EMS Dispatch - Structure and Function

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Disclosures and Conflicts

- **Disclosures and Affiliations**
  - **Western Michigan University Homer Stryker MD School of Medicine**
    - Professor and Chief, Division of EMS and Disaster Medicine
  - **Kalamazoo County Medical Control Authority**
    - EMS Medical Director
  - **Michigan Department of Health and Human Services**
    - State Medical Director, Division of EMS and Systems of Care
  - **Kalamazoo County Consolidated Dispatch Authority**
    - Board Member
  - **Yellowstone and Indiana Dunes National Parks**
    - Associate EMS Medical Director
  - **American Board of Emergency Medicine - EMS Sub-Board**
    - Sub-Board Member

- **Conflicts**
  - No Conflicts

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Thanks IAED!

International Academies of Emergency Dispatch.

Access eBook at:
https://prioritydispatch.mimeo.digital/library

Key: **USTILSXF9815**

https://www.emergencydispatch.org

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Core Content of EMS Medicine

2 MEDICAL OVERSIGHT OF EMS
- **2.2 EMS Systems**
  - **2.2.1 Public Safety Answering Points**
    - 2.2.1.1 Pre-arrival instructions
    - 2.2.1.2 Dispatch
      - 2.2.1.2.1 Use of lights and sirens
      - 2.2.1.2.2 Prioritization of response
        - (e.g., determining local needs based on local resources)
      - 2.2.1.2.3 Tiered-response

Source: American Board of Emergency Medicine © 2019

American Board of
Emergency Medicine

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Medical Directors and Dispatch

- Dispatch isn't really my concern.
- It's not really clinical, so it's not a medical director thing.
- It involves a separate agency that I have no control over.
- Dispatch just sort of happens and there's nothing I can do to make it better.
- **Dispatch is the entry point to the EMS system.**
  - **If dispatch fails, the system fails!**
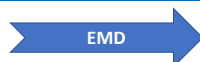
Authority vs. Leadership

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EMS Dispatch Components

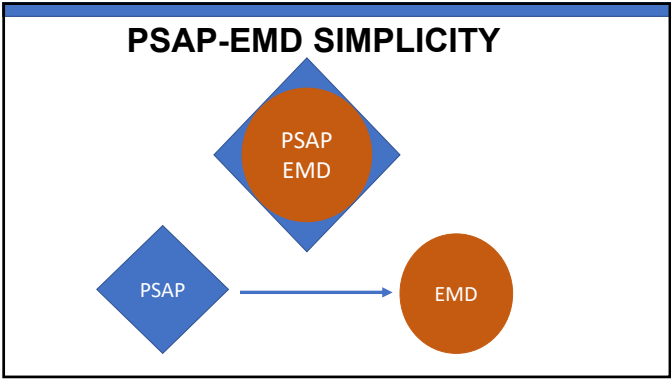**PSAP = Public Safety Answering Point**
- AKA: "911 Center"
- Receives 911 call
- Determines service needs
- May perform EMD function or transfer caller to EMD
- May dispatch EMS unit(s)

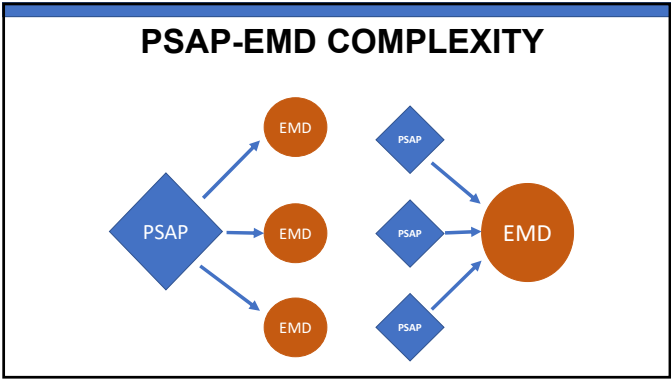**EMD = Emergency Medical Dispatch**
- Prioritizes Call
- Dispatches EMS unit(s)
- Pre-Arrival Instructions
- May be co-located with PSAP or separate
- "Secondary PSAP"

