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# In-depth Historical Analysis of Healthcare Screening Systems

M. N. CUNHA<sup>‡</sup>

**Purpose:** The management facilitated by Triage Systems raises numerous inquiries for both healthcare professionals and users, rendering it an increasingly pertinent concern. In Portugal, emergency services cater to millions of individuals annually. The dynamic shifts in care are abundant and contingent on the specific nature of the healthcare required. Change, therefore, stands as a perpetual element in the realm of medicine, with alterations unfolding at an accelerating pace and growing complexity. Within the realm of emergency services, Triage serves as the inaugural stage in the healthcare delivery process. It necessitates a meticulous and rigorous approach, a task reserved for adept professionals who are adequately prepared for responsibility. The intricate nature of Triage underscores its pivotal role, setting the tone for the subsequent stages of healthcare provision. As the landscape of healthcare continues to evolve, the effectiveness and precision of Triage become even more crucial, emphasizing the need for ongoing training and adaptability among healthcare professionals.

**Design/Method/Approach:** The methodology of the research consists of a thorough literature review to compare different screening systems in healthcare, to better understand the current situation.

**Findings:** The findings indicate that the Screening System is both valid and beneficial. Nevertheless, ongoing adjustments in service management are required to enhance its effectiveness and alignment.

**Theoretical Implications:** This paper explores how healthcare screening systems have evolved over time, tracing their roots from historical practices to modern technologies. It identifies paradigm shifts in healthcare thinking, policy and technology that have influenced the development of screening systems.

**Practical Implications:** The screening system is a vital process mandated for all individuals seeking assistance in the emergency department, serving to ascertain the severity of their clinical condition. The primary goal of this assessment is to delve into the historical evolution of Screening Systems in Healthcare. Presently, in Portugal, the Manchester Sorting System stands out as the predominant and widely utilized approach.

**Originality/Value:** The study provides a comprehensive comparative analysis of healthcare screening systems.

**Research Limitations/Future Research:** Future studies could perform other types of analyses. Namely, qualitative ones in which health professionals gave opinions.

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## Поглиблений історичний аналіз систем скринінгу в охороні здоров'я

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**Мета роботи:** Управління, яке забезпечують системи сортування, викликає численні запитання як у медичних працівників, так і у користувачів, що робить його дослідження все більш актуальним. У Португалії служби невідкладної допомоги щорічно обслуговують мільйони людей. Динамічні зміни в наданні медичної допомоги відбуваються дуже часто і залежать від специфіки необхідної медичної допомоги. Таким чином, зміни є постійним елементом у сфері медицини, причому вони відбуваються все швидше і стають дедалі складнішими. У сфері екстреної допомоги сортування є початковим етапом у процесі надання медичної допомоги. Воно вимагає ретельного і скрупульозного підходу – завдання, яке під силу лише досвідченим фахівцям, які належним чином підготовлені до цієї відповідальності. Складний характер сортування підкреслює його ключову роль, яка задає тон усім наступним етапам надання медичної допомоги. Оскільки ландшафт охорони здоров'я продовжує розвиватися, ефективність і точність сортування стають ще більш важливими, що підкреслює необхідність постійного навчання та адаптації серед медичних працівників..

**Дизайн / Метод / Підхід дослідження:** Методика дослідження полягає в ґрунтовному огляді літературних джерел для порівняння різних систем скринінгу в охороні здоров'я, з метою глибшого розуміння поточної ситуації.

**Результати дослідження:** Отримані дані свідчать про те, що система скринінгу є обґрунтованою та корисною. Тим не менш, для підвищення її ефективності та узгодженості потрібні постійні корективи в управлінні послугами.

**Теоретична цінність дослідження:** В роботі досліджено, як системи скринінгу в охороні здоров'я еволюціонували з часом, простеживши їхнє коріння від історичних практик до сучасних технологій. Визначено зміни парадигм у мисленні, політиці та технологіях охорони здоров'я, які вплинули на розвиток систем скринінгу.

**Практична цінність дослідження:** Система скринінгу є життєво важливим процесом, обов'язковим для всіх осіб, які звертаються за допомогою у відділення невідкладної допомоги, і слугує для визначення тяжкості їхнього клінічного стану. Основна мета цієї оцінки – заглибитися в історичну еволюцію систем скринінгу в охороні здоров'я. В даний час в Португалії домінуючим і широко використовуваним підходом є Манчестерська система сортування.

