HALSTEAD FIRE SEPSIS CASE

FACILITATED LEARNING ANALYSIS

Salmon-Challis National Forest • September 2012

1. SUMMARY

On September 13, 2012, a firefighter from the Halstead fire, near Stanley, Idaho, was transported via ambulance to a hospital in Ketchum, Idaho. The next morning he was transported by life flight to Twin Falls, Idaho. He was diagnosed with pneumonia and sepsis, and was suffering from septic shock. He stayed in the ICU for two days and remained in the hospital for three additional days. The fire was started by lightning on July 27th. By September 13th there were about 300 people assigned to the fire, and the fire size was 154,372 acres. At the time of this incident, the firefighter had been assigned to this fire for 13 days.

TOPICS FROM THIS FLA THAT MERIT FURTHER DISCUSSION ON HOME UNITS

There is a tendency to accept being sick and continuing to fight fire. Why do we accept this risk and what should we do to mitigate it?

The need to have access to medical personnel who have the training and capability to administer I.V.s is a critical need and very likely is the only thing that prevented a fatality on this incident. If you're a safety officer or medical unit leader, how much risk are you accepting if you don't have this capability on hand?

Sometimes firefighters get stressed out. Being away from home, away from friends, and working long hours in situations of high uncertainty can elicit a lot of anxiety. How do we notice this in others, and take care of one another?

Local EMS personnel often have different protocols they have developed over time that can have great value to how we plan for emergency response. What do we need to do to ensure we seek out and learn from this resource?

Why is Crew and camp hygiene important?

When possible, involve the Wildland Firefighter Foundation early. They are amazing and will take care of and coordinate with the victim's family. They provide services that the Forest Service is incapable of providing which makes the whole process run as smoothly as possible. They have provided airline flights, rental cars, and paid for motel rooms which frees up the families of victims to just worry about their loved ones, and not have to take care of any logistical issues.

2. NARRATIVE

At the end of shift on the 13th, Firefighter A (let's call him Jim) volunteered to hike down a little hill with a crewmember to drain the water out of a hose line so it would not freeze that night. On the way back up the hill he said he was feeling tired. One of his crewmembers joked, "look at the way Jim walks." He started laughing and told his crewmember to shut up. He seemed fine and in good spirits. After he drained the hose, Jim joined up with his crew and hiked back to the trucks (about a 10 minute hike). He started sharpening his tool, and started sweating and complaining that his back was really hurting. The crew EMT looked him over and decided to get him back to camp. The crew EMT thought Jim was coming down with the Flu. The Crew Boss and Crew Boss Trainee (CRWB(t)) were at a different location attending a debriefing. EMT called them on the radio and told them the crew was headed back to camp. On the drive back to camp, Jim began shaking uncontrollably. When they got back to camp, Jim was shaking so badly that the crew EMT could not measure his pulse rate. At camp, Jim began vomiting. The Crew Boss and CRWB(t) arrived at the camp as the crew EMT was having Jim change into dry clothing. Jim was immediately put back in the truck and drove to ICP to get him to the medical unit (about another 15 minute drive). Jim vomited again at ICP, and then went to the medical tent. CRWB(t) had gone ahead to the medical tent to brief the medical staff about Jim's condition.

When Jim showed up to the medical tent, the paramedic (Medic) on scene could tell right away that Jim was very ill due to the fact that he was visibly shaking, and because of his body language and overall demeanor. Medic asked Jim how much water he had to drink that day and was told three quarts. Medic took Jim's temperature, and found that Jim had a fever. The thermometer showed a temperature of 101°, however, Medic's assessment was that Jim's temperature was actually higher than what the thermometer indicated. Medic continued with his assessment and found that his resting pulse rate was 121 beats per minute. Initially, Medic thought the symptoms were due to dehydration, but concluded that the combination of high body temperature and rapid heart rate were indicators of some type of infection. Medic decided to start an I.V. in an effort to bring down Jim's heart rate, bring up his blood pressure, and rehydrate him. He also gave him 400 milligrams of Ibuprofen to treat the fever, and administered oxygen. Medic had seen cases of appendicitis begin this way and decided to err on the side of safety and send Jim to the hospital in Ketchum.

