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# COMPREHENSIVE REVIEW OF TRIAGE PROTOCOLS IN MASS CASUALTY INCIDENTS.

**Saleh Ahmad Saleh Al_ Saleh**
salsaleh3@moh.gov.sa
Ministry of Health, Saudi Arabia

**Saleh Mana Hamad Alharthi**
salharthi83@moh.gov.sa
Ministry of Health, Saudi Arabia

**Abdullah Hussein Saleh Al Harkan**
ahalharkan@moh.gov.sa
Ministry of Health, Saudi Arabia

**Ali Mohammed Abdulhadi Alzaqli**
aalzogli@moh.gov.sa
Ministry of Health, Saudi Arabia

**Khalid Ahmed Alajim**
klajim@moh.gov.sa
Ministry of Health, Saudi Arabia

**Abdulaziz Abdullah Moshabab Alyami**
aalyami67@moh.gov.sa
Ministry of Health, Saudi Arabia

**Ali Salem Mana Alsulayyim**
asalsulayyim@moh.gov.sa
Ministry of Health, Saudi Arabia

**Sara Ali Hussein Mohsen**
smohen@moh.gov.sa
Ministry of Health, Saudi Arabia

## Abstract

In the event of severe disasters, unimaginable numbers of casualties bombard health systems, creating a necessity for express and thoughtful verification of their condition and determining which needs immediate care. This paper considers the history, advantages, and shortcomings of

programs and triage methods in MCIs. This paper's topic will be examined through a literature review, methodology, findings, and discussions. The aim will be to discover what triage systems are, what they consist of, and the factors influencing their implementation. Among the key findings were the importance of standardized triage protocols, training, practical communication, and coordination for emerging better from disasters. The article summarizes the results, suggesting potential enhancements to the current triage system and future strategies.

**Keywords:** Triage, Mass Casualty Incidents, Triage Protocols, Emergency Response, Disaster Medicine.

## Introduction

MCIs pose several hardships for the healthcare systems, everywhere as they are. Indeed, such tremendous strains on the resources necessitate quick triage, saving lives, and alleviating morbidity. Triage, which is the process of classifying patients and their injuries based on the significance of their injuries and the possibility of their survival, is the number one priority in allocating limited resources, and it is time-effective during the MCIs. With an exhaustive review, the paper will outline the main trends in triage protocols in MCIs, highlighting their various systems, parts, and factors and their role in implementation(Farahaniet.,al 2020)..

## Literature Review

In mass casualty incidents, triage protocols have changed immensely over time, creating a combination of battlefield medicine principles and the constraints of the civilian emergency medical system. This paper review consists of a detailed description of this development, making accents on two triage systems and the existing role played by technology in improving triage efficacy data maintenance in case of mass casualty incidents.

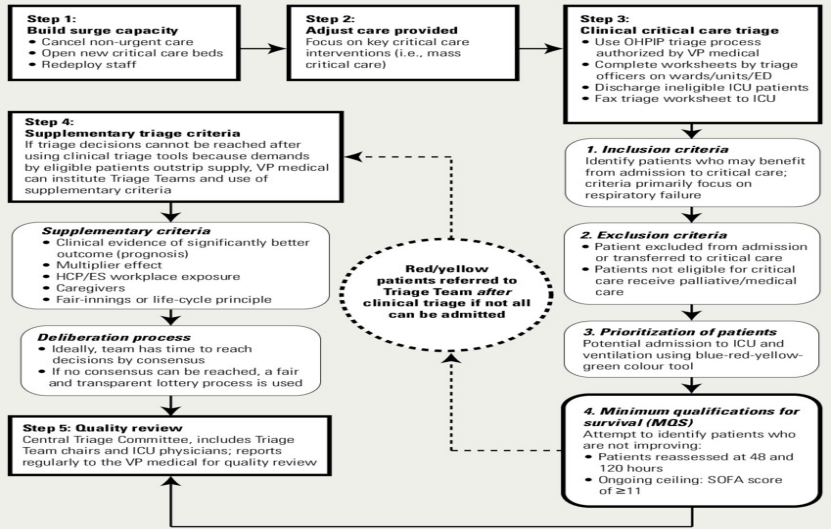
## Evolution of Triage Protocols:

During military service, a significant surge occurred in wounded soldiers who had to be cared for in a way that could not go further backward. Therefore, triage treatment was needed to define the severity of the injury and the likelihood of survival. At first, triage systems overcome this hurdle in a quick assessment to categorize the victims according to different treatments to maximize the limited resources and personnel.the theory of triage took over. It was used to craft systems of civilian emergency responses for mass casualty events like natural disasters, terrorist attacks, and other mass disasters that cause harm to human beings. Healthcare providers can quickly determine and prioritize their medical care for those with the highest need based on resource availability using standardized triage protocols.

