

LIGHTNING DATA CENTER
MINUTES
SEPTEMBER 13, 2002
ST. ANTHONY HOSPITAL, DENVER

Quote of the Month:

"The evening darkens over.
After a day so bright
The windcapts waves discover
That wild will be the night.
There's sound of distant thunder."

Robert Bridges (1844-1930)

1. Meeting began at 11:30 am and adjourned at 1:15 pm.
2. Members present: Anderson, Barron, Benson, Boyle, Bradley, Burrows, Cherington, Collier, Keen, Kozak, Maas, Molen, Olson, Ross, Russon, Sanders, Stewart, Swanson, Terrill, Wachtel, Yarnell.
3. I brought the following articles from the literature (abstracted in part here):
 - a. Urquhart CK, Craft PD, Nehlawi MM. Transient diabetes insipidus following electrical burns in two patients. South Med J 1994;87:412-413

In light of last months case presentation of a patient with worsening of hypokalemic periodic paralysis following electrical shock, I thought this article concerning an endocrine complication would be of interest to our members. The authors state: "This syndrome is divided into neurogenic DI, nephrogenic DI, and primary polydispsia...A thorough review of the literature..reveals no reported cases of diabetes insipidus occurring after electrical injury."

Since then, another article on diabetes insipidus after electrical injury has been written. That article is the following:

- b. Ozdemir AI, Seymen P, Yurekli A, et al. Transient hypothalamic hypothyroidism and diabetes insipidus after electrical injury. South Med J 2002;95:467-468.

"A 29-year old woman referred to hospital after an electric shock injury had an electricity entrance hole in the left hand and exit sites in both feet...the exact mechanism through which both vasopressin-producing supraoptic and paraventricular nuclei and TRH_synthesizing anterior hypothalamus are affected..are not known."

c. Makdissi M. Brukner P. Recommendations for lightning protection in sport. Med J Austral 2002;177:35-37.

"There has been an increase in proportion of casualties occurring during outdoor sport and recreational activities over recent years...Organizers of sporting events should have a lightning safety policy...Suspension and resumptions of play should follow the '30/30' rule: play should stop when the flash-to-bang count is 30 seconds, and should not resume until 30 minutes after the last lightning."

d. Sharp D. Lightning strikes. Lancet 2002;360:354.

"True primary prevention is impossible; avoidance of lightning strikes is the issue...Being struck by lightning may not mean a direct hit, and puzzling fatalities with no obvious sign of contact have prompted a search for other explanations."

4. Three members present today (Anderson, Boyle, Maas) are students of Nikola Tesla and his inventions. They have agreed to provide us with "Tesla Presentation" at a future LDC meeting.

5. Sheryl Olson brought photographs of severe burns in an electrical trauma patient. The patient, a utility company worker, suffered burns to the right upper and lower extremities, including a third degree burn of his hand. This case is yet another example of severe burns in an electrical trauma patient. The burns in lightning patients, except in a few cases, are generally less severe than electrical trauma patients. Ernest Kozak reminded us that 60 Hertz AC electricity is responsible for deep tissue injury. Lightning, by contrast, consists of high frequency currents and some direct current effects.

6. Bill Sanders reported that Fire Department personnel and others have empirically observed that long duration lightning strikes are likely to be responsible for forest fires. When an observer sees a long duration strike, one should be prepared to fight a fire. Carl Swanson, David Maas, and Rich Collier engaged in this discussion. They suggested that a long duration strike could well represent multiple strokes and return strokes.

7. Professor Rich Keen gave a superb presentation entitled: Current Events - An Overview of Thunderstorms & Lightning. I cannot do justice to his talk with a summary, but I did take notes as follows:

a. Rich records Thunderstorms Days (TSD) from his Mt. Thorodin Coal Creek Canyon Observatory. He records an average of 86 TSD each year. Rich stated that this is more TSD than any other place in the USA except for Florida. TSD is observational data. It refers to audible thunder. TSD data from last year: Denver 42, Boulder 55, Mt. Thorodin 84.

b. The lightning capital of the western hemisphere is Panama and Columbia.

c. There is much less lightning activity over Oceans.

d. "El Nino" refers to the disappearance of a large band of cold water in the Pacific Ocean.

e. Where do thunderstorms form in Colorado? Over the mountains. Mt. Evans is the "hottest spot" in Colorado.

f. Rich showed slides of the evolution of "lightning" clouds. The "tower stage" cloud rises to the troposphere (about 30,000 feet). Commercial plane usually fly above that altitude. The stratosphere is above the troposphere.

g. One theory about the genesis of lightning suggests that ice crystal collide with snowflakes. The ice crystals acquire a negative charge and collect along the base of the cloud. Positive charges are induced below on the ground.

h. Positive flashes were first recognized about 2 decades ago when the National Lightning Detection Network was created. The positive flash begins at the top of a cloud and travels a longer distance to ground. Since there is a greater voltage difference from the top of the cloud to ground, the positive flash carries more energy than the usual negative charge.

i. Ten percent of all lightning is cloud to ground; 90 % -- lightning in clouds.

j. Rich showed a slide of the largest hailstone ever photographed: 7 inches in diameter. It was found in Kansas.

k. Lightning elsewhere in the Solar System. Lightning has been imaged on Jupiter and maybe on Venus.

8. These minutes do not represent official positions of the Lightning Data Center. They reflect the comments of members present.

9. The next meeting will be at 11:30 am on Friday, October 11, 2002 in the Main Auditorium of St. Anthony Central Hospital. The meeting will include a presentation by Dave Benson and Rich Burrows.

Respectfully submitted,

Michael Cherington, MD