



Advanced Automatic Crash Notifications and Urgency Factors: Can We Standardize?

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Agenda

- **Introduction of panel members**
- **Acronyms and Definitions**
- **Overview of ACN technology**
- **Overview of AACN technology**
 - **CDC Report: Recommendations from the Expert Panel**
- **Injury Severity Prediction Tools, Aka: “The Urgency Factor”**
- **Overview of AACN Joint APCO/NENA Working Group Activities**
- **Questions from the audience**
- **Panel discussion**

Acronyms and Definitions

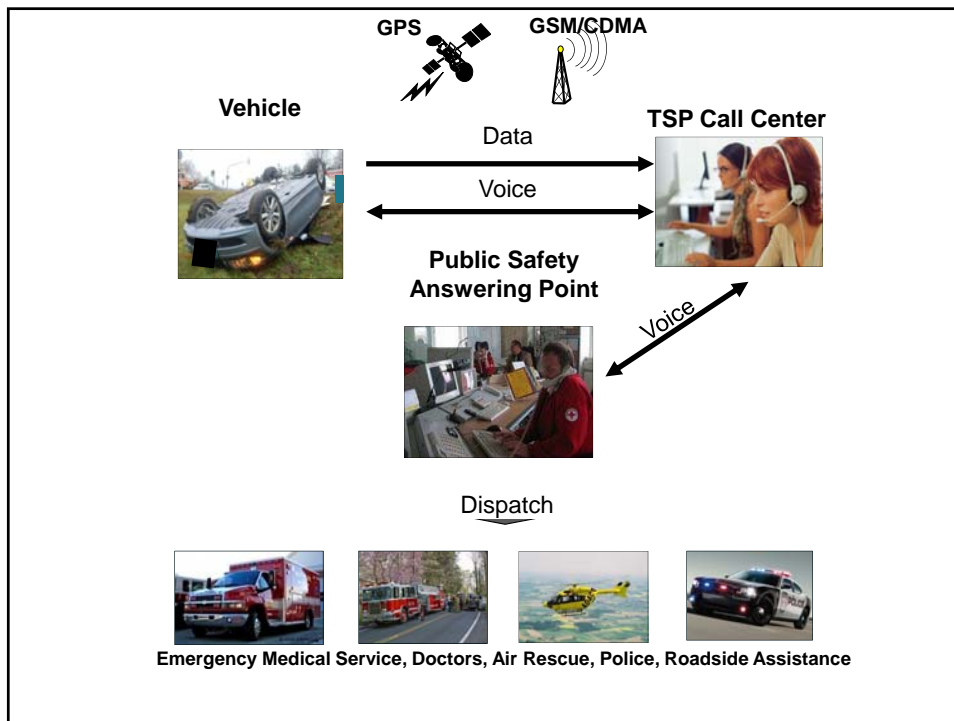
- ❑ **ACN - Automatic Collision (or Crash) Notification**
- ❑ **AACN – Advanced Collision (or Crash) Notification**
- ❑ **CDC - Centers for Disease Control and Prevention**
- ❑ **ISS – Injury Severity Score**
- ❑ **NEMSIS – National EMS Information System**
- ❑ **NHTSA – National Highway Traffic Safety Administration**
- ❑ **TSP - Telematics Service Provider**
- ❑ **VEDS – Vehicle Emergency Data Set**

Is There a Better Way?



Automatic Collision Notification Technology

- **ACN Technology in Use as Early as 1997 by TSPs –**
 - Included manual & automatic calls for assistance
 - Data source primarily from airbag sensors & communications components
 - Typically the vehicle transmitted data to a 3rd party call center
 - 3rd party call center notified the 911 PSAP via telephone
- **What was Lacking-**
 - Additional data about the crash and the occupants to predict severity
 - No electronic method to deliver the data from the TSP to the PSAP
 - No initial notification of the crash to agencies beyond the PSAP

