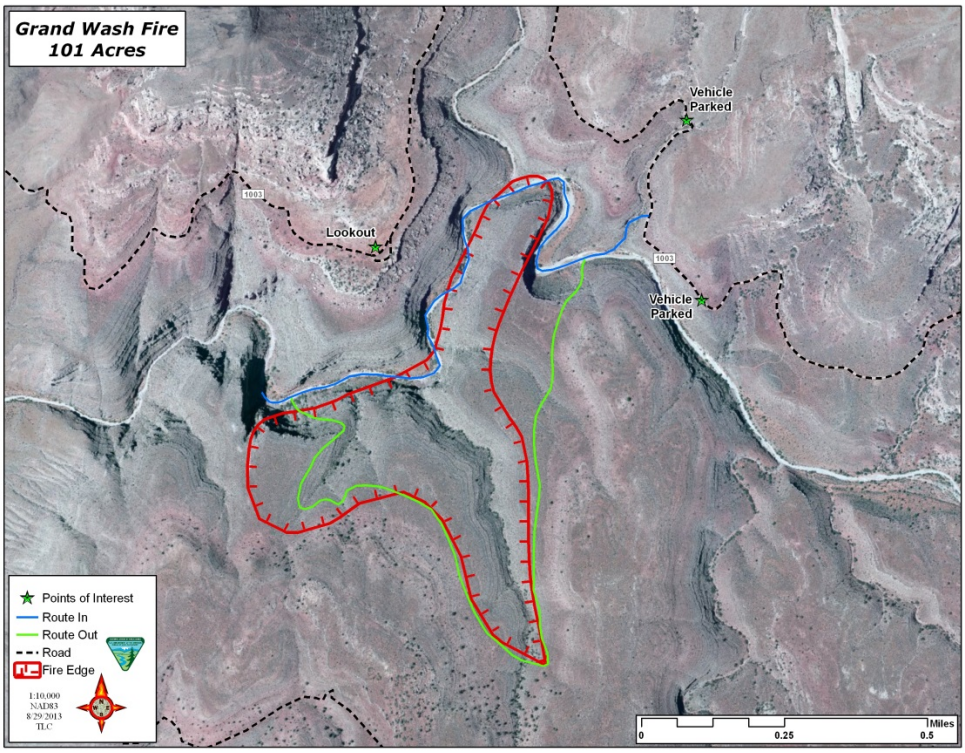
GRAND WASH HEAT-RELATED ILLNESS

FACILITATED LEARNING ANALYSIS



Arizona Strip BLM• August 2013

Topics and factors to keep in mind while reading this FLA:

Lack of sleep
Limited shade
High temperatures
Use of OTC medication (Claritin)
Recent recovery from major illness (pneumonia)
The importance of clearly defining local protocol
Being caught up in the events of the day and forgetting to drink water
The lack of a clear definition of what an Incident within an Incident is
Drinking water in sips throughout the day vs. large quantities all at once
The gray area between following protocol and deferring to on-scene expertise

1. NARATIVE

On August 16th, 2013, a type 2 crew received a dispatch with instructions to report to Boise, Idaho. The plan was to assemble the crew and head to Salt Lake City, Utah, tie in with the qualified Crew Boss, and then continue on to Boise. The Crew Boss they were going to tie in with used to work on this crew a couple of years ago, and still knew most of the people on it. The Crew Boss Trainee (CRWB (t)) had begun a detail only a couple of weeks prior to this assignment and was new to both the crewmembers and their home area. While in transit to Salt Lake, the crew was re-assigned. Two crewmembers broke away from the crew in a utility truck to pick up the qualified Crew Boss, while the CRWB (t) travelled with the rest of the crew on a bus en route to the Arizona Strip. The Crew Boss and two crewmembers met up with the rest of the crew in Cedar City, Utah, and then continued down to St. George, Utah, where the AZ Strip BLM office is located.

