



WELCOME



Teaching Mass Casualty Triage: Implementing the New MUCC Instructional Guidelines

EMS FOCUS

Today

- ▶ Importance of using evidence-based triage systems during mass casualty incident response
- ▶ What educators need to know about the model uniform core criteria
- ▶ Lessons learned during the implementation of the new MUCC EMS instructional guidelines

Today's Speakers

- ▶ E. Brooke Lerner, PhD, Professor, Department of Emergency Medicine
 - ▶ Medical College of Wisconsin
- ▶ Kandra Strauss-Riggs, MPH, Education Director
 - ▶ National Center for Disaster Medicine and Public Health
- ▶ Leaugeay Barnes, MS, EMS Faculty
 - ▶ Kapi'olani Community College

Developing a National Guideline for Mass Casualty Triage

E. Brooke Lerner, PHD
Professor of Emergency Medicine
Medical College of Wisconsin

EMSFOCUS

Conflict of Interest

- ▶ No financial conflicts related to this material

The Mass Casualty Triage Project

- ▶ Started in 2006
- ▶ Part of CDC sponsored:
 - ▶ Terrorism Injuries: Information Dissemination and Exchange (TIIDE) project
- ▶ Effort to develop national guideline for mass casualty triage



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Project Goal

- ▶ Review available evidence on mass casualty triage
- ▶ Develop a position paper on a national standard for mass casualty triage



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Workgroup

- ▶ ACEP
 - ▶ Eric S. Weinstein
- ▶ AMA
 - ▶ Phillip Coule
 - ▶ Ray Swienton
- ▶ ACS-COT
 - ▶ Jeffrey Hammond
 - ▶ Jeffrey Salomone
 - ▶ Eileen Bulger
 - ▶ Sharon Henry
 - ▶ Howard Taekman
- ▶ NAEMT
 - ▶ Greg Lord
 - ▶ David Markenson
- ▶ NAEMSA
 - ▶ Teri Sanddal
- ▶ NAEMSP
 - ▶ David Cone
 - ▶ E. Brooke Lerner
 - ▶ Robert O'Connor
 - ▶ Richard Schwartz
 - ▶ Ian Wedmore
 - ▶ Jason Lui
- ▶ NASEMSO
 - ▶ Wayne Misselbeck
 - ▶ Nick Nudell
 - ▶ Joseph Schmider
- ▶ Federal Partners
 - ▶ Jon Krohmer, DHS
 - ▶ Tasmeen Singh, EMSC
 - ▶ Gamunu Wijetunge, NHTSA
 - ▶ Bob Bailey, CDC
 - ▶ Rick Hunt, CDC
 - ▶ Scott Sasser, CDC
 - ▶ David Marcozzi, ASPR

Compared Existing Systems

- ▶ For each triage system assembled:
 - ▶ Research evidence
 - ▶ Practical experience
- ▶ Compared features of each system
- ▶ Reviewed by consensus

Best Comparison Evidence Identified



- ▶ Garner 2001
- ▶ Comparison of START, Sieve, Care Flight
- ▶ Sensitivities 45-85%
- ▶ Specificity 86-96%
- ▶ Care Flight did the best
- ▶ Done in the ED non-MCI conditions
- ▶ Used a resource use criteria to determine accuracy

Comparative Analysis of Multiple-Casualty Incident Triage Algorithms

Alan Garner, MSc*
 Anna Lee, MPH, PhD**
 Ken Harrison, MBRBS*
 Carl H. Schultz, MD†

Study objective: We sought to retrospectively measure the accuracy of multiple-casualty incident (MCI) triage algorithms and their component physiologic variables in predicting adult patients with critical injury.

Methods: We performed a retrospective review of 1,144 consecutive adult patients transported by ambulance and admitted to 2 trauma centers. Association between first-recorded out-of-hospital physiologic variables and a resource-based definition of severe injury appropriate to the MCI context was determined. The association between severe injury and Triage Sieve, Simple Triage and Rapid Treatment, modified Simple Triage and Rapid Treatment, and CareFlight Triage was determined in the patient population.