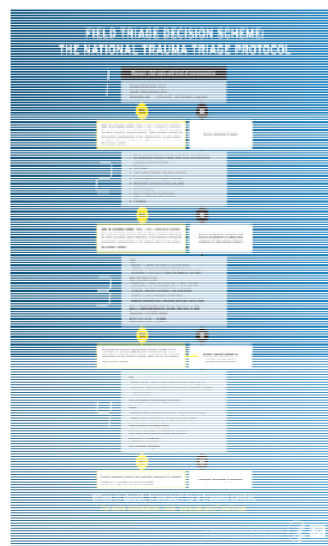


Evolution of Advanced Automatic Collision Notification Technology

- **In 2004, new vehicle sensors are added -**
 - In addition to airbag data, new data became available
 - Delta velocity
 - Where the impacts occurred (principle direction of force)
 - Whether multiple impacts occurred
 - Rollover status
 - Vehicle make and model (existing since 1997)
- **Emergency Response Alliance “Comcare” forms ACN Working Group**
 - Knew that AACN technology was evolving
 - Created a XML-based VEDS Ver. 2.0 to include data elements to-
 - Provide PSAPs and other agencies predictive crash data
 - Increase the odds of a positive outcome for the patient

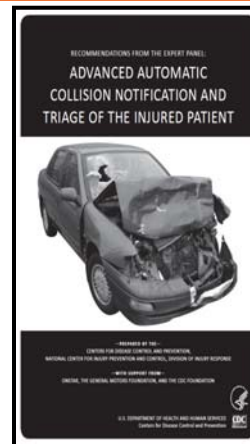
The CDC Gets Involved

- **Impetus: MacKenzie study**
 Risk of Death Reduced by 25% for Severely Injured if Treated at a Level I Trauma Center Compared to non-Trauma Center
- **Field Triage Decision Scheme**
 - Step 1: Vital Signs
 - Step 2: Physical Signs of Injury
 - Step 3: Mechanism of Injury
 - Placeholder:
 “Vehicle Telematics Consistent with High Risk for Injury”



**Recommendations from the Expert Panel:
AACN & Triage of the Injured Patient**

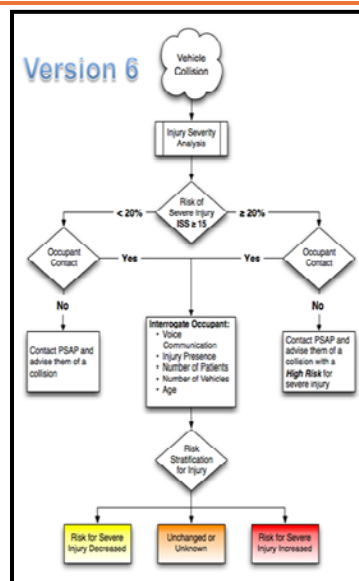
- **Report concluded AACN showed promise in improving severely injured outcomes by:**
 - ▣ Predicting likelihood of serious injury
 - ▣ Decreasing response times of 1st Responders
 - ▣ Assisting with field triage destination/transport decisions
 - ▣ Decreasing time to receive definitive trauma care
- **Report made 10 recommendations for further action**



www.cdc.gov/injuryresponse/aacn.html

**Recommendations from the Expert Panel:
AACN Protocol Recommended**




CDC recognized that AACN data had not been used in previous clinical decision-making and suggested that pilot studies be implemented ASAP using this protocol →

