

# Pediatric Disaster Triage: Doing the Most Good for the Most Patients in the Least Time

## Revised Audio Script

### Course Introduction

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#### Audio Track 1 (Slide 1):

Hello. I'm Mark Cicero, a pediatric emergency medicine physician, and on behalf of the Pediatric Research in Disaster Education Research Network, I would like to welcome you to Pediatric Disaster Triage: Doing the Most Good for the Most Patients in the Least Time. This online training is sponsored by the Emergency Medical Services for Children Program, and has received support from the National Association of State EMS Officials.

#### Audio Track 2 (Slide 2):

A few things to keep in mind when navigating this course:

At the bottom of the screen is the navigation bar. The bar indicates your location within the course. At any time, you can pause the course by clicking the "Pause" button. Click the "Pause" button a second time to continue the course.

A Table of Contents is accessible on the top left hand side of the screen. A "Table of Contents" button is also located on the bottom right hand side of the screen next to the navigation bar. The Table of Contents allows users to move between different sections of the course.

This course is designed to run automatically. However, certain sections of the training will require user interaction. When this occurs, you will see "Interface" buttons appear on the screen, prompting you to answer a question or to reveal additional information or hints about a specific topic. The course will automatically pause until you have completed the user interaction request. Once completed, the course will continue to run automatically.

At the end of the training, you will have the opportunity to assess your knowledge of course content. After completing the Post-assessment, a "Certificate of Completion" will be generated that you can print as proof of course completion.

#### Audio Track 3 (Slide 3):

For pediatric disaster triage or multiple patient incident triage the guiding principle is "To do the best [pause] for the most [pause] using the least."

Today, we will learn how to recognize a disaster or multiple casualty event. We'll discuss disaster triage rational and how disaster triage is complicated by having child victims or a mix of child and adult victims.

We'll review four disaster triage methodologies that are commonly used in the United States. These include the JumpSTART algorithm, Smart, SALT, and clinical decision-making. We'll also consider some special triage situations, such as children with head injuries and children with special health care needs. And, finally, we'll discuss the importance of preserving the family unit during triage.

## **Model One: Defining A Disaster**

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### **Audio Track 4 (Slide 4/Module One Cover Slide):**

How do we define a disaster, and what separates it from day-to-day practice?

### **Audio Track 5 (Slide 5):**

A disaster is an event that overwhelms medical resources. Three terms are sometimes used to describe a disaster based on the number of patients who are in need of care.

1. A MPI or **multiple patient** incident involves up to 25 patients. This is a major medical event and more likely to occur than larger scale events. Although smaller, it will overwhelm day-to-day available resources and certainly call for a heightened response by both pre-hospital professionals and by receiving facilities.
2. An MCI or **mass casualty** incident involves 25 to 100 patients.
3. And a true disaster is an event that has more than 100 patients. Hurricanes, earthquakes, commercial airline crashes, and acts of major terrorism often fall under this category.

### **Audio Track 6 (Slide 6):**

Let's take a minute to test what you've learned so far. Using your mouse or keypad, select the correct number of patients that are involved in each major event type. Then click "Submit." When completed, click the "Next" button and the training will automatically resume.

## **Module Two: Disaster Triage Rationale**

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### **Audio Track 7 (Slide 7) /Module Two Cover Slide):**

What are some guiding disaster care principles that can be followed to ensure that front-line health care providers do their best for the most with limited time and resources?

### **Audio Track 8 and 9 (Slide 8):**

When we think about disaster care, two general principles come to mind. The first is scene assessment. Click on each tab below to learn more about the three

steps to scene assessment. When complete, click the “NEXT” button and the training will resume automatically.

The first step to assessing the scene is to identify ongoing hazards. For example, was a hazardous material part of the disaster – a chemical spill, the use of a biological weapon, less likely, but possible, the use of a dirty bomb or other radiological attack? The safety of you the responder and the safety of people who are not yet victims, but potential could be, is critical.

