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Physician and departmental performance metrics in pediatric emergency care: secondary use of
patient visit data

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Abstract

Objectives: To develop, implement, and validate a physician and departmental performance metric feedback process based on secondary use of patient visit data using the level of electronic health record implementation available in most Canadian pediatric emergency departments (PEDs). **Methods:** Patient visit data for the IWK Health Centre PED in Halifax, Canada were used to create individual physician and departmental performance metrics including : physician dwell time, 24 and 72 hour return-rates, admission rates, sign-over rates. Visit acuity was measured using the Canadian Triage and Acuity Scale (CTAS). Feedback directly to physicians was contextual, anonymous, non-proscriptive and non-threatening. Relationships between various performance metrics were analyzed to explore the rational trade-off hypothesis. This data acquisition and analysis has become an annual part of the departmental review process. **Results:** Wide practice variation was found. Exposure to personal performance feedback was associated with positive change in physician behaviour. Analysis failed to find a rational trade-off between increased resource utilization and holistically better care. Physician buy in was excellent. **Conclusions:** At this preliminary stage, surveillance of physician and departmental metrics derived from secondary use of patient visit data shows promise in improving care, dissecting clinical decision making, and (possibly) directing professional development processes. Secondary data analysis, even in small centres and in the absence of sophisticated electronic health records management, can provide clinically and administratively useful data. Further studies, at a multi-centred scale, are planned.

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1. Introduction

Data warehousing and secondary use of patient visit information is a natural consequence of the expanded use of electronic health records. While considerable effort has been spent investigating technical data issues, processing techniques and appropriate data networking, relatively little is written about obtaining clinically or administratively relevant output, particularly in the acute care setting. Further, most publications on the secondary use are written from the perspective of a fully implemented electronic health record (EHR) environment, whereas Canadian pediatric emergency departments (PEDs) continue to rely largely on paper-based records enmeshed within an electronic admissions/discharges/transfers (ADT) support system. We describe a methodology that works with the level of EHR implementation available in Canadian PEDs, one that has been developed at a single centre and is now being scaled for multi-centre implementation. We have demonstrated the feasibility of using data collected for national surveillance purposes to provide clinically and administratively relevant output.

1.1 Background

While it is relatively easy to find references discussing fundamentals for secondary patient visit data use^{1,2,3,4,5}, evidence of useful output that might change clinician or administrator behaviour, particularly in emergency care, is not common. Systems which share the patient's extended health data have been investigated, and modest, though somewhat confounded, improvements have been found^{6,7}. Potential financial benefits have been published⁸. However, we did not find much research on secondary use that was directly associated with change in physician or administrator behaviour in emergency care. Similarly, no literature was found advocating further research into which content, analyses or visualizations are most desired by emergency clinicians or clinical administrators. It seems clear that sometimes information provided is not seen by clinicians as helpful, and may in fact add noise rather than clinically or administratively valid signal.

Previous research has shown great diversity in the performance of physicians working in the same PED, even when approaching similar patient populations⁹. This diversity offers a quality assurance opportunity, with more efficient physician performance offering a target for others. A method that allowed feedback of this information resulting in improved key performance metrics might be seen as clinically and administratively valid.

One barrier to the improvement of key performance metrics is the concept of a rational trade-off, the notion that a tendency to increased resource utilization in the PED is a marker for better care, rather than an indication of avoidable waste. For example, a clinician who spends significantly more time than his peers with each patient (a higher "dwell" time) might argue that by doing so the risk of admission or unscheduled return by the patient to the emergency department is reduced. Exhorting this clinician to reduce his dwell time might therefore be seen as unethical, both by the clinician and the administrator involved. Similar arguments can be made regarding the relationship between return rates and admissions.

We were unable to locate published literature about the extent of EHR adoption in Canadian PEDs. However administrative reviews conducted from our institution (Taylor BW, unpublished data, 2014) suggest that paper charting for physicians and nurses is essentially universal in Canadian PEDs. Data collation for secondary use is consequently hampered. Fortunately, most centres, including ours, report data to the Canadian Institute for Health Information (CIHI) for the National Ambulatory Care Reporting System (NACRS)¹⁰. In our institution, data for this purpose is manually abstracted from paper PED charts by trained data abstractors, and an archive of this data is available for local research and administrative audits.

In this publication, we present the implementation of a small scale, single centre secondary data use project based on NACRS data. Our methodology supports plans to scale our trial into a multi-centred, perhaps even national product.

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