

Quote of the Month:

"The term apoptosis first appeared in the biomedical literature in 1972....The justification for the new term apoptosis was the realization that cells entering death in development undergo a unique and distinct set of structural changes and that similar or identical changes are also shared by cells dying in a wide variety of circumstances outside of development: T-cell killing, negative selection within the immune system,.....and in tumors and normal tissues following exposure to the appropriate (low) doses of ionizing radiation, chemotherapy, and even hypoxia. Moreover, this process of death was clearly different from necrosis, till then the only mode of death that had been well described....and which appears to be the consequence of extreme perturbations of the cellular microenvironment."

Andrew H. Wylie, *Brit Med Bull* 1997

1. Meeting began at 11:30 am and adjourned at 1:20 pm.
2. Members present: Bergschneider, Breed, Clark, Cherington, Foley, Gustafson, Kamin, Keen, Kithil, Langford, Larson, Smith, Toler, Walker, Yarnell.
3. Items from the literature:
  - a.) Vianello F. A man in the thunderstorm: coronary injuries and electric shock. Letter to the Editor. *Cardiology* 1997;88:486  
A healthy 32 year old man was disconnecting a central plug during a thunderstorm when he received a short duration hand to hand electric shock probably due to lightning which stroke the main power cable. After 4 days, he was admitted to the hospital because of retrosternal pain and left upper limb paresthesia. Coronary arteriography revealed 90% occlusion of the descending anterior artery. After transluminal angioplasty only 10% occlusion was left.
  - b.) Blanco-Pampin JM et al. An unusual case of death by lightning. *J Forens Sci* 1997;42:942-4.  
The authors report a case of lightning-related death of a man while he was in bed, involving the production of a spark between an electric wire and the body through the bed-head. At autopsy, a "fern-like" cutaneous mark in the chest wall was found. The muscles of both arms were vigorously contracted, though rigor mortis was not present.  
Examination of the bed-head showed a perforation of about 1 cm in diameter at the level of the electric wire in the wall. This was interpreted as being caused by the lightning penetrating through the wooden bed-head. There were burns of the pillow and mattress. "A pattern of transitory discharge is very dangerous for any person caught under the influence of such highly charged fields, because currents which exceed the threshold permissible for a human being may be induced into the body."
  - c.) Adler CH, Caviness JN. Dystonia secondary to electrical injury: surface EMG evaluation and implications fro the organicity of the condition. *J Neurol Sci* 1997; 148:187-192.  
A patient developed right arm dystonia following an electrical injury. Surface EMG revealed constant tonic activity of arm muscles at rest, that was not distractible. This finding supported an organic disorder that was related to an electrical injury.

3. I brought to the meeting Bulletin Bibliographique - Electropathologie & Keraunopathologie that was sent to me from Dr. Elisabeth Gourbiere of Paris, France. This book is a useful reference summary of articles published during the years 1995 and 1996. It will be available to our members.

I received an email letter from Dr. Mary Ann Cooper regarding an upcoming program on lightning on the Discovery Channel. She will be a part of the program that is scheduled to air on November 23.

4. Ron Larson brought for discussion a matter that concerns him and his neighbors on Lookout Mountain. Lookout Mountain is the site of over 600 television and radio station antennae. (Ron's graduate training was in electromagnetism and antennae). The residents are concerned about the possible nonthermal effects of these devices and possible health risks, including leukemia. Two of our LDC members have written extensively on the possible relationship of EMF and cancer, etc. Howard Wachtel was out of town today. Sid Deutsch of Florida wrote on EMF Cancer Scares, (see last month's minutes). We suggested that Ron contact Howard, Sid, and others and let us know when and how this issue is resolved.
5. Phil Yarnell presented a case that he saw in his office this week. The patient, a college football player, was leaning against a goal post during a practice period about one year ago. The goal post was struck by lightning and the patient was thrown to the ground. Since then the patient has suffered from impaired memory, depression, lack of concentration. He is being followed by a psychiatrist. He has also suffered two cerebral concussions on the football field. Phil stated that, in his and other's experience, most football players who sustain concussion on the football field do not usually have the post-concussive syndrome found in people who suffer whiplash syndromes, etc. in auto accidents. Rick Smith observed that one explanation for this discrepancy might be the force of the injury. Rick stated that Pet Scans might be useful to further evaluate these kinds of injuries in football players.
6. Peggy Gustafson reported that she is awaiting responses from regional school administrators on whether they would like to have seminars on lightning safety. In honor of Peggy's birthday, we took a short recess to bring a birthday cake and sing "Happy Birthday." (sang in various keys).
7. Barry Kamin suggested that we state what our minutes represent and what they do not represent. I shall summarize the consensus of the members present on this matter:

The minutes are taken contemporaneously with the meeting. They reflect the comments of our round table conversations. The LDC provides a forum for our members, an eclectic group of people to share their ideas and perceptions. LDC, for the most part, **does not take official positions**. Much of what is discussed can be described as in the arena of speculation. Each member is free to explain his/her own ideas, observations, and points of view.

