

June
2021

Fire Line Newsletter

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From the Balcony - Clearing Out Our Hard-drives

This past week, career firefighters (and law enforcement officers) won Workers’ Compensation consideration for job related disability due to Post Traumatic Stress Disorder (PTSD). The reality of our profession is that PTSD if left untreated can have career/life ending consequences. I have read many times of firefighters that didn’t get the help they needed for fear they would lose their job and their ability to provide for their families in the future. This is why Wisconsin Senate Bill 11 is so important for all of us. This did get me thinking about all the things that are stored in our memory or “hard drive” as I like to call it.

I have been told that I have memory that is sometimes downright frightening! I can recall many specific dates, telephone numbers, high school locker combination, even the date I received my driver’s license (license number and all). I am not exactly sure why all these things have been committed to my hard drive, but not everything I have on my hard drive is there on purpose and often I wish I could erase the specific memory that I have stored.

My hard drive holds some very fragile and disturbing memories of traumatic events I have witnessed over the past 30 plus years as a firefighter. For the most part I think I have reconciled with them pretty well though once in a while a new event triggers something in my hard drive which causes me to replay that memory again. This is where things get tricky for me. How well can I reset my brain and separate the past from the present? When I first came on the job Employee Assistance Programs (EAP) did not exist. Critical Incident Management was not well known either so firefighters became counselors for each other and we talked and talked until we felt like we had things sorted out in our hard drives.

Back then, no way would we admit we were hurting inside, it was always implied that it’s better to suck it up and move on!

Today firefighters have better tools to help us reconcile traumatic events and mental fitness is becoming as important to our profession as our physical health. A loaded question you might hear sometime would be something like what is the worst call you’ve ever been on. Instead of answering that in the literal sense and before the question actually triggers our hard drive, we need to find a way to combat the question because we know we are not living a Hollywood TV drama, we live in the real life where people die and we see it firsthand. We live with the loss, heartache, horror and helplessness that sometimes surrounds our profession. The accumulation of the trauma we see can be what needs to be reconciled in our hard drives and we can do so knowing that benefits related to PTSD are recognized in Wisconsin for career firefighters and police officers. Our firefighting profession has to do better and it starts with us assuring each other that it’s okay not to be okay. I am grateful for this legislation and for everyone who helped make it a reality. This is a huge victory for Wisconsin.

I know some volunteer and part-time firefighters say the bill left them out and for that I am truly sorry. It is my hope that the same elected officials which helped to make this legislation into law can find a way to help the volunteer fire and EMS workers so they too can share in the benefit if they ever need it.

*Until Next Month,
Be Safe and Be Well*

**Fire Chief
Peter O’Leary**



FOND DU LAC FIRE RESCUE OPERATIONS

By: Assistant Chief
Erick Gerritson



Crisis Leadership at Mass Violence Incidents

Following are four primary lifesaving missions that fire service leaders need to manage mass violence.

MASS VIOLENCE FORMS CRISIS LEADERS

Extreme events not only require the skills to manage incidents but also demand crisis leadership. Police, fire and EMS Officers, along with hospital doctors, are asked to exercise crisis leadership by connecting, collaborating and coordinating with each other to cope with the various aspects of active shooter incidents.

It has become a first responder cliché to “stop the killing and stop the dying,” but to do this takes courage, teamwork and leadership. Every day we see courage displayed by our first responders. It is up to the Officers to demonstrate teamwork and leadership to make sure the injured and rescuers can go home to their families.

CONNECTING DECISION-MAKERS

Teamwork begins with connecting decision-makers to critical information for situational awareness. Leaders need to ensure that information is shared at the scene and that Emergency Operations Centers connect to develop a common operational picture. This is especially important when multiple events are occurring simultaneously.

Next, crisis leaders set the condition for collaboration.

This is done by introducing yourselves to your counterpart and articulating that you are willing to share the risk of making tough decisions. Incident commanders from fire, police and EMS must stay within arm's distance of each other. If they are across the street from each other, they will not talk. However, setting this simple condition of co-locating commanders within arm's distance will dramatically enhance collaboration and coordination. Without collaboration, there is no coordination. Crisis leadership is like real estate; it is all about location, location, location.

FOUR PRIMARY LIFESAVING MISSIONS

During active shooter incidents, ICs must exercise leadership by coordinating across four primary lifesaving missions:

1. Engaging the shooters (Law Enforcement)
2. Creating warm zones (LE and Fire)
3. Deploying Rescue Task Forces (LE and Fire)
4. Transporting victims (Fire)

Engaging the shooters: Ever since the 1999 Columbine shooting in Colorado, law enforcement has learned that quickly engaging the shooters saves lives.

Hearing the gunfire at the Bataclan, (<https://www.bbc.com/news/world-europe-34827497>) two police officers with 9mm

handguns entered and quickly engaged the shooters. One police officer firing his weapon hit one of the terrorists in the chest, which caused his suicide vest to detonate. The other two terrorists retreated to the second floor and took hostages. The action by these officers stopped the killing in the Bataclan.

During the engagement phase, it is crucial to have paramedics standing by to take care of any injured officers. These activities may occur before the formation of a Rescue Task Force (RTF).

Creating warm zones and deploying RTFs: An important lesson learned from mass shootings is for fire and police departments to form RTFs that can enter a warm zone as quickly as possible to stop the dying by providing emergency medical care. Even with police force protection and fire personnel ready to go, there are questions: Who decides when to change an area from hot to warm? How is this done without falling into the same Columbine dilemma of waiting too long for a SWAT Team to declare the area warm?

After many full-scale exercises between FDNY and NYPD, it was learned that it is a best practice to assign a law enforcement officer with the authority to create a warm zone. This police officer needs a team (with Fire Officer assistance) whose only

Crisis Leadership at Mass Violence Incidents...Continued

mission is rapidly designate warm zones. Think of this as if it was a distribution of work at a fire scene. Engine companies extinguish the fire, while ladder companies search for victims.

