

# Overcrowding in emergency departments: strategies and solutions for an effective reorganization

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## ABSTRACT

Overcrowding in emergency departments (EDs) is a common and worldwide phenomenon, widely reported even by the non-specialist press. It contributes to a number of consequences that can affect both the number of resources available and the quality of care. Strategies to address this incriminating situation for patients, nurses, doctors, and hospital administrators are urgently needed. For this reason, and based on the input from the Ministry of Health, a series of projects and procedures have been developed in various Italian regions, aimed at reducing the waiting times and the diagnostic-therapeutic process of patients arriving in the ED. In this article, we will examine the main critical issues within EDs and discuss the most impactful strategies and solutions to manage these difficulties.

## Introduction

In recent years, we have witnessed the increasing phenomenon of overcrowding in emergency departments (ED) in large cities but the phenomenon is now so widespread that

it involves the entire national territory.<sup>1</sup> By overcrowding, we mean the situation in which the normal operation of the emergency room is affected by the disproportion between the healthcare demand (number of patients waiting and being treated) and the available logistical, instrumental, and professional resources.<sup>2</sup>

When overcrowding is constant, it is generally due to the under-sizing of the ED compared to access in terms of structural, technological, human and/or organizational resources.

Overcrowding has serious consequences:<sup>3</sup>

- i) on patients: worsening of outcomes: increased mortality, delays in evaluation and treatment, increased length of stay, risk of readmission in the short term, reduced patient satisfaction, exposure to mistakes;
- ii) on operators: failure to adhere to good clinical practice guidelines, increase in stress and burnout, increase of episodes of violence towards the operators themselves;
- iii) on the system: increase in length of stay in the emergency room and hospital stay.

In Figure 1, it is possible to appreciate the complexity of the current track that, due to the large amount of waiting time between the various operational phases, determines a clogging of the ED, both at the entrance and at the end of the process.

Among the main critical issues occurring within the ED, some are more relevant than others. In particular, the relations of the ED with the other structures of the hospital system and with the healthcare activities in the area have always been conflictual. Furthermore, the ED, representing the hub between the system of territorial services and the hospital services, collects the inefficiencies and other organizational dysfunctions of both, without adequately structured interconnections, neither incoming nor outgoing. This is confirmed by the fact that numerous works, that have studied the effects of possible organizational initiatives aimed at preventing access to the Department of Emergency Urgency and Acceptance for minor problems, have not demonstrated any positive results.<sup>4</sup> The EDs now represent, for a not negligible percentage of the socially fragile population, a haven against the difficulties in accessing the healthcare system.<sup>5</sup>

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By analyzing the three macro-phases of the access flow to the “emergency system” (Input/Throughput/Output), we find that the factors that have the greatest impact on the progressive increase in the time spent in the ED are:<sup>6</sup>

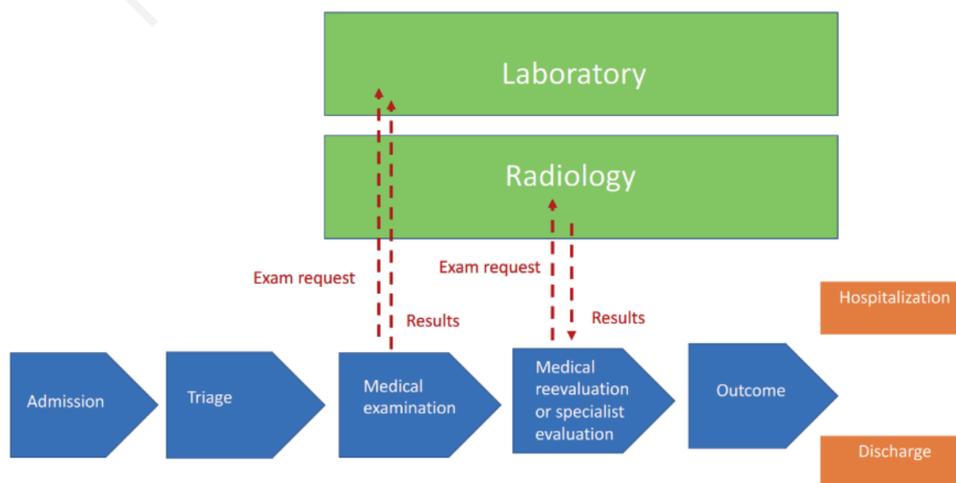
- Input factors: onset of new or unsatisfied care needs in appropriate areas for taking charge of the territory; progressive aging of the population; increase in the number of complex patients; the advent of new diagnosis and treatment technologies; increase in access to pathologies linked to seasonal epidemiology (e.g., flu epidemics and heat waves);
- Internal factors (throughput): all those factors that affect the progressive increase in length of stay in the ED linked to the need to activate specialist consultations and instrumental diagnostic tests and in particular those of a more advanced level (e.g., computed tomography scan). These elements occur with increasing frequency, both due to the increase in the average age of patients and comorbidities, and due to the evident need of the system to guarantee appropriate hospitalizations and safe dismissal;
- Output factors: linked to the difficulty in promptly hospitalizing, due to the lack of available beds for emergency admissions or to their inefficient management; the effect is defined by the term “boarding”. This, in addition to creating serious organizational difficulties, leads to an increase in adverse events for patients awaiting hospitalization (home therapies not provided, suboptimal control of vital parameters, delay in changes in the general condition of patients).