One should not look at the minutes as one would look at articles in a peer review journal. Our minutes, as minutes in most organizations, should be and are subject to corrections, additions, clarifications, etc. at subsequent meetings.

Many members, local and out of town, have communicated to me that the success and uniqueness of the LDC are as a marketplace for these ideas and speculations. Not all the ideas will be met with universal agreement. To quote Dan Breed at today's meeting: "**some of the comments are off the wall.**" But we hope they stimulate thought and discussion.

Finally, we welcome and encourage input from our out of town members to join our idea marketplace. Please send your comments (agree or disagree) and we shall bring your ideas to our next meeting.

8. Steve Clark raised an issue that many of us have wondered about: What evidence can one use to establish that lightning occurred, if the NLDN data does not confirm a lightning strike? The following findings were suggested by those present:
  - a. Eye witness account;
  - b. residual trace magnetism;
  - c. physical evidence, e.g. damage to tree;
  - d. independent detection systems;
  - e. outage of nearby low voltage equipment.
  
9. Ken Langford said that he will be traveling to Tucson, AZ to meet with other lightning photographers. Many of the photographers meeting there are on the list supplied by Nicolas Floret.
 

Ken brought pictures that he took of our social gathering in July at the Bella Ristorante.
  
10. Rich Keen reported that the number of thunderstorm days recorded this year at Coal Creek Canyon Observatory was 93. This is more than any year since 1991 when there were 101. (Average year = 86).
  
11. Rich Kithil reported that he, along with Carl Swanson, contributed an article in ChemEcology (Oct 97). Rich distributed copies of the 1995 NFPA 780 Standard for the Installation of Lightning Protection Systems.
 

Rich said that because plastic pipes are now being used in the construction of homes, new codes will be required for grounding structures.
  
12. Mike Foley will send to members of the Administrative Committee preliminary drafts on our revised mission statement.
  
13. Julie Walker said that Michael Boyson has completed the outpatient data collection project. We shall soon meet to analyze all our data on lightning casualties for the years 1993 - 1995. Julie has been promoted. Her new position is Corporate Coding Director. Her new office will be at Centura offices at the Toch Center.
  
14. Enclosed is a summary of responses to our LDC Member Questionnaire. Thanks to all the members who sent in their responses.
  
15. Next meeting: 11:30 am on December 12, 1997 at Centura Health St. Anthony Hospital Central, Main Auditorium.

Happy Thanksgiving, everyone.

*M. C.*

Michael Cherington, MD  
Chairman, Science Committee LDC

# **LDC MEMBER QUESTIONNAIRE**

1. *Is the LDC newsletter useful to you?*

- YES - Interesting discussion on my favorite topic: lightning and thunderstorms
- I can follow what other medical professionals are doing for lightning safety
- YES - It keeps me updated on the human factor which use for safety briefings
- YES - It keeps me updated
- Definitely - I like to keep up with the medical literature, and the various case studies are wonderful
- YES - I can not usually attend the meetings, and it tells me who is active in what topic area
- It provides stimulating material on high voltage and lightning injuries from many sources
- YES - Provides me with additional knowledge for my job
- YES - the LDC is the only well organized country interested in all aspects of lightning with different fields of scientific backgrounds. Detailed interesting information
- YES - You provide a tremendous amount of very current and 'cutting edge' information
- YES - it has kept me current with information on lightning and the goals and accomplishments of LDC
- YES - it is very useful to know what is the situation in the U.S.; new lightning cases. Concerns - the bibliography quoted: it is of great interest but as a specialist know the paper quoted

2. *LDC is seeking new directions and new missions. What future work should LDC undertake?*

- Seek rigorous documentation on ball lightning
- Collect data/demographics on lightning injuries during sporting or recreational activities
- Coordinate national network and publish ads to inform the population
- Systematic gathering of data on lightning deaths and injuries is long overdue
- No major changes
- Position statements
- Possibly more information on lightning related issues to telecommunication workers
- Organizing a lightning library specifically including ancient literature. We have a lot in Europe very accessible because we are familiar with the French and German language
- Maybe more focus on implementation. Training and research are great but don't do any good if it's not implemented. There might be an opportunity out there to help more in this process.
- I think, and it is just an idea, that it would be important to develop your interest towards other countries as France. As a member of LDC, I could help you. Even in a national association, it is always interesting to have a knowledge of what is done abroad.