At an active shooter incident, patrol and SWAT officers engage the shooter(s), while the Zone Team creates a warm zone, so an RTF can be deployed to do patient care.

Developing a policy to create a warm zone rapidly is the next evolution in active shooter procedures. The critical element for this to occur is to designate a separate team to push for warm zones aggressively.

Transporting victims to selected trauma centers and hospitals: While continuing to treat the patients, the last lifesaving mission is to transport the patients to a trauma center or hospital immediately.

It was not that long ago in France that they debated whether they should stay and play (do advance medical care at the scene) or scoop and go (rapid transport patients to hospitals).

It has been learned that the best chance for survival is to get the patients to the operating room as fast as possible. The public also knows this and will seek any means for transportation, whether it is by ambulance, taxi or private vehicle, often overloading the nearest hospital, so it is imperative that this transportation is a coordinated effort.

As patients arrive, each hospital needs to institute a Hospital Incident Command System. There are at least four critical positions: 1) The IC for the hospital; 2) the

Operations Chief, who manages a 3) Triage Leader and 4) Clinic/Operating Room Coordinator.

Doctors are great under stress to take care of patients, but they are uncomfortable in the role of incident management. Every hospital needs to train its medical staff to manage extreme events.

ANTICIPATE FUTURE EVENTS

Before a crisis, Officers must anticipate future extreme events. It can be projected that the probability of mass violence will increase as the skills needed to carry out these attacks decrease, and the availability of weapons is easily attained.

On 9/11, it took a lot of skill and money to use commercial airlines as weapons against

high-rise buildings. But taking over a plane was done with readily available weapons. Today, the probability of using planes as missiles is lower because acquiring the skills and carrying weapons onto a plane is more difficult to attain.

However, it does not take a lot of skill or money to acquire and use assault rifles with large-capacity magazines for mass murder. Therefore, we can anticipate more mass violence.

Our job as Fire Rescue Officers is to always think of the safety of our first responders and the public. We do this through preparedness efforts and joining together to lessen the probability of these attacks.

Reference: Assistant Chief Joseph Pfeifer, FDNY (Ret.)

Until next month, Stay Safe!



Operations by the Numbers

April, 2021	By Month		Year-To-Date	
PREVENTION	Last Year	This Year	Last Year	This Year
Total Inspections	17	248	773	1046
Total Defects	6	112	506	476
SUPPRESSION				
Alarms Involving Fire	13	6	40	34
Fire Mutual Aid Given	0	0	8	7
Fire Mutual Aid Received	0	0	0	5
Service/Good Intent Calls	45	47	178	169
False Alarms/False Calls	20	33	90	106
Other Calls	17	11	44	38
Total Fire Alarms & Calls	95	97	352	347
EMS				
Total Ambulance Calls	428	499	1913	2007
Total Fire/EMS Responses	523	596	2265	2354
Fire Property Loss	\$35,000.00	\$3,000.00	\$226,000.00	\$200,263.00
Fire Contents Loss	\$19,150.00	\$1,200.00	\$110,151.00	\$98,150.00
Engine Assisted EMS Calls	183	202	809	805



The Code Summary

By: Assistant Chief Todd Janquart

Five Common Causes of Sudden Unexpected Death Every EMS Provider Should Know

Authored by: Corey M. Slovis, MD: JEMS.com

You're called to the scene where a 50-year-old male was working in his yard when his wife witnessed him collapse. He's found pulseless and apneic with no signs of trauma. His wife is performing CPR when you arrive.

What are the five common causes of sudden death that could have led to his demise, and what are some symptoms the patient may have been experiencing in the hours or days leading to his arrest?

Introduction

EMS providers are often faced with patients in cardiac arrest. Many of these patients have complicated medical histories and have been ill for a long period of time. This article will discuss the five major causes of acute sudden death that may occur without warning in previously healthy patients, with a focus on the etiology, recognition and treatment of these conditions. The article is written to better allow prehospital providers to consider these causes and initiate appropriate time-sensitive care whenever possible.

The five causes of sudden death discussed in this article are: fatal **arrhythmias**, acute **myocardial infarction**, intracranial hemorrhage/massive stroke (**cerebrovascular accident**), massive **pulmonary embolism** and acute **aortic catastrophe**.

1. Arrhythmia

There are many causes of fatal arrhythmias including

cardiomyopathies, inherited defects in the conduction system (such as prolonged-QT syndrome or Brugada syndrome), and the most commonly associated factor: ischemic injury from acute myocardial infarction (AMI) or previous infarct. Electrolyte imbalance can lead to arrhythmias and sudden death, such as hyperkalemia seen in patients with end stage renal disease on hemodialysis and hypokalemia in patients taking diuretics. Both of these are usually asymptomatic, but can prolong the QT interval leading to torsades de pointes. Other potential causes of malignant arrhythmias include illicit drug ingestion, medications that prolong the QT interval, acute changes in pH, worsening heart failure, Wolff-Parkinson-White syndrome and commotio cordis following chest trauma.

A significant number of patients who suffer sudden cardiac death will have no preceding symptoms. Other patients may have a history of chest pain, shortness of breath, palpitations, dizziness or syncope. Thus, even healthy, relatively young patients with "minor complaints," such as palpitations, need to be taken seriously and should be carefully monitored enroute to the hospital.

These complaints should always prompt EMS providers to consider arrhythmia as a potential cause of the patient's symptoms. To that end, patients with these complaints always need what we refer to as the "opening gambit": oxygen,

oxygen saturation monitoring, IV access, continuous cardiac monitoring and a 12-lead ECG.

Sudden death from a cardiac cause accounts for the majority of events, with estimates as high as 80%.⁴ Less than 8% of patients who have arrested will survive to be discharged from the hospital, and those who do live are likely to present with shockable rhythms. Unfortunately, it appears that only about one quarter of out-of-hospital cardiac arrests will have unstable v tach or v fib, and the remaining 75% who present in pulseless electrical activity (PEA) or asystole will have a bleak prognosis.

