SPECIAL FOCUS

Model Uniform Core Criteria for Mass Casualty Triage

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ABSTRACT

There is a need for model uniform core criteria for mass casualty triage because disasters frequently cross jurisdictional lines and involve responders from multiple agencies who may be using different triage tools. These criteria (Tables 1-4) reflect the available science, but it is acknowledged that there are significant research gaps. When no science was available, decisions were formed by expert consensus derived from the available triage systems. The intent is to ensure that providers at a mass-casualty incident use triage methodologies that incorporate these core principles in an effort to promote interoperability and standardization. At a minimum, each triage system must incorporate the criteria that are listed below. Mass casualty triage systems in use can be modified using these criteria to ensure interoperability. The criteria include general considerations, global sorting, lifesaving interventions, and assignment of triage categories. The criteria apply only to providers who are organizing multiple victims in a discrete geographic location or locations, regardless of the size of the incident. They are classified by whether they were derived through available direct scientific evidence, indirect scientific evidence, expert consensus, and/or are used in multiple existing triage systems. These criteria address only primary triage and do not consider secondary triage. For the purposes of this document the term *triage* refers to mass-casualty triage and *provider* refers to any person who assigns primary triage categories to victims of a mass-casualty incident.

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Key Words: mass casualty triage, disaster

TABLE 1

General Considerations

Criteria	Basis (Science, Indirect Science, or Consensus)	Used by Other Systems	Relevant Literature
1.1 Triage systems and all their components must apply to all ages and populations of patients.	Indirect Science	Other Systems	Wang and Hung 2005; Wallis and Carley 2006[1,2]
1.2 Triage systems must be applicable across the broad range of mass casualty incidents where there is a single location with multiple patients.	Consensus		Hodgetts 2001; Baker 2004; Cone and Koenig 2005[3-5]
1.3 Triage systems must be simple, easy to remember, and amenable to quick memory aids.	Indirect Science	Other Systems	Kilner and Hall 2005; Wang and Hung 2005[2,6]
1.4 Triage systems must be rapid to apply and practical for use in an austere environment.	Consensus	Other Systems	Lee, Chiu et al. 2002[7]
1.5 Triage systems are resource dependent and the system must allow for dynamic triage decisions based on changes in available resources and patient conditions.	Consensus	Other Systems	Benson, Koenig et al. 1996[8]
1.6 The triage system must require that the assigned triage category for each patient be visibly identifiable (eg, triage tags, tarps, markers).	Consensus		
1.7 Triage is dynamic and reflects patient condition and available resources at the time of assessment. Assessments must be repeated whenever possible and categories adjusted to reflect changes.	Consensus		Okumura, Suzuki et al. 1998; Hodgetts 2001; Kragh, Walters et al. 2008; Kahn, Schultz et al. 2009; Kragh, Littrel et al. 2009; Kragh, Walters et al. 2009[5,9-13]

TABLE 2

Global Sorting

Criteria	Basis (Science, Indirect Science, or Consensus)	Used by Other Systems	Relevant Literature
2.1 Simple commands must be used to initially prioritize victims for individual assessment.	Indirect Science	Other Systems	Meredith, Rutledge et al. 1995; Garner, Lee et al. 2001; Holcomb, Niles et al. 2005[14-16]
2.2 First priority for individual assessment is to identify those who are likely to need a Lifesaving Intervention. They can be identified as those: (1) unable to follow commands and not making purposeful movements, or (2) those with an obvious life threat (eg, life threatening external hemorrhage).	Indirect Science		Meredith, Rutledge et al. 1995; Garner, Lee et al. 2001; Holcomb, Niles et al. 2005; Kragh, Walters et al. 2008; Kragh, Littrel et al. 2009; Kragh, Walters et al. 2009[10-12,14-16]
2.3 Second priority for individual assessment will be those who are unable to follow the command to ambulate to an assigned place but are able to follow other commands (eg, wave) or make purposeful movement.	Indirect Science		Meredith, Rutledge et al. 1995; Garner, Lee et al. 2001; Holcomb, Niles et al. 2005[14-16]
2.4 Last priority for individual assessment will be those who follow commands by ambulating to an assigned place (or making purposeful movements) and have no obvious life threatening conditions (eg, life threatening external hemorrhage).	Indirect Science	Other Systems	Meredith, Rutledge et al. 1995; Garner, Lee et al. 2001; Holcomb, Niles et al. 2005[14-16]
2.5 All patients must be individually assessed regardless of their initial prioritization during global sorting. This includes the assessment of walking patients as soon as resources are available.	Indirect Science		Garner, Lee et al. 2001; de Ceballos, Turegano-Fuentes et al. 2005[14,17]

