



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

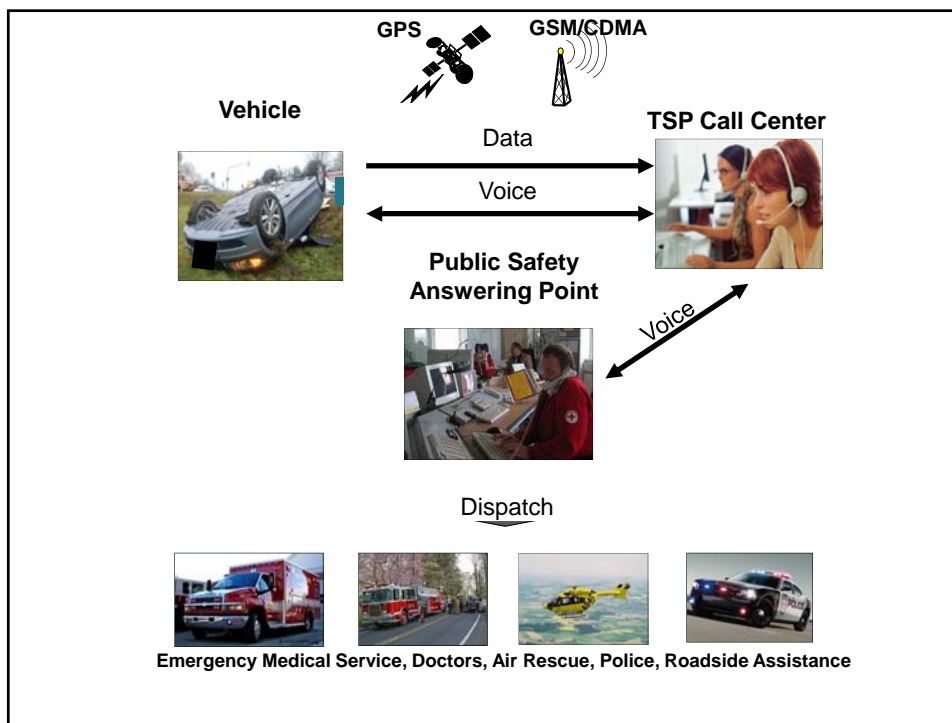
- ❑ **ACN - Automatic Collision (or Crash) Notification**
- ❑ **AACN – Advanced Collision (or Crash) Notification**
- ❑ **CDC - Centers for Disease Control and Prevention**
- ❑ **ISS – Injury Severity Score**
- ❑ **NEMSIS – National EMS Information System**
- ❑ **NHTSA – National Highway Traffic Safety 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

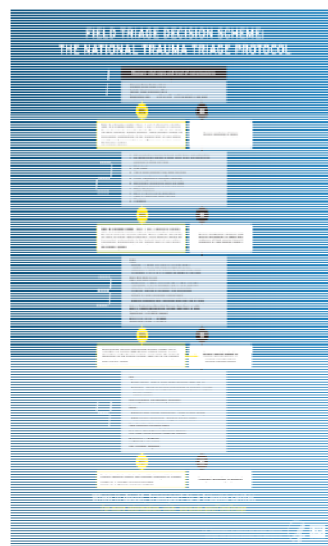


Evolution of Advanced Automatic Collision Notification Technology

- **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

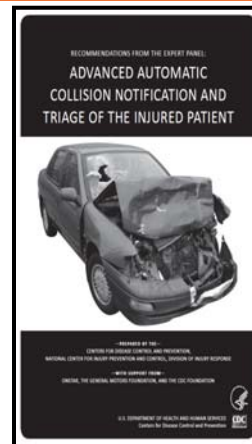
The CDC Gets Involved

- **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

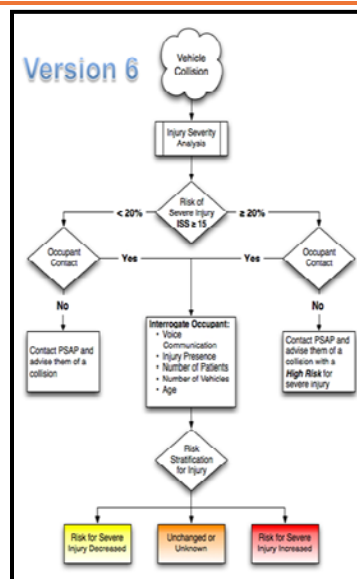
- **Report concluded AACN showed promise in improving severely injured outcomes by:**
 - ▣ Predicting likelihood of serious injury
 - ▣ Decreasing response times of 1st Responders
 - ▣ Assisting with field triage destination/transport decisions
 - ▣ Decreasing time to receive definitive trauma care
-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