Triage System Comparison

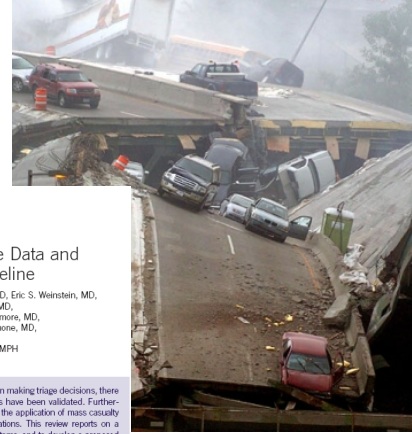


- ▶ Comparison Grid
 - ▶ Coding
 - ▶ Parameters for categories
 - ▶ “Pre-dead” therapy
 - ▶ Who can use
 - ▶ Cost
 - ▶ Training time
 - ▶ Validation
 - ▶ Key Differences
- ▶ Found many common features

System	Coding	Status Assigned Based on	Permitted Therapies Before Assigning to Dead Category	Comments
Simple Triage and Rapid Treatment (START) ⁵	Immediate: red Delayed: yellow Walking wounded: green Deceased: black	Immediate: respiratory rate >30, slow capillary refill, or cannot follow commands Walking wounded: able to walk Deceased: not breathing after 1 attempt to open airway Delayed: all other patients	1 attempt to open the airway through positioning	1. Modified version replaces capillary refill with no palpable radial pulse
Jump START ⁶	Immediate: red Delayed: yellow Minor: green Deceased: black	Immediate: respiratory rate <15, >45, or irregular; or no palpable peripheral pulse; or inappropriate posturing or unresponsive (P or U on AVPU scale) Delayed: unable to walk, regular respiratory rate 15-45; and palpable peripheral pulse; and A or V on AVPU scale Minor: able to walk Dead: not breathing after 1 attempt to open airway and 5 rescue breaths	Open the airway using basic positioning. If there is still on breathing and there is a palpable radial, give 5 rescue breaths Reassess after immediate and delayed children have been taken care of	1. Developed for pediatric patients 1-8 y old 2. Developed to parallel structure of START triage system 3. If a child is carried to ambulatory area he or she should be first child assessed in that area 4. Has modification for non-ambulatory children

Consensus

- ▶ Did not find overwhelming evidence supporting any system
 - ▶ Most systems had identified weakness
- ▶ Developed new system using best of all systems



REVIEW

Mass Casualty Triage: An Evaluation of the Data and Development of a Proposed National Guideline

E. Brooke Lerner, PhD, Richard B. Schwartz, MD, Phillip L. Coule, MD, Eric S. Weinstein, MD, David C. Cone, MD, Richard C. Hunt, MD, FA-CEP, Scott M. Sasser, MD, J. Marc Liu, MD, Nialah C. Huskell, NREMT-P, CCEMT-P, Ian S. Wiedmaier, MD, Jeffrey Hammond, MD, MPH, Eileen M. Bulger, MD, Jeffrey P. Salomone, MD, Teri L. Sanddal, BS, NREMT-B, Graydon C. Lord, MS(c), NREMT-P, David Markenson, MD, FAAP, EMT-P, and Robert E. O'Connor, MD, MPH