## Discussion

Considering the growing importance of overcrowding in EDs and its potential effects on the wellness of patients and employees, the need to develop strategies to deal with or mitigate the problem has become evident. As part of the reorganization of the ED, some fundamental requirements must be met:<sup>7</sup> i) there must be a clear and declared mission of the hospital regarding what the main and support processes are; ii) a strong correlation must be created between the ED schedule (given by the pace of the demand) and the support services;

iii) revolutionary and efficient programs must be developed for the reorganization of emergency rooms.

The role of the hospital concerning emergency management must be declared: if the Local Health Unit declares that the main process of the hospital is emergency/urgency, it follows that the admission processes in Medicine and Surgery must be in support and, therefore, subordinate to those of the ED. To prevent this structure from disrupting the system of internal relations, it is desirable to decouple the urgent processes from the elective ones, creating two separate lines. In addition, it should ensure the emergency line has a 24/7 operational dimension (diagnostic services, laboratories, endoscopy and continuous operation of the departments throughout the 24 hours, without breaks on public holidays). Support services must be aligned with the need for ED services. This aspect refers not only to the number and types of services needed to respond to the needs of the ED but also to the times for providing services. A preliminary evaluation of the macro-phases of the ED process has highlighted that the three main offline processes are represented by specialist consultations, radiodiagnostics and the laboratory. For this reason, we are starting to develop company procedures that allow these tracks to be realigned to the needs of the emergency rooms. There must be, within 24 hours, an adequate capacity of spaces, equipment and staff to adequately respond to the change in incoming demand. Given that the need for resources varies substantially over 24 hours, flexible organization methods must be adopted for the available staff (during the day and the periods of the year) to adapt to the care requests, avoiding overload.<sup>8</sup> In some EDs in the United States, to reduce patient waiting times, triage has been completely revised through the extensive implementation of vertical patient flow.<sup>9</sup> This model, which aspires to the complete elimination of time and waiting areas at the entrance, is based on some key points: the taking charge and evaluation of the patient (vertical) by a doctor at the ED admission, even before the registration procedures and its location within large fast track areas. This model assumes the creation of large chair-based treatment areas for non-critically ill patients. Regardless of the type of system used, triage, even in the new versions, reconfirms its importance not only as a moment for reception and selection of care priorities but also as an “engine” of treatment paths.<sup>10</sup>



**Figure 1.** The traditional clinical-care path in the emergency department.

- Temporary modulation of the provision of beds in favor of the disciplinary areas with the greatest need in conditions of overcrowding
- Optimization of the staff organization aimed to have greater resources available during the hours of higher care commitment
- Extraordinary dashboard of supernumerary beds or in support or blocking of hospitalizations or other activities, “full capacity protocol”
- Boarding management: boarding objective not managed by emergency department staff, the establishment of the functional area between Emergency-Urgency Medicine and Internal Medicine in a transition phase
- Activation of inactive beds, and use of weekday areas to reduce the number of patients waiting for hospitalization on the day after the holidays
- Procedure for the specialist care in the emergency department of patients for whom immediate hospitalisation in the specialist department is not possible.
- Company paths for the direct care by the organization units of people already being treated for emergency conditions without going through the emergency department
- Real-time knowledge of available beds at any time of the day or night

**Figure 2.** Reorganization interventions of hospital structures.

In Figure 2, it is possible to identify some interventions that, by modifying the concept of a rigid system, such as the one currently adopted in most Italian hospitals, can lead to a system that gives immediate responses to the continuous changes occurring daily within the EDs.<sup>11</sup>

Another fundamental factor for improving the working atmosphere and trust of healthcare workers is the ability to respond to some fundamental needs of waiting patients.

We can divide these needs into three types:<sup>12</sup> i) environment: an accurate design of some elements of the space can help to guide user behavior, implicitly convey some information (to support orientation for example), to influence the perception of the offered service; ii) understanding: the user’s knowledge and understanding of some information that concerns them directly and of the dynamics of the ED (why am I waiting? What am I waiting for? Whom should I talk to? What kind of exam am I doing?) can contribute to reducing numerous states of anxiety and frustration; iii) empowerment: the possibility of participating in some choices regarding one’s own health and the possibility of carrying out some activities independently (from self-check-in to the possibility of drinking a glass of water) contributes to reducing the feeling of impotence and the perception of institutionalization.

We believe that the further development of the following internal processes of hospital structures could be able, in the medium term, to improve the management processes within the EDs:<sup>13,14</sup>

- Availability of fast-track routes divided by specialties;
- Multidisciplinary care continuity paths for highly complex networks and pathologies;
- Evolution of bed management into a corporate function that integrates the management of hospitalizations, the

flow of hospitalization (including procedures), the change of setting and the social component and the connection with the territorial operative centers;

- Definition of an appropriate track to allow the taking over by the organization units of people already being treated for emergency conditions without going through the ED;
- Activation of “widen units of short and intensive observation” by assigning beds to patients suffering from specialist pathologies requiring a short observation period, in relation to specialist expertise within the departments;
- Definition of an appropriate track for end-of-life discharge pathway;
- Definition of tracks for the care of patients with chronic degenerative diseases;
- Real-time knowledge of available beds at any time of the day or night through computer programs.

## Conclusions

In conclusion, there must be a vision behind every expectation and ambition for improvement.

The EDs of the near future must have characteristics of functionality and effectiveness, but also of sustainability and innovation, and, therefore, it is necessary to create collaboration between professionals from different disciplinary sectors and on the contamination that derives from the intertwining of knowledge and experiences. Such type of approach, regardless of the specific results that may return, produces the growth of a homogeneous and compact cultural vision made up of objectives, reflections and perspectives, rather than pre-established solutions.<sup>15,16</sup>

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