British Association of General Paediatrics

769 A SERVICE EVALUATION OF GENERAL PAEDIATRIC CASELOAD

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Background In the literature there is currently little data regarding general paediatric caseload. There are some reports of acute attendances, ward admissions and outpatient clinics, however most of these are from the 1990's and early 2000's with limited recent data available. The caseload within the general paediatric service has changed over the last 10–20 years and there have been recent changes due to COVID-19.

Objectives To describe general paediatric caseload at University Hospital Southampton (UHS) including emergency department (ED) attendances, ward admissions and outpatient clinic appointments in order to contribute to local service improvements, national projects and research planning.

Methods Data was collected for all patients under the age of 18 years. ED and ward data were collected retrospectively, the clinic data was collected both prospectively and retrospectively. Analysis was carried out using Microsoft Excel.

Results Between 11th September 2019 and 10th September 2020, 22,940 patients attended the ED. The top 3 presenting complaints were shortness of breath (10.8%), head injury (9.7%) and fever (9.5%) and the top 3 diagnoses (made by a doctor) were 'no abnormality detected/no diagnosis recorded' (21.9%), URTI (6.6%) and closed fracture (5.6%). In the 12–17-year-old age group, mental health issues were the 4th most common diagnosis (8.4%). Over the same year, 3212 patients were admitted to wards under general paediatrics. The top reason for admission was viral infection for stays less than 24 hours (16.3%) and 24–72 hours (13.8%) and acute bronchiolitis (20.9%) for stays over 72 hours. The median length of stay was 1 day, and the most common length of stay was 0 days. Over 8 weeks of outpatient clinics (September–October 2020) there were 476 appointments. The top 3 reasons for attendance were constipation (8.2%), food allergies/intolerances (5.9%) and abdominal pain (4.2%). 16.3% of appointments were unattended.

Conclusions This is the first report of the full service provided by the general paediatric department at UHS, identifying common conditions presenting to the service. There may be a number of reasons why the final diagnosis made in ED was most commonly 'no abnormality detected'. These include patients' symptoms easing prior to consultation and miseducation, where the patients attend for a reason perceived to be concerning, however the child is found to be well. Review of current guidance has shown a lack of information available for some common conditions and developing new pathways of care may be beneficial for clinicians and families. Additional targeted work and focussed education into these areas may lead to improvements in care. The data can be used to help inform further research projects, as well as to develop services within local healthcare systems, improving the management of patients presenting with conditions that could be dealt with outside a hospital setting.

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770 IMPROVING THE CURRENT METHODS OF FRACTION OF INSPIRED OXYGEN CALCULATION IN NEONATAL POPULATION

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Background Low flow oxygen is commonly used to provide supplemental oxygen in neonatal units. There is no standard formula to calculate effective fraction of inspired oxygen in this population. Currently there are two formulae (Benaron and Benitz- 1994 and Finer et al-1996), used in clinical practice with variable results.

Objectives The objective of this study is to evaluate these two formulae in determination of effective FiO₂ using retrospectively collected preterm infants discharged home on low flow oxygen and to define the best way to calculate effective FiO₂ delivered by LFNC.

Methods Analysis was performed on the main variables, factors and assumptions in the two commonly used models for calculation of effective fraction of inspired oxygen. This was validated by comparison to hypopharyngeal oxygen measurements obtained from the literature. These models were also validated with data from preterm infants discharged home on low flow oxygen. A web-based interface was developed with a new hybrid model to provide easy access to the formulae for calculation of fraction of inspired oxygen.

Results FiO₂ increases with flow rate, oxygen concentration and inspiratory time; and decreases with weight, respiratory rate and tidal volume. The Finer formula consistently estimated higher values than Benaron-Benitz in all comparisons, with especially large differences at weights between 0.5 to 2 kg and low flow rates > 200 mL/min. When comparing model values to empirical measurements from Gonzalez, we see the general trend with flow rate (linear increase then asymptote above ~1000 mL/min) is most similar to the Benaron and Benitz model which correlates strongly with the measured data and predicts within the error bars of all points (Figure 1). The Finer model overestimates all measured values and does not come within the error bars of most points (Figure 1). Assumption of inspiratory time could make a significant difference to the estimated FiO₂ value, which is less sensitive to small changes in tidal volume. The Benaron-Benitz formula was found to fit much better to hypopharyngeal measurements. With data from 112 preterm infants discharged home on low flow oxygen, median FiO₂ (IQR) predicted by Finer et al and Benaron and Benitz were 32% (26–41%) and 25% (23–28%) respectively (p < <0.001) (Figure-2). A 'static' HTML website was produced to provide convenient access to the NICU Tools, Benaron-Benitz and our hybrid formulae, which can be accessed at [fio2calculator.github.io](https://github.io).

Conclusions Significant variations are seen in calculation of fraction of inspired oxygen using currently existing formulas. Our interface provides convenient access to all the existing formulae including our new hybrid model.