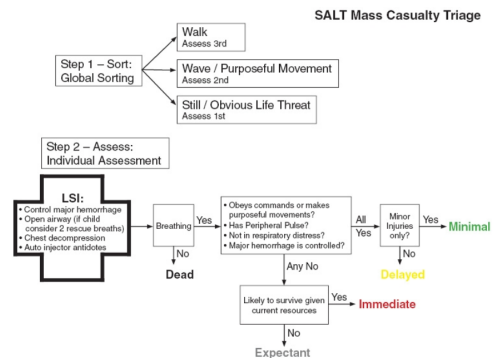
ABSTRACT

Mass casualty triage is a critical skill. Although many systems exist to guide providers in making triage decisions, there is little scientific evidence available to demonstrate that any of the available systems have been validated. Furthermore, in the United States there is little consistency from one jurisdiction to the next in the application of mass casualty triage methodology. There are no nationally agreed upon categories or color designations. This review reports on a consensus committee process used to evaluate and compare commonly used triage systems, and to develop a proposed national mass casualty triage guideline. The proposed guideline, entitled SALT (Sort, assess, life-saving interventions, treatment and/or transport) triage, was developed based on the best available science and consensus opinion. It incorporates aspects from all of the existing triage systems to create a single overarching guide for unifying the mass casualty triage process across the United States. (Disaster Med Public Health Preparedness. 2008;2(Suppl 1):S25-S34)

Key Words: triage; trauma and injury; emergency medical services

SALT Triage

- ▶ Sort – Assess – Life Saving Interventions – Treatment and/or Transport
- ▶ Simple
- ▶ Easy to remember
- ▶ Group large numbers of patients quickly
- ▶ Applies rapid lifesaving interventions early
- ▶ All hazards
- ▶ All populations



SALT Triage

- ▶ Concept endorsed by:
 - ▶ 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
 - ▶ State and Territorial Injury Prevention Directors Association

Special FOCUS

SALT Mass Casualty Triage

Concept 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

It is recognized that there is a need for a national standard for mass casualty triage, because disasters frequently cross jurisdictional lines involving responders from multiple agencies. After reviewing all of the existing triage systems, a consensus review panel found that there was insufficient evidence to support 1 system over the others. Using aspects of the various systems and based on best available SALT T

be asked to walk to a designated area and should be assigned last priority for individual assessment. Those who remain should be asked to wave (ie, follow a command) or be observed for purposeful movement. Those who do not move (ie, are still) and those with obvious life-threatening conditions should be assessed first because they are the most likely to need life-saving interventions (Box 1).



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What Went Wrong?

- ▶ Not enough organizations involved
- ▶ Representatives did not actually have the power to make decisions on behalf of their organizations
- ▶ We made a new thing
- ▶ It was a start

Model Uniform Core Criteria

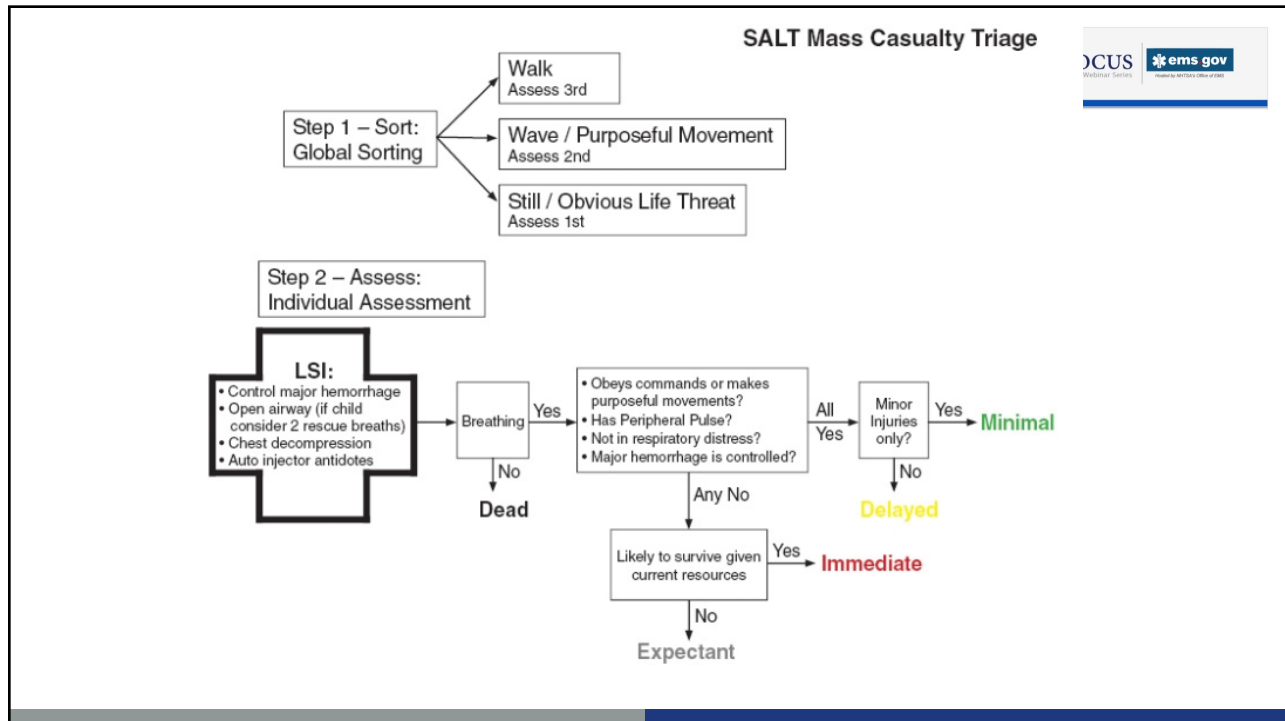
- ▶ Yes that spells MUCC
 - ▶ Involve more stakeholders
 - ▶ Create a check list rather than a system
- ▶ Like cardiac arrest treatment
 - ▶ ILCOR – consensus on science = MUCC
 - ▶ AHA – treatment guidelines = SALT

