HEALTH CARE MANAGEMENT

Monitoring emergency and urgent surgery: an improvement in a Healthcare Management Unit at a third-level hospital in Italy

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Keywords

Emergency • Urgent surgery • Monitoring • Surgeon list

Summary

Introduction. *At San Martino IRCCS Hospital in Genoa, Italy, emergency and urgent surgery is classified according to the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) classification, whereby cases are divided into two categories and colour-coded accordingly: - EMERGENCY – (Colour-code: RED) "Surgery to be performed within minutes"; - URGENCY – (colour-code: YELLOW) "Surgery to be performed within hours". In this context, it is essential that the emergency surgical team gets clear and complete information from the proposing surgeon, in order to complete the surgical list.*

Methods. *Between 14th April 2023 and 23th July 2023, a new method of requesting urgent and emergency surgery by filling out an online form was tested.*

Results. *A total of 406 online requests were made, resulting in 367 E/U surgeries. The greatest number of emergency operations concerned thoracic-abdominal surgery (45%), followed by urology (19%). The requests analysed classified 18% of cases as red and 71% as yellow. The remaining 11% contained compilation errors. Moreover, 11% of the interventions were not performed within the time limits defined according to the severity code.*

Conclusions. *By means of this new tool, San Martino IRCCS Hospital's Healthcare Management Unit can monitor requests for surgery in real time, thereby achieving greater efficiency and implementing corrective measures in the use of Operating Room resources.*

Introduction

Emergency and urgent surgery accounts for an increasing proportion of surgical activities performed in hospitals and requires a significant commitment from hospital staff to meet clinical needs [1, 2]. In daily practice, general and specialist surgeons deal with many surgical emergencies, scheduling and providing care both for patients arriving at the emergency room and for those admitted to the various units for elective surgery [3]. San Martino IRCCS Hospital in Genoa, Italy, is the regional tertiary adult acute-care reference hospital. It has 1,400 beds and two daytime operating theatres for emergency surgery. In the absence of a universal classification defining the timing of emergency and urgent surgery, the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) classification [4], which is applicable to all surgical disciplines, is adopted. According to this classification, surgical cases are divided into the following two categories, to which a colour –code is assigned [5]:

- EMERGENCY – (Colour code: RED) "Emergency surgery to be performed within minutes". This category comprises life-saving, organ-saving or limb-saving interventions or critical situations in which surgery is concurrent with resuscitation manoeuvres (performed within 1 hour);
- URGENCY – (Colour code: YELLOW) "Urgent surgery to be performed within hours". This includes situations with acute onset or clinical deterioration or situations that potentially threaten the life, organ or limb of the patient, or conditions that require surgery for fracture fixation, relief of pain or other stressful symptoms (performed within 6-12 hours) [6].

In this context, it is essential that the emergency surgical team gets clear and complete information from the proposing surgeon [7, 8]. It is therefore necessary to ensure rapid and effective communication, in order to minimize the time between referral and surgery [9].

Methods

Up until April 2023, requests for E/U surgery at the San Martino IRCCS Hospital were based exclusively on the information provided on a paper form; text fields had to be handwritten by the proposing surgeon and the form was sent to the anaesthetist and the surgeon on call. In order to meet the demand for E/U intervention quickly

