephalic cyst	1.55 (1.03, 2.34)	0.036

PDA=patent ductus arteriosus, IVH= Intraventricular hemorrhage, PVL=periventricular leukomalacia
REF=reference.
Regression model for computing adjusted odds ratios also includes center as a random effect.
Independent variables were selected using backwards stepwise regression with p < 0.1 as the retention criterion.



Disclosures: The authors have no financial relationships to disclose or conflicts of interest to resolve. Any real or apparent conflicts of interest related to the content of this poster have been resolved. This poster does not involve discussion of unapproved or off-label, experimental or investigational use of a drug.

Acknowledgements: The National Institutes of Health and the Eunice Kennedy Shriver National Institute of Child Health and Human Development provided grant support for the Neonatal Research Network. We are indebted to the infants and their parents who agreed to take part in this study and to our medical and nursing colleagues at: Brown University; Case Western Reserve University; Cincinnati Children's Hospital Medical Center; Duke University; Emory University; Nationwide Children's Hospital/Ohio State University, RTI International; Stanford University; University of Alabama at Birmingham; University of Iowa; University of New Mexico; University of Pennsylvania, University of Rochester; University of Texas Southwestern Medical Center; University of Texas Health Science Center at Houston; University of Utah.