



**Needham Public  
Health Division**  
Prevent. Promote. Protect.

# **Sudden Cardiac Arrest – why should Public Health care**

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# What we will cover

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1. Sudden cardiac arrest (SCA)
2. Brief History of CPR
3. Why SCA is a Public Health issue
4. What can you do in your community to help
5. Advocacy: local, state, federal
6. Quick talk about HEARTsafe community
7. Questions

# We hope you will

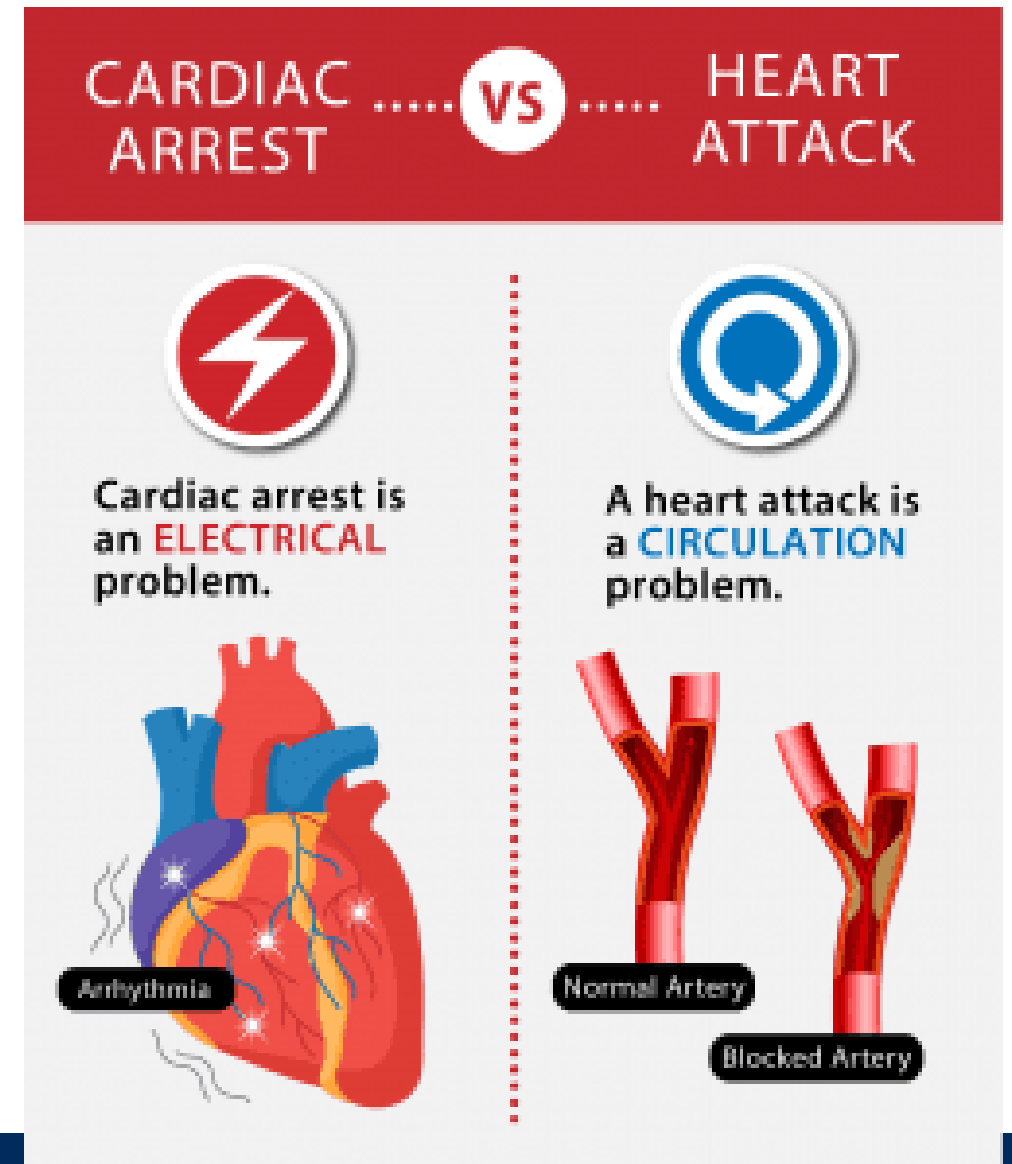
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1. Refresh memory on heart function and what happens in SCA
2. Learn how CPR developed from an accidental discovery to a life saving technique
3. Increase awareness of how public health is instrumental in responding to SCA
4. Understand what barriers there are to providing bystander CPR
5. EMS system in MA and how it could be improved
6. Learn about current legislative actions to increase bystander participation
7. Get some practical ideas on what to do in your own community to improve SCA survival

# Function of the heart

- Acts as a pump to circulate blood through rest of the body.
- Controlled by cardiac conduction system
- Sinus rhythm is normal rhythm
- Can have electrical abnormalities
- Can have circulatory abnormalities

