

Field Triage Implementation Guide for Emergency Medical Services Leaders



National Center for Injury Prevention and Control
Division of Injury Response



Field Triage Implementation Guide for Emergency Medical Services Leaders is a publication of the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. See www.cdc.gov/Fieldtriage.

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An Implementation and Training Guide for You

Overview and History of the Guidelines

Thank you for your help in implementing the Guidelines for Field Triage of Injured Patients. You are a critical step in helping us save lives and money through accurate field triage.



As you know, field triage is a key component of the emergency care system. This process helps guide emergency medical service (EMS) providers in transporting injured patients to the right place, at the right time.



Injury and Field Triage

In the United States, injury is the leading cause of death for persons aged 1–44 years, and emergency medical services (EMS) providers working in EMS systems across the country have a substantial impact on the care of injured persons and on public health. At an injury scene, EMS providers determine the severity of injury, initiate medical management, and identify the most appropriate facility to which to transport the patient through a process called “field triage.” This triage process has profound implications. The risk for death of a severely injured person is 25% lower if the patient receives care at a Level I trauma center.¹ However, not all patients require the services of a Level I trauma center; patients who are injured less severely might be served better by being transported to a closer emergency department capable of managing milder injuries. Transferring all injured patients to Level I trauma centers might overburden the centers, have a negative impact on patient outcomes, and decrease cost-effectiveness.

In 2009, the Centers for Disease Control and Prevention (CDC) published guidance on the field triage process in *Guidelines for Field*

Triage of Injured Patients, Recommendations of the National Expert Panel on Field Triage in the Morbidity and Mortality Weekly Report (MMWR). This document provided not only background material on trauma systems, EMS systems and providers, and the field triage process, but also reflected the 2005-2006 deliberations and recommendations of the National Expert Panel on Field Triage (the Panel). It also provided accompanying rationale for each criterion in the Guidelines and was an effort to ensure that existing guidance for field triage was reflective of the current evidence.

Since publication of the 2009 *MMWR*, CDC has disseminated the Guidelines through training guides, educational materials, and resources for EMS providers. Additionally, CDC has worked closely with





multiple states, through site visits, mini-grants, and technical assistance efforts, to learn from their experience in adopting and implementing the Guidelines at the state and local levels—a process which has provided valuable insight into the experience of implementing national

guidelines at a local level.

The Panel reconvened in the spring of 2011 to evaluate any new evidence published since the 2005-2006 revision and examine the criteria for field triage in light of any new findings.

Defining the Impact: Why Accurate Field Triage Matters

Accurate field triage lowers the risk of death for the severely injured

The CDC-funded National Study on the Costs and Outcomes of Trauma showed a 25% reduction in deaths for severely injured patients who received care at a Level I trauma center rather than at a nontrauma center.¹ Furthermore, a retrospective study of 11,398 severely injured adult patients admitted into hospitals in Ontario, Canada showed that deaths were significantly higher among patients who were initially

transported or undertriaged to nontrauma centers.²

Accurate field triage reduces healthcare costs and overtriage to trauma centers

A recent study of three Level I trauma centers illustrated that using the 2006 Guidelines would have resulted in a 12% reduction in patients transported to a trauma center.³ Results from a current CDC study showed that implementing the 2006 Guidelines could produce an estimated national savings of \$568,000,000 per annum.⁴



Disseminating, Adopting, and Evaluating Guidelines for Field Triage of Injured Patients

Dissemination

CDC developed educational resources and training materials to support nationwide adoption and implementation of the field triage guidelines. Since 2009, CDC has:

- Disseminated more than 350,000 field triage educational materials, including the *MMWR* report.
- E-mailed approximately 150,000 copies of field triage education materials to EMS providers.

- Disseminated more than 40,000 copies of the *Training Guide for Emergency Medical Services Leaders* to local, state, and regional emergency medical leaders.
- Launched a CDC field triage Web page that has received more than 74,000 page views and 11,000 *MMWR* downloads.

Adoption

A 2010 survey of state EMS Web sites showed that 16 states had partially or completely adopted the 2006 Guidelines (as shown on map).

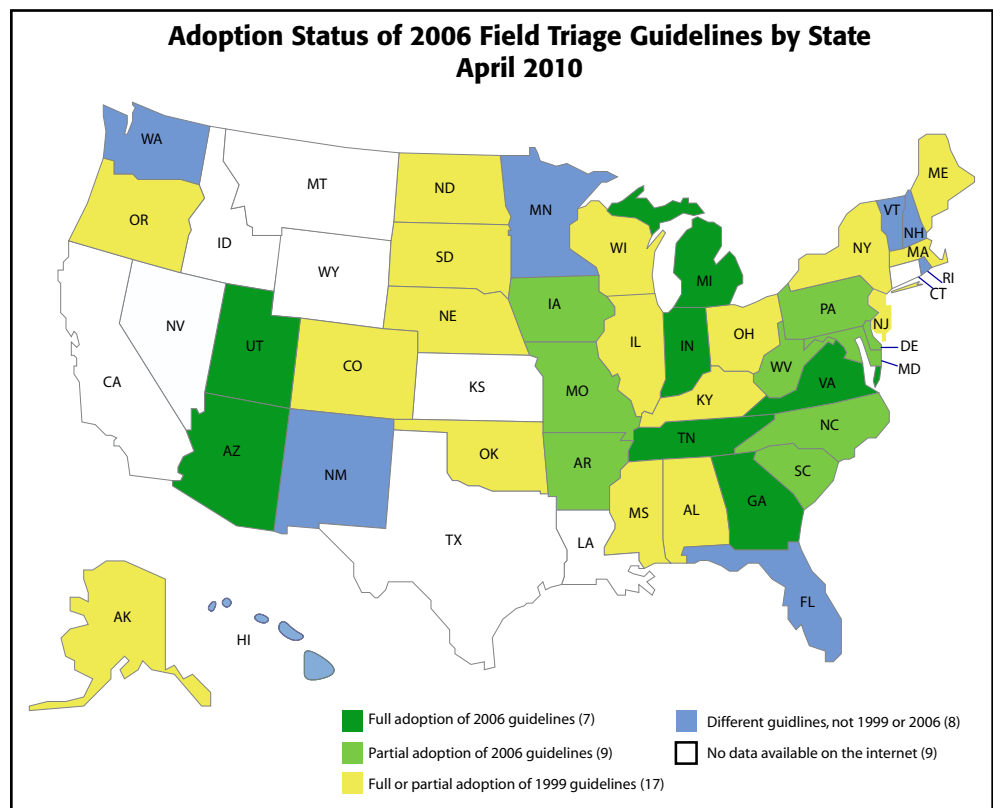


FIGURE 1: Adoption of 2006 Field Triage Guidelines⁵

References

1. MacKenzie EJ, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, Egleston BL, et al. A national evaluation of the effect of trauma center care on mortality. *N Engl J Med* 2006;354(4):366–78.
2. Haas B, Gomez D, Zagorski B, Stukel TA, Rubenfeld GD, Nathens AB. Survival of the fittest: the hidden cost of undertriage of major trauma. *J Am Coll Surg* 2010;211(6):804–11.
3. Lerner EB, Shah MN, Swor RA, Cushman JT, Guse CE, Brasel K, et al. Comparison of the 1999 and 2006 trauma triage guidelines: where do patients go? *Prehosp Emerg Care* 2011;15(1):12–7
4. Faul M, Wald MM, Sullivent EE, Sasser SM, Kapil V, Lerner EB, et al. Large cost savings realized from the 2006 Field Triage Guidelines: reduction in overtriage to US trauma centers. *Prehosp Emerg Care*. 2012 Apr;16(2):222-9.
5. Sasser SM, Ossmann E, Wald MM, Lerner EB, Hunt RC. Implementation status of the 2006 field triage decision scheme, October 2009-April 2010. 6. *West J Emerg Med* 2011;12(3):275–83