Second, estimate the number of patients, the age of patients, and the general needs of the patients. Often, first reports of events are vague and estimates of the numbers of patients may be grossly overestimated or underestimated. Estimating the number of victims, and thinking about the number of adults, the number of children, and if possible, the number of people with special health care needs can help identify the pre-hospital response and which receiving facilities would be appropriate. Will patients be taken to a children’s hospital, hospitals with burn facilities, and/or hospitals with intensive care units?

Third, determine if the current available resources are sufficient, and if not, what additional resources are needed? Consider the need for additional ambulance companies to transport patients, the need for additional police to help with crowd control and traffic direction, and the need for the control of hazardous materials. Should local emergency management and disaster authorities be contacted?

### **Audio Track 10**

**Click Me statement:** The request for addition resources prior to triage assessment is in the best interest of both the response team and more importantly the patients. I often think of this as the equivalent of calling 911 at the very beginning of a resuscitation event.

### **Audio Track 11 (Slide 9):**

The second general principle of disaster care is triage assessment. Triage is the rapid **sorting** of victims based on the severity of their illness or injury and on the likelihood of them benefiting from the expenditure of scarce resources. Initial or **primary** triage allows everyone to be seen once, briefly, to determine who gets treated first and who needs to be transported. Triage is not the actual **treatment** of patients.

Assumptions are: medical resources are overwhelmed and additional resources will eventually become available.

### **Audio Track 12**

**Click Me statement:** Triage in a disaster setting may be quite difficult. It may happen outdoors and there may be ongoing hazards.

### **Audio Track 13 (Slide 10):**

Perhaps the simplest way to begin sorting victims of disasters – whether they be children or adults – is to sort people by their ability to walk or move. A simple technique to sort multiple victims quickly is to say, “If you can hear me and you're able to, walk over here.”

This may quickly sort out large number of patients or may show you there are a lot of victims that cannot walk or obey commands. Alternately, some triage systems or algorithms ask for all victims to move their limbs because the ability to move the limbs also means a lot about their perfusion, breathing, and circulation.

**Audio Track 14 (Slide 11):**

Most triage sorting systems used in the U.S. utilize a color-coded system. Patients who are the most ill and injured, and who are likely to benefit from the expenditure of scarce resources, are triaged category Red. Patients are triaged Yellow when they have a potentially life threatening illness or injury; however, the severity of their illness or injury is felt to be a situation that can wait for an hour to up to four hours.

Patients are categorized Green when they are ambulatory or are able to move in a developmentally appropriate way. A patient who is walking or moving their arms or legs means they are perfusing their brain. Their heart is working. They're breathing. Their muscles are working. These are patients who are the least ill and injured.

A category that is especially difficult to discuss, especially when we are discussing children, are those patients who are deceased or non-recoverable. Depending on the triage methodology used, some triage systems call these patients category Black for deceased and some Blue for deceased or non-salvageable.

**Click Me statement:** It is important to note that many victims in disasters who are initially triaged category Green or who self extricate themselves before being triaged, may transport themselves to the hospital. Complicating the situation is when these Green patients are the first to arrive at the hospital and the hospital becomes bogged down by lower acuity patients just as sicker patients are transported by ambulance to the hospital.

**Audio Track 12 (Slide 12):**

There are three basic tenets of the color-coded triage system. Click on each tab below to learn more about each. When complete, click the “NEXT” button and the training will resume automatically.

First, once a patient is categorized, stop evaluating and move to the next victim. For example, if a patient is found to be triaged category Red because they are tachypneic they become no more Red by virtue of having difficulty with circulation. If the patient is a Red, you stop. If they are triaged category Yellow or

Green there is no further need for triage, and the same is true if the patient is categorized Black.

The second principle is that a minimum amount of treatment is provided during initial triage. Airway maneuvers, chin tilts, jaw thrusts, and five rescue breaths are common treatments in most triage systems. Some algorithms also address active blood loss that puts a patient at danger for severe volume loss. The goal is to triage a patient in up to 30 seconds or less.

A final general principle of triage is that once **ALL** patients are assigned to a color-coded category in **primary** triage, **secondary** triage begins. During secondary triage, responders re-evaluate patients to determine if they should be moved to a different category.