On the night of the 18th, the crew ate dinner in a restaurant and stayed in a hotel. They planned to continue south to the fire the next day. CRWB (t) briefed his crew to hydrate well that night, because he thought it likely that they might not have drank a lot of water that day during the drive in an effort to cut down on the number of needed bathroom stops. He drank a bottle of water once he got to the hotel. The Crew Boss and CRWB (t) shared a room that night in St. George. CRWB (t) did not sleep well, estimating that he might have gotten 2 hours of sleep. He couldn't put his finger on a reason why, but he just tossed and turned all night in his bed.

The crew got up about 05:30 on Monday, August 19th, and the hotel had laid out some food for them so they could have an early breakfast at about 05:45. CRWB (t) had some orange juice, yogurt, cold cereal, and a cup of coffee and loaded into the bus. They made it to the BLM office just after 06:00 and received a briefing from the Duty Officer (DO). The DO gave them "a very thorough briefing", and said that the probability of them getting lost was high. So they spent a fair amount of time going over the map that morning to ensure they knew where to go. Each person on the crew had four, one-quart water bottles in their gear. In looking at the fire assignment they had in front of them, CRWB (t) requested 40 extra water bottles to ensure everyone would have enough water carrying capacity for their assignment.

The crew then headed out to the fire. They took the drive slowly, monitoring the map the whole way to help ensure they would not take a wrong turn. During the drive, CRWB (t) drank a bottle of water before he got to the fire. They tied in with the Incident Commander (IC) at about 11:00. CRWB (t) got a thorough briefing from the IC while the Crew Boss helped the crew get ready for the day. The Crew Boss got bits and pieces of the briefing, but was not there for the whole thing. At the end of the briefing the Crew Boss told the crew to load up in the bus. CRWB (t) gave instructions to get out of the bus, gear up, and get ready to hike from where

they were. Two crewmembers were assigned to move the trucks to a parking area, and CRWB (t) began to round everyone up and start briefing the crew. The Crew Boss told the two drivers to catch up with the crew, and told everyone to start hiking. He said that they would brief once they got to the fire. The fire was about 100 acres, in light and flashy fuels, and not very active.

The Crew Boss was thinking that the day was only going to get hotter, and wanted to get the hike over with as early in the day as possible. The home area of the crew was very similar to the Arizona Strip. CRWB(t) was not from the desert, but had fought quite a few desert fires over the course of his career. The Crew Boss was also antsy to get out and see the fire because things had been moving pretty slowly up to that point. The reasons for pushing the briefing off until they got to the fire were not discussed and CRWB (t) was feeling a little frustrated with the situation. He was anxious to brief the crew.

As he understood his assignment from the briefing, the crew was to hike up a big drainage until they came to the point that the fire crossed over to the other side of the drainage. The crew began their hike, leaving the two drivers (who were strong hikers) to catch up with them. The crew saw the fire on the left side of the drainage, and kept going expecting the fire to cross over to the right side at some point in front of them.

As they hiked, the drivers radioed the main crew to make sure they were going the right direction. At about 1300, the crew was told to shade up and have a quick bite of lunch while the Crew Boss and CRWB (t) scouted the area to make sure they were in the right place. Just after the crew shaded up, the two drivers radioed again and asked whether they should go right or left. At this point the Crew Boss and CRWB (t) decided to hike back to them to determine if the main crew had hiked too far down the drainage.

The Crew Boss and CRWB (t) met up with the drivers and came to the conclusion that the fire never crossed the major drainage. They realized that the IC had meant that they were to start working where the fire had crossed a small tributary drainage on the left side of the main drainage. They radioed the crew and told them to come back down the main drainage a quarter mile or so to the tributary drainage and begin working there. Once the crew got there, they all began to hike up the tributary drainage to the edge of the fire.