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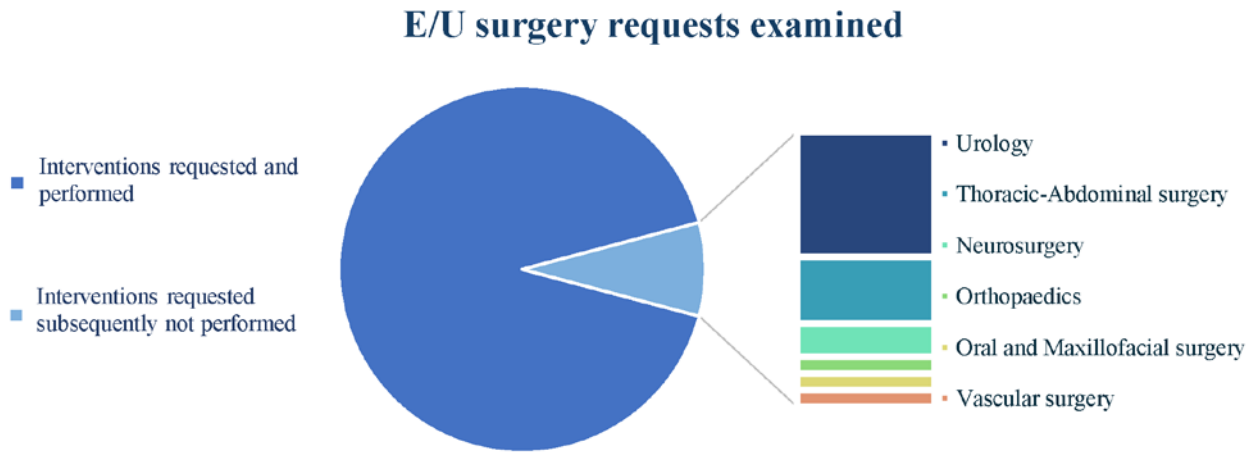
Fig. 1. E/U surgery requests submitted in the period between 14th April 2023 and 23th July 2023. The distribution of the surgical disciplines that sent requests for E/U surgery which was subsequently not performed is also shown.



and efficiently, the paper form contained the following information: the patient's personal details, suspected diagnosis and planned surgery, severity code (colour code class), date and time of report, proposing surgical unit, and the name and signature of the proposing surgeon. Subsequently, a new method of requesting urgent and emergency surgery was introduced; this involved filling out an online form. The clinical information reported on the online form is the same as that previously handwritten on the paper form. This online form is filled in by the proposing surgeon, but is promptly accessible to other crucial healthcare personnel, such as anaesthesiologists, other surgeons and nurses. The surgical team can access the form through the IT application used to compile the surgical register.

A three-month period of analysis and monitoring followed the introduction of the online form, with the aim of testing the new method and identifying any major criticalities and shortcomings. From April to July 2023 an experimental period was run, during which both communication methods, *i.e.* both paper and online forms, were available at the same time and used in parallel.

Results

E/U surgery requests submitted in the period between 14th April 2023 and 23th July 2023 were analysed: a total of 406 requests were made, resulting in 367 E/U surgeries (Fig. 1).

Some of the remaining patients were rescheduled for elective surgery, after medical re-evaluation, while others experienced a deterioration of their clinical conditions, prompting the decision that surgery was no longer appropriate for them.

Analysis of the data collected enabled us to identify the percentage distribution of the surgical disciplines involved. Thoracic-abdominal surgery accounted for the greatest number of emergency operations (45%), followed by urology (19%), neurosurgery (13%),

Fig. 2. E/U surgery requests submitted in the period between 14th April 2023 and 23th July 2023 in San Martino IRCCS Hospital in Genoa, categorized by surgical disciplines.

