Lightning Data Center

April 14, 2000 Minutes

Centura Health St. Anthony Hospital

Quote of the Month:

"The power suddenly went out leaving us to feel our way around in the tenth-century darkness until we found and lit a stash of candles"

Billy Collins, After the Storm 1998, University of Pittsburgh Press

1, Meeting began at 11:30 am and adjourned at 1:10 pm.

2, Members present: Anderson, Blanke, Cherington, Foley, Hawkes, Lines, Yarnell.

3. I brought the following articles from the literature (abstracted in part here).

a.) Gundestrup M, Storm HH. Radiation-induced acute myeloid leukaemia and other cancers in commercial jet cockpit crew: a population-based cohort study. Lancet 1999;354:2029-31.

"Aircrafts are occupationally exposed to cosmic radiation mainly consisting of neutrons and gamma radiation..Both malignant melanoma and skin cancer were found in excess in cockpit crew members with a long flying history, probably attributable to sun exposure during leisure time a holiday destinations…The study shows that male cockpit crew members in jets flying more than 5000 have significantly increased frequency of acute myeloid leukaemia."

b.) Hubler GK. Fluff balls of fire. Nature 2000;403:487-8

"Ball lightning has been well documented since the Middle Ages as a natural phenomenon associated with thunderstorms. It is relatively rare -- only 1% of the population ever reports seeing it…Previous models of ball lightning have mostly centered on electromagnetically confined plasmas of various kinds, nuclear processes and the chemical burning of gases…The model proposed by Abrahamson and Dinniss…can explain most aspects of ball lightning. The model has three important parts. First… the same chemistry used by the integrated-circuit industry to extract pure silicon from the silica-carbon mixtures..could be at work in nature…Second..free silicon cools rapidly and condenses into nanoparticles..Third.the authors calculate the thermal properties of a 30 cm ball of silicon nanostrings."

c.) Abrahamson J, Dinnis J. Ball lightning caused by oxidation of nanoparticle networks from normal lightning strikes on soil. Nature 2000;403:519-21.

"When normal lightning strikes soil, chemical energy is stored in nanoparticles of Si, SiO or SiC which are ejected into the air as a filamentary network. As the particles are slowly oxidized in air, the stored energy is released as heat and light."

4. Schultz DM. Late-effect snowstorms in northern Utah and western New York with and without lightning. Weather and Forecasting 1999;14:1023-1031.

"Late-effect snowstorms with lightning have significantly higher temperatures and dewpoint in the lower troposphere and significantly lower lifted indices than lake effect snowstorms without lightning…Observations of lightning and
thunder occurring during snowstorms..have been reported at least as early as the nineteenth century in Western literature."

5. Five members of LDC (Cherington, Kithil, Lammertse, H Wachtel, and T Wachtel) spoke at the CRING (Colorado Rehabilitation Insurance Nurses Group) annual meeting on April 6, 2000. The topic: Medical Aspects of Electrical & Lightning Injuries. Early reports were that the meeting was a success. CRING made a generous contribution to LDC/St. Anthony.

6. We spent a considerable amount of time discussing ball lightning. Leland Anderson wrote a review of several aspects of this subject including an Historical Review and mechanisms of ball lighting passage into aircraft. Phil Yarnell reviewed the clinical aspects of the patient presented here in the past. Gunnar Blanke stated that Air Force fighter jets often pick up electrical charges during storms. Ball lightning enters the front of aircraft, passes down the center aisle, and exits via the rear of the aircraft. Leland stated that the windows (that are "capacitors") can be responsible for magnetically induced fields. The windows occupy only 1% of the fuselage.

Gunnar asserted that often during relatively clear twilight and evenings, virga (virga does not reach the ground) might be associated with a few small clouds. The ice crystals can electrify these clouds and may be responsible for isolated or scattered lightning strikes. This might explain a lightning strike case in Colorado during a relatively clear sky evening.

7. I read parts of a letter from Steve Marshburn asking about the relationship, if any, between lightning strikes and cancer (especially skin cancer). This subject may have some connection with the article listed above about cancers in airplane pilots. Phil Yarnell said that he is not aware of any good statistical article in the literature that proves a relationship between cancer and being struck by lightning. Allison Hawkes suggested that what is needed is a good case control study. Age, gender, occupation, etc should match the control group. Gene Lines stated that solar hot spots might be more active this year. Some have wondered if there may be some correlation with increased incidence of skin cancers.

8. Phil Yarnell mentioned that several of our patients have abnormal white matter "lesions" found on T-2 images on MRI scans. In many of these cases there are no strong clinical correlates with these "demyelinating" MRI findings and the neurologic examinations.

9. We discussed (with apologies to the absent Howard Wachtel, our authority on EMF and possible health hazards) the subject of power lines and any health risk. Phil reminded us that Howard believes that traffic patterns may be as important a factor as power line exposure. Gene Lines informed us that power companies are now installing DC power lines for short distance between AC power lines.

10. These minutes reflect the comments of the members present and do not represent official positions of LDC.

11. Next meeting: Friday, May 12, 2000 at 11:30 am in the Main Auditorium of St. Anthony Central Hospital.

Respectfully submitted,

Michael Cherington, MD
Chair, Scientific Committee, LDC