Implementation Case Reviews

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RA Faculty

Retired Captain, Medic One - Seattle Fire Department

Public Health
Seattle & King County

HARBORVIEW MEDICAL CENTER
UW Medicine

Principles

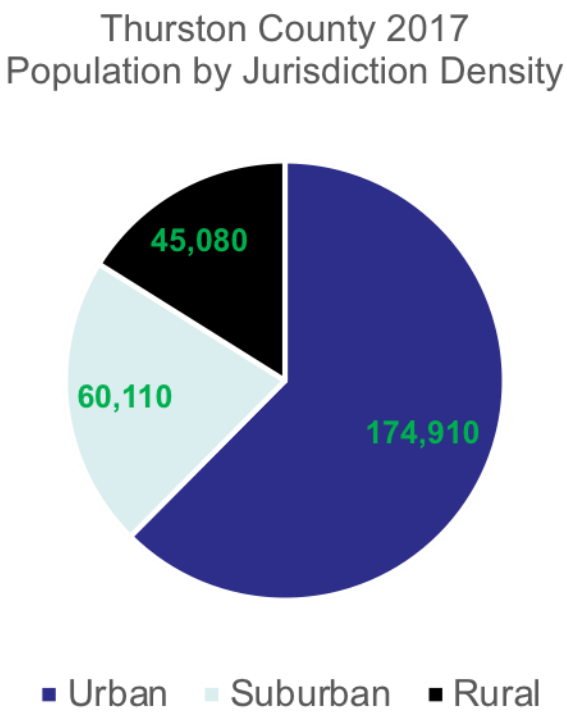
- Identify partners
- Know your community
- Plan and set goals
- Think strategically, patience and timing
- Consider a pilot project

Principles

- Get buy in / engagement
- Tell your story – if you don’t someone else will make it up
- Celebrate success
- Empower your providers
- Use competition constructively

Thurston County, WA

- 750 miles^2 / 2000 km^2
- Pop. ~250,000
- Fire based Tiered
- 13 Fire Departments
- 2 private ambulance
- > 575 EMS Providers
- Champion:
  - EMS Training Officer



Hypothesis

Emphasis on CPR Density will increase survival from CA by 5%

- Before (22% averaged over 4 years) and After Study

Priorities for Study

- CPR Density Score
  - At least 85% (BLS only)
  - At least 92% (ALS, BLS Combined)
- Complete Recoil
- BLS Timekeeper
- Change Compressor every 2 mins
- Don’t let AED run the call
- Continuous data recording (BLS-ALS)
- Minimum interruptions for interventions
- Record entire CA and review 100% of events

Challenges and Solutions

- **Challenge**: Low Volume Cardiac Arrests
  - Maintain competency and enthusiasm
- **Solution**: Mandatory Quarterly Reviews
  - Scenario based, rotate positions
- **Solution**: MPD Feedback

- **Challenge**: Audio from entire resuscitation needed for QI (BLS, ALS)
  - Initial resistance from ALS

- **Solution**: Establish County Policy, State – Approved Coordinated CQI program

- **Challenge**: Voice Recording AED
  - Physio/Medtronic discontinued LP 500 voice recording (2006)

- **Solution**:
  - Medic One stocked up LP500
  - Physio (now Stryker) currently has no solution

- **Challenge**: Inconsistent Feedback to Providers
  - Timely feedback from MPD
  - Intra-Department Communication
- **Solution**:
  - Hired PM to review
  - Full time MPD
  - Email feed back to providers

- **Challenge**: Relatively low rates of bystander CPR

- **Solution**:
  - Hired Community Outreach Coordinator
  - Numerous public presentations
    - CPR Flash Mob
    - PSA Movie Theaters


