

**LIGHTNING DATA CENTER MINUTES**  
**July 12, 2013**  
**ST. ANTHONY HOSPITAL WEST, LAKEWOOD, CO**  
**On the Web at: [www.stanthonyhosp.org/ldc](http://www.stanthonyhosp.org/ldc)**

Monthly Quote: “It is of great advantage to the student of any subject to read the original memoirs on that subject...” James Clerk Maxwell, as cited in Tesla Coils 1890-1980: 100 Years of Cavity Resonator Development. Kenneth and James Corum, 1990.

1. The meeting began at 11:50 PM and adjourned at 1:05 PM. Members Present: Clark, Keen (Rich & Helen), Collier, Cherington, Yarnell, Nibbe, Wells, Wachtel, Gift, Cui-Gift, Claus, and Elder. Clark moderated the meeting.
  
2. Phil Yarnell presented a patient who was cleaning landscaping when lightning hit about 100 feet away. The ground was wet at the time. He was holding a gas-powered water hose and he saw the lightning come up the hose. He was holding a metallic nozzle with his right hand. The hose also had strands of reinforcing metal within the tubing. Patient thinks he began to experience flexion (clenching of the fist) in his right hand about 45 minutes following the strike. Due to the flexion, patient has to wear a splint. When the splint is removed, the hand lies flat for anywhere from 45 minutes to 2 hours, at which time the flexion returns. The clenched fist is straight along the axis of the arm, not bent downwards. He has to wear the splint all the time or the hand will revert. Patient tries to wear the splint at night when he sleeps. On those nights when he does not, when he wakes up in the morning, the flexion is very tight and difficult to break open, and it can be very painful. A day after the strike, patient was able to wiggle his thumb and fingers. His movement of the right hand is limited, and when he does move it, the motion is somewhat “ratchety”. The lightning did not knock him down. He reported his arm “felt like it was on fire”. There was a small burn on his right hand near his middle finger. There were no marks on the ground left by the lightning. He cannot move his fingers in the right hand, but he can move his right thumb and left fingers. There is numbness in his forearm and his middle finger. He has had a hard time concentrating and has had sleep problems. Phil Yarnell ran some tests on him during the meeting. Testing showed stiffness in the left wrist, albeit with some movement in the wrist. Phil thinks this is a case of focal dystonia. Patient's left hand is rough (normal) and the right hand is smooth. Both Phil and Michael Cherington think topical drugs may help allow the fist to unclench. Other possible remedies for unclenching the fist included the use of a 124-Hz tuning fork, warm water, and warm sand.

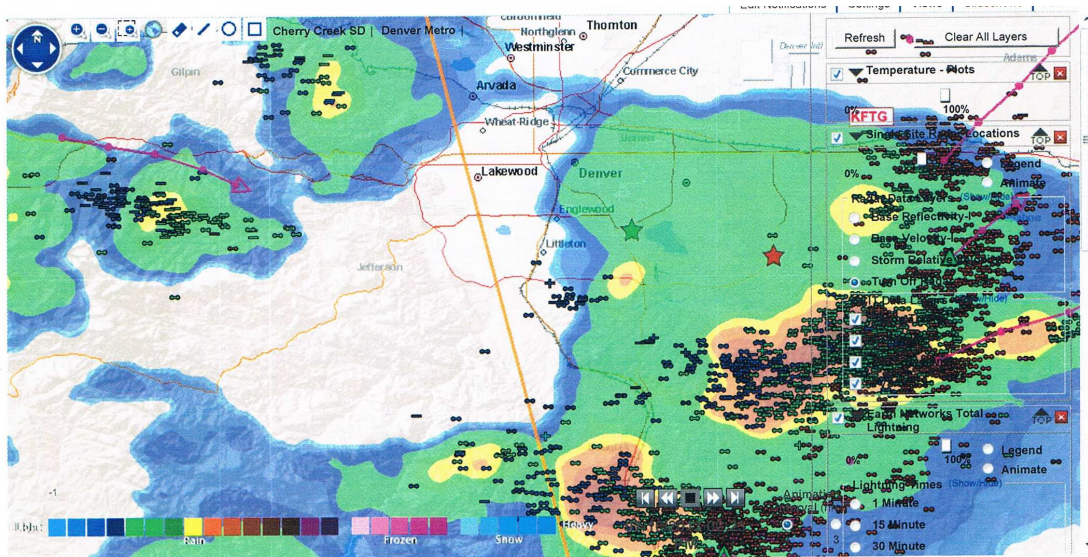
Another patient Phil is seeing was pulling a 240-V plug from a wall socket. The plate was loose and patient was shocked up the arm. Patient had a burn mark on the inside of his hand that resembled a plug. This patient also had flexion of the hand; but unlike the lightning strike patient, the fist was bent downwards relative to the arm. This patient was not present at the meeting.

