The Effect of Age on Chest Pain Mortality

- Clawson • Dernocoeur

The issue of using age to prioritize advanced life support response in chest pain patients has been a mildly controversial feature of priority dispatch since its inception. This is an important issue since chest pain accounts for approximately 10% of all EMS cases; however, the low rate of heart attacks among total cases of chest pain presenting as the chief complaint at dispatch has supported EMDs utilization of a protocol method to sort those having life-threatening events from other less lethal causes of chest pain. Twenty years ago the age for reasonably considering the likelihood of acute myocardial infarction (heart attack) was established as 35 years and above based on the standard of care.

One of the largest and most respected studies of heart disease incidence began in Framingham, Massachusetts (U.S.) in 1948. Several study parameters were followed for 30 years. Incidence rates of heart attacks were determined among a population of 5,127 subjects. Heart attack occurrence in men and women of various age ranges were reported as shown below.

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**MPDS Q&A**

Cardiology from an EMD Perspective

- Brian Dale, EMT-P, EMD Instructor

A “heart attack” is the single leading cause of death in America according to 1994 U.S. statistics (see related article above). Heart attacks result from blood vessel disease in the heart. Coronary heart disease (CHD) and coronary artery disease (CAD) are more specific names for heart disease.

Since EMDs function as remote medical triage and treatment providers, learning about the causes and treatment for “myocardial infarction” (the medical term for a heart attack) is good background information and continuing dispatch education. This knowledge also assists with the interrogation of certain callers and helps in understanding the MPDS protocols. That is the purpose of this article.

Look through the MPDS Protocols 6, 10, and 19 to see where this information can assist you as an EMD. Pay close attention to all Additional Information sections, as this is where the majority of the background information is found. Many of the determinants are based on this as well.

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How Often Must We Get It Right?

- Alexander Kuehl, MD, MPH, FACS, FACEP

Recently in Syracuse, New York, a series of mistakes in a public safety dispatch center led to a tragic loss of life. It is still not exactly clear what happened, but it seems that the combination of an ill-timed dinner break, an unclear protocol, a dispatch trainee, an inattentive call-taker, and an unusual call led to a lengthened response time and a horrible result. I am sure that the leadership will carefully and deliberately investigate and eventually take the right actions; however, what impressed me the most was the public debate.

For example, the first letter to the editor suggested that the predictable media clamor was a “witch hunt” and that the public should not be concerned because, “the dispatch center did it right most of the time.” The public reaction to that diatribe was powerful, swift, and exact. Other letters followed saying, “Dispatch cannot be haphazard” and “Dispatch cannot be okay 90% of the time.” In short, the public recognized what some of the public officials and dispatchers did not—that efficient life-impacting actions on the part of trained EMDs are not “exceptions” to be recognized with medals and reenactment on Rescue 911, but are simply our public’s expectation. Anything less... is malpractice.

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...anything below certified, recognized and prioritized Emergency Medical Dispatch as part of our professional practice standard is simply unacceptable.

The Academy Supports Increased Dispatcher Compensation Legislation

The Academy was pleased to place its support behind Utah HB60 “Compensation for Public Safety Dispatchers,” which passed the State House and Senate and was signed into law on March 21, 1998, by Governor Leavitt.

This bill, sponsored by Rep. Bud Bowman (R), revised the Utah Code §67-19-12.3 to include dispatchers in the State’s pay plan analysis, survey of salary ranges, and benefits, and to allow the director to consider, “internal comparisons and other factors in order to allow the state to recruit and retain the highest qualified peace officers, correctional officers, and public safety dispatchers.”

The bill also appropriated an additional $125,000 for fiscal year 1998-99 for the Department of Public Safety—specifically for “compensation for public safety dispatch personnel” effective July 1, 1998.

One of the primary missions of the Academy is to further professionalize EMD and dispatcher compensation plays a significant role in this movement. If you are aware of any similar legislation proposed or pending that will help further this goal, let us know and the Academy will review the legislation and issue a letter of support or provide other encouragement whenever appropriate.
Cardiology from an EMD Perspective

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Why Did the Tin-Man Want One?