CARDIAC ARREST ..... VS ..... HEART ATTACK



**Cardiac arrest is an ELECTRICAL problem.**

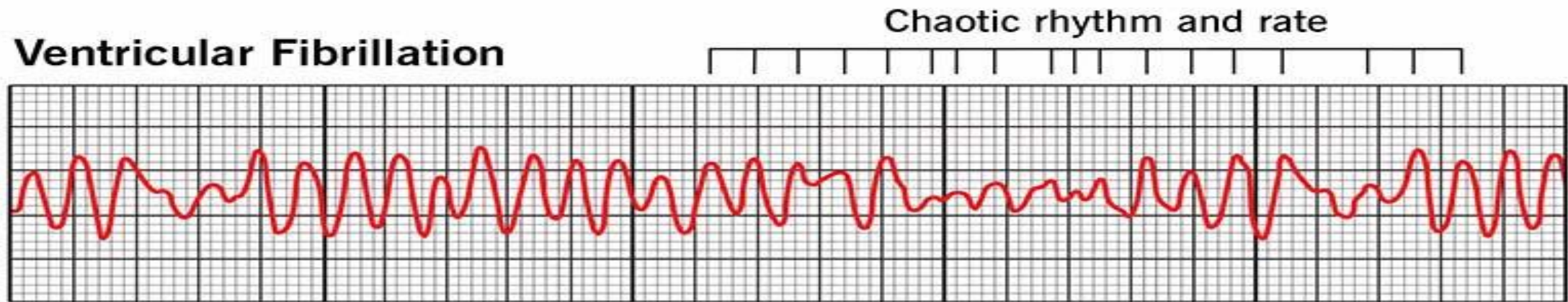
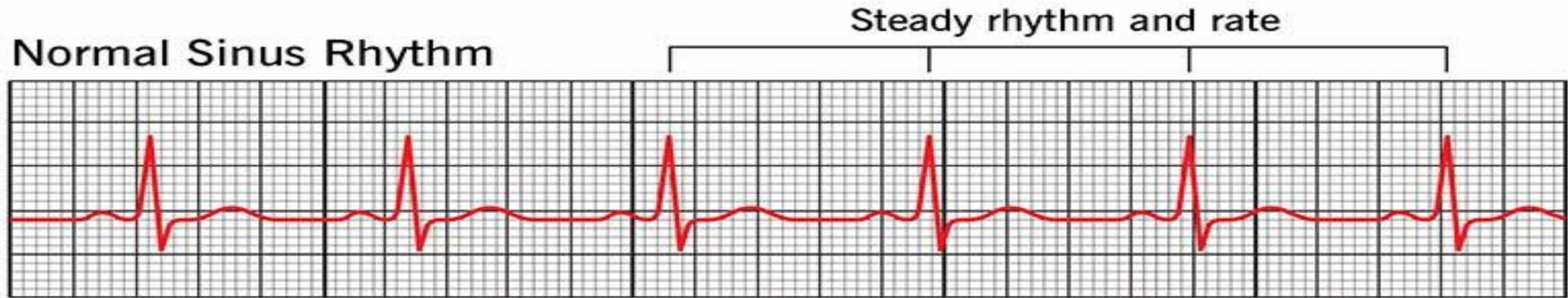
**A heart attack is a CIRCULATION problem.**

Arrhythmia

Normal Artery

Blocked Artery

# Sinus rhythm vs Ventricular Fibrillation



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# Sudden Cardiac Arrest (SCA)

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Inability of the heart muscle to function properly & pump blood through the body. Can happen to anyone, anytime regardless of past medical history or age.

**Causes:** Electrical arrhythmia (VF / VT), drowning, electrocution, drugs / alcohol, commotio cordis (hit to the heart)