3. Our featured guest was Larry Bull, Director of Activities and Athletics at the Cherry Creek School District. He gave us a presentation on the lightning detection systems installed at the Stutler Bowl at Cherry Creek High School and at the Legacy Stadium at Cherokee Trail High School, two of the largest football stadiums in Colorado. Mr. Bull gave us the rationale for the purchase and usage of these devices, as seen through the eyes of an athletic director. The decision to purchase the new system was pretty easy. The old, hand-held lightning detector had some problems. The unit itself was not very accurate. It would indicate the lightning was 15 miles away, and then the storm would be on top of them within 30 seconds. This was not acceptable. Also, there was the human uncertainty with clearing the field, and, if the field was cleared, when play could be resumed.

The new system, designed by Earth Networks, has lightning detectors that are mounted atop the press box at both stadiums. They will detect both in-cloud and cloud-to-ground lightning. The detection radius of lightning can be set at a certain distance from the stadium, which was set at 10 miles for both facilities. A horn is set to sound when lightning is within 10 miles of the detector. When lightning strikes, an automatic clock is activated to tell when it is safe to resume play – 30 minutes after the last strike. The clock is reset with each strike inside the radius. After 30 minutes has elapsed since the last strike, the horn will emit 3 loud bursts, which means play can resume. Even after play is resumed, the alarm could still sound again, ordering an evacuation of the field. The lightning detection system is part of a larger meteorological instrument package, with a thermometer, anemometer, wind vane, rain gauge, and moisture sensor. In addition to the hardware, software is available to display radar images, text messages, and plots of lightning strikes. According to Earth Networks' website, there are almost 700 lightning sensors in the U.S.; thus, it appears the lightning strikes are plotted using their own proprietary system. Bob Glancy said his son used to play soccer at a field in Greenwood Village several years ago. The lightning detection system in place then could only see cloud-to-ground strikes. Mr. Bull said there have been approximately 20 to 25 events where the detector has warned of lightning. At Legacy Stadium, if people are told to evacuate, smaller crowds will be evacuated to the high school only, as seating is restricted to that side of the stadium. For larger events, people will evacuate to the high school on the one side and to the middle school on the other side. Players are sent to their locker rooms. Fans also can evacuate to their cars. People are not forced to evacuate, but it appears that most, if not all, heed the call. Mr. Bull appreciates the system and has noted the system is much appreciated by the officials, fans, and to a somewhat lesser degree, the coaches. The nice thing about the system is there is no gray area for interpretation. When the horn sounds, it means evacuate – period. The-all-clear alarm is also appreciated, although it can be frustrating, thinking you're about to resume play – and then another flash of lightning occurs, adding another 30 minutes of delay. To further augment the system, the public address system is used to make announcements as conditions warrant.

Steve Clark feels the system appears to be reasonable, with one exception. These detection systems may not capture the first lightning strike of the day. Rich Keen mentioned a study by the LDC's Steve Hodanish, with the Pueblo National Weather Service. His study of 8 lightning fatalities found that 7 of the 8 fatalities were caused by the first strike of the day. The one big difference is the capability to detect in-cloud lightning, which could prove to be a difference-maker.

