

STATE FIRE MARSHAL'S OFFICE

Line of Duty Death Investigation



Investigation Number 02-334-04

Firefighter Kevin L. Baker

Mid-North Volunteer Fire Department

Johnson County

April 7, 2002

Texas Department of Insurance
Austin, Texas

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Summary

A rookie volunteer firefighter, age 39, died of a heart attack after assisting ambulance crewmembers in carrying a stretcher through deep mud and preparing an injured person for transport by helicopter ambulance.

On April 6, 2002 at 11:01 p.m., the Johnson County Sheriff's Department received a 911 call reporting a shooting at a mobile home with injuries at 7800 County Road 915. Sheriff's Deputies were dispatched at 11:03 p.m., and both the Mid-North Volunteer Fire Department and American Medical Response (AMR) ambulance company were notified at 11:05 p.m.

The Mid-North Volunteer Fire Department Fire Department is contracted with the Johnson County Rural Fire Prevention District to provide first response level emergency medical care.

Mid-North Engine 83 responded with a crew of three firefighters including firefighter Kevin L. Baker at 11:15 p.m., and staged at a safe distance from the scene of the shooting pending arrival of law enforcement. An AMR ambulance arrived with the engine at the staged location at 11:23 p.m.

After law enforcement personnel secured the scene, fire and EMS units entered the area, arriving at the driveway 50 yards from the shooting scene at 11:26 p.m. The area had received rain for several days prior to this incident and the ground was saturated. Baker, wearing leather lace-up work boots, blue jeans, a sweatshirt and a bunker coat, helped carry the ambulance cot and equipment across the muddy yard to where the mobile home was located. According to one of the ambulance attendants, the mud was so deep they had to forcibly pull their feet out of the mud at times while crossing the yard. The victim firefighter also assisted with carrying the shooting victim back across the yard to the ambulance.

Baker and Engine 83 then drove approximately $\frac{1}{4}$ mile to the intersection of two county roads where they secured a landing zone (LZ) for the helicopter ambulance. The helicopter landed as the ground ambulance arrived at the LZ with the shooting victim. As the shooting victim was being removed from the ground ambulance to be transferred to the helicopter, Baker stepped around to the side of the ambulance and collapsed. The shooting victim's mother saw Baker collapse and she told the rescuers that a firefighter had fallen.

One of the ambulance crewmembers began immediate assessment of the victim firefighter while the others transferred the shooting victim to the helicopter. Baker was suffering from a seizure and cardiac arrest. Advanced cardiac life support (ACLS) measures were begun immediately, including administration of cardiac drugs and defibrillation. Baker failed to respond to CPR, which continued as the victim firefighter was transported by ground ambulance, departing the LZ at 12:08 a.m. and arriving at Huguley Memorial Hospital at 12:36 a.m. ACLS was continued at the hospital. Baker

was pronounced dead after he failed to respond after twenty minutes of treatment. Baker's body was transported to the Tarrant County Medical Examiner for autopsy. Cause of death was attributed to hypertensive atherosclerotic cardiovascular disease.

Firefighter Kevin L. Baker, who had just joined the Mid-North Volunteer Fire Department a month earlier, was engaged to be married. Baker had no children.

Introduction

Mid-North Volunteer Fire Department Assistant Chief Lance Trout notified the Texas State Fire Marshal's Office of the death of a firefighter on April 7, 2002. State Fire Marshal's Office (SFMO) investigator Ed Cheever was assigned as the lead investigator and SFMO Incident Coordinator. Cheever traveled to Mid-North Volunteer Fire Department to conduct an investigation of the incident.

Upon arrival, Cheever was advised that Kevin L. Baker, a Mid-North Volunteer Fire Department firefighter, was assisting at the scene of a medical emergency and helicopter evacuation when he collapsed and went into cardiac arrest. Baker was transported from the scene to Huguley Memorial Hospital in Burleson, Texas, where he was pronounced dead a short time later. Baker's body had been transported to the Tarrant County Medical Examiner for autopsy.

The SFMO commenced an LODD investigation under the authority of Texas Government Code Section 417.0075. The statute requires SFMO to investigate the circumstances surrounding the death of the firefighter, including the cause and origin of the fire, the condition of the structure, and the suppression operation, to determine the factors that may have contributed to the death of the firefighter. The State Fire Marshal is required to coordinate the investigative efforts of local government officials and may enlist established fire service organizations and private entities to assist in the investigation.

The National Fallen Firefighter's Foundation and the National Institute for Occupational Safety and Health (NIOSH) Fire Fighter Fatality Investigation and Prevention Program were notified.

Origin and Cause Investigation

This fatality did not occur as a result of firefighting operations. It occurred during fire department first responder operations assisting the local Emergency Medical Service.

Building Structure and Systems

No buildings were involved in the fatality.