weisfield JEWELERS
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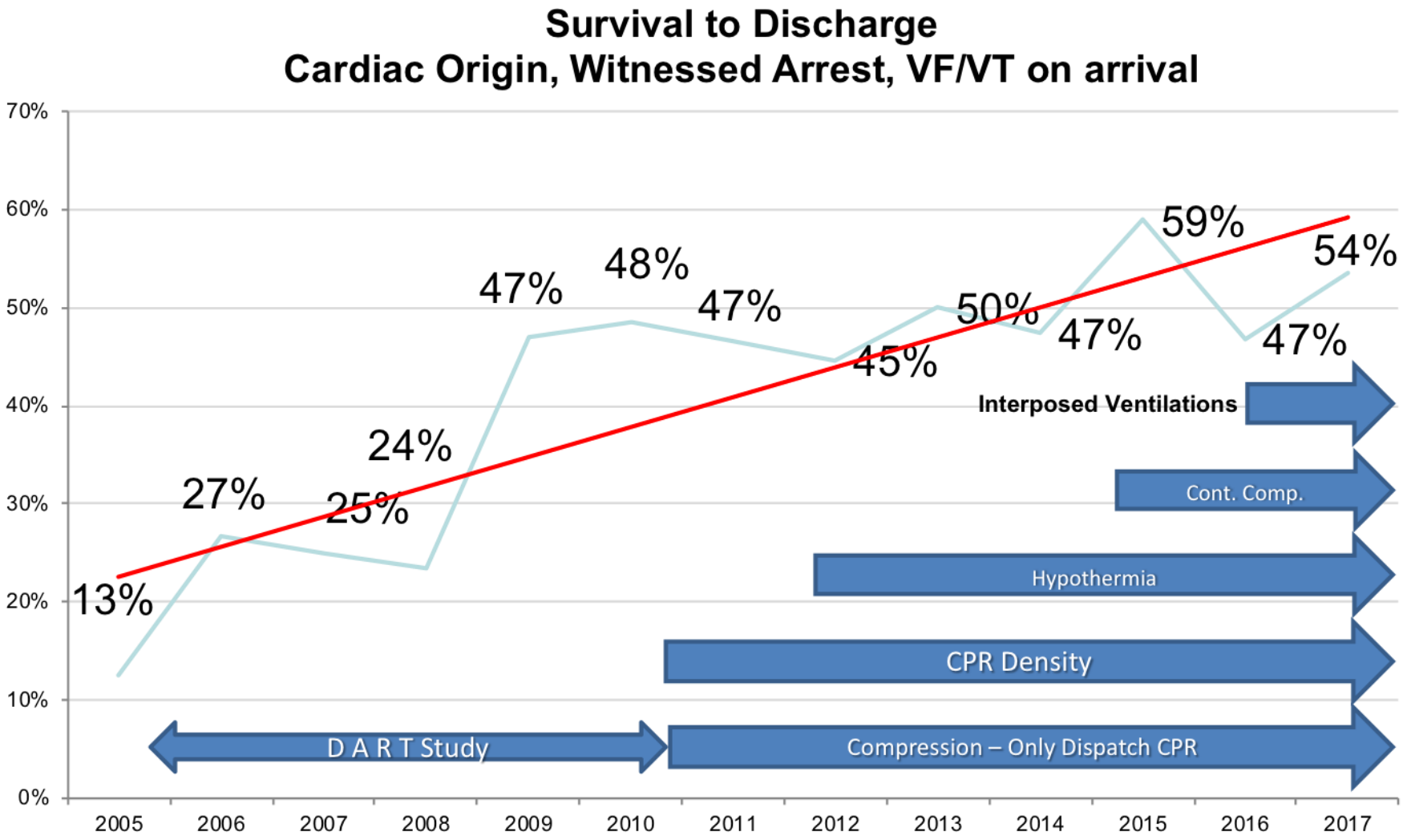
The Only Bed That Knows You