Just as Medic was getting ready to drive the ambulance to Ketchum, another patient arrived at the medical tent. He was in the process of passing a kidney stone and was given narcotic drugs as treatment for his condition. Jim was already loaded into the only ambulance assigned to the fire, and Medic decided to load both patients into the ambulance and transport both

patients to the hospital. The ambulance driver, Medic, CRWB(t) and the two patients all loaded into the ambulance and headed for Ketchum. The ambulance only had one set of monitoring equipment. Medic used the one set of monitoring equipment to assess both patients by continually moving the leads back and forth between the patients. Medic always uses monitoring equipment to monitor patients who have been given narcotics. Three miles into the 68 mile drive to the hospital, the ambulance lost cell service. Cell service would not be available again until about four miles from Ketchum. As they continued their 1 hour and 45 minute drive to the hospital, Medic noticed Jim's blood pressure was dropping--even though the I.V. was on high flow. Jim's initial blood pressure was measured at 120/68 at about 2100 hours. At about 2235 hours, it was measured at 103/45, and at about 2200 hours at it was measured at 98/46.

At this point Medic considered administering a Dopamine drip, but was hesitant to do so because of how much stress the patient was already under. Medic was confident in his abilities as a paramedic. He would have been within his scope of authority to administer the Dopamine on his own, but would have felt more comfortable with the situation if he were able to communicate with a doctor. In the end, Medic decided against administering Dopamine, due, in part, to the fact that they were 10 minutes away from the hospital when the last blood pressure was taken (2200 hours). By the time the ambulance reached the hospital, Jim had received 2.5 liters of I.V. fluids. Medic advised the hospital staff that Jim may be suffering from septic shock.

The next morning the attending physician elected to transport Jim via life flight to a larger medical facility in Twin Falls. Jim had been diagnosed with pneumonia and sepsis, and was suffering from septic shock. In layman's terms that means he had fluid in his lungs and was suffering from blood poisoning, and the blood poisoning sent his body into shock. The doctor's assessment was that the blood poisoning was caused by the pneumonia.

The next morning CRWB(t) saw Jim just after he had a "central line" put in his neck. A central line is used to administer medication or fluids, obtain blood tests (specifically the "mixed venous oxygen saturation"), and directly obtain cardiovascular measurements such as the central venous pressure. CRWB(t) saw quite a bit of blood on Jim and saw his demeanor and became very concerned. He asked one of the hospital staff how Jim was doing and the person replied by asking CRWB(t) how old he was. CRWB(t) said "27" and the person said, "If this had happened to you, you would be dead right now." CRWB(t) did not leave Jim's side from that moment until Jim's mom came to look after him.

According to WebMD (www.webmd.com), permanent organ damage can occur in people who survive sepsis, the death rate for sepsis is 20%, and the death rate from septic shock is over 60%.

On the morning of September 14th, the comp/claims specialist had completed both the CA-1 and CA-2 (these are standard medical forms) and brought them with him to the hospital. After talking with Jim and the physician, the comp/claims specialist found that he had pneumonia and sepsis. In order to complete and submit the correct forms to OWCP (Office of Workers Compensation Programs), the comp/claims specialist called the Albuquerque Service Center OWCP office and was informed that a CA-2 should be used as this was an illness, not an injury. At that time, Jim appeared alert to the comp/claims specialist (sitting up in bed and talking clearly). The comp/claims specialist waited with him and CRWB(t) until Jim was transported by life flight to Twin Falls, Idaho. The comp/claims specialist explained the CA-2 process to both Jim and CRWB(t), the fact that the employee would have to submit the CA-2 to OWCP, and that the CRWB(t) needed to get it into SHIPS as soon as possible so that OWCP could make the determination to accept or reject the claim. The specialist also mentioned to both of them that the employee would be responsible for the bill, and if accepted by OWCP, would be reimbursed for medical expenses. CRWB(t) was concerned that Jim was under the influence of narcotic drugs during this conversation, and wondered if the paperwork reflected what actually happened accurately.

"I believe this was Jim's first helicopter flight ever." Jim seemed very nervous and seemed to be trying to wrap his mind around what was happening to him. CRWB(t) recognized the life flight pilot because he used to fly helicopters as a fire suppression pilot. CRWB(t) also knew one of the flight nurses from somewhere as well. The fact that CRWB(t) knew these people seemed to have a very calming effect on Jim. After the flight, Jim was admitted to the Intensive Care Unit (ICU), where he stayed for two days. He was released from the hospital on the 18th.

Jim's mom came to the hospital in Twin Falls. It took some time for her to get there because she didn't have a ride. Once Jim's mom showed up, CRWB(t) finally got himself something to eat. CRWB(t) stayed at the hospital until Jim was released from ICU, and then went home to his family. Jim was released from the hospital on September 18th.