Early defibrillation is the reason patients in v fib have a four-fold increase in odds of survival compared to those found in PEA, and nearly 20-fold increase in odds of survival compared to patients found in asystole.⁸

In the case of v fib patients, it's estimated that every one minute in delay of defibrillation will decrease the chance of survival by up to 10%.⁷ For this reason, encouraging automated external defibrillator (AED) placement wherever there are large crowds or sporting events is essential.

Key concepts: Fatal arrhythmias are a common cause of sudden death. Early recognition of patients at the risk for these arrhythmias and appropriate treatment of reversible causes saves lives. Patients found in v fib or v tach stand a much greater chance of survival when early defibrillation and high-quality chest compressions are delivered.

2. Acute Myocardial Infarction (AMI)

Another cause of sudden death is AMI. Plaques that develop within arteries progress over time and eventually rupture and occlude blood flow. Much like a sprinter will feel a burn in his muscles as he fatigues at the end of a race, the lack of adequate oxygen delivered to the heart (ischemia) results in fatigue that causes the anginal symptoms experienced by most patients during acute coronary syndrome (ACS). If ischemia affecting a large enough area of the heart is prolonged, extensive cell death follows and results in an AMI. Damage to the conduction pathways within the heart can degenerate into bradycardia, heart block, unstable v tach, v fib or PEA with the common endpoint of asystole. In the hundreds of thousands of cardiac arrests in out-of-hospital settings each year, approximately 80% are thought to be related directly to ischemic heart disease.

When a patient presents with symptoms suggestive of AMI, it's critically important to obtain a 12-lead ECG, which can help confirm the diagnosis of ST elevation myocardial infarction (STEMI). However, only 20-60% of patients having an AMI will initially have an ECG showing a true STEMI on presentation.

It's important to realize there are many mimics of AMI that require different management. Furthermore, there are many atypical presentations of AMI

5 Sudden Causes of Unexpected Death...Continued

that won't be immediately recognized if a provider isn't aware of them. For example, it's been estimated that as many as one in four patients with AMI won't have chest pain. Missed cardiac ischemia is more common in patients with atypical symptoms, younger patients, the elderly, women and minorities.

The five most common atypical symptoms of an AMI are:

1. Dyspnea **2. Diaphoresis**
3. Central nervous system (CNS) symptoms including syncope, pre-syncope, dizziness, and stroke-like symptoms **4. Gastrointestinal symptoms including nausea and non-localizing mild abdominal discomfort** **5. Weakness.**

The classic presentation of AMI is chest pain. The pain is sometimes difficult to delineate from indigestion, but several factors are known to increase the likelihood that a patient's chest pain is related to ischemia. Pain that's similar to a previous heart attack, pain that radiates to either or both arms, and pain that's precipitated by exertion increase the likelihood that a patient's chest pain is associated with an AMI or ischemia preceding an AMI.

Factors associated with chest pain that decrease the likelihood of an AMI or an ischemic etiology are pain that is sharp, stabbing, worse with respiration, positional or worse with pressure applied to the affected area. Pain relieved by nitroglycerin isn't predictive of ischemic chest pain. It's best to have a high index of suspicion for possible signs and symptoms of ACS and to remember: Atypical is typical! Doing more 12-lead ECGs rather than less should be the practice pattern for all providers working in EMS and ED's. In the presence of an AMI, expedient transport to the nearest medical center that can offer specialized cardiovascular intervention is paramount. Minimizing the time to percutaneous intervention will improve the patient's outcome and chance of survival. While enroute to a specialized medical

facility, remember that administration of aspirin has been shown to significantly improve mortality.

Key concepts: Time is muscle, and early recognition of patients suffering an AMI, even in the absence of chest pain or ECG changes, will ensure the opportunity to intervene appropriately isn't missed. EMS providers must maintain a high index of suspicion for AMI as patients will often not present with a "classic history".

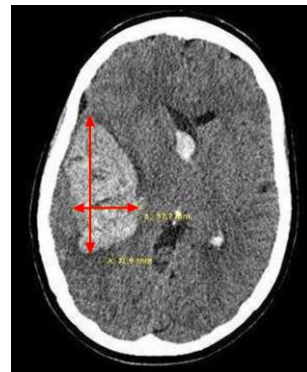
3. Intracranial Emergencies

Intracranial catastrophe is an often overlooked cause of sudden death. Unlike other tissues in the body, the brain has a uniquely limited capacity to tolerate low oxygen delivery. This is the same reason ensuring appropriate blood flow through maintaining adequate blood pressure and oxygenation in head trauma patients is emphasized in Prehospital Trauma Life Support (PHTLS) training. In the case of a cerebrovascular accident (CVA), the blood flow to a part of the brain has stopped due to either obstruction from an embolism or from the rupture of a vessel carrying blood to the affected area of the brain.

In non-hemorrhagic strokes, where thrombolytic therapy is thought to benefit certain subpopulations of patients when delivered within the first several hours, timely transport is imperative. These patients can present with syncope, vertigo, facial droop, dysarthria, unilateral weakness, unilateral loss of sensation or hemiparesis. Initial assessment should include a blood glucose measurement as hypoglycemia can mimic stroke-like symptoms. Cardiac monitoring is also important as strokes have been associated with ensuing fatal arrhythmias leading to sudden unexpected death.

In the case of a massive hemorrhagic CVA, which is

associated with markedly elevated blood pressures and obtundation, patients frequently die before the initiation of medical therapy. Declining mental status in particular is one of the early signs of increased intracranial pressure, a harbinger of impending fatal herniation of the brain. However, there are many patients who can potentially benefit from emergent therapy and thus transport shouldn't be delayed so that timely diagnosis and management



can be initiated at a medical center capable of providing advanced care. Either type of a CVA (hemorrhagic or non-hemorrhagic) can be devastating and can lead to lifelong disability or death even when treated early and aggressively.