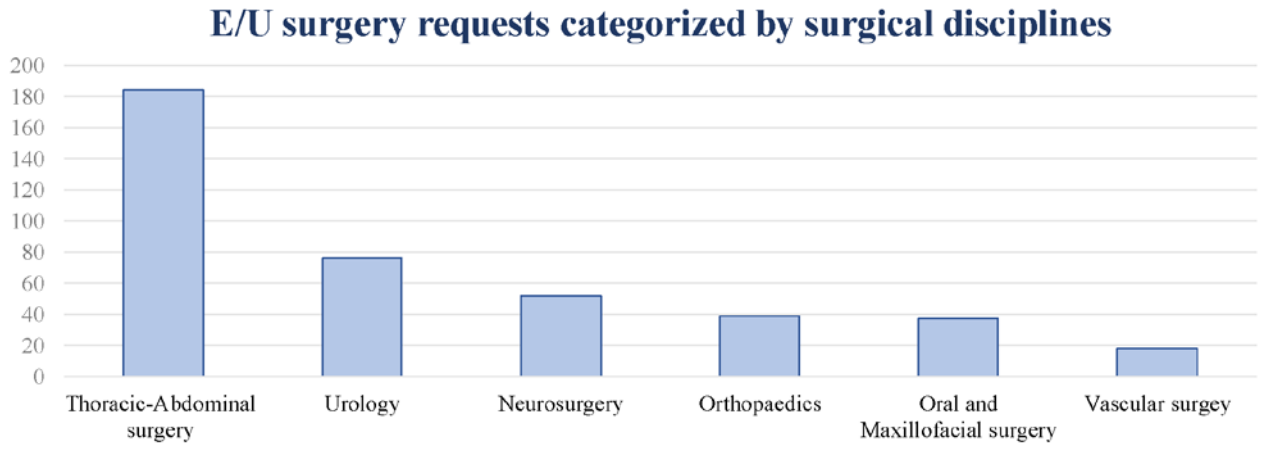
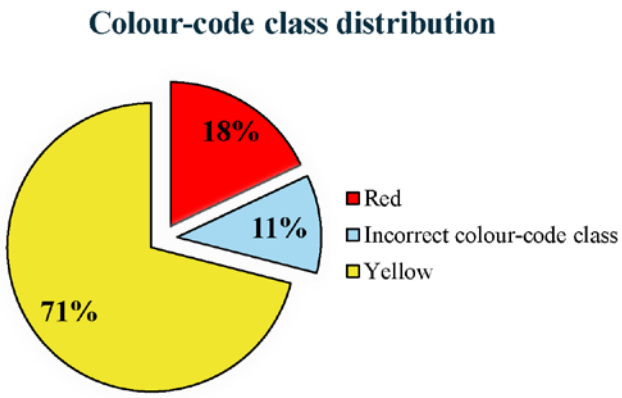


Fig. 3. Percentage distribution of E/U requests by colour-code classes submitted in the period between 14th April 2023 and 23th July 2023 at the San Martino IRCCS Hospital in Genoa.



orthopaedics (10%), oral and maxillofacial surgery (9%), and vascular surgery (4%) (Fig. 2).
The requests analysed reported colour-code classes with the following frequency: 18% were classified as red, and 71% as yellow. The remaining 11% of requests contained compilation errors (Fig. 3). The most frequent compilation errors were: omission of the colour-code class field on the paper form, changes or deletions on the form, and selection of an invalid colour-code class.
Analysis of the data obtained revealed the following critical issues:

- 11% of requests incorrectly reported the severity code (colour-code class);
- 11% of the surgical interventions were not performed within the time limits defined according to the severity code (colour-code class).

Discussion

The main limit of using paper forms is that information is available only to a small number of health workers; moreover, incomplete and/or illegible forms may give rise to doubts in interpretation or analysis [10]. This does not allow an accurate global picture of the number of requests for E/U interventions as well as the number of cases with similar colour-code class presented in the same time [11].
In order to avoid any misunderstandings and ensure proper interpretation, it is essential to limit handwritten healthcare data and to use electronic tools and standardized data management systems [12]. Indeed, if all emergency surgery workers use the same reporting system, the effectiveness of communication may improve and delays in the management of patients may be reduced [1].
To the best of our knowledge, similar digitalization trials have been conducted in other Italian hospitals, for example at the Azienda Ospedaliera Universitaria Integrata (AOUI) in Verona. In that facility, a digital request form for elective surgery was introduced in order to track the request and ensure that all mandatory fields were filled in [13].

Conclusions

In order to solve the problems observed, a dedicated tab for emergency/urgency operations was introduced into the online form in May 2023; this obliges users to enter the essential information contained in the previously used paper forms.
After a three-month experimental period, during which both reporting tools were used in parallel, paper forms were entirely replaced by online forms.
This latter tool ensures the standardisation and accuracy of the data reported and allows traceability of the E/U pathway. Indeed, San Martino IRCCS Hospital's Healthcare Management Unit can monitor requests for surgery in real time, thereby achieving greater efficiency and implementing corrective measures in the use of Operating Room resources.

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Conflicts of interest statement

None declared.

Authors' contributions

AM and GO: conceived the study. LI and MK: drafted the manuscript. IB: revised the manuscript. LI, MK and IB: performed a search of the literature. All authors critically revised the manuscript. All authors have read and approved the latest version of the manuscript.

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