Investigation of the Death of the Firefighter

On April 6, 2002 at 11:01 p.m., the Johnson County Sheriff's Department received a 911 call reporting a shooting with injuries. The location given was 7800 County Road 915 in the Mid-North Volunteer Fire Department response area. Fire Departments contracting with the Johnson County Rural Fire Prevention District are required by contract to provide first response level emergency medical care. Sheriff Deputies were dispatched at 11:03 PM, and both the Mid-North Volunteer Fire Department and American Medical Response (AMR) ambulance company were notified at 11:05 PM.

Mid-North Engine 83 responded with a crew of three firefighters including Kevin L. Baker at 11:15 p.m. and staged at the intersection of County Road 915 and County Road 915B along with AMR ambulance unit #901 at 11:23 PM. Following the arrival of the Sheriff deputies, Engine 83 and Unit #901 arrived at the scene at 11:26 PM. The shooting victim was located at a mobile home approximately 50 yards from the roadway where the ambulance could park. The area had received rain for several days prior to the incident and the ground was saturated. The weather immediately prior to and during the incident included thunderstorms with very heavy rains and some hail.

Once on the scene, firefighter Baker, wearing leather lace-up work boots, blue jeans, a sweatshirt and a bunker coat, helped carry the ambulance cot and equipment across the muddy yard to where the mobile home was located. According to one of the ambulance attendants the mud was so deep they had to forcibly pull their feet out of the mud at times while crossing the yard. Baker also assisted with carrying the shooting victim back across the yard to the ambulance.

Baker and Engine 83 then drove approximately ¼ mile to the intersection of County Road 915 and County Road 913A where they secured a landing zone (LZ) for the Careflite helicopter ambulance. The Careflite helicopter landed at 11:46 p.m. as AMR Unit #901 arrived at the LZ with the shooting victim.

As the shooting victim was being removed from the AMR ground ambulance to be transferred to the helicopter, Kevin L. Baker stepped around to the side of the ground ambulance and collapsed. The shooting victim's mother was standing where she could see Baker and she told the rescuers that a firefighter had fallen.

One of the ambulance crewmembers began immediate assessment of Baker while the others transferred the shooting victim to the helicopter. During the initial assessment, it was determined that Baker was having a clonic-tonic seizure followed by immediate unresponsiveness. A cardiac monitor was attached and revealed the victim was in

ventricular fibrillation. The AMR Paramedic defibrillated the victim immediately three times with no success.

Cardio-pulmonary resuscitation (CPR) was initiated and continued as the victim was transported to Huguley Memorial Hospital at 12:08 a.m. on April 7, 2002. The ambulance arrived at the emergency department (ED) at 12:36 a.m. and advanced cardiac life support (ACLS) protocols were continued for approximately 20 minutes until the victim was pronounced dead.

Personal Protective Equipment Evaluation

Firefighter Baker was wearing leather lace-up work boots, blue jeans, a sweatshirt and a bunker coat. This was not a firefighting operation and there were no hazardous areas involved.

Medical Background of Victim

The Mid-North Volunteer Fire Department requires all new prospects to complete a 12-page application form. A portion of this application refers to the applicant's medical history. An applicant must indicate if there is any reason he/she would have difficulty performing any of the essential duties of the Department and Kevin L. Baker marked the space indicating "no".

According to the fire department, the applicant is also provided an opportunity to indicate specific problems including heart trouble and the victim's application shows no indication of any specific problem. A background check is conducted to verify the information on the application, and a panel of officers interviews each applicant.

Each new applicant must complete a 70-hour course consisting of basic firefighting training before they are allowed to respond on fire calls. Before being allowed to respond as an emergency medical first responder, the applicant must complete the basic first aid training prescribed by the Texas Department of Health. In-house training is provided every Monday night and consists of a three-hour session with all personnel expected to attend approximately 70% of the training. Other training is provided through the Johnson County Rural Fire Prevention District Fire Training Facility consisting of both classroom and live-fire field training.

The victim had begun the 70-hour basic training and had not missed any classes. He was only allowed to respond on emergency medical calls as an additional person to provide assistance with equipment. The victim's full-time job was as a supervisor for a swimming pool construction company. In this job, he drove to various job sites to check on sub-contractors. He spent most of his time driving or in the office.

Kevin L. Baker had previously experienced chest pain, cardiac arrhythmia, shortness of breath, and loss of peripheral vision in September 2000 and consulted a cardiologist,

Dr. Sergio Sanchez-Zambrano, M.D. At the time of this visit, Baker had a blood pressure of 120/78, a pulse rate of 80 and weight of 233 lbs. Dr. Zambrano ordered a pulmonary function test since the victim was a smoker and was experiencing shortness of breath.

The pulmonary function report indicated a minimal amount of obstructive pulmonary disease. An echocardiogram was conducted that revealed a mild degree of mitral valve prolapse and trivial mitral and tricuspid regurgitation as well as left atrial enlargement.