**Оригінальність / Цінність дослідження:** У дослідженні проведений комплексний порівняльний аналіз систем скринінгу в охороні здоров'я.

**Обмеження дослідження / Майбутні дослідження:** Майбутні дослідження можуть включати інші типи аналізів. Зокрема, якісний аналіз, в якому медичні працівники висловлювали б свою думку.

**Тип статті:** Концептуальний

**Ключові слова:** сортування; служби екстреної медичної допомоги; національна система охорони здоров'я, менеджмент в охороні здоров'я, управління скринінгом.

## 1. Introduction

The emergency service stands as the primary point of contact between patients and the healthcare system, facing a rising influx of cases and heightened quality expectations, everything is within the imperative of cost reduction. However, sustaining the system requires a comprehensive approach beyond mere cost containment. Strategies must consider the physical layout of emergency services, accessibility, responsiveness in critical situations, and working conditions – key factors shaping the quality of care and subsequent demand. In this tumultuous setting, effective leadership is paramount. A leader should embody not only character, respect, and justice, but also excel as a manager and communicator, fostering adaptive and expansive learning to enhance care delivery. This study is a continuation of, and complementary to, the research started by *Cunha & Vianna (2023)* entitled “Exploring the Evolution of Screening Systems in Healthcare”.

Emergency services constitute intricate scenarios where diverse diseases and processes intersect (*Yu et al., 2020*). It is crucial to emphasize that these environments demand meticulous control for efficient and effective service delivery. Managing such places is inherently challenging due to overcrowding (*Peng et al., 2019*). This overcrowding correlates with delayed patient treatment, escalating the risk of medical errors resulting from potential mismanagement, ultimately leading to increased mortality.

The prolonged stay of patients and their massive influx contribute significantly to overcrowding, diminishing patient satisfaction and hindering the optimal performance of healthcare professionals (*Peng et al., 2019*). To complicate matters further, the global population is aging, resulting in a higher volume of patients with more severe complaints. Consequently, individuals turn to emergency rooms more frequently (*Yu et al., 2020*), even when their health status might not warrant such immediate attention. This reality underscores the intricate challenges that emergency services face while meeting the evolving healthcare needs of an aging and expanding population.

## 2. Theoretical Background

### 2.1. Screening Methods

When medical care needs significantly exceed available resources, decisions must be made taking into account how these resources will be distributed, recognizing that not all needs will be met immediately. Several terms, including “screening”, “rationing” and “apportionment”, are generally used to refer to the distribution of medical resources to patients in different healthcare settings with “screening” being the most widely used.

The term “triage” derives from the French word *Trier* and means to separate. It was originally used to describe the separation of agricultural products, being associated with the wood industry in the eighteenth century and the separation of coffee beans in the nineteenth century. Currently, screening is used almost exclusively in specific health contexts, consisting of the separation of people not due to the diagnosis but to the prognosis.

The practice of health-related screening arose from the impositions of war and remains closely associated with military medicine. The oldest documented systems date back to the 18th century and were designed to distribute health care among soldiers wounded during the wars. The armies made little effort to provide medical assistance to their soldiers and the care provided was ineffective. Wounded soldiers generally depended on their comrades and most died from war wounds that were not properly treated.

In the 18th century, military surgeons developed and implemented the rules of battlefield triage, the first formal battle triage system was assigned to the French baron and military surgeon Dominique-Jean Larrey, surgeon-in-chief, head of the imperial guard of Napoleon Bonaparte. Larrey recognized the need to promptly assess and categorize wounded soldiers during the battle. His system consisted of treating and evacuating those who required more urgent medical

care rather than waiting hours or days for the end of the battle as it had happened in previous battles.

Based on this assumption, Larrey ended up performing hundreds of amputations on the battlefield while it was at its peak. Always with a well-defined ideology, during this time he designed a modern method of military surgery, created field hospitals and an army ambulance system that he called “flying ambulances”, which served to quickly transport the wounded. In those battles, the treatment of the wounded was provided taking into account their officer rank, giving the priority to the most senior officers and then lower classes. Prisoners of enemies were often sacrificed in light of this paradigm. In the French invasion of Russia in 1812, also known as the Patriotic War of 1812, Larrey adopted a new methodology of intervention and issued a clear rule for classifying patients in need of care. Larrey knew that soldiers with critical injuries had a better chance of survival if they were operated on in the first hour after the trauma occurred. Those with minor injuries had to wait while those with greater severity were soon treated. Soldiers who had less chance of survival were put aside, often with alcohol to comfort them.

