

Seeking Professional Opinion: Charting the Course to Deliver AACN Education to EMS Medical Directors

A project of NHTSA's
Office of Emergency Medical Services
(OEMS)



The Team

- **Laurie Flaherty**, Coordinator, National 911 Program, US DOT
- **Paul Stiegler, M.D., FACEP**, Lead Subject Matter Expert; medical director of the Dane County (Wis.) Public Safety Communications Center
- **Robert R. Bass, M.D., FACEP**, Subject Matter Expert; executive director of the Maryland Institute for Emergency Medical Services Systems (MIEMSS) and member of the CDC Expert Panels on FTT and Advanced Automatic Collision Notification
- **Jake Knight**, Project Lead; partner with the RedFlash Group
- **Tricia Duva**, Project Manager; account manager with the RedFlash Group

About the Project

- Funded by the NHTSA Office of Emergency Medical Services
 - Two-year project to develop an outline of the content and other recommendations for a course targeted to EMS medical directors on AACN
 - The course will educate medical directors on AACN and how to implement
 - Final deliverables (course outline and recommendations) due in October 2013
 - The course will be developed after 2013 and may be expanded to target other stakeholders
 - We are here today to seek your input
- 

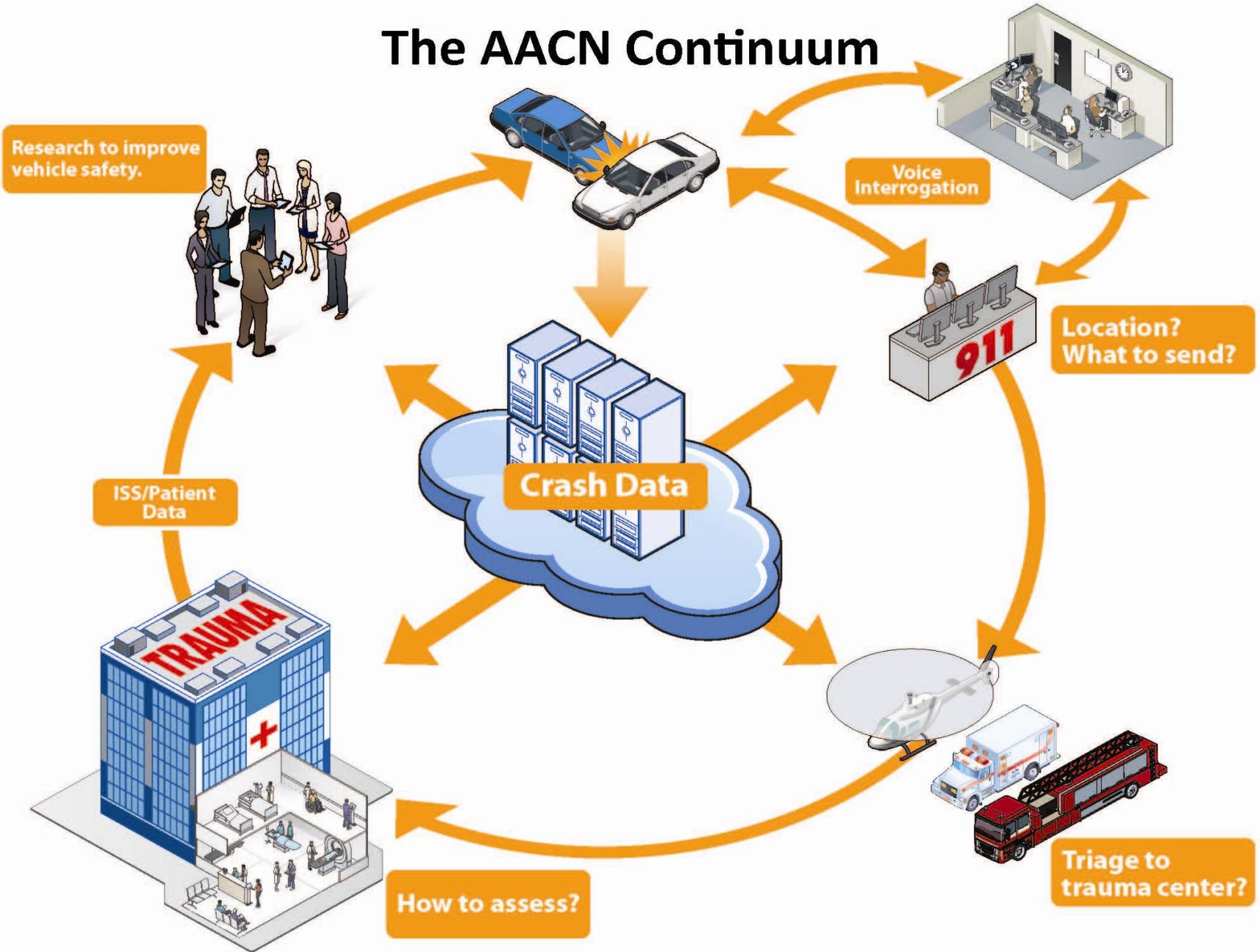
What is Advanced Automatic Collision Notification (AACN)?