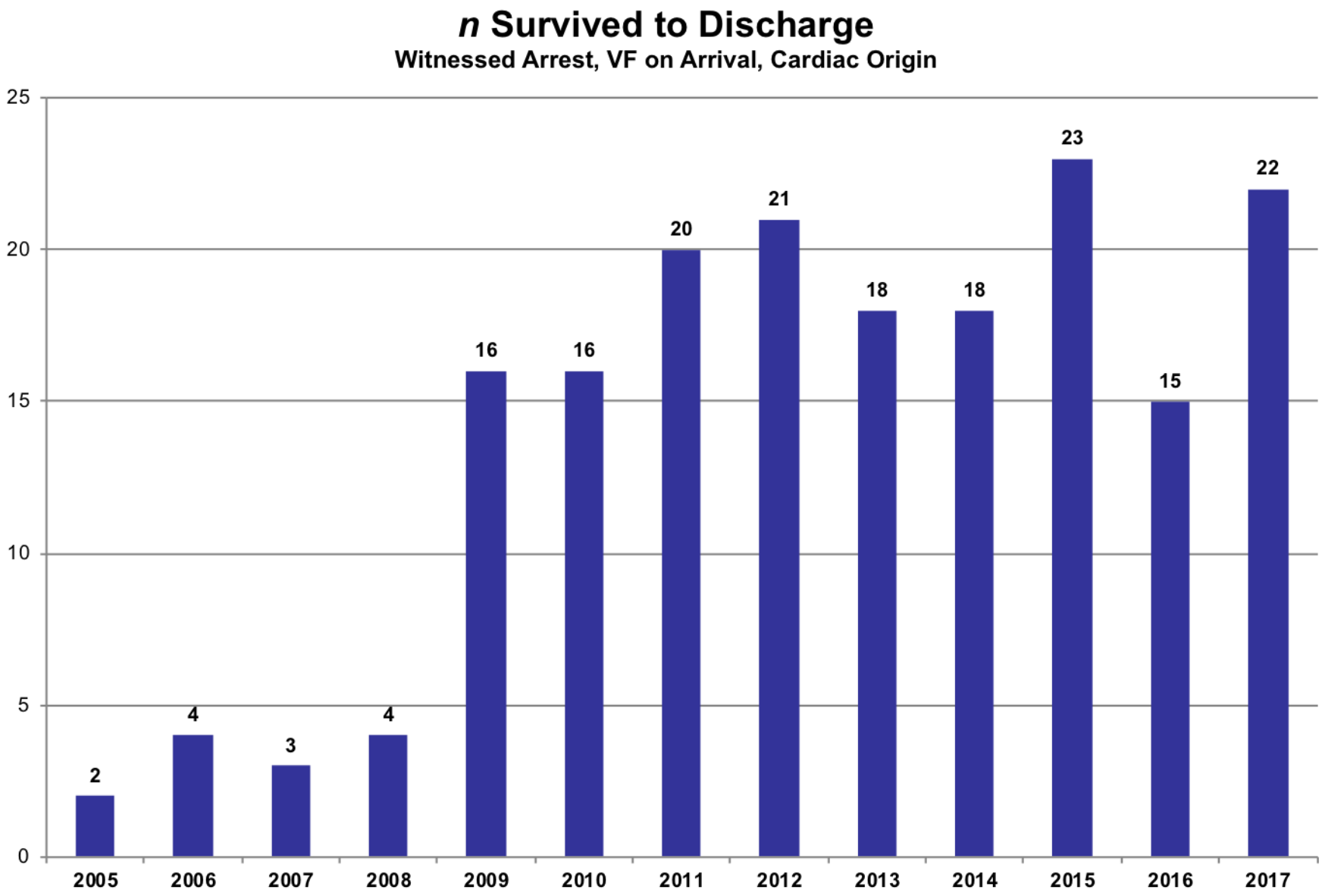
Success Stories

Measure and Improve



Other CA Survival

- Increased survival rate for non-Utstein CA
  - PEA, Asystole, other rhythms and not-witnessed
  - Usually 5-7 additional survivors / year
  - 2017: 13 additional


n Survived to Discharge
Witnessed Arrest, VF on Arrival, Cardiac Origin
25
20
15
10
5
0
2
4
3
4
16
16
20
21
18
18
23
15
22
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017

SPH In-Hospital CA

2014: Presentation to Managers & Directors

2015: Began Training with EMS

2016: Resuscitation Academy

CA Survival Rate 2014 = 29.6%

CA Survival Rate 2016 = **40%**

Average for hospitals similar size = 24%

Chelan & Douglas County, WA

Rural Communities

Improving Outcomes in Rural America

Lance Jobe, MD
Medical Program Director
Chelan and Douglas Counties
Washington

Chelan & Douglas County, WA

- 5,000 miles^2 / 13,000 km^2
- Pop. ~110,000
- Fire based BLS / ALS Pvt Amb
- Multiple Fire Departments
- 4 private ambulance Companies
- Champion:
  - Medical Director (Magician)

Challenges for Rural EMS Systems

1	**Leadership**	Smaller (often rural) fire and EMS systems may not have dedicated EMS leadership
2	**Resources**	Lack of physician involvement, administrative and financial support
3	**Call Volume**	Inadequate call volume for crews to gain practical experience
4	**Small numbers**	Data accumulation is slow—is system improving?

Conclusion—not easy—but it can be done!

