

International Network for Evaluation of Outcomes (iNeo) in Neonates: Overview

Background and aims: Comparisons between various national neonatal networks have identified marked variations in neonatal outcomes. For example, a comparison between Canada and Japan revealed that Canada has higher rates of necrotizing enterocolitis, sepsis and neurological injury, whereas Japan has higher rates of chronic lung disease and retinopathy. Similarly, Australia and New Zealand have lower rates of mortality and several morbidities; however, they have higher resource utilization, higher air leak, and higher rates of sepsis than Canada. Though population differences explain a certain proportion of this variation, much of it is due to differences in health service delivery and utilization. Developing a thorough understanding of the variations in outcomes, processes of care, and the physical and environmental factors that affect the care of preterm infants across the world will ultimately improve outcomes for this vulnerable population. Thus, the aims of the International Network for Evaluation of Outcomes (iNeo) in neonates are to:

1. Compare outcomes, processes of care, and health care service delivery for extremely preterm/extremely low birth weight infants among nine international neonatal networks spanning ten countries.
2. Identify areas and practices for improvement in neonatal outcomes.
3. Implement and continually evaluate the impact of data-informed and evidence-linked practice changes in NICUs within each member network.
4. Disseminate the knowledge gained as widely as possible, including to health care leaders across the world, to ensure maximum impact.
5. Train and mentor junior researchers and faculty members in the conduct of health services research in Neonatal-Perinatal Medicine to ensure sustained interest and expansion in this important area of research.

Proposed approach: The first five years of the iNeo collaboration will consist of four phases. **Phase 1:** Development of a core dataset that leverages the existing platforms of each network to harmonize key process and outcome definitions, establishment of the iNeo structure, and finalization of the process of data management, access and use (6 months). **Phase 2:** Collection of baseline neonatal and maternal care and outcomes data and additional annual snapshot surveys of physical, environmental and human factors for each NICU (12 months). **Phase 3:** Analysis of data, benchmarking, and identification of practice improvements tailored to each network (18 months). **Phase 4:** Implementation of a continuous cycle of practice change implementation, evaluation, and improvement in NICUs within each network. The process of implementation of practice changes will use Evidence-based Practice for Quality Improvement (EPIQ) methods (24 months).

Knowledge translation, mentoring, and education: Users of the knowledge generated by iNeo will be individual network sites (>200 NICUs), various national and international paediatric organizations, and policymakers in participating countries involved in monitoring and improving efficiency of the use of the vast health care resources needed for neonatal care. Partnership with the Knowledge Exchange Network of the Canadian Academic Paediatric Health Centres will allow iNeo members to exchange ideas, opportunities and results and learn from each other. The iNeo collaboration will provide a solid platform to train junior researchers in the field of neonatal-perinatal health services research by collaborating with various undergraduate and graduate programs at affiliated institutions in each network, as well as providing an opportunity for national and international trainees to spend time at the iNeo Coordinating Centre in Toronto.

Impact: The iNeo collaboration will not only serve as a strong platform for neonatal-perinatal health services research but also as a reference for benchmarking standards for each country and centre, and subsequently lead to improved outcomes for neonates globally. Paediatric associations and organizations in participating countries will be active knowledge users/consumers and will complete the knowledge cycle.