# Cardiac Arrest - Translating Recommendations into Action: Using Your Data


Robert B Dunne MD FAEMS, FACEP
Medical Director, Detroit Fire Department
EMS Program Director, Professor
Wayne State University

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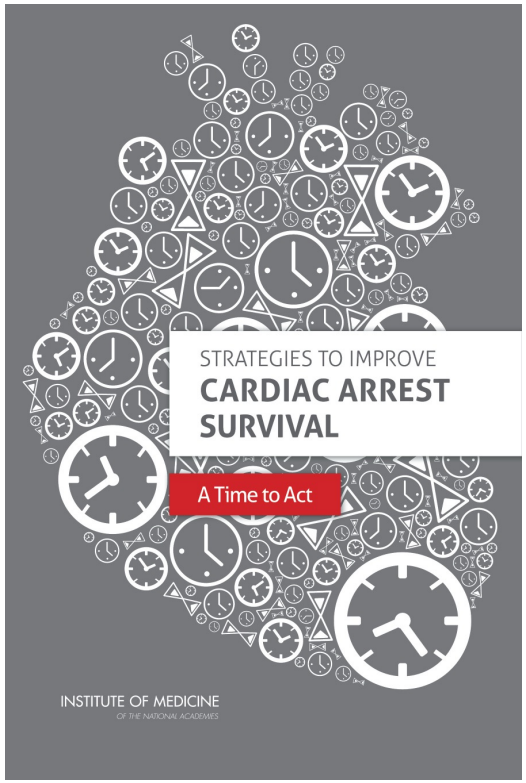
# Key Findings & Recommendations from the IOM Report - 2015




- **Poor Survival Rates:** Cardiac arrest remains a major public health issue with low survival, highlighting gaps in current systems.
- **Data Deficit:** A major barrier was the lack of a national surveillance system to track OHCA and IHCA, hindering progress.
- **Need for Collaboration:** The report urged diverse groups (government, non-profits, healthcare providers) to work together.
- **Systemic Improvements:** Recommendations focused on improving immediate bystander response, EMS, hospital care, and post-arrest rehabilitation

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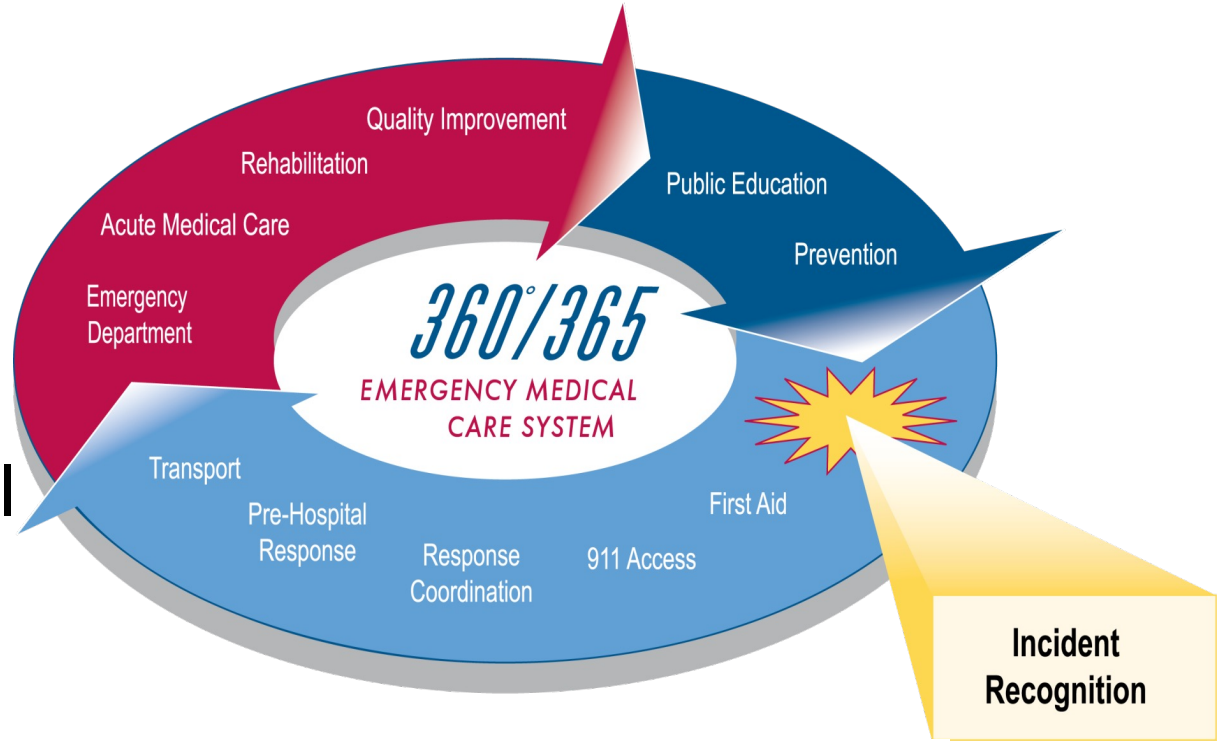
# Cardiac Arrest System of Care

- Citizen Response
- 911 Dispatch
- EMS/Prehospital Care
- Hospital Care





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# Finding your Own Solutions

ELSEVIER

RESUSCITATION

www.elsevier.com/locate/resuscitation

CLINICAL PAPER

## Outcomes from out-of-hospital cardiac arrest in Detroit☆

Robert B. Dunne[a,*], Scott Compton[a,b,c,d], R.J. Zalenski[b], Robert Swor[c], Robert Welch[d], Brooks F. Bock[d]

[a] *Department of Emergency Medicine, Sinai-Grace Hospital, Wayne State University, Detroit, MI, United States*
[b] *Department of Emergency Medicine, John D. Dingell VA Hospital, Wayne State University, Detroit, MI, United States*
[c] *Department of Emergency Medicine, William Beaumont Hospital, Wayne State University, Detroit, MI, United States*
[d] *Department of Emergency Medicine, Detroit Receiving Hospital, Wayne State University, Detroit, MI, United States*

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**KEYWORDS**
Out-of-hospital CPR;
Emergency medical services;
Adult;
Cardiac arrest