• System Profile

• System Profile

Call Volume: 6300/yr

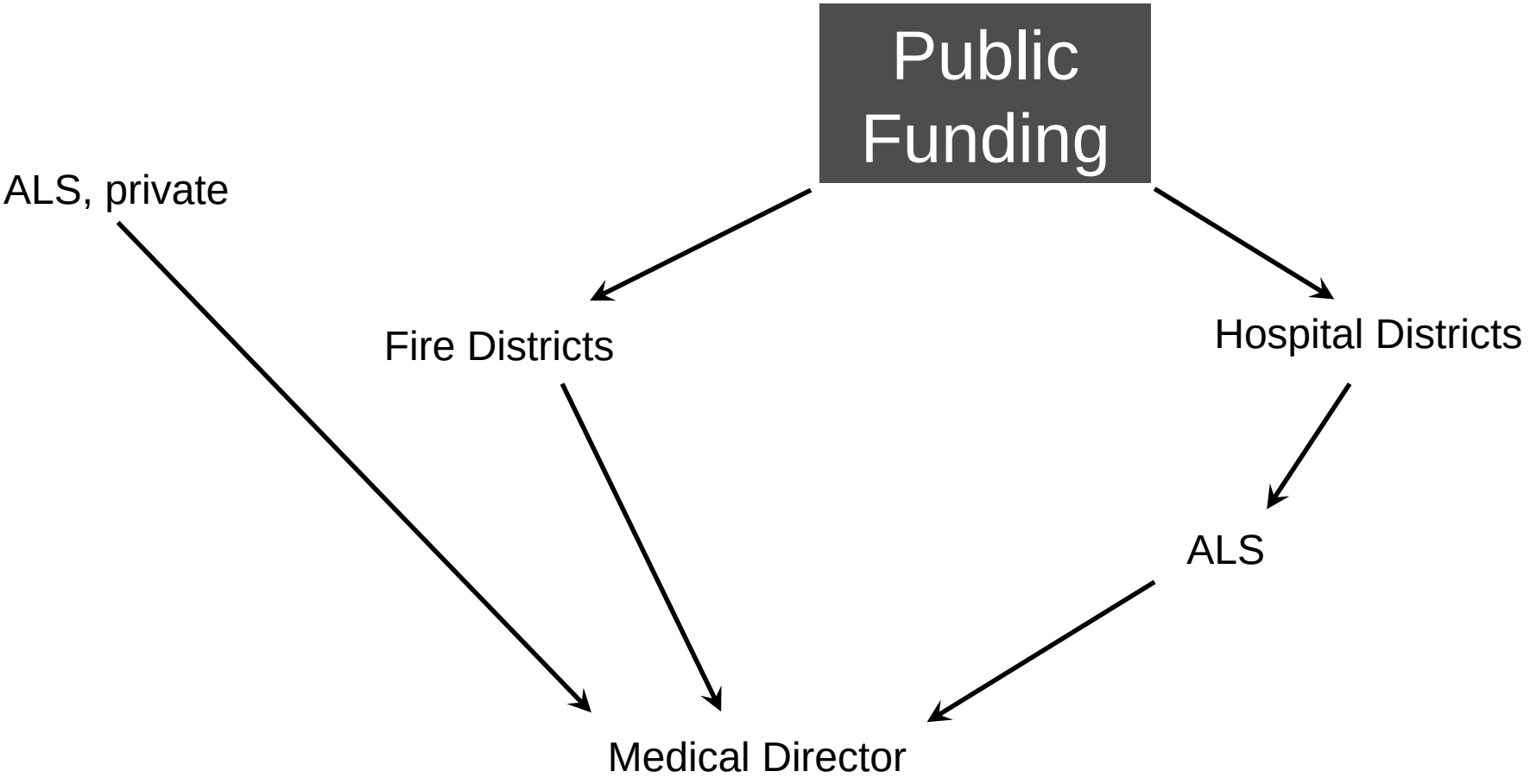
Call Volume: 4800/yr

Call Volume: 900/yr

Call Volume: 1100/yr

Post-RA Goals

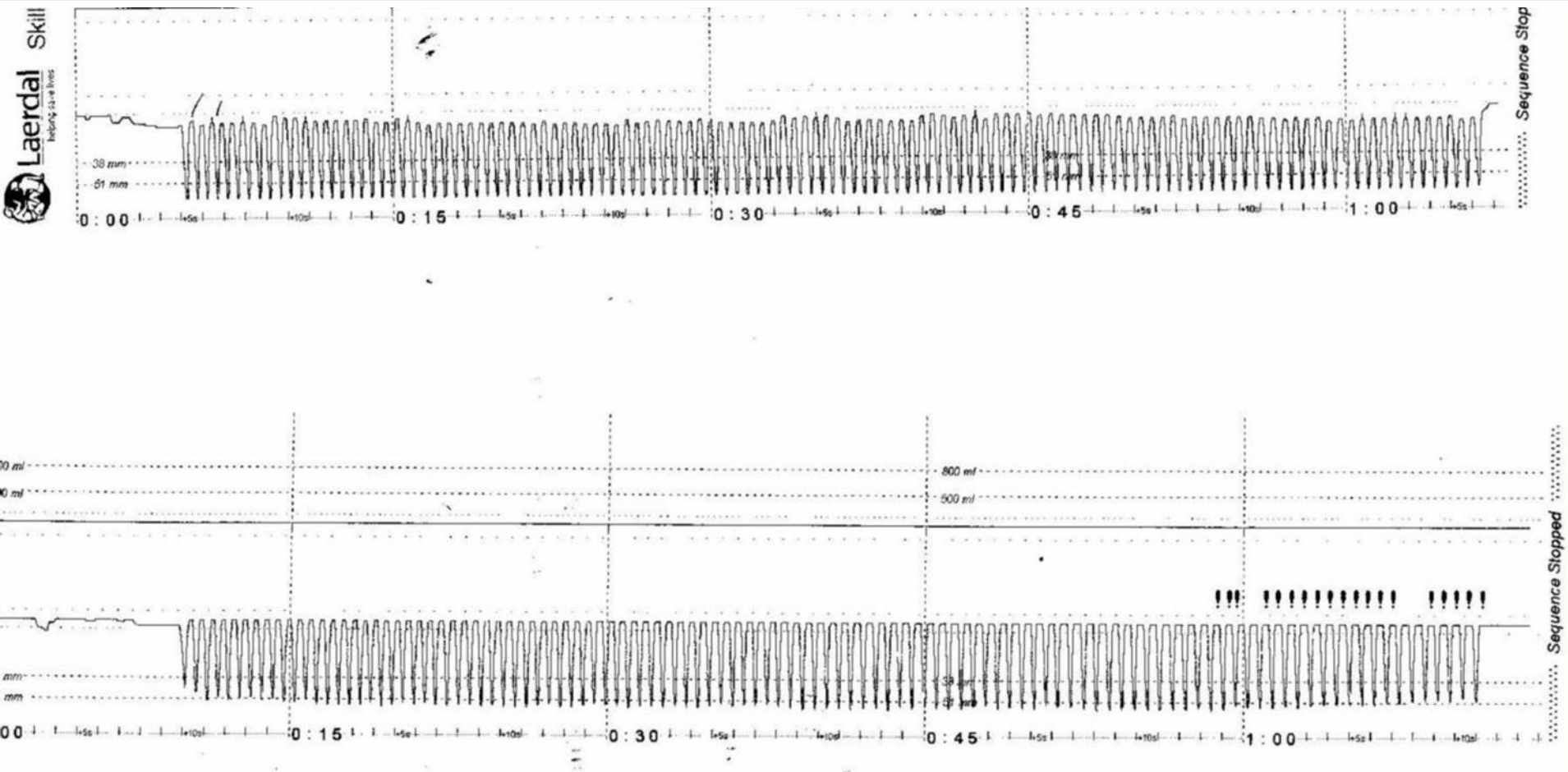
1. Establish High Performance CPR
2. Start measuring survival from OHCA
3. Create a new position: County QI Officer
4. Improve quality of CPR
5. Evaluate all OHCA and provide feedback



