# **Developmental Coordination Disorder (DCD), general coordination and** fine motor deficits are prevalent in children with Rolandic epilepsy

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### Introduction

- Cognitive problems in Rolandic epilepsy (RE) may involve speech, language and literacy (Pal et al., 2010, Smith et al., 2015, Vega et al., 2015).
- These problems are prevalent within families of children with RE and may represent an endophenotype.
- New evidence suggests dyspraxia or developmental coordination disorder (DCD) may also be present in children with RE (Brindley et al., 2016, Kirby et al. 2017, Currie et al 2017).
- Previously, at the International Epilepsy Congress, we presented data indicating that the prevalence of DCD in children with RE is larger than siblings and healthy controls.
- Here we replicate the analysis with an expanded RE and sibling cohort.
- Furthermore, we investigated whether individuals without an indication for DCD had deficits.

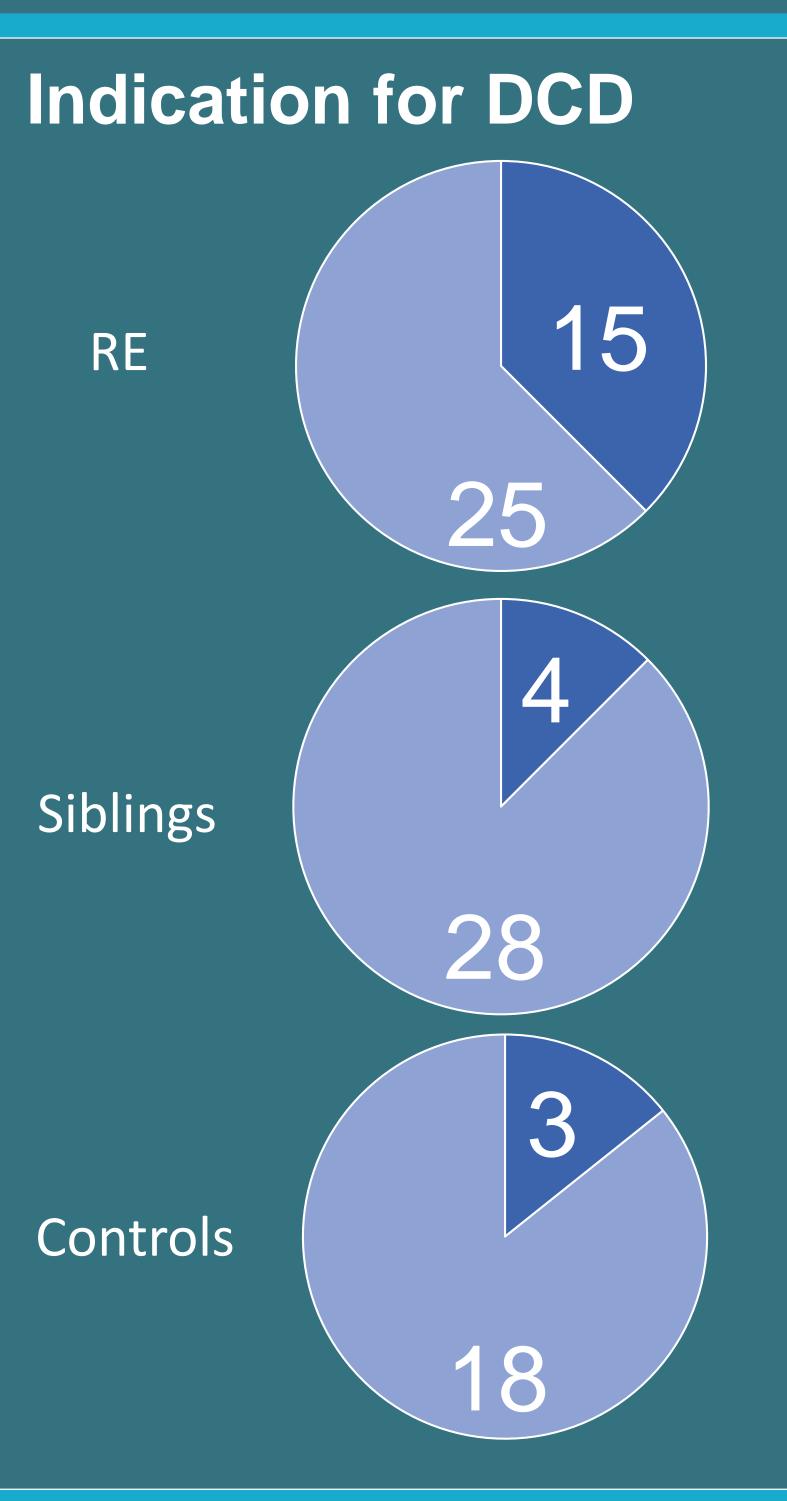
### Goals

- Use the DCDQ'07 to calculate the prevalence of DCD cases in children with RE, their siblings and controls.
- 2. Identify the key features in motor deficits from subscores in groups.
- 3. See if motor deficits exist in non-cases.