The adage "time is brain", copied from "time is muscle", is meant to emphasize that in the cases where intervention is possible, the sooner it's initiated, the more hopeful the patient's prognosis will be.

Subarachnoid hemorrhage (SAH) is another CNS cause of stroke and sudden death. Most commonly a result of a ruptured intracranial aneurysm, SAH often presents with the rapid onset of a severe headache often referred to as a "thunderclap headache". Other signs and symptoms may include nausea,

vomiting, neck stiffness or focal neurologic deficits. Beware of patients who experience syncope during exertion, sexual intercourse, or after developing "the worst headache of their life," as these are classic presentations of a subarachnoid hemorrhage due to a rupture of an arteriovenous malformation or cerebral aneurysm.

Key concepts: As with other causes of sudden death, patients with intracranial emergencies may have no preceding symptoms. However, signs and symptoms such as new or worsening headaches, focal neurologic complaints and declining mental status can be seen. A glucose value should always be obtained to avoid missing hypoglycemia and profound hyperglycemia. When transporting patients with suspected intracranial hemorrhage/CVA, it's critical to avoid hypotension or hypoxia as both will significantly increase morbidity and mortality. To that end, paramedics should rarely use anti-hypertensives in patients suspected of a CVA and should carefully monitor oxygenation.

4. Pulmonary Embolism (PE)

PE classically occurs more frequently in the elderly, cancer patients, patients who recently underwent surgery, patients on estrogen-containing medications, the bedbound and those who've previously had a deep venous thrombosis (DVT) or PE. Virchow's Triad describes the three factors that are ultimately found to cause almost every PE:

1. Stasis of blood flow (e.g., immobilization);
2. A hypercoagulable state (e.g., estrogen therapy, smoking and inherited causes); and
3. Vascular injury (e.g., trauma—even relatively minor).

5 Sudden Causes of Unexpected Death...Continued

However, a PE can occur in patients with none of these risk factors known prior to presentation. Alarming, in one study it was estimated that sudden death was the first manifestation of PE in as many as 25% of patients. Of these, dyspnea and chest pain were the predominantly associated symptoms. Unexplained dyspnea should always raise the suspicion of a pulmonary embolism.

A PE occurs when a thrombus, commonly from a lower extremity DVT, becomes dislodged and embolizes via the inferior vena cava to the right side of the heart. Once ejected from the right ventricle, it enters the pulmonary circulation where it wedges into the branches of the pulmonary arteries, inhibiting blood flow through the lung. This also reduces oxygenation of venous blood prior to its return to the rest of the body. If the blood clot is large enough, cardiovascular collapse will occur as a result of obstructive shock. The left ventricle will be unable to deliver enough blood to the brain and body, resulting in the patient becoming hypotensive and obtunded.

Many patients who have a PE will often present with sinus tachycardia early on without any other findings. The combination of tachycardia, decreased oxygen saturation and pleuritic chest pain should prompt the provider to consider PE. Although associated with PE, hemoptysis is rarely, if ever, present. In the presence of a large PE, an initial ECG may show signs of right heart strain, although further testing will be required to confirm the diagnosis.

In patients suspected of having a PE, it's important to secure the ABCs (airway, breathing, circulation) with oxygen, pulse oximetry, IV access, cardiac monitoring and obtaining a 12-lead ECG while expediting transport. In cases of cardiovascular collapse or sub

massive PE with imminent collapse, interventions such as thrombolytic therapy or endovascular clot removal can not only be lifesaving, but also prevent progression to right heart failure. Thus, early recognition and timely transport is essential to the patient's outcome.

Key concepts: While acute pulmonary embolism often presents with pleuritic chest pain, signs and symptoms such as unexplained tachycardia, syncope, hypoxia, hypotension, anxiety and/or right heart strain should immediately prompt a provider to consider the diagnosis of PE. In such cases, supportive care and timely transport can be not only lifesaving, but also prevent long-term consequences from right heart failure and pulmonary hypertension.

5. Aortic Catastrophe

Lastly, acute aortic catastrophe, namely dissection or aneurysmal rupture, can cause sudden death. In patients with vascular disease (often the result of long-term comorbidities such as hypertension, high cholesterol or smoking), turbulent blood flow in the aorta can lead to outpouchings (aneurysms) of the arterial wall at points of stress due to weakening of the vessel from atherosclerosis.

While initially benign, as these aneurysms grow in diameter over the years, they become increasingly at risk for rupture. An aortic aneurysm, although generally painless, can cause pain that radiates to the back or flank when acutely expanding or upon rupturing. Aortic rupture results in extensive internal bleeding. After exsanguination from the rupture, but prior to death, PEA is likely to be encountered due to extensive volume loss. Whenever a patient over the age of 60 has a chief complaint of back, flank or abdominal pain, it's essential aortic aneurysm always be high on the differential diagnosis. A

large pulsatile mass palpated in the mid-abdomen makes the diagnosis much more likely, though is often not appreciated. These patients will require management in an intensive care unit and, very likely, surgery if the aneurysm is rapidly expanding or has already ruptured.

If the aorta's wall is weakened by chronic changes from vascular disease, it becomes more susceptible to shearing stress that can tear the normal layers of the aorta apart. There are three layers of the healthy aorta that keep blood within the artery. Hypertension can cause blood to "dissect" through the innermost layer into the middle layer and then proceed to tear the wall of the aorta apart internally in a phenomenon called aortic dissection. This distinguishes a dissection from an aneurysm because in aneurysms the three layers of the aorta remain intact and instead bulge out together from their normal position.

Aortic dissection often presents with chest pain, described as "ripping" or "tearing" radiating to the back. Pain from aortic dissection is sudden and maximal in intensity at onset for the majority of patients.

