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SPECIAL ARTICLE

# Triage in Spanish hospitals

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The objective to determine what triage systems are being used in Spanish national health service hospitals and to define the characteristics of the models in place. Cross-sectional descriptive survey of hospitals with more than 100 beds in the Spanish national health service. Responses to a questionnaire sent to 123 hospitals were received from 54.5% of the facilities. The Andorran Triage Model adapted for use as the Spanish Triage System (ATM-STS) was used in 37.3% of the hospitals. The Manchester Triage System was used in 23.9%. Of the 58 hospitals that use some triage system, 53.4% had not carried out a study before starting to apply the selected system. The professionals in charge of triage are nurses in 77.6% of the hospitals and physicians in 6.9%. No triage committee or group had been established in 53.7% of the hospitals responding to the survey. The degree of satisfaction with the chosen system expressed on a scale of 1 to 5 was 3.16 for physicians, 3.28 for residents in training, and 3.23 for nurses. Another system would be chosen by 49.2% of the respondents. The difference in the numbers of hospitals using the ATM-STS and the MTS was not great. [Emergencias 2013;25:66-70]

**Keywords:** Triage. Hospitals. Emergency health services. Spanish triage system. Manchester triage system.

## Introduction

Emergency departments (ED) in Spain have experienced a radical increase in demand for care, from about 18 million visits in 1977 to 26.2 million in 2008[1]. This is partly due to numerous visits for non-severe complaints, as many as 70% according to some studies, which may contribute to delayed attendance of patients with serious conditions[2]. The first healthcare professional to prioritize medical assistance on the battlefield and to use the term triage was Baron Dominique-Jean Larrey (1766 - 1842)[3], whose role in nursing was as illustrious as that of Florence Nightingale (1820-1910)[4]. But the first to introduce systematic triage was E. Richard Weinerman in Baltimore 1964[5]. The concept of triage has been defined as the preliminary clinical assessment which orders patients according to urgency / severity before diagnosis and complete therapy[6]. It has also been defined as reception, attendance and classification (RAC), which is the term coined by the Spanish Society of Emergency Nursing (SEEUE), but the term triage is currently that used both nationally and internationally[7]. The triage system categorizes patients so that those with more urgent needs are seen before others when the situation in the ED generates waiting times[6].

At present, there are several 5-level triage models for ED use: the Australian Triage Scale (ATS), the Canadian Emergency Department Triage and Acuity Scale (CTAS), the Manchester Triage System (MTS), the Emergency Severity Index (ESI) and the Andorran Model of Triage (MAT), with the latter having been adopted as standard for Spain and called the Sistema Español de Triaje (SET), following recommendations of the Spanish Society of Accident and Emergency Medicine (SEMES)[6,8,9].

In Spain, the two most widely used systems are the MTS and the MAT-SET2. Both are structured with 5 levels of clinical priority. The MTS classifies patients according to 52 possible reasons for visiting the ED[8,10], and the MAT-SET has 613 clinical reasons within 32 symptomatic categories[6,11]. The recommended maximum attendance times are similar in both[9,11-13] (Table 1).

The objective of structured triage[6] is to manage the influx of ED users according to urgency and not in order of arrival[8,14]. So the purpose is

**Table 1.** Comparison of performance times between different triage systems[1]

| Priority level | MTS | CTAS-ATS | SET-MAT |
|---|---|---|---|
| Critical-Level I | Immediate | Immediate | Immediate (98%)* |
| Emergency-Level II | 10 mins | 15 mins | Immediate by nurse/7 mins physician (85%)* |
| Urgent-Level III | 60 mins | 45 mins | 15 mins (80%)* |
| Standard-Level IV | 120 mins | 120 mins | 30 mins (75%)* |
| Non-urgent-Level V | 240 mins | 240 mins | 40 mins (70%)* |

ATS: Australian Triage Scale; CTAS: Canadian Triage and Acuity Emergency Department Scale; MTS: Manchester Triage System; MAT: Andorran Model of Triage; SET: Spanish Triage System. 1Percent of patients who are to be attended within this period of time.

not to reduce general waiting time, but to improve ED attendance and risk control, i.e. clinical safety. Among the standards and recommendations for EDs is the need for a standardized triage system[12]. SEMES has also proposed ED accreditation[15].