Meanwhile, the IC was with a Lookout and was in position to see the whole fire from the other side of the main drainage. They were not in a position to see down in the drainage where the crew was hiking. After the crew had been hiking for a while, the IC sent the lookout down off the lookout point to see if he could get a better look at where the crew was hiking. The IC stayed on the lookout point to continue coverage of the fire. After a while the IC saw the crew hiking up a very steep hill coming up out of the drainage and realized they had hiked farther down the drainage than the IC had intended. He saw where they were going and could tell they were headed to the right place and was satisfied that he had a visual on all the resources

assigned to the fire (four local firefighters and the Type 2 crew). It was a pretty steep climb, and the crew followed a switchback pattern to make it easier to ascend the hill. About three quarters of the way up the hill, CRWB (t) started to feel sluggish.

He realized that he had not drank any water on the hike as he was anxious to brief the crew, anxious to find the place they were supposed to start, and a little frustrated about the earlier events of the morning. CRWB (t) regretted letting the events of the morning cause him to lose focus, and chided himself for not drinking more on the hike.

He knew his body well enough to know that if he pushed himself, he would likely “fall out”. He began drinking some water and swallowed his pride and informed the Crew Boss that he was not feeling well. The Crew Boss told the Crew Lead EMT, a former Hospital Corpsman in the Navy with combat experience and certified as an Advanced EMT, to stay back with CRWB (t) and make sure he was doing ok.

The EMT began to assess CRWB (t). He noticed that he was sweating, and drinking fluids. CRWB (t) had not vomited, and was able to eat some food. The EMT took his vitals and noticed that CRWB (t)’s heart rate was high, indicating that CRWB (t) might be dehydrated. The EMT determined that CRWB (t) was extremely fatigued and a little dehydrated. He told CRWB (t) to shade up and get some rest.

From the lookout point, the IC could see that one crewmember was hiking slower than the rest of the crew. The IC saw the slower hiker and another crewmember shade up under a tree about three quarters of the way up the hill. He called the Crew Boss and asked if everything was going ok. The Crew Boss responded that things were going fine. The IC watched as the rest of the crew made it to the top of the hill and shaded up at the fire’s edge. He watched as a couple of crewmembers started working the edge of the fire, and had a good visual on the slow hiker who was still shaded up on the hillside. It took 30 minutes or so for the slow hiker and his buddy to catch back up to the crew.

Once they caught back up to the crew, the Crew Boss did an assessment of CRWB (t). The Crew Boss then radioed the IC and informed him that there was a crewmember with signs of heat illness, but that things were going ok. At this point the tactical net and command channel (radio frequencies) became much more active, and a lot of things started to happen at once.

> “That is when the Volcano erupted”—EMT

The IC directed a local firefighter to go check on the crew, and began checking on the availability of a helicopter. Dispatch said that the I.A. Helicopter was committed to a fire, and the IC asked about the ETA of a Life Flight helicopter. Dispatch relayed that a Life Flight helicopter could be there in 15 minutes. The DO called and asked for an update.

The EMT, Crew Boss and CRWB (t) were a bit surprised by the reaction, and felt that a flight was not necessary. They assured the IC that the EMT could get CRWB (t) back to the truck in the air conditioning and everything would be fine.

The DO heard the radio traffic about the Life Flight Helicopter availability and tried to figure out what was going on by listening in to the radio traffic between dispatch and the IC. The DO didn't really feel like he had a pulse on the situation and so he called the IC directly to get more information. The IC said that they had a guy who was not feeling well, and was hiking back to the truck. The IC just wanted to check on helicopter availability just in case things took a turn for the worse. The DO understood and felt the IC had the situation handled.

The Crew Boss indicated the EMT and CRWB (t) were going to hike back the way they came and utilize the air conditioning in the truck to cool CRWB (t) down. The IC suggested a different route out up high on the ridge instead of the big drainage. The IC thought that the Crew Boss was a little reluctant to take a new route back to the truck until a local firefighter showed up on scene and indicated he would show them the route on the ridge. The local firefighter on scene and the IC both suggested that they hike out on the ridge instead of the drainage because there was no place for a helicopter to land in the drainage. The Crew Boss saw the logic of the proposed new route and agreed.