Have any patients who were initially triaged category Yellow decompensated and now need a higher level of care? Have any patients improved? Have available resources changed, and if so, how does this affect the care of your patients? For patients who were initially triaged category Black, they should be reassessed after the Red patients have been treated.

**Audio Track 13 (Slide 13):**

Let's take a minute to test what you've learned about basic triage principles. You come upon an accident involving multiple casualties, using your mouse or keypad, drag and drop the steps provided below into their proper sequence, then click "Submit." When completed, click the "Next" button and the training will automatically resume.

**Module Three: Pediatric Disaster Triage Considerations** 

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**Audio Track 14 (Slide 14)/ /Module Three Cover Slide):**

When disaster strikes it will likely involve child victims. What should health care providers consider and plan for prior to a mass casualty or disaster involving children?

**Audio Track 15 (Slide 15):**

When we think about the challenges that are specific to children and disasters, keep the following in mind. Kids don't always follow commands. They may actually hide from rescuers or may be too scared to respond to a rescuer's question or instructions, such as "Can you move your arm or foot?" or "Where does it hurt?"

Children also respond differently to injury and illness than do adults. For example, a heart rate of 120 is quite fast for an adult but is normal for a child who is in preschool or younger. Likewise, apneic children are more likely to have primary respiratory issues than adults.

You should also consider developmental issues. Children may have pre-existing conditions, such as asthma, which can complicate the triage process.

Some children, especially toddlers, may wander away either before or after initial triage. They will need dedicated supervision to ensure their safety. Injured children may be extricated by parents or other caregivers who are less injured or ill. This can delay triage and treatment.

**Audio Track 16 (Slide 16):**

Let's take a minute to test what you've learned so far. Read the question provided below and, using your mouse or keypad, select the correct answer. Then click "Submit." When completed, click the "Next" button and the training will automatically resume.

No Voice Over:

When responding to an event involving multiple child and adult victims, what should the primary triage officer do? (Choose all that apply.)

- A. Immediate triage and treat the children first, starting with the youngest victims.
- B. Send all children to a safe area away from the scene to be triaged separately.
- C. Quickly assess the scene to determine the number of child victims and notify medical control and/or local disaster authorities of the need for additional pediatric resources.
- D. Ask parents and/or adults who are ambulatory to transport all children to the nearest medical facility as quickly as possible.
- E. Work with non-medical bystanders to help keep child victims from wandering off and from causing further damage to themselves and others.

Answer: C and E. Before beginning the triage process, it is important to assess the scene to determine the number, the age, and the needs of all victims, including pediatric patients. It is also important to identify potential hazards that could further harm victims. Children will need additional supervision to prevent them from entering any dangerous areas.

OR

True or False. Child victims respond differently to illness and injury than do adults due to their unique physiology. As such, disaster triage personnel should immediately treat pediatric triage patients while performing primary triage?

Answer: False. Minimal treatment is provided to patients, including pediatric victims, during primary or initial triage. JumpSTART, SMART, and Start triage systems limit treatment options to airway maneuvers, chin tilts, jaw thrusts, and five rescue breaths.

## Module Four: Common Triage Methodologies (Use Branching) ---

### **Audio Track 17 (Slide 17)/ /Module Four Cover Slide):**

In this next section, we will discuss four commonly used triage methodologies: JumpSTART, SALT, Smart, and clinical decision-making. You may choose the methodology of most interest to you by clicking on its name or click "NEXT" to learn more about all four triage methodologies.

### ***START/JumpSTART Branch (Audio Tracks 18-20, Slides 18-20)***

JumpSTART is one of the most commonly used tools specifically for the triage of children in the multi casualty/disaster setting. It was developed in 1995 to parallel the structure of the START system, the adult MCI triage tool.

START stands for "Simple Triage And Rapid Treatment." The algorithm applies the same principles previously discussed in this training. Responders must determine if the child or adult is ambulant? Do they have a clear airway? Are they breathing? What is their circulation like? And, finally, JumpSTART considers disability and mental status.

Let's take a closer look at the JumpSTART algorithm. If the patient looks like a child, use JumpSTART, and if they look older, use the START algorithm. For example, if it is a male with facial hair or a female with breast development, use START.