Workgroup

- ▶ Expanded to 30 members
 - ▶ Prior members
 - ▶ Representatives from more organizations
- ▶ Review science again and develop list of recommended criteria
- ▶ Identified key components, a triage system should include to meet the national guideline
- ▶ Allow flexibility and innovation in triage systems while still creating interoperability
- ▶ Foundation SALT Triage

Sample Criteria

Criteria	Basis	Used by Other Systems	Relevant Literature
3.1 Lifesaving interventions are considered for each patient and provided as necessary, prior to assigning a triage category. Patients must be assigned a triage category according to their condition following any lifesaving interventions.	Indirect Science	Yes	(Bellamy 1984; Baker 2004; Krugh, Walters et al. 2008; Krugh, Littrel et al. 2009; Krugh, Walters et al. 2009)
3.2 Lifesaving interventions are performed only if: (1) the equipment is readily available, (2) the intervention is within the provider's scope of practice, (3) they can be quickly performed (i.e., less than a minute), and (4) they do not require the provider to stay with the patient.	Consensus		
3.3 Lifesaving interventions include the following: control of life threatening external hemorrhage, opening the airway using basic maneuvers (for an apneic child consider 2 rescue breaths), chest decompression, and auto injector antidotes.	Science		Hemorrhage: (Bellamy 1984; Bellamy, Pedersen et al. 1984; Brodie, Hodgjets et al. 2007; Lee, Porter et al. 2007; Doyle and Taillac 2008; Krugh, Walters et al. 2008; Krugh, Littrel et al. 2009; Krugh, Walters et al. 2009) Chest Decompression (Barton, Epperson et al. 1995; Eckstein and Suyehara 1998; Davis, Pettit et al. 2005) Airway: (Bellamy 1984) Auto injector antidotes: (Okumura, Suzuki et al. 1998; Baker 2004)



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Broader Endorsements

- ▶ Endorsed by
 - ▶ American Academy of Pediatrics
 - ▶ American College of Emergency Physicians
 - ▶ American College of Surgeons – Committee on Trauma
 - ▶ American Trauma Society
 - ▶ Children's National Medical Center, Child Health Advocacy Institute, Emergency Medical Services for Children National Resource Center
 - ▶ International Association of Emergency Medical Services Chiefs
- ▶ National Association of County and City Health Officials
- ▶ National Association of EMS Physicians
- ▶ National Association of State EMS Officials
- ▶ National Disaster Life Support Education Consortium
- ▶ National EMS Management Association
- ▶ Society for the Advancement of Violence and Injury Research
- ▶ Concurrence by:
 - ▶ HRSA/MCHB Emergency Medical Services for Children Program