Two years prior to this event the Arizona Strip had eight cases of heat related illness. The previous year they had another three cases. The local Fire Management decided to be very aggressive in dealing with heat related illnesses, especially after the heat related fatality of a wildland firefighter in Texas in 2011. Although the IC did not feel that this situation had yet escalated to an emergency, he immediately began to plan for the worst-case scenario.

The EMT and CRWB (t) began hiking to the truck. The local firefighter organized his crew and spaced them out along the ridge along the proposed hiking route to the truck. Electrolyte (Nuun) tablets were offered to help CRWB (t) feel better. Extra water was placed along the proposed route to ensure that CRWB (t) had plenty of water during his hike.

"My whole goal was to get [CRWB (t)] to the truck, get some AC, and put him on an I.V."—EMT

CRWB (t) and the EMT made their way back to the truck. They took frequent breaks and hiked very slowly. The terrain and vegetation type afforded very little shade, but the hikers took advantage of what shade they could find. The Crew Boss went back to the crew and began to work with the crew to mop up the fire. The IC watched the events unfold from his lookout point, and noted that from his vantage the fatigued firefighter seemed to be doing pretty well on the hike. The IC felt good about the decision to hold off on the helicopter.

As they made it to the truck, the EMT began prepping CRWB (t) for an I.V. The IC met them at the truck and noticed what the EMT was doing. The IC stated that if the EMT was going to give CRWB (t) an I.V., then CRWB (t) was going to be flown out on a helicopter to the hospital. The EMT was pretty conflicted about what to do next. He felt very strongly that CRWB (t) was going to recover on his own. He also felt that an I.V. would speed up the recovery process and make CRWB (t) feel a lot better. The EMT did not see this medical situation as outside of his comfort zone, and definitely didn't feel it was worth the exposure to the Life Flight helicopter to request a flight.

"He knew my name and everything else." "He was sweating good still." –IC

"Nothing required a helicopter to be brought in." –EMT

"Helicopters and heat don't mix." –EMT

"Last year I had to carry a kid who wanted to hike out to an LZ after he collapsed."

"There is too much weird [crap] going on in the last few years."

"Why hike two miles in the heat of the day when you are not feeling good."

"It is a new generation we live in, we have all these tools—why not use them."

—Local Firefighter

The crew showed up about 45 minutes after the EMT and CRWB (t) made it to the truck around 1800 or so. They began rehabbing their tools to get ready for the next day's shift. The Crew Boss and the IC had a conversation about how they should handle the heat illness. The

IC informed the EMT that it was local protocol to fly people out if they were given an I.V. The Crew Boss was unclear whether an I.V. patient could be driven out by truck, or whether he must be flown out. The local protocol seemed to bounce back and forth during the course of the conversation.

"I told the EMT 'I am not telling you not to stick him. If you think he needs it, do it.' But, that, in my eyes, elevates it to the next level. He needs to go to town—if a helicopter is not available, then he will go by pickup truck."—IC

"It almost seems that that's what those guys do. If someone gets tired, they give them an I.V. and stay out [working]. That's not the way we do things."—IC

"We could never nail down what our options were [with regard to medical transport, I.V. use, and local protocols]. They kept changing." –Crew Boss

The EMT accepted that the IC wanted to follow his protocol, and decided not to administer an I.V. CRWB (t) also had suffered from pneumonia about five weeks prior to this assignment. He recovered about a week and a half later. CRWB (t) had told the lead EMT about his history at the beginning of the assignment. CRWB (t) felt he had fully recovered from the pneumonia about three weeks prior to this assignment. But had begun suffering from allergies about a week after his recovery.

CRWB (t) had accepted a temporary detail that started right after he recovered from his pneumonia, and had found that his system was reacting to some pollen found in the area of his new reporting location. He was taking Claritin until they left the area en route to this assignment. The last time he took Claritin was the previous morning, Sunday, August 18th.

