Arizona’s EMS Strategic Map: Moving Upstream to Improve Public Health Outcomes

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Director
Arizona Department of Health Services

Arizona Fire District Association Annual Meeting, Laughlin, NV, January 18, 2014
Determinants of Health

Factors Influencing Health Status

- **Genetics**: 30%
- **Behavioral Patterns**: 40%
- **Social Circumstances**: 15%
- **Environmental Exposure**: 5%
- **Health Care**: 10%

**Health Care** - one of the last remaining areas where small changes make a big difference

Improvements in Longevity

100 Years of Progress

Century

Years

Public Health measures

Medical care advances

1900

2000

Health and Wellness for all Arizonans

http://www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm
Factors that Affect Health

Examples

- Condoms, eat healthy, be physically active
- Rx for high blood pressure, high cholesterol
- Immunizations, brief intervention, cessation treatment, colonoscopy
- Fluoridation, 0g trans fat, iodization, smoke-free laws, tobacco tax
- Poverty, education, housing, inequality

Smallest Impact

Counseling & Education

Clinical Interventions

Long-lasting Protective Interventions

Changing the Context to make individuals’ default decisions healthy

Socioeconomic Factors

Largest Impact
Arizona’s EMS & Trauma System
Demonstrating Progress

Where We’ve Been

The Wheel Was Invented and We Rolled With It

1981 – Certificate of Necessity requirement
1993 – Arizona State Trauma System Development Act
1994 – State Trauma Advisory Board
2002 – First Arizona EMS & Trauma System Plan
2005 – First state designated Level I Trauma Center
2006 – Arizona State Trauma Registry standardized data
2008 – First state designated Level IV Trauma Center
2010 – Premier EMS Agency Program
2011 – Arizona Prehospital Info. & EMS Registry System
2012 – First state-designated Prov. Level III Trauma Center
Where We’re Going

• State Trauma System Plan
• Performance improvement
• EMS agency quality assurance quarterly reports
• County level trauma reports
• American Indian Trauma Report
• Dispatcher CPR
• Trauma System Consultation Report
• AZ EMSTS Strategic Plan
• State Trauma Advisory Board
Where We’re Going, cont’d

- Resuscitation Quality Improvement Project
- Utilizing Public Health Education Programs
- Measure over-triage and support countermeasures
- Support operational excellence
- Launch and maintain online EMCT certification
- Expand schools of public health collaboration
- Support statewide community paramedicine
- Building Level IV trauma center in rural Arizona
1.0

Time Sensitive Injuries and Illnesses Program
Time Sensitive Injuries and Illnesses Program

In Forefront Supporting Chain-of-Survival Improvements

This program focuses on improving outcomes for Trauma, Stroke, STEMI and Out-of-Hospital Cardiac Arrest.
Time Sensitive, cont’d

In Forefront Supporting Chain-of-Survival Improvements

• Pre-hospital Best Practices for TBI
• CPR Training
• Dispatch Assisted CPR
• Survivor Support Program (SHARE)
• Cardiac Centers
• AED Placement
Time Sensitive, cont’d
Pre-Hospital Best Practices for TBI

226 Participating Agencies
Improving TBI patient outcomes through changes in prehospital care guidelines

Health and Wellness for all Arizonans
Time Sensitive, cont’d

CPR Training

Bystander CPR: Incidence and Type

- 2005: 28.2%
- 2006: 30.3%
- 2007: 32.4%
- 2008: 34.5%
- 2009: 36.6%
- 2010: 38.7%

41.5% relative increase

P = 0.001

SHARE - JAMA 2010; Oct

Health and Wellness for all Arizonans
Time Sensitive, cont’d

Dispatch-Assisted CPR

Dispatch-Assisted CPR Times: Pre- and Post- Implementation Measures

<table>
<thead>
<tr>
<th></th>
<th>Time to Recognition</th>
<th>Time to Start Instructions</th>
<th>Time to First Compression</th>
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<tbody>
<tr>
<td>Pre</td>
<td>92</td>
<td>188</td>
<td>242</td>
</tr>
<tr>
<td>Post</td>
<td>70</td>
<td>128</td>
<td>162</td>
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</table>

80 Seconds!
Time Sensitive, cont’d

Save Hearts in Arizona Registry & Education (SHARE)