This is unlike angina, which builds in intensity and is rarely felt as ripping or tearing. In approximately one third of patients with aortic dissection, there will be a greater than 15 mmHg difference in systolic blood pressure between the upper extremities and approximately one quarter will have a diastolic murmur. However, neither of these findings are likely to be appreciated in the field. Patients are usually elderly (on average 65 years old), hypertensive (approximately 50% of patients), and sometimes have neurological deficits (less than 1 in 5 patients with dissection).

It's important to realize aortic dissection can often mimic ACS.¹¹ As the treatment for ACS requires anticoagulation, appropriate recognition of a dissection saves lives as incorrectly diagnosing a dissection as ACS and treating with anticoagulation can lead to aortic rupture. Thus, any interventions beyond aspirin for chest pain should be pursued only after the diagnosis of dissection has been considered and thoughtfully ruled out.

Key concepts: Aortic rupture from aneurysm or dissection requires the thoughtful practitioner to first consider the diagnosis in any patient with chest pain, flank pain, abdominal pain or sudden collapse. This is particularly true in elderly patients with hypertension who present with either ripping or tearing chest pain in the case of dissection, or in the case of ruptured aortic aneurysm patients presenting with severe back, flank or abdominal pain. Reducing hypertension and tachycardia while expediting transfer to a specialized medical center is critical.

Conclusion

Through improved awareness, the skilled provider will be able to more efficiently initiate appropriate therapy and avoid the pitfalls of misdiagnosis and resultant unintended harm to the patient. It's held true for centuries that history and physical examination are an essential guide to the medical management of our patients, and these shouldn't be undervalued. It's also important to remember the basics: securing ABCs, opening the gambit and expediting transport to a qualified medical center.

Article from the 1/20/15 online edition of JEMS.com

**Decide what you want, decide what you are willing to exchange for it.
Establish your priorities and go to work.** H.L.Hunt

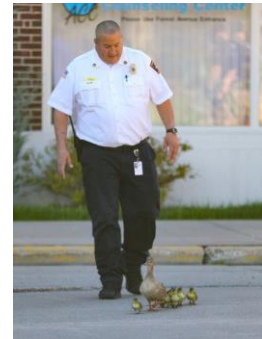
NEWS AT THE STATION



The annual brat fry held on Friday, May 7th was another huge success as over \$5800 was raised for the local chapter of the Red Cross. *Good Day Wisconsin* did a live broadcast from the station promoting the brat fry and the Red Cross.



A sure sign of spring...
duck rescues.
Crews have been busy the past
few weeks rescuing ducklings
from sewer drains.



Happy June Birthday

Rick Gerritson • Carl Bahr •
Edgar Ramirez-Tellez • Anthony Gonzalez



Well-trained people are the best defense against fire.

By: Assistant Chief of
Training/Safety
James Knowles III

The Well-Hole Stretch *Source: Rowett Jr., A. (2018) www.firehouse.com*

Advancing a hoseline up a stairwell is a resource- and energy-depleting operation, especially when a 2½-inch hoseline must be advanced up the stairwell. As the hoseline is advanced, additional hoseline is required to navigate the turns of the stairwell. Pinch points that may be created around those turns will reduce the efficiency of, or even stop, the hoseline advancement operation if they are not effectively managed. Managing these pinch points requires additional staffing.

One hoseline advancement tactic that is available to firefighters is the well-hole stretch, which utilizes the space between the sections of stairs in the stairwell. When considering a well-hole hoseline stretch operation, firefighters must always first ensure that the well hole is of adequate size to allow for the charged hoseline and couplings to pass through it. One safe practice is to have a firefighter insert both of their closed gloved fists into the well hole. If both fists fit, the well hole will be of adequate size for this type of stretch operation.

Next, the firefighter must determine how many lengths of hoseline will be necessary. If the hoseline were to be advanced up the stairwell without using the well-hole stretch tactic, one length of hoseline (50 feet) would need to be provided for every floor

of the stairwell that the hoseline must ascend. Additional lengths of hoseline are also required to reach from the stairwell to the fire area, and then one length of hoseline must be allowed for the fire area itself.

Consider advancing a hoseline to the fourth floor for a fire area that is located 40 feet from the stairwell. The stairwell stretch breaks down like this:

- Floors 1-4; four lengths of hoseline (200 feet)
- Stairwell to fire area (located 40 feet from stairwell): one length of hoseline (50 feet)
- Fire area: one length of hoseline (50 feet)

When combined, the total length of hoseline is 300 feet.

By using the well-hole stretch technique, the number of lengths of hoseline will be greatly reduced. The well-hose stretch allows for one length of hoseline to ascend the stairwell vertically in a straight line, therefore the length of the hoseline is the same height of the stairwell. (One length of hoseline should only be considered adequate to advance up to four floors when using the well-hole stretch tactic.) It is advisable to have the hoseline exit the well hole on the floor below the fire floor

and then advance up to the fire floor in the same fashion as a standpipe operation. An additional length of hoseline must be allotted for ascending the stairwell from the floor below the fire floor to the fire floor. Additional lengths of hoseline are also required to reach from the stairwell to the fire area, and then one length of hoseline must be allowed for the fire area itself. As such, the well-hole stretch breaks down like this:

- Floors 1-3 (well-hole stretch): 1 length of hoseline (50 feet)
- Floor 3 to Floor 4: one length of hoseline (50 feet)
- Stairwell to fire area (located 40 feet from stairwell): one length of hoseline (50 feet)
- Fire area: one length of hoseline (50 feet)

When combined, the total length of hoseline is 200 feet.

Keep in mind that the amount of hose needed for the stretches described above only applies to the hoseline needs for the building itself. The amount of hose needed to cover the setback (the distance from the building entrance to the apparatus) must be determined and added to the amount of hoseline needed to cover the building. The combination of the amount of hoseline needed to cover the building as well as the setback is the

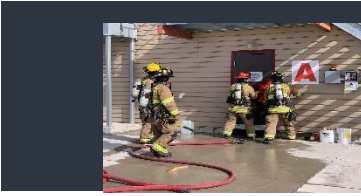
total required length of the hoseline.