**Summary**
*Objective:* To determine the out-of-hospital cardiac arrest survival rate, and prevalence of modifiable factors associated with survival, in Detroit, Michigan, over a 6-month period of time in 2002.
*Methods:* A retrospective review of all out-of-hospital cardiac arrests responded to by the Detroit Fire Department, Division of Emergency Medical Services. All elements of the EMS runsheet were transcribed to a database for analysis. Patient hospital records were reviewed to determine survival to hospital admission. All survivors to hospital admission were surveyed later in the Michigan Department of Vital Records death registry search.
*Results:* During this study timeframe, there were 538 confirmed out-of-hospital cardiac arrests within the City of Detroit, of which 67 were excluded for being dead on scene [51 (12.5%)] or having no available hospital records [16 (3.0%)]. Of the remaining 471 patients, 443 (94.1%) died before hospital admission. Only 44 (9.9%) of the 471 patients had a first recorded rhythm of ventricular fibrillation (VF), and 339 (76.5%) were asystolic. Of the 28 patients who survived to hospital admission, only 2 (7.1%) were noted to have a first rhythm of VF, and 15 (53.6%) were asystolic. Only one patient survived to hospital discharge.
*Conclusions:* In this urban setting, out-of-hospital cardiac arrest is an almost uniformly fatal event.


☆ A Spanish translated version of the summary of this article appears as Appendix in the final online version at

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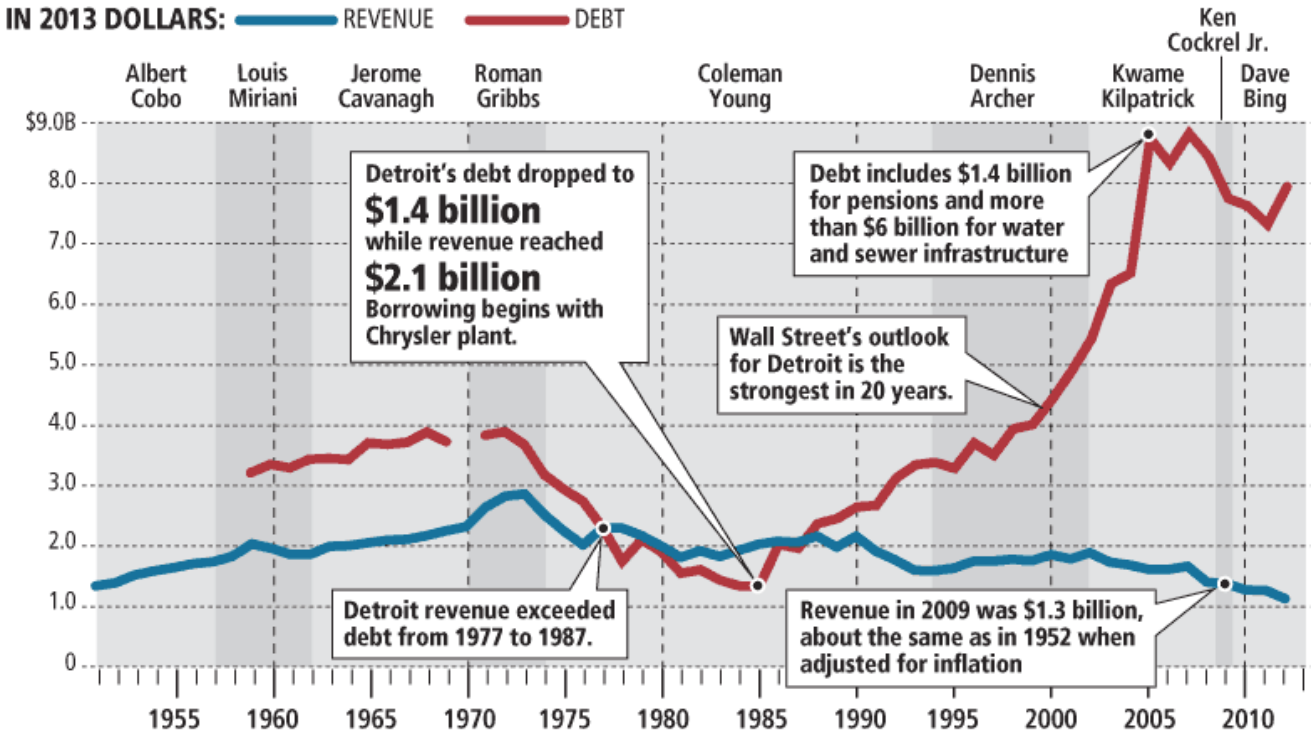
# BEG-BORROW-STEAL

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# KNOW YOUR DATA


## Utstein Survival Report

All Agencies

Incident State: MI | Date of Arrest: 01/01/13 - 12/31/20

Resuscitations Attempted
48217

Trauma Etiology
1954

Non-Traumatic Etiology
46263

Unwitnessed Arrest
24424
*see page 2

Witnessed by 911 Responder
5062
*see page 3

Witnessed by Bystander
16774

Initial Rhythm Asystole
6222
Sustained ROSC in field = 1902

Initial Rhythm VF/VT
4579
Sustained ROSC in field = 2218

Other Initial Rhythm
5973
Sustained ROSC in field = 2320

Died in Field
2485
Died in ED
2253

Died in Field
731
Died in ED
1662

Died in Field
1398
Died in ED
2497

Admitted to Hospital
1484 (1 incomplete)

Admitted to Hospital
2186 (1 incomplete)

Admitted to Hospital
2078 (3 incomplete)

**Non-Traumatic Etiology Survival Rates**

| | |
|---|---|
| Overall: | 8.3% (46263) |
| Bystander Wit'd: | 12.9%(16774) |
| Unwitnessed: | 3.8% (24424) |
| Utstein[1]: | 28.4% (4579) |
| Utstein Bystander[2]: | 32.1% (2597) |