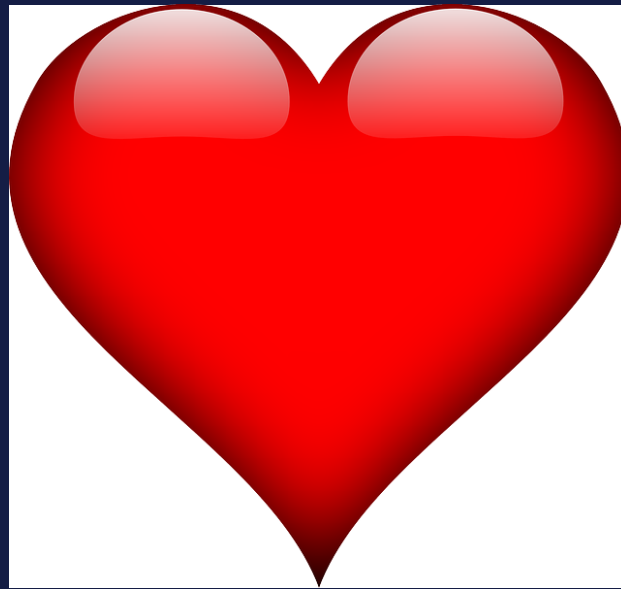
**Sign:** loss of consciousness

**Treatment:** CPR / AED / medications

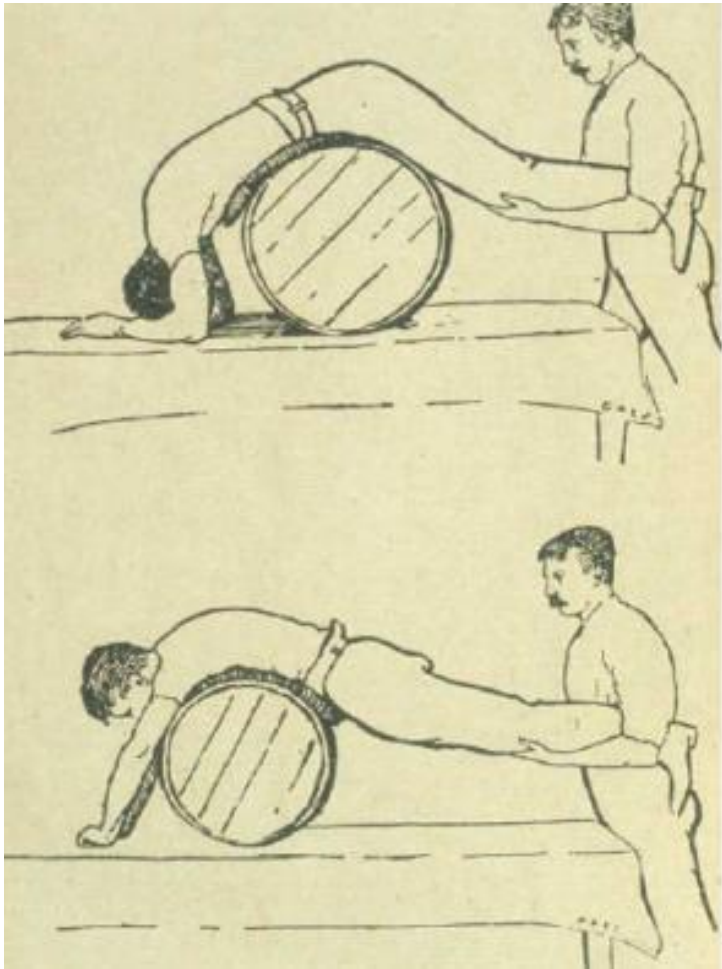
**Statistics:** US (2022) outside of hospital cardiac arrest: ~350 000. 75% at homes, 15% in public places, 10% at nursing homes.