Multiple Techniques

There are multiple techniques that firefighters can use to perform the well-hole hoseline stretch operation, whether advancing with a charged or uncharged hoseline.

Raise via utility rope – The first technique involves hoisting the hoseline up using a utility rope, and should follow these steps:

1. Firefighters ascend the stairwell to the floor below the fire floor with the utility rope.
2. They lower the utility rope through the well hole of the stairwell.
3. A firefighter, who remained positioned at the base of the stairwell, ties off the hoseline to be hoisted using the correct technique depending on whether the hoseline is charged (if a charged hoseline is to be hoisted, the firefighter must ensure that the nozzle control bale is secured in the closed position).
4. The firefighters positioned on the floor below the fire hoist the hoseline up to their position through the well hole and over the hand rail to where it can then be advanced up to the fire floor and into the fire area.
Note: All of the available hoseline must be



The Well-Hole Stretch Continued

advanced to this floor and be raised over the hand rail of the stairwell and on the stairs of the stairwell; no available hoseline should remain at the base of the stairwell.

5. The firefighters positioned on the floor below the fire floor tie off the hoseline on the floor below the fire floor.
6. Firefighter flake out the hoseline.
7. As the firefighter who remained positioned at the base of the stairwell ascends the stairwell, they will tie off the hoseline every 4 floors to reduce the pressure that is placed on the hoseline couplings.

Stretch as you ascend – The second technique is for the firefighters to stretch or advance the hoseline up the well hole as they ascend the stairwell, and should include these steps:

1. Crews position the hoseline inside of the stairwell hole while at the base of the stairwell.

2. Firefighters ascend the stairwell, while holding just the nozzle, to the floor below the fire floor (as the firefighters ascend the stairwell, the hoseline will be raised through the well hole of the stairwell). *Note:* All of the available hoseline must be advanced to this floor and be raised over the hand rail of the stairwell and onto the stairs; no available hoseline should remain at the base of the stairwell.

3. Firefighters tie off the hoseline on the floor below the fire floor.
4. Firefighters flake out the hoseline.
5. Once the hoseline is advanced to the floor below the fire floor, one firefighter must ensure that the hoseline is tied off every 4 floors to reduce the pressure that is placed on the hoseline couplings.

Carry nozzle and lead length as you ascend – The difference between this technique and the second

technique is that in this one, the firefighter will advance the nozzle and the lead length (50 feet) of the hoseline up the stairwell while advancing the remaining lengths of the hoseline up the well hole. To perform this technique:

1. The nozzle firefighter loads the lead length of the hoseline onto their shoulder and ascends the stairwell with the nozzle in hand until reaching the floor below the fire.
2. Another firefighter inserts the hoseline into the well hole of the stairwell.
3. As the nozzle firefighter ascends the stairwell, the hoseline is raised through the well hole. *Note:* All of the available hoseline must be advanced to this floor and be raised over the hand rail of the stairwell and onto the stairs; no available hoseline should remain at the base of the stairwell.
4. Firefighters tie off the hoseline on the floor below

below the fire floor.

5. Firefighters flake out the hoseline.
6. Once the hoseline is advanced to the floor below the fire floor, one firefighter ensures that the hoseline is tied off every 4 floors to reduce the pressure that is placed on the hoseline couplings.

In sum

Performing a well-hole hoseline stretch operation will reduce the strain that is placed on the resources available on the fire scene by reducing the length of the hoseline that must be advanced up the stairwell. This tactic will also assist in conserving the energy of the firefighters who are performing the operation, allowing them to focus their energy on the fire-attack operation. The well-hole stretch is a simple tactic that all firefighters should understand as well as be able to perform.



Current Status of New Construction

- River Hills Mixed Use Development on S. Main St. – *Buildings 10, 11, 12 are under construction*
- Forest Mall – *Demolition continues*
- Badger Liquor – *Warehouse is under construction*
- Huberty CPA's on S. Pioneer Rd. – *New Construction*
- Excel Engineering – *New addition*
- Country Lane Cottages - *Townhouses under construction*
- Sullys Tavern – *Under Construction*
- Holiday Collision Center - *Under Construction*
- Mid States Aluminum Addition – *Nearing Completion*
- Parkside, Evans, Sabish Schools – *Under Construction*
- Sister Catherine Drexel Homeless Shelter – *Under Construction*

Fire Prevention

The Bureau Never Sleeps

By: Division Chief Garth Schumacher



Electrical Safety at Home Checklist

According to the National Fire Protection Association (NFPA), in 2010 U.S. fire departments responded to an estimated 46,500 house fires that were caused by electrical malfunction or failure. From 2005-2009, 49% of those home electrical fires involved lighting or electrical distribution equipment; another 46% were attributed to other known types of equipment, including stove ranges, washers, dryers, space heaters, and fans.

In many of these cases, the resulting deaths (420 in 2010), injured (1,520 in 2010) and direct property damage (\$1.5 billion in 2010) could have been avoided.

You already practice fire safety, but fire prevention is the best way to protect your family – and that starts with ensuring that your electrical systems and appliances are functioning properly and safely: Run through this checklist regularly, since electrical malfunction can happen at any time and for many reasons.

✓ Cords & Plugs

☐ Check all cords, plugs, surge protectors and extension cords for frayed casing, exposed wire or broken components. Replace immediately.

☐ Never run extension cords under carpets or over door thresholds.

☐ Don't use an extension cord as a permanent fixture. If you need additional outlets,

contact a licensed electrician to install some wherever you require.

☐ Always follow the manufacturer's instructions for plugging a device into the outlet.

☐ Do not overload one outlet with several high-wattage or heat-producing devices, for example a space heater or coffee maker.

