The term triage means to sort or select. EMS and other healthcare providers use the principle of triage at different times for a variety of reasons during the provision of emergency care. Examples range from determining whether an injured patient needs the resources of a trauma center to identifying which emergency department patient needs to be placed in a treatment room first. During a mass casualty incident, triage decisions must be made more rapidly; EMS providers have less time to gather information and decide who to treat first. Further, the emphasis shifts during a mass casualty incident from ensuring the best possible outcome for each patient, to ensuring the best possible outcome for the greatest number of patients. Military organizations were the first to develop the concept of mass casualty triage and these concepts have been adopted for use in the civilian setting.\(^1,2\)

Mass casualty triage occurs when there is more than one casualty and the available resources require a provider to initiate care for one patient over another. In a synthesis of available evidence, Frykberg found that during mass casualty incidents there is an almost linear relationship between over-triage and poor patient outcome.\(^3\) This finding indicates that the methods used to prioritize victims of a multicasualty event for treatment and transport may have a significant effect on patient outcome.

**TRIAGE CATEGORIES**

The goal of mass casualty triage in the prehospital setting is to prioritize patients for treatment and/or transport. Most triage systems accomplish this by placing patients in one of five categories: immediate, delayed, minimal, dead, or expectant. Immediate casualties, typically designated by the color red, are those who need immediate medical attention due to an obvious threat to life or limb. Patients in this group can include those who are unresponsive, or have altered mental status, respiratory distress, uncontrolled hemorrhage, amputations proximal to the elbow or knee, sucking chest wounds, unilateral absent breath sounds, cyanosis, or rapid weak pulses. Delayed casualties, typically designated by the color yellow, are those in need of definitive medical care, but should not decompensate rapidly if care is delayed initially. Examples of patients in this group include those with deep lacerations with controlled bleeding and good distal circulation, open fractures, abdominal injuries with stable vital signs, or hemodynamically stable head injuries with an intact airway. Minimal casualties are typically designated by the color green; these patients have self-limited injuries and can tolerate an extended delay in treatment without increasing their risk of mortality. These patients have minor injuries such as abrasions, contusions, and small lacerations. Their vital signs are stable, and while they require medical attention, it can be delayed for days if necessary without any adverse effect. Dead casualties, typically designated by the color black, have no respirations following basic airway maneuvers. The final category, expectant, is not used in some triage systems. Expectant casualties have little or no chance for survival despite maximum therapy. Initially, resources should not be directed toward this group as they will be needed to care for patients who...
are more likely to survive. As the event progresses and resources become available, attempts should be made to resuscitate these casualties and/or provide them with comfort care.

**TRIAGE SYSTEMS**

A recent review of existing triage systems conducted by a multidisciplinary panel sponsored by the Centers for Disease Control and Prevention (CDC) identified nine existing mass casualty triage systems, including two pediatric-specific systems. These systems include Simple Triage and Rapid Treatment (START), JumpSTART, Homebush, Triage Sieve, Pediatric Triage Tape (PTT), CareFlight, Sacco Triage Method (STM), military triage, and the Italian CESIRA (Coscienza, Emorragie, Shock, Insufficienza respiratoria, Rotture ossee, Altro) protocol. These systems have been described in detail in other works, and are relatively similar in that most use a four- or five-category scheme (described above) that is grounded on basic physiologic criteria. A notable exception is the STM, which uses a proprietary computer-based algorithm to generate a numeric treatment priority score based on physiologic criteria and available community resources. Several secondary triage tools, such as Secondary Assessment of Victim Endpoint (SAVE) triage and System of Risk Triage (SORT), also exist. These systems allow responders to further prioritize patients once they have been placed in the five groups.

**START TRIAGE**

In the United States, the START method is likely the most widely used method of mass casualty triage among first responders. This algorithm, used for the triage of adult multicasualty patients, is based on respiratory function, quality of perfusion, and mental status (Figure 1). JumpSTART is similar to START but is intended to be used to triage child casualties.
(Figure 2). Once patients are triaged and sorted using START, life-saving treatments are administered as needed. Casualties are loaded onto appropriate vehicles as they become available and transported to hospital facilities in the area.

**MASS TRIAGE**

The MASS (Move, Assess, Sort, Send) triage system, as presented in the National Disaster Life Support suite of courses, allows the use of any triage categorization system while providing guidance on the process of evaluating patients at the scene. This system recognizes the need for an initial global sorting of patients prior to individual assessment. This is done in the move stage by asking ambulatory patients to go to a specific location and then asking those who cannot move to wave. The rescuer then heads first to patients who are not moving or waving to conduct an individual assessment. The individual assessment is used to categorize patients, who are then sorted into categories to stage for transport. Once this process is complete, patients are sent to an appropriate receiving facility.