3. ***Would it benefit your organization for LDC to work more closely with it? In what areas or capacity?***

- Help with evaluation of lightning benefits (i.e. areas where greater information on lightning activity would benefit
- No- x2
- I think it would benefit both
- Okay now
- Not at present time - x2
- Unknown
- It could help our PR department implement lightning safety in the community. This might also require some training. Might try and do for some community organizations at the same time.
- Of course, as I have explained it in #2  
Area: cases which occur in France or other European countries  
Capacity: Protection (public awareness) medical management and follow-up, etc.  
and also: Pathophysiology.

4. **What is your specific interest in lightning issues?**

- The physical origin and role of LDC
- Lightning safety with regards to athletics
- Personal and property protection, safety awareness
- Safety and injury/death reporting
- Physics of lightning cloud electrification, lightning protection, lightning detection
- Casualties, damage, flash frequencies
- Lightning injuries in mining and construction areas
- I am responsible for grounding and lightning protection for approximately 1600 telecommunication locations in the province of Saskatchewan Canada. In addition, I am an instructor in EMT, grounding, lightning and radiation hazard
- Medical history, meteorology
- Lots
- I am interested in mountaineers being able to avoid dangerous weather and make good decisions when surprised by bad weather. I am equally interested in golfers knowing what to do in lightning situations. The golf course administrators need to be the leaders and supportive (even offering a rain check).
- In fact, my work at "Electricite de France" (the French National Electricity Company) is devoted to research on electrical injuries (occupation or not) and on lightning injuries

5. *Would you be interested in actively participating in research projects taken on by LDC? This may include writing a research paper.*

- Possibly-3
- Yes-6
- If data were complete in time and space for a specific topic
- No-1

6. *Other?*

- Increase general public awareness of your existence
- Always remember why LDC was formed to begin with
- The organization should remain relatively loose in organization as it is. Excessive ruler and bureaucracy will destroy it quickly
- Keep up the good work - x2
- Please continue with your initiatives
- I would like to know whether it would be interesting for you that I send you an English copy of the French National?
- Have a specific medical form for collection of data in lightning accidents
- Apart the Aperi N. Floret's form, in France, we have a medical form to be given to any physician who manages a victim

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Main Office: 891 N. Hoover Ave., P O Box 778, Louisville CO, 80027-0778

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WWWWeb : <http://www.lightningsafety.com>

## **MONTHLY NEWS FROM NLSI, NOV. 1997**

1. A Lightning Risk Abatement Review was conducted in Oct. by major Western USA optical and radio observatories at Sunspot, NM. Some 25 participants from Fermilabs, Kitt Peak, Apache Point, NRO, US Naval Observatory, LANL, VLA, and the universities of Michigan, NM Tech., NM State, Princeton, Washington, and Tokyo attended the two day session.

At high altitude scientific sites, lightning threatens expensive equipment, interrupts operating schedules and presents personal dangers to researchers and visitors. NLSI presented a risk management overview to the group, and examined the Apache Point (NM) site grounding, bonding, TVSS, and shielding. NLSI also addressed safety upgrade issues at the Executive Session during the meeting's final day.

2. NLSI re-visited NASA's Johnson Space Center in Houston, investigating personnel lightning safety issues to the overall facility. The site contains some 100+ buildings, with 3000+ employees in a campus-like environment. The Final Report was submitted, with recommendations including:

- 1) Improvements to lightning protection systems (LPS).
- 2) Adoption of widespread signage and signaling devices.
- 3) Regular inspection and maintenance of LPS.

3. A large supplier of industrial gases to the petrochemical industry retained NLSI to investigate lightning safety issues in the Texas/Louisiana areas. They operate 62 production facilities, 1500 miles of pipeline and 300+ metering stations. A fatality last year, with lightning as the proximate cause, prompted heightened awareness of the hazard.

4. NLSI's monthly Newsletter will appear regularly at NLSI's WWWwebsite effective this issue.

5. NLSI has been retained as expert witness for the defense in the NJ case *Atlantic City vs. Manssner*. The issues here relate to allegations of negligence where lightning caused injuries on a golf course.