In 1846, a British naval surgeon named John Wilson also made a major contribution to military triage, arguing that to make the effort of surgeons in the context of battles more effective, they should focus on patients in need of immediate treatment, since it is likely to be successful, delaying treatment to those whose wounds were less severe. With the outbreak of the civil war in 1861, medical services remained scarce and disorganized, and there was no homogeneous method of screening. The principle was “first come, first served”. After a disastrous first year, mortality decreased considerably when Jonathan Letterman, medical director of the Potomac army, implemented a combination of triage procedures with first-rate medical care and ambulances (*Iserson & Moskop, 2007; Mirhaghi, et al. 2017*). Screening protocols have been improved by military surgeons over time with the aim of improving assistance to the wounded on the battlefield, and it was during the First World War when the term “triage” was officially used for the first time.

The concept of screening was thus associated with scenarios with multiple victims, in which there were situations of exception characterized by inequality between health care needs and the response of services. With the outbreak of the First World War, sorting began to be done by applying the best resources to obtain the best results. After World War II, triage was used to identify fighters who were more likely to return to the battlefield after medical intervention. Sorting has improved over the years but is constantly associated with wars or major disasters, never being applied to the civilian population until the 1960s.

The first systematic description of a hospital triage methodology appeared in 1964, in Baltimore – Beveridge. Later, in 1977, in Australasia, the Box Hill Triage Scale system was developed. This system defined priorities as follows: Immediate, Urgent, Fast, Not Urgent, and Routine.

After 1977, the initial science in this field called the Box Hill Triage Scale system was developed in Australasia. This system elucidated the priorities as follows: Immediate, Urgent, Fast, Not Urgent, and Routine. Later, this screening system, designated Box Hell Triage Scale, went from reading priorities to reading priorities and time, that is, each priority would correspond to a certain waiting time, and this was called the Ipswich Triage Scale. The idea was to establish a link between the priority assigned at the Ipswich Scale and the workload at the Emergency Service. In North America, in 1999, two screening systems gained notoriety, the Canadian Triage Acuity Scale (CTAS - Canada) and the Emergency Severity Index (ESI - USA).

CTAS is based on a list of patients who make complaints with first and second order modifiers for specific conditions. Its main operational objective determines the time for the initial evaluation of the patient by a doctor. Medical care should be performed immediately to level 1, in 15 minutes to level 2, in 30 minutes to level 3, in 60 minutes to level 4, and in 120 minutes to level 5 (*Saswattecha et al., 2017*).

ESI was developed according to five levels. Patients who need immediate interventions and who should be treated as soon as they reach the ED are at level 1. At level 2, there are patients at high risk, who are confused, lethargic, disoriented, with severe pain, distress and highly abnormal vital signs. These should be analyzed in ten minutes. Level 3 is for patients who need two or more resources, that is, they can be diagnosed in terms of laboratory investigations or electrocardiogram. Level 4 is for patients expected to need a resource, and level 5 if no resource is required (Saswattecha et al., 2017). This system has a scale of 0-10 points with distinction of two levels, based on the existence or not of life risk. A specific flow chart for children with fever was also added to ESI (Saswattecha et al., 2017).

With regard to the most widespread sorting systems worldwide, it seems important to mention also the Australasian Triage Scale (ATS) and the Manchester Triage System (STM).

The Australasian Triage Scale or ATS can be divided into primary and secondary screening decisions. Primary screening decisions are based on screening evaluation, assignment of a triage category and patient at the beginning of nursing interventions for emergency care and promotion of patient comfort. Medical care should be given immediately to level 1, within 10 minutes to level 2, within 30 minutes to level 3, within 60 minutes to level 4, and within 120 minutes to level 5 (Saswattecha et al., 2017). In order to improve the functioning of the SU in Portugal, the Manchester Triage System (STM) was implemented by the National Health Service (SNS).

## 2.2. Types Screening Systems

Screening can rely on various considerations, incorporating demographic information, anatomical data, injury mechanisms, physiological parameters, and clinical judgment.

The preferable attributes for an optimal system to assess these considerations encompass rapid execution, ease of comprehension and implementation, reproducibility, dynamism (adapting to evolving time and concepts), and, in the event of catastrophic situations, the capability to forecast final outcomes.

