

**LIGHTNING DATA CENTER
MINUTES
FEBRUARY 13, 2004
ST. ANTHONY HOSPITAL**

Quote of the Month:

“The mortal hero-physician Asklepios, mentioned in Homer’s *Iliad*, exemplified the ideal Greek physician...In perhaps the most popular tale, Askepios is examining a man, Glaukos, whom Zeus had recently struck dead with a thunderbolt. During the examination, a snake gliding into the room surprised Asklepios, and he responded by killing it with a blow from his staff. Asklepios was subsequently intrigued by the arrival of a second serpent, which placed certain herbs in the mouth of the dead serpent and thereby restored it to life. Asklepios quickly perceived the lesson, revived Glaukos by recourse to the same herbs, and, as mark of respect adopted the serpent coiling about his staff as his emblem.”

RA Wilcox and EM Whitham, History of Medicine
Ann Intern Med 2003;138:673-7.

1. Meeting began at 11:30 am and adjourned at 1:20 pm.
2. Members present: Bradley, M Cherington, N Cherington, Collier, Gift, Keen, Kithil, Langford, Mains, Mouchantat, Nibbe, Rossie, Wachtel, Wells, Yarnell.
3. I am sad to report that LDC member, Henry W. Rackley passed away on January 25, 2004. The family has requested that memorial contributions be sent to the Henry Rackley Fund at the Denver Museum of nature and Science, Attention Development Offices, 2001 Colorado Blvd, Denver, CO 80205
4. I brought the following articles (abstracted in part here):
 - a. Shmatov ML. New model and estimation of the danger of ball lightning. J Plasma Physics 2003;69:507-527.

“The main model assumption is that ball lightning has a core consisting of clouds of electrons and totally ionized ions which oscillate with respect to each other. According to the model, ball lightning emits high energy photons that are sometime dangerous for human beings, and in a number of situations it can kill humans by electric pulses....These estimates predict that ball lightning can be created in the experiments with ordinary lightning or powerful installations.”
 - b. Driscoll TR, Mitchell RJ, Hendrie AL, et al. Unintentional fatal injuries arising from unpaid work at home. Injury Prevention 2003;9:15-19.

“The most common mechanisms of the fatal incidents were falls from a height (28%), contact with electricity (19%), being hit by falling objects (12%) and contact with heat (12%). In younger age groups, contact with electricity was by far the largest single mechanism (45% of deaths in the age group), whereas falls (44%) and contact with hot objects... (27%) were the most common mechanisms in the older age groups.”

5. This is the 12th Anniversary of Lightning Data Center. I introduced my wife, Nancy, whose encouraging ideas were in large part responsible for LDC’s birth at St. Anthony Hospital in February 1992 when Peter Donald was CEO. I brought photographs taken in early 1992 of LDC members: Chambers, Cherington, Clark, Collier, Estep, Holle, Langford, Lopez.
6. Sue Wiggins has given us a list of those LDC members who responded in the affirmative to our communication asking whether or not individuals on our old roster wanted to remain on the roster. The revised roster will be reviewed by Mike Foley and then adopted as the 2004 Roster.
7. William P. Roeder sent via the email the following lightning truism: “Being hit by lightning does ‘not’ in of itself increase the chances of a person being hit by lightning. It doesn’t change your body chemistry or open infrared holes around you allowing lightning to strike you more easily (don’t laugh, I’ve seen those things proposed). However, if you do at-risk behavior that increases your lightning risks.”
8. Steve Marshburn sent an email asking if our members would discuss the possible relationship between diabetes mellitus and lightning or electrical trauma.

There is no definitive answer. Rich Mouchantat commented that the pancreas was situated close to the spinal column. Since bone, more than other tissues, was likely to store heat after lightning strike, the pancreas might be vulnerable to thermal damage. Phil Yarnell quoted work from Stanford that chronic stress precipitates a cascade of events: stimulation of adrenal glands, followed by elevated cortisol levels and the elevated blood sugar levels. Charles Mains remarked that hyperglycemia is seen immediately after major trauma. Trauma patients may need insulin drips. He wondered if the pancreas might suffer a vascular insult.

Karen Wells did a literature search and found the following related articles: (Some of these articles pertain to diabetes insipidus, not diabetes mellitus)

- a. Kane M, Swift PG. Diabetes unmasked by electric shock. Arch Dis Child 2002;86:210.
- b. Ozdemir A, et al. Transient hypothalamic hypothyroidism and diabetes insipidus after electrical injury. South Med J 2002;95:467-8.
- c. Inglis A, et al. A metabolic complication of severe burns. Burns 1995;21:212-4.

- d. Urquhart CK et al. Transient diabetes insipidus following electrical burns in two patient. South Med J 1994;87:412-413.

Thanks, Karen.

Ken Langford proposed: Autopsy Guidelines for Fatalities due to Lightning or Electricity. Ken suggests that a collaboration between health professionals who treat Lightning Strike and Electric Shock patients and coroner who see fatal cases. He suggested coroners look for the following lesions: Pancreas damage, tympanic membrane damage, skin burns, Lichtenberg figures.

Thanks, Ken. We shall ask Mike Foley, who attends the Colorado Coroner's meeting, to pursue these ideas.

9. Rich Kithil reported on a problem he was asked to consider. A flag pole was situated outside a building and near a fourth floor office window. What to do? Possible solutions: remove the flag pole, replace the conduction material with dielectric material, etc. I wondered if we could ask Rich to begin a monthly or quarterly program: Rich's puzzle of the month.
10. Richard Mouchantat gave an outstanding clinical presentation, Plastic Surgical Considerations of Lightning and Electrical Injuries. Rich has been Chief of Department of Surgery and Division of Plastic Surgery at St. Anthony Hospital.

I cannot do justice to Rich's presentation here, but I shall transmit my notes.

Lightning and electric shock patients are treated as trauma patients first. Prolonged CPR is often more successful in lightning patients than in other trauma patients. After CPR look for compartment syndromes. Vulnerable areas are fibro-osseous tunnels such as carpal tunnel (median nerve) and Guyon's canal (ulnar nerve).

Muscle damage. Surgically remove non-viable tissue to improve situation for viable tissue.

Rich presented 2 patients who suffered electrical trauma. They were touching the outside of a utility truck when the truck driver moved the boom so that it was in contact with electrical lines (15,000 v). Both patients had wounds of their hands, fingers, thumbs requiring skin graft. A successful skin graft requires tissue carrying intact blood supply. One of the patients suffered a 4th degree burn of his hand. This patient also needed treatment for posttraumatic stress symptoms.

11. Phil Yarnell spoke about the possible neurologic states of some patients who suffer from hypoxic encephalopathy following CPR lightning or electrical trauma. He mentioned:
- a. Persistent vegetative state.

- b. Minimally responsive state – result of global brain involvement.
 - c. Locked-in-syndrome. Patient’ state of consciousness - awake. This condition is seen in some patients with brainstem lesions.
12. These minutes do not represent official positions of LDC or its members. They simply reflect comments made at the meeting.
13. Next meeting: 11:30 am on Friday, March 12, 2004 in Main Auditorium.
Guest speaker: Tom Resignolo
Topic: Emergency Care of Lightning-strike Patient

Respectfully submitted,

Michael Cherington, MD