The recommendations of various scientific societies or associations such as SEMES[9,15], the Spanish MTS group[10] and SEEUE[16] advise that the triage function be performed by nurses. Articles 52, 53 and 54 of Royal Decree 1231/2001, of November 8, by which the General Statutes of the College of Nursing Organization in Spain[17] are approved, and Article 59, paragraphs 4 and 9, of the statute regulating non-physician health personnel[18] also support the role of nurses in triage. Nursing functions regulated by the North American Nursing Diagnosis Association (NANDA), through nurse interventions classification triage (NIC 6364), aim to obtain results [Classification of Nursing Outcomes (NOC)] which guarantee patient safety (NOC 3010), detect risk (NOC 1908), and improve quality of life (NOC 2000) through monitoring risk (NANDA 0035). A level of priority is assigned in each case, with the most appropriate area for treatment and continuous evaluation of the patient[19].

Despite this consensus that triage is a nursing competence, certain studies suggest that nursing triage with physician support is more efficient than nursing triage alone[2,6]. Thus, SEMES MAT-SET is not an exclusively nurse-based system (with physician participation if necessary), involving physicians in the process of study and implementation of the system and integrates multi-disciplinary professionals in the process[20,21].

Initial and ongoing training that is specific for triage as well as professional experience in an ED are essential pillars of the system. So a certain minimum of experience in emergency medicine is necessary although the recommendation on this is variable. For SEMES it consists of at least 12 months[9], while MTS and SEEUE have not established a specific period. The recommendations on the profile of professionals selected for the triage function include aptitude and attitude, which in turn should include: ability to make decisions and handle difficult situations, good communication skills, empathy, tact, patience and organizational ability[20].

The recommendations for EDs that implement the MAT-SET system include the presence of a commission, working group or triage committee with sufficient support that can liaise between the different stakeholders: managers, professionals and patients[20]. Its functions include performing a feasibility study (if a triage system is needed, which one is the most suitable, and what is needed: human resources and specific training, structural and material resources) and a specific plan of implementation and monitoring. In addition, the use of clear action protocols and staff consensus should be addressed[20].

The main objective of this work was to determine the triage model used by hospital EDs on the national public health network. As secondary objectives, the study aimed to: a) describe the type of professional in charge of triage, their training and experience, b) assess the degree of compliance with recommendations regarding a feasibility study before implementation, and c) assess the degree of professional satisfaction with the triage system they use.

## Method

This cross sectional study was conducted in hospitals forming part of the national public health network, each with at least 100 beds for admission (data from the website of the Ministry of Health, Social Policy and Equality)[22,23]. We excluded psychiatric, geriatric and long stay hospitals and those that did not provide an email electronic contact; it was understood that they did not wish to participate in the study. We made a simple random selection of hospitals meeting the inclusion criteria. For data collection, the supervisor of the unit or ED was contacted by telephone and told about the study. An email contact was established to provide more detailed information and the auto-fill form containing quantitative and

qualitative variables. The time period for data collection was between 15 January to 15 March 2011. Data forms were tabulated using Excel 2010® and statistical analysis was performed using SPPS v12.0®.

## Results

Forms were sent to 123 of the 211 hospitals meeting the selection criteria, of which 67 (54.5%) responded. The categories of the hospitals surveyed were: general 56.4% (n = 38), county 34.1% (n = 23), provincial 7.2% (n = 5) and one unknown 1.3% (n = 1). The median number of patients treated in the ED during 2010 in these hospitals was 81,256 patients with a range up to 199,000 patients.