While triage has been evolving over the years, it has steadfastly adhered to its foundational purpose – selecting individuals for treatment in situations where resources are limited, guided by their clinical condition. Currently, the predominant screening systems include pre-hospital screening and hospital screening, with the primary distinguishing factor being the environment in which they are administered. The modernization of triage has not compromised its core principle of prioritizing individuals based on their clinical needs, even in the face of changing methodologies and environments.

Pre-hospital screening systems cover all those in which the screening of victims is carried out outside the hospital, and the best known are incident screening (multi casualty), military screening (Battlefield) and screening in disaster situations (mass casualty). More recently, Telefónica Clinical Triage has been created.

### • Incident Triage (Multi Casualty)

Incident screening is intended to respond to incidents that cause multiple victims, such as rail accidents. In situations where there are several victims it is necessary that pre-hospital emergency professionals identify the most priority to proceed to their transport and immediate treatment. Additional personnel may need to be called in to carry out the initial screening and evaluation of the high number of victims, always taking into account that the less serious may have to wait longer.

### • Military Triage (Battlefield)

Military screening is done by military doctors and patients may or may not be military. In this type of screening, several parameters were initially considered in addition to emergent treatment situations, such as hierarchical position, military mission / strategy, and international laws.

However, surgeon Dominique Jean Larrey, who is considered the driver of modern military triage, subsequently sought to change this ideology, since it was essential to value the triage of the wounded on the battlefield and their rapid transport to a place with surgical capacity, regardless of the rank. In Silva's study (2009), it is mentioned that since the Persian Gulf War in 1991, significant improvements in military screening have been implemented, and victim assessment scales have been used, namely the Revised Trauma Score. This scale is characterized by providing a comprehensive assessment by a medical professional in the field. It is a physiological scoring system with high reliability in predicting death. It is calculated from the first evaluation of the victim using physiological data such as the Glasgow Coma Scale, systolic blood pressure, and respiratory rate. The maximum score is 12, and the lower the score is, the lower the probability of survival, that is, a score of 12 on the scale exposes a mortality risk of less than 1%, 5 of 50% and 1 of 75%, or higher. In the armies of the United States of America (USA) and the United Kingdom, in addition to the Revised Trauma Score, the Sieve and Sort Trauma Scale is also used.

Sieve and Sort screening is based on the principle of “doing the most for the most”. The initial assessment of victims (primary screening) is performed on site and is done according to Sieve screening. Secondary screening of victims occurs when they are evacuated to another location and is done according to Sort screening (Smith, 2012). This scale was used in preparation for the 2010 World Cup in South Africa, adapting to the Major Incident Medical Management and Support System. Also, the North Atlantic Treaty Organization currently uses a system based on military sorting.

This system seeks to identify the injured who can be expected (classified as green), those who are priorities (red and yellow), those who are dead (black) or who are in the state which is so serious that death is expected, and there is an indication of treatment limitation (blue). As an alternative to this color system, there is the denomination by numerical priorities (P1 Immediate, P2 Urgent and P3 Deferred) and by treatment priority (T1, T2 and T3, with the designations described above, respectively).

### • Triage in disaster situations (Mass Casualty)

Screening in disaster situations is designed to be performed when natural or human accidents occur with destructive effects in a particular area or community, such as bomb attacks. In these situations, different screening of incidents is required due to their destructive magnitude. Disaster screening aims to define who will receive treatment or not.

According to Pereira et al. (2017), priority sorting is fundamental to any disaster response system with multiple victims, constituting one of the priorities of a manager who deals with exceptional situations. The most widely used disaster screening system is the Simple Triage and Rapid Treatment (START), largely due to the influence of the USA, which was its major driver. In Portugal, this system is used by the National Institute of Medical Emergency. Developed in the 1980s in California by Hoag Memorial Hospital and the Newport Beach Fire Department, START screening quickly determines the severity of injuries and does not require great diagnostic ability by integrating basic treatment and stabilization procedures. Moreover, this type of screening is easy to learn.

Due to the diversity of sorting methods in disaster situations, there are different systems for identifying the relative priority of victims. These identification systems or Triage tags must have certain essential characteristics for the purpose they are intended. However, it is important to ensure good visibility of the priority / color assigned and, where possible, they shall contain a mechanism enabling the changeover from one priority to another in the upward and downward direction.