The human heart is an absolutely amazing piece of equipment. It is a strong, muscular pump a little larger than a fist. It pumps blood continuously through the body's circulatory system. Each day the average heart “beats” (or expands and contracts) 100,000 times and pumps about 2,000 gallons of blood. In a 70-year lifetime, an average human heart beats more than 2.5 billion times.

The circulatory system is the network of elastic tubes through which blood flows. It includes the heart, arteries, arterioles (small arteries), and capillaries (minute blood vessels). It also includes venules (small veins) and veins, the blood vessels through which blood flows as it returns to the heart. If all these vessels were laid end-to-end, they would extend for about 60,000 miles—enough to encircle the earth more than twice. The circulating blood brings oxygen and nutrients to all the organs and tissues of the body, including the heart itself. It also picks up waste products from the body's cells. These waste products are excreted via the kidneys, liver, and lungs.

What Causes a Heart Attack?

A heart attack occurs when the blood supply to part of the heart muscle itself—the myocardium—is severely reduced or stopped. This occurs when one of the arteries that supply blood to the heart muscle (coronary arteries) is blocked. The blockage sometimes occurs from buildup of plaque (deposits of fat-like substances) due to atherosclerosis, or it can also be caused by a blood clot lodged in a coronary artery (sometimes called a coronary thrombosis or coronary occlusion).

A myocardial infarction is the damage to (or death of) an area of the heart muscle resulting from a reduced blood supply to that area. If the blood supply is reduced severely or for a long time, muscle cells suffer irreversible injury and die. Disability or death can result, depending on how much heart muscle is damaged and where it is located functionally.

Sometimes a coronary artery temporarily contracts or goes into spasm. When this happens the artery narrows and blood flow decreases or even stops. What causes a spasm is unclear, but it can occur in normal-appearing blood vessels as well as vessels partly blocked by atherosclerosis. If a spasm is severe enough, a heart attack may result.

How Do We Identify a Heart Attack?

Heart attack patients may present in a multitude of ways. One very common chief complaint is difficulty breathing. A patient may become symptomatic due to their inability to breathe effectively. When the right side of the heart is weakened fluid can collect in the extremities. This is the reason many patients say their ankles are swollen. When the left side of the heart (the pumping side) weakens the fluid collects in the lungs, producing a physical barrier between the alveolar air sacs and the circulating blood. This is the process behind the breathing difficulty (see Protocol 6).

Dr. Steve Joyce, Medical Director for the Salt Lake City Fire Department, and the University of Utah Medical Center recently evaluated over 100 consecutive heart attack patients. This evaluation included patients transported by EMS and those brought in by private vehicle. The average time from onset of chest pain to E.R. evaluation was 11 hours. They found that 60% of those patients actually experiencing an M.I. came into the hospital by private vehicle. Denial is a very powerful thing, as this demonstrates. This is why we ask patients having "abdominal pain" if there is also chest pain.

When a caller indicates that the patient "is having a heart attack," does this always mean they are having chest pain? Can it be this person is not breathing, has difficulty breathing, or is just feeling ill? The answer is any of the above. That is why EMDs must ask "What's the problem? Tell me exactly what happened." We, as EMDs, must treat the problem, not why the person is having the problem or what the caller perceives the problem may be.

When a caller states, "My husband is having a heart attack," this prompts the EMD to follow chief complaint protocol 19. Allow the process to do what it's programmed to do—in a medical triage process that is safe and efficient.

What in The World is an A.I.C.D.?

An A.I.C.D. is a device designed to administer an electric shock to control tachyarrhythmias—the very rapid and/or uncoordinated activation of individual heart fibers—and restore a normal heartbeat. Basically, an A.I.C.D. is a "Lifepak" unit inside the patient's chest; watching and waiting for the rapid heart rate to occur and when it occurs, resetting the system with electricity. It's kind of like the slap in the face to a hysterical person. No, you cannot use this technique for obnoxious callers, sorry. Its purpose, like a big "reset button," is to actually stop the heart and all uncoordinated activity and allow the normal pacemaker to take over and function again.