The first step in triaging all patients is to ask those who can walk to move to a designated area. Those patients that can walk move on to secondary triage.

If the patient is unable to walk, the next consideration is to determine if the patient is breathing. If the patient is not breathing, we reposition their airway. If the patient begins to breath, they are triaged category Red. If an older child/adolescent does not begin to breath after airway repositioning, triage category Black.

If the patient is a **child** and he or she does not begin to breath after airway reposition, we look for a palpable pulse? If the child didn't respond to airway repositioning, and has no pulse, then the patient is consider deceased, triage category Black.

If the child does have a palpable pulse and is still not breathing, we move on to five rescue breaths with a simple mouth shield or mask. If the child then begins to

breath, he or she is triaged category Red. If the patient is still not breathing after giving five rescue breaths, even if the patient has a palpable pulse, the victim is triaged category Black.

If the patient was breathing initially and required no airway repositioning the next thing we look at is whether the patient is breathing fast. In JumpSTART, the normal range for respirations is 15-45 per minute. If the child has respiratory rate that is slower or faster than that, he or she is triaged category Red.

If, however, the respiratory rate falls within the normal range, we move on to circulation, assessing the child's palpable pulse. If there is no palpable pulse in this breathing patient, categorize Red. If the patient does have a palpable pulse, move on to AVPU, the scale JumpSTART uses to determine whether a patient is alert or responsive to voice.

If the child is alert or appropriately responsive to pain, triage category Yellow. In contrast, patients who are only responsive to pain, or who are truly unconscious are triaged category Red.

**Click Me statement:** Preferred locations to assess the pediatric pulse include: the carotid, femoral, or brachial arteries.

### ***SALT Branch (Audio Tracks 21-25, Slides 21-25)***

The SALT triage system, which stands for "Sort, Assess, Life Saving Interventions, and Treatment/Transport," begins by using voice commands to globally sort patients into three groups. The goal of Global sorting is to quickly prioritize patients for individual assessment.

As you approach a scene with multiple patients, start by saying, "Everyone who can hear me and needs help, move to some designated area." Those who are able to move are then grouped and will be the last priority for individual assessment.

Next, identify non-ambulatory patients who can follow commands or are making purposeful movements by saying "If you need help, wave your arm or move your leg and we will be there to help you in a few minutes." Those who are moving purposefully are prioritized second for individual assessment.

Casualties are now prioritized for individual assessment. Priority one are patients that are still, and those with obvious life threat. Priority two patients are waving or making purposeful movements. And, Priority three patients are walking.

The next step as part of triaging the individual is to provide life saving interventions, such as controlling major hemorrhage, opening the airway, applying chest decompressions, and, in the case of a chemical or nerve agent



attack, injecting antidotes. If you are treating an apneic child, consider giving two rescue breaths.

The SALT system categorizes patients into one of five groups: Red or Immediate, Yellow or Delayed, Green or Minimal, Grey or Expectant, and finally Black, the patient is already dead.

Those patients with serious, life threatening injury are tagged Red. The patient is breathing, but is unable to obey commands or move. Additionally, peripheral pulse(s) may be absent or the patient may be experiencing symptoms of respiratory distress. If you can say “no” to any of the following listed, but the patient is likely to survive given available resources, then the patient should be tagged Red.

The key factor between tagging these patients Red or Grey is the consideration of current resources. Red tagged patients are likely to survive with the resources currently available to them and Grey tagged patients are not likely to survive.

A Yellow or Delayed tagged patient has a serious injury – for example, a long bone fracture – however, care can be delayed without increasing morbidity or mortality. These patients are breathing, have a peripheral pulse, and are able to follow commands or move. Patients with green tags have minor injuries, such as abrasions, minor lacerations, or in the case of a chemical or nerve agent attack, a mild runny nose.

### ***Smart Branch (Audio Tracks 26-31, Slides 26-31)***

The Smart triage system is contained in a red zippered pouch. It affixes to a person’s belt with Velcro and when unzipped reveals the triage equipment inside. For adults and adolescents, triage is carried out using a triage card, which can be found inside and is attached by an elastic band. For children, triage is carried out using a length-based tape.