**Bystander Intervention Rates [3]**

| | |
|---|---|
| CPR: | 35.9% (33564) |
| Public AED Use: | 12.1% (4649) |

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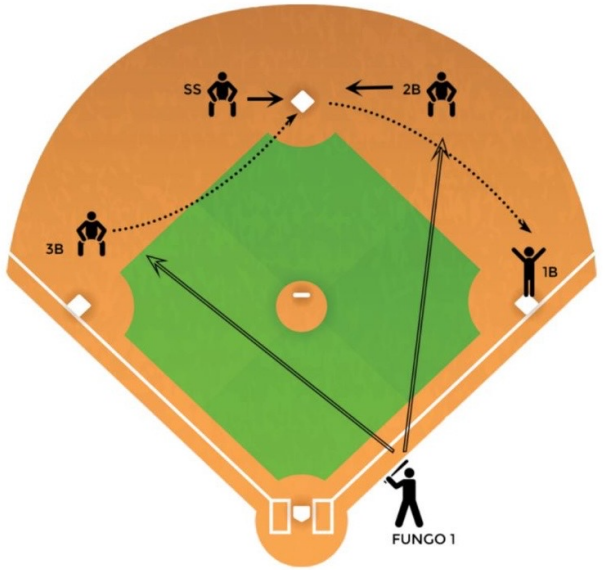
# Fundamentals MATTER

- Brain injury begins within 4–6 minutes
- Permanent damage by 8 minutes without circulation
- Importance of bystander intervention
- No Fundamentals = No Survival

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# HEART SAFE COMMUNITY - SELF ASSESSMENT

| Requirement | STATUS |
|---|---|
| **Lead Organization** | **DFD** |
| Cardiac Arrest Data System | In Place since 2004, CARES |
| Community Training | Ongoing |
| Recognition of Community Responders | Ongoing, Recent Events |
| Public Awareness | Education, CPR training, Partnership |
| 911 CPR Coaching | Currently Part of Our Call Taker Training and QA |
| Emergency Response Plans | GAP: NEEDS to be confirmed and collected, |
| Community AEDs | Continue to expand |
| AED Registry | GAP: NEEDS to be established, |
| First Responder AED | DFD – mostly complete, DPD limited |
| High Performance CPR | Training and Protocols in Place, just updated |
| Quality Improvement Project | Ongoing |
| Public Health Interventions | Ongoing, DHD, community Partners |

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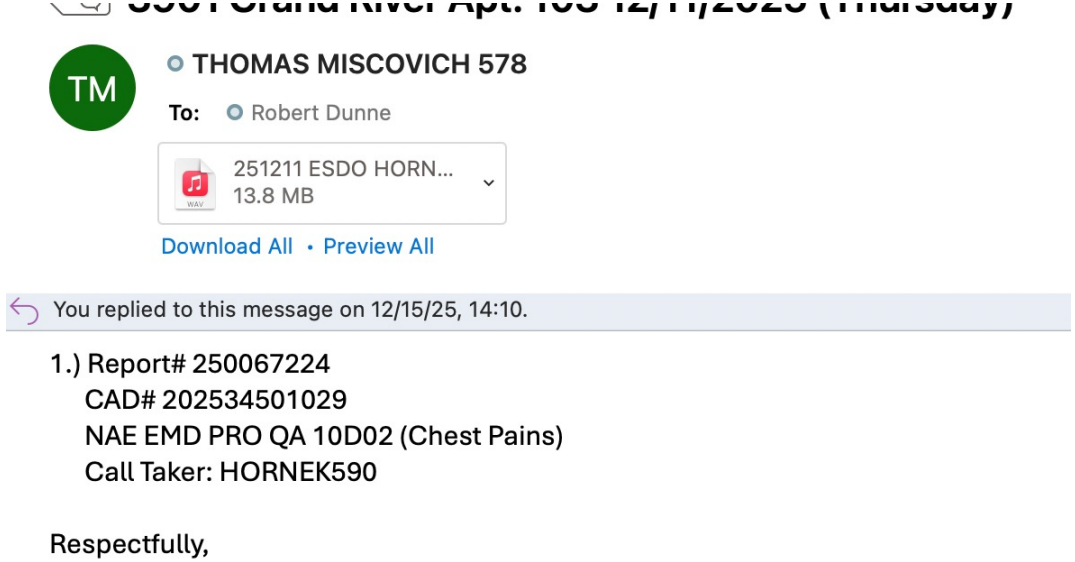
# Listen to the 911 Calls

CARES Dispatcher Assisted CPR module

- Telecommunicator performance and quality improvement activities

The module collects the following data:

- Was the need for CPR recognized?
- Were telephone-CPR instructions given?
- Were chest compressions started?
- Time to recognition of cardiac arrest, CPR instructions, and compressions