☐ Plugs should fit snugly into outlets. If yours do not, contact a licensed electrician.

☐ Major appliances – washers, dryers, refrigerators, stoves, air conditioners, hot water heaters, etc. – should be plugged directly into a wall outlet. Do not use surge protectors, plug strips or extension cords.

☐ Only use water resistant extension cords in damp areas (like the basement).

✓ Lighting

☐ Only use lightbulbs at or below the maximum wattage listed on your lamp or light. (There will be a sticker on the appliance indicating max wattage.)

☐ Always place lamps on a flat, level surface and at least a foot from anything flammable (e.g. curtains).

✓ Appliances

☐ Place heat-producing appliances (toaster, heater, coffee maker, etc.) away from flammable or combustible goods (potholders, paper napkins, etc.)

☐ Unplug kitchen countertop and bathroom (e.g. toaster or hair dryer) appliances when not in use.

☐ Keep your kitchen exhaust fan clean and free of grease, lint and other obstructions.

☐ Never use a portable heater in the bathroom. The only safe options are a ceiling unit or strip heater placed up high.

☐ If you use portable or space heaters, be sure they receive a seal of approval from a nationally recognized testing laboratory (NRTL) like UL, ETL, or CSA.

✓ Extra Safety Considerations

☐ If you have young children, consider re-outfitting your home with tamper-resistant (TR) electrical receptacles. Always use a licensed electrician (Note: As of 2008, TR receptacles are required by law in all new and renovated homes.)

☐ Arc fault circuit interrupters (AFCIs) are a special type of circuit breaker that shuts off the current when dangerous conditions arise. Ask a licensed electrician about installing AFCIs in your home.

☐ Ground fault circuit interrupters (GFCIs) are a special type of circuit breaker that shuts off the current when dangerous conditions arise. Ask a licensed electrician about

installing AFCIs in your home.

☐ Test AFCIs and GFCIs at least once per month.

☐ If you need to dig, always dial 811 (U.S. only) to have your underground lines marked.

✓ Warning Signs

If you experience any of these warning signs, call your landlord or a licensed electrician immediately:

X You feel a tingling sensation when you touch a plug or light switch.

X Your circuit breaker flips frequently or fuses blow regularly.

X An appliance gives off a faint rubbery or burning smell.

X Your outlet plates are warm to the touch or discolored.

X An electrical appliance has been waterlogged or submerged in any liquid (throw away immediately).

X An outlet sparks.

X Your lights dim or flicker.

Flipping a light switch.
Plugging in a coffeemaker.
Charging a laptop computer.
These are second nature for most of us. Electricity makes our lives easier. However, please be cautious and keep safety in mind.

*Until next month,
stay safe out there!*

Outdoor Electrical Safety

Lighting to improve the look and safety of our homes, electric tools to make our outdoor work easier, and power lines to our home, all need to be handled with care.

Outside Electrical Work

- Have a qualified electrician do all electrical work.
- To prevent an electrical shock, make sure all your outside electrical receptacles are GFCI (ground-fault circuit interrupter) protected.

Equipment Safety

- Use lighting and power tools that are listed by a qualified test laboratory and make sure they are made for outdoor use.
- Store your electrical tools indoors.
- Keep electric tools away from children.
- Keep the area around your electric meter and other electrical equipment clear.
- Check lighting and extension cords for damage before using. Replace any damaged cords right away.
- Use extension cords that are listed by a qualified test laboratory and are marked for outdoor use.
- Extension cords are not meant for long-term use.

POWER LINES

Have a professional tree cutting service trim branches that might fall on electric wiring. Use a wooden or fiberglass ladder outside. Keep the ladder at least 10 feet away from power lines. Never touch anyone or anything in contact with a downed wire. Power lines may be live, stay a safe distance away. Report downed wires to authorities right away.

IMPORTANT REMINDER

Call "Before You Dig" (8-1-1) before any digging on your property. They will mark where your underground utilities are located. *It's a free service!*



Your Source for SAFETY Information

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PEER FITNESS TIPS

By: Peer Fitness Trainer
Jack Prall

The Four Components of Firefighter Fitness

The sedentary hours firefighters may spend in the fire station may be as hazardous for them as fighting a fire.

Coaches and athletes have long appreciated the role exercise plays in the enhancement and prevention of injury. But the power of exercise isn't limited to gymnasiums and playing fields. The same benefits need to be applied to the fire stations.

It has been said that firefighters expend as much energy during a major emergency as the players in a football game, if not more. This assertion is supported by many studies that demonstrate the need for and benefits of high levels of physical fitness in the fire service.

The sedentary hours firefighters may spend in the fire station may be as hazardous for them as fighting a fire. A major reason for firefighters high risk of heart attacks may be that they get little or no exercise while on-duty or neglect to perform while at home. The sudden, intense energy demand that is needed to fight a fire is what puts the firefighter who is not in good physical condition in grave danger. A firefighter's lack of physical fitness can be viewed as a matter of public safety as well as one's individual health.

A firefighter is just like an athlete being they must be properly equipped, skilled

at what they do, and fit for the demands of their jobs. Optimal fitness is a combination of lifestyle, nutrition and habits, but it cannot be reached without an appropriate level of physical fitness.

Let's look at what is considered the major components of being physical fit and to understand their benefits and how they play a part in building a firefighter's body to the ultimate.

Cardiorespiratory Endurance

Nothing is more important to overall health and fitness than cardiovascular or aerobic training.

Cardiovascular exercise improves the ability of the lungs to provide oxygen and the heart and vessels to supply blood to the tissues. This type of fitness largely determines your ability to participate in vigorous physical activities for extended periods of time. Firefighting is a physically demanding occupation because they have to perform heavy physical labor under extreme environmental conditions. Unlike manual jobs where most of the effort has been engineered out of manual handling tasks, firefighters must respond to an ever-changing set of environmental conditions for extended periods.

