The Queensland Cerebral Palsy Child Studies have completed data collection for all children with CP in the birth years 2006, 2007, 2008, 2009 up to the age of 5 years. These studies funded by the National Health and Medical Research Council (NHMRC) were the 1. Motor Development and Brain Function study (NHMRC 465128) and the 2. Growth, Nutrition and Physical Activity study (NHMRC 569605).

The studies aimed to determine the relationship between brain structure, motor development, nutrition, physical activity and growth in preschool age children with cerebral palsy (CP) across the full range of abilities. We followed 245 children from 18 months to 5 years of age and assessed how these outcomes related to the severity of the brain lesion.

At each visit, information has been gathered relating to:
- Gross motor function
- Muscle length and joint range
- Hip development
- Independence in daily tasks
- Health status
- Communication skills
- Eating and drinking skills
- Dietary intake and growth
- Muscle and body fat stores
- Physical activity levels
- Use of medical and allied health resources.

The knowledge gained from these studies will assist us in future planning of interventions and support for children with CP and their families.
Summary of Results

- MRI scans can be used to measure the severity of the initial brain injury and are related to the Gross Motor Function Classification System (GMFCS Level).
- Body fat and lean tissue stores can be estimated accurately through a technique called bioelectrical impedance analysis.
- Dietary energy intake can accurately be measured using a weighed food record over a period of 3 days.
- An ActiGraph® triaxial accelerometer worn for 3 days can be used to measure habitual physical activity, and cut-points to assess time spent sedentary have been validated.
- Modified cut-points for assessment of oropharyngeal dysphagia (OPD) are recommended when using the Dysphagia Disorder Survey (DDS), Pre-Speech Assessment Scale (PSAS) and Schedule for Oral Motor Assessment (SOMA) in young children with CP.
- Gross motor functional level is directly related to the risk of hip displacement in older children but this relationship is less clear in younger children.
- Children with CP demonstrate reduced school readiness as measured by the key areas of mobility, self-care, social function and communication.
- Children with poorer gross motor function are more at risk of delayed communication, however children in each GMFCS level show some degree of risk, indicating a need for early screening.
- Children with CP have lower energy requirements than children with typical development and the energy requirements of children with marked CP (GMFCS IV-V) are lower than those with mild CP (GMFCS I-III).
- Between 60% and 80% of children with CP had feeding difficulties. Children with more severe gross motor impairment had more severe feeding difficulties.
- Children with feeding difficulties had lower energy intakes and were shorter in height than those without feeding difficulties.
- Overall children with mild CP (GMFCS I-III) are more physically active than those with more severe CP (GMFCS IV-V). There is a wide range of physical activity levels amongst children with mild CP: some children are very physically active whilst others are very inactive.
- Children classified as GMFCS I are on average of similar height to children with typical development and also grow at a similar rate per year. Children classified as GMFCS III-V are on average shorter and grow slower than children classified as GMFCS I.
- Children who are born extremely premature (<28 weeks gestational age) are on average shorter than their GMFCS peers born closer to term.

As expected, we found there is a wide variation in the way individual children with Cerebral Palsy grow, develop and participate in life.
List of Publications to date

Nutrition

Physical Activity

Gross Motor Function

Hip Displacement

School Readiness

Eating and Drinking Difficulties
- Benfer KA, Weir KA, Bell KL, Davies PSW, Ware RS, Boyd RN. (2014) Oropharyngeal dysphagia in preschool children with cerebral palsy: Pharyngeal phase impairments. Research in Developmental Disabilities. doi.org/10.1016/j.ridd.2014.08.02

Communication

Queensland Cerebral Palsy & Rehabilitation Research Centre
Centre for Children’s Health Research, 62 Graham Street, South Brisbane QLD 4101
Telephone 07 3069 7370 • Email r.boyd@uq.edu.au