- Provides opportunities to speak at events that promote the latest in resuscitation
- Provides resources for support, answers and education
- Extends an invitation to Sudden Cardiac Arrest Foundations’ Survivor Network to connect with other survivors and family members
- Provides advocacy opportunities for survivors of cardiac arrest
Survivor Rates

Annual Out-of-Hospital Cardiac Arrest Survivors (2004-2012)

- 2007: 96 survivors
- 2008: 127 survivors
- 2009: 172 survivors
- 2010: 245 survivors
- 2011: 235 survivors
- 2012: 412 survivors
Time Sensitive, cont’d

Cardiac Centers Enrollment Progress

Cumulative Cardiac Center Enrollment (2007-2013)

EMS Bypass Protocol Approved

2007 2008 2009 2010 2011 2012 2013*

Cardiac Centers: 2, 18, 27, 37, 37, 38, 39
Log. (Cardiac Centers)

2013 (As of October 30)

Health and Wellness for all Arizonans
Time Sensitive, cont’d

Cardiac Centers in Arizona

Total in AZ=39
Incl. Receiving and Referral Locations
Time Sensitive, cont’d

Cardiac Centers in Greater Phoenix Area
Time Sensitive, cont’d

AED Registry

There are 3,734 AEDs registered throughout the state
Time Sensitive, cont’d

AED Locations

Figure. Map of out-of-hospital cardiac arrest incidents and number of automated external defibrillators per ZIP code tabulation area of Metro Phoenix
2.0

Trauma System Development
Trauma System Development

Past Accomplishments:

2007 – Started with 7 Level I Centers
2013 – 32 Trauma Centers (I, III, IV)

2014 Fiscal Year Objectives:

• Reduce by 5% statewide over-triage incidence by 11/1/14
• Ensure that all 16 designated trauma centers are re-designated by 12/31/14
Support Progress in Trauma Center Designations

Progress in Trauma Center Designations in Arizona (2007-2013)

- Level III
- Level IV
- Level I

<table>
<thead>
<tr>
<th>Year</th>
<th>Level I</th>
<th>Level IV</th>
<th>Level III</th>
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<tr>
<td>2007</td>
<td>7</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>2008</td>
<td>8</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
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<td>3</td>
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<tr>
<td>2013</td>
<td>8</td>
<td>21</td>
<td>3</td>
</tr>
</tbody>
</table>
Trauma System Development, cont’d

Trauma Placement Centers in AZ

Anticipated for January 2014
3.0

Emergency Medical Care Technician Certification
Emergency Medical Care Technician Certification

Promote Online Certification

Annual Emergency Medical Care Technician Certifications (2005-2013)

- 2005: 14,489
- 2006: 15,173
- 2007: 15,435
- 2008: 15,692
- 2009: 17,907
- 2010: 17,313
- 2011: 17,707
- 2012: 17,791
- 2013*: 19,320

*2013 through Sept.

Legend:
- Active EMCT's
- Linear (Active EMCT's)
Emergency Medical Care Technician Certification

Address Education Needs & Statewide Content Changes
Support the Transition to National Certification Categories

Bridge Courses

EMT-Basic  ➔  EMCT  ➔  Advanced EMT/Paramedic
EMT-I-99  ➔  Paramedic
EMT-P
Data & Quality Assurance
Data & Quality Assurance

*Build and Support a Robust EMS & Trauma Data Collection System*

Public health and safety is evidence-based and data-driven, with data and quality assurance enabling agencies to measure population needs, service delivery needs, and patient outcomes.
Data & Quality Assurance, cont’d

The What and Why

Data enables public health and safety agencies to:

• Assess the needs of their service community;

• Devise services targeting their service community’s needs;

• Measure the effectiveness, efficiency, and cost of services;

• Implement measures to improve patient outcomes and service delivery.
Data & Quality Assurance, cont’d

*The What and Why*

Quality Assurance Allows Public Health & Safety Agencies to:

- Interpret data that measures services delivered and patient outcomes;
- Identify gaps in service and information;
- Develop and refine performance indicators to establish benchmarks;
- Act upon the data results from established performance indicators.
Data & Quality Assurance, cont’d

The What and Why

Examples:

- AZ-PIERS run data support QA measures and reports:
  - Improving EMS-to-12 Lead Placement Times;
  - Premier EMS Agency Program support to participants
  - Cardiac Arrest Aggregate baseline data
  - STEMI Aggregate baseline data
  - Aggregate county injury and illness incident data
Data & Quality Assurance, cont’d