The power source is implanted in a pouch beneath the skin of the chest or abdomen and is connected to patches...
placed on the heart. Newer devices can be installed through blood vessels, which eliminates the need for open chest surgery. Some models have the capability to not only defibrillate but to pace the heart as well.

The use of A.I.C.D. devices is becoming more common (see Protocol 10, Rule 3). The EMD must have a basic knowledge of what they are and how they affect our care in the Dispatch Life Support arena. If you are treating a patient who has an A.I.C.D., there are no changes you should worry about. Treat the patient, not the machine.

If the patient is in cardiac arrest, continue CPR even if the unit discharges. There will only be approximately 4 joules of electricity reaching the skin surface when the unit discharges, so the caller may feel it, but it will not injure them. It might scare them, yes, but not injure them. The unit is designed to discharge four times with a fifteen second delay between each discharge. After the unit has fired its fourth time, it is programmed to shut down until it sees at least 30 seconds of a normal rhythm. There is a possibility that the unit may malfunction and not turn itself off. There is nothing we can do about this but update the EMS units responding to the scene and continue DLS as the situation warrants.

How Do We Treat a Heart Attack?

When a heart attack occurs, it's critical to recognize the signals and respond immediately. About half of all heart attack victims wait two hours or longer before deciding to get help. This reduces their chance of survival, because delay in the early phases increases the risk of sudden death. It also lessens the chance of preserving heart muscle, which raises the risk of disability for those who survive. This denial time is critical.

Prompt and appropriate care for heart attack victims dramatically reduces damage to the heart. In fact, 80% of heart attack survivors can return to work within three months. Most communities have an emergency cardiac care system that can react appropriately to an emergency. Prompt medical care for heart attack victims isn't the only reason so many people recover so quickly, but it's an important one.

When a coronary artery becomes blocked, the heart muscle doesn't die instantaneously. Instead, damage increases the longer an artery remains blocked. If a victim gets to an emergency room fast enough, reperfusion therapy may be done using a variety of techniques including drug administration (thrombolysis), Percutaneous Transluminal Coronary Angioplasty (P.T.C.A.), or coronary artery bypass surgery. The sooner any of the reperfusion techniques occur, the more likely the patient will have a good result. If not done immediately, in the weeks after a heart attack, either P.T.C.A. or bypass surgery may be performed to improve the blood supply to the heart muscle. Once part of the heart muscle dies, its function can't be restored. However, function may be restored to areas with decreased blood flow.

It's important to remember that the heart is the most sensitive organ to hypoxia, or lack of oxygen. While the brain can survive without oxygen for 4-6 minutes, the heart begins to die the very minute it is deprived of oxygen. Ergo, the reason for early CPR and mouth to mouth. Remember that the patient having a heart attack or irregular heart rhythm can worsen at any time (see Protocol 10, Rule 1); it is imperative to remind the caller to call back if the patient's condition worsens (or for the EMD to stay on the line if there is any question).

A Self-Assessment

Now that you've read this article, look through the MPDS protocols and find at least one or two things that you now know that you did not before. Write them down and share your new knowledge with your neighbor.

And one final word, please remember if a caller's answer to the question, "Does s/he have any chest pain?" is yes (or something close to it), it does not matter how bad it is, the answer was YES—dispatch accordingly.

Brian A. Dale is a certified EMD Instructor and a Senior National Faculty member for the Academy. He is the Fire Captain responsible for the QIU at Salt Lake City Fire Dept., an Accredited Center of Excellence. He is also a member of the Academy's Council of Standards and Board of Curriculum and can be reached through the Academy or via email: cqmmedic@yahoo.com.

Brian will be lead instructor for the EMD-Q Certification Course held in connection with Navigator '98 this Fall. He and Scott Freitag, his Salt Lake City Fire Department QIU counterpart, will also be presenting a special session about their recent work integrating 9-1-1 EMD services with a prominent managed care organization. Please refer to the official registration brochure for details.

Are you looking for an employer who will recognize your EMD accomplishments?

The St. Louis Fire Department (an Accredited Center of Excellence) is now accepting applications for EMD positions. NAEMD Certification is required. Excellent wages and benefits package.