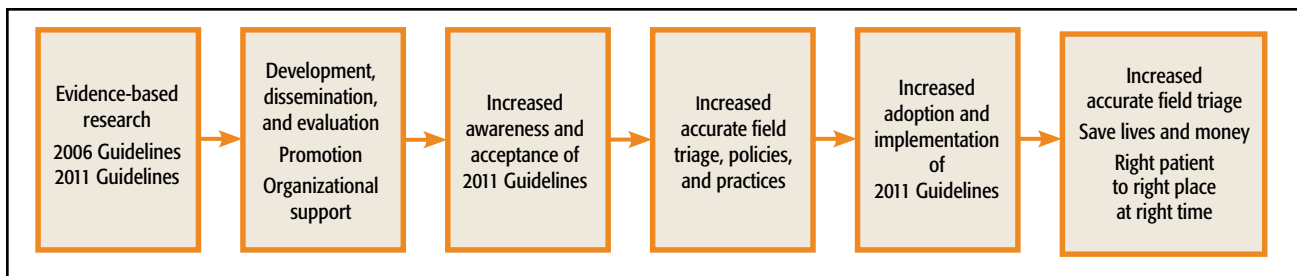


FIGURE 2: An Evaluation Model for 2011 Guidelines for Field Triage of Injured Patients

Evaluation of 2006 Guidelines

CDC surveyed 2,505 EMS, emergency medicine, and trauma care providers about their knowledge and use of the guidelines for field triage and use of accompanying materials. Among the participants who used the materials, the *Training Guide for Emergency Medical Services Leaders* was rated highly, with 51.8% of respondents indicating it was very useful.

Sixty two percent of EMS providers and 71% of others surveyed stated that they would use the *Training Guide*. In addition, 70% of EMS providers and 65% of others found the pocket card useful. CDC has received nearly 900 comment cards that were inserted into the *Training Guide for Emergency Medical Services Leaders*. Approximately 90% of these contained positive feedback about the guidelines.







This Implementation Guide will help you educate the EMS providers in your state, region, or area about how to incorporate the *2011 Guidelines for Field Triage of Injured Patients* (2011 Guidelines) into daily field triage practices and it provides:

- A brief overview and history of the Guidelines;
- The 2011 Guidelines;
- A summary of the recent updates to the Guidelines;
- Talking points for the 2011 Guidelines PowerPoint presentation; and
- A list of helpful tools and resources to use and share with your EMS providers.

KEY POINTS:

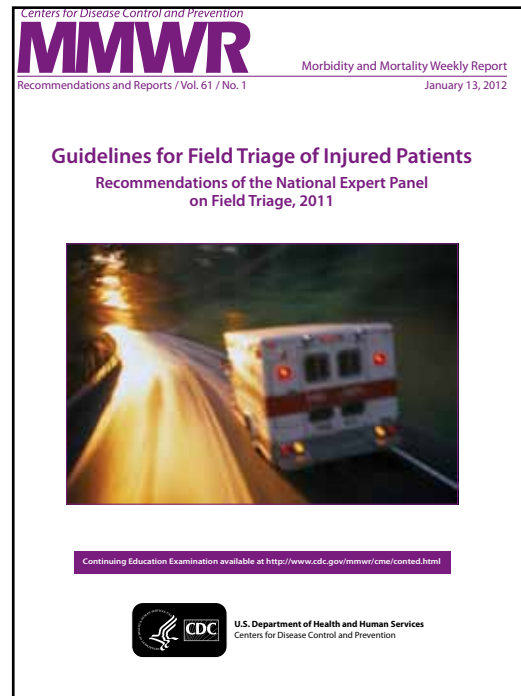
- The *2011 Guidelines for Field Triage of Injured Patients* and the field triage decision scheme will also be published by the American College of Surgeons (ACS) in its publication *Resources for the Optimal Care of the Injured Patient*.
- These Guidelines were developed to help EMS providers respond to daily occurring injuries, not mass casualty events.

Just the Basics

In 1976, the American College of Surgeons developed guidelines with four major steps to help EMS providers decide where to transport injured patients. Since then, the Guidelines have been updated multiple times to include new information and research.

The most recent update began in 2011 when the CDC, working closely with ACS and the National Highway Traffic Safety Administration, convened meetings of experts to look at the latest research and to develop recommendations for updating the Guidelines. These experts—the National Expert Panel on Field Triage—reviewed more than 289 research articles, and incorporated the experience of states, communities, and providers in using the 2006 version of the Guidelines. The result was the *2011 Guidelines for Field Triage of Injured Patients*. In January 2012, CDC's *Morbidity and Mortality Weekly Report Recommendations and Reports* published a summary of the expert panel's decisions about the protocol and the rationale for making those decisions, along with a continuing education opportunity.