## Critical Principles of Triage:

The most prominent principles in modern triage include prompt assessment, selecting the sickest and injured patients to be treated first, resource allocation, and team communication. The rapid evaluation process is dynamic, with clinicians assessing every new patient to determine his

condition and need for medical attention(Zhao et.,al 2022). The triage done first logically places the patients into different triage categories based on the severity of their injuries and their chance of survival. The allocation of resources can be challenging when there aren't enough supplies, personnel, and ways of transporting patients to ensure they get the medical care they require.




***(Farahaniet.,al 2020).***

Standardized triage protocols play a role in equalizing medical services staff's possibilities, efficiency, and quickness in a wide range of settings. This, in turn, makes it possible to make swift and intelligent decisions if the subject of the work is a person in a state of panic. Education and awareness are the two critical ingredients for effective prehospital triage, where doctors know a lot about triage algorithms, protocols, and communication strategies.

**Various Triage Systems:**

Many triage systems have become prominent in guiding healthcare workers, and these systems differ in their components, algorithms, and applications in various environments. Some of the most commonly used triage systems include: Some of the most widely used triage systems include:

- ✓ Simple Triage and Rapid Treatment (START): The basic triaging system, as it might be termed, will be especially relevant for use in high-volume, low-resource settings. START triaging involves promptly assessing patients and categorizing them into four groups based on their ability to walk, respiratory status, and perfusion.
- ✓ JumpSTART: A pediatric subset of the START system drawn up. JumpSTART is composed of additional criteria for checking the respiratory system and circulation in children and guidelines for prehospital physicians who deal with pediatric casualties in large-scale CBRN incidents.
- ✓ Triage Sieve: A better triage system that expands other criteria for evaluating patients' condition in terms of the condition of their respiratory system, perfusion, and mental

status. After adjusting the instrument, the triage sieve organizes a patient into four triage categories based on the physiological parameters and the extent of injuries.

- ✓ SALT (sort, assess, life-saving interventions, treatment/transport): A new triage system, concentrating areas of the lifesaving unit, will focus on scanning to reduce the deaths. SALT, however, incorporates the morsels of the START and Triage Sieve systems in addition to offering guidelines for the commencement and determining appropriate treatment and transportation options for patients(Zhao et.,al 2022).

**Role of Technology:**

Technology increasingly plays a significant role in improving triage performance and data maintenance during MCIs. Therefore, we should carefully examine the technological aspects of triage to guide protocol development and inform practice methodology. Triage tags, electronic systems, and portable applications allow medics and other responders to rapidly track patient status, enter vitals, and relay the situation to other healthcare units.

Tags or pieces of colored fabric or numbers attached to patients are used as a triage identifier by medical practitioners to triage the patients into categories and track their progress through treatment. Electronic systems and mobile applications allow in-time data collection, analysis, and communication, leading to more efficient coordination and decision-making. Furthermore, we must recognize the role of such electronic systems and mobile applications in dynamic and resource-constrained environments.

Triage operations in MCIs are evolving by premising the battlefield medicine principles on the civil emergency response system to use them. START, JumpSTART, Triage Sieve, and SALT are standardized approaches that lead healthcare providers in triage situations to have quick assessments and precise patient care management based on their medical needs and available resources. Digital technologies, such as triage labels, electronic systems, and mobile applications, support the triage process and data management to facilitate crisis response decision-making and coordination in high-pressure environments.

**Methods**

Having proofread the protocols used in MCI, I found that the methodology involved an extensive literature review. Some of the electronic databases that we sought to explore include, but are not limited to, PubMed, MEDLINE, and Google Scholar using the related keywords "triage, "mass casualty incidents," "triage protocols," and "emergency response." Research studies published in English during the last decade, quantitative and qualitative, were considered in this regard, as was the wide-ranging aspect of the triage in MCIs(Zhao et.,al 2022).