The Wildland Firefighter Foundation was called on September 15th. Up until the time that the Foundation got involved, Jim's mom had paid her neighbor to drive her to Twin Falls as Jim's mom was worried that her car could not make the drive to Twin Falls from her home. Jim's mother paid for her own hotel room and taxi service between the hotel and the hospital. Once the Foundation was called, they were able to help out by covering all the family expenses such as food, hotel rooms, taxi, and travel both ways until Jim made it back home. A representative from the Foundation drove the cash down to them from Boise, Idaho. After Jim was released, the hospital called the Foundation to find out who was going to pay the hospital bill.

3. ADDITIONAL BACKGROUND INFORMATION

Cold, Heat, and Smoke –

In the days leading up to the incident, the Medical Unit on the fire reported having 30 to 40 cough and cold symptom related cases a day; roughly 10 to 15 percent of the people in camp. Some of Jim's crewmembers were among those inflicted with "Camp Crud". Most of them started feeling better after two or three days. Jim had reported to the Medical Unit on September 11th, two days before the incident, and reported that he was feeling sick. He was given NyQuil and told his crewmembers that he was sleeping better as a result of the medication. He reported to medical again on the 12th to obtain more NyQuil. Jim's crewmembers reported that they could hear him cough at night following the trip to the medical tent. He was coughing during the day as well, but not as much as during the night. Medical personnel were unaware that Jim had visited the medical tent on the 11th and 12th until it was discovered during the FLA process. There was some discussion about trying to figure out a way to track people who visit the medical tent, but privacy (HIPAA) concerns proved to make this issue very difficult to resolve.

Temperatures at camp during the time Jim was there ranged from lows at night as low as 12° F and highs in the day as high as 82° F. The fire camp was often smoked in. There were a string of days during the assignment that the inversion did not break until 1400 hours.

Crewmembers were instructed to take down their tents each morning, before heading out to the line. After a few days of this practice, some people chose not to set up a tent so that they would not have to tear it down every morning. The crew had a regular practice of sending people back to the trucks throughout the day after the inversion broke, to dry out their gear from the heavy morning dew and frost. They did this so they would not have to sleep in wet sleeping bags. Once they moved to a new, warmer camp at Stanley Lake, wet gear did not seem to be a problem anymore. Most people did not have any problems with their gear after the move. A few people reported having "damp" sleeping bags and would have liked to have the opportunity to dry out their gear during the day. When asked, the people with the damp gear admitted that they never mentioned any of their concerns to any of the crew leadership. Most all of the crewmembers agreed that they would have preferred to be able to leave their tents up. They felt like their gear would have been able to dry out throughout the day and they would not have to stand out in the cold every morning and tear down their tents. By the end of the tour, 18 of the 23 crewmembers reported that they had been sick at some point during the course of the tour.

It is worth mentioning that all crew members were given two sleeping bags, and many (but not all) stated that they were sleeping warm at night once they took advantage of the second sleeping bag (the crew decided to bring extra sleeping bags from the home unit on top of the sleeping bags that were already issued to crewmembers because they were going to Stanley, Idaho). It seems that most of the complaints of being cold stemmed from before they began to double up on sleeping bags and from standing outside while tearing down their tents. It is a common practice among some wildland firefighters to not leave any gear at camp. This is so that if you get reassigned, or end up in an impromptu spike out situation, you have all of your gear with you and there is not a need to go back to camp.

EMT/Medic Communications with Physician En Route to Hospital –

There was a system of radio repeaters set up along the highway used to transport Jim to the hospital. This system of repeaters is capable of allowing medical personnel to contact the hospital en route. The local EMS resources use the repeater system for medical calls on a regular basis. This fact was unknown at the time of the transport. There was some mention of using satellite phones as a means of communication, but in that discussion it was brought to light that sat phones need to be stationary in order to keep reception. The Safety Officer on the fire stated that using a sat phone was a less-than-optimal means of communication for this application.

Awareness and a Common Operating Picture –

Although not a factor in this incident, none of the personnel assigned to the medical unit was aware that fire suppression helicopters do not have night flying capabilities, and had assumed up to this point that they could count on fire suppression helicopters to be available for possible Medevac missions at night. The Communications Unit Leader was under the impression that fire suppression helicopters could fly at night if needed as well.

