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Title: Long term effects of prematurity on neuropsychological and health outcomes in adolescence

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#### Introduction:

Preterm birth is defined as infants who are born at fewer than 37 week's gestation. The normal human gestational period is 40-42 weeks. Very preterm birth refers to infants born at less than 32 weeks gestation. Continuing advances in technology have greatly increased the survival rates of children born preterm, however, it is well documented that they are at increased risk of health morbidities across infancy and early childhood. Less is known about the long-term health outcomes for those born preterm as they move through later childhood and into adolescence. The results of this project contribute to an established, longitudinal cohort study. This study aims to investigate the long-term health trajectories of a regional cohort of very preterm (VPT) and full term (FT) children, identifying neonatal and environmental risk factors and protective factors, that influence the development of children and adolescents who are born VPT. Participants are now reaching 17 years of age and the latest data wave is in progress. With regard to health outcomes, GP and hospital contact records from 0-4 years have been analysed. For the current project, we have examined the health service utilisation of the cohorts between the ages of 9 and 12 years.

A similar investigation of health resource utilisation between the ages of 12 to 17 years is now being recorded after their 17-year assessment with 25% of assessments completed.

#### Aim:

To assist in data collection and analysis of previously collected health data, of the current data wave at age 17 years.

To collate and analyse hospital inpatient admissions and outpatient consultations from 9 to 12 years.

#### Impact:

This work provides further understanding of the long-term health needs of children born very preterm as they move through later childhood and into adolescence. It also suggests there is a potential need for a group of those born VPT to undergo a health review at age 9 years that is designed specifically for the needs of this group.

#### Method:

A consecutive sample of 110 VPT infants (<32 weeks gestation) and 113 FT controls was recruited between July 1998 and March 2001. These children have been studied prospectively from birth through to 17 years of age, with a follow up rate of 90% in both groups. Hospital admissions and outpatient records were collected for the cohort between the ages of 9-12 years for 95 VPT participants and 102 FT participants. All hospital records were collected from Health Connect South and were supplemented with parent reported health information. Inpatient visits were recorded by length of stay and reason for the admission. Outpatient visits were recorded by type of specialty attended. The same method was used between the ages of 12-17 years for the 38 VPT and 14 FT participants who have been assessed to date at age 17. The data was analysed using Microsoft Excel.

#### Results:

Health resource utilisation was significantly higher in the VPT born group compared to the FT born controls in both the inpatient and outpatient setting at age 9-12 years. Of the VPT 27 % had an admission compared to 9.8% in the FT group ( $p < 0.001$ ). Admissions were primarily surgical. Orthopaedic procedures were the most common, with 6 of 16 VPT children with cerebral palsy (38%) having a surgical procedure. The number of fractures was equal in both the VPT and the FT groups ( $n=6$ ). Hospital dental extractions were higher in the VPT group (5 cases vs. 2).

Few participants had medical admissions, 4 VPT and 5 FT, with only one in each group for asthma. Parents reported 22 VPT and 12 FT with ongoing asthma at age 12 years.

With regard to outpatient visits, at ages 9-12 year's surgical consultations exceeded medical attendance. Of the VPT group 44% had a surgical outpatient visit compared to 20% of FT controls ( $p < 0.01$ ). General surgery and urology, ear nose and throat (ENT), orthopaedics, ophthalmology and plastics were the most common. The number of outpatient visits was higher in the VPT group compared to the FT group across all surgical specialties, and the difference between the groups reached statistical significance with regards to ENT, which includes audiology ( $p < 0.05$ ), ophthalmology ( $p < 0.001$ ) and plastics ( $p < 0.05$ ). The number of children born VPT who had at least one medical outpatient visit was significantly higher than that of the term born controls, 22% vs. 8% ( $p < 0.05$ ). Emergency Department visits were not significantly different between the two groups (28 VPT vs. 41 FT). However, allied health visits, including physiotherapy, occupational therapy and enuresis services were higher in the VPT group and this difference was highly statistically significant ( $p < 0.001$ )

**Conclusion:**

The health resource utilisation between the ages of 9-12 years is significantly higher in those born VPT in the inpatient and the outpatient setting. Surgical contacts exceed medical attendance and were significantly increased in the VPT group. Allied health visits were also significantly higher in VPT group compared to the FT group. Further analysis will explore whether there is a group of VPT who should have a specific review at 9 years in order to ensure their higher health needs are met.