Making It a Thing

- ▶ Dr. Hunt felt strongly that NGO's had to endorse before federal agencies considered it
- ▶ Grass root efforts were initiated (bottom up)
 - ▶ Textbook chapters, training courses, local and state initiatives
- ▶ FICEMS considered and released implementation plan (top down)

What's Next?

- ▶ MUCC
 - ▶ Build the science
 - ▶ Sustain the process so it improves
- ▶ The rest of the event
 - ▶ MUCC addresses ONLY the first level of sorting
 - ▶ Probably a very short part of the response
 - ▶ For example, it does not address:
 - ▶ Transport priority
 - ▶ Resource allocation
 - ▶ Population based triage

Kandra Strauss-Riggs, MPH

Operations Director

National Center for Disaster Medicine and Public Health

Disclaimer



- ▶ The views expressed are those of the speaker and do not reflect the official policy or position of the Uniformed Services University of the Health Sciences, the Department of Defense, or the United States Government

National Center for Disaster Medicine & Public Health



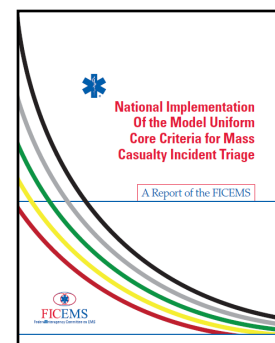
- ▶ **Mission:** To improve our Nation's disaster health readiness through education and science.
- ▶ **Vision:** The NCDMPH will be the Nation's academic center of excellence leading domestic and international disaster health education and research efforts. In collaboration with partners, we create and translate science and education to improve readiness.

Center Overview and History

- ▶ Founded: 2008 under HSPD 21 to be “... an academic center of excellence in disaster medicine and public health...”, and “...shall lead Federal efforts to develop and propagate core curricula, training, and research related to medicine and public health in disasters.”
- ▶ The National Center is listed as an implementing organization in the National Health Security Strategy 2015-18, and has an important role to play in implementing Strategic Objective 4 – Enhance the integration and effectiveness of the public health, healthcare and emergency management systems.

FICEMS MUCC Implementation Plan

- ▶ Approved December 2013
- ▶ Strategy One: Support the education of EMS personnel, system leaders, clinicians and others on triage protocols that are MUCC compliant
- ▶ Action Steps: I.I DOT/NHTSA should create an addendum to the Instructional Guidelines of the National EMS Education Standards that outlines the MUCC principles and enables educators to instruct students on the use of triage systems that are MUCC compliant and consistent with State and local practice (2013-2014)



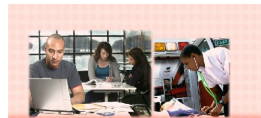
Instructional Guidelines



NATIONAL EMERGENCY MEDICAL SERVICES
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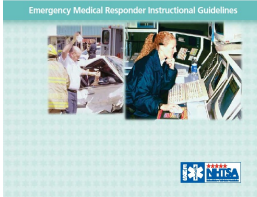
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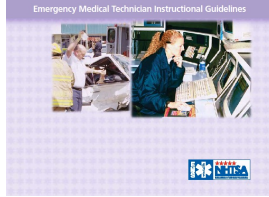
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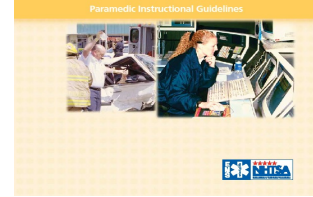
Emergency Medical Responder Instructional Guidelines