- Challenges of Implementation

Building political support

Using competition



The Perfect Strip

Case Report Card

Chief Baker
Douglas County Fire District #2
Responding with: Lifeline

Date of OHCA: 8/23/2016 at 0401 hours

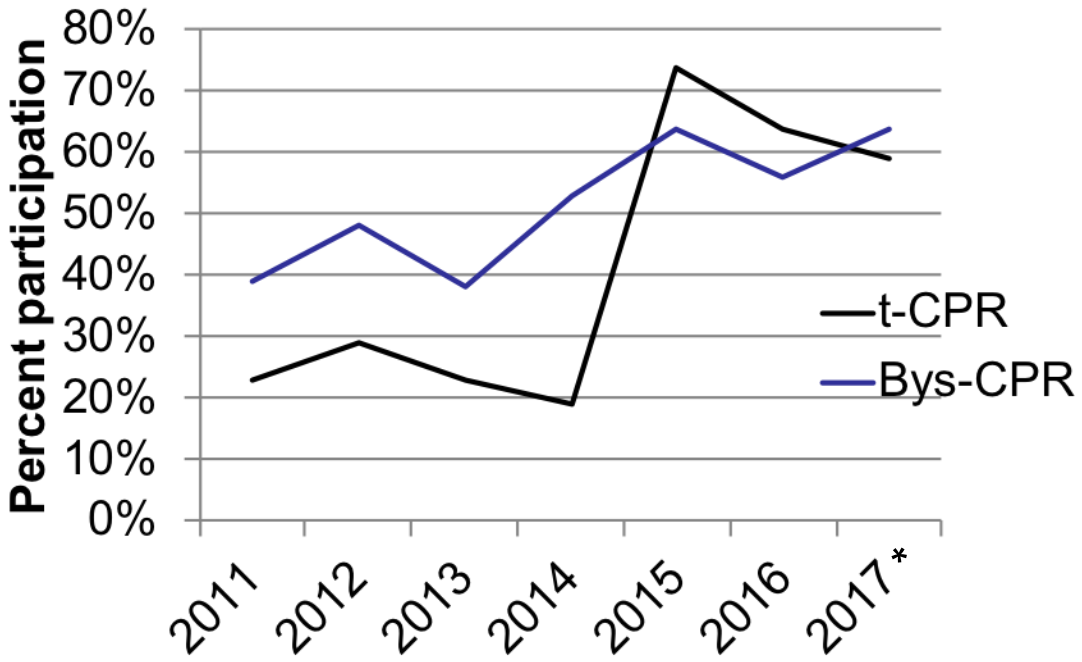
	Time	Percentage
Total time CPR needed (pulseless time)	36:41	NA
Total hands on chest (CPR Fraction)	34:43	95%
Total pause time (no CPR occurring)	1:58	5%

	Shortest	Longest
Pre-shock pauses (seconds)	1	5
Post-shock pauses (seconds)	2	3

	Average	% achieving goal
Compression Rate	110	96%
Compression Depth (inches)	2.1	65%

Data from Zoll RescueNet Software

Dispatch: Key Player



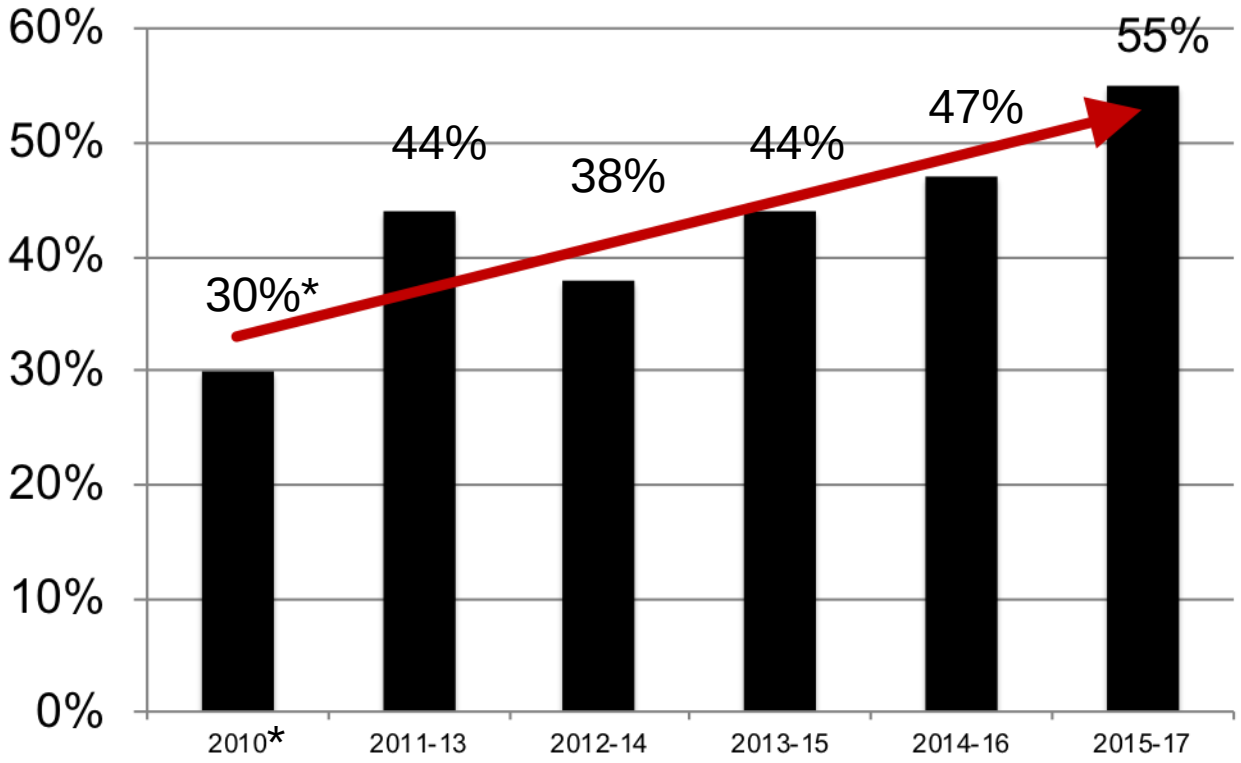
Changes in 2015:

- Start Criteria Based Dispatch
- Contract for medical direction
- Review all 911 calls for OHCA and t-CPR

*Data from Jan-Aug 2017

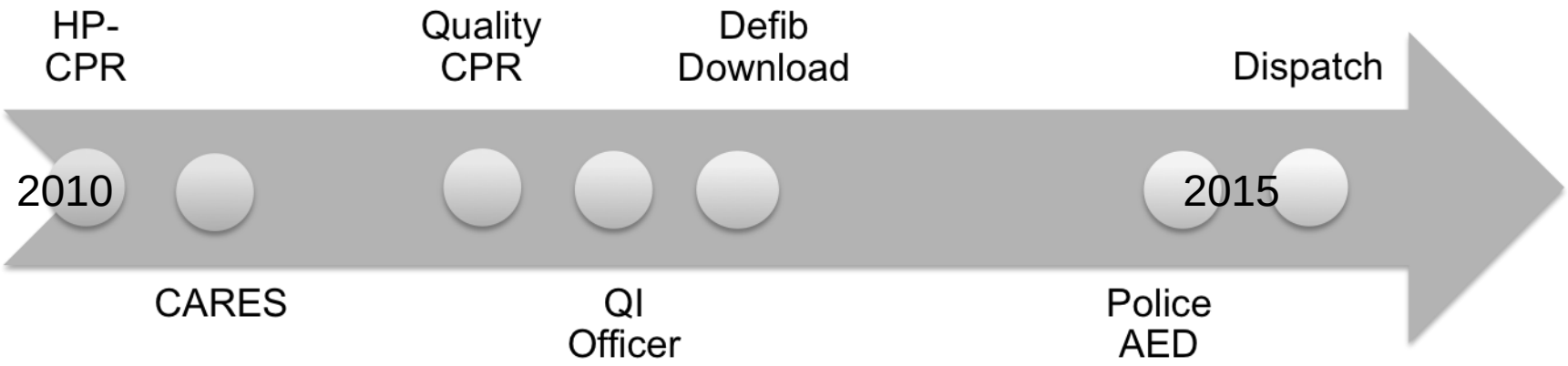
• 3-year Aggregate Utstein Survival

Chelan & Douglas Counties



*2010 data from retrospective review

• Change occurs step by step (mantra #4)



Howard County, MD

Howard County, MD

- 5,000 miles^2 / 13,000 km^2
- Pop. ~110,000
- Fire based Tiered BLS / ALS
- Single Agency - career/vol.
- Champions:
  - Medical Director
  - EMS Training Officer
- Support from County Executive and Fire Chief

Strategy

- Bottom up & top down approach
- Pilot projects
  - Operations Captain trained single Engine Co in HP CPR - empower the crew

Strategy

- Bottom up & top down approach
- Pilot projects
  - Command Officer engaged Police Department
  - Medical Director agreed to review cardiac arrests with initial shockable rhythms and provide feedback to the crews