Guidelines for Field Triage of Injured Patients



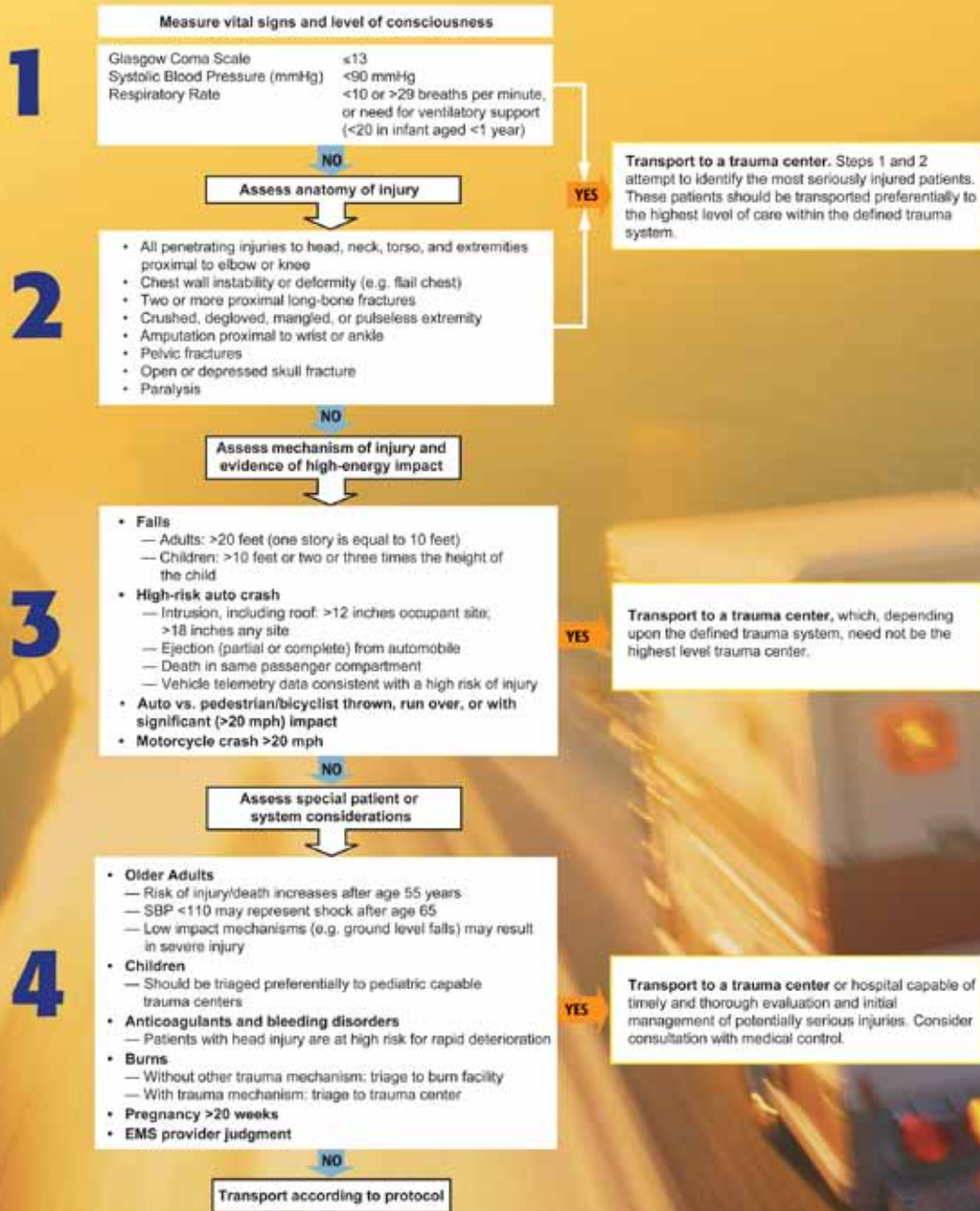
As the *MMWR* article indicated, the Guidelines were not designed as a rigid set of rules, but as guidance to be adapted to state, regional, and local needs. In addition, field triage is only one part of the overall process. Ensuring that every injured patient has timely access to appropriate trauma care requires a broader, integrated framework of injury care through trauma systems that include organized, coordinated efforts to deliver a full range of care to all injured patients.

What You Do Really Matters!

CDC-supported research found that severely injured patients who receive care at a Level I trauma center, rather than a nontrauma center, have a 25% decreased risk of death.

2011 Guidelines for Field Triage of Injured Patients

2011 Guidelines for Field Triage of Injured Patients



When in doubt, transport to a trauma center.

Find the plan to save lives, at www.cdc.gov/FieldTriage

The Decision Scheme Overview

The current Field Triage Decision Scheme includes four steps:

Step 1 Physiologic criteria: The EMS provider determines whether the patient has physiologic changes (e.g., abnormal vital signs or altered level of consciousness) that mandate preferential transport to the highest level of care within the defined trauma system.

Step 2 Anatomic criteria: If the patient is physiologically stable, the provider determines whether the patient has anatomic injuries (e.g., proximal amputations, paralysis, or penetrating injuries to the head, neck, torso, or extremities proximal to elbow or knee) that mandate preferential transport to the highest level of care within the defined trauma system.

Step 3 Mechanism of injury criteria: If the patient does not meet physiologic or anatomic criteria for transport to the highest level of care within the defined trauma system, the provider then considers whether the mechanism of injury suggests a high risk for serious injury (e.g., a fall from a height or a high-risk automobile crash). This step also incorporates vehicle telemetry, which will be discussed later. Patients who meet Step 3 criteria, in the absence of Step 1 or Step 2 criteria, should be transported to a trauma center, which depending upon the defined trauma system, need not be the highest level trauma center.

Step 4 Special patient or system considerations: If the patient does not meet any of the criteria in the first three steps, the provider determines whether any special circumstances might place the patient at a higher risk for severe injury or indicate the need for specialized care (e.g., pregnancy, age, or use of certain medications). Patients who meet only Step 4 criteria should be transported to a trauma center or hospital capable of timely and thorough evaluation and initial management of potentially serious injuries.

Not all injuries require care at a Level I trauma center. Transporting less severely injured patients to a lower level trauma center or nontrauma center can help ensure that resources at Level I trauma centers are available for those patients who need them most.

What's New

The 2011 Guidelines reflect the results of the Panel's deliberations and include changes made based upon the best available evidence, and incorporate the experiential base that CDC has developed through its close work with states, national organizations, communities, and individual providers.

After review of the research and experience with the 2006 version of the Guidelines, the National Expert Panel on Field Triage recommended some updates to the Guidelines. Below is a brief summary of those changes, which include additions, modifications, and deletions. If you would like to see more details about the changes and the rationale for each change, you can access the full report on the decision scheme published in *MMWR* at: www.cdc.gov/FieldTriage.

The *MMWR* also discusses important information we received from the states, regions, and communities on utilization and name of the guidelines; specific criteria such as rollover and extrication; and other topics discussed by the Panel (e.g., tourniquet use, Glasgow Coma Scale (GCS) motor score, rollovers, vehicle telemetry).

Changes to Each Step

Step 1. Physiologic Criteria

MODIFIED:

Glasgow Coma Scale (GCS) from <14 to GCS ≤13.

- *Rationale:* Experience with the 2006 Guidelines indicates that many readers interpreted this criteria as recommending that patients with a GCS of 14 or less should be taken to trauma centers. This was rewritten in an effort to reduce confusion.

ADDED:

Need for ventilatory support

- *Rationale:* After reviewing the literature, the Panel added “or need for ventilatory support” to the respiratory rate criterion, recognizing that adults and children requiring ventilatory support (including both bag-mask ventilation and intubation) represent a very high-risk group, whether or not they have a respiratory rate of <10 or >29 breaths per minute (<20 in infants aged <1 year).

Step 2. Anatomic Criteria

MODIFIED:

Crushed, degloved, mangled, or pulseless extremity

- *Rationale:* “Pulseless” was added to the criteria for crushed, degloved, or mangled extremity for the following reasons:
 1. Vascular injuries of the extremity may lead to significant morbidity and mortality.
 2. These injuries require a high level of specialized trauma care involving multiple medical specialties.
 3. Vascular injuries exist in the absence of a crushed, degloved, or mangled extremity.

Chest wall instability or deformity (e.g., flail chest)

- *Rationale:* “Flail chest” was changed to “chest wall instability or deformity (e.g., flail chest)” for the following reasons:
 1. “Flail chest” is rarely diagnosed by EMS providers.
 2. The terminology “chest wall instability or deformity” more accurately describes what EMS providers are asked to identify in the field environment.
 3. The broader terminology ensures that patients with additional blunt trauma to the chest will be identified and transported to the appropriate facility.

Penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee

- *Rationale:* The wording of this criterion was modified from “elbow and knee” to “elbow or knee” to recognize that these types of injuries generally occur separately and that each can represent a severe injury.