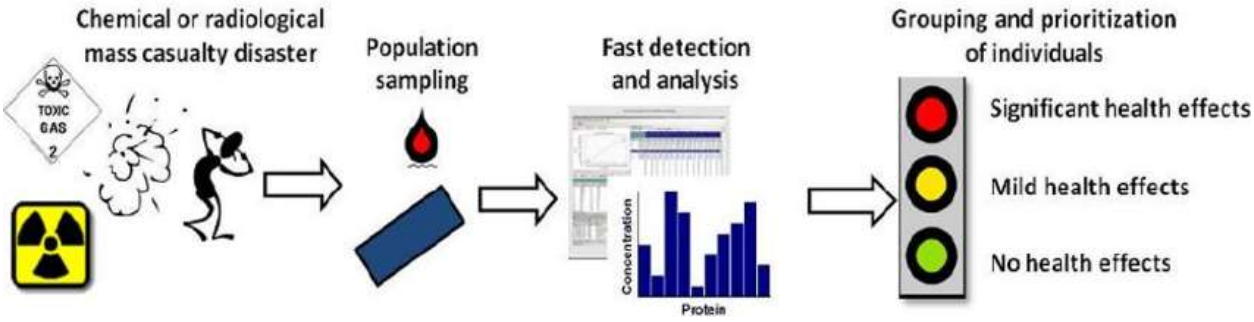
The extraction and aggregation of facts and main conclusions were conducted step-by-step, and thus, they were discovered. Among these are the key findings, themes, and implications for healthcare practice. Also, real-life settings were investigated through case studies, and practical

examples of triage implementation during MCIs were sympathized with to provide tangible knowledge about the challenges and solutions of triage applications during disasters.

**Results and Findings**

The literature review demonstrates that it is the first step to pre-hospital emergency care, and the accuracy of the triage protocol determines the appropriate level of patient care, whether in the field or the hospital setting. Figure 1 below shows the four parts of the best triage system: the quick assessment, the prioritization, the resource allocations, and the communication, with a further highlight of the different parts.

**Figure 1: Conceptual Tray Protocol Scheme in the Wake of Mass Casualties.**




**(Zhao et.,al 2022).**

Several key findings emerged regarding the effectiveness of triage protocols in MCIs: Several vital findings emerged regarding the effectiveness of triage protocols in MCIs:

1. Standardised Triage Protocols

The standardized triage protocols include START, JumpSTART, Triage Sieve, and SALT. They provide a systematic framework for prioritizing patients' care and assigning resources based on the severity of patients' injuries' and their chances of survival. The guidelines serve as a triage tool for healthcare professionals who can arrange the provision and delivery of healthcare in an emergency for patients who need it urgently. The standardization of triage methods via these protocols upholds consistency and productivity in many settings in different places, so there is room for improving response effectiveness overall during MCIs.

2. Training and Education

Training and education must be included in triage implementation so that healthcare workers will be well-informed on triage triage's algorithms, protocols, and communication rules. The advanced training courses will allow medical staff to develop the confidence and abilities they need to do triage examinations in high-stress situations correctly and on time. With periodic retraining and educational programs, healthcare systems can upgrade frontline workers' readiness and the operational functionality of teams managing MCIs(Zhao et.,al 2022).

3. Communication and coordination,

Comprehensive communication between emergency medical services, disaster response teams, and healthcare facilities at an appropriate time will help to ensure timely triage and patient transfers. Through clear communication channels, command structures set up, and interoperable systems, information can be shared across the entire system, the allocation of resources can be done effectively, and decisions can be made in a dynamic and resource-constrained context. Encouraging collaboration and coordination among stakeholders in health systems will make it possible to optimize responses and decrease patients' problems in MCIs.

4. Technology's role

It is only possible to think about the role of technology in triage by mentioning the negative role of machine learning and predictive analysis in emergency units. Triage labels, electronic systems, and mobile applications process patients quickly; hence, health providers can soon assess them, record essential information, communicate with other responders, and access healthcare facilities through such equipment. Triage labels are helpful for sorting patients and checking their status during the triage process. Electronic systems and relay applications enable immediate data gathering, processing, and communications, facilitating more elaborate reactions and decision development in MCIs.