The triage systems used were MAT-SET in 25 centers (37.3%), the MTS in 16 (23.9%), the CTAS in 2 (2.9%) and other unspecified systems in 15 (13.5%). Nine centers (22.4%) had no triage system. Of the 58 hospitals that employed a triage system, 16 (27.6%) had performed prior study before implementation, 31 (53.4%) had not, and the remaining 11 centers (19%) did not know or did not answer the question. Of the 15 hospitals using an unspecified triage system, none were using a validated system. Of the 38 hospitals with most ED visits per year (more than 60,000 during 2010), 34.2% had no triage system or it was not validated.

The professional responsible for conducting triage was a registered nurse in 77.6% of cases (n = 45), a physician in 6.9% (n = 4); a medical intern resident physician (MIR) in 3.4% (n = 2), a physician plus a nurse in 6.9% (n = 4); a nurse plus a MIR in 3.4% (n = 2) and a nurse plus an auxiliary nurse in 1.8% (n = 1). Most (84.5%: n=49) had received specific training for triage while 13.7% (n = 8) had not. The question was not answered (DK / NA) in 1 case (1.8%). Regarding a minimum ED experience, this was required in 79.3% (n = 46) of hospitals with a triage system, with a median of 6 months and a range of 23 months. On the question of who is the best professional for triage, 77.7% of respondents (n = 52) indicated a trained nurse, 13.4% (n = 9) a physician plus a nurse, and 8.9% (n = 6) a physician.

In 75.9% of hospitals (n = 44), triage was maintained 24 hours a day, and in the remaining 24.1% (n = 14), triage was reduced to a part of the day, ranging from 7-16 hours. Regarding the existence of a commission / committee / triage task force, it did not exist in 53.7% of cases (n = 36) and 8.9% (n=6) did not answer the question. Of all these, 71.5% (n = 30) believed it was necessary. Average satisfaction (1: strongly disagree: 5: very satisfied) among ED physicians was 3.16, for the MIR 3.28 and for the nursing professionals it was 3.23 (Table 2).

Of the 67 hospitals surveyed, 49.2% (N = 33) would change the triage system in operation (Table 3). Virtually all (93.9%) of the hospitals surveyed (N = 62) had a specific room for triage or prioritization of patients, located at the entrance to the ED in 90.3% (n = 56). Equipment of the triage room varied according to center (Table 4).

## Discussion

The structured triage system most widely adopted in the hospitals studied was the MAT-SET, followed by MTS. How long they have been in use was not determined. The present study found a significant number of hospitals that employed non-externally validated triage systems. It is noteworthy that these hospitals are among those attending the highest number of patients per year, so we believe there is no guarantee of patient safety in the event of having to wait for medical attention.

We found a relatively high response rate to the survey, above 40%[24], but in the context of a limited sample size. We could not compare our results with others since we did not find other studies with a similar database.

The study shows that less than a quartr of the participating hospitals performed a triage feasibility study before implementation, which we consider an important error to consider. We believe this is because autonomous communities purchase dif-

**Table 2.** ED staff satisfaction with triage system

| | Strongly Disagree | Disagree | Satisfied | Somewhat satisfied | Very satisfied | No response or do not know |
|---|---|---|---|---|---|---|
| ED physicians | 5.97% | 8.96% | 46.27% | 7.46% | 13.43% | 17.91% |
| MIR physicians | 4.48% | 4.48% | 35.82% | 4.48% | 13.43% | 37.31% |
| DUE (RNs) | 4.48% | 16.42% | 41.79% | 13.43% | 16.42% | 7.46% |

ED: Emergency department; MIR: Medical Intern Resident; DUE: Diplomado Universitario en Enfermería (equivalent to RNs or registered nurses).