Amputation proximal to wrist or ankle

- *Rationale:* The wording was changed from “amputation proximal to wrist and ankle” to “amputation proximal to wrist or ankle” to recognize that these types of injuries most commonly occur separately and that each can represent a severe injury.



Step 3. Mechanism-of-Injury Criteria

MODIFIED:

High-risk automobile crash

- *Rationale:* “Including roof” was added to the intrusion category for the following reasons:
 1. The 2006 Guidelines do not clearly convey that vertical roof intrusion carries the same implication for increased injury severity as horizontal intrusion into the vehicle occupant space.
 2. Current review of the literature confirms that intrusion, including vertical roof intrusion, is an important predictor of trauma center need.

Step 4. Special Patient or System Considerations

MODIFIED:

Older adults

- *Rationale:* “SBP <110 may represent shock after age 65 years” and “low-impact mechanisms (e.g., ground-level falls) may result in severe injury” were added under “Older Adults” in Step 4 for the following reasons:
 1. Undertriage of the older adult population is a substantial problem.
 2. The evidence reviewed suggests that the physiologic parameters used in younger patients may not apply to older adults.
 3. Occult injury is likely to be greater among older adults.
 4. Low-energy transfers (e.g., ground-level falls) may result in serious injuries in this population.
 5. There is a need to be more proactive in the field identification of serious injury among older adults.

Anticoagulation and bleeding disorders

- *Rationale:* Anticoagulation use has been associated with an increased risk of intracranial hemorrhage following head injury. This criterion was modified to underscore the potential for anticoagulated patients who do not meet Step 1, Step 2, or Step 3 criteria, but have evidence of head injury, to undergo rapid deterioration.

REMOVED:

End-stage renal disease requiring dialysis

- *Rationale:* The Panel elected to remove this criterion, noting that there is no research demonstrating the value of dialysis as a triage criterion for identifying patients with serious injury and that concerns regarding anticoagulation in this population are addressed under the anticoagulation and bleeding disorders criterion.

Time sensitive extremity injury

- *Rationale:* With the addition of “pulseless” to Step 2 criteria, the Panel thought this criterion was redundant, and removed it from the 2011 Guidelines.

MODIFIED:

Transition boxes

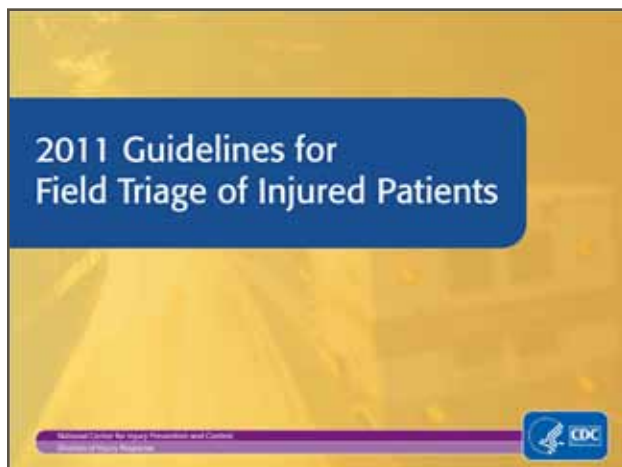
- *Rationale:* To improve the layout of the transition boxes, the Panel took two steps. First, because the transition boxes between Steps 1 and 2 communicate the exact same information, they were thought to be redundant and were consolidated into one box. Second, all transition boxes were moved to the right side of the page for easier readability and determination of outputs for patients meeting different steps in the Guidelines. The Panel also modified the language within the boxes to ensure consistency between transitions in the Guidelines.

Implementing the Guidelines

To help make implementation as easy as possible, we have created a set of PowerPoint slides and sample talking points to use in training staff.

PowerPoint Presentation Content and Talking Points

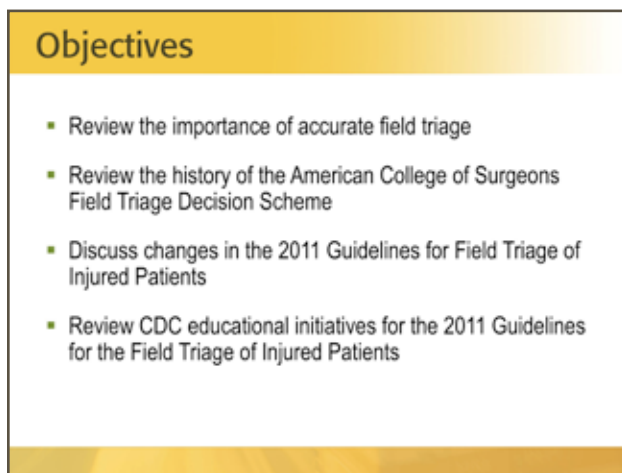
SLIDE 1:



Welcome! Today, we are going to discuss the *2011 Guidelines for Field Triage of Injured Patients* (2011 Guidelines).

This presentation and the revised guidelines are designed to help you do your job as emergency medical services (EMS) providers by helping you to respond to severely injured patients more effectively.

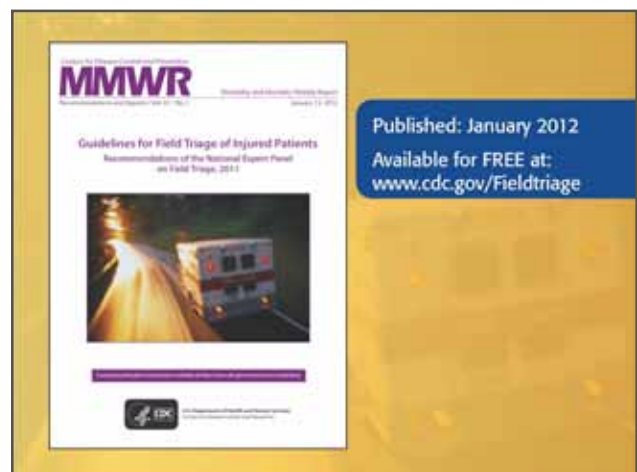
SLIDE 2:



The goals for this presentation are to:

- Review the importance of accurate field triage in trauma care;
- Review the history of the American College of Surgeons (ACS) Field Triage Decision Scheme;
- Discuss the changes in the *2011 Guidelines for Field Triage of Injured Patients*; and, finally,
- Review the Centers for Disease Control and Prevention (CDC's) educational initiatives for the decision scheme.

SLIDE 3:



The decision scheme is based upon *Guidelines for Field Triage of Injured Patients: Recommendations of the National Expert Panel on Field Triage, 2011* published in January 2012 in CDC's *Morbidity and Mortality Weekly Report (MMWR) Recommendations and Reports*.

SLIDE 4:



Injury is the leading cause of death for Americans aged 1–44 years.

So, understandably, almost half of the 16.6 million transport calls per year that we—the approximately 1 million EMS providers—respond to are related to injury.

SLIDE 5:

"If you are severely injured, care at a Level I trauma center, rather than a nontrauma center, lowers your risk of death by 25%."

A National Evaluation of the Effect of Trauma-Center Care on Mortality

CDC-supported research shows that if you are severely injured, care at a Level I trauma center, rather than a nontrauma center, lowers your risk of death by 25%. This statistic is important to remember because, as an EMS provider, you know that getting the right patient to the right place at the right time is critical.