Another procedure was conducted consisting of a left heart catheterization, ventriculography, and selective right and left coronary angiography. This procedure revealed a portion of the mid-left anterior descending coronary artery that narrowed significantly during systole. Dr. Zambrano prescribed the drug Inderal and advised the victim to stay away from salt and not do any form of strenuous physical activity.

According to his fiancée, Baker told her he had been given a clean bill of health and if he continued to experience chest pain he was to take a Bayer aspirin. According to his fiancée, the victim has complained in the past of chest pain he attributed to heartburn and has taken Tagamet for relief. The Assistant Fire Chief indicated that the victim took Tagamet quite often.

The day of the incident, Baker spent time working around the fire station with some of the other fire fighters and his fiancée. The evening of the incident, Baker went to eat at a local restaurant with his fiancée and some of his fellow firefighters and their families. According to his fiancée, Baker ordered a steak and also ate from the salad buffet. He made no mention of any pain or discomfort during this time.

Baker had not made any emergency calls with the fire department for several days previous to his collapse, according to his fiancée.

The cause of death was described by the Tarrant County Medical Examiner as hypertensive atherosclerotic cardiovascular disease. The following conditions were observed during the autopsy:

- The coronary arteries were severely narrowed due to atherosclerosis with 90% occlusion of the left main coronary artery and multifocal 90% occlusion in the left anterior descending branch.
- The heart was enlarged (Cardiomegaly) and presented concentric left ventricular hypertrophy.
- Bilateral pulmonary vascular congestion, marked with edema.

Recommendations

The following recommendations are based upon nationally recognized consensus standards for the fire service. Volunteer fire departments are not required by state statute to comply with these standards. All fire departments should be aware of the content of the standards and may develop programs based on them to increase the level of safety for fire department personnel.

- Fire departments should make every reasonable effort to screen firefighters for heart disease in an effort to reduce the number of heart attack deaths.

In 2001, 87 firefighters died in the line of duty in the United States. This does not include the 340 firefighters killed in the collapse of the World Trade Center towers on September 11.

Of the six firefighter deaths investigated by SFMO in FY 2001, three were attributed to heart attacks. In the other three deaths investigated, one firefighter became disoriented in a burning building, and was trapped and asphyxiated. One firefighter died when a wall fell on him outside of a building fire and one died in a motor vehicle accident.

Three of the ten calendar year 2000 Texas fatalities were attributed to heart attacks. (Source: U.S. Fire Administration (USFA) LODD Memorial Database) Four involved firefighters who were trapped in a burning buildings and asphyxiated. The other three involved on and off road vehicle accidents and an aircraft crash.

Four of the eleven 1999 Texas fatalities were attributed to heart attacks. (From USFA LODD database) Three involved firefighters who were trapped in a burning building in the same incident, two were asphyxiated and one died of burns. Three involved motor vehicle accidents. One firefighter died of heart failure secondary to a seizure disorder caused by a head injury sustained in a 1998 training accident.

From 1999 to the present, 40% of the line of duty deaths in Texas have been caused by heart attacks. (Data from USFA LODD database and SFMO investigations) This mirrors the 2001 national figure of 40% of line of duty deaths caused by heart attacks. In addition, autopsies of two Texas firefighters who died of trauma during FY 2001 revealed early stages of heart disease. Autopsies for firefighters who died before the SFMO LODD program were not available to study the rate of heart disease present in all deceased firefighters, regardless of actual cause of death.

- The Texas Commission on Fire Protection standards recommend that all regulated fire departments use NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, as a guide for all fire protection operations.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, Chapter 10.1.3 states: "Candidates and members who will engage in fire suppression shall meet the medical requirements specified in NFPA 1582, *Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians*, prior to being medically certified for duty..."

NFPA 1582, *Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians*, states: "The combination of the physical stress of fire fighting and exposures for a person with preexisting coronary heart disease would be expected to increase the risk of a myocardial infarction or other acute event."

NFPA 1582 describes a history of coronary artery disease as a Category B Medical Condition. This is a medical condition that, "based on its severity or degree, could preclude a person from performing as a member in a training or emergency operational environment by presenting a significant risk to the safety and health of the person or others."

Explanatory material in Appendix B to NFPA 1582 recommends that for those individuals with symptoms suggestive of coronary artery disease, as reported in their yearly medical histories or interim reports, biannual testing is indicated. Periodic treadmill testing on members with cardiac histories is recommended.

- Fire departments must encourage applicants to be forthright in disclosing medical conditions that may endanger their lives or the lives of other firefighters or civilians.

If an applicant indicates a medical condition that poses a significant risk of injury or death, the department may choose to assign the applicant to non-emergency duties that would not subject the applicant to undue stress or physical exertion. Medical screening may be required to make a final decision in permitting applicants to undergo firefighting training and assignment as active firefighters.

Active firefighters and applicants that will operate fire apparatus should undergo periodic medical screening to detect conditions that could cause them to become incapacitated and lose control of the vehicle.

There are a large number of administrative functions and support roles that would allow otherwise medically disqualified applicants to serve the community without endangering themselves and others.