### Methods

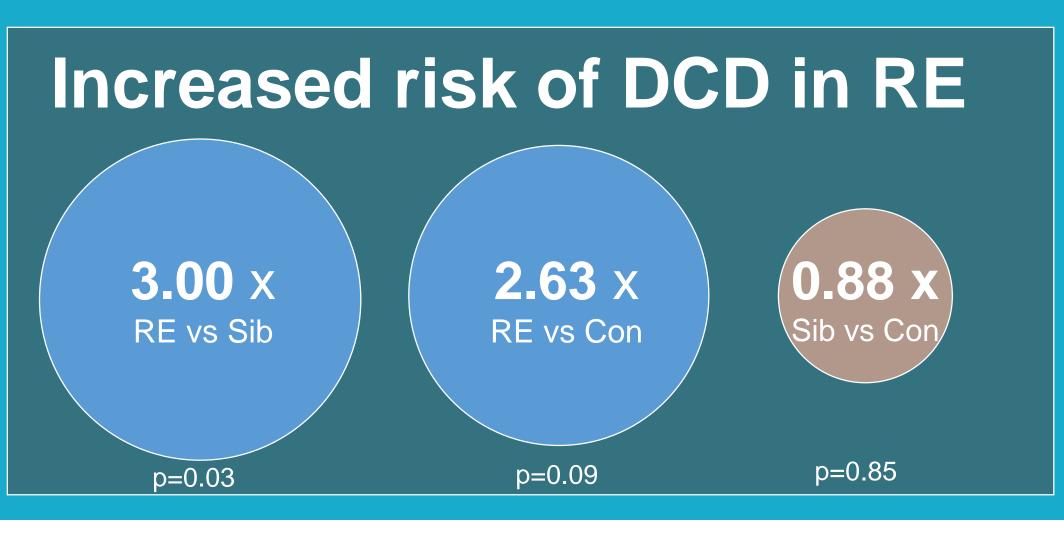
- Age 4-17, IQ>80,
- Three groups: RE N=40, Sibs N=32 and Con N=21
- 55% of RE using AEDs
- % male: RE 60, Sibs 37.5 and Con 58
- Chi-squared testing
- MANOVA of subscores: Control during movement, fine motor and coordination. Sex as a covariate.

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### **Group analysis**

- **<u>37.5%</u>** of children with RE had an indication for DCD which was larger than the controls 12.5%  $(\chi^2=3.57, p=.058)$  and siblings 11.76%  $(\chi^2=5.72, p=.058)$ p=.017).
- No significant difference between controls and siblings ( $\chi^2$ =.0353, p=.851)



## Group analysis irrespective of indication for DCD

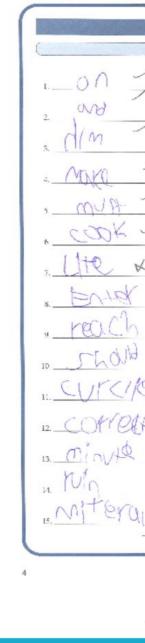
DCD

No DCD

- below.

#### Group average subscores Control during movement Fine motor General coordination Sibs Control RE Gelive K **THE DEVELOPMENTAL COORDINATION DISORDER QUESTIONNAIRE 2007**® (DCDQ'07) " character Marke 13 broke x 31 MUA 20. SUCSSEEK 55. × COMPORT CODK ~ Lite x 22. EXOTIVO \* 11-22. EXOTIVO \* 11-22. EXOTISTISTICO \* 14-Enter.v N. RECONTER 14\_ reach B.N. Wilson, M.Sc., OT(C) and S.G. Crawford, M.S Calgary, Alberta, Canada · rrain -25. CASZIAN \* BN Wilson 2007@ IL CUTCIPCK 20 ORCHUNDER # 41 March 2012 12 COPPERT 21 CUESIOFIEX, 12 13 MINUTE 28 MEUSOCUONE Letter Writing Raw Spore Speiling Raw Score efully acknowledge the financial support of the children's Hospital Foundation and the Alberta 1. Miteral X Child, Family and Community Research Spelling Total Raw Score roperties of the Revised Developmental Coordination maire. Physical & Occupational Therapy in Pediatric

100%	
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Handwriting of 8 year old male with RE

• MANOVA analysis of group subscores was significant. (Pillai's Trace, F=2.336 p=.<.034).

 Significant subscore were found for general coordination (F= 4.41 p=.009) and fine **motor** (F=3.445 p=.019)

Bar graph of average subscores (percentage) shown

# Individuals without an indication for DCD

- F=1.62 p=.146.

## Conclusions

#### References:

05-711.

Behavior 53 (2015): 174-179.





• MANOVA analysis was not <u>significant</u>. Pillai's Trace

• Being female was a significant covariate for control during movement (F=5.451, p=.023).

Interestingly, a post-hoc contrast ANOVA found significance for **general coordination** (p=.015) and **fine motor** (p=.039) between children with RE and healthy controls.

These data suggest an increased risk of **DCD** in children with RE compared to healthy controls and siblings.

• As a group, in children with RE, there appears to be an a specific deficit in **genera** coordination and fine motor skills.

Interestingly, in children with RE, without an indication for DCD there is a similar deficit.

These data suggest that in children with RE, motor problems are apparent but not universal.

Further investigation is required to identify why some children with RE are affected with DCD.

 Possible factors could be age of seizure onset, seizure frequency or trauma at birth.

Brindley, Lisa M., et al. "Ipsilateral cortical motor desynchronisation is reduced in Benign Epilepsy with Centro-Temporal Spikes." Clinical Neurophysiology 127.2 (2016): 1147-1156.

Currie, Nicola et al. (2017) Reading comprehension difficulties in children with rolandic epilepsy. Developmental Medicine and Child Neurology. ISSN 0012-1622 (In Press) Kirby, Amanda, et al. "Benign childhood epilepsy with centrotemporal spikes (BECTS) and developmental co-ordination disorder." Epilepsy & Behavior 72 (2017): 122-126.

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