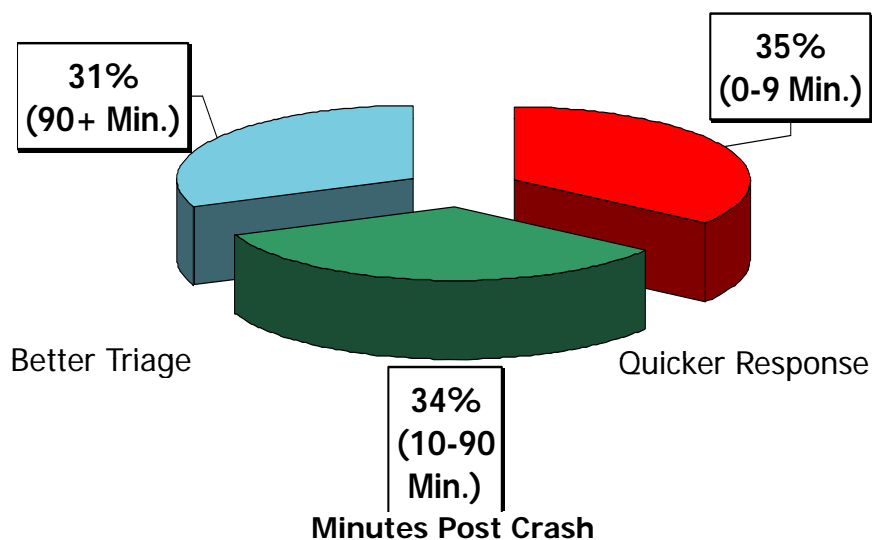


Next Steps for CDC / NHTSA Interagency Work Groups

- ❑ 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???)



Fatalities by Time of Death After Crash



*Based on FARS 2005 Data

The Urgency Factor/Algorithm

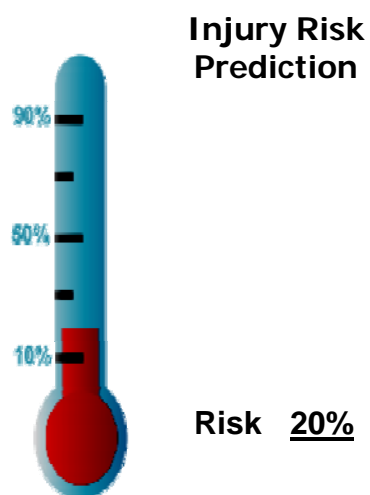
- **URGENCY** interprets key crash information to estimate injury risk
- **Multinomial regression models** are used to estimate risk based on several crash factors at the same time



**Urgency –
A Thermometer for Trauma**

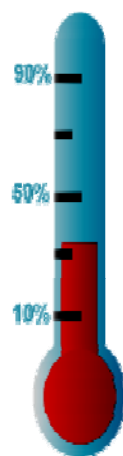
Example of Injury Risk Calculation

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



Example of Injury Risk Calculation with Added Variables

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

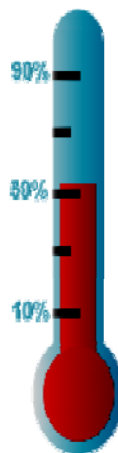


Injury Risk Prediction

Risk 38%

Example of Injury Risk Calculation with Added Variables

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



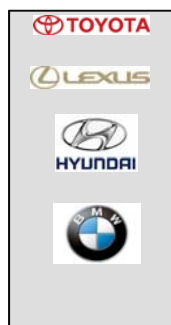
Injury Risk Prediction

Risk 56%

Vehicles with Embedded Telematics



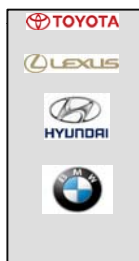
All Private Call Center



All Private Call Center

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Annual Emergency and Security Interactions: ATX

