

**LIGHTNING DATA CENTER
MINUTES
DECEMBER 12, 2008
ST. ANTHONY CENTRAL HOSPITAL, DENVER, CO
www.stanthonyldc.org**

“Science is the great antidote to the poison of enthusiasm and superstition.”
~Adam Smith, *The Wealth of Nations*, 1776

1. Meeting was held in Auditorium A, began at 11:45 AM and adjourned at 1:20 PM. Moderated by Ken Langford.
2. Members present: Cherington, Elder, Gift, Keen, Kithil, Langford, Stewart, Wachtel, Wallace, Wells, Yarnell
3. Roundtable discussion: Richard Keen commented that there were no storms of note since mid-October in Colorado. “It was a low season.” “[We’ve experienced]...two of the lowest seasons in the last 30 years.” The occurrence of graupel was cited as a favorable condition for lightning strike. Thundersnow is a distinct form of precipitation associated with lightning. A quick check of the internet reminds us that the sound of thunder has limited range in a thundersnow. During this discussion we were reminded of studies which show that a large percentage of lightning injuries occur during the early stages and late stages of a storm. In graupel-type storms, there are usually only a few flashes, so the lightning hazard often is unwarned except by the presence of graupel. Several cases of lightning injury on ski slopes are associated with graupel events.
4. We utilized the internet to watch slow motion images of lightning formation, captured at 10,000 frames per second. Members marveled at vivid images of illuminated branching stepped leaders. These images were captured utilizing a special high-speed video camera. Storm chaser Tim Samaras plans to roll out his custom modified camera that runs at a million frames per second during the 2009 storm season.
5. Ken Langford reviewed the dynamics of how the stepped leader connects with an upward propagating streamer, and how the return stroke delivers current to the ground (in the example cited). He reminded us that a lightning flash does not transport a given electron from cloud to ground; rather, the flow of current is on the order of a few yards, moving more like a stack of marbles before dissipating. The term “Recoil Leader” was also introduced as a relatively new finding in the physical dynamics of lightning. The first evidence of these came from high-speed video of positive lightning flashes. Scientists say that “the existence of the RLs may help to explain observations of UHF-VHF radiation during the development of +CG flashes.”
<http://www.agu.org/pubs/crossref/2008/2007GL033000.shtml>

Video of this phenomenon can be viewed here:
<http://www.youtube.com/watch?v=dhD3rbRZ-f8>
6. Dr. Cherington mentioned that Ron Holle has provided 2008 data on lightning fatalities. This year Colorado produced the same number of fatalities as Florida:

4. It was pointed out that this figure is average for Colorado, but low compared with an average Florida season. Florida normally will show about double this year's figure.
7. In an attempt to draw in participation by other leading physicians at St. Anthony Central Hospital, Dr. Cherington has been in communication with Dr. Charles Mains. The group discussed the value of including presentations on other electrical phenomena that might be of value to the medical staff here. We resolved to keep the focus on lightning, while encouraging related presentations as they appear appropriate and useful to the group.
8. Dr. Phil Yarnell pointed out that many hospitals have incorporated a formal "Center of Excellence" to represent their services in specialized areas. The University of Illinois' Lightning Injury Research Program was cited as an example. <http://tiger.uic.edu/labs/lightninginjury/> Dr. Yarnell commented that the conferences on wilderness medicine have offered little in the way of innovative treatments for lightning strike victims beyond "standard care".
9. Howard Wachtel commented that there is much being done now in therapies that utilize electricity. "There is a larger clinical community we could draw in." Electrical brain stimulation was discussed. Howard suggested that the LDC attract speakers to present on the subject of electro-therapies. He said the LDC could "start building outward" to include electrical therapies. Dr. Yarnell noted that this pioneering work has been applied toward such things as stroke rehabilitation therapy and paralysis cases. Applications for magnetic devices are also being explored. Incorporating these new treatment options could draw in a large community for future projects. Howard cited advancements in anatomical mapping. Dr. Yarnell pointed out that "Pain management is a huge industry for electrical stimulation." The term Transcutaneous Electrical Nerve Stimulation (TENS) was introduced. It was noted that many of the same complaints are shared for impact accidents and those for lightning injuries.
10. Rich Kithil noted that while many members are involved with lightning as a hobby, he approaches the phenomenon from a business perspective. He suggested that St. Anthony might capitalize on the LDC with a similar approach. Rich also chose this meeting to announce a long-range retirement plan for himself, and expressed interest in training a suitable candidate to carry his good work with the National Lightning Safety Institute into the future. It was suggested that this individual should consider participating in an upcoming NLSI workshop in New Mexico. Rich can be contacted through his website: <http://www.lightningsafety.com>
11. Ken Langford reminded members that plenty of content is still needed to add to the new website. Ken requests that anyone who would like to contribute should contact him by email. Messages can be routed through Sue Wiggins. Bob Wallace commented that the LDC is building a foundation with the website and that "rooms" can be added as the project progresses. It was deemed important to make all relevant scientific/medical papers available on the website where copyright allows.

12. Recognition was given to Sue Wiggins who has given so much time and effort to keep the LDC operating smoothly. All present expressed their deep appreciation to her.
13. These minutes do not represent official positions of LDC or its members. They simply reflect the comments made at the meeting.
14. Next meeting: Friday, January 9, 2009 at 11:30 AM in the Main Auditorium of St. Anthony Central Hospital. Subject: Round Table.

Respectfully Submitted,

Gregory Stewart