**Survival:** US National 8-10%, King County WA ~50%, Denmark ~60%, MA 3-5%\*.

# Rebecca's story

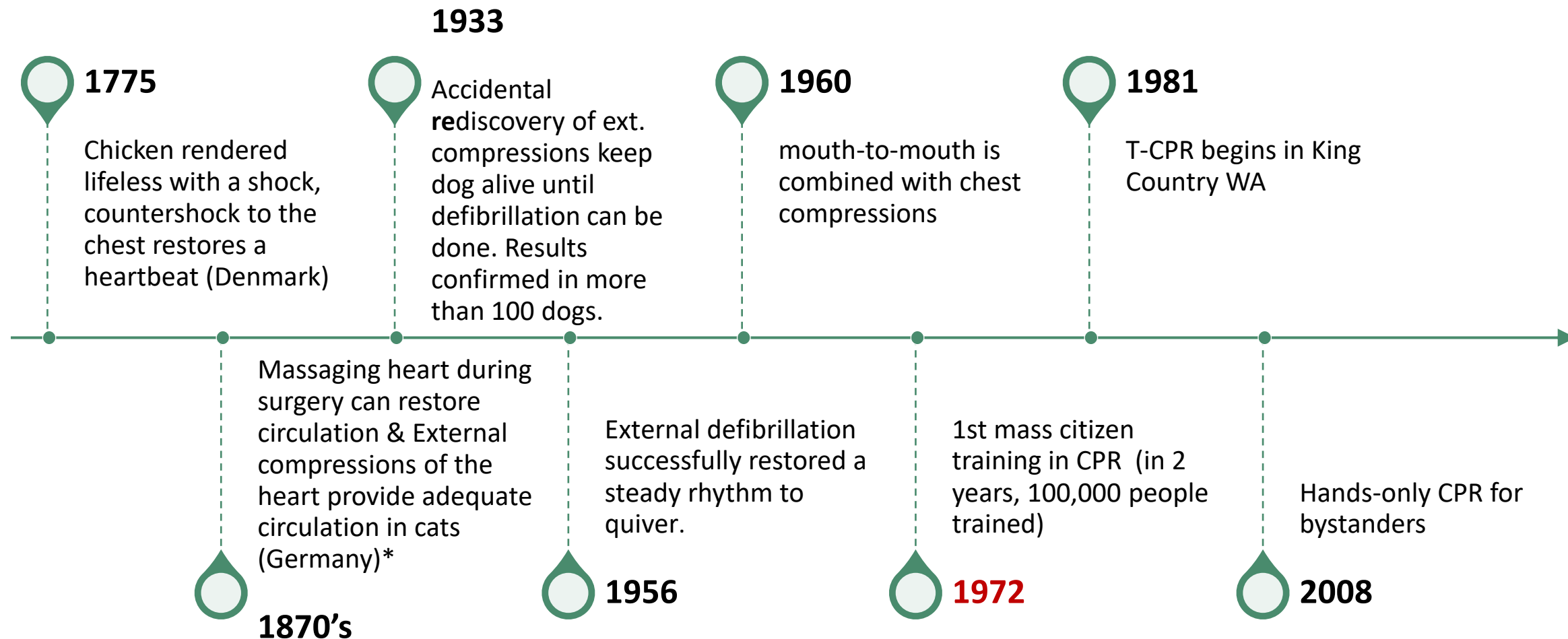


# CPR “back then”





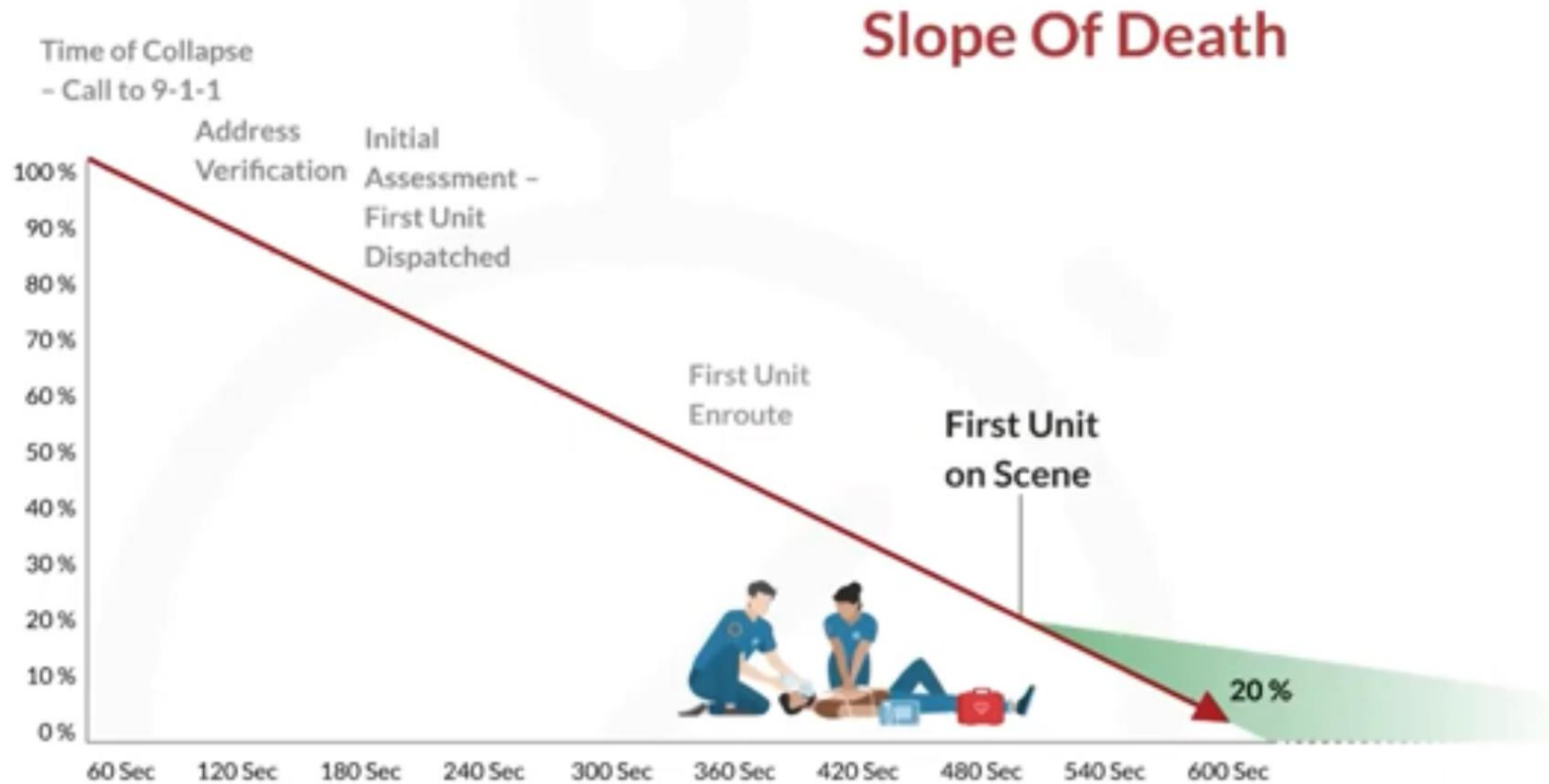
# Development of CPR..



