

The JumpSTART® Tool For Pediatric MCI Triage

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Disasters large and small frequently include pediatric victims. When faced with multiple victims or mass casualties, emergency medical services (EMS) and even emergency department personnel must be prepared to triage victims of all ages in order to assure that limited resources are allocated in the most efficient and effective manner. Primary triage, usually performed at the incident site, is a very rapid objective sorting of victims into priority categories based on physiologic threats. Each individual is triaged without regard to the status of other victims. Secondary triage is a more subjective phase that includes consideration of the detailed patient assessment, mechanism of injury and overall numbers and acuity of other victims.

The most commonly used objective primary mass casualty incident (MCI) triage system in the United States is START (Simple Triage And Rapid Treatment), developed by the Newport Fire and Marine Department and Hoag Hospital in Newport Beach, California. START has also been adopted for use by agencies outside the United States. The START system triages victims into four categories: red is critical, yellow is delayed, green is ambulatory and black is dead or expected to die. The assessment is based on a sequential analysis of the ability to ambulate, presence/absence of respirations, respiratory rate, capillary refill and ability to obey simple commands. All patients who can walk are advised to clear the scene and walk to a designated area for secondary triage. All are initially triaged in the green category, so designated by a triage tag or a green ribbon tied around a wrist. Apneic patients are triaged in the black category if they do not start to breathe after upper airway positioning. These patients undergo no assessment for sustained circulation. An apneic patient who starts to breathe after upper airway positioning is triaged into the red category. Other red category indices are: a respiratory rate $> 30/\text{min}$, capillary refill > 2 seconds and the inability to obey simple commands. A nonambulatory patient with a respiratory rate of $= 30$, a cap refill of $= 2$ seconds and the ability to obey commands is triaged into the yellow (delayed) category. In essence, this means they can't walk but have adequate respirations and circulation and a neurological status that allows the patient to protect his/her own airway.

The developers of START determined they would recommend use of their system for patients who weigh 100 pounds or more. They state they never intended it for use with pediatric victims. When the EMS agencies in the Miami-Dade metropolitan area decided to use START as a unified MCI triage system, I recognized it had several pitfalls that might result in both under- and over-triage of children and so developed JumpSTART as a parallel algorithm for pediatric victims. JumpSTART may be best used in conjunction with START but can also act as a stand-alone pediatric system. JumpSTART not only sets objective criteria based on a range of pediatric "normals" but also helps to assure that children will be triaged more by the head and less by the heart. Providers of all levels readily admit their tendencies to "go the extra mile" for children. Many providers have told me they would simply "make all the kids reds," thereby potentially consuming resources that might be more effectively assigned and potentially exposing children to unnecessary painful and traumatizing interventions. In addition, providers have admitted their hesitance to leave a child for dead under almost any circumstances. An objective system takes the personal responsibility for making that decision away from the triage officers, thereby easing some of the guilt and preventing resource consumption in fruitless resuscitation efforts. I recommend that the transition from JumpSTART to START be somewhere in the teenage years. Ages and weights may not be easy for triage officers to judge. Triage "adult sized" teens with START and smaller teens with JumpSTART.

The JumpSTART algorithm (see Figure) parallels the START algorithm. The triage officer first instructs all who can walk to move to a designated area for secondary triage. Some children may be developmentally unable to walk (due to age or disability) or carried by their ambulatory guardians. These children should be triaged as soon as possible at the green rendezvous point using the JumpSTART algorithm. At that time, children meeting red criteria should be transported to the on-scene treatment area. Children who meet yellow criteria should be assessed briefly for obvious or suspected external or internal injuries. Those with such injuries are classified as yellow (and moved

to the treatment area) and those without may be classified as green.

Triage continues with the officer moving to the closest victim. As with START, he/she looks for spontaneous respirations. If present, the respiratory rate is assessed. If the child is apneic, the officer positions the upper airway. If no breathing ensues, JumpSTART deviates from the START algorithm to include a pulse check.

Cardiopulmonary arrest in children most often stems from primary respiratory failure. Children may have a "window of salvage ability" in which the patient is apneic but circulation is still present because the heart muscle has not yet failed due to anoxia. In JumpSTART, the apneic patient without a peripheral pulse is tagged in the black category. Those with a peripheral pulse are given the "jumpstart" of five mouth-to-barrier ventilations. This is a lower airway-opening maneuver similar to the jaw-thrust or head-tilt, chin lift used to open the upper airway. Those who remain apneic after the ventilatory trial are tagged black. Those who start to breathe are tagged red and the triage officer *moves on to the next patient*. They must not stay to continue to treat the child or they are defeating the purpose of the triage officer.

For those patients with initial spontaneous respirations, the algorithm continues in parallel with START. Note the respiratory rate parameters (15-45/min) incorporate not only the normally higher rates of children but also reflect the significance of slow rates. The combined respiratory rate parameters for both systems can be remembered as increments of fifteen (15-30-45). Palpation of peripheral pulses takes the place of capillary refill, which is very dependent on environmental temperature and the rescuer's ability to see the refill. For the neurological assessment, the widely recognized AVPU (Alert, Verbal, Pain, Unresponsive) assessment replaces ability to obey commands, which may be dependent on both the child's developmental and emotional status. Patients with response levels from alert to appropriate response to pain (localization of painful stimulus and localized reaction) are deemed capable of protecting their own airways and are tagged yellow. Those with inappropriate (generalized) response to pain, posturing or no response are tagged red.

The JumpSTART algorithm satisfies a number of needs. It provides a physiology-based, age-appropriate primary triage tool for children. Any tool that enhances any component of triage enhances the entire triage process and appropriate resource allocation for all victims in the MCI. JumpSTART also addresses the emotional issues common to EMS providers with regard to children. Its objectivity helps to exclude emotions from the triage process and helps to shield the provider from the emotional consequences of such an extremely stressful mission. The system matches START's goal of triaging each victim within a 30 second time frame and requires only one addition to the triage officer's equipment, in the form of a barrier device for ventilation. JumpSTART closely parallels the most widely recognized adult triage system, minimizing problems in initial training and skills retention. JumpSTART was developed for use in the field but can also be used by emergency department personnel for primary triage of self-referred victims in mass casualty incidents.

JumpSTART has been well received nationally, thanks in large part to support from federal and state emergency medical services for children (EMSC) programs. It is currently being taught in at least nine states and is mandated in three states. Israel will be considering adding JumpSTART to its national protocols. JumpSTART has been included in several course curricula, including the Pediatric Disaster Life Support course and the core curriculum for the National Disaster Medical System. JumpSTART will very likely be added to the curriculum of the CDC-sponsored First Responder training program for underdeveloped EMS systems internationally. A training video is available through the EMSC National Resource Center (www.ems-c.org). I would be pleased to provide further information, including PowerPoint presentations, to anyone interested. Please call me at (305) 261-5835.

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JumpSTART Triage