The What and Why

More Examples:

• The Trauma Registry data support QA measures and reports:
  • Reducing Over- and Under-Triage Rates;
  • Improving prehospital management of TBI patients;
  • Reducing ED dwell times;
• Improving Out-of-Hospital Cardiac Arrest Survival.
• Improving Dispatch-to-First Compression Times.
Data & Quality Assurance, cont’d

EMS Data Registry (AZ-PIERS)

Cumulative EMS Records (2011 – 2013)

66 EMS/Fire Agencies
369,850 Records (December 31, 2013)
29 Hospitals
4 EMCT Training Schools
Data & Quality Assurance, cont’d

Arizona State Trauma Registry

Cumulative Annual Trauma Cases (2005-2012)

35 Hospitals
180 Data Elements
213,145 Records (Dec. 2012)
Data & Quality Assurance, cont’d

The Premier EMS Agency Program (PEAP)

EMS and trauma systems have a proven capability to improve outcomes of trauma, STEMI, cardiac arrest, and stroke patients.

The Premier EMS Agency Program supports these outcomes.
Data & Quality Assurance, cont’d

What is PEAP?

The PEAP is a four-part quality improvement initiative for EMS agencies designed to improve emergent patient care and outcomes, including:

• Agency leadership commitment
• Perform 100% quality improvement program to measure:
  – Trauma
  – Cardiac Arrest
  – STEMI
  – Stroke
• Collect EMS run data submitted to ADHS under QA standards
• Continuously train and educate EMS personnel using EMS data
Community-Based EMS
Community-Based EMS

Support efforts to reduce risks of chronic disease

Community paramedicine can help patients better manage:

- Cardiac Heart Failure
- Asthma
- Diabetes
- Hypertension
Community-Based EMS, cont’d

Support Partnerships Providing Preventive Care in Underserved Areas

Health and Wellness for all Arizonans
Community-Based EMS, cont’d

What is Community Paramedicine?
“Community paramedicine is a locally designed, community-based, collaborative model of care that leverages the skills of paramedics and EMS systems to address care gaps identified through a community-specific needs assessment.”

What is a Community Paramedic?
“A community paramedic is a paramedic with additional standardized training who works within a designated community paramedicine program under local medical control as part of a community-based team of health and social services providers.”

Community Paramedicine Expands the Role, Not the Scope of Paramedics

UC Davis Article, pp. 7-8
# Community-Based EMS, cont’d

**A Paradigm Shift in Using Paramedics**

Emerging model where paramedics function outside the usual prehospital response and transport role, delving into primary care and preventative community health.

<table>
<thead>
<tr>
<th>EMS Function</th>
<th>Expanded Role</th>
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</thead>
<tbody>
<tr>
<td><strong>Patient Assessment</strong></td>
<td>Checking Vital Signs &lt;br&gt; Blood Pressure Screening &amp; Monitoring &lt;br&gt; Prescription Drug Compliance &amp; Monitoring &lt;br&gt; Assessing Patient Safety Risks</td>
</tr>
<tr>
<td><strong>Patient Treatment &amp; Intervention</strong></td>
<td>Breathing Treatments &lt;br&gt; Wound Care &amp; Dressing Changes &lt;br&gt; Patient Education &lt;br&gt; Intravenous Monitoring</td>
</tr>
<tr>
<td><strong>Patient Referrals</strong></td>
<td>Mental Health &amp; Substance Use Disorder Referrals &lt;br&gt; Social Service Referrals</td>
</tr>
<tr>
<td><strong>Prevention &amp; Public Health</strong></td>
<td>Immunizations &lt;br&gt; Well Baby Checks &lt;br&gt; Asthma Management &lt;br&gt; Disease Investigation</td>
</tr>
</tbody>
</table>
Community-Based EMS, cont’d

Why Community Paramedicine?

POPOPULATION OF RURAL AMERICANS 25%

PRACTICING DOCTORS 10%

Increased Demand for Health Care

Decreased Availability of Health Care Resources
Community-Based EMS, cont’d

Why Community Paramedicine?

• 14% - 27% of ED visits are for non-urgent care and could be treated elsewhere, saving $4.4 billion annually ([2010 Rand study](#)).