Bearing all this history in mind, the EMT decided to recommend that CRWB (t) go back to town with the meal truck driver. That way he could get checked out at the hospital, and rest up in a hotel to recover. The EMT figured that would be the best long-term solution. He figured CRWB (t) would be fully recovered after a day of rest, and possibly an I.V. if they decided to give him one at the hospital. It was the best-of-both-worlds scenario. CRWB (t) could get the I.V. and recovery time he needed, without having to expose the helicopter to an unnecessary flight.

"The biggest issue to me was being stifled from giving the patient the care I thought he needed to be able to stay with the crew."—EMT

"If the wildland fire world is going to have Advanced Life Support Personnel on crews—then they are going to need latitude to make decisions"—EMT

CRWB (t) was tied in with the meal truck driver, and hitched a ride back to town to get checked out at the hospital. Once in St. George, a local BLM liaison checked him into the E.R. The Doctor at the hospital gave him some fluid via an I.V., prescribed a light duty day the next day, then said he would be cleared to go back to regular work. CRWB (t) made it to his hotel room at about 0200 in the morning. He stayed on light duty the next day helping out around the ware house at the district office, and rejoined his crew the following day and was re-assigned to a new fire.

The EMT determined that since he did not administer an I.V., that he had not really rendered care. He said that if he would have given the I.V., he would have gone with CRWB (t) to town. The way it all played out, he didn't feel the need to accompany CRWB (t) on the drive.

The information was relayed back to the office in St. George. The DO, Logistics Manager (LOG), and FMO were informed that there was a sick firefighter catching a ride with the meal truck back to town. The DO and LOG picked up from the radio traffic that the person coming in was suffering from mild heat illness and was going to be checked out at the hospital. The FMO doesn't recall being aware of the nature of the injury until early the next morning. When he found out, he asked for a thorough debriefing. He was a little frustrated, feeling that he hadn't been informed of the situation as it escalated. He was also concerned about the fact that the Emergency Medical Protocols on the Page 49 Insert of the IRPG were not followed. Specifically he was concerned that there was no Point of Contact (POC) or Incident within an Incident Commander appointed.

During the course of the FLA process, it was discovered that different people had different definitions of what constituted an "Incident within and Incident". The IC stated that, to him, this situation did not meet that threshold. A need to clarify expectations was discussed, and plans were made to have that conversation in the future.