Interested candidates should contact the Dept. of Personnel at (314) 622-4308 or write to the Bureau of EMS at 2634 Hampton Ave., St. Louis, MO 63139.
El Paso-Teller County
Colorado
EMD Accreditations

The El Paso-Teller County E 9-1-1 Authority Board, located in Colorado Springs, CO, recently had two of their Public Safety Answering Points (PSAPs) awarded Accreditation. Mr. James Anderson, System Mgr., states that the Authority Board has demonstrated their commitment to providing quality EMD at each of the 10 PSAPs in the Pike’s Peak region. The Authority Board provided the equipment, MPDS Protocols, and the training necessary for the centers to succeed in becoming Accredited. Dr. Marilyn Gifford, Medical Director for the Board, provided invaluable support and encouragement.

The Colorado Springs Police Communications Center and the Fountain Police Communications Center received their Accreditation awards from Dr. Clawson in ceremonies held February 24, 1998.

Fountain was the 17th center to earn this status. Ms. Julie Jones is the supervisor of the Fountain PSAP and also dispatches as needed. Until recently, there was only one person on duty per shift at this PSAP. That person not only processed the 9-1-1 call, but also was responsible for dispatching police, fire, and medical units as well. Fountain has an annual EMS call volume of only 1900, the smallest of any center to be Accredited by the Academy to date.

Ms. Jones readily admits that she was skeptical in the beginning about performing EMD considering the center’s other responsibilities. Mr. Dave Herrmann was appointed by Jones to assist with the in-house Q.A. A strict Q.A. program was implemented with the support of Ms. Shawna Mistratta at the Authority Board’s Quality Improvement Unit. Fountain performs case review on 100% of their EMD calls. The dispatchers soon developed a system of processing the call through Key Questions, placing the caller on hold, dispatching the appropriate response units, then returning to the caller to give appropriate Post Dispatch Instructions. Ms. Jones has stated that this system has clearly raised the standard of care for Fountain’s citizens.

Following closely, Colorado Springs became the 18th Center to be recognized. Mr. Lynn Sherman is the Manager of the Communications Center. He has encouraged his Q.A. Manager, Ms. Charlotte Olsen, in the campaign to bring the MPDS to 9-1-1 customers.

At the Fountain Accreditation Ceremony (L to R): Dr. Jeff Clawson, Dr. Marilyn Gifford, El Paso-Teller County E 9-1-1 Medical Director; Julie Jones, Fountain Disp. Supv.

Ms. Olsen is a past Authority Board member and was the project coordinator responsible for the implementation of the MPDS for the entire service area. Olsen and Colorado Springs’ EMDs are making it possible for the Colorado Springs Fire Dept. and AMR to safely tier their emergency response. This is perhaps the biggest change in the local EMS system in many years. The Academy congratulates these outstanding Colorado communication centers for their commitment to excellence.

The Effect of Age on Chest Pain Mortality
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In 1995, the National Institutes of Health (U.S.) reported on the 1992 death rates of 72 selected causes. Of specific interest is the rate of death per a 100,000 population for acute myocardial infarction (ICD9-410). The following chart shows the percentage each age range is of all heart attack (AMI) deaths that year.

<table>
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<th>M.I. Death Rate (per 100K pop.)</th>
<th>%M.I. Deaths (per age bracket)</th>
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</tr>
<tr>
<td>1-4</td>
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<tr>
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<td>57.26</td>
</tr>
</tbody>
</table>

Statistically, chest pain in young people is rarely related to true prehospital emergencies. But once a person reaches the age range in which heart attack is more likely, the system prefers to “err on the side of safety,” which leads to Rule 2 on protocol 10.

This does not mean that younger people cannot have heart attacks. It does mean that the dispatch standard of care is not expected to provide costly and inefficient over-response to account for these rare events. To cover this possibility, the EMD is provided some latitude of professional judgment.

Examination of a larger set of data, covering almost a quarter of a century, confirms one deduction from the above table: over 99% of male MI deaths occur in men over 35 years old. Similarly, less than 1% of female MI deaths occur in women younger than 45. When the study is finished, the Research and Standards division of the Academy will publish the results in a medical journal. A brief report will also be published to our membership in a subsequent issue of DISPATCH!