• Frequent users comprise 4.5-8% of ED patients and account for 21-28% of visits ([2010 Annals of Emergency Medicine](#)).

• Patients with a regular healthcare provider [have fewer preventable ED visits and hospitalizations](#).
Why Community Paramedicine?

- In 2012, 54 million Americans lived in areas having shortages of primary medical care.

- During first half of 2011, 80% of adults visited the ED because they didn’t have access to another provider National Center for Health Statistics.
Community-Based EMS, cont’d

- Reduce Healthcare Costs
- At-Home Vital Signs Monitoring
- Extension of Primary Care Providers
- Existing Trained Resource
- Communications with Medical Directors
- Patient Care Documentation

Health and Wellness for all Arizonans
Community-Based EMS, cont’d

Catalyst for Starting a Community Paramedicine Program

- Gap analysis of health needs: 68%
- Community assessment: 66%
- Other CP programs: 30%
- Other healthcare stakeholders: 20%
- Other: 7%
- Combat repeat users: 1%

N = 46 States & Territories

Respondents were able to select more than one response, resulting in a percentage total greater than 100%.
Community-Based EMS, cont’d

EMS is a Collaborative System

EMS integrates with other services and systems to maintain and enhance community health and safety.

EMS operates at the crossroads of health care, public health and safety.

EMS often announces the emergence of significant public health problems (outbreaks and epidemics).
Community Paramedicine is the Continued Evolution of EMS

The Vision - EMS of the future will:

• be community-based health management
• be integrated with the overall health care system
• identify and modify illness and injury risks
• contribute to treatment of chronic conditions
• contribute to community health monitoring

-1996 NHTSA
Community-Based EMS, cont’d

Grass Roots Community Paramedicine Programs

• Are relevant to both rural and urban areas, with differing services
• Are extenders of primary healthcare providers
• Address specific local problems
• Utilize paramedics trained to provide specific needed services
• Provide paramedic level services under physician direction and supervision
• Utilize locally developed collaborations between EMS and other healthcare and social service providers
Community Paramedicine, cont’d

Benefits

- Efficient Use of Emergency Care Services
  - Transporting patients with non-emergent low acuity illnesses away from hospital EDs and to more appropriate destinations.
  - Assist needs of frequent 911 callers and ED users.
Community Paramedicine, cont’d

*Increased Access to Primary Care for Medically Underserved Populations*

- Follow-up home visits for recently discharged patients.
- Support services for patients with chronic diseases (e.g., diabetes, COPD).
- Provide preventative care (BP checks, diabetes screening, patient education).
Community Paramedicine, cont’d

My Vision for Arizona

Community paramedicine builds on the strength of the current EMS system to improve patient outcomes.
Community Paramedicine, cont’d

Integrated EMS & Trauma Care

The goal of an integrated EMS and trauma system is to:

“Get the right patient, to the right treatment, at the right time.”

The goal of Community Paramedicine is to:

“Get the patient to the right care, delivered to the right provider, at the right time, resulting in the best outcomes and most efficient use of health care resources.”
Community Paramedicine, cont’d

Getting There with Preventative Services and Support

• Assisting patients with serious chronic disease in managing their care.
• Providing preventative services in rural and medically underserved communities
• Improve access to care and reduce emergent hospital admissions.
Community Paramedicine, cont’d

Getting There with Preventative Services and Support

Providing at-home services:
- Vaccinations
- Blood pressure
- Blood sugar
- Pulmonary monitoring
- Breathing treatments
- Patient and family health education.
Before integration with other providers is possible, Community Paramedicine needs to address:

- **Community**: Addressing a current unfilled need.
- **Complementary**: Enhancement without duplication.
- **Collaborative**: Interdisciplinary practice.
- **Competence**: Qualified practitioners.
- **Compassion**: Respect for individuals.
- **Credentialed**: Legal authorization to function.
Community Paramedicine
Arizona’s Progress

Case Studies

1. Rio Rico - Rural Fire District
2. Guardian Medical Transport – Hospital-based
3. Phoenix Fire – Urban Fire Department
4. Life Line Ambulance - Private EMS
Case Study 1

Rural Fire District - Rio Rico

Bridge the Gap in Community Health and Healthcare Education
Instead of responding to a costly 911 call, PROACTIVELY going to a patient’s home before they have an emergency
Case Study 1

Rio Rico

Partnerships
CP Project will be a collaboration between:

