

# Movement Assessment of Children (MAC): validity, reliability, stability and sensitivity to change in typically developing children

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## Abstract

**Aim** The purpose of this study was to establish the validity, reliability, stability and sensitivity to change of the family-centred Movement Assessment of Children (MAC) in typically developing infants/toddlers from 2 months (1 month 16 days) to 2 years (24 months 15 days) of age.

**Background** Assessment of infant/toddler motor development is critical so that infants and toddlers who are at-risk for developmental delay or whose functional motor development is delayed can be monitored and receive therapy to improve their developmental outcomes. Infants/toddlers are thought to be more responsive during the MAC assessment because parents and siblings participate and elicit responses.

**Methods** Two hundred seventy six children and 405 assessments contributed to the establishment of age-related parameters for typically developing infants and toddlers on the MAC. The MAC assesses three core domains of functional movement (head control, upper extremities and hands, pelvis and lower extremities), and generates a core total score. Four explanatory domains serve to alert examiners to factors that may impact atypical development (general observations, special senses, primitive reflexes/reactions, muscle tone). Construct validity of functional motor development was examined using the relationship between incremental increases in scores and increases in participants' ages. Subsamples were used to establish inter-rater reliability, test-retest reliability, stability and sensitivity to change.

**Results** Construct validity was established and inter-rater reliability ICCs for the core items and core total ranged from 0.83 to 0.99. Percent agreement for the explanatory items ranged from 0.72 to 0.96. Stability within age grouping was consistent from baseline to 6 months post-baseline, and sensitivity to change from baseline to 6 months was significant for all core items and the total score.

**Conclusion** The MAC has proven to be a well-constructed assessment of infant and toddler functional motor development. It is a family-centred and efficient tool that can be used to assess and follow-up of infants and toddlers from 2 months to 2 years.

## Keywords

child development, functional motor development, motor function, motor skills, movement

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The recent focus on family-centred care emphasizes the active involvement of the child and the family in all phases of care – assessment, goal setting and intervention, with the end result

being better outcomes (American Hospital Association 2013). Consistent with this emphasis, the Movement Assessment of Children (MAC; Chandler *et al.* 2012), a companion tool of