![Murdoch Children's Research Institute logo]

BabyMoves
Video Data Collection App for Clinical Research

The opportunity

Cerebral Palsy (CP) is one of the most common physical disabilities of childhood with the majority of cases (94.4%) due to brain injury occurring during the prenatal/perinatal period. Furthermore, there are a disproportionate number of preterm children with CP compared to full-term children. Infants born extremely preterm (EP; <28 weeks gestation) and/or extremely low birth weight (ELBW; <1000g birth weight) are at increased risk for adverse neurodevelopmental outcomes.

It is challenging to predict those EP/ELBW infants destined to have long-term neurodevelopmental impairments in order to target early intervention to those in most need. The General Movement Assessment (GMA) in early infancy has high predictive validity for neurodevelopmental outcomes in preterm infants. However, for many people access to a GMA may be limited due to geographical constraints and a lack of GMA-trained health professionals.

The Application

Developed by Murdoch Children's Research Institute (MCRI) neonatal research scientists, Baby Moves is a smartphone application (app) that allows caregivers to video and upload their infant's general movements to be scored remotely by a certified GMA assessor.

BabyMoves has been designed for non-medical people as an easy to use app for parents to video their child's movements using a smartphone. The BabyMoves app is in a format that enables remote trained assessors to upload the child's general movements (GMs) as recorded by the parent. Assessment is thereby not limited by geographical distance or clinicians' skill levels at a local service. As infants can be assessed remotely, it is also likely to be highly cost-effective by reducing the need to attend clinics on-site for a GMA.

Whilst the Baby Moves app will not replace infants' current routine medical and neurological follow-up; it does offer the ability to collect additional GMA for those infants who would not have otherwise had access. Diagnosis of a neurodevelopmental impairment, such as CP, is a complex process and while we expect that the app will facilitate identification of infants at high

risk of CP and/or other neurodevelopmental impairments, it is not a stand-alone diagnostic test.

The technology

BabyMoves is available for both iOS and Android through iTunes and Google Play.
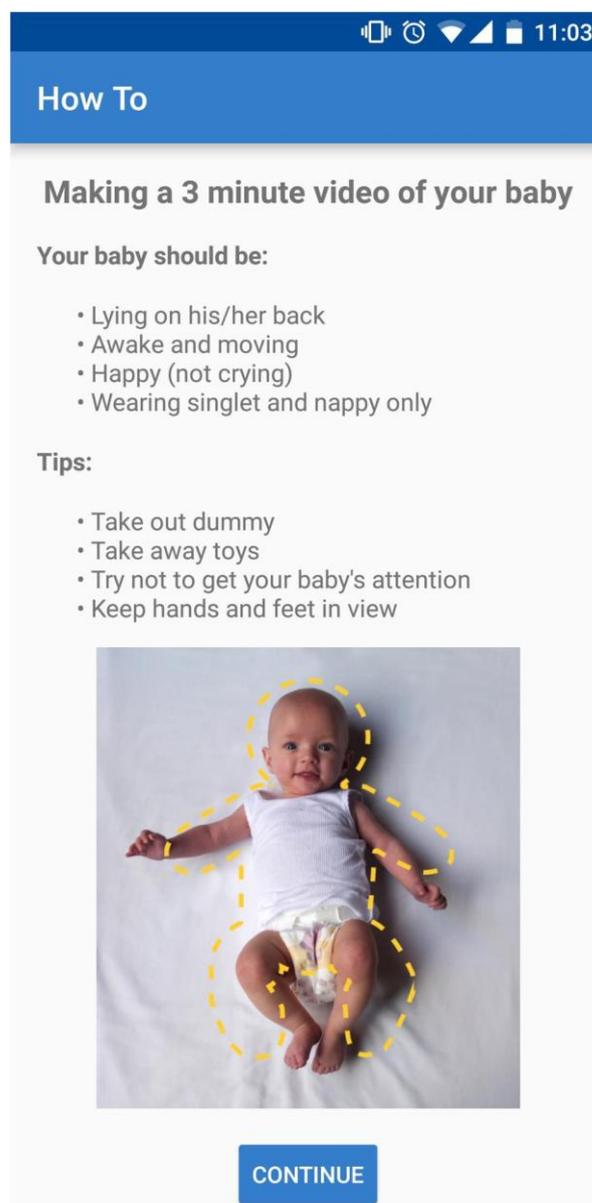
Future Product Development

Current studies are evaluating the BabyMoves App for its effectiveness in early detection and facilitating a faster diagnosis of CP particularly for people living in remote regions with limited access to health services. Currently, the BabyMoves App allows parents/caregivers to record their infant's GMs at specific time points between 3 and 4 months of age, in order to capture specific GMs which have high predictive validity for neurodevelopmental outcome. Future development of the App is planned so that GMs can be recorded at other time points.

Given the potential for the Baby Moves app to be used for remote assessment, future applications of Baby Moves may also include other developmental assessments that can be scored from a video recording by health professionals with expertise in infant development.

Further product development of BabyMoves may also include its application in developing countries where there is limited access to healthcare. Clinician versions may also be developed using similar principles, and used for infants attending follow-up clinics.

Applications and market

Governments worldwide are seeking ways in which to deliver healthcare services at a reduced cost particularly to those who have the greatest need. There are opportunities for the BabyMoves App to be embedded as part of a telehealth solution for 'care-in-the-home' for preterm infants. Future product iterations may also include versions for clinicians and/or a diagnostic tool.

Publications

BMJ Open (2016) 'The BabyMoves prospective cohort study protocol: using a smartphone application with the General Movements Assessment to predict neurodevelopmental outcomes at age 2 years for extremely preterm or extremely low birthweight infants.' AJ Spittle, J Olsen, A Kwong, LW Doyle, PB Marschik, C Einspieler, JLY Cheong.
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