• Rio Rico Fire Department
• South East Arizona Area Health Center
• Holy Cross Hospital
• Mariposa Community Health Center
• University Medical Center
Case Study 1

Rio Rico

Chronic Disease Management
Reduce tertiary care used by residents with:

- Diabetes
- Asthma
- CHF
- COPD
- Environmental Scans
- Other
Case Study 2

Hospital-Based - Guardian Medical Transport

Guardian Medical Transport’s Vision of Community Paramedicine:

Avoid Costly Hospital Admissions by At-Home Healthcare & Community Education
Case Study 2

Guardian Medical Transport

Paramedics work with discharge planners & telemedicine specialist providing at-home patient follow-ups, performing assessments and patient education.
Case Study 2

Guardian Medical Transport

At-Home Patient Care and Follow-Up

- Patients at high risk for readmission.
- Assist patients with medications.
- Monitor, record, and report vitals signs.
- Perform tests, assessments, and treatments.
- Screenings to reduce ED or doctor visits.
- Follow-up on non-transported EMS patients.
Case Study 2

Guardian Medical Transport

Community Health and Education
• Vaccination clinics
• School health and safety
• Community first aid and CPR
• Health and safety fairs
Case Study 3

Urban Fire District - Phoenix Fire Department

Phoenix Fire Department focuses on helping residents during an emergency and when there is no emergency.
Case Study 3
Phoenix Fire Department

- Vaccination clinics
- Community health and fitness information
- Injury prevention and water safety
- Preventative patient screening and services
- Record at-home patient vitals signs
Case Study 3
Phoenix Fire Department

Community Partnerships

STOP the SPREAD
StopTheSpreadAZ.org

BABY SHOTS
FREE Immunization Clinics

PROTECT CHILDREN AROUND WATER!
Water Safety Hotline: 602-534-POOL (7665)

FiTPHX

Health and Wellness for all Arizonans
Case Study 4

Private EMS - Life Line Ambulance
Life Line Ambulance views a community based paramedic program as a system that improves a patient's wellbeing, while utilizing a model that supplements traditional EMS responses.
Case Study 4

*Life Line Ambulance*

The primary goal is to bridge the gap between community health service and the traditional EMS system.
Case Study 4

Life Line Ambulance

Although many community paramedicine programs are yet to be designed, the picture will come clear through collaboration and data analysis.
Community Paramedicine

Arizona’s Progress

ADHS Develops “Community Paramedicine Workgroup”

Includes:

• Health Education
• Medication Education
• Patient Follow-ups
• Immunizations
Community Paramedicine

Community Paramedicine Workgroup

• Definition and scope of community paramedicine in Arizona.
• 8 topics that need to be explored and described.
• Regional EMS Councils to each select 5 representatives for the Workgroup.
• Community Paramedicine guidance document for Arizona EMS agencies.
• Community Paramedicine Toolbox on the ADHS/BEMSTS webpage.
Community Paramedicine
Community Paramedicine Workgroup, cont’d

Develop a collaborative CP model in AZ leveraging expertise of paramedics and EMS systems to address healthcare gaps, improve efficiency & patient outcomes.
Community Paramedicine

Community Paramedicine Workgroup, cont’d

• CP Workgroup Comprised of 5 Representatives from each of the Four EMS Regions:
  • 2 Fire Department Representatives;
  • 1 Hospital-based Representative;
  • 1 Ambulance Representative;
  • 1 Educator
• First Meeting in December 2013, and subsequent meetings scheduled for 2014.
Community Paramedicine In Other States

**CP/MIHC Program Models**

- **Frequent EMS User**: 66%
- **Readmission avoidance**: 46%
- **Primary care/physician extender model**: 28%
- **See and refer to alternate destination after assessment**: 24%
- **911 Nurse Triage**: 8%

Respondents were able to select more than one response, resulting in a percentage total greater than 100%.
Community Paramedicine In Other States

Texas

Greater Fort Worth EMS provider for more than 880,000 people

Implemented CP in 2009, identifying high system users and developed individual patient care plans.

Impact since Inception:

• Saved more than $3.3 million in healthcare expenditures.
• Reduced 9-1-1 use by frequent patients by 86.2% 12 months post-enrollment.
On the Path of Public Health Improvement, Community Paramedicine is Just Around the Bend
Get More Information

• Visit our website for resources and additional info:

  