The photo below is a sample of the imaging capability of Earth Networks' Streamer RT display system. The two stadiums are the stars to the right-of-center (Stutler Bowl at left and Legacy Stadium at right). The dark marks indicate lightning flashes and the colors indicate the intensity of precipitation. Straight red line segments indicate the direction of storm movement.



4. In response to Greg Stewart's ball lightning presentation during the June meeting, Russian ball lightning research Mikhail Shmatov sent an article about a ball lightning incident in Russia. Most of you may have received this. The article was written in Russian and was accompanied by three photographs. I attempted to translate the Russian into English using a trial version of language translation software. I have attached the article to these minutes, with the very rough and incomplete translation. While trying to locate an English description of this on the Internet, I learned of another apparent episode in early June at a Russian apartment building. The link to that episode, see Lightning Links below, also contains a Russian newscast video describing the incident. The link also has excerpts from various Russian news sources.

## A Russian Ball Lightning Case, May 27, 2013

On Monday, 27 May, approximately 15 hours of on the eastern outskirts of the village Морсохон dominating one of the houses had suffered from an explosion caused by an extremely rare natural phenomenon - the ball lightning. According to the accounts of the inhabitants of the village and eyewitness events, the day there is nothing foreshadowed tragedy, began a normal rain, as suddenly hit thunder such a force, that onlookers and cattle, who were at the time on the street, from frightened пригнулись to land and mount Gilboa in different parties.

After one minute the sky separated bright solid ball and crossed through the roof in the home of the family I felt jubilated"Санданова. As soon as this was followed, in premises thundered deafening explosion, and it literally was just starting out in pieces. At the time, the house was only hostess, a spouse I felt jubilated", which baroness Uddin in the kitchen after lunch. A woman was under the rubble walls and received serious damage. Now the victim is in the hospital. Note, the house was built in the year 2002.







5. Next meeting: Friday, August 9, 2013 at 11:45 AM at St. Anthony Hospital West. Conference Room TBA.

Respectfully Submitted,

Steven E. Clark, Consulting Meteorologist

### **In Case You Missed It...Lightning Links**

**This is a monthly listing of news, articles, websites, and videos about lightning and allied areas as reported in the media. A headline or description is listed, followed by the link. Please note that some of the links are perishable, which means you'll need to go to the source for the information. Enjoy!**

“Video: Lightning Strikes Mother and Daughter”

<http://www.ems1.com/ems-oddities/articles/1460855-Video-Lightning-strikes-mother-and-daughter/>

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“Columbine Survivor Matthew Depew Electrocuted Working on Power Lines for Xcel Energy”

<http://www.thedenverchannel.com/news/local-news/columbine-survivor-matthew-depew-electrocuted-working-on-power-lines-for-xcel-energy>

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“Lightning Strikes Sends 23 Boys to the Hospital”

<http://concord-nh.patch.com/articles/lightning-strike-sends-boy-scouts-to-hospital>

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“Study: More Lightning Deaths from Fishing Than Golf”

[http://weather.aol.com/2013/06/24/study-more-lightning-deaths-from-fishing-than-golf/?icid=main-grid%7Cmain5%7Cd117%7Csec1\\_ink3%26pLid%3D335143](http://weather.aol.com/2013/06/24/study-more-lightning-deaths-from-fishing-than-golf/?icid=main-grid%7Cmain5%7Cd117%7Csec1_ink3%26pLid%3D335143)

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“Apple to Probe Death of Chinese Woman Who Used iPhone When It Was Charging”

<http://news.yahoo.com/apple-probe-death-chinese-woman-died-charging-iphone-105228058.html>

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“Baby, Parents Survive ABQ Lightning Strike”

<http://www.krqe.com/dpp/news/environment/three-survive-abq-lightning-strike>

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“Ball Lightning Strikes Twice in Southern Russia?”

Russian Newscast Titled in English as” “Aliens Burn Down Buildings in Russia? 2013”

<http://www.sott.net/article/263610-Ball-lightning-strikes-twice-in-southern-Russia>

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Earth Networks Homepage

<http://www.earthnetworks.com/Products.aspx>

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