When triaging adults, the basics of the Smart algorithm includes quickly sorting ambulatory victims. Those that can walk are triaged category Green. If not ambulatory, assess the patient’s respiration, perfusion, and motor skills, in that order, to determine if the patient should be categorized Yellow, Red, or Black.

For example, if the patient is not breathing, does the patient respond to airway repositioning? If yes, triage category Red. In Smart, those who have a respiration rate greater than 30 are also triaged category Red.

A patient should be categorized Yellow if the patient is breathing, has a respiration rate less than 30, a capillary refill under two seconds, and obeys simple commands such as squeeze my hand or blink your eyes.

When triaging children, the Smart system uses a length-based tape that is placed next to the child's head and then unrolled along the child's body. Where the feet align on the tape indicates which triage algorithm to use.

The Smart system uses three separate algorithms for children: one for infants that are between 50 to 80 centimeters in length or 3 to 10 kilograms in weight, one for toddler and pre-school sized children, and one for children between 100-140 centimeters in length or 19 to 32 kilograms. Remember, you don't need to worry about calculating the height or weight of the child since this is a length-based system. The tape also considers pediatric physiology, such as varying heart rates and respiratory rates.

***CDM Branch (Audio Tracks 32-34, Slides 32-34)***

Scene assessment and triage is certainly a daunting task for any pre-hospital provider. Those providers that rely on clinical decision making to triage children and adults must draw from their previous training and education, and from their experience and the experience of their colleagues.

For purposes of this training, clinical decision making is the process by which health care providers determine who needs what, when without the support of a triage methodology, such as Smart, JumpSTART, or SALT. There is no evidence that any of these systems work, or alter patient outcomes.

Did you know that medical literature exists to support the use of clinical judgment as a valid way for medics to make decisions about categorizing child and adult disaster victims.

No Voice Over: add reference

The literature also suggests that standardized tools or algorithms may not improve triage decisions in the field.

No Voice Over: add reference

**Audio Track 35 (Slide 35):**

Let's take a minute to test what you've learned so far. Read the questions provided and, using your mouse or keypad, select the correct answer. Then click "Submit." When completed, click the "Next" button and the training will automatically resume.

No Voice Over:

Which of the four triage methodologies discussed in this training is specifically designed for children?

Answer: JumpSTART. The JumpSTART Pediatric MCI Triage Tool is the first objective tool developed specifically for the triage of children in the multicasualty/disaster setting.

**Audio Track 36 (Slide 36):**

Using any one of the triage methodologies discussed in this training, determine the color-coded category for the following patient:

An 8-year-old patient is brought to a field hospital 30 minutes after an earthquake with 20 others. He is unable to walk. The child moans when asked questions. He has a respiratory rate of 60, which is abnormal for a child his length and his age. He has no obvious injuries; however is tachypneic for an unclear reason. His triage category is?

Answer: Red. It is important to note that recent research has found that this patient would be categorized Red regardless of whether the JumpSTART or SMART algorithm is used. If used correctly, both the JumpSTART and SMART methodologies produce the same triage category results.

## **Module Five: Special Pediatric Triage Considerations**

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**Audio Track 36 (Slide 36)/ /Module Five Cover Slide):**

Pediatric disaster triage training would not be complete without considering children with special health care needs, children with head injuries, and the importance of preserving the family unit.

**Audio Track 37 (Slide 37):**

Children with special medical or physical needs have a wide variety of illnesses and injuries and they are as wide and varied as children in general. These children may have physical, developmental, behavioral, or emotional conditions. They may have difficulties with their senses, including hearing, seeing, and speaking. They may be dependent on technology.

It can be especially difficult for responders to separate out those children who have new illnesses and injuries from those that have chronic medical problems when they are amidst a group of other disaster victims.

**Audio Track 38 (Slide 38):**

When it comes to children with special health needs, remember that you're local triage algorithm still applies. If there is a chronic non-ambulatory patient who has no problem with airway, breathing, and circulation, this patient is still triaged to the Green area. Those children who are technology dependent, who are on ventilators, may be more reasonably placed into a Red or Yellow triage category.