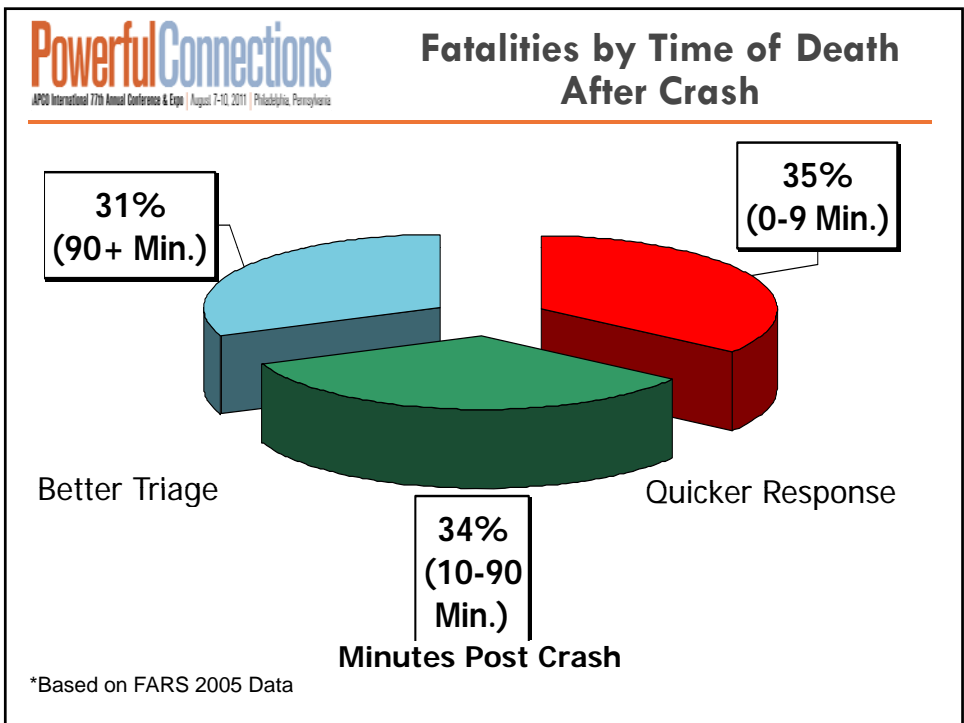


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Next Steps for CDC / NHTSA Interagency Work Groups

- ❑ Estimate the number of lives that could be saved and the economic impact of using AACN to augment dispatch and triage decisions.
- ❑ Determine the algorithm based on scientific evidence
- ❑ Develop a plan to train and educate EMS Medical Directors and EMS providers on why AACN data is useful and the Field Triage Decision Scheme
- ❑ Develop a plan to implement algorithm adoption among EMS & 911 Medical Directors / Protocol Developers
- ❑ Coordinate activities with CDC / NHTSA to ensure consistency
- ❑ (Recommendations for Regulations???)








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The Urgency Factor/Algorithm

- **URGENCY** interprets key crash information to estimate injury risk
- **Multinomial regression models** are used to estimate risk based on several crash factors at the same time