PSAP →   EMD →

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PSAP-EMD SIMPLICITY

PSAP EMD

PSAP → EMD

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PSAP-EMD COMPLEXITY

PSAP → EMD
PSAP → EMD
PSAP → EMD

PSAP → EMD
PSAP → EMD
PSAP → EMD

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A Tail of Two Counties

Allegheny County, PA
- Area: 745 sq mi
- Population: 1.24 million
- 47 EMS Agencies

Single Countywide PSAP/EMD

Oakland County, MI
- Area: 978 sq mi
- Population: 1.25 million
- 48 EMS Agencies

21 PSAP/EMDs in County

Source: Federal Communications Commission. (2022, December). 911 Master PSAP Registry. Retrieved from https://www.fcc.gov/general/9-1-1-master-psap-registry

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PSAP Operations

- >4,600 Primary PSAPs nationally
  - >240 million calls
- Call Taking
  - Via landline, cellular, text, VoIP, MLTS
- Automated Number Identification (ANI)
- Automated Location Identification (ALI)
- Provide EMD services (~54%)
  - *or* Transfer caller to separate internal/external EMD center (AKA: "Secondary PSAP")
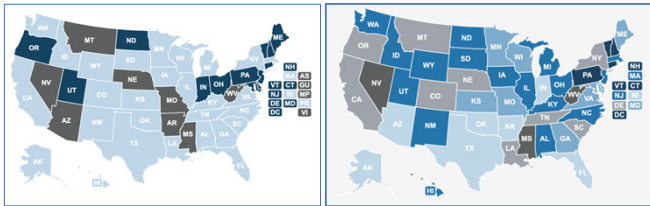- Dispatch all or some EMS/Public Safety units
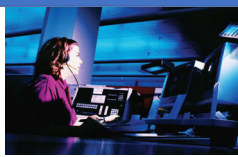
Source: NHTSA. (2022, February). 2020 National 911 Progress Report. Retrieved from https://www.911.gov/assets/National_911_Annual_Report_2020_Data.pdf
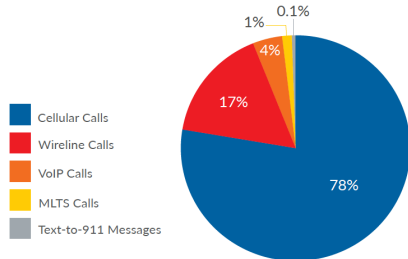
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Percent of PSAPs Providing EMD Services

2017   2021

Legend: 0 - 24% | 25 - 49% | 50 - 99% | 100% | State reported unknown | State did not submit

Source: https://www.911.gov/issues/911-stats-and-data/

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911 Calls By Source – 2019

- Cellular Calls — 78%
- Wireline Calls — 17%
- VoIP Calls — 4%
- MLTS Calls — 1%
- Text-to-911 Messages — 0.1%

Source: NHTSA. (2019, November). National 911 Progress Report. Retrieved from https://www.911.gov/project_national911progressreport.html.

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911's deadly flaw: Lack of location data

A TECHNOLOGY SHORTFALL CAN LEAD TO TRAGIC RESULTS, A NATIONAL INVESTIGATION SHOWS.

John Kelly and Brendan Keefe, USA TODAY

Published 9:16 a.m. ET Feb. 22, 2015 | Updated 11:37 p.m. ET Feb. 22, 2015

"An estimated 10,000 people each year would be saved with accurate location standards from indoor cellphone calls,"

Source: https://www.usatoday.com/story/news/2015/02/22/cellphone-911-lack-location-data/23570499/

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"New" FCC Rules

Wireless 911 Location Accuracy Rules
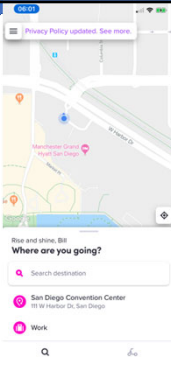
2015 Performance Standards