The Medical Emergency Triage Tag is the most used model as a reference, either for injuries or in situations with victims poisoned by biological or chemical substances. The response of hospital institutions to exceptional situations also needs to be highlighted. In Portugal, with the planning of the 2004 European Football

Championship, Portuguese hospitals had to develop contingency plans and regional health administrations under the domain of the Ministry of Health developed a specification in which the adoption of mechanisms for sorting compatible priorities was a key aspect. STM was chosen to be an integral part of this planning. In 2007, being aware of the impact of STM on promoting hospital disaster plans, the Portuguese Triage Group (GPT) developed a typified record sheet that became an integral part of the contingency plans of many Portuguese hospitals in the face of catastrophic situations (Yu *et al.*, 2020).

What differentiates all existing pre-hospital screening scales is the most reliable parameters to consider in the evaluation of victims. According to Prasad, Saraswathi & Winson (2019), the motor component of the Glasgow Coma Scale is extremely important while screening pre-hospital priorities, since it is a predictive indicator of mortality, with victims who can fulfill simple orders being separated from the others.

In addition to the previously stated scales, other screening systems are also known, such as: Circulation, Respiration, Abdomen, Motor, and Speech (CRAMS); Triage Index; Revised Trauma Index; Trauma Triage Rule; Trauma Checklist revised Trauma Scale; Revised Trauma Scale and Prehospital Index. All these screening systems are described in the literature, although today they are less used.

- *Clinical telephone screening*

The first clinical telephone screening service created was called “First Help” and was developed in the USA with the aim of addressing the most common acute complaints with users divided into groups (adults, children, women, and mental health people).

In 1984, the first 24-hour counseling line emerged, which later evolved into the first system with computerized protocols (Simões, 2012; Yu *et al.*, 2020). Over the years, information systems have made it possible to develop a powerful form of telephone screening, in which counseling and clinical referral of people were prevalent. In 1999, the National Health Service (NHS) Direct emerged in the UK.

NHS Direct is a helpline run by nurses who provide health information and/or refer people to NHS institutions. In a short time, it was concluded that this line brought gains to health services, reduced costs and consequently decreased the inflow to hospital emergencies. Currently, NHS Direct is considered one of the world’s largest telephone nursing triage services. In Portugal, based on the system set up in the United Kingdom, a Helpline of health also emerged in 1999, whose objective was to respond to difficult access to pediatric care due to excessive inflow to emergency services.

This service was known as “Dof-Dof-Trim-Trim” and it was performed by nurses who, based on telephone requests and assisted in a computer system, determined the most correct routing. Once it became very popular and effective, the Ministry of Health proposed the construction of a care center which would cover the entire Portuguese population. It was 2006 when Health Line 24 was designed, being officially launched in 2007 by indication of the Ministry of Health. According to Simões (2012), Health Line 24 has its origin associated with a private sector insurer, and the contract had an objective to advise and refer people aged between 0 and 15 to the most diverse institutions integrated into the National Health Service (NHS). Currently, this line responds to the entire population. Also, in 2006, the Manchester Triage Group recognized the importance of telephone screening in the second edition of the book *Emergency Triage* (Mackway-Jones, Marsden & Windle, 2006). At that time a project was developed based on the results obtained through face-to-face screening to delineate a telephone screening protocol. The goal was to have the entire hospital emergency network and pre-hospital emergency under the same system, consistently. Thus, telephone screening was born - a new application of STM. In 2009, GPT also valued this aspect and developed its own chapter related to clinical telephone screening in its new manual, and in 2013 it began the validation of clinical telephone screening in a pilot project in the Autonomous Region of the Azores, where it is currently being implemented.

### 2.3. The Manchester Sorting System

As mentioned in the previous chapter, in order to try to improve the functioning of emergency services in Portugal, the National Health Service (NHS) has implemented the Manchester Triage System (STM). This is a screening method consisting of 5 levels of the emergency department that has been continuously developed over the years in the UK and adopted by several countries (Mirhaghi *et al.*, 2016).

STM is based on the approach of an algorithm in which the patient’s complaints are compared with one of the 52 flow diagrams as well as with the main discriminators for each of these diagrams (Mirhaghi *et al.*, 2016). Based on the flow charts, they are considered general discriminators, such as life-threatening conditions and level of consciousness. Then, the selected discriminator identifies a level of urgency. Medical care should be provided immediately to level 1, within 10 minutes to level 2, within 60 minutes to level 3, within 120 minutes to level 4, and within 240 minutes to level 5.