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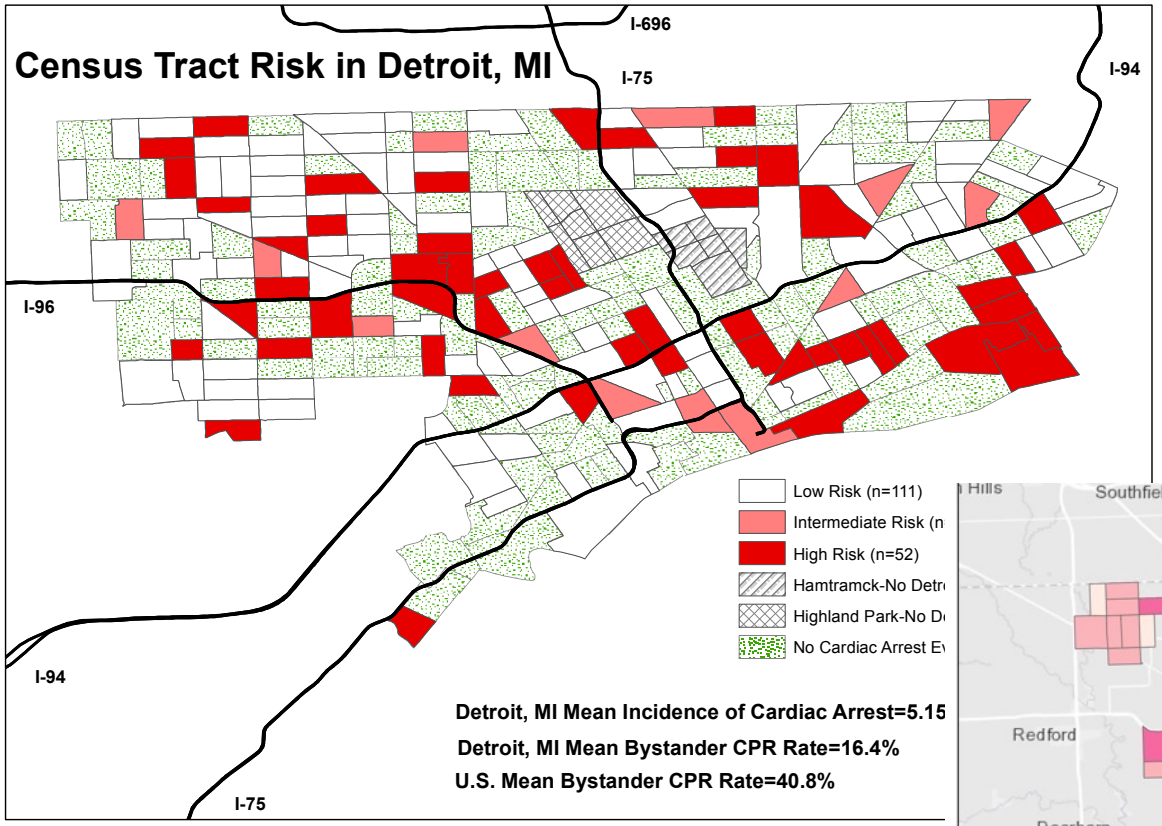
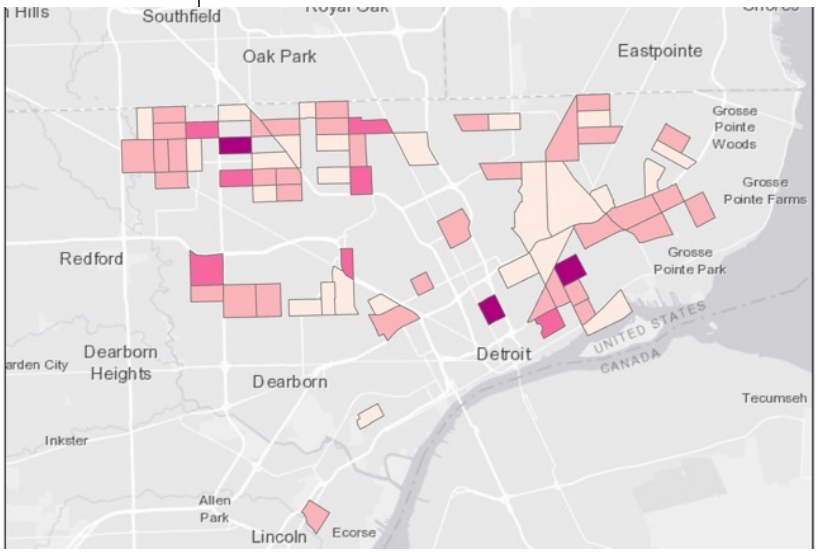
# Targeting CPR Training




**Intermediate Risk: Incidence of Cardiac Arrest>5.15 per 10,000 people, Bystander CPR Rates>16.4% but <40.8**

**High Risk: Incidence of Cardiac Arrest>5.15 per 10,000 people, Bystander CPR Rates<16.4%**


100,000 + Hands on per year

# Key Performance Indicators

**CPR Performance Indicators (The "How")**

- **Compression Rate:** 100-120 compressions per minute.
- **Compression Depth:** At least 2 inches (5 cm) for adults.
- **Chest Recoil:** Allow full chest recoil after each compression.
- **Compression Fraction (CCF):** Aim for >80% of the time spent performing compressions, minimizing pauses.
- **Ventilation:** Avoid excessive ventilation.
- **Timely Defibrillation:** Deliver shocks quickly after pauses

**System & Team Performance Indicators (The "Who & When")**

- **Time to CPR:** Immediate initiation of CPR after collapse.
- **Resuscitation Team:** Cohesive, with clear roles.
- **Effective Communication:** Clear leadership and communication during the event.
- **Debriefing:** Post-event analysis to identify errors and improve future

**Patient Outcome Indicators (The "Result")**

- **Return of Spontaneous Circulation (ROSC):** Restoration of a pulse.
- **Survival to Hospital Discharge:** The ultimate measure of success.
- **Neurological Function:** Preserving brain function, a key to long-term recovery.

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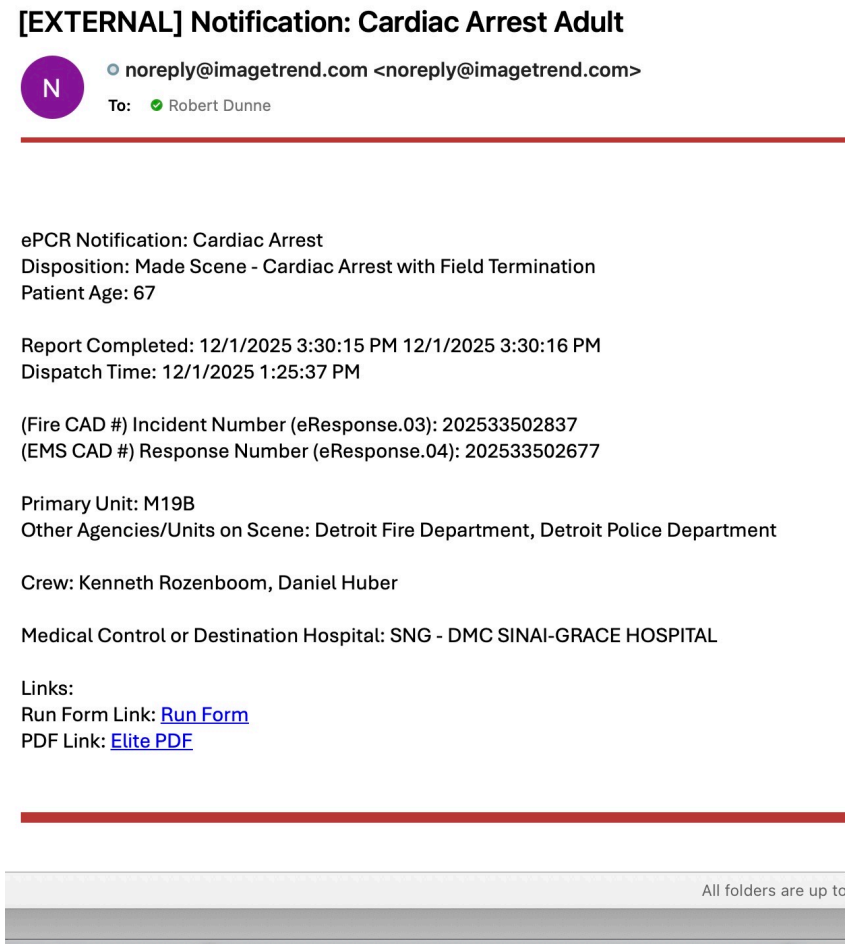
# Reviewing Every Arrest in Near Real Time