However, not all injuries require care at a Level I trauma center. Transporting less severely injured patients to a lower level trauma center or

nontrauma center can help ensure that resources at Level I trauma centers are available for those patients who need them most.

SLIDE 6:

History of the Decision Scheme

- The American College of Surgeons-Committee on Trauma (ACS-COT) developed guidelines to designate "trauma centers" in 1976
 - Set standards for personnel, facilities, and processes necessary for the best care of injured persons
- Studies showed mortality reduction in regions with trauma centers

In 1976, the American College of Surgeons Committee on Trauma developed guidelines to authenticate trauma centers and set standards for personnel, facilities, and processes necessary for the best care of injured persons.

Studies in the 1970s and early to mid-1980s showed a reduction in mortality in those regions with specialized trauma centers.

SLIDE 7:

History of the Decision Scheme

- National consensus conference in 1987 resulted in first ACS field triage protocol, the "Triage Decision Scheme"
- The Decision Scheme serves as the basis for field triage of trauma patients in most EMS systems in the U.S.


These studies led to a national consensus conference in 1987 that resulted in the first ACS field triage protocol, known as the "triage decision scheme" for trauma patients.

Since 1987, this decision scheme has served as the basis for field triage for trauma patients in most EMS systems in the United States.

SLIDE 8:

History of the Decision Scheme

- The Decision Scheme has been revised five times (1990, 1993, 1999, 2006, 2011)
- In 2005-2006 the Centers for Disease Control and Prevention (CDC), with support from the National Highway Traffic Safety Administration (NHTSA), convened the National Expert Panel on Field Triage
- In 2011 the Panel reconvened to review and update the 2006 Guidelines



Since its initial publication, the decision scheme has been revised five times: 1990, 1993, 1999, 2006, and 2011.

We will discuss the 2011 decision scheme today. The 2011 decision scheme was developed when the National Expert Panel on Field Triage, which was initially formed to develop the 2006 Guidelines, reconvened to review the 2006 Guidelines in the context of recently published literature and experiences of states and local communities working to implement the Guidelines.

The National Expert Panel on Field Triage comprises persons with expertise in acute injury care, including EMS providers and medical directors, state EMS directors, hospital administrators, emergency medicine physicians and nurses, adult and pediatric trauma surgeons, persons in the automotive industry, public health personnel, and representatives of federal agencies.

SLIDE 9:

National Expert Panel on Field Triage

- Membership
 - National leadership, expertise, and contributions in the realm of injury prevention and control
- Members
 - EMS Providers and Medical Directors
 - Emergency Medicine Physicians and Nurses
 - Trauma Surgeons
 - Public Health
 - Federal Agencies
 - Automotive Industry



This Panel included professionals with a variety of backgrounds, including EMS, emergency medicine, trauma surgery, nursing, public health, research, and automotive engineering.

SLIDE 10:

National Expert Panel on Field Triage



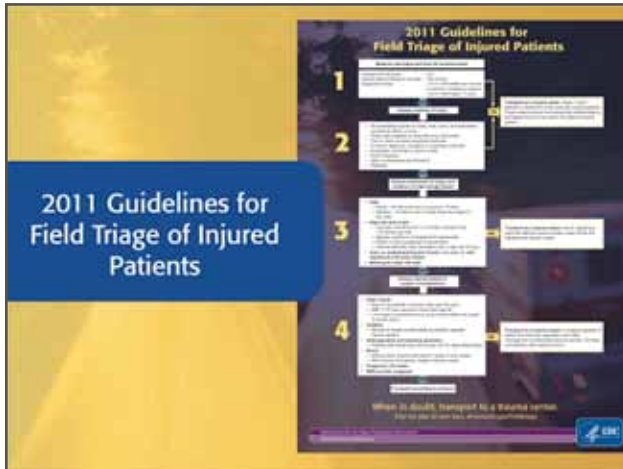
- The role of the Expert Panel is to:
 - Periodically review the Decision Scheme
 - Ensure criteria are consistent with existing evidence
 - Ensure criteria are compatible with advances in technology
 - Make necessary recommendations for revision

The National Expert Panel on Field Triage's role is to:

- Periodically review the decision scheme,
- Ensure that criteria are consistent with existing evidence,
- Ensure that criteria are compatible with advances in technology, and
- Make necessary recommendations for revision.

The Panel is not an official advisory committee of CDC and does not have a fixed membership or an officially organized structure.

SLIDE 11:



As I pointed out earlier, the decision scheme was developed to assist local medical directors and EMS providers with decisions about field triage and destination facility.

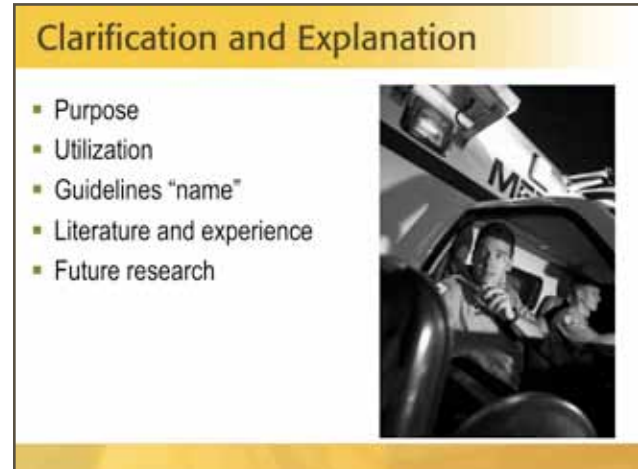
It is the foundation for field triage protocols for trauma patients in most EMS systems across the United States.

The decision scheme is divided into four steps:

- Step 1. Physiologic criteria,
- Step 2. Anatomic criteria,
- Step 3. Mechanism-of-injury criteria, and
- Step 4. Special patient or system considerations.

After each step, the Guidelines include two transition boxes. One box provides guidance on the appropriate destination for a patient that meets the criteria outlined in the preceding step. The other box moves the reader to the next step in the Guidelines if the patient does not meet the criteria in the preceding step. In essence, the Guidelines help you determine the gravity of the injury and the most appropriate destination facility for your patient, or help you move further through the decision scheme criteria.

SLIDE 12:



Purpose

So what is the purpose of the Guidelines? They are intended to lay the foundation for developing local and regional field triage protocols, including areas with limited medical resources and/or geographic hurdles to transporting patients to trauma centers. The Guidelines were revised to facilitate more effective triage and better match trauma patients' conditions with the medical resources best equipped to treat them.

Purpose—clearly states that Guidelines are not for mass casualty triage

The Guidelines provided in this report are not intended for mass casualty or disaster triage; instead, they are designed for use with individual injured patients and provide guidance for EMS providers who care for and transport patients injured in U.S. communities daily through motor vehicle crashes, falls, penetrating injuries, and other injury mechanisms.

Utilization

The Guidelines cannot account for all EMS systems, every injury, or every mode of transportation. They must ultimately be based upon local data and analysis of systems. The Panel recognizes that these Guidelines cannot address the specific circumstances of each EMS system in the United States or all circumstances that might arise at the scene of

injury or while the patient is being transported to a hospital or trauma center. The Guidelines discuss core elements of any well-managed field triage process, and should be adapted to fit the specific needs of local environments within the context of defined state, regional, or local trauma systems and in accord with an analysis of local data. In areas of uncertainty, or in those not addressed by the Guidelines, local EMS systems should rely on direction from local EMS medical directors, regulations, policies, and protocols.