STM establishes, therefore, five categories or clinical priorities assigned during Risk Classification, establishing a color for each of them: red (emerging), orange (very urgent), yellow (urgent), green (little urgent), and blue (not urgent). Each of these categories represents a degree of severity with a respective waiting time for the first medical care.

Among the various systems of Risk Classification recognized worldwide, the Manchester Sorting System has shown a great diffusion, particularly at European level.

According to Stapleton & Degitz (2015), STM has the sole objective of prioritizing users according to their clinical severity. The goal is to triage priorities, that is, to identify criteria of severity in an objective and systematized way, facilitating clinical management of people, and also the service, indicating the clinical priority with which the person should be treated and the respective target time recommended until medical observation.

STM is a powerful tool that promotes equity of access for people to NHS emergency services, consisting of a priority management tool that identifies the clinical priority and the recommended target time until the first medical observation, either in normal operating situations of the ER or in disaster situations. According to Zachariasse *et al.* (2017), STM has the sole objective of prioritizing patients according to their clinical severity in the service. A STM method is based on three principles: the purpose of screening observation in an ER is to facilitate the clinical management of people in parallel with the management of service through the exact allocation of a priority; the screening observation time cannot aim at obtaining a diagnosis if it is not delivered to failure; a priority does not necessarily have to be related to the diagnosis and should reflect a number of aspects of a particular condition presented by the person (Mirhaghi *et al.*, 2017).

This system takes into account the symptomatology of the person and the data collected through possible observations and/ or measurable assessments, and subsequently a clinical priority, not a diagnosis, is assigned. In general, nurses are required to select one of the conditions presented and look for a set of signs and associated symptoms.

Signs and symptoms are a differentiating criterion between clinical priorities and are designated as discriminators and displayed in a flow chart for each condition presented. Discriminators that indicate a higher priority are selected primarily. The methodology of this process is to identify the criteria of gravity inherent to the complaint submitted by the person, to identify and choose the corresponding flow chart (there are 50 possible flow charts, plus 2 related to the disaster), which best suits your complaint, and to answer to one of the questions or discriminators of this flow chart. Questions or discriminators are presented in descending order of priority, that is, the first questions correspond to more serious situations. In this way, the criterion of gravity of a person is recognized through a specific methodology. The discriminators may be specific to the situation in

question (for example: pre-cordial pain) or general (for example: pain, bleeding, state of consciousness, temperature).

Before the identification of the relevant discriminator and corresponding question of the algorithm that has a positive response, the clinical priority and the respective color of identification are determined. Screening ends with the registration of the data and the referral of the person to the specific area of care or waiting, depending on specific indications of each institution. STM has five categories / priorities of urgency, which can be assigned to the person, selecting the respective color to each of them: "Emergent or Red", "Very Urgent or Orange", "Urgent or Yellow", "Little Urgent or Green", and "Not Urgent or Blue". Each of the categories represents a degree of severity and respective recommended waiting time for the person to be submitted to the first medical observation. People with more severe symptoms, soon emerging, in which one of the first discriminators of the flow chart is attributed to red color, have to be provided with immediate care (Davaraani et al., 2014). Very urgent cases receive the color orange with a recommended waiting time of 10 minutes. Urgent cases, corresponding to the yellow color, have a target waiting time of 60 minutes. People who are assigned the color green and blue are less serious cases (little or no urgent, respectively), and should be attended in 120 and 240 minutes, respectively.

All these times are recommended by GPT. In Portugal, with the knowledge and authorization of the Manchester Triage Group, the category "White" was also introduced in 2000 with subsequent revision in 2009 to designate situations that are not related to a clinical complaint and that arise in the emergency service, corresponding to about 5 to 10% of most people (de Triagem, 2005). The inclusion of the color white in STM is a way to identify an organizational dysfunction because it was found that varied people who have nothing to do with the SU come to emergency services. Examples of this are people who are accompanied by the forces of authority for blood collection and determination of alcohol and/or toxic substances, or people who are called for transplantation in hours when the ER is in operation, or even the people who were sent to the ER to monitor the progress of treatment / reassessment instead of being directed to attend their physicians or hospital consultations. It will be easy to see that these people, without any evidence of responsibility for the trip to the ER, could not enter into the hierarchy of care for others with emerging, very urgent, or urgent problems (Coutinho, Cecílio & Mota, 2012; Yu et al., 2020).