**Audio Track 38 (Slide 38):**

Another special triage condition to consider is children with head injuries. Head injuries carry a special risk for children because the skull is a rigid enclosed space. Brain swelling that accompanies head injury increases risk of intracranial hemorrhage and cerebral edema.

**Audio Track 39 (Slide 39):**

To assess a child's brain function, we think about the AVPU mnemonic. Children who are "alert," children who are not initially alert but responsive to "voice," children who are only responsive to "pain," and finally those children who are truly "unconscious."

Children who are alert and appropriately responsive to pain may be less critically ill than those who are unconscious or only inappropriately responsive to pain. Some triage systems consider these, others don't. It is important for all to know that head injuries carry special risks for children.

**Audio Track 40 (Slide 40):**

Preserving the family unit during disaster triage is often difficult to do. One thought is to send the entire family to the triage color-coded area appropriate for the most ill or injured family member. However, the preservation of the family unit may not be possible if someone is particularly ill or injured.

This is an important psychological consideration for pediatric disaster triage. Separation from parents and siblings greatly increases anxiety of child and parents.

**Audio Track 41 (Slide 41):**

Communities best prepared are those with well-established disaster plans that address family triage situations. Disaster plans should also include reunification strategies that incorporate tracking systems to assist families in locating loved ones.

**Audio Track 42 (Slide 42):**

Let's take a minute to test what you've learned in this module. Listen to the scenario provided and, using your mouse or keypad, select the correct triage category for the patient. Then click "Submit." When completed, click the "Next" button and the training will automatically resume.

A 16-year-old boy is a victim of a school bus roll over. He is rocking back and forth, laying on the ground, refusing to get up. A teacher comments that the child has autism. His left arm is bleeding and he has a bruised and swollen left ankle. He is initially mute, then starts yelling "My foot hurts! Why did this happen? His vital signs are normal. His triage category is?"

No Voice Over:

Answer: Yellow. This child should be triaged Yellow even though he has a special health care need. He is alert and moving, and has normal vital signs. His bleeding arm and swollen ankle do not need to be treated immediately.

**Audio Track 43 (Slide 43):**

Here is a child who has had a serious head injury. He is unconscious. He was hit in the head by debris from an earthquake. He is in a room full of injured children, and not breathing. You reposition his airway and he still doesn't breathe. His triage category is?

If in this scenario the boy begins to breathe after airway reposition. His triage category is?

**Audio Track 44 (Slide 44):**

Let's consider this family triage case study. Two parents and their three-year-old child are on a bus that has crashed. The parents are walking, but have bruises and minor lacerations, and the mom has a broken forearm. The child has a hematoma of the scalp and is unresponsive, although breathing. In this situation, the child requires a higher level of care than the parents, and most likely would be triaged Red or Immediate.

Should the parents be triaged to the same color-coded location and then treated at the same receiving facility?

No Voice Over:

Answer: Yes. It is important to recognize that parents will not want to be separated from their child. Whenever possible, the parents should be triaged and transported to the same location as their child.

## Course Summary

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**Audio Track 45 (Slide 45):**

In summary, it is reasonable to say that children will be victims in most foreseeable disasters. Disaster scene assessments must include the identification of and the anticipated needs for child victims. Triage strategies should address the unique needs of children, keeping in mind that this vulnerable population responds differently to illness and injury than do adults due to their unique physiology. JumpSTART, SALT, and Smart, three of the four triage methodologies reviewed in this course, specifically address these physiological differences. JumpSTART is the only triage methodology currently in use that was specifically designed for the pediatric patient. It is also important to note that

recent research on JumpSTART and SMART suggest that the same color-coded category will be assigned to a patient no matter which of the two triage methods are used.

Children with head injuries and children with special health care needs will complicate the triage process and plans should be in place to meet the needs of these special conditions. Preserving the family unit during triage is something every disaster plan should address. If the family cannot be kept together during triage or is transported to different receiving facilities than plans should be in place to track their whereabouts to facilitate reunification.

**Audio Track 46 (Slide 46)**

Thank you for your participation in this course. Please click the “Post-assessment” button to measure your knowledge of course content. After completing the assessment, a “Certificate of Completion” will be generated that you can print as proof of course completion.