Emergency Medical Technician Instructional Guidelines



Advanced Emergency Medical Technician Instructional Guidelines



Paramedic Instructional Guidelines

Addendum Creation

- ▶ NCDMPH and NHTSA created the addendum and convened experts to review, recommend piloting
- ▶ Sabina Braithwaite
- ▶ Art Cooper
- ▶ Brooke Lerner
- ▶ Juan March
- ▶ Gregg Margolis
- ▶ Ray Mollers
- ▶ Mike Stern
- ▶ Mike Touchstone
- ▶ Jolene Whitney

Oklahoma Pilot

- ▶ Seven formal MUCC addendum deliveries to:
 - ▶ EMT Classes (Tulsa Community College)
 - ▶ Paramedic Classes (Tulsa Community College)
 - ▶ Police Officer Training
 - ▶ Firefighters Conference
 - ▶ School Administrators

Oklahoma Pilot Cont.

- ▶ Very positive feedback from instructor and students
- ▶ Adapted the Addendum into a presentation for clear content delivery
- ▶ Created a table top exercise to implement MUCC utilizing 16 cases

Leaugeay C. Barnes, MS, NRP, NCEE, FP-C
Faculty, Kapi'olani Community College

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Implementation

- ▶ Partnership between TCC and TPD allowed us to implement within the EMT and paramedic education programs as well as in a real world environment with police officers.
 - ▶ Anthony First with TPD was instrumental in the development and instruction of the content
 - ▶ Provided a short PowerPoint - MUCC in a Nutshell!
 - ▶ Utilized a table top exercise to allow practice
- ▶ These tools were later successfully utilized to train new nursing students for a multi-agency airport exercise done in Hawai'i every 3 years for airport accreditation

Why MUCC?

- ▶ There are numerous triage systems in use across the country (SALT, START, Etc...)
- ▶ The implementation and interpretation of these systems can vary greatly even between neighboring agencies
- ▶ Most current triage systems were never meant to be used in the austere environment

What is MUCC (not)?

- ▶ MUCC is NOT a new and separate triage system
- ▶ MUCC is not to be used for individual patient assessment
- ▶ It is hoped that MUCC will standardize the various systems being used across the country

How MUCC was Born

- ▶ MUCC is a collaborative effort between federal public safety entities, experts, committees, and others
- ▶ The principals of MUCC rely on evidence and research

One Size Fits All

- ▶ Your triage method must be applicable to all ages and populations of patients

Any time, Any place

- ▶ You must be able to apply your triage system to a wide variety of multiple casualty incidents in which the patients are at a single location

KISS

- ▶ Your triage system must be easy to remember and easy to apply by all levels of responders

Danger Zone!



- ▶ Your triage system must be rapid to apply and practical in the austere (hostile) environment

Semper Gumby – Always Flexible



- ▶ All triage systems are resource dependent
- ▶ Your system must be flexible enough to change as your resources change
- ▶ It must allow for the changing of patient categories
- ▶ Your system must require that patients be reassessed when possible and that their category reflect any changes

Tag'Em!

- ▶ Your system must require that each patient be visibly marked and their category be easily recognizable (tags, wraps, etc...)