Guidelines Name

The Panel decided not to change or modify the name of the decision scheme because creating a new and different name would likely only add to or increase any confusion or misunderstanding that exists. The Panel recommended that the decision scheme be called either the “field triage decision scheme” or the “guidelines for field triage of injured patients.” The Panel also recommended that the Guidelines not be referred to as a “national protocol” because using the term “protocol” has an unintended proscriptive inference for the end-user that could restrict local adaptation required for optimal implementation.

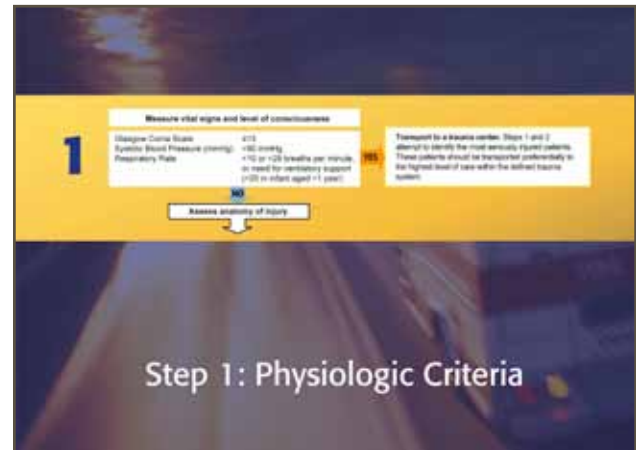
Literature and Experience

Changes to the Guidelines are based upon literature review AND experience of states, regions, and communities working on field triage.

Future Research

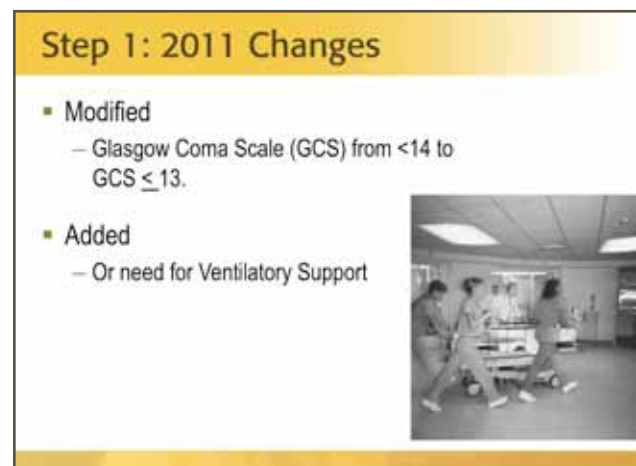
More research on field triage is needed. Ensuring that the Guidelines are based on the best clinical evidence requires expanded surveillance, focused research using robust study designs, and consistent outcome measures.

SLIDE 13:



Now, let’s take a look at the decision scheme step by step, starting with Step 1, Physiologic Criteria.

SLIDE 14:



The criterion on the Glasgow Coma Scale (GCS) was changed from less than 14 to GCS less than or equal to 13.

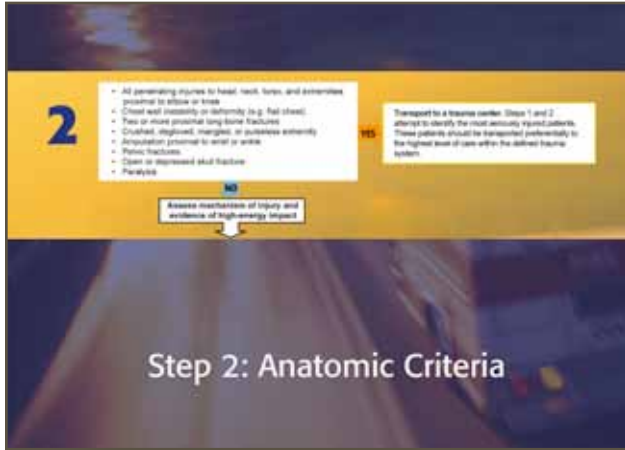
- Experience with the 2006 Guidelines indicates that many readers interpreted this criterion as recommending that patients with a GCS of 14 or less should be taken to trauma centers. This was rewritten in an effort to reduce confusion.

The need for ventilatory support was added to the respiratory rate criterion.

- After reviewing the literature, the Panel added “or need for ventilatory support” to

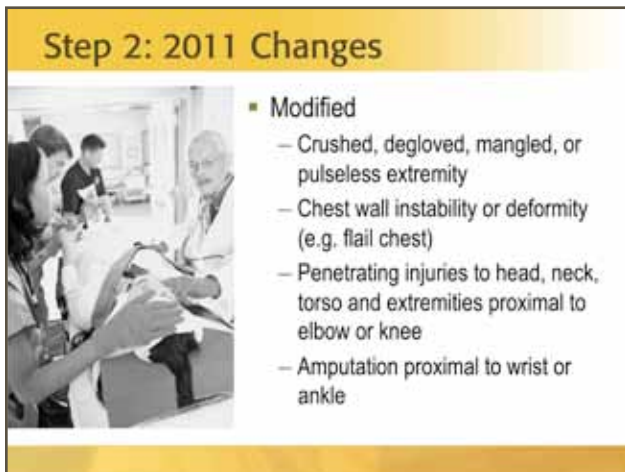
the respiratory rate criterion, recognizing that adults and children requiring ventilatory support (including both bag-mask ventilation and intubation) represent a very high-risk group, whether or not they have a respiratory rate of <10 or >29 breaths per minute (<20 in infants aged <1 year).

SLIDE 15:



We now move to Step 2, Anatomic Criteria.

SLIDE 16:



“Pulseless” was added to the criteria for crushed, degloved, or mangled extremity for the following reasons:

- Vascular injuries of the extremity may lead to significant morbidity and mortality.
- These injuries require a high level of specialized trauma care involving multiple medical specialties.

- Vascular injuries exist in the absence of a crushed, degloved, or mangled extremity.

“Flail chest” was changed to “chest wall instability or deformity (e.g., flail chest)” for the following reasons:

- “Flail chest” is rarely diagnosed by EMS providers.
- The terminology “chest wall instability or deformity” more accurately describes what EMS providers are asked to identify in the field environment.
- The broader terminology ensures that patients with additional blunt trauma to the chest will be identified and transported to the appropriate facility.

Penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee was modified. The wording of this criterion was modified from “elbow and knee” to “elbow or knee” to recognize that these types of injuries generally occur separately and that each can represent a severe injury.

Amputation proximal to wrist or ankle was modified. It was changed from “amputation proximal to wrist and ankle” to “amputation proximal to wrist or ankle” recognizing that these types of injuries most commonly occur separately and that each can represent a severe injury.