**[EXTERNAL] Notification: Cardiac Arrest Adult**

N noreply@imagetrend.com <noreply@imagetrend.com>

To: Robert Dunne

ePCR Notification: Cardiac Arrest
Disposition: Made Scene - Cardiac Arrest with Field Termination
Patient Age: 67

Report Completed: 12/1/2025 3:30:15 PM 12/1/2025 3:30:16 PM
Dispatch Time: 12/1/2025 1:25:37 PM

(Fire CAD #) Incident Number (eResponse.03): 202533502837
(EMS CAD #) Response Number (eResponse.04): 202533502677

Primary Unit: M19B
Other Agencies/Units on Scene: Detroit Fire Department, Detroit Police Department

Crew: Kenneth Rozenboom, Daniel Huber

Medical Control or Destination Hospital: SNG - DMC SINAI-GRACE HOSPITAL

Links:
Run Form Link: Run Form
PDF Link: Elite PDF

All folders are up to

- Notification
- Review Run Sheet
- Pull Down Monitor Data
- Reach out to Hospital
- Early Follow Up to Medics
- Reach Back to 911 Center

- TEAM
  - Medical Control Authority
  - EMS Fellows
  - Fire Training Division
  - 911 Canter

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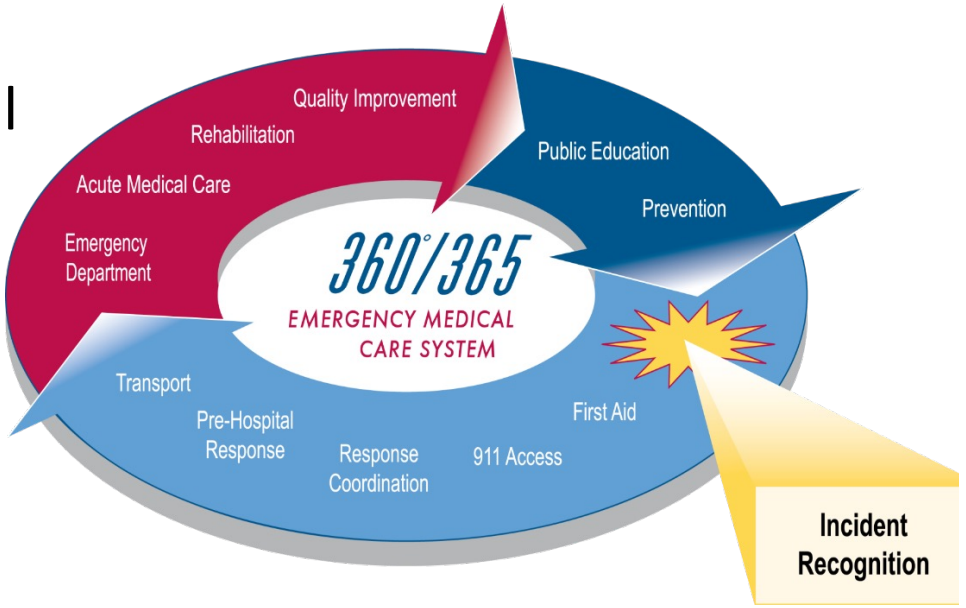
# CPR QUALITY

- Code Reviews
- CPR quality monitoring
- Metrics
  - 911 call to first shock interval
  - CPR performance and physiologic response
  - ROSC
- BENCHMARKS
- Goals
- Celebrate saves

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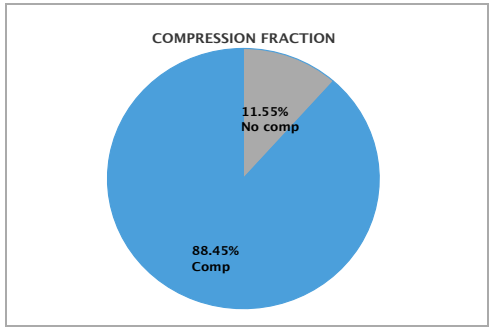
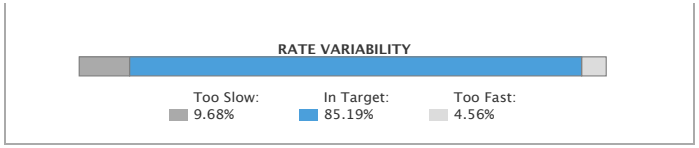
# Follow up Feedback

Case File Detail 1/20/19, 4:59 PM



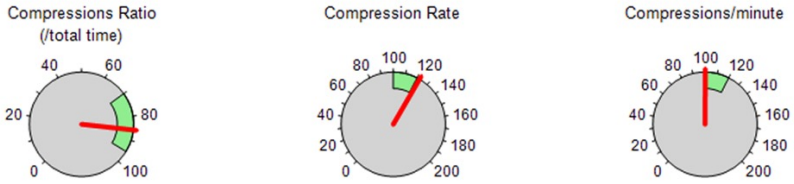

| LONGEST PAUSES |
|---|
| 18.6 Seconds / Time: 14:58:57 |
| 16.2 Seconds / Time: 15:05:57 |
| 14.4 Seconds / Time: 15:08:08 |