Progress

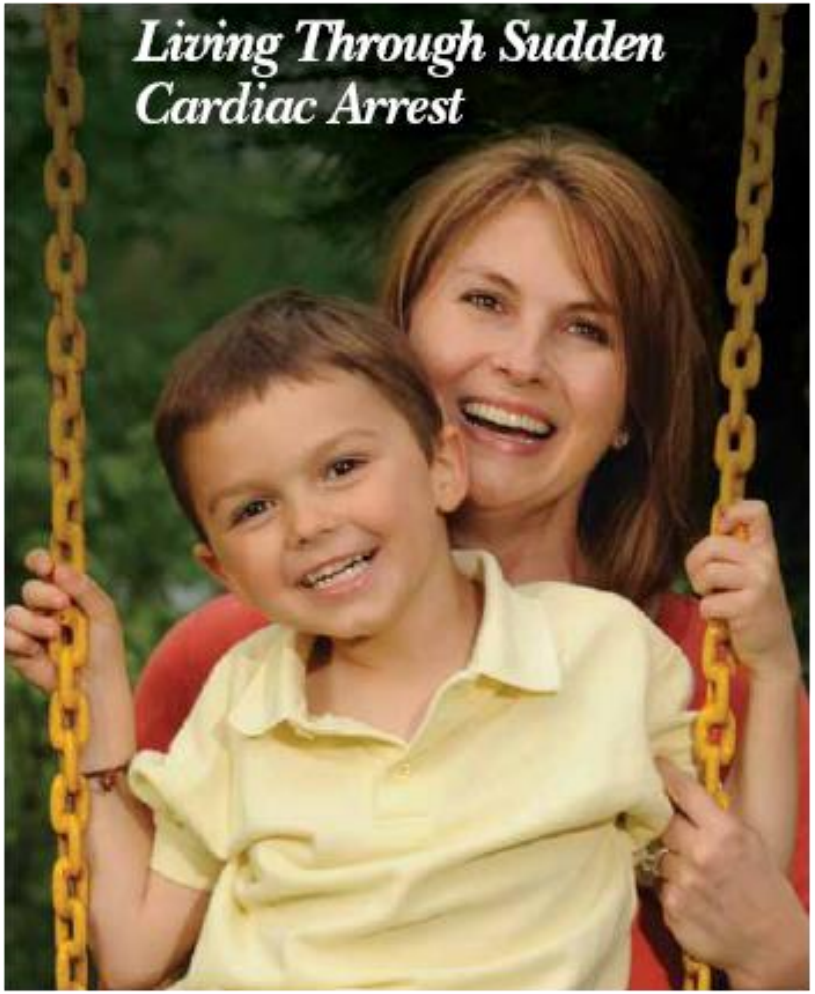
- Pilot Engine Co had several patients with return of ROSC
- Then the ‘Christmas Gift’
- Shift of the culture and ownership
- Success drove interest

Culture Change

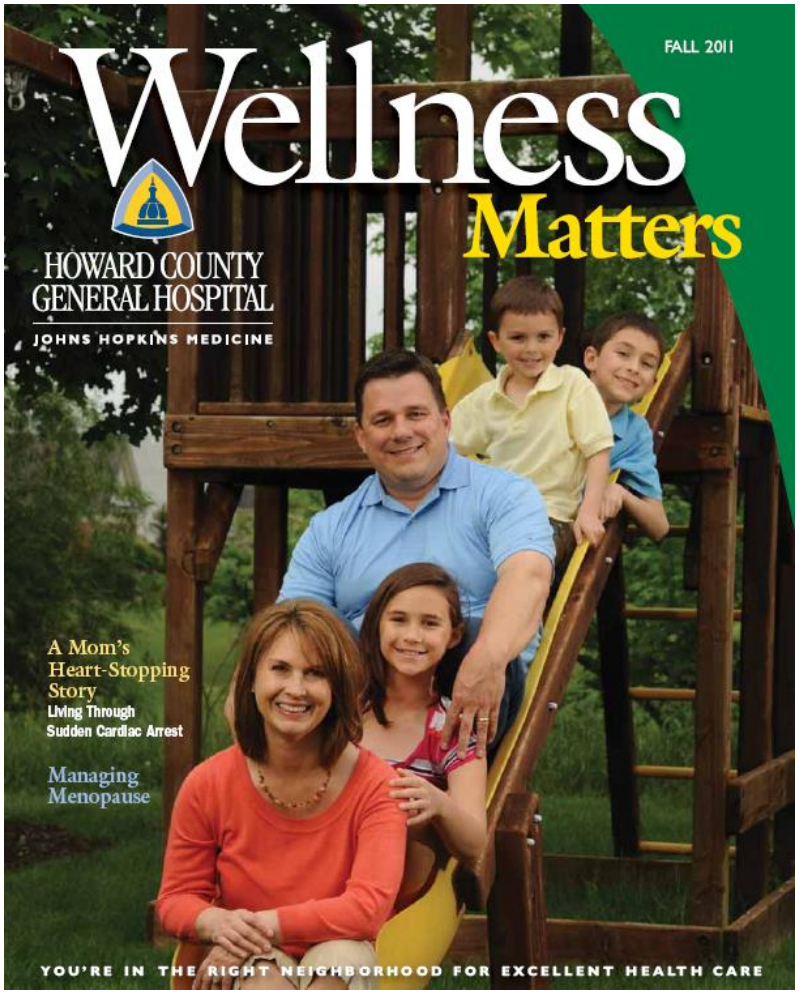
- Give it to the workers who use these techniques every day
- Celebrate/praise/publish success
- Set up healthy competition
- Seek out best practices
  and adopt to your organization
  - Give credit
- See one, do one, teach one
  - Teach others HP CPR techniques