The heart rate response to hard physical work has been demonstrated to be a reliable and valuable tool for

establishing the intensity and arduousness of work being performed. As the rate increases, the amount of oxygen consumed by the body increases. In fact, it is the demand for the increased amount of oxygen that triggers the increase in heart rate.

The maximal heart rate declines with age, ($220 - \text{your age} = \text{your maximum heart rate}$) is generally accepted as the basis for establishing the "red line" for people who are exercising or working in arduous settings. Most people can only sustain high percentages (90 percent) of their heart rate for a short duration.

The studies pretty much shows that aerobic capacity is so important to a firefighter's performance that it provides an independent and necessary indicator of the physical fitness of firefighters to perform the more critical elements of their job. In other words, without cardiovascular fitness, you can't do your job safely or well.

To increase your cardiovascular fitness, you must undertake a regular program of sustained aerobic exercise. Criteria must be met with frequency, intensity, time, and type to be effective. The most effective exercises for producing an improvement in cardiovascular fitness are those that are performed continuously while using large muscle groups. Activities that meet these criteria include jogging, brisk walking, cycling, stair climbing, rope skipping, aerobics, cross country skiing,

swimming, rowing, etc.

Firefighters perform their job under the most arduous conditions, enduring high heat and oxygen-deficient environments. Compound this with an intense level of mental stress and you can see the importance of keeping the cardiovascular system in tip-top shape. A cardiovascular workout also lowers serum cholesterol levels, triglyceride levels, and blood pressure, thereby reducing the risk of heart disease, diabetes, and osteoporosis, as well as many other ailments.

The way I look at it in this modern high-pressure world, you cannot afford not to work out. Back to square one with the leading cause of line-of-duty death for firefighters across the country is heart attack, it then seems logical for all fire departments to implement some type of fitness and wellness program.

Flexibility

Flexibility and balance are critical factors in achieving your peak physical potential, but they are overlooked many times. It seems all you hear is "pumping iron" is what you need to do. Not!

A good dose of stretching which is what many people refer to as flexibility now should precede and follow just about any exercise routine the American Council on Exercise says. Flexibility, the ability of a joint to move through its full range of motion, is extremely important for general fitness



The Four Components of Firefighter Fitness Continued

and wellness. What you achieve by stretching your tight muscles, tendons and ligaments are balance. Balance from all the stresses and strains of everyday life as well as balance in training.

These aspects of fitness is very important to firefighters whose work involves strenuous physical activity, restrictive areas, slippery or otherwise unsafe conditions, awkward and/or heavy loads, requirements for rapid movement, etc.

Flexibility just doesn't help firefighters work with less risk of injury but can also contribute to the following:

- Increased physical efficiency and performance.
- Increased circulation.
- Increased neuromuscular coordination.
- Improved balance and posture.
- Reduced stress and tension.
- Personal enjoyment.

Sounds too good to be true from just doing a few stretches, ha.

Muscular Fitness

For the firefighters, the benefits here are obvious I would think. Carrying heavy equipment to the scene or up many flights of stairs while clad in suffocating, insulated clothing and then being required to perform at full capacity puts tremendous demands of strength and endurance on the human body. Firefighting and rescue work frequently involves moving your body into different positions: therefore, all your

muscles need to be strong at every position within their normal range of motion. When we look at muscular fitness it encompasses three properties of muscle tissue:

- **Strength** – the maximum amount of force a muscle can generate during a single contraction.
- **Power** – the rapid generation of force, or the ability to move loads quickly.
- **Endurance** – the ability of a muscle to perform repeated contractions for a prolonged period of time.

Muscular fitness is an entirely separate and unique component of physical fitness, different from flexibility and cardiovascular fitness. The high demands of firefighting require a high degree of muscular fitness. Strength training produces new muscle tissue, which is then available to contract and generate force allowing the job to be done better and safer.

Body Composition

The fourth component of physical fitness is body composition. This is the makeup of the body in terms of relative percentages of body fat to fat-free mass (muscle and bone). A minimum amount of body fat is necessary to cushion and protect body organs from injury. These adipose tissues serve the important function of storing and releasing energy in response to metabolic demands.

If your body's energy intake from eating exceeds your normal energy for daily activities including exercise, the excess energy is stored as body fat. Storage of excess fat enlarges cell size and can increase the number of fat cells in the body (commonly known as the chubbies). Attaining a healthy body weight and maintaining it over your lifetime should be a goal of every member of the fire service.

Functional Exercises

In closing of this very important topic I wanted to show you several examples of functional exercises and how they relate to preparing for the rigors of the firefighting:

Functional Exercise.... Related Firefighting Skill

Squat.....Stair and ladder climb, hose line operation, overall strength in transporting heavy equipment

Lunge.....Stair and ladder climb, balance, coordination

Bench Press.....Hose line operation, hand tool operation, and forcible entry

Standing Curl.....Climbing, pulling yourself through tight places

Shoulder Press.....Hose line operation, hand tool operation, pulling ceilings

Rowing.....Hose line operation, heavy power tool operation and roof sawing

Push-ups.....Hose line operation, hand tool operation

Sit-up.....Hose line operation, heavy power tool and overall strength in transport of heavy equipment

You can see how important these exercises can make your life as a firefighter safer and healthier if performed in the proper way. As they say, knowledge is power. The importance of physical fitness and conditions for firefighters and emergency responders is beyond any doubt. But just being fit is not enough for this dangerous occupation.

To minimize risks, each firefighter of the department needs to take an active role in managing their health in areas as diverse in nutrition, weight control, stress management, substance abuse prevention, and personal safety. A healthy low-fat eating plan, combined with regular physical activity is the key. But remember, who is a firefighters best friend...water.

Author: Becky Sherek is a registered nurse and paramedic program coordinator for the Mesabi Range Community and Technical College in Minnesota. Becky holds two masters degrees, one in Community Health Administration and other in Wellness Promotion and is a contributor to Minnesota Fire Chief Magazine.