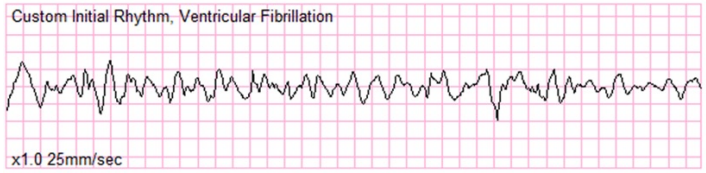



PHYSIO CONTROL

| | | | |
|---|---|---|---|
| Device Type: | LIFEPAK 20 | Duration: | 00:11:06 |
| Power On: | 2/2/2006 9:48:50 AM | Incident ID: | CPR13 |
| CPR Annotations Edited: | Yes | Statistical Parameters: | 1000-0300-3000-05 |
| Device Configuration: | | | |

*Times have been adjusted by the system




Goal 90% CPR fraction

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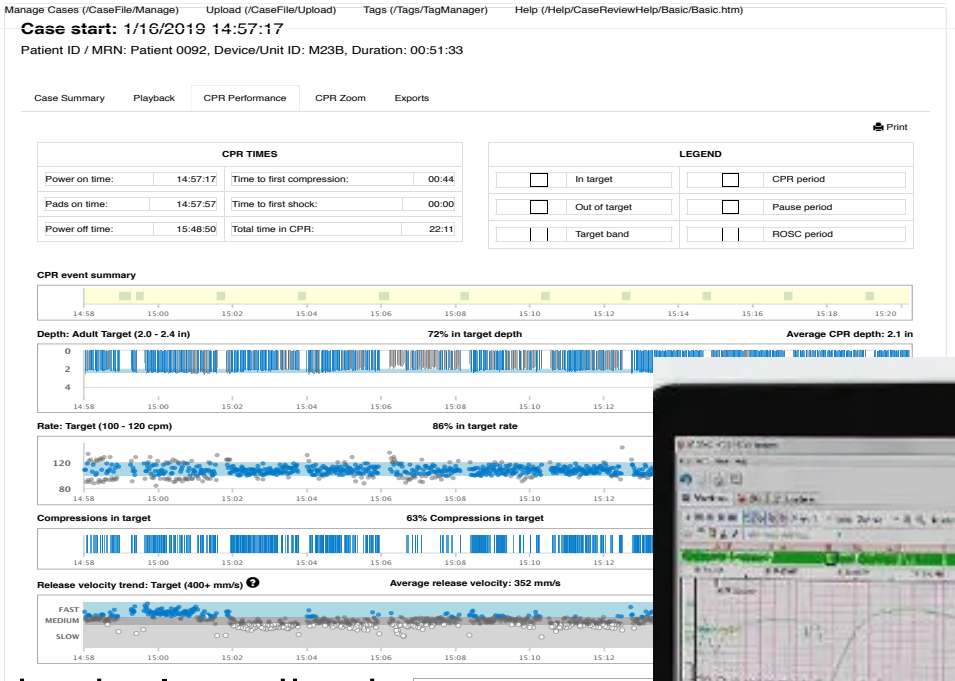
# Follow up Feedback




Individual Feedback

Use for Training

- In Person
- Podcasts
- Just in Time

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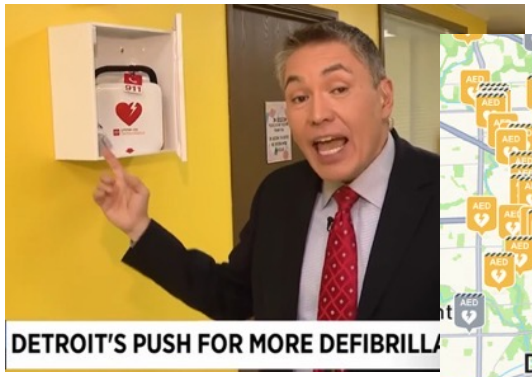
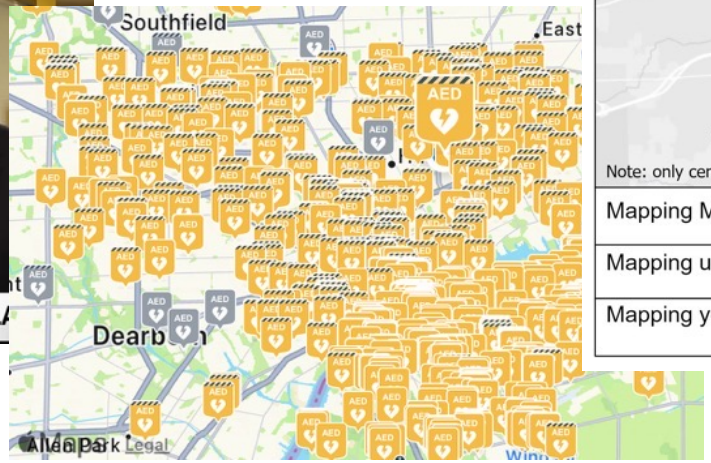
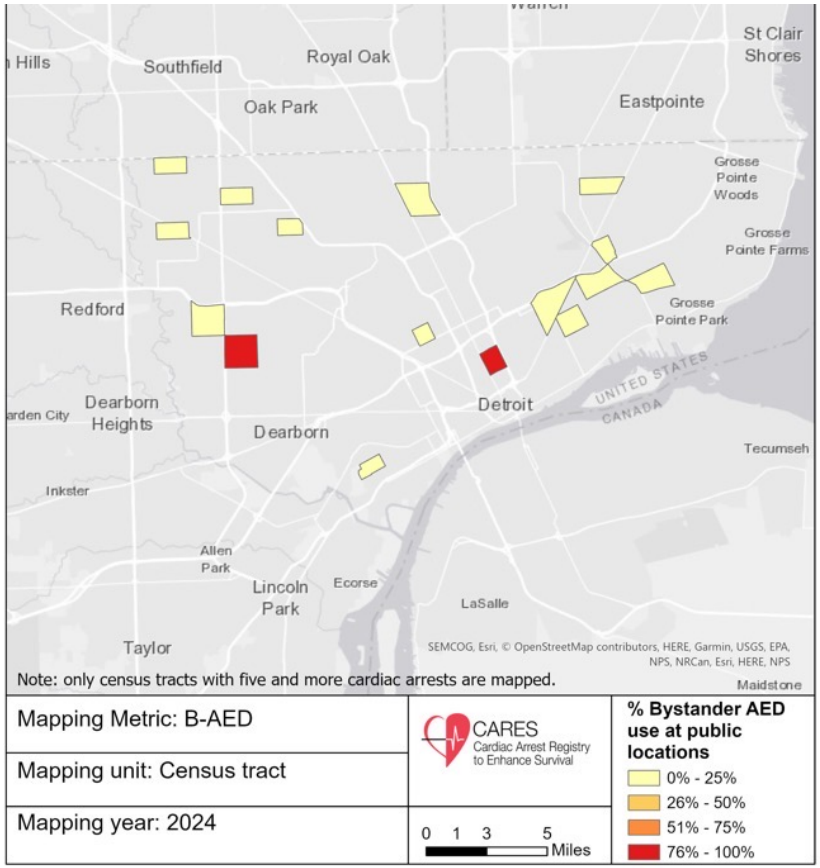
# AED Mapping and PulsePoint AED