**Table 3.** Triage system actually used and system preferred

| Triage system used | Triage system preferred | | | | |
|---|---|---|---|---|---|
| | MAT-SET | CTAS | MTS | Other system | No response or do not know |
| MAT-SET (n = 25) | | 0 | 2 | 2 | 4 |
| CTAS (n = 2) | 1 | | 1 | 0 | 0 |
| MTS (n = 16) | 2 | 0 | | 0 | 3 |
| Another system of triage (n = 15) | 6 | 0 | 3 | 1 | 1 |
| No system of triage (n = 9) | 6 | 0 | 1 | 0 | 0 |

CTAS: Canadian Triage and Acuity Emergency Department Scale; MTS: Manchester Triage System; MAT: Andorran Model of Triage; SET: Spanish Triage System.

ferent computer programs supporting triage without prior testing and without considering local peculiarities, although in some regions the decision to use MAT-SET counted on the participation of ED professionals and scientific societies.

We found that nurses were responsible for triage in more than three quarters of hospitals, as recommended in the literature consulted[9-11,16-18]. Similarly, there was general consensus that registered nurses were best suited to performing this function, both because of their training and qualities, since the triage functions does not involve diagnosis but the preliminary assessment of signs and symptoms with the sole purpose of establishing the priority level and the reason for consultation[6,20].

Most hospitals require and provide specific training to perform triage and also require a minimum period of ED work experience, as recommended by scientific societies, although this varied according to the hospital involved. It was noteworthy that a quarter of the hospitals did not provide 24-hour triage despite the fact that some attend as many as 50,000 emergency visits per year, and that MAT-SET recommendations include 24-hour daily triage[20].

The study revealed that most hospitals had no triage commission / committee / working group to evaluate the triage activity. However, most thought it would be good to have one, so we conclude that its creation would favor daily work and that would be a great benefit to ED professionals, as recommended by SEMES20. The overall degree of satisfaction among ED professionals in relation to their triage system was fairly high, a fact that contrasts with the finding that nearly half would change the triage system if they could.

We conclude that there is significant implementation of 5-level structured triage systems but we believe there should be full implementation, 24 hours a day, as this would improve ED patient safety. Evidently, both specific training for triage and minimum experience in the ED are fundamental for the sustainability of the system, as well as strict observance of authoritative recommendations and the establishment of triage commissions to better manage hospital EDs.

**Table 4.** Material equipment available in triage rooms

| Material | Hospitals (n = 67) |
|---|---|
| Computer Systems | 60 |
| Stretcher bed | 30 |
| Blood pressure monitor | 59 |
| Wound treatment material | 23 |
| Electrocardiogram | 24 |
| Thermometer | 54 |
| Glucometer | 54 |
| CPR equipment | 3 |
| Paging system | 35 |
| Triage Computer Program | 44 |
| Pulse oximeter | 13 |
| Monitor | 17 |

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## El *triaje* en urgencias en los hospitales españoles

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El objetivo del presente artículo es conocer el modelo de *triaje* utilizado y sus características principales en los hospitales de la red sanitaria nacional pública. Se hizo un estudio descriptivo transversal en los hospitales públicos con más de 100 camas para el ingreso. Se envió un formulario a 123 hospitales, y se obtuvo respuesta en el 54,5%. Los sistemas de *triaje* empleado son el Modelo Andorrano de *Triaje* (MAT) o Sistema Español de *Triaje* (SET) en el 37,3% de los casos y el Sistema de *Triaje* de Manchester (MTS) en el 23,9%. En los 58 hospitales que tienen implantado algún sistema, no se realizó estudio previo de implantación en el 53,4% de los casos. Los profesionales encargados de realizar el *triaje* son el enfermero (DUE) en el 77,6% de los casos y el facultativo (FEA) en el 6,9%. No existe una comisión/grupo de *triaje* en el 53,7% de los casos. El grado de satisfacción (1-5) es para el FEA de 3,16; para el médico interno residente (MIR) de 3,28 y para el DUE de 3,23. Cambiarían el sistema el 49,2% de los centros encuestados. No se observan diferencias significativas de implantación en cuanto a los modelos MAT-SET y MTS. [Emergencias 2013;25:66-70]

**Palabras clave:** *Triaje.* Hospital. Urgencias. Sistema Español de *Triaje. Manchester Triage System.*