(Daoust et al., 2014).

Thus, it was assumed that such cases would be identified by white color. The usual percentage of these people are variable, and in emergency services with a more explicit organization, we can find values in the order of 3%, and such values may amount to higher percentages. This rating does not include any waiting time. More recently, on April 8, 2016, Despacho n.º 4835-A/2016 was published under National Health Plan 2012-2016 (extension to 2020), which defines new criteria for the care of people classified as white in the SU. According to this plan, this service can only be applied in situations that are defined by GPT; the service should not exceed 5% of the global service of these services in 2016 and 2% in 2017; if the percentage referred to above is exceeded, hospital institutions shall implement corrective measures which they consider relevant to meet the objective set. Since 2017, the goal has been to reach less than 2% of people with white color classification, and this criterion is integrated in the process of contracting health care that is implemented in the NHS, associated with the application of penalties under the program contracts established annually between regional health administrations and hospital institutions. Being a risk management instrument, whenever there is a worsening of the clinical situation of the person while waiting for medical observation, this should be retracted by the most differentiated element in priority screening (Daoust et al., 2014).

Corroborating, Azevedo et al. (2013) report that STM provides the retrieval of the person when his or her medical condition worsens while waiting for medical care, and such situations should rank high on the list of priorities. Another important aspect is the

misidentification of a low-level priority, which can cause damage to care for the person due to long waiting time. However, the inappropriate identification of a high priority can increase the waiting time of really urgent cases and also have serious repercussions. According to Souza et al. (2015), one of the parameters used to assess the validity of STM in the studies found was the percentage of patients screened that were above the real priority, called 'overtriage' in the English language, and the percentage of patients screened that were below the real priority, called 'undertriage'. According to the authors, in a study conducted in the Netherlands, the percentage of patients screened with a lower priority than the real were 15%. In the same study, higher than real prioritization occurred in 40% of patients. This is even more relevant when it comes to pediatric screening. Taking into account that hospital emergencies intend to quickly meet all people at risk for their health, the more serious the clinical situation is, the faster these measures should be met (Dallaire et al., 2012; Roaten et al., 2018).

It should be noted carrying out evaluation or screening which allows classifying the severity of the situation of each person. Any decision making has a scientific basis that requires discipline in the application of the screening algorithm, so it should be done by a qualified professional, who, in the case of Portugal, is the nurse under medical supervision. All incorrect acts in the application of the screening algorithm that jeopardize the health of a person are subject to evaluation by GPT as an entity recognized by the Manchester Triage Group and the Ministry of Health (Conforti et al., 2011; Mirhaghi, et al. 2017).

### 3. Conclusion

Presently, the Standardized Triage Method (STM) is regarded as an indispensable tool for the planning and management of emergency services in Portugal. It stands as an excellent indicator for assessing quality and managing clinical risks. The utilization of a standardized nomenclature, common definitions, a robust methodology for tracking, and the implementation of a comprehensive training model contributes to the auditable nature of this method (Azevedo et al., 2018). In an accord acknowledged by the Ministry of Health, the General Health Directorate (GPT) in its protocol with hospitals, adopting STM, commits to conducting internal audits (performed by the hospital itself, adhering to GPT standards) and provides the possibility of external audits (conducted by GPT). The Ministry of Health is kept informed of the audit results (Silva, 2009). Since its implementation, numerous studies have affirmed that STM is a sensitive, reliable, and widely validated instrument, even for pediatric patients. According to Azevedo et al. (2015), assessments of STM reveal that apart from prioritizing patient care, it successfully predicts the progression of patients during their stay in the institution. Dallaire et al., (2012) and Roaten et al. (2018) also note in their study that STM is a crucial tool for distinguishing patients between high risk and low risk of life as well as identifying those who are likely to stay in the hospital for at least 24 hours before being discharged. In a comprehensive literature review conducted by Azevedo et al. (2014) on the effectiveness of STM, researchers concluded that only 2 out of the 22 studies analyzed presented unfavorable results regarding the application of STM. This body of evidence underscores the consistent and favorable outcomes associated with STM in enhancing the quality and predictive capabilities of emergency services in Portugal.

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### 5. Competing interests

The authors declare that they have no competing interests.



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