- PulsePoint AED integration in Detroit
  - 600+ AEDs mapped
  - AEDs placed in:
    - Select DPD units and precincts
    - Select DDOT buses
    - Places could request

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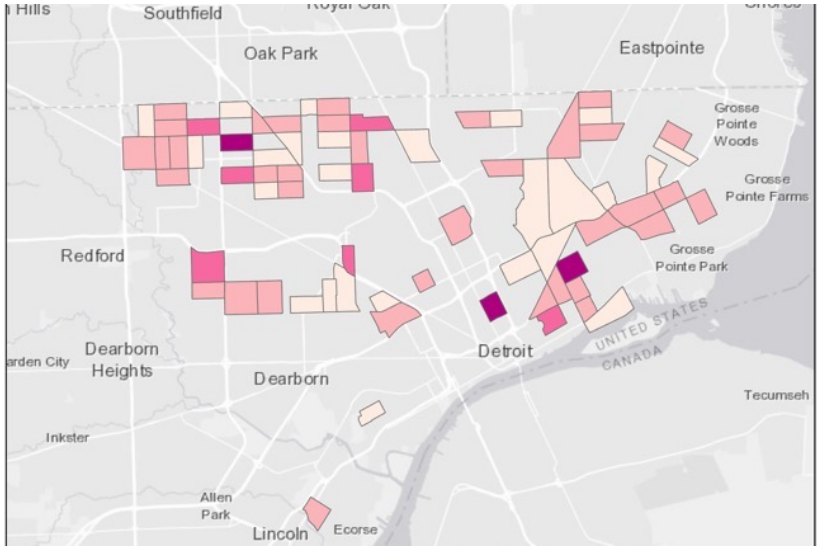
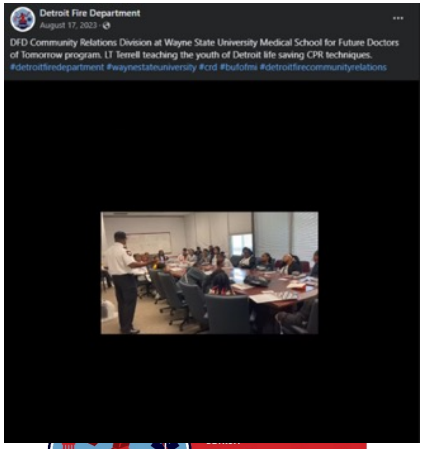
# Future Commitments Based on Data

- Expand AEDs to all buses and more police units
- 100% CPR trained city workforce + Seasonal
- CPR education in targeted communities
- New Deployment strategies



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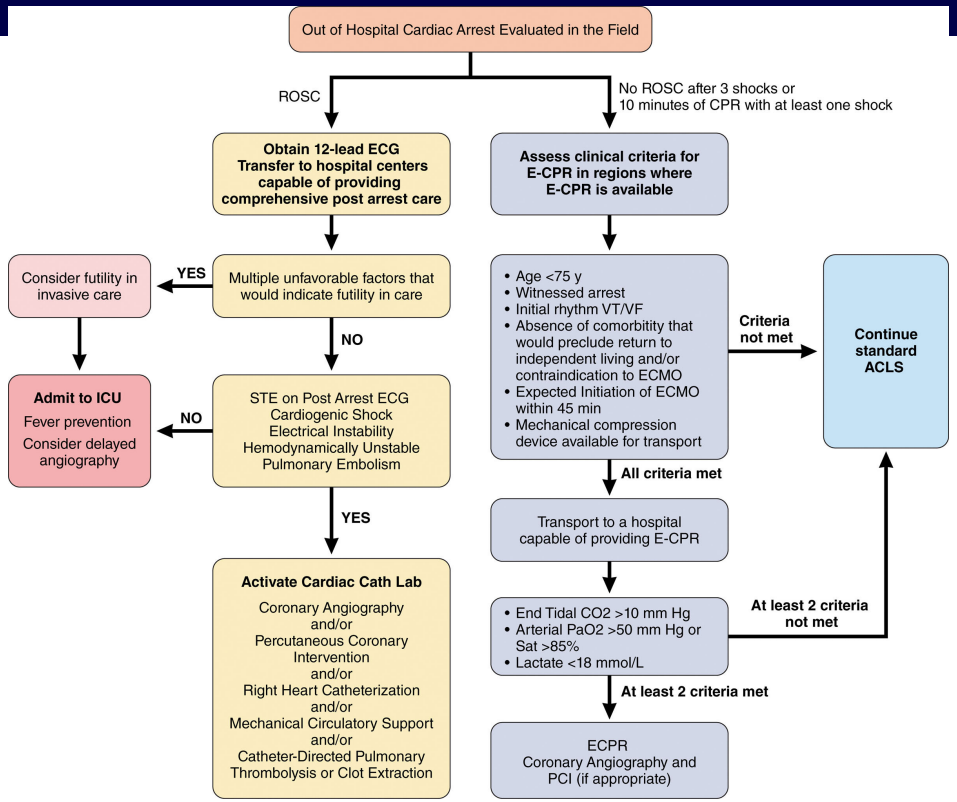
# Hospital Care and Outcomes




Detroit East Medical Control Authority

10200 Erwin Street, Detroit, MI 48234

-Leave functioning extra-glottic airways in place, they are stable for up to 24 hours and exchanging them can lead to delays in CPR. Intubating a patient with a functioning airway in place offers no benefit and potential harm.