Appendix A: Diagram of SALT and Tables Detailing MUCC

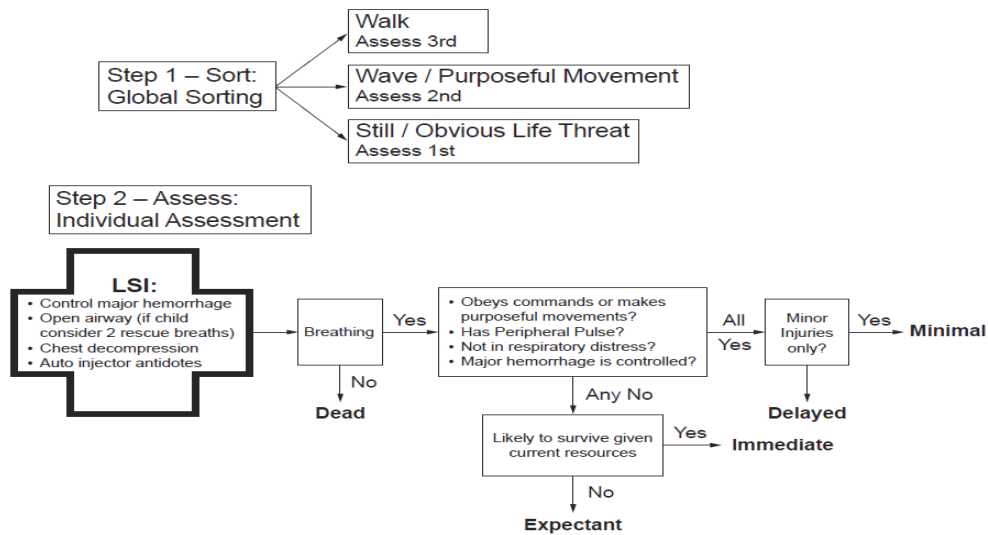


Figure 2: The Sort-Assess-Lifesaving Interventions-Triage/Treatment (SALT) Triage System

LSI= Lifesaving intervention

1. Global Sorting

- ▶ Global sorting refers to initial efforts to sort out large numbers of patients and identify those requiring life saving interventions (LSI)
 - ▶ Your first on-scene units usually initiate global sorting
- ▶ Instructions to patients should be easy to understand and follow:
 - ▶ LSI- red patients
 - ▶ Those with purposeful movement- yellow patients
 - ▶ Those who can move themselves and follow commands- green patients

2. Individual Assessment

- ▶ Occurs **AFTER** global sorting
 - ▶ Employs yes and no responses rather than vital signs/ assessments
- ▶ Patients are sorted into one of five categories
 - ▶ Red- immediate
 - ▶ Yellow-delayed
 - ▶ Green- minimal injuries
 - ▶ Expectant- incompatible with life with current resources
 - ▶ Black- deceased
- ▶ Patients are reassessed and categories changed as appropriate

Life-Saving Interventions (LSI)

- ▶ LSI must be performed before assigning to a category
 - ▶ LSI should last no longer than 1 minute
 - ▶ LSI must be within the provider's scope of practice
 - ▶ LSI should be performed only if equipment to do so is readily available
 - ▶ LSI must not require a responder to stay with the patient
- ▶ If a patient does not respond to an intervention they are assigned-
expectant
 - ▶ Resuscitation and comfort care can be provided as resources dictate

LSI Procedures

- ▶ Controlling gross hemorrhage
- ▶ Basic airway maneuvers
 - ▶ Apneic children may be provided 2 rescue breaths
- ▶ Chest decompression
- ▶ Auto-injector antidotes

Table Top Exercise

- ▶ Tulsa Cohorts:
- ▶ Participants were each given a list of patient scenarios and asked to perform the process and categorize each
- ▶ Group discussion
- ▶ Hawai'i Cohorts:
- ▶ Participants were placed in 4 groups to simulate airport exercise
- ▶ Group 1 & 2 provided global sorting and categorization
 - ▶ Paper men with scenarios on each
- ▶ Group 3 & 4 reassessed and re-categorized each patient
- ▶ Role reversal
- ▶ Discussion

Outcomes

- ▶ Very successful in both locations
- ▶ Paramedic and EMT students performed correctly most of the time with no more than 1 patient incorrectly identified
- ▶ Police officers performed correctly 100% of the time
- ▶ Nursing students in two cohorts performed correctly most of the time with no more than 1 patient incorrectly categorized which was correctly re-categorized during the individual reassessment phase
- ▶ Nursing students were asked where they learned to triage at the exercise where other healthcare professionals and students were participating

Q/A

For more information about the MUCC Instructional Guidelines, visit ems.gov/education

For free SALT training, visit saltrriage.org

A recording of this session will be available on ems.gov/ems-focus

Q/A

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