Emergency department overcrowding – implications for paediatric emergency medicine

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Emergency department (ED) overcrowding has been an international phenomenon for more than 10 years. It is important to understand that ED overcrowding is a measure of health system efficiency and is not strictly related to ED volumes or capacity. ED overcrowding is defined as a situation in which the demand for emergency services exceeds the ability of physicians and nurses to provide quality care within a reasonable time. The major factor resulting in ED overcrowding is the presence of admitted patients in the ED for prolonged periods of time, not a high volume of low-acuity patients. While limited data are available for paediatric EDs, winter respiratory illnesses set the stage for ED overcrowding, which are epidemic in adult or general EDs. Prehospital-, ED- and hospital-related factors are described in the present article, and these may help prevent or manage this important patient safety problem.

Key Words: *Emergency department overcrowding, Emergency paediatrics*

Le débordement des urgences : Les répercussions pour la médecine d'urgence en pédiatrie

Le débordement des urgences est un phénomène mondial depuis plus de dix ans. Il faut comprendre qu'il représente une mesure de l'efficacité du système de santé, laquelle n'est pas strictement liée au volume ou à la capacité des urgences. Le débordement des urgences se définit comme une situation selon laquelle la demande de services aux urgences est supérieure à la capacité des médecins et infirmières à offrir des soins de qualité dans un délai raisonnable. La présence de patients admis à l'urgence pendant une période prolongée, et non un volume élevé de patients ayant des besoins non aigus, est le principal facteur découlant du débordement des urgences. On possède peu de données à l'égard des urgences pédiatriques, mais les maladies respiratoires hivernales ouvrent la voie au débordement des urgences, qui sont épidémiques dans les urgences générales ou pour adultes. Le présent article contient une description des facteurs préhospitaliers, hospitaliers et reliés aux urgences qui peuvent contribuer à la prévention ou à la prise en charge de ce grave problème de sécurité des patients.

Emergency department (ED) overcrowding, more correctly defined as access block, has become a worldwide phenomenon in the past 10 years (1). It has been defined by a joint statement (2) of the Canadian Association of Emergency Physicians and the National Emergency Nurses Affiliation as a situation in which the demand for emergency services exceeds the ability of physicians and nurses to provide quality care within a reasonable time. Because the prevalence of this situation has increased in Canada, a number of initiatives such as the 'Stop the Waiting Campaign' have begun, but to date, a comprehensive national strategy is not in place to address this serious patient care problem (3).

Despite the existence of position papers and media attention, there has been limited research in this important field and even confusion about definitions and measurements. In 2006, the Canadian Agency for Drugs and Technologies in Health (CADTH) sponsored a number of reports to determine the extent of ED overcrowding, to define measurement parameters and to outline an evidenced-based strategy for improvement (4,5).

Subsequently, the province of Ontario commissioned a detailed review (6) based on administrative data collected by the National Ambulatory Care Reporting System. The Canadian Information in Health Institute is responsible for the National Ambulatory Care Reporting System database, and currently, Ontario is the only province contributing comprehensive ED data. As the number of studies increase, solutions remain elusive.

UNDERSTANDING ED OVERCROWDING

It is important to recognize that the picture of ED overcrowding presented in the media, with admitted patients on stretchers and waiting rooms full of patients as well as their families, is a symptom of a systemic problem in the health system, rather than strictly factors related to the ED. Indeed, calls for expansion of EDs with additional staff may have minimal effect on overcrowding (7). As an analogy,

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when did adding more lanes to a highway ever reduce traffic jams? It is useful to divide the problem of ED overcrowding into prehospital-, ED- and hospital-related factors.

Prehospital factors include lack of access to primary care physicians in the community, waiting time for specialist referral, waiting time for diagnostic tests and lack of home care or community support (8). The number of Canadians without a family physician continues to increase, and even for those who have family physicians, after-hours access is often an issue. Although walk-in clinics have filled a need for nonurgent after-hours care, this patient population makes only a small contribution to ED overcrowding.

Ambulance diversion is a significant problem in many urban areas of Canada and has been suggested as a surrogate marker for ED overcrowding (9). Access block has been defined as prolonged waiting of patients at community and rural hospitals before transfer to tertiary care hospitals due to ED overcrowding (10). This problem is also seen in urban areas, where ambulance offloading times have increased due to lack of available ED stretchers (9).

