

LIGHTNING DATA CENTER
JUNE 10, 2005
MINUTES
ST. ANTHONY HOSPITAL, DENVER CO
www.Stanthonyldc.org

Quote of the Month:

“The boys went back to camp, a good deal awed; but they found there was still something to be thankful for, because the great sycamore, the shelter of their beds, was a ruin now. Blasted by the lightnings, and they were not under it when the catastrophe happened.”

Mark Twain in *The Adventures of Tom Sawyer*

1. Meeting began at 11:30 am and adjourned at 1:15 pm.
2. Members present: Burrows, Cherington, Collier, Cui-Gift, Gartling, Gift, Keen, Kelly, McDonough, Mullan, Nibbe, Poulton, Sessions, Stewart, Wachtel, Wermuth, Yarnell.
3. I brought the following articles (abstracted in part here):
 - a. Dwyer JR. A bolt out of the blue. Scientific Am 2005;292:63-71.

“...lightning may carve its jagged, conductive, channels by sending out blasts of high-speed electrons...When you traverse the carpet, your shoes rub off electrons and you accumulate an electrical charge, which produces an electric field between you and other objects in the room. For small fields, air is a good insulator—electrons attach to oxygen atoms faster that they are knocked loose by collisions—and electric current cannot flow in any appreciable amount. As your finger approaches the knob, however, the electric field becomes locally enhanced. If it reaches a critical value of about three million volts per meter, called the breakdown field, the air becomes a conductor and a discharge occurs: current bridges and the gap...viewing lightning as an entirely conventional discharge, like a spark to a door knob, is not correct. It turns out that another, more unusual kind of discharge exists: runaway breakdown...runaway electrons can accelerate to nearly the speed of light, gaining enormous amounts of energy and producing the discharge called runaway breakdown.”

- b. Bunch TJ, Hammill SC, White RD. Outcomes after ventricular fibrillation out-of-hospital cardiac arrest: expanding the chain of survival. Mayo Clin Proc 2005;80:774-782.

“Survival after a VF out-of-hospital cardiac arrest depends on a sequence of events termed the *chain of survival*. This chain includes rapid access to emergency medical care, cardiopulmonary resuscitation (CPR), defibrillation, and advanced care...reported survival rates vary from 3% to 10%. Reports from...early defibrillation programs suggest a...survival improvement of 8% to 23% compared with historical controls...Because of widespread implementation of defibrillation programs, more patients survive VF.”

- c. Zafren K, Durrer B, Herry JP, Brugger H. Lightning injuries: prevention and on-site treatment in mountains and remote areas. Official guidelines of the International Commission for Mountain Emergency Medicine and the Medical Commission of the International Mountaineering and Climbing Federation (ICAR and UIAA MEDCOM).

“Specific preventive measures include staying of ridges and summits, and away from single trees...Treatment...is based upon the ABC’s—(Assessment airway, breathing, and circulation. Victims who are not breathing can often be resuscitated and should be helped first...Keraunoparalysis is not a neurological injury but is due to intense vasospasm which resolves with hours...Dilated or non-reactive pupils should never be used as a poor prognostic sign or as a criterion for brain death in a lightning victim.”

4. Ryan Blumenthal sent an email to comment further on bathtub electrocutions that were mentioned in Al Nibbe’s presentation. He sent the following information from the 2nd Edition of Forensic Pathology by Vincent J. DiMaio.

“Bathtub electrocutions...are becoming less common, because of the fairly widespread use of low-voltage Ground-Fault Current interrupters (GFCI)...This device monitors the current flow. If there is a greater than 5mA difference, the circuit is broken, thus preventing electrocution. A normal circuit breaker does not function until a 15-A difference is detected...Electrocution in water could also be caused by defective lights in a swimming pool. GFCIs prevent this type of accident.”

5. Dick Burrows suggested there is a need for a lightning safety pamphlet or publication that would provide mostly practical and some theoretical information that could be available to many outdoors people in Colorado. Dick is a member of the Colorado Mountain Club. Greg Stewart believes that more information should be available at the Mountain Clubs. The US Forest Service and other agencies might welcome such materials. Dick agreed to Chair a committee to pursue these matters. The committee members are: Burrows, Mullan, Stewart, Wermuth. I suggested the committed begin by reviewing the Lightning Safety

Recommendations of the Lightning Safety Group and the American College of Emergency Physicians web site on lightning safety.

6. John Gartling brought several challenging riddles for the group to solve. Example:

Scientists use the Torino scale to measure the potential damage caused by which of the following:

- a. Nuclear explosion
- b. Tidal waves
- c. Volcanic eruptions
- d. Asteroids *

7. Al Nibbe, who gave a presentation last month, provided comments to complete that presentation. He spoke about tissue lesions caused by heat and electricity. He quoted electron microscopic studies on skin by Thomsen et al. in Forensic Science International 1981. Al recently spoke with a forensic pathologist who told him that new staining techniques have reduced the need for many electron microscopic studies.

8. I gave a brief presentation on: Lightning – Medical Historical Perspectives and Personalities. I spoke about the contributions of people in past centuries (including James Parkinson and Jean Martin Charcot,). Reference: Cherington M. James Parkinson: Links to Charcot, Lichtenberg, and lightning. Arch Neurol 2004;61:977.

Next meeting will be at 11:30 am on the **3rd Friday of July** (Not the usual 2nd Friday).

The **third Friday is July 15, 2005**.

Location: Main Auditorium, St. Anthony Central Hospital

Our guest speaker will be Dr. Munir Ahmed, Executive Director of TARA (Technical Assistance for Rural Administration), Dhaka Bangladesh. Dr. Ahmed is the founder of the Lightning Awareness Center at TARA. TARA has support from UNESCO, NLSI, and USAID. He will discuss South Asian Lightning issues.

Respectfully submitted,

Michael Cherington, MD