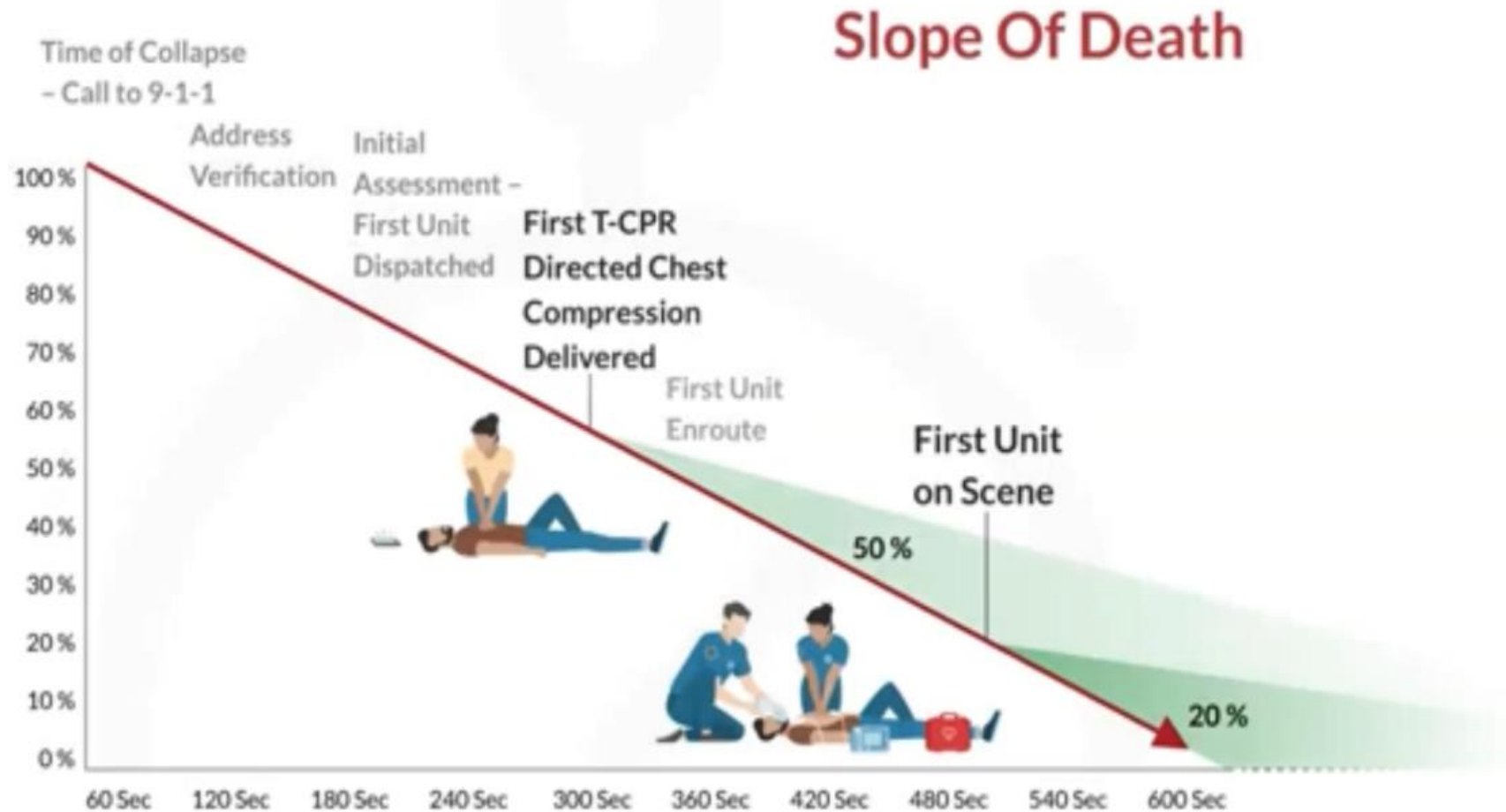
# Why SCA is a Public Health Issue?

- High mortality rate ~ 90%
- Large impact on quality of life
  - Neurologic injury
  - Functional disability
- Economic burden
  - Health care costs
  - Loss of revenue
- Prevention opportunities
  - Many risk factors can be altered with lifestyle changes
- Public awareness and access to care
  - Bystander action can triple survival

# Slope of Death in SCA



# Slope of Death in SCA with Bystander CPR



# Critical teaching points

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1. Recognize cardiac arrest
2. Initiate EMS system by calling 911
3. Perform immediate compressions: depth, rate, limiting interruptions, recoil of chest
  - Helps keep in VT
  - Makes shock most effective
4. Use of an AED as soon as possible

These are all things Public Health can raise awareness of, educate & empower, promote for resources.

# Barriers

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## 1. Not being confident about recognizing sudden cardiac arrest

- Mistaken for seizure / fainting / other cardiac event
- Symptoms can be confusing
  - agonal breathing can delay starting CPR, but it is also associated with increased survival
  - brief seizure activity due to anoxic brain injury

## 2. Bystanders might call family / friends prior to calling 911

- Distrust towards law enforcement
- Financial consequences (inadequate insurance)
- Immigration status & Limited English proficiency

# More barriers

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## 3. Lack of CPR training

- Median CPR knowledge is 2.4% (2014), varies greatly between areas.
- Accessibility for classes (fees / time / instructor)
- Consider alternatives (get attention on how fast one can learn!!)
  - COCPR
  - in the community
  - ultra-short videos
  - PSA's
  - social media campaigns

# In the Community





# Barriers cont.

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## 4. Legal Restrictions

- Good Samaritan Law – tell people about the protections they have
  - Every state is different, in MA protects those who provide emergency care to others in good faith.
  - People with limited English proficiency have more hesitancy.

