

Minutes Nov. 12, 1993 Lightning Data Center St. Anthony Hosp.

Quote of the Month:

"Surely the Thunder of Heaven is no more supernatural than the Rain, Hail, or Sunshine of Heaven, against the inconvenience of which we guard by roofs and shades without scruple." -- Benjamin Franklin

1. Meeting began at 11:30 am and adjourned at 1:15 pm.
2. Members present: Bergschneider, D. Breggin, Cherington, D. Clark, S. Clark, Collier, Kithil, Knight, Lammerertse, Yarnell.

3. Introductions:

I introduced Susan Knight as a new member. She will be working with Peter Vellman and me to obtain data on outpatient lightning injuries for the years 1988 to 1991 from front range participating trauma hospitals. She will be paid \$500 from our grant funds for this important work.

Rich Kithil introduced two visitors: Bruce Kaiser and Larry Conrad from LightningMaster Corporation of Clearwater, FL. They contributed to the lively discussion that occurred during the meeting.

4. I reported that Dan Breed had phoned earlier today to report that he was unable to attend because of automobile trouble. He did have the following suggestions: a) We add to our general mission statement that we are planning to acquire data on outpatient lightning victims for the years 1988-1991. Dan suggested that various stated missions or goals may be retired as they are accomplished. b) We consider starting a newsletter that would be circulated to centers worldwide with missions similar to ours. We should also solicit news from such centers to be part of the newsletter.

I have recently written to Dr. Chris Andrews of Australia to give us some guidance on this matter. Rich Kithil mentioned that Earl Williams of M.I.T. does circulate a publication with current lightning information. Rich, Dan, and I will plan to meet in Boulder before our new meeting to discuss this further.

5. Dave Breggin and Rich Kithil suggested that we emphasize one of the paragraphs of our mission statement that refers to educating health care workers and the public about the dangers of lightning. Dave suggested that we prepare a pamphlet in the "do's and don'ts" of how to reduce the risks of lightning injuries. He pointed out that in much of current literature there is conflicting advice. For example, what position should one assume during a thunderstorm if one is caught in an open field? Dave and Rich will pursue this subject more and report back at our next meeting. I suggest that the information collected might be important in two spheres: a) a scientific publication and b) a pamphlet for the general public.
6. Dave reported that he and Ken Langford had worked on the reporting form to be used in our database on lightning

injured patients. They suggested that the medical data be separated from the meteorological data. They also made a few changes such as asking for additional information for questions such as CRP ? ---- For how long? How long did it take for paramedics to arrive? etc. Dave asked for a definition of "other people affected" during the lightning storm. We agreed that the definition include anyone who either sought or received medical care. The committee agreed with the suggested changes. Dave will meet with Susan regarding the updated questionnaire and computer bank for our data.

7. Rich Kithil gave a most informative discussion on lightning protection. His talk covered a wide area and included the following: (With apologies to Rich for oversimplifying and taking things out of context, I have constructed the following after listening to his presentation).

Historical aspects; Benjamin Franklin and the lightning rod (1752).

Isokeraunic map. Most lightning in tropics; in the USA, most lightning in Florida and SE and then Colorado and New Mexico. Map shows thunderstorm days per year. Types of lightning now include: cloud to ionosphere.

Cloud to ground lightning. Upward streamers meet downward leaders. This phenomenon must be understood to build lightning protection systems. We are unable to control or manipulate lightning but we can alter or manipulate upward streamers.

Why does lightning zigzag? Air is not homogeneous. Lightning takes the path of least resistance.

Air terminals are of at least three types:

- 1) Early streamer emitter.
- 2) Conventional light rod.
- 3) Streamer retarder.

Theory of point discharge phenomenon. Ionization = electrical agitation of metal objects on the ground. The sharper the point, the more easily energized (Coulomb). St. Elmo's fire = point discharge. Pointed rod is better than blunt rod for lightning rod. Streamers compete to become upward stroke. Multiple points retard or protect against upward streamer -- 'non-preferred target for lightning'. These are now being used on buildings, satellite dishes, radio towers, trees.

Early streamers delay formation of upward streamer until high voltage is reached.

Protection systems are built to protect against:

- 1) Direct strikes
- 2) Surges
- 3) Induced current.

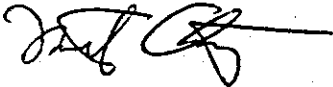
8. Bruce Kaiser spoke about ring counterpoise as a way of protecting structures from ground current. This system is buried about 2 feet around the building. I asked about this

system after reading an article by Edwin Kessler entitled "Twelve cattle killed by lightning" in Weather 1993.

9. Deb Clark will look into the matter of our members giving educational talks to various outside organizations.

10. Next meeting: Friday, December 10, 1993 at 11:30 am in Conference Room B at St. Anthony Hospital.

Respectfully submitted,



Michael Cherington, M.D.
Chairman, Lightning Data Center