It's personal

43 year old mother of three



Sudden Cardiac Arrest Survivor



The Maryland Resuscitation Academy

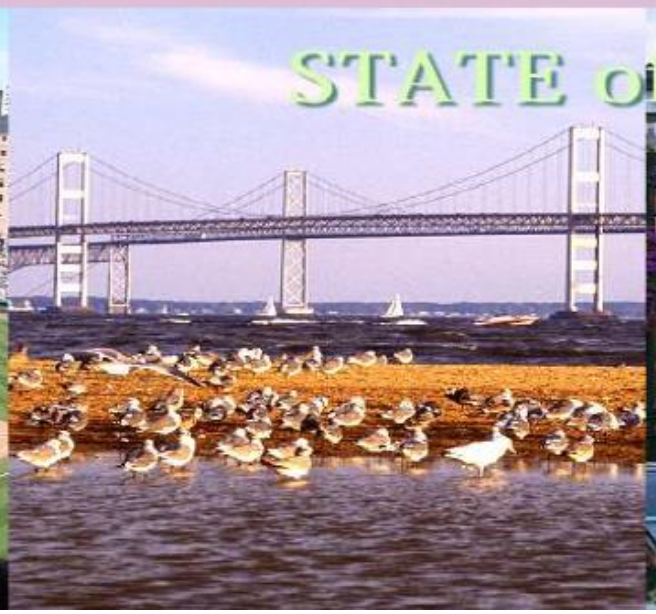
- 2012 – First RA
- 13 RAs in Maryland
- Today 23th RA, in 7 states, reaching over 1300 graduates
- Outreach to new HeartRescue US partner states

Where are we now?

- 19% ROSC to hospital arrival – no HP CPR
  - 2002-2003
  - Did not track beyond ER admission

- 2016 Utstein Survival: 47.6%
  - Discharged neurologically intact
    - (CPC 1-2)
  - Bystander CPR Rate: 49.3%
  - Bystander PAD Rate: 14.3%

CARES Statewide Implementation



Demonstration of cardiopulmonary resuscitation at the Johns Hopkins Hospital, circa 1960; Dr William B. Kouwenhoven maintaining airway with "chin-lift technique" and Dr. James J. Jude performing "closed-chest massage." "Patient" is third member of research trio, Dr Guy Knickerbocker.

First Reported Out of Hospital Save

January 6, 1960 - Baltimore, Maryland

Dr. C. Park and Dr. Peter Safar, Dept. of Anesthesia, Baltimore City Hospital and Capt. Martin McMahon, Chief, Baltimore Fire Department Ambulance Service

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The Development of the Defibrillator

WILLIAM B. KOUWENHOVEN, M.D., *Baltimore, Maryland*

SUMMARY: I was fortunate in [illegible] being chosen a member of a team to study the effects of electric shocks on human beings. In 1930 we were asked to investigate the statement of Prevost and Battelli (1) that they had been able to defibrillate the ventricular fibrillating dog's heart by applying an alternating current shock directly to the myocardium. They had used direct cardiac massage to circulate oxygenated blood. We confirmed their statement and developed an alternating current defibrillator. That method became a standard operating room procedure in fibrillation cases.

We also found that the human heart could be defibrillated by placing the electrodes on the surface of the chest and applying low-level electric energy. This procedure eliminated the need for thoracotomy.

We continued our studies and have developed the Hopkins AC, monophasic and biphasic DC capacitor-type defibrillators, and external cardiac massage.

THE DEVELOPMENT OF THE defibrillator was initiated by Dr. J. W. Lieb, President of the Consolidated Edison Co. of New York. In 1925 he became disturbed by the increasing number of electric shock accidents and deaths. Dr. Lieb called on Dr. Simon Flexner of the Rockefeller Institute, New York, for advice. Conferences were held and five committees were formed with the following chairmen: Physiology, Dr. W. H. Howell (The Johns Hopkins University); Pathology, Dr. W. B. MacCallum (The Johns Hopkins University); Engineering, Dr. Philip Drinker (Harvard University); Electrocution, Dr. H. B. Williams (Columbia University); Cytology, Dr. W. J. Gies (Rockefeller Institute). Funds were made available by the power company.

At Johns Hopkins I was fortunate in being chosen as one of three faculty members to carry on the experimental studies under the direction of Dr. Howell and Dr. MacCallum. The other two were Dr. R. D. Hooker, Professor of Physiology, and Dr. O. R. Langworthy, Associate Professor of Neurology.

Ventricular fibrillation was known to be one of the effects of electric shock, and in May of 1928 Dr. Hooker began an experimental study on the treatment of fibrillation with drugs.

Langworthy and I were to study other effects. Dr. Lieb invited us to visit him in New York so that we could learn at first hand the types of electric shock accidents (2) that occurred in industry and homes. He

Received April 8, 1969; accepted April 17, 1969.
From The Johns Hopkins Hospital, Baltimore, MD.

Requests for reprints should be addressed to W. B. Kouwenhoven, M.D., 1101 Bloch Bldg., The Johns Hopkins Hospital, 601 N. Broadway, Baltimore, MD. 21205.

Albany, NY

Albany, NY

- 22 sq miles^2 / 55 km^2
- Pop. ~100,000
- Fire based Tiered BLS / ALS
- Private ALS ambulance transport
- Champion:
  - Division Chief/Training Officer
- Support of EMS Chief & Medical Director

What could go wrong……?

Review and Questions

Biases

- **More lives can be saved**
- **If you've seen one EMS System, you've seen one EMS System**
  - **The best model is the one that works for YOU**
- ***"There are no silver bullets." - L. Cobb***
- ***"There is only hard work." - M. Copass***
- **You have to play the long game**


WAIT A MINUTE... THEY'RE PERFORMING CPR ON YOU.
IN DENMARK


25687


MEDIC ONE
FIRE DEPARTMENT
SEATTLE
CHEAT'N DEATH SINCE 1969
S·F·D