# Barriers cont.

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## 5. Emotional, Mental, Health Factors

- Psychological: panic, apprehension, feelings of inadequacy in emergency setting
  - Women / non-English speakers state this as reason not to act more than others
  - Also, why strangers are often better suited to act calmly in emergency (less panic / emotional stress)
- Confusion about “protocol”, lack of knowledge of CPR, fear of incorrect CPR technique are all cited as reasons to delay acting.
- Mouth-to-mouth ... COCPR addresses this concern
  - Pathogens
  - Vomiting / regurgitation

# Strategies to increase bystander CPR training

## 1. Increase training / learning opportunities

- Those who know will act more frequently

## 2. Certification courses

- Only about 5% of US population has a CPR **certification** of some sort
- These trainings do not reach **lay** people in large quantities (esp. Hispanic & African-American)
- Find & train those who are most likely present where SCA happens (friends / family of high-risk people)

# Strategies cont.

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- Schools
  - Catches all socio-economic sectors
  - Students share knowledge with their parents / siblings.
  - Learn lifetime skills for appropriate responding to emergencies
    - Use teachers (not health professionals) for teaching
    - Self-instruction kits / computer-based trainings as homework.

# Strategies cont.

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## 3. Songs!

- With beats 100-120 / minute. Play lists for people to find their own jam. AHA website.

## 4. Food for thought .. CPR as Pre-Req.

- 50% of EU countries require this prior to driver's license given (at 18) (Denmark, Sweden)

# Strategies cont.

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## 5. Prepare Family Members of high-risk individuals

- 70% happens at homes (4/5)
- CPR training: reduces anxiety, empowers helpers, increases self-confidence to act, increases secondary training of friends and family
- Consider having as part of hospital discharge program / for pt's at ER's who are high risk patients.

# Word about AEDs

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- In the US 1 million purchased, no national registry.
  - Federal, state, local regulations could help.
- Daycares, dental offices, gyms – required in MA but who monitors / maintains this?
- AED's have a label (incorrectly) “for trained professional use only”
  - Discourages use by lay personnel
- Police First Responder Program (FRP)
  - AEDs in each car? Do you have that in your town / city?

# Collecting Data

## 1. Why

- Need reliable and uniform data collection to
  - Measure effectiveness of response
  - Assess impact of interventions
  - Improve survival from SCA

## 2. CARES (Cardiac Arrest Registry to Enhance Survival)

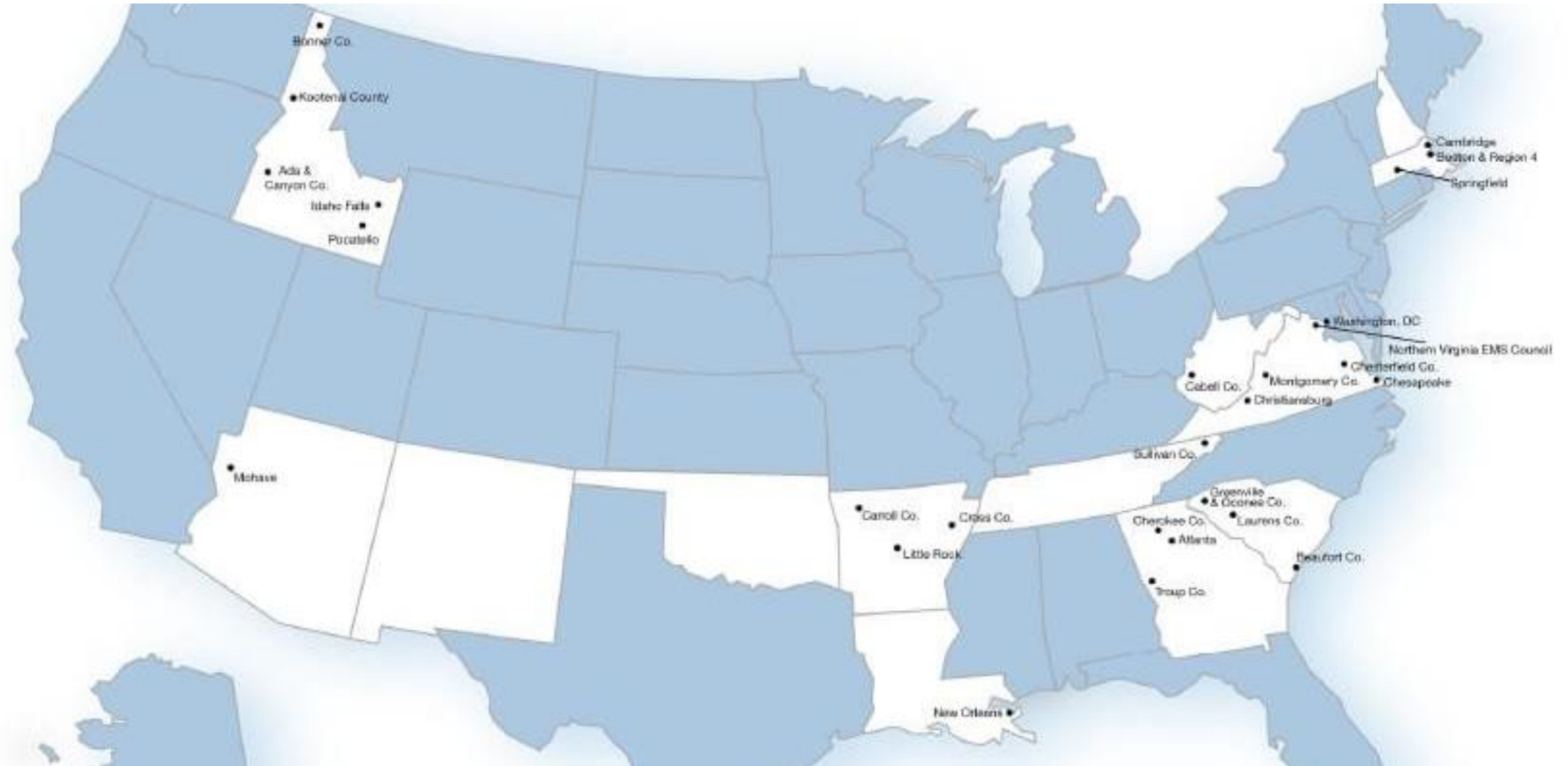
- Web based management system, HIPAA compliant
- Demographic information
- Circumstances of CA
- Resuscitation specific data
- ER and hospital data

