

Neuroprotective Developmental Care as pre-emptive intervention for Autism Spectrum Disorder: theoretical foundations and clinical translation

Pamela S Douglas^{1,2,3}

¹Medical Director, Possums Education, Brisbane, Queensland

²Adjunct Associate Professor, Maternity Newborn and Families Research Centre MHIQ, Griffith University

³Senior Lecturer, Discipline of General Practice, The University of Queensland

Email: p.douglas@possumsonline.com

ASD is an emergent public health problem, posing significant health and economic burdens upon the individual, family, and health system. There are now strong calls for early or pre-emptive intervention for high risk infants. Neuro-imaging of high risk infants who later develop ASD demonstrates altered cortico-cortical connectivity at six months of age, indicating that ASD neuropathy originates prenatally or in the first months of life. ASD is best conceptualised as a spectrum disorder of connectome development, in which one or more feedback loops amplify small functional variations in the very early development of sensory-motor pathways. An individual's complex ASD genetic predisposition will be impacted by a myriad of environmental factors which alter epigenomic regulation and phenotype expression. This results in a 'butterfly effect' of unpredictable cascades of structural and functional imbalances in the global neuronal workspace. The first 100 days post-birth is a critical window of neuroplasticity, which corresponds with the persistence of the injury-sensitive cortical subplate, the laying down of neural templates for stress regulation, and the crying period. Neuroprotective Developmental Care ('the Possums programs') is an innovative clinical approach to early life care, which aims to optimise parent-infant attachment and infant mental health. NDC has been developed from peer-reviewed and published systematic reviews and preliminary studies over the past 15 years, offering a paradigm shift in each the clinical domains of breastfeeding support, cry-fuss problems, sleep, sensory needs, and parent mood. It has been successfully delivered since 2011 in primary and secondary care settings, and in online programs, with an accreditation pathway now available for health professionals. This paper develops the theoretical framework for implementation and evaluation of NDC as early and pre-emptive intervention for infants at risk of ASD, and more broadly, as a public health strategy in the first six months of life to optimise neurodevelopmental outcomes.