**SALT TRIAGE**

The recent CDC-sponsored project recognized that there is a need for a national guideline for mass casualty triage, as disasters frequently cross jurisdictional lines involving responders from multiple agencies. A systematic review of the identified triage systems was undertaken to evaluate the scientific basis of each system. The panel found that there was insufficient evidence to support any one system over the others, and in fact, indicated that there are essentially no meaningful data to support preference for any existing system. Using aspects of all identified systems that were supported by the best available evidence and expert opinion, the panel developed a proposed national triage guideline called SALT (Sort, Assess, Life-saving interventions, Treatment and/or transport) triage (Figure 3). SALT triage was developed as an all-hazards mass casualty initial triage standard for all patients (adults, children, and special populations). The concept has been endorsed by the American College of Emergency Physicians, American College of Surgeons Committee on Trauma, American Trauma Society, National Association of EMS Physicians, National Disaster Life Support Education Consortium, and State and Territorial Injury Prevention Directors Association.

SALT begins with a global sorting of patients to prioritize them for individual assessment. Patients who are capable are asked walk to a designated area, and these patients are assigned last priority for individual assessment. Those who remain are told to wave and are observed for purposeful movement. Those who do not move and those with obvious life threats (e.g., uncontrolled hemorrhage) are assessed first since they are the most likely to need life-saving interventions.

Individual assessment begins with limited rapid life-saving interventions, which include the following:

1. Controlling major hemorrhage through the use of tourniquets or direct pressure provided by other patients or other devices

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**JumpSTART**

![JumpSTART Algorithm](attachment:JumpSTART_Algorithm.png)

**FIGURE 2. JumpSTART Algorithm.** AVPU scale: alert, voice, pain, unresponsive (used to determine patient’s level of consciousness by EMS responder).
2. Opening the airway through positioning or basic airway adjuncts and, if the patient is a child, giving two rescue breaths.
3. Chest decompression for suspected tension pneumothorax.
4. Auto-injector antidotes when indicated.

These interventions are performed only if they are within the scope of practice of the responder providing triage, and if necessary equipment is immediately available.

Next, patients are prioritized for treatment and/or transport by assigning them to one of five categories: immediate, delayed, minimal, expectant, or dead. The mnemonic ID-MED is a simple reminder of the triage categories. Patients with mild injuries that are self-limited if not treated and who can tolerate a delay in care without increasing their risk of mortality are triaged as minimal and designated with the color green. Patients who are not breathing even after attempted life-saving interventions are triaged as dead and designated with the color black. Patients who do not obey commands, lack a peripheral pulse, are in respiratory distress, or have uncontrolled major hemorrhage are triaged as immediate and designated with the color red. However, if any of the immediate patients have injuries that are likely to be incompatible with life given the currently available resources, they are instead triaged as expectant and designated with the color gray. The remaining patients are triaged as delayed and designated with the color yellow.

**TRIAGE TAGS**

Once a patient has been assessed and assigned a prioritization category, a means of rapidly identifying the patient’s category is useful. This is traditionally done using commercially available triage tags. Tags come in a variety of designs. Regardless of the type of tag, it should allow for bidirectional changes in triage category as the patient’s clinical condition changes (either worsens or improves). If tags are not available, a marking pen can be used to identify the assigned triage category on each patient’s forehead. Alternatively,
casualties can simply be physically placed in separate locations based on the triage category to which they have been assigned.

**AFTER INITIAL TRIAGE**

It is important that casualties be re-triaged at each phase and level of care and whenever clinically and tactically allowable, because the initial triage category may change as clinical status changes. The prioritization process should be considered dynamic, and may be altered by changing patient conditions, resources, and scene safety. In general, treatment and/or transport should be provided for immediate patients first, followed by delayed patients and then minimal patients. Expectant patients should be provided with treatment and/or transport when resources permit. Efficient use of transport assets may include mixing categories of casualties and using alternate forms of transport, so rules for transport order should not be unduly restrictive. A system for communicating with destination hospitals and dividing patient volume according to their capabilities is also critical.

**CONCLUSION**

Triage is an important aspect of scene management during a mass casualty incident that, if done properly, may have a positive effect on patient outcome. Standardization of triage across jurisdictional lines is also desirable for a unified response. This chapter provides a triage methodology that was developed based on a systematic review of the literature. This methodology has been endorsed in concept by multiple professional organizations for the standardization of mass casualty triage. As the body of scientific evidence continues to grow in the area of mass casualty triage, this evidence should be further integrated into this triage methodology.

**REFERENCES**