    50m horizontal (x/y) accuracy

       • 2017 40% reliability >>>> 2021 80% reliability

2019 Performance Standards

    3m vertical (z-) accuracy

       2021 80% reliability in top 25 CMAs

       2023 80% reliability in top 50 CMAs
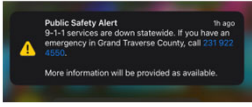
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Next Generation 911 (NG911)

- Transition from analog to <u>digital</u>
- Exploit smart phone technology
  - Text messaging, photos, videos
- Emergency Services Internet Protocol (ESInet)
- Rollouts currently underway (but variable)
- Full implementation 2-4 years
  - Text to 911 now widely available but not universal

Public Safety Alert   1h ago
9-1-1 services are down statewide. If you have an emergency in Grand Traverse County, call 231 922 4550.
More information will be provided as available.

911 send police

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Percentage of population served by NG911 capable PSAPs by state - 2021

0%
1-25%
26-50%
51-75%
76-99%
100%
Unknown
Did not submit

Source: NHTSA https://www.911.gov/assets/2021-911-Profile-Database-Report_FINAL.pdf

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What 3 Words to the Rescue?

- Divides the world into 10' x 10' squares
- Give each square a 3-word name
- Free smartphone app
- PSAPs send a text with link to "find me" app

https://what3words.com/business/emergency

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First Responder Network Authority

- Mission to build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety
- 9/11 Commission recommendation
- Became law in 2012 / Contract awarded 2017 / Launched 2018
  - Public – Private (ATT) partnership
- Provide a single interoperable platform for emergency and daily public safety communications – Band 14
- Provides priority access and preemption to emergency responders

Available to EMS Medical Directors

www.firstnet.gov

www.firstnet.com

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EMS Dispatch - Function
Call Taking, Pre-arrivals, and System Integration

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Emergency Medical Dispatch

- **Responsibilities**
  - Call Prioritization
  - EMS Unit Dispatch
  - Pre-Arrival / Post Dispatch Instructions
- **Formal EMD System**
  - Protocol Driven
    - Guide card >>>>>> computer
  - Avoids dispatcher free-lancing
  - Various national EMD systems
    - EMD Center Accreditation
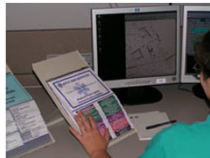
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EMD Call Prioritization

- Purpose
  - Send "right resource in right mode in right time"
    - BLS vs ALS vs BLS+ALS +/- 1st responders
    - Decrease emergency (lights/siren) responses
- Use structured, protocol-driven caller interrogation
- Call Prioritization vs. Call Screening
  - Call Screening – EMS response optional
  - Call Prioritization – EMS response assured

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EMS Unit Dispatch

- **Confirm incident location**
  - Must re-confirm from PSAP
  - Secondary PSAP: EMD receives ANI/ALI
- **Computer-Assisted Dispatch (CAD)**
  - Tracks status of all EMS units
    - Integrates into vehicle GPS tracking
  - Documents all EMD activities
    - Critical times: response, scene, and transport times
    - Pushes data to patient care record
  - CAD to CAD integration connects PSAPs to EMDs
- **Alert responding unit(s)**

EMS Control Center

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## Pre-Arrival / Post-Dispatch Instructions

- Provide "Dispatch Life Support"
  - "Zero response time"
  - Dispatcher-Assisted CPR = Dispatch Life Support (DLS)
    - Where's the public AED?
    - "Crowd Sourcing" CPR (e.g., PulsePoint)
  - Assist in childbirth, give naloxone, give Epi autoinjector
- High public expectations
  - Increasing published evidence showing safety and efficacy
  - Liability for not offering?
- Use EMD Protocol Reference System

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EMD Protocol Reference System

- **Initial Key Questions**
  - Universal caller interrogation
  - Goal: Identify Chief Complaint
- **Chief Complaint Categories**
  - 32 *Chief Complaints*
  - Complaint-specific **key questions** leads to *Determinants*
  - Determinants used for *Call Prioritization*
- **Scripted Medical Protocol**
  - Provides clear, simple instructions to caller
  - Medical director approval