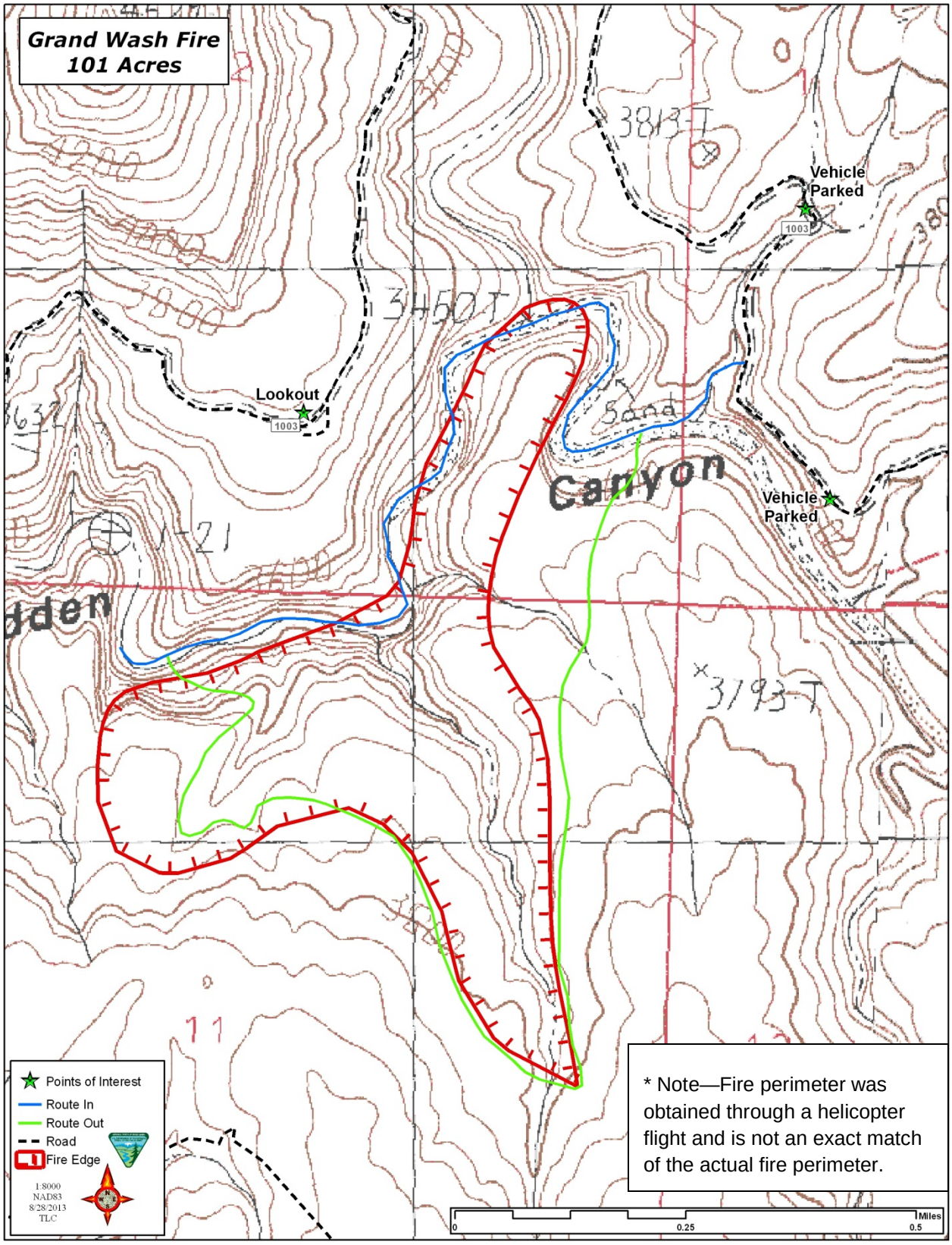
Grand Wash Fire Spot Weather Forecast

On Site Observations

Time	Temp	RH	Remarks
1230	88	34	10% Cloud Cover
1330	90	32	0% Cloud Cover
1430	92	27	10% Cloud Cover

Forecast

Max Temp	90-95
Min RH	19-24
CWR	15%


Grand Wash Fire
101 Acres
Vehicle
Parked
1003
Lookout
1003
Vehicle
Parked
Canyon
Points of Interest
Route In
Route Out
Road
Fire Edge
1:8000
NAD83
8/28/2013
TLC
* Note—Fire perimeter was obtained through a helicopter flight and is not an exact match of the actual fire perimeter.
0
0.25
0.5
Miles

a

2. LESSONS LEARNED FROM THE PARTICIPANTS

Ensure that if you have highly qualified medical personnel on your crew that the IC knows about it and can factor that in to his or her decisions.

“If the Fire World is going to have Advanced Life Support Personnel on crews, then they are going to need latitude to make decisions.”

“If you have formal medical protocols in place, it is a good idea to alert incoming resources to those protocols so they know what to expect.”

Commendations

The practice of assigning a liaison to go to the hospital with the patient can help things run much more smoothly than if no liaison were assigned.

Communication out on the fireline was very good throughout, and appropriate people were notified and updated about the situation as it unfolded. Everyone was allowed to express their opinions while options were being considered, indicating an atmosphere of mutual respect.

Given the history and nature of this area, the District leadership impressed upon their fire personnel to take aggressive action when it comes to heat related illness. The IC was committed to give the situation the attention it deserved.

Assigning the EMT to stay with the victim was very important because heat illnesses can progress into a very dangerous situation within minutes.