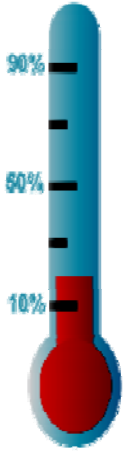


**Urgency –
A Thermometer for Trauma**

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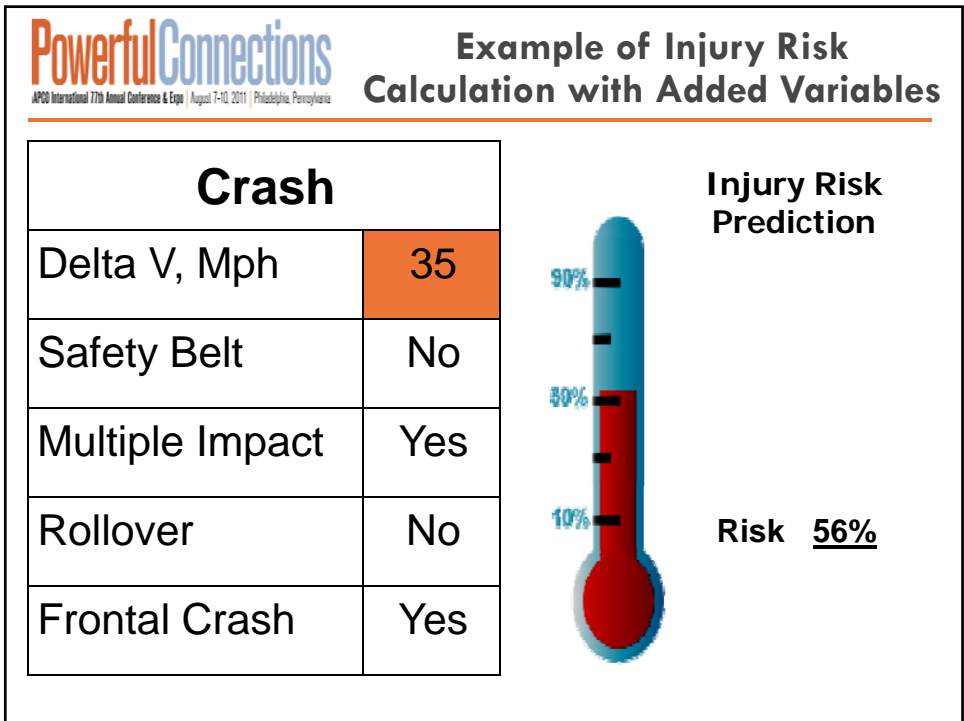
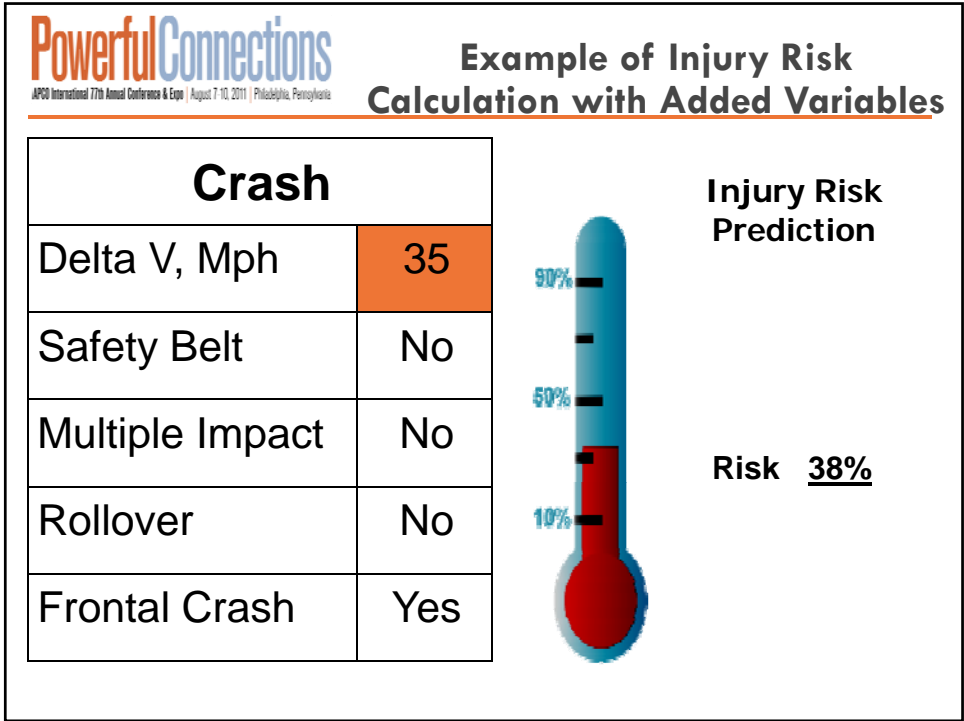
Example of Injury Risk Calculation

Crash	
Delta V, Mph	35
Safety Belt	Yes
Multiple Impact	No
Rollover	No
Frontal Crash	Yes






Injury Risk Prediction

Risk 20%


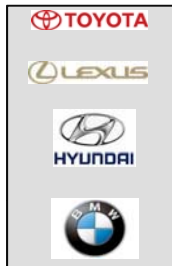


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Vehicles with Embedded Telematics



All Private Call Center

All Private Call Center

17

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All Private Call Center



Automatic Crash Notifications <i>(includes 2,596 Advanced ACNs)</i>	11,432
Emergency (ACN+SOS) Dispatches	19,244
Stolen Vehicle Recovery	718
Remote Door Unlock/Lock	25,098
Roadside Assistance / Remote Services	12,933

Appx. 1,317,500 Active Subscribers
(U.S. and Canada)


(EOY 2010 Statistics)

PowerfulConnections OnStar's Annual Emergency and Security Interactions


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Automatic
Crash
Response
24,000/Annual