## 3. Barriers to signing on:

- Willingness to be transparent with outcomes?



# CARES States



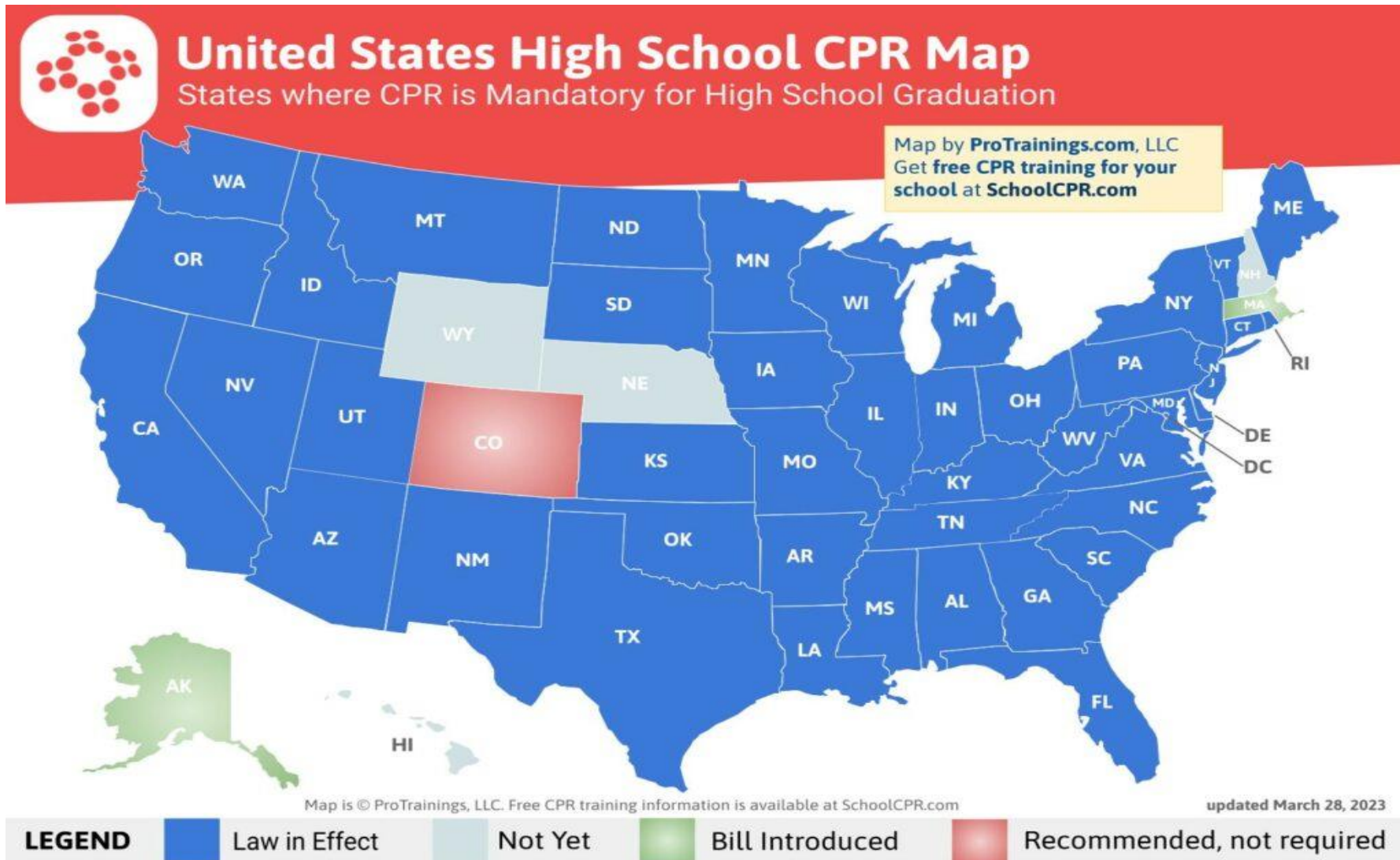
# EMS System in MA



alamy

Image ID: G39J3P  
www.alamy.com

# CPR required for High School graduation



# Advocacy

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## 1. Federal level

- “*Access to AEDs Act*” (S.1024) was introduced in 3/2023. This bill would require US Dept of Health and human services to fund AEDs to public school as well as CPR / AED use training. Pending before the Senate.
- “*HEARTS Act*” (H.R. 6829) Cardiomyopathy Health Education, Awareness, Research and Training in Schools passed the House of Representatives in September.