ED factors include triage systems, presence of a 'fast-track' area for low-acuity patients, emergency nurse and physician coverage, use of protocols for diagnostic testing (11) and consultation or admission process. Some data have shown that an experienced physician with an orientation to 'patient flow' can reduce waiting times, but more research is needed in this area (12). The development of short-stay units, observation beds and the provision of support staff, such as discharge planners and social workers, may also be helpful.

Many large EDs have now installed ED information systems. These electronic, real-time systems are important tools to manage a busy ED and to track factors affecting ED overcrowding (13).

However, the most important factor affecting ED overcrowding is the presence of admitted patients on stretchers in the ED (7). Because the number of these patients has increased, ED length of stay (LOS) has increased in a linear fashion. The presence of admitted patients in the ED and the perceived lack of control of this problem have led to a sense of 'learned helplessness' that limits internal ED solutions to improve patient flow (3).

Hospital factors resulting in a prolonged LOS for admitted patients in the ED have been well described and are probably the most difficult to solve. There has been a well-documented increase in the number of alternative level of care (ALC) patients in acute care hospitals in Canada, who comprise of 20% of the acute bed capacity (7). These patients are usually elderly, with multiple chronic medical problems and awaiting long-term care placement. In many provinces, the complexity of the long-term care sector and the poor linkage with acute care have compounded this problem. This increased number of ALC patients, when combined with approximately 20% reduction in acute care bed capacity in Canada in the past 10 years, has resulted in the 'perfect storm' of ED overcrowding. Canada now has an acute care bed ratio of three per 1000 population, ranking it at 26 of 30 Organisation for Economic Co-operation and Development countries. Hospital bed occupancy rates are routinely over 95% (3).

DEFINITIONS AND MEASUREMENTS

The CADTH report called for uniform measurements and definitions for ED overcrowding. This is important for policy development and further research. Some clear-cut data elements can be used to track overcrowding and measure the effects of system change. Most EDs in Canada now triage patients using the Canadian Triage and Acuity Scale (CTAS). Five levels of acuity have been defined, with level 1 being the highest. Apparent definitions are in place for each triage level, with recommended 90th percentile waiting times from triage to physician assessment. The CTAS has been adapted for paediatric use with specific definitions of paediatric complaints by triage level (14).

In addition, most EDs can also track their LOS as well as patients who leave without being seen (LWBS) by a physician. This patient population has been well studied and is a useful marker of overcrowding. An 'acceptable' LWBS rate is approximately 2% to 3% (15).

Ambulance diversion rate, measured as the number of hours per month, is a specific measure depending on local resources and conditions, and is not useful for national comparisons. Many EDs are also documenting waiting times for admitted patients, which are defined as the time between the decision made to admit the patient by the consulting service and the time when the patient actually leaves the department. These times can be used to assist in problem solving and in tracking the effect of interventions. It should be apparent that even an ED without an electronic information system can collect useful data to monitor ED overcrowding.

PAEDIATRIC CONSIDERATIONS

Currently, no published data are available on ED overcrowding in paediatric EDs in Canada. Paediatric EDs have a number of characteristics that distinguish them from adult or general EDs. In general, the acuity level is lower, with a higher number of patients with CTAS 4, and a lower number of children with CTAS 2 and CTAS 3. The admission rates are low, in the range of 8% to 10%, compared with 15% to 20% in many adult EDs. The number of ALC patients is very low, although these few patients are often very complex and difficult to discharge to the community. Also, ED patient-volumes peak in the evening compared with adult EDs that may see a high volume of patients throughout the day. Paediatric EDs also experience a higher volume of patients in the winter months, coinciding with outbreaks of respiratory illnesses (16).

Paediatric hospitals also have a relatively limited number of beds and may often be accepting children beyond the anticipated bed capacity, especially in the winter months. Furthermore, physicians in paediatric EDs see younger children with a higher acuity and complexity of medical illnesses compared with general hospitals that see paediatric patients.

Canadian studies, including several surveys on overcrowding, did not indicate data related to children if they were seen at a general hospital, but it may be safe to suggest that because of the lower admission rate and the small number of ALC patients, ED overcrowding is not as much of a setback compared with other Canadian general EDs. As paediatric hospitals continue to move to family-centred care with the addition of single-patient rooms, special school-like activities, and emphasis on reduced pain and anxiety, we may expect bed capacity to continue to decrease, resulting in possible severe ED overcrowding.