-Use continuous waveform capnography, every case, every kind of airway. This is the best way to prevent hyperventilation and provides prognostic value and assessment of CPR quality. It is standard of care in EMS and is not often continued in the hospital.

-Epinephrine should be at 5 minutes not 3 (current guideline is 3 to 5) there is mounting evidence that epinephrine is harmful in many cases and any benefit is limited and at lower doses only. Also consider 0.5 instead of 1 mg, best if used early in non-shockable rhythms.

-Do not use BiCarb during arrest without measuring a pH and considering underlying cause such as hyperkalemia, indiscriminate use of bicarb decreases survival.

-Do not treat for hyperkalemia unless you have good evidence to support the diagnosis. Inappropriate use of Calcium decreases survival.

- Cath lab: except in cases of obvious overdose or traumatic arrests, a primary cardiac etiology of the cardiac arrest is likely. These patients need to go to the cath lab as soon as possible, EVEN IF THERE IS NOT A STEMI on the 12-lead ECG (up to 50% of patients will still have a culprit lesion that needs intervention and likely led to the arrest). This is per the current AHA Guidelines. All STEMIs and shockable rhythms should be evaluated in the Cath Lab.

- Targeted temperature management: improves neurologic and functional outcome for post-cardiac arrest patients, AHA recommends the use of TTM in all survivors of cardiac arrest.

- Appropriate prognostication: should not even consider attempting until 48-72 hours following rewarming (72-96 hours after hospital admission); PUPIL SIZE AND REACTIVITY MEANS NOTHING IN THE EMERGENCY DEPARTMENT, nor in the first 48 hours.

-Severe hypothermic cardiac arrest requires intravascular rewarming. Dialysis machines, bypass and intravascular temperature management devices should be used.

- Impella and ECMO to support cardiac function, cardiac arrest centers in Detroit place impella devices. ECPR (with ECMO) is expanding rapidly. Pittsburgh will soon deploy field ECMO as is used in Europe.

**Q: What is the role of the ED physician when providing medical control in Michigan?**

A: In Michigan the ED physician is an agent of hospital on behalf of the medical control authority (MCA) when providing radio medical control. EMS operated under protocols that have been approved by all hospitals in the region. Some of those protocols require radio



## FEEDBACK TO HOSPITALS

Jacqueline E. Tamis-Holland. Circulation. Cardiac Catheterization Laboratory Management of the Comatose Adult Patient With an Out-of-Hospital Cardiac Arrest: A Scientific Statement From the American Heart Association, Volume: 149, Issue: 5, Pages: e274-e295, DOI: (10.1161/CIR.0000000000001199)

# Recognition and Celebration

- Partnerships Locally and Regionally
- Celebrations for bystanders and responders
- Spirit of Detroit awards for youth and citizens
- Public media coverage to highlight success
- Actual Lives in your community

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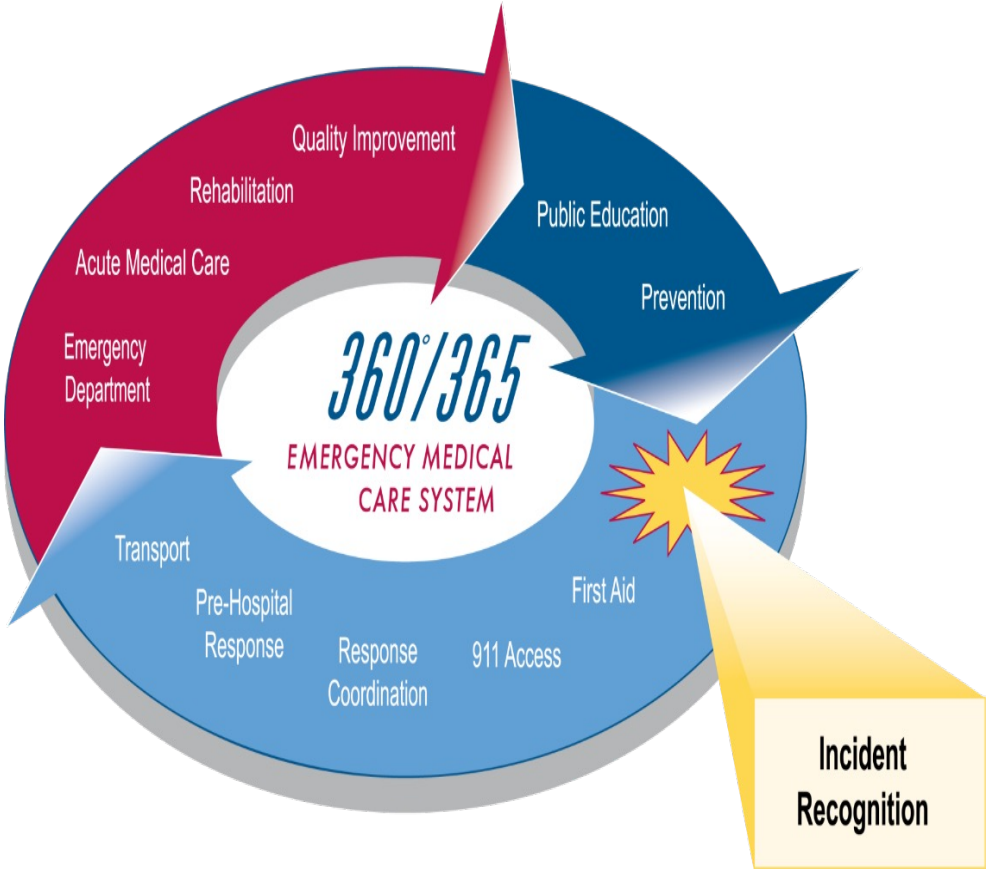
# Close the Loop

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# QUESTIONS

Help Wanted, Med. Pers. 42Help Wanted, Med. Pers. 42

**THE CITY OF DETROIT**

announces openings for

EMERGENCY MOBILE MEDICAL TECHNICIANS

**$9,636 to $10,600 per yr.**

**MEDICS - CORPSMEN**

Join a medical team trained to provide emergency treatment for disaster victims. City of Detroit needs 134 technicians to staff its new Emergency Medical Service. Training and good physical condition are required. Call, write or apply in person at the Detroit Civil Service Commission, 612 City-County Building.



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