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ProQA Computer-Based System

Source: Life EMS Ambulance - ProQA/MPDS™
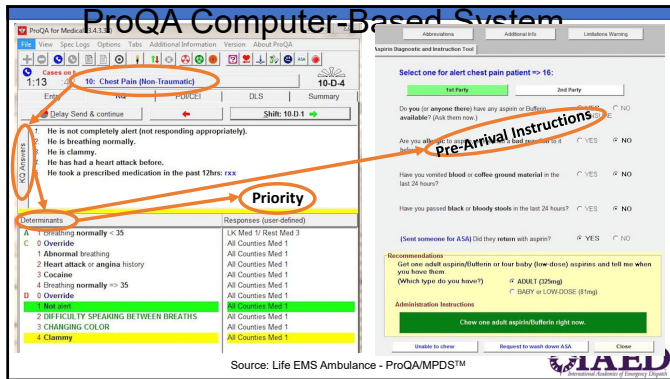
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2020 AHA Guidelines for CPR & Emergency Cardiovascular Care[1]

- EMD Centers should offer T-CPR to patients in OHCA
- An adult victim who is unresponsive, with absent or abnormal breathing, should be considered to be experiencing OHCA and should immediately receive T-CPR instructions for chest compression only CPR.
- Emergency dispatch systems should alert willing bystanders to nearby events that may require CPR or AED use through mobile phone technology.
- The delivery of T-CPR instructions should be included in system quality improvement process.

NO — Conscious
NO — Breathing Normally
GO — CPR Instructions

[1]Berg KM, Cheng A, Panchal AR, et al; on behalf of the Adult Basic and Advanced Life Support, Pediatric Basic and Advanced Life Support, Neonatal Life Support, and Resuscitation Education Science Writing Groups. Part 7: systems of care: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2020;142(suppl 2):S580–S604. doi: 10.1161/CIR.0000000000000899

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Whoa on No-No-Go!

"…the IAED does not endorse the 2-question algorithm commonly known as the No-No-Go protocol, nor does it recommend, sanction, or support in any way its local adaptation into an existing MPDS implementation. While this protocol may suffice as the bare minimum for identifying OHCA in the absence of any structured protocol for telecommunicators receiving emergency medical calls, it should not be considered optimal…."   12/12/2021

Source: International Academies of Emergency Dispatch
https://www.emergencydispatch.org/in-the-news/official-statements/10a5dbec-6401-463f-955a-a94b6ccf3131

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How Well Does EMD Work?

- Can we safely allow for decreased response configurations?
  - BLS instead of ALS
  - "Cold" response
  - Mobile Integrated Healthcare alternative
- What is an acceptable under triage rate?
- Are there consequences of over triage?
- Do Pre-Arrival Instructions work?

MORE RESEARCH IN EMD NEEDED!

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Final Thoughts

- EMS Medical Directors should…

  - Champion high-quality EMS dispatch
  - Visit PSAPs and EMD centers (regularly)
  - Include dispatchers in debriefings
    - Don't forget when giving positive feedback
    - Make dispatch feel like part of the team (they are)

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Links to Resources

- **911 / PSAPS**
  - www.911.gov
  - www.nena.org
  - www.apcointl.org

- **EMD**
  - www.apcointl.org
  - http://www.emergencydispatch.org
  - www.powerphone.com/

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Additional Links

- FirstNet
  - www.firstnet.gov
  - www.firstnet.com
- Selected (Free) Applications for EMS Medical Directors
  - First Responder Support Tools (FiRST) Application (DHS)
    - https://www.dhs.gov/sites/default/files/publications/FIRST-Application-Fact-Sheet-Transitioned-SLUpdate-160526-508.pdf
  - Full Code Pro (AHA)
    - https://cpr.heart.org/en/cpr-courses-and-kits/healthcare-professional/full-code-pro
  - Pulse Point
    - https://www.pulsepoint.org/implementation/
  - What3Words
    - https://what3words.com/clip.apples.leap

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