SLIDE 17:

3

- **Falls**
 - Adults <20 feet (one story or equal to 10 feet)
 - Children >10 feet or less or three times the height of the child
- **High-risk auto crash**
 - Situations including roof >12 inches occupant side >10 inches any side
 - Ejection (partial or complete) from automobile
 - Death to same passenger compartment
 - Vehicle inventory class consistent with a high risk of injury
- **Auto vs. pedestrian/bicyclist/brown, run over, or with significant P/D injury suspect**
- **Motorcycle crash >20 mph**

Transport to a trauma center, which, depending upon the defined trauma system, need not be the highest level trauma center.

Assess special patient or system considerations


Step 3: Mechanism of Injury Criteria

Moving on to Step 3, Mechanism-of-Injury Criteria.

SLIDE 18:

Step 3: 2011 Changes

- **Modified**
 - High-risk automobile crash



Step 3: Mechanism of Injury Criteria

“Including roof” was added to the intrusion category for high-risk automobile crashes for the following reasons:

- The 2006 Guidelines do not clearly convey that vertical roof intrusion carries the same implication for increased injury severity as horizontal intrusion into the vehicle occupant space.
- Current review of the literature confirms that intrusion, including vertical roof intrusion, is an important predictor of trauma center need.

SLIDE 19:

4

- **Older Adults**
 - Risk of injury/severity increases after age 65 years
 - SBP <110 may represent shock after age 65
 - Low impact mechanisms (e.g. ground level falls) may result in severe injury
- **Children**
 - Should be triaged preferentially to pediatric capable trauma centers
- **Anticoagulants and bleeding disorders**
 - Patients with head injury are at high risk for rapid deterioration
- **Burns**
 - Without other trauma mechanism: Stage 1 best facility
 - With other trauma mechanism: Stage 2 trauma center
- **Pregnancy >20 weeks**
- **EMS provider judgment**

Transport to a trauma center or hospital capable of triage and thorough evaluation and initial management of potentially serious injuries. Consider consultation with medical control.

Transport according to protocol

Step 4: Special Considerations

Now we have reached Step 4, Special Patient or System Considerations.

SLIDE 20:

Step 4: 2011 Changes

- **Modified**
 - Older adults
 - Anticoagulation and bleeding disorders



Step 4: Special Considerations

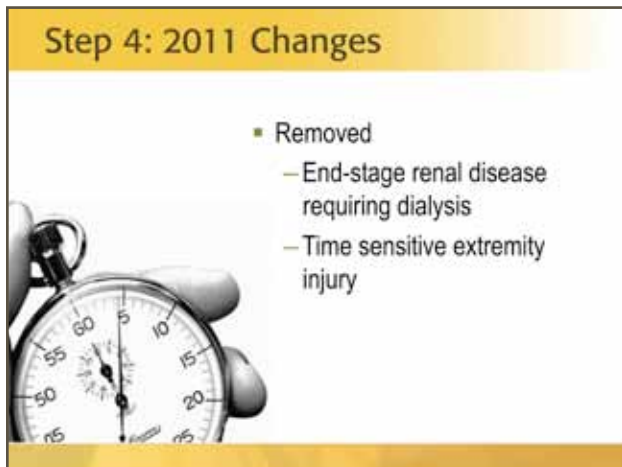
“SBP <110 may represent shock after age 65 years” and “low-impact mechanisms (e.g., ground-level falls) may result in severe injury” were added under “Older Adults” in Step 4 for the following reasons:

- Undertriage of the older adult population is a substantial problem.
- The evidence reviewed suggests that the physiologic parameters used in younger patients may not apply to older adults.
- Occult injury is likely to be greater among older adults.
- Low-energy transfers (e.g., ground-level falls) may result in serious injuries in this population.

- There is a need to be more proactive in the field identification of serious injury among older adults.

“Patients with head injury are at high risk for rapid deterioration” was added to anticoagulation and bleeding disorders. Anticoagulation use has been associated with an increased risk of intracranial hemorrhage following head injury. This criterion was modified to underscore the potential for anticoagulated patients who do not meet Step 1, Step 2, or Step 3 criteria, but have evidence of head injury, to undergo rapid deterioration.

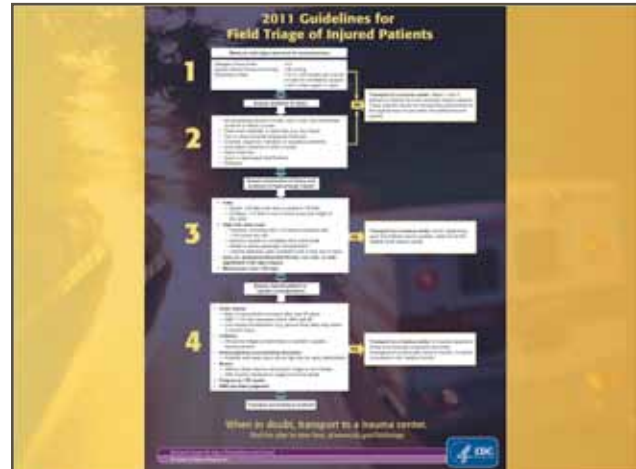
SLIDE 21:



End-stage renal disease requiring dialysis was removed because there is no research demonstrating the value of dialysis as a triage criterion for identifying patients with serious injury and that concerns regarding anticoagulation in this population are addressed under the anticoagulation and bleeding disorders criterion.

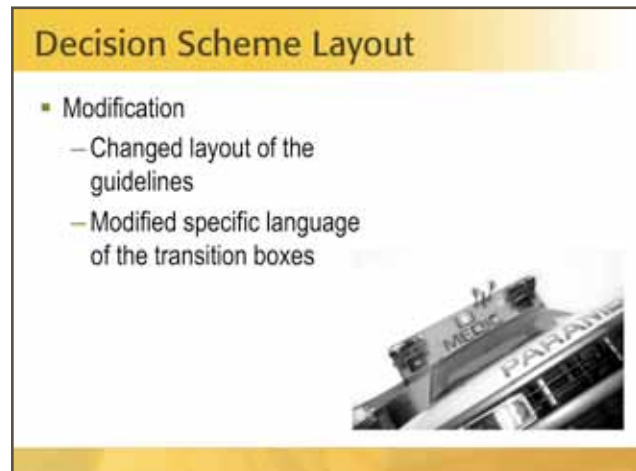
Time sensitive extremity injury was removed because with the addition of “pulseless” to Step 2 criteria, the panel thought this criterion was redundant.

SLIDE 22:



The Decision Scheme layout was modified to make it easier to follow and use within any trauma system.

SLIDE 23:



To improve the layout of the transition boxes, the Panel took two steps. First, because the transition boxes between Steps 1 and 2 communicate the exact same information, they were thought to be redundant and were consolidated into one box. Second, all transition boxes were moved to the right side of the page for easier readability and determination of outputs for patients meeting different steps in the Guidelines. The Panel also modified the language within the boxes to ensure consistency between transitions in the Guidelines.