Although it was not put into use in this incident, it is worthy to note that **Idaho has a statewide hotline in place for anyone who needs to order a life flight mission**. The requesting party does not have to determine which life flight ship is the closest one available; the hotline takes care of that task. Life flight helicopters do have night flying capabilities. The medical staff commented that this was a very useful service, and wanted to make it known to those who may need to make use of this service. **The number to Idaho State Communications is 1-800-632-8000**. This does *not* ensure the life flight aircraft can provide the needed service. Environmental conditions like weather and smoke could render any helicopter mission unavailable; as well as other emergencies that could take priority.

Another item worthy to mention is the number of hospital visits from firefighters assigned to this incident in the week preceding this Facilitated Learning Analysis. Aside from this incident,

there were two other ambulance transports, and four non-ambulance transports to the hospital. Most of these visits were the result of pneumonia, severe dehydration, and severe cold symptoms. These visits took place near the end of a long fire season, and from a fire camp that is located at high elevation. The camp is in the midst of very cold temperatures (as low as 12° F) and, at times, gets socked in with smoke due to inversion. The incident Safety Officer expressed his opinion that the number of recent hospital visits are indicative of the kind of stress this season has had on the wildland fire community.

Notification Process-

On September 14th, between the hours of 7:00 and 20:40, CRWB(t) received 36 phone calls related to Jim's condition. On the 15th, he received 39 phone calls. He received 10 phone calls related to this incident on his days off (16th and 17th). There were times that he missed what the doctor was saying to Jim because CRWB(t) was on the phone. Some of the phone calls were very helpful, but there were a lot of calls where different people were calling and asking the same questions. CRWB(t) found himself repeating the same message to several different people. CRWB(t) was concerned about privacy laws, and was not exactly sure what he could share and what he shouldn't. "People weren't bugging me, they were interested--they cared." But "there is somebody at the hospital who-that's their job to know how to answer those questions."

4. LESSONS LEARNED AND QUOTES FROM PARTICIPANTS

Medical Unit Leader:

"I wish he would have come in earlier."

There is a definite need to have someone assigned fires that has the authority to administer I.V.'s.

Having someone with the experience and training at the paramedic level assigned to the fire is invaluable. The paramedic on scene acted swiftly and decisively. In these extremely time sensitive situations, time saved through deliberate and immediate action raises the probability of successful outcomes.

From the Medical Unit Leader's perspective, there seems to be reluctance among firefighters to seek after or even accept needed medical care. She related a story that happened earlier on this fire where a Line EMT identified someone who he felt needed medical attention. The Line EMT asked the firefighter to go into medical that night when he got back to camp, but doubted that the firefighter would heed his advice. The Line EMT based this assessment on the demeanor of the sick firefighter and the nature of the conversation. The Line EMT followed up

with the Medical Unit Leader, and pointed the sick firefighter out to the Medical Unit Leader in camp. She (the Medical Unit Leader) approached the firefighter, and this interaction led to the diagnosis of pneumonia.

Paramedic:

The paramedic had his hands full with two patients and only one set of monitoring equipment. He stated that there were other paramedics assigned to the fire that he could have utilized to help him. CRWB(t) was also an expired EMT, and Medic said that he could have used him to help with some of the smaller tasks but didn't. In the future, Medic will make an effort to assess the resources available to him and make use of them.

Medic was surprised to find that the fire suppression helicopters do not have the capability to fly at night. Medical professionals assigned to incidents in many cases are not federal employees, and may not be aware of the things that Federal employees are assumed to know.

Team Safety Officer:

During the course of this FLA, the team Safety Officer stated that it is a good idea to tie in with local EMS personnel to see what their local protocols are for medical calls. It is unclear how much communication transpired between the team that was in charge of the fire at the time of the incident and the local EMS personnel, but it is clear that the personnel involved in patient transport did not know about the repeater system.

Operation Section Chief:

Operations relayed a story about an assignment he was trying to plan out. They were getting ready to do a burn out, and Ops briefed the crews that were going to be involved. He said that due to the nature of the assignment, the crews involved may need to work late and spike out in order to complete the task. He then asked the crew bosses to tell him if they had any sick people on their crews—Ops was trying not to expose those who were already sick to those working conditions. All crew bosses said that their crews were good to go. Later in the morning, Ops noticed a sick crewmember who had stayed back at the crew vehicles rather than go with the crew. "We depend on crew bosses to assess their crews. We can't have crew bosses not giving honest assessments of their crews just because they don't want to miss out on a good assignment."

Operations was speaking about crew bosses in general, and was not speaking to this particular incident. He felt that this was a pertinent point to include because he wanted to highlight the fact that it is not just firefighters who don't report illnesses and want to keep pushing. This attitude exists at other levels in the organization as well.

