

# Beneficial Functional Outcomes of Selective Dorsal Rhizotomy (SDR) Are Long Lasting and Alter the Natural History of Motor Development in Spastic Cerebral Palsy

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### Introduction

Large-scale natural history studies of gross motor development have shown that children with spastic cerebral palsy (CP) plateau during childhood and actually decline through adolescence. Selective dorsal rhizotomy (SDR) is a wellrecognized treatment for spastic CP3, but no studies have reported long-term functional outcomes on large numbers of patients using standardized assessment tools.

### Methods

We analyzed long-term follow-up data to assess the durability of functional outcomes after SDR. Children were evaluated by a multidisciplinary team preoperatively and at 1, 5, 10, and 15 years postoperatively, using quantitative, standardized assessments of lower-limb spasticity, gross motor function, and activities of daily living (ADLs).

## **Learning Objectives**

1. SDR decreases spasticity and improves gross motor function, and these benefits are durable through adolescence and into early adulthood.

2. When compared to large populationbased natural history curves of gross motor development in spastic CP, SDR positively alters this natural history by protecting against declines through adolescence.



Long-term outcomes after selective dorsal rhizotomy (SDR) for spasticity of hip adductors, hamstrings, and ankle plantar flexors as measured by the modified Ashworth score comparing preoperative values to 1, 5, 10, and 15 year follow-up values.





Long-term outcomes after selective dorsal rhizotomy (SDR) for Gross Motor Function Measure (GMFM) comparing preoperative values to 1, 5, 10, and 15 year follow-up values. (a) Total GMFM scores, as well as

GMFM Dimension D (standing) and Dimension E (walking, running, jumping), which are directly related to lower limb function; (b) GMFM Dimensions A (lying and rolling), B (sitting), and C (crawling and kneeling) which involve upper limb function as well; (c) Total GMFM scores stratified according to CP severity by Gross Motor Function Classification System (GMFCS) Groups.

# Fig3-Activities of daily living

Long-term outcomes after selective dorsal rhizotomy (SDR) for Pediatric Evaluation of Disability Inventory (PEDI) comparing preoperative values to 1, 5, 10, and 15 year follow-up values. (a) PEDI scaled scores for self-care and mobility for all patients; (b) PEDI mobility scaled scores stratified according to CP severity by Gross Motor Function Classification System

Motor Function Classification System (GMFCS) Groups; (c) PEDI self-care scaled scores stratified according to CP severity by GMFCS Groups.