Notes From The Facilitator…

I think it is worthy to note that a discussion thread seemed to be weaved throughout the interview process at all different levels of the organization during the course of this FLA, and was a recurring topic. Much conversation seemed to be centered on the use of Advanced Life Support Personnel in wildland firefighting. People with this type of training are becoming more common-place on the fireline. It has been my experience that the role and degree of authority granted to people with these skills has not been well-defined at the organizational level.

Story after story came up regarding the use of I.V.'s as pretty commonplace outside the realm of wildland fire. Stories about ambulance drivers working at the Ironman competition in St. George, Utah, giving each other I.V.'s in shifts. While one medic stays out in the hot sun working the event, the other medic is in the back of the ambulance recovering from his or her shift with an I.V. in his or her arm.

Similar stories were mentioned about Volunteer Fire Departments, and the military. Stories came up about medical unit personnel administering I.V.'s to wildland firefighters and sending them back out on the line without even thinking to report the incident to the local Type 3 IC—due to the commonness, and comfort level with this treatment. Most wildland firefighters agreed that in wildland fire, the use of an I.V. is a pretty big deal. It seems that at least some are beginning to wonder why it is such a big deal, and whether all of the hubbub is truly warranted. An unspoken question seems to hang in the air in the minds of some, that "maybe these other guys have it right". I, myself, have always sided with the cautious crowd. But for the first time, during this write up I found myself questioning whether all of the caution is warranted. An experienced and qualified medical practitioner didn't offer the care he wanted to his patient for no other reason than the wildland fire community wanted to be cautious. Is it indeed necessary to carry out an expedited evacuation of a person solely due to the use of an I.V.?

I don't have an answer to that question, but thought it was worth high-lighting as food for thought. Everyone seemed to agree that if a patient is experiencing an altered level of consciousness, he or she should go to the hospital ASAP. All also agreed that you shouldn't necessarily wait until that point to make the call to transport. The consensus seemed to be, in the event of a patient without and altered stated of consciousness, the incident should be evaluated on a case-by-case basis. And careful thought should be given to the level of medical skills and experience of the personnel on scene.

On another note, a report was sponsored by the BIA a couple of years ago that addresses the topic of Heat Illness and Wildland Firefighting. It was written with the mind-set of summarizing the peer-reviewed literature for the wildland fire practitioner audience.

This paper can be found at

http://wildfirelessons.net/documents/Heat_Illness_and_the_Wildland_Firefighter.pdf

Here is a previous, heat related incident report from the AZ Strip BLM:

http://wildfirelessons.net/documents/AZ_Strip_Heat_Stroke_LLR.pdf

It is interesting to note that both of these documents mention sleep deprivation, acclimatization, and medication as factors that can increase the occurrence of heat related illness.

The “Heat Illness and the Wildland firefighter” paper states that the human body usually dissipates heat through radiation, convection, and evaporation. But “once the environmental temperature exceeds that of the skin, heat can only be released through the evaporation of sweat.” This statement highlights the importance of hydration, but also suggests that an increase in relative humidity (which would slow down evaporation) on a hot day, would have a potentially dramatic effect on the body’s ability to cool itself down. The paper highlights threshold conditions of “>91 °F, very light or absent winds, and high humidity.” The paper also states that fatalities from heat related illness can occur in the absence of severe dehydration as “adequate hydration may not be able to dissipate the rising core temperature through sweat and other mechanisms”.

Another noteworthy point is that “sipping throughout each hour may be more effective than consuming in large, singular amounts.” Nobody wants to be the person continually asking for bathroom breaks while driving to a fire…but data suggests that limiting water intake during the drive and then pounding water when you get to your destination is not a good way to go.

“Heat exhaustion can mimic other disorders, such as hypoglycemia,” which highlights the importance of having qualified and experienced medical personnel on scene.

Fire seasons seem to be getting longer, hotter, and drier. The issue of heat related illness is not going to go away, and may become more prominent in the future. It seems the more we know about it, the better off we will be.

FLA Facilitator

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