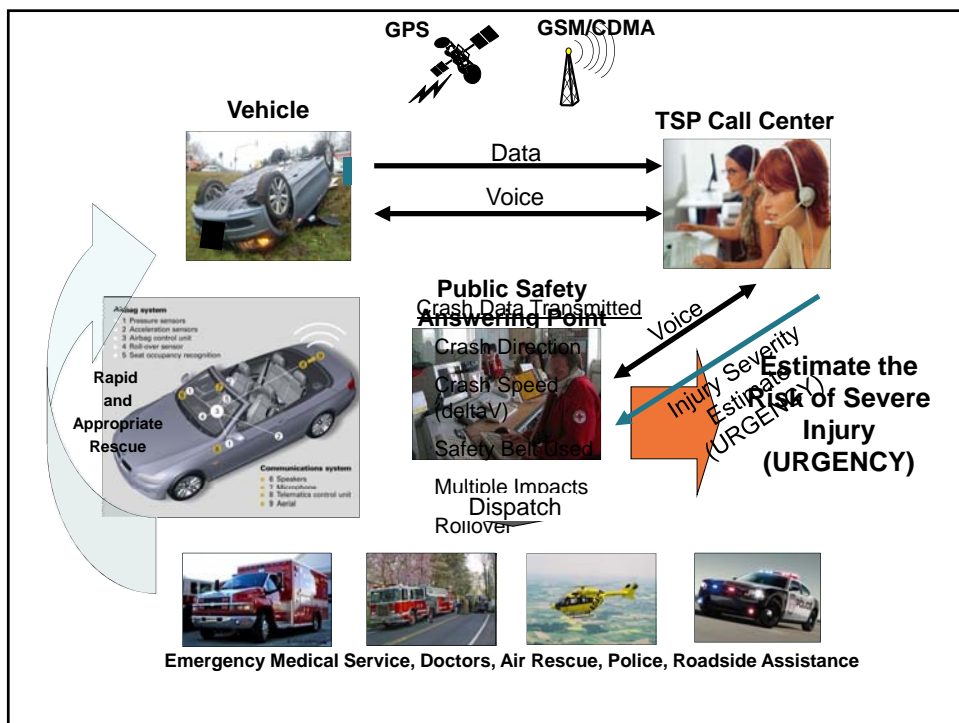
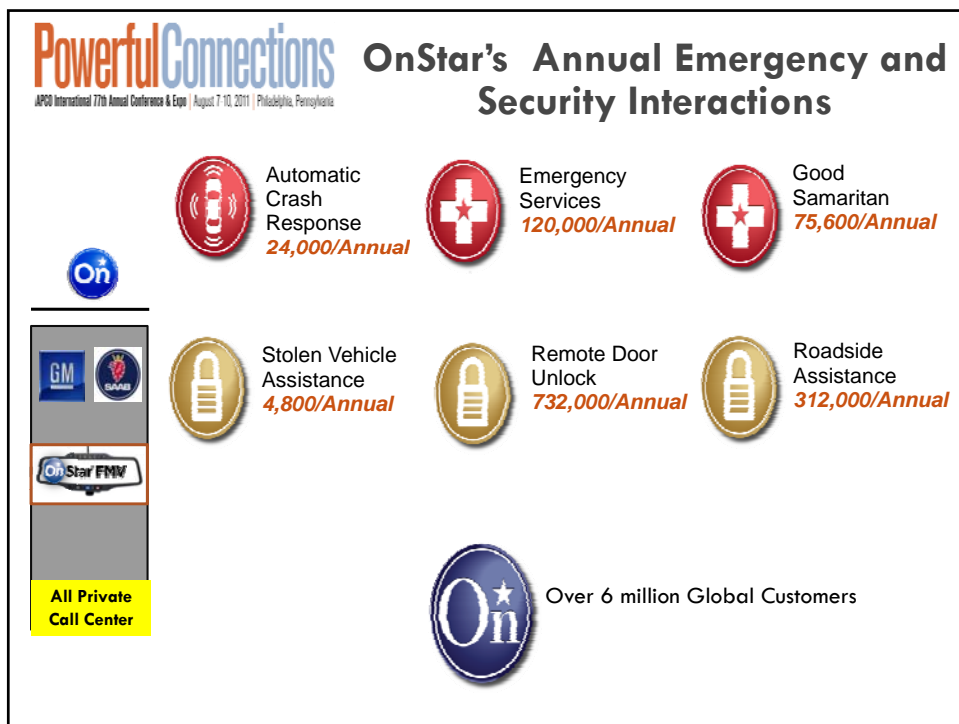


All Private Call Center

Automatic Crash Notifications (includes 2,596 Advanced ACNs)	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)



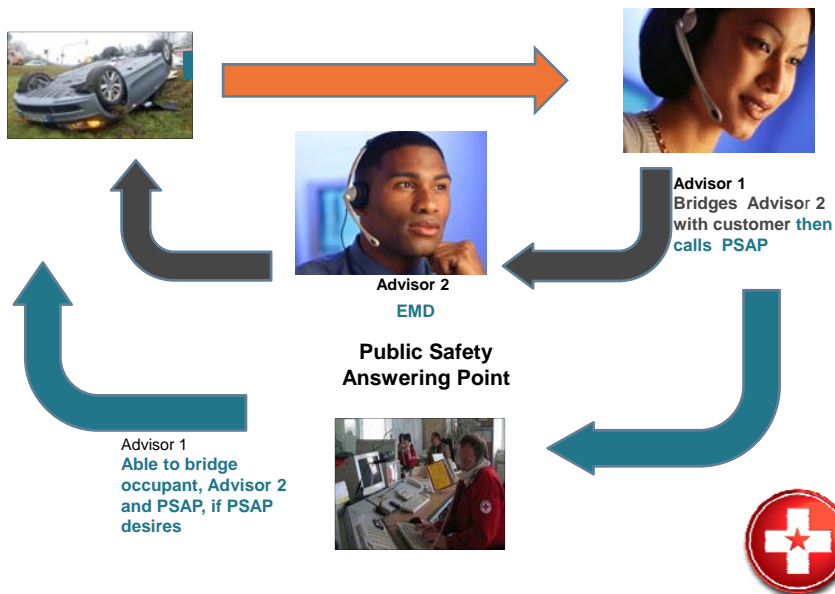
APCO is Approached by TSPs

- **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?



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.**



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

- | | |
|---------------------|--------------------------------------------|
| ▣ OnStar | ▣ Priority Dispatch |
| ▣ ATX Group | ▣ National Academies of Emergency Dispatch |
| ▣ NHTSA | ▣ APCO/NENA Staff and Practitioners |
| ▣ Hughes Telematics | |
| ▣ HiTech | |
| ▣ Ford | |
| ▣ Intrado | |
| ▣ Qualcomm | |
| ▣ KIA | |

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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