Crew Boss:

“I think that in those types of temperatures large sleeping tents with heaters should be considered. Even large tents just to keep the frost off would help people stay warmer at night.”

The Crew Boss also mentioned that he felt a little light on overhead. On the crew manifest, the CRWB(t) was counted as the third Squad Boss. So he split the crew into two squads, and turned the crew over to the CRWB(t). The Crew Boss spent virtually all of his time with the saw teams because they were snagging in lodgepole pine and he felt that the fallers needed close supervision. The Crew Boss said he felt much more disconnected from the crew than he usually does as a Crew Boss.

CRWB(t):

“Is this really in the job description of a GS-5 Crew Boss Trainee?”

“What if we didn’t have a trainee on the crew, does this task fall to an FFT1? The crew can’t operate without a Crew Boss. I know a lot of qualified FFT1’s that haven’t had S-260 “(Fire Business Management).

“When I didn’t know what to do, I called my mentors.”

“People kept saying over the phone, ‘You’re doing a great job.’ And I kept wondering ‘Of what?’”

“Very confused the whole time.”

“I had Forest Supervisors and others, and I think one time somebody from the Washington Office, calling me on a regular basis. A lot of the time, I didn’t really know who I was talking to.” “At what point do I stop being the coordinator.”

Crewmembers:

“You’re not going to want to go home from the fire so you are not going to want to tell anyone [that you are sick]. We need to do a better job of looking out for each other.”

“I saw crews skipping the hand washing station in the chow line. I think someone should be out there watching for that kind of thing.”

“I didn’t want to touch the salt and pepper shakers.”

“Riding back to camp [with Jim] in the truck was terrifying. There was nothing I could do to help.”

Wildland Firefighter Foundation:

When asked how the wildland fire community could help make the Foundation's job easier, they responded that the earlier the Foundation receives a call the better. They also said that there is a tendency, in some cases, for firefighters in the hospital to get lost in the shuffle during Incident Management Team transitional periods.

Notes from the Facilitator:

As I have gone through the process of facilitating this FLA, I have heard many people express that the lesson here is to seek medical attention early, and that they hope firefighters on the ground learn that lesson.

I remember from my days as a seasonal that some people regarded their sick time as pretty precious. They were seasonal employees and did not have a whole lot of sick leave built up. If they were going to use up their sick time, they wanted to be at home in a comfortable bed, watching T.V., and have someone like their mom there to cook them Chicken Noodle Soup. They did not want to spend their sick leave sitting in fire camp on a cot in the medical tent while their crewmates were getting hazard pay and overtime. Is it really reasonable to expect people to go to the medical tent at the earliest onset of illness when there is such a strong incentive not to?

During this incident a full 10 percent of the workforce was getting treatment for cold and cough related illnesses. It is easy to say that we want people to seek medical attention early when we are sitting in our offices reading through FLA's, but I wonder how the organization as a whole and how the culture of wildland firefighters would react in reality if 10 percent of the workforce on any given fire were to stay back at camp because they had runny noses.

I remember a fire I was on where the camp crud was particularly bad, and my supervisor told us to eat our meals in the trucks. The food tent was full of people coughing and sneezing. He wanted to keep us out of there. The food unit leader tracked him down and told him to stop taking food out of the tent. He said that the team had two choices: they could let us eat in the trucks, or they could demob us. In the end they relented and let us eat in the trucks. To this day my supervisor credits the fact that no one on our crew got sick on that fire to having the crew eat in the trucks. Working in wildland fire has the capability to bring out the inner "germ-a-phobe" in anyone (well, okay, almost anyone…well… most people anyway). We should put in place policies that encourage people to listen to their inner germ-a-phobic voice, not policies that tell us to ignore it.

In my view this is a complex issue, and it deserves a lot of deep thought. I have personally worked on a fire where I was feeling pretty under the weather, and when I got back home I went to the doctor and was diagnosed with what the doctor called walking pneumonia. I was a permanent at that time and using a little sick leave was the furthest worry from my mind.

We live in a culture that encourages us to "gut it out." One year a crew I was on decided (at the crew level, no overhead was involved) to start an "Iron Man Club". The people who went the whole year without having to stay back at camp for any reason were part of the club.

It is not uncommon for camp crud to sweep through a camp, but the fire is still burning and line still needs to be put in. We could leave the solution in the hands of the people who are at the "pointy end of the spear", or we can try to find a way to change the incentives to encourage (as opposed to discourage) the behavior we say we want to see.

5. FACILITATED LEARNING ANALYSIS FACILITATOR

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