Emergency
Services
120,000/Annual




Good
Samaritan
75,600/Annual






Stolen Vehicle
Assistance
4,800/Annual




Remote Door
Unlock
732,000/Annual



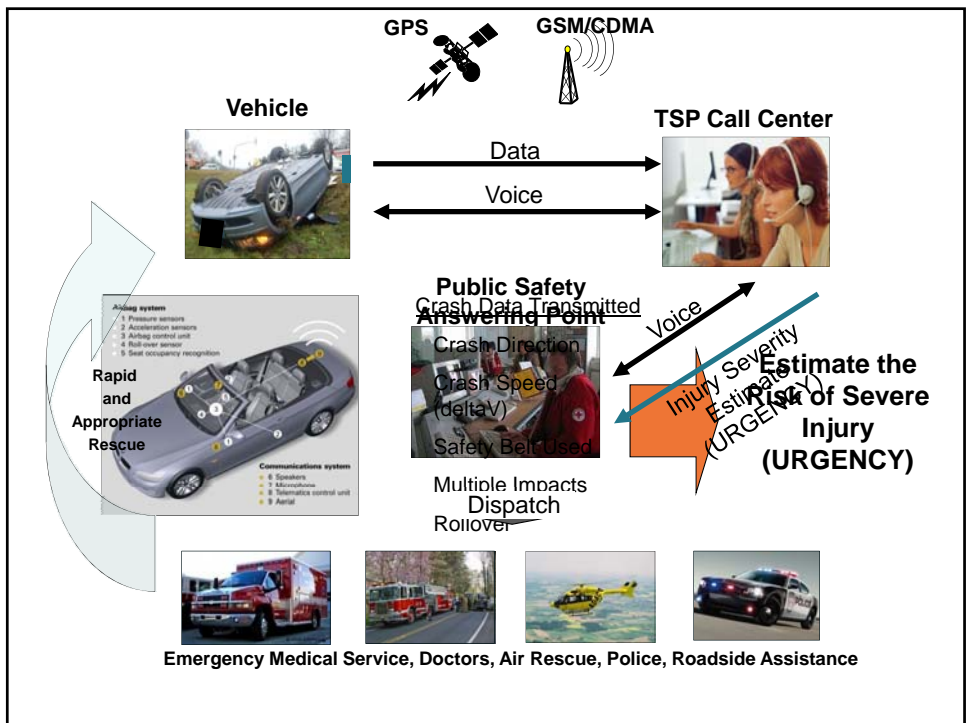
Roadside
Assistance
312,000/Annual

All Private
Call Center



Over 6 million Global Customers



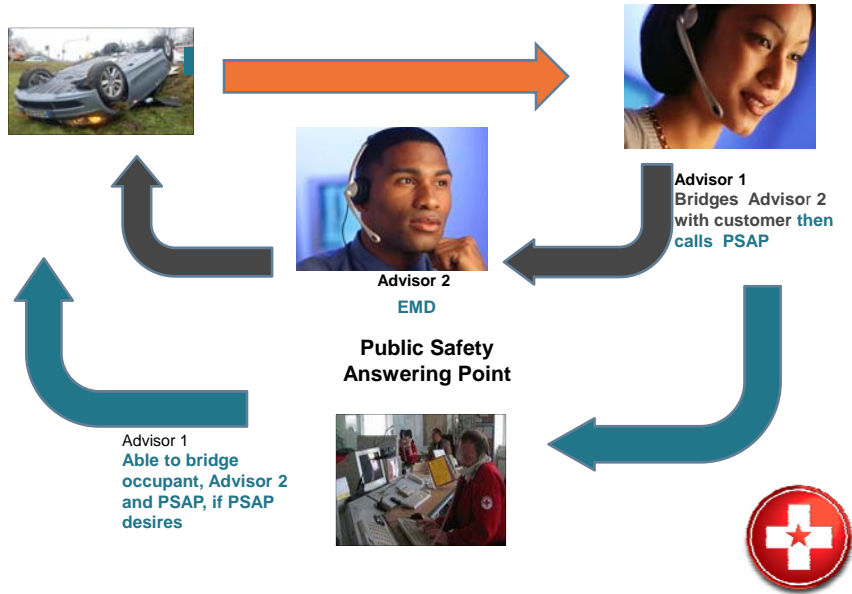
APCO is Approached by TSPs

- **OnStar & ATX approach APCO with “Houston we have a problem”**
 - No ANSI-approved AACN data standard exists
 - VEDS 2.0 was never submitted to an ANSI SDO for processing
 - Other TSPs planning to introduce AACN devices; concern over consistency
 - No Standard Operating Procedures in place for PSAPs to take AACN calls and how to handle them
 - No training standards exist for handling AACN calls from TSPs
 - TSPs are being asked to do pilots as soon as possible
 - Need to get all TSPs on the same page or this WILL get out of control