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**Upcoming Courses**

For more info, on these and other EMD Certification Courses call Medical Priority: (801) 363-9127:

- **May 4-6**
  - Belton, MO
  - Cass County EMS
- **May 4-6**
  - Ft. Walton, FL
  - Okaloosa County EMS
- **May 4-6**
  - Torrance, CA
  - Torrance Fire Dept.
- **May 5-7 & 12-14**
  - Bluffs, IA
  - Pottawattamie Co. Sheriff's Dept.
- **May 6-8**
  - Oklahoma City, OK
  - American Medical Response
- **May 6-8**
  - Sedona, AZ
  - F.D./Camp Verde Marshal's Off.
- **May 6-8**
  - Lewiston, ME
  - United Ambulance
- **May 7-9**
  - Noblesville, IN
  - Noblesville Communications
- **May 7-9**
  - St. Paul, MN
  - St. Paul Fire Dept.
- **May 8-10**
  - Fort Collins, CO
  - Medical Priority Consultants, Inc.
- **May 11-13**
  - Republic, WA
  - Ferry County 911
- **May 12-14**
  - Green Bay, WI
  - N.E. Wisconsin Tech. College
- **May 13-15**
  - Jackson, MS
  - American Medical Response
- **May 13-15**
  - Mobile, AL
  - Mobile Fire Rescue Dept.
- **May 13-15**
  - Garden City, MI
  - Northville Township Pub. Safety
- **May 15-17**
  - New Cumberland, PA
  - Emerg. Health Services Fed.
- **May 18-20**
  - Cambridge, MD
  - Dorchester County 9-1-1
- **May 19-21**
  - Bloomington, IL
  - McLean County 9-1-1
- **May 20-22**
  - Vincennes, IN
  - Knox County Central Dispatch
- **May 20-22**
  - Tyler, TX
  - Trinity Mother Frances HealthSys.
- **May 21-23**
  - Geneva, IL
  - Kane County Sheriff's Office
- **May 21-23**
  - Salt Lake City, UT
  - Medical Priority Consultants, Inc.
- **May 26-28**
  - Grand Island, NE
  - Grand Island Emerg. Center
- **May 27-29**
  - Las Vegas, NV
  - Las Vegas Fire Department
- **May 27-29**
  - Tucson, AZ
  - Rural Metro Corporation
- **May 28-20**
  - Normal, IL
  - McLean County 9-1-1

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**Footnotes:**

The following organizations offer training & services of interest to Academy EMDs.

- **University of Iowa—EMS Learning Resource Ctr.**
  - Mike Hartley 319-356-2597
  - <www.shcuiowa.edu/pubinfo/EMS/LRC>

- **U. of Alabama-Huntsville**
  - Rick Beck 205-551-4413

- **U. of South Alabama**
  - Phyllis Vinson 334-639-1070

- **Rogers University**
  - Larry Brewer 918-343-7635

- **Columbus State Comm. College (Ohio & region)**
  - Art Ghilani 614-228-1745

- **Palm Beach Community College (Florida & region)**
  - Barry Duff 561-439-8213

- **Nash Comm. College**
  - Rocky Mt, NC Jay Dornseif (252) 443-4011 x312

- **Phoenix College (AZ)**
  - Dr. K. Lewis 602-285-7207

- **NH Bureau of Em. Com.**
  - Bruce Cheney 603-271-6911

- **Memorial Hospital EMS**
  - Chattanooga, TN
  - Bud Hathaway 423-495-4678

- **Mid-America Safety Cons. (Memphis, TN)**
  - Glenn Fought 901-725-0911

- **Mtn. EMS (Susanville, CA)**
  - Jeff Dishl or Aaron Himmelst (916) 257-0249.

- **San Jose Fire Dept. (CA)**
  - Gary Galasso 408-277-4105

- **Acadian Am. (Lafayette, LA)**
  - Todd Laporte 318-267-1523

- **Abbott Am. (St. Louis, MO)**
  - John Huffman 314-768-1000

- **Team Dispatch (FL)**
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  - Send success stories for review.
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