- Vehicle telematics systems have evolved over the past several decades
 - Combine and integrate cellular phone technology, GPS location, and data from sensors in the vehicle.
- Early pilots of ACN utilized air bag deployment to identify “serious” crashes.
- As technology advanced, more data became available including delta V, principal direction of force, seatbelt usage, multiple impacts, and vehicle type
- These additional data enable a more accurate prediction of the likelihood of serious injury

Why Should You Care?

- AACN is here (6-7 million cars on the road already) and will continue to expand with growing public expectations
- Vehicles with embedded telematics today:
 - OnStar: GM
 - Agero: Toyota, BMW, Hyundai, Infiniti, Lexus, Rolls Royce, Mercedes
 - 911 Assist: Ford (Bluetooth technology, not telematics)
- This is increasingly impacting EMS systems and, therefore, state EMS offices
- Your feedback is critical to the development of an educational program that will inform medical directors about AACN

The AACN Continuum



Course Elements

1. Introduction to Advanced Automatic Collision Notification (AACN)
2. The Science Behind AACN and Injury Predictive Algorithms
3. The Role of AACN in Field Trauma Triage (FTT)
4. Implementation of AACN

Section 1: Introduction to Advanced Automatic Collision Notification (AACN)

- Early ACN pilots and the evolution to AACN as vehicle telematics systems added more information
- AACN telematics providers today – OnStar and Agero
- AACN can provide an accurate location of the crash and has the ability to predict injuries with better accuracy
- Many benefits:
 - Quicker dispatch, better allocation of resources, precise location
 - Improved accuracy of field trauma triage
 - Used to grade the level of assessment at the trauma center
 - Improved crash reconstruction => safer vehicles and better data
 - Potential to improve patient outcomes and reduce costs

Section 2: The Science Behind AACN and Injury Predictive Algorithms

- Early ACN pilots – location and airbag deployment only
- AACN (2004) – adds more data: DOF, Delta V, rollover, multiple collisions, and more
- Accuracy and limitations of AACN data in predicting severity of injury (urgency algorithm)
- Ongoing research

Section 3: The Role of AACN in Field Trauma Triage (FTT)

- Field Trauma Triage Guidelines:
 - ACS-COT developed in 1986 with periodic updates since
 - CDC convened National Expert Panel in 2005 with support from NHTSA
- FTT guidelines include a decision scheme that is a four-step process that evaluates: 1) physiology; 2) anatomic injuries; 3) mechanism; and 4) special considerations
- Steps 3 and 4 improve sensitivity of the algorithm, but produce much more over-triage (“over-triage to avoid under-triage”)
- The FTT Expert Panel focused on improving the accuracy of the guidelines, particularly with “mechanisms”
- Multiple studies suggest the use of AACN data is more accurate in predicting the likelihood of serious injury than traditional indicators such as “high speed crash,” “major auto deformity,” and “extrication time > 20 minutes,” etc., which were removed



2011 Guidelines for Field Triage of Injured Patients

1

Measure vital signs and level of consciousness

Glasgow Coma Scale ≤ 13
 Systolic Blood Pressure (mmHg) < 90 mmHg
 Respiratory Rate < 10 or > 29 breaths per minute, or need for ventilatory support (< 20 in infant aged < 1 year)

Transport to a trauma center. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the defined trauma system.

2

Assess anatomy of injury

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee
- Chest wall instability or deformity (e.g., flail chest)
- Two or more proximal long-bone fractures
- Crushed, degloved, mangled, or mangled extremity
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis

3

Assess mechanism of injury and evidence of high-energy impact

- Falls**
 - Adults: > 20 feet (one story is equal to 10 feet)
 - Children: > 10 feet or two or three times the height of the child
- High-risk auto crash**
 - Intrusion, including roof: > 12 inches occupant site; > 18 inches any site
 - Ejection (partial or complete) from automobile
 - Death in same passenger compartment
 - Vehicle telemetry data consistent with a high risk of injury
- Auto vs. pedestrian/bicyclist thrown, run over, or with significant (> 20 mph) impact**
- Motorcycle crash > 20 mph**

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

4

Assess special patient or system considerations

- Older Adults**
 - Risk of injury/death increases after age 55 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: triage to burn facility
 - With trauma mechanism: triage to trauma center
- Pregnancy > 20 weeks**
- EMS provider judgment**

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

Transport according to protocol

When in doubt, transport to a trauma center.
 Find the plan to save lives, at www.cdc.gov/FieldTriage