SLIDE 24:

Education Initiative

- CDC, in collaboration with partners and experts, has developed FREE educational tools:
 - Morbidity and Mortality Weekly Reports (MMWR) Recommendations and Reports Guidelines for Field Triage of Injured Patients: Recommendations of the National Expert Panel on Field Triage (includes continuing education opportunity)
 - Implementation guide for EMS leaders
 - Large decision scheme poster- available in color and black & white (size: 17 x 22 inches)
 - Small decision scheme poster - available in color and black & white (size: 8.5 x 11 inches)
 - Badge (size: 2.5 x 3.5 inches)
 - Pocket card (folded size: 2.5 x 6 inches)
 - Implementation guide fact sheet
 - Online course developed with the University of Michigan
 - SmartPhone application



CDC and its partners have developed resources and tools to help educate EMS leaders and professionals about the decision scheme. These resources include:

- *Morbidity and Mortality Weekly Reports (MMWR) Recommendations and Reports, Guidelines for Field Triage of Injured Patients: Recommendations of the National Expert Panel on Field Triage* (includes continuing education opportunity)
- Implementation guide for EMS leaders
- Large decision scheme poster – available in color and black & white (size: 17 x 22 inches)
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SLIDE 25

Endorsing Organizations (Partial Listing)



Thirty-seven organizations and agencies endorse the decision scheme with concurrence from the Federal Interagency Committee on Emergency Medical Services and the National Highway Traffic Safety Administration. They include:

- Air Medical Physician Association
- American Academy of Orthopedic Surgeons
- American Academy of Pediatrics
- American Association of Critical-Care Nurses
- American Association for Respiratory Care
- American Association for the Surgery of Trauma
- American Burn Association
- American College of Emergency Physicians
- American College of Osteopathic Surgeons
- American College of Surgeons
- American Public Health Association
- American Trauma Society
- Association of Air Medical Services
- Association of Critical Care Transport
- Association of Public-Safety Communications Officials
- Association of State and Territorial Health Officials
- Brain Trauma Foundation
- Commission on Accreditation of Medical Transport Systems
- Eastern Association for the Surgery of Trauma
- Emergency Nurses Association.

SLIDE 26



Other organizations and agencies that endorse the decision scheme include:

- International Academies of Emergency Dispatch
- International Association of Emergency Medical Services Chiefs
- International Association of Fire Chiefs
- International Association of Flight and Critical Care Paramedics
- National Association of Emergency Medical Technicians
- National Association of EMS Educators
- National Association of EMS Physicians
- National Association of State EMS Officials
- National EMS Information System
- National EMS Management Association
- National Volunteer Fire Council
- Safe States Alliance
- Society for Academic Emergency Medicine
- Society for the Advancement of Violence and Injury Research
- Society of Emergency Medicine Physician Assistants
- Trauma Center Association of America
- Western Trauma Association
- Federal Interagency Committee on Emergency Medical Services (comprising representatives from the U.S. Department of Health and Human Services, the U.S. Department of Transportation, the U.S. Department of

Homeland Security, the U.S. Department of Defense, and the U.S. Federal Communications Commission).

The National Highway Traffic Safety Administration concurs with these Guidelines.

SLIDE 27:



Here are the references for this presentation. However, 85 references included in the *MMWR* article were used for revising the decision scheme.

SLIDE 28:



Visit CDC's Web site for more information about the decision scheme and to take advantage of the continuing education opportunity. You can also order or download the materials to use in your trauma system at no cost.

The Web site is: www.cdc.gov/Fieldtriage.

Implementation Tools

2011 Guidelines for Field Triage of Injured Patients Educational and On-the-Job Materials

Our goal is to help you provide your EMS providers with useful information and tools related to the decision scheme. With that in mind, we have developed the following resources, plus other electronic resources available online.

PRINT MATERIALS



- MMWR report and continuing education opportunity

- Laminated ambulance poster (size: 8.5 x 11 inches)



- Large poster (size: 16 x 22 inches)

- Pocket card (folded size 3 x 5 inches)



- Laminated badge with the decision scheme to clip to uniform (size: 2.5 x 3.5 inches)

ONLINE MATERIALS



- Online course for emergency medical services professionals



- Smartphone application

Find the plan to save lives at

www.cdc.gov/FieldTriage.

2011 National Expert Panel on Field Triage

List as of April 2011

Gregory J. Jurkovich, MD (Chair)

John Armstrong, MD

Bob Bailey, MA

Robert Bass, MD

Eileen Bulger, MD

Alasdair Conn, MD

Arthur Cooper, MD, MS

Theodore Delbridge, MD, MPH

John Fildes, MD

Catherine Gotschall, ScD

Daniel Hankins, MD

Mark Henry, MD

Teresita Hogan, MD

Richard C. Hunt, MD

Jorie Klein, RN

Douglas F. Kupas, MD

D. Randy Kuykendall, MLS, NREMT-P

E. Brooke Lerner, PhD

Robert Mackersie, MD

N. Clay Mann, PhD, MS

Gregg Margolis, PhD

Craig Newgard, MD, MPH

Robert O'Connor, MD, MPH

Eric Ossmann, MD

Ritu Sahni, MD, MPH

Jeffrey P. Salomone, MD, NREMT-P

Nels Sanddal, PhD, NREMT-B

Scott M. Sasser, MD

Sean Siler, MD

John Sinclair, EMT-P

Chris Van Gorder, FACHE

Gary Wallace

Stewart Wang, MD

Christopher E. Way, MICT, BA

Robert Winchell, MD

Joseph Wright, MD, MPH

Organizations and Federal Agencies Endorsing the Guidelines for Field Triage of Injured Patients

List as of December 2011

Air Medical Physician Association
American Academy of Orthopedic Surgeons
American Academy of Pediatrics
American Association of Critical-Care Nurses
American Association for Respiratory Care
American Association for the Surgery of Trauma
American Burn Association
American College of Emergency Physicians
American College of Osteopathic Surgeons
American College of Surgeons
American Public Health Association
American Trauma Society
Association of Air Medical Services Association
of Critical Care Transport
Association of Public-Safety Communications
Officials
Association of State and Territorial Health
Officials
Brain Trauma Foundation
Commission on Accreditation of Medical
Transport Systems
Eastern Association for the Surgery of Trauma
Emergency Nurses Association
International Academies of Emergency Dispatch
International Association of Emergency Medical
Services Chiefs
International Association of Fire Chiefs
International Association of Flight and Critical
Care Paramedics
National Association of Emergency Medical
Technicians
National Association of EMS Educators
National Association of EMS Physicians
National Association of State EMS Officials
National EMS Information System
National EMS Management Association
National Volunteer Fire Council
Safe States Alliance
Society for Academic Emergency Medicine
Society for the Advancement of Violence and
Injury Research
Society of Emergency Medicine Physician
Assistants
Trauma Center Association of America
Western Trauma Association
Federal Interagency Committee on
Emergency Medical Services (comprising
representatives from the U.S. Department
of Health and Human Services, the U.S.
Department of Transportation, the U.S.
Department of Homeland Security, the U.S.
Department of Defense, and the U.S. Federal
Communications Commission).
The National Highway Traffic Safety
Administration concurs with these Guidelines.

Your input matters.

We want to hear from you. As with most guidelines, the decision scheme will need to be updated, so we want to hear your reactions—positive, neutral, or negative—about the actual criteria. We would like to know what EMS leaders and providers are saying (or what questions you and they have) about the decision scheme during your trainings or how the protocol will affect what you and your EMS providers do every day. Also, please feel free to share any research that shows a need for considering changing the criteria in the future.

Please e-mail comments to ncipcdir@cdc.gov.

www.cdc.gov/Fieldtriage