TABLE 3

Lifesaving Interventions

Criteria	Basis (Science, Indirect Science, or Consensus)	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	Other Systems	Bellamy 1984; Baker 2004; Kragh, Walters et al. 2008; Kragh, Littrel et al. 2009; Kragh, Walters et al. 2009[3,10-12,18]
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 (ie, 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, Hodgetts et al. 2007; Lee, Porter et al. 2007; Doyle and Taillac 2008; Kragh, Walters et al. 2008; Kragh, Littrel et al. 2009; Kragh, Walters et al. 2009[10-12,18-22] Chest Decompression: Barton, Epperson et al. 1995; Eckstein and Suyehara 1998; Davis, Pettit et al. 2005[23-25] Airway: Bellamy 1984[18] Auto injector antidotes: Okumura, Suzuki et al. 1998; Baker 2004[3,26]

TABLE 4

Individual Assessment of Triage Category

Criteria	Basis (Science, Indirect Science, or Consensus)	Used by Other Systems	Relevant Literature
4.1 Each victim must be assigned to one of five triage categories (Immediate, Delayed, Minimal, Expectant, Dead). Each category must be represented with an associated color: Immediate/red, Delayed/yellow, Minimal/green, Expectant/gray, Dead/black.	Consensus	Other Systems	
4.2 Assessment must not require counting or timing vital signs and instead use yes or no criteria. Diagnostic equipment must not be used for initial assessment.	Indirect Science		Burkle, Newland et al. 1994; Bazarian, Eirich et al. 2003; Waisman, Aharonson-Daniel et al. 2003; Holcomb, Salinas et al. 2005; McManus, Yershov et al. 2005; Sztajnkrycer, Baez et al. 2006[27-32]
4.3 Capillary refill must not be used as a sole indicator of peripheral perfusion.	Science	Other Systems	Schriger and Baraff 1991; McManus, Yershov et al. 2005[29,33]
4.4 Patients who are not breathing after one attempt to open their airway (in children two rescue breaths may also be given) must be classified as dead and visually identified as such.	Consensus	Other Systems	Hogan, Waeckerle et al. 1999[34]
4.5 Patients are categorized as immediate if: they are unable to follow commands or make purposeful movements; OR do not have a peripheral pulse; OR are in obvious respiratory distress; OR have a life threatening external hemorrhage; provided their injuries are likely to be survivable given available resources.	Indirect Science	Other Systems	Koehler, Baer et al. 1986; Koehler, Malafa et al. 1987; Meredith, Rutledge et al. 1995; Quintana, Parker et al. 1997; Garner, Lee et al. 2001; Holcomb, Niles et al. 2005; Holcomb, Salinas et al. 2005; Holmes, Palchak et al. 2005; McManus, Yershov et al. 2005; Kragh, Walters et al. 2008; Kragh, Littrel et al. 2009; Kragh, Walters et al. 2009[10-12,14-16,29,30,35-38]
4.6 Patients are categorized as expectant if: they are unable to follow commands or make purposeful movements; OR do not have a peripheral pulse; OR are in obvious respiratory distress; OR have a life threatening external hemorrhage; AND are unlikely to survive given the currently available resources. These patients should receive resuscitation or comfort care when there are sufficient resources available.	Indirect Science	Other Systems	Burkle, Orebaugh et al. 1994; Meredith, Rutledge et al. 1995; Fong and Schrader 1996; Garner, Lee et al. 2001; Hodgetts 2001; Frykberg 2002; Borden Institute 2004; Frykberg 2004; Christian, Hawryluck et al. 2006; Coule and Horner 2007[5,14,16,39-45]
4.7 Patients are categorized as Delayed if: they are able to follow commands or make purposeful movements; AND have peripheral pulses; AND are not in respiratory distress; AND do not have a life threatening external hemorrhage; AND have injuries that are not considered minor.	Indirect Science	Other Systems	Meredith, Rutledge et al. 1995; Garner, Lee et al. 2001; Holcomb, Niles et al. 2005; Holcomb, Salinas et al. 2005; Holmes, Palchak et al. 2005; McManus, Yershov et al. 2005[14-16,29,30,38]
4.8 Patients are categorized as Minimal if: they are able to follow commands or make purposeful movements; AND have peripheral pulses; AND are not in respiratory distress; AND do not have a life threatening external hemorrhage; AND their injuries are considered minor.	Indirect Science	Other Systems	Koehler, Baer et al. 1986; Koehler, Malafa et al. 1987; Meredith, Rutledge et al. 1995; Garner, Lee et al. 2001; Holcomb, Niles et al. 2005; Holcomb, Salinas et al. 2005; Holmes, Palchak et al. 2005; McManus, Yershov et al. 2005[14-16,29,30,36-38]
4.9 Patients categorized as immediate are the first priority for treatment and/or transport followed by patients categorized as delayed and minimal. Patients categorized as expectant should be provided with treatment and/or transport as resources allow. Efficient use of transport assets may include mixing categories of patients and using alternate forms of transport.	Indirect Science	Other Systems	Garner, Lee et al. 2001; Hodgetts 2001; Einav, Feigenberg et al. 2004; Hines, Payne et al. 2005; Holcomb, Niles et al. 2005; Kahn, Schultz et al. 2009[5,9,14,15,46,47]

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