POTENTIAL INTERVENTIONS

The CADTH review carefully analyzed the success of interventions aimed at reducing or mitigating ED overcrowding. Many of these interventions are at an early stage of development, but the methodological quality of the studies is poor. Nevertheless, there is an emerging body of literature to guide us. Due to its complex nature, multiple interventions are more likely to be successful, but are difficult to study.

Interventions to control input, such as ambulance diversion, use of walk-in clinics and provision of home care have not been shown to be successful. These findings are not surprising, based on current knowledge of the causes of ED overcrowding (17).

Triage systems with fast-track areas have been shown to improve throughput and reduce waiting times mostly for patients with CTAS 4 and CTAS 5. However, these interventions do not address the most significant group of patients affected by ED overcrowding – those with CTAS 3. These patients commonly need a stretcher and require diagnostic testing, resulting in extended ED LOS. Examples of patients with CTAS 3 are an infant requiring work up for the source of fever, children with asthma exacerbation and those requiring procedural sedation. Due to higher numbers of patients with CTAS 4 and high volume of patients during the evening hours, the provision of fast-track areas in paediatric EDs would likely have an effect on ED waiting times (18,19).

Physician order entry, point of care testing and bedside registration may improve patient flow, based on the concept of parallel rather than linear processing (20). Short-stay units with 'treat and release' policies have been shown to be successful (21). This may be pertinent to EDs that have observation units. Careful admission and treatment processes are required to ensure that observation units are used wisely and for children with anticipated discharge, rather than conditions that will result in admission to the hospital.

Electronic tracking boards may be a useful tool to better manage ED flow and reduce the rate of LWBS. They may also aid in monitoring peak volumes and LOS, and to more effectively plan physician and nursing schedules (22).

Recent changes in some EDs across Canada and system-wide modifications may be the key to the overcrowding dilemma. Some of these changes in policy may have evolved due to a specific trigger, such as the number of admitted patients in the ED and the number of patients with CTAS 3 in the waiting room. Some of these changes include 'swing' beds that may be used in time of need, cancellation of surgeries and interhospital transfers that are put on hold until ED congestion is abridged. The 'full-capacity protocol', recently implemented in EDs in Vancouver, British Columbia, and Edmonton, Alberta, allows transferring admitted patients to hallways on the accepting floors, resulting in reduced congestion in the ED.

A number of American studies (23-25) have shown that this approach has significantly reduced ED LOS, and that patients hosted in hallways are rapidly placed in more appropriate settings within the accepting ward. In the United Kingdom, external benchmarks of a 4 h LOS for admitted patients have been instituted (10), with penalties for incompliant hospitals.

In Canada, a recent statement from the Canadian Association of Emergency Physicians on overcrowding has recommended an ED LOS of less than 6 h for (adult) patients with CTAS 1, CTAS 2 and CTAS 3, and 4 h for patients with CTAS 4 and CTAS 5, with a limit of 2 h in the ED for any admitted patient once the decision to admit has been made (3).

PAEDIATRIC ED OVERCROWDING – A TOOL KIT

Although the unique aspects of the paediatric ED may safeguard this environment from severe overcrowding, it is important for paediatric emergency physicians to be prepared to take action to prevent the problems now plaguing many adult and general EDs. The following approach may be helpful.

Data collection and decision on system-wide Canadian benchmarks for timely management of children in the ED are important. Even without an ED information system, fundamental data elements should be monitored on a regular basis. Data on waiting times and patient volumes by CTAS category, admission rates, LOS for admitted and nonadmitted patients, and rate of patients LWBS are crucial. These data should be shared on a regular basis with senior hospital and physician leadership.

A family advisory committee can help with many aspects of paediatric emergency care, and can play a key role in advocating to reduce ED overcrowding.

A complete, vigilant and ongoing analysis of the consultation and admission process is needed, so when challenges arise, clear policies and accountabilities are already in place.

It is important to focus on ED flow at all times. Comparisons of patients-seen-per-hour may be useful to share with the physician group to improve throughput.

Guidelines for management of common conditions, diagnostic testing processes and appropriate use of an observation unit may be also helpful.

Fast-track triage and assessment processes with appropriate staffing may assist in the usual high-volume evening hours.

Staffing flexibility during the winter months may also be helpful.

The Canadian Council on Health Services Accreditation accredits all hospitals on a three-year cycle; ED overcrowding is an important marker for patient safety. The accreditation process may apply external pressure to find solutions.

ED overcrowding is an international health care issue. While all solutions are ultimately local, national and international advocacy has an important role for all emergency health care providers, as we fulfill our role to advance child health.

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