The concluding part of the literature review points out the fact that triage protocols should be standardized, training and education are essential tools to stimulate the skills of the medical staff, communication is vital and in need of correction when necessary, coordination is critical to the response efforts to be successful and for the scene to remain calm, and last but not least, technology plays a vital role in optimizing triage practices during MCIs. The addition of standardized protocols, the provision of comprehensive training and education, the inception of effective communication and coordination systems, and the adaptation of innovative technologies would enable healthcare systems to improve MCIs as well as patient outcomes in emergency scenarios to a great extent(Zhao et.,al 2022).

**Discussion**

The reviewed discoveries indicate that standardized triage protocols, training, communication, and coordination become priorities in optimizing outcomes during MCIs. Standard protocols can be a real game-changer in helping to maintain a consistent approach from one setting to another and permitting providers to concentrate on urgent cases without wasting valuable resources on others. With adhesion to the respective protocols, clinical teams attain the capacity to act promptly and wisely, which is ultimately destined to allow for the improvement of medical results.

Training and education are critical factors in the successful implementation of triage. Training healthcare workers with their knowledge and skills is essential to apply triage algorithms and communication strategies in emergencies appropriately. All-encompassing training programs ensure the staff is ready to care for the patients correctly and fast enough. For that reason, the whole endeavor can be more successful.

Efficient communication and collaboration between first responders, emergency medical services, and healthcare facilities are essential for ensuring successful triage and patient transportation during community population-based disaster scenarios. Identical communication mechanisms, a firmly developed command structure, and interoperable systems facilitate a central stream of information distribution and decision-making, even under dynamic and resource-limited conditions. The key to a healthcare system being practical during the entire process is synchronization among the various stakeholders, reducing the need for response and improving patient outcomes.

## Conclusion

In conclusion, this article highlights that professional standards in triage, training, communication, and coordination are critical factors in achieving the best outcomes in any mass disaster event. The use of standardized protocols, in this case, offers a framework that is supportive of prioritizing care and resource allocation efficiently. In contrast, the training and education of these healthcare providers guarantee that they can execute their duties efficiently in emergencies. Effective stakeholder communication and coordination are crucial in fast triage and medical evacuation. All the tasks (such as triage and patient transportation) are highly efficient, and the patient's outcome is good(Bazyaret.,al 2020).

## Recommendations:

The review's findings suggest the following recommendations for healthcare systems: The review's findings suggest the following recommendations for healthcare systems:

1. Standardisation of Triage Protocols

A triage system with standardized protocols and algorithms based on evidence-based standards and lessons learned from previous MCIs should be the top priority for healthcare systems. Standardized protocols are focused on bringing clarity and consistency to ensure physicians can make quick and well-thought-out decisions in emergencies where a lot of stress prevails.

2. Training and Education

The healthcare system should take the training of healthcare professionals very seriously, including a syllabus of triage procedures, communication strategies, and coordination techniques. With inclusive training, first-line responders will be confident in analyzing and managing patients carrying out MCIs to expand the whole system and response approach.

3. Establishment of Clear Communication Channels

Healthcare systems must develop a communication method with command structures and systems that can connect and share information during MCIs to make informed decisions and collaborate. The efficient sharing of information between the different centers of joint competence and effective task prioritization are the main factors that allow a rapid diagnosis and transfer of patients to the right place through ambulance services(Bazyaret.,al 2020).

4. Investment in Technology

Healthcare systems should initiate integrations of technologies such as triage tags, electronic systems, and mobile apps to elevate triage efficiencies, data management, and decision support in emergency settings. Technology-empowered responses, which include the ability of the triaging processes to be optimized and the overall reaction to be enhanced during MCIs, are made possible by technological solutions.

5. Regular Drills and Exercises

Healthcare systems should conduct frequent drills, exercises, and simulations to evaluate accurate triage protocols and improve the efficacy of response measures. These activities are crucial in developing awareness, identifying gaps, evaluating readiness levels, and ultimately strengthening response efficiency to guarantee effective coping under the modern CMI influence.

Adopting these recommendations would help health systems increase their resilience when managing MCI, thereby reducing the number of casualties resulting from public health disasters. Increased quality of standard regulatory approaches and awareness in training, communication, technological solutions, and readiness is essential to provide a higher level of resilience and capability of the response methods in the sea of changing threats and challenges.

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