

Complex acute medicine: the internist in the lead

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Crowding in the emergency department (ED) occurs when the identified need for emergency services exceeds available resources for patient care in the ED, hospital, or both.¹ The result of ED crowding is reduced quality of care, affecting morbidity, mortality and patient satisfaction. This is illustrated by two recent studies that demonstrate a direct association between ED crowding and an increased risk of mortality.^{2,3} In addition, delays in patient treatment also effect outcomes in conditions that benefit from short door-to-needle times, such as myocardial infarction, stroke, sepsis, meningitis and pneumonia. One of the most important indicators of quality of care and patient satisfaction is pain management, which is negatively affected by ED crowding as well. Therefore, understanding the causes, effects and solutions of ED congestion is important and subject of research questions.⁴

To examine the complex logistic process of patient care on the ED, the process can be divided in three components: input, throughput and output. Input corresponds with aspects of patient inflow. Throughput corresponds with the process of patient care within the ED. Output corresponds with aspects of patient discharge from the ED.

Concerning input factors, ED visits are increasing. In our hospital, an inner city hospital in Amsterdam, a 17% increase to 49,000 ED visits per year was noted in the last eight years. A further rise is expected because of increasing numbers of self-referrals, ageing with shortage of care facilities, reduced number of hospital beds, waiting list problems, weakening of primary care services, illegal or uninsured patients and the demand for short diagnostic pathways. In addition, the Dutch government has intentions to concentrate acute care, which will put even more pressure on emergency departments. Research on input factors has focused on the patient with non-urgent complaints, such as an ankle sprain, normal cold, wound care, etc. Unlike the expectations, there is no evidence

that this patient category is the cause of ED crowding and increased waiting times.⁵ In fact, it is the sick patient that needs hospital admittance and who is waiting for transfer to the ward that causes ED crowding and prolonged length of stay. This is mainly determined by the availability of hospital beds.^{6,7} So, improving output seems to be more important than reducing input to prevent ED congestion.

In this issue of the *Netherlands Journal of Medicine*, Vegting *et al.* describe throughput factors that influence the length of stay within the ED.⁸ They analysed completion times of all patients presenting to the ED during one month. The study results show that factors causing the throughput time to exceed a four-hour target were urgent triage category (ESI 3), age above 65, additional diagnostic investigations (CT scan) and evaluation by internal medicine, neurology or multiple specialities. Hospital admission as output factor was also associated with extended length of stay in the ED. Throughput factors have been evaluated at the ED of our hospital as well by a time analysis of internal medicine patients.⁹ In addition to the factors already mentioned, determinants we found were waiting time before arrival of the doctor, ED visit between 12.00 and 18.00 hours and the experience level of the resident. The door-to-doctor time and arrival times also contributed to the length of stay in the study of Vegting *et al.*; however these factors were not associated with the four-hour target.⁸

Those patients who are evaluated by internal medicine are associated with a long throughput time in the ED. This has often to do with the complexity of the patients. Using our experience, the flow of these patients through the ED process can be improved by the following recommendations.

Firstly and foremost, acute care based on 'Advanced Life Support' (ALS) principles should be quick and effective.

These principles are aimed at identifying life-threatening problems. In addition, resuscitation and treatment is immediately started before a certain diagnosis is made. Since January 2011, it is mandatory that all physicians working in an ED in the Netherlands have followed special training in ALS.¹⁰

Secondly, ordering diagnostic tests immediately after triage accelerates the patient flow.¹¹ This is especially useful when the doctor cannot directly see the patient for any reason. Almost every patient seen by internal medicine needs additional laboratory or radiographic examinations. Standardised symptom-based protocols have been developed that can be used for diagnostic work-up according to the presenting symptom, such as dyspnoea or abdominal pain. The availability of the results during the evaluation of the patient accelerates the diagnostic process in the ED.

Thirdly, monitoring of the diagnostic process is important, especially if multiple patients present simultaneously. To prevent crowding in the ED, only those diagnostic tests that contribute to making clinical decisions should be performed in the ED. This includes consultation of other specialities. To improve patient flow during peak hours two residents of internal medicine are scheduled in the ED of our hospital.

Fourthly, clinical decision-making supported by direct supervision reduces length of stay in the ED. In our hospital an internist is physically present at the ED and available for direct supervision during peak hours. The aim is to review every patient within two hours after presentation. The presence of an internist is also a valuable contribution in the training of residents by direct bedside teaching and supervision.

Fifthly, effective discharge planning is helpful to improve output. This can be achieved by having an overview of occupancy of hospital beds and effective communication about patient discharge from the ED. For logistic reasons, some hospitals create acute medical units to smooth the integrated hospital processes. Thinking one step ahead, after leaving the hospital, the patient may need extra care at home or in a nursing facility. Organising this care can substantially extend the admission period, blocking new admissions from the ED. To maintain the continuity of patient care, outflow of patients with support of community services must be arranged. This illustrates that continuity of acute care and crowding issues reach further than the ED.

Last but not least, coordination of acute care will improve ED congestion and also quality of care in complex patients with multiple problems. Although it cannot be drawn from the study results, Vegting *et al.* conclude that lack of

coordination of care is responsible for prolonged length of stay in the ED.⁸ Definitely, better coordination of care is needed. This can be demonstrated by looking at an individual patient, for example the elderly patient presenting to the ED after being found on the floor with a decreased consciousness. After evaluation by the ED physician, several medical specialities will be consulted. For example, neurology for ordering a CT scan, cardiology for atrial fibrillation and internal medicine for elevated inflammatory parameters. After all the diagnostic procedures have been performed, the patient will have been in the ED for more than eight hours, while immediately upon arrival it is evident that this patient needs hospital admission. This patient has all the risk factors for prolonged length of stay that are described in the study by Vegting *et al.* Instead of serial assessment of this patient by different specialities, this complex patient with multiple problems needs an integral approach.

The expert in this field is the internist working in the ED department, whose specific domain is the complex undifferentiated patient with multiple disorders. The internist can adequately consider the (pathophysiological) context of a complex presentation and offers broad multidisciplinary knowledge and skills to achieve an integrated approach and treatment of these patients. Furthermore, the internist can identify these patients and initiate the coordination of acute care at the ED. In order to fulfil this role, the internist should be physically present in the ED. It is the strength of the internist to get the patient at the right place. This may also mean referral to another speciality by timely consultation.

In recent years, a new subspeciality of internal medicine has been developed: 'Acute Medicine'. The internist with the subspeciality acute medicine is a generalist with specific expertise in acute care through extensive knowledge and skills in ALS, pain treatment and toxicology. In addition, this doctor has been trained in the coordination and logistics of acute care. Working at the interface between the first line, the emergency department, the clinic and the outpatient clinic, the internist is able to guide patient flow. Further professional development of this subspeciality will contribute to the quality and effectiveness of acute care and will have a positive effect on training, education and research in the field of acute medicine.

In conclusion, patient flow at the ED is complex and crowding issues are here to stay. Numerous measures for improvement have been identified and can be implemented. Coordination of complex acute medicine is the expertise of the internist. Therefore, the internist fulfils a key position at the ED.

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