The Gait Outcomes Assessment List (GOAL): responsiveness to change in gait function for children with cerebral palsy

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Background
A number of outcome measures have been described to assess aspects of gait function in ambulant children with cerebral palsy (CP). Although they may provide objective information, none to date include the child or family’s priorities and expectations. The Gait Outcomes Assessment List (GOAL) has recently been developed by a multidisciplinary team of researchers from Toronto, to evaluate the aims and priorities of children and their parents. It has been designed to address all domains of the World Health Organisation International Classification of Function (WHO-ICF). The validity of the GOAL has been established but responsiveness to change has not.

The aims of this study were to evaluate whether the magnitude and direction of change in GOAL scores reflect those of a valid measure of gait function, the Gait Profile Score (GPS).1

Methods
The study design was a prospective cohort study. 43 children and youth with CP, GMFCS levels I-III, (29 boys, 14 girls, mean (SD) age 10 years 9 months (3 years 4 months), range 6–23 years, attending a gait analysis laboratory between April 2014 and December 2016, on two occasions with a mean (SD) interval between assessments of 1.5 years (4 months). This was part of routine clinical care and follow up. Twenty-two children had undergone orthopaedic surgery in the interval between assessments. Parents completed the GOAL during their child’s gait assessment (3DGA).

Total GOAL scores and domain scores were calculated using a formula protected spreadsheet. The GPS was calculated from kinematic data for comparison with the GOAL total and domain scores. Children were grouped according to whether they had undergone surgery or observation. The hypothesis being that there would be more change in gait (GPS) seen in the post-surgical group than the observation group at this time.

Results
The surgical group showed an improvement in total GOAL, from mean (SD) 61.7 (18.1) to 63.8 (16.1) (figure 1a). This corresponded to an improvement in GPS from mean (SD) 12.8 (4.2) degrees to 11.5 (3.8) degrees (figure 1b), twice the minimal clinically important difference (MCID).2 In the observation group there was a small decrease in the total GOAL from mean (SD) 65.5 (7.6) to 64.6 (16.4) (figure 2a) which corresponded to an increase in GPS, mean (SD) 10.6 (2.8) degrees to 11.5 (3.8) degrees (figure 2b) indicating a slight decline in gait function.

Correlation between change in total GOAL and GPS for all children was -0.42 (figure 3a). The strongest correlation was -0.47 between the gait appearance domain and GPS (figure 3b).

Discussion
This study provides preliminary evidence that the GOAL is responsive to changes in gait function for children with CP. Changes in GOAL score and GPS were in the same direction, showing improvement in the surgical group and a slight decline in gait function in the observational group. The GOAL has already provided clinicians with an improved understanding of the child and family’s aims and expectations related to their gait function and, it may provide a means to evaluate changes in these aims and expectations over time, which will complement the objective assessment from 3DGA.

Further studies with larger numbers and longer-term follow up are required to study the responsiveness of the GOAL to changes in gait function after intervention and to determine the MCID of the GOAL.

Conclusion and significance
The GOAL is the first measure of gait function that evaluates the aims and priorities of children and their families.

The GOAL has previously been shown to be a valid measure.1 This study demonstrates that the GOAL is able to detect change in gait function over time. The GOAL will be an important and significant addition to the matrix of measures used for children and adolescents with cerebral palsy.

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References