Passing federal legislation bolsters state action. Reach out to your representatives to encourage them to support and act on these.

# Advocacy cont.

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## 2. State level

- H.492 is a bill that would make the knowledge of CPR and use of AED a graduating requirement for MA high school seniors. Contact Rep. Patricia Haddad regarding this bill.
- 1427 aims to introduce Telephone CPR as a requirement for all 911 telecommunicators, make SCA reportable & create AED registry. Senator Michael Moore is the sponsor for this bill.

Reach out to your representatives to encourage them to pass these bills.

# Advocacy cont.

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## 3. Local Level

- Make connections to your legislator, town manager / mayor, school health director, EMS director, Medical director, police.
- Share the message of hands-only CPR with all town departments.
- Get the community excited about this through events / scavenger hunts / social media posts.

# HEARTSafe

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- By the Citizen CPR Foundation
- 13 criteria to improve outcomes from sudden cardiac arrest (SCA) at the local level.
- Foundational concepts:
  - To strengthen chain of survival by promoting
    - widespread CPR instruction / bystander activation
    - public access defibrillators
    - aggressive resuscitation protocols for first responders
    - data collection and analysis ..which leads to quality improvement

# 13 Criteria

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## 1. Establish a lead agency

## 2. Use data to drive solutions

- enrollment in CARES

## 3. Trained citizen rescuers

- 15 % of residents need to know how to recognize a SCA and what to do in the event.

## 4. Recognizing bystander intervention



# Criteria cont.

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## 5. Educated and responsive citizens

- targeted awareness campaigns
  - February (AED scavenger hunt / AED skills lab)
  - June (social media campaign / CPR & AED skills lab)
  - October (Harvest Fair CPR walk-by training, social media, News article?)

## 6. Telephone guided CPR

- initiatives at the state level.
- locally: technically everyone trained

# Criteria's cont.

## 7. Planned and practiced response

- should have periodic drills
- protocols in place and everyone trained on those

## 8. Strategically placed AED's, 24/7 accessible

- mapping AEDs in town
- 24/7 accessibility only on EMT / Police vehicles / greens field



# Criteria's cont.

## 9. 911 Integrated AED registry

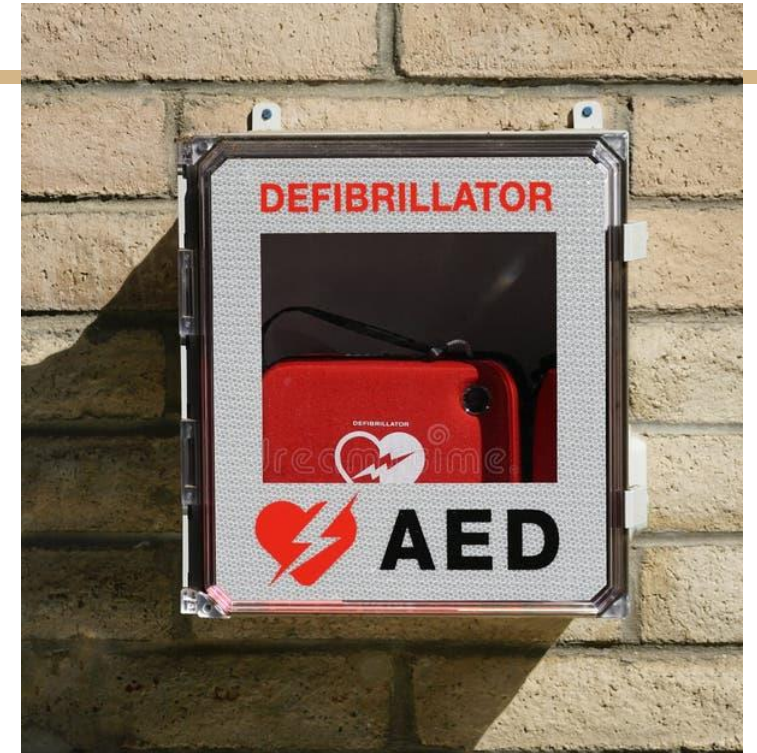
- PulsePoint

## 10. First responder defibrillation

- everyone trained
- all police cars have AEDs in them, all officers trained

## 11. High-performance resuscitation

- Lucas x2 / LifePack for feedback / hospital w/ cardiac Cath suite)



# Criteria's cont.

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## 12. Quality improvement and public reporting

- Handtevy app in July (FIRE)
- Annual Town report (possibly)

## 13. Meaningful health promotion and prevention efforts

- Primary: by the individual to prevent onset of disease (lifestyle choices, diet & exercise)
- Secondary: reducing impact of disease with early diagnosis to prevent permanent damage

# Questions?

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