APCO Reacts Quickly

- **APCO & NENA create 2 joint working groups**
 - AACN Data Standardization Joint APCO/NENA Working Group (APCO led)
 - Work has been completed on the document VEDS 3.0 revision created including the group’s review of NEMSIS data set
 - VEDS 3.0 draft disseminated to all TSPs, NHTSA, and CDC
 - NENA/APCO urgency algorithm/Third party call center EMD working group (NENA led)
 - Third Party Document completed

As an enhancement to Emergency Services, OnStar will now provide EMD using MPDS protocol



Continuing Challenges

□ How to Ignite the “spark”?

- Crash Data has been available since 2004 and has been verbally relayed to the PSAPs
- Crash data, in raw form is difficult to interpret quickly to make dispatch decisions
- Injury Severity Prediction calculation has been in use for the past two years, PSAPs need training on how to interpret
- EMS needs to embrace the use of the data to make modifications to dispatch protocols
- Many moving parts, many stakeholders.....how do we get this lifesaving data into mainstream use?



- **The more information...the better the response**
- **Provides capability of an improved response**
 - Responders can prioritize their responses based on probability of injury
 - Limited resources, respond to the most severe incident first
 - Low speed crash -vs.- Roll over
 - Criteria based systems can incorporate the probability of injury into their process
 - Airlift can be put on standby prior to units arriving on-scene
 - Multiple units can be sent based on information
 - Other systems can provide the probability of injury upon dispatch
 - Responders can choose to take specialized equipment based on information

- **If TSP says there is likelihood of severe injury, remember the Expert Panel's recommendation: transport to location with the highest level of trauma care**
- **Consider AACN data in conjunction with current dispatch & response policies; then apply it to the Big Picture.**
- **PSAP should consider:**
 - Are additional police units possibly needed for traffic control?
 - Is heavy rescue likely to be needed to stabilize the vehicle?
 - Does the information indicate initial ALS response ?
 - Do the GPS coordinates map to an area needing specialized response?

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Why We Need to Standardize?

- **PSAPs/1st Responders need to know what data to expect & how to use it effectively**
- **Injury Severity is not calculated consistently between TSPs. Without standardization the use and impact of this valuable data could be compromised.**
- **As Next generation 9-1-1 is implemented, it will be possible to send AACN data electronically to PSAPs and 1st Responders.**
- **Before Next Generation 9-1-1 is implemented, it may be possible to send AACN data electronically to PSAP CAD Systems.**
- **If the format of this data is not standardized it will be difficult to incorporate it into call-taking & dispatch software, electronic PCR's, RMS, hospital tracking and billing systems.**

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Next Steps

- **VEDS IEPD/schema to be developed**
 - Data fields to be NIEM conformant
 - Schema will provide a consistent data set to guide TSPs
- **Pilots to occur and data will be collected for analysis**
- **The NENA/APCO operational issues working group to finish their work**
- **Once pilot data analysis is complete and stakeholders concur, VEDS 3.0 can be submitted to the APCO ANS process.**

Acknowledgements – Information Sources

Information Sources:

- ▣ CDC
- ▣ Comcare
- ▣ OnStar
- ▣ ATX, BMW
- ▣ NHTSA
- ▣ William Lehman Injury Research Center

Acknowledgements – 1st Joint APCO/NENA Working Group

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|---|--|
| <ul style="list-style-type: none"> ▪ OnStar ▪ ATX Group ▪ NHTSA ▪ Hughes Telematics ▪ HiTech ▪ Ford ▪ Intrado ▪ Qualcomm ▪ KIA | <ul style="list-style-type: none"> ▪ Priority Dispatch ▪ National Academies of Emergency Dispatch ▪ APCO/NENA Staff and Practitioners |
|---|--|

Questions from the Audience?



Resources

For More Information:

- CDC Report: Recommendations from the Expert Panel: AACN and Triage of the Injured Patient - <http://www.cdc.gov/injuryresponse/aacn.html>
- CDC Field Triage Decision Scheme: The National Trauma Triage Protocol - <http://www.cdc.gov/fieldtriage/index.html>



Thank You for Attending!!!

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