Current Step 3 Mechanisms

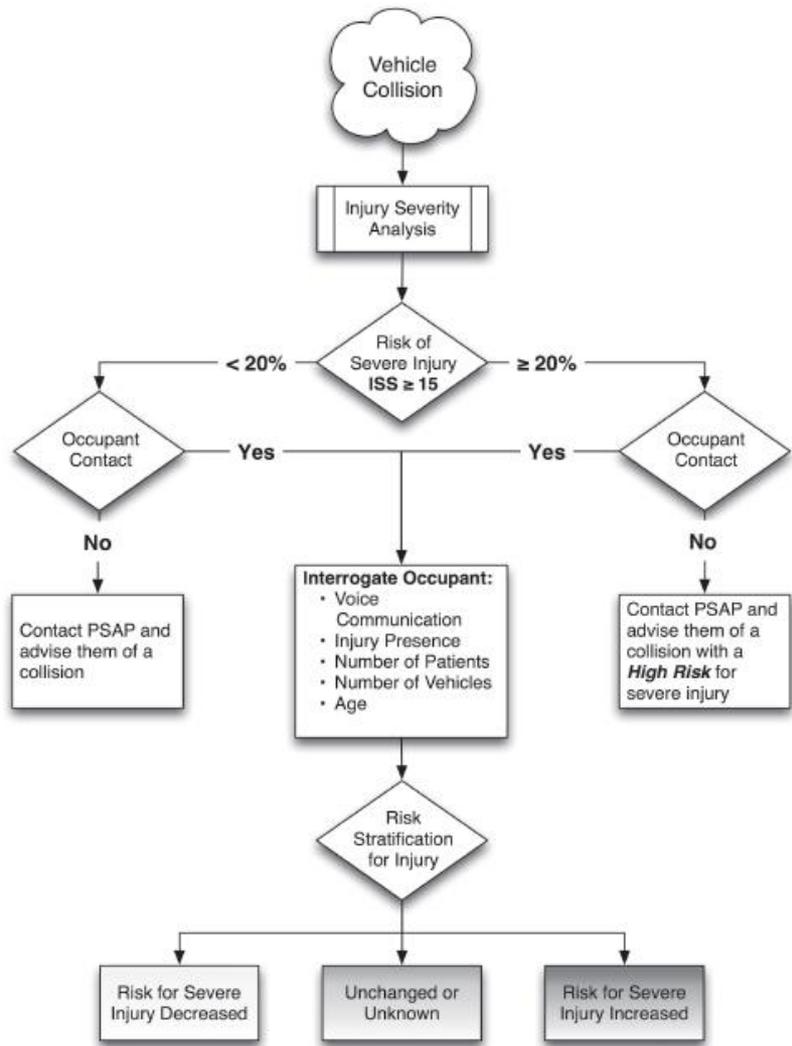
- Falls**
 - Adults: > 20 feet (one story is equal to 10 feet)
 - Children: > 10 feet or two or three times the height of the child
- High-risk auto crash**
 - Intrusion, including roof: > 12 inches occupant site; > 18 inches any site
 - Ejection (partial or complete) from automobile
 - Death in same passenger compartment
 - Vehicle telemetry data consistent with a high risk of injury
- Auto vs. pedestrian/bicyclist thrown, run over, or with significant (> 20 mph) impact**
- Motorcycle crash > 20 mph**

Seriously injured patients treated at a trauma center have a 25% reduction in mortality
 MacKenzie, et al, *NEJM*, 2006

Section 4: Implementation of AACN

- Local
 - Must be collaborative effort – must identify key stakeholders
 - Educate on the benefits, added safety, improved efficiency and outcomes
 - Identify barriers and work to mitigate
- Local and national
 - Need for data standards and SOPs for the TSP/911 interface and dispatch

RECOMMENDATIONS FROM THE EXPERT PANEL:
**ADVANCED AUTOMATIC
 COLLISION NOTIFICATION AND
 TRIAGE OF THE INJURED PATIENT**



— PREPARED BY THE —
 CENTERS FOR DISEASE CONTROL AND PREVENTION,
 NATIONAL CENTER FOR INJURY PREVENTION AND CONTROL, DIVISION OF INJURY RESPONSE

— WITH SUPPORT FROM —
 ONSTAR, THE GENERAL MOTORS FOUNDATION, AND THE CDC FOUNDATION

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
 Centers for Disease Control and Prevention




Course Structure Considerations

- 4 course sections
- 15 minutes each
- CE/Test
- Online
- In person/online
- Highly interactive and engaging
- Multimedia
- Speaker's Guide/Toolkit

Q & A

Contact Info

Questions:

- Dr. Paul Stiegler – pmstiegler@gmail.com
- Dr. Bob Bass – rbass@miemss.org
- Laurie Flaherty – Laurie.Flaherty@dot.gov

Course content suggestions:

- Jake Knight – jknight@redflashgroup.com