

Quote of the Month:

"The Russians were helped by their fierce winter. Stalingrad lay at the crossroads of two converging climates -- the icy Siberian winds from the northeast and the warm Caspian currents from the south. The clash of cold and warm winds left an unpredictable climate, most of it bad."

Louis Synder in *Epic of Stalingrad, 1942* (Describes the role of climate in the history of human events)

1. Meeting began at 11:30 am and adjourned at 1:20 pm.
2. Members present: Bergschneider, Cherington, Clark, Kamin, Keen, Kithil, Swanson, Toler, H Wachtel, T Wachtel, Yarnell.
3. I brought the following materials from the literature:
  - a. Letter in BMJ by Campbell-Hewson G, Egleston CV, Robinson SM. *Death after electric shock and lightning strike is more clear cut than suggested.* BMJ 1997;314:442-3.

The authors state: "The inference that cardiopulmonary arrest after lightning strike is particularly amenable to successful resuscitation with prolonged cardiopulmonary resuscitation has no substance in fact. It stems from a case report in 1961 that was misinterpreted in a classic article. There is no reason to distinguish apparent death from electric shock or lightning strike from other arrhythmia related deaths such as ventricular fibrillation...The suggestion that death from upper airway obstruction requires an unusually prolonged resuscitation is illogical. Cardiac arrest from upper airway obstruction is preceded by profound hypoxia and hypercarbia and consequently results in a poor outcome from resuscitation efforts."
  - b. Kuisma M, Jaara K. *Unwitnessed out-of-hospital cardiac arrest: is resuscitation worthwhile?* Ann Emerg Med 1997;30:69-75.

"This survey shows that survival after unwitnessed out-of-hospital cardiac arrest is unlikely with an initial response of basic life support alone. Withdrawal of resuscitation should be considered if an adult victim of unwitnessed cardiac arrest is found in asystole and the arrest is of obvious cardiac origin...unwitnessed cardiac arrests...represent approximately one third of the total cardiac arrest population."
  - c. Fatovich DM. *Electrocution in Western Australia, 1976-1990.* Med J Aust 1992;157:762-4.

"There were 104 victims. Death occurred most frequently in young men exposed to low voltage current during summer, and nearly half the fatalities occurred in the workplace. Water was present in up to 52% of fatalities."
4. I discussed a lightning fatality case from Pitkin County. The case involved a 21 year old who left his home for a twilight jog and mountain climb. The body was found the next day. His friends stated that there was no lightning or thunder that night. The accident happened on July 24. I visited the region with Deputy Coroner

David Blaine one month ago. We spoke with the forensic pathologist, Dr. Robert Kurtzman who found bilateral ruptured tympanic membranes.

5. Carl Swanson told us about a phenomenon, (? ball lightning) at the Taylor Reservoir witnessed by several of his friends. They described a red ball (volleyball size) lasting for a few seconds after a clap of thunder. I asked Rich Keen to give us a brief account of what is known about ball lightning at our next meeting. Carl will do a search to see if there are any photographs of this phenomenon. Rich mentioned that ball lightning is to be differentiated from St. Elmo's fire which is a coronal discharge.
6. Phil Yarnell discussed 4 patients that he has recently seen.
  - a.) A prison guard who suffered a lightning strike to his left upper limb. Since then the patient has a progressive dystonic abnormality. Phil brought a plaster cast of the patient's hand. This is the third patient of Phil's who developed a "clenched fist" posture after partial nerve injury.
  - b.) A young woman who was struck under a tree on a golf course this summer and was unconscious for days. She has recently been transferred to a chronic care facility. She has regained consciousness and can recognize family members.
  - c.) A golfer from Montana was struck by lightning over 3 years ago. He now has symptoms of either a sensory neuropathy or spinal cord lesion with burning feet. He also has lost hair over his legs. Phil believes that this may suggest involvement of the autonomic nervous system.
  - d.) A woman from Houston, Texas suffered transient loss of consciousness while on the telephone in April 1997. She now has symptoms of irritability and memory loss. He has provided the patient with articles on telephone-related lightning injuries by Chris Andrews.
7. Rich Keen reported on data from the Coal Creek Canyon Observatory. There were 26 thunderstorm days in August (average = 20). Total for the year is 88 (slightly above average).
8. Tom Wachtel spoke to us about the Colorado Trauma Registry which is 11 years old. The new "E" code will help identify lightning cases. Peggy Gustafson has the Registry lightning data and will bring the data to our next meeting.
9. Howard Wachtel suggested that we may soon see the time when mountain hikers will be equipped with cell phones hooked up to ECG monitoring devices. Rescue efforts may be enhanced when this happens. Tom Wachtel said that with the new low level satellites, there will be few, if any, "dead zones" for cell phones.
10. Rich Kithil's "News from NLSI" are attached to these minutes. Rich brought a lightning detector that took a lightning strike near Gainesville, Florida. The detector was being used by an Air Force station. Rich distributed a copy of the 1997-1998 NCAA Sports Handbook, which has a section on lightning safety (written in part by Ron Holle and Raul Lopez.)
11. Steve Clark has been working on data from local newspapers on lightning casualties in Colorado for the 3 year period ending in 1995. This data will be an important addition to our ongoing analysis.
12. Carl Swanson showed us slides of lightning he recently took using infrared film.
13. Next meeting will be on Friday, October 10, 1997 at 11:30 am in the Main Auditorium of Centura Heath St. Anthony Hospital Central.

Respectfully submitted,

*M. C.*

Michael Cherington, MD  
Chairman, Scientific Committee, LDC

# NATIONAL LIGHTNING SAFETY INSTITUTE

⇐ Risk Management of the Lightning Threat ⇐

Analyses & Audits • Consulting/Design/Engineering • Safety Seminars

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## NEWS FROM NLSI, SEPTEMBER 1997

1. NLSI's web page is updated with additional information. Check it out (see URL, above). New pages are:

- a. "Lightning Safety for Swimming Pools."
- b. "NLSI High Altitude Lightning Observation Site."
- c. "Inspection, Maintenance and Testing of the Lightning Protection System."
- d. "USA General Lightning Damage."
- e. "Wisdom from Benjamin Franklin."
- f. "Recommended Grounding Guidelines."

2. NLSI's intensive training program "Certified Lightning Safety Professional" (CLSP) next is scheduled for Louisville CO on Sept 16 & 17. This is the sixth such two day class to be conducted this year.

The CLSP seminar is mandated by the EPA for two groups of EPA inspectors - On Scene Coordinators and Remedial Program Managers.

In August, 1997 NLSI presented the CLSP program to 27 attendees at Los Alamos National Laboratories (LANL), Los Alamos, NM. LANL has invited NLSI to return to their site in early November for a second round of training. Ultimately, we expect the CLSP workshop, along with our "*Inspection, Maintenance, and Testing of the Lightning Protection System*" class, to be adopted as a standard part of safety education at all DOE facilities.

3. The National Collegiate Athletic Assn. (NCAA) has adopted its first-ever Lightning Safety Policy. Hats off to Brian Bennett, ATC at William & Mary College, Williamsburg VA for his leadership on this project. Ron Holle of the National Severe Storms Laboratory also played a pivotal role here. Both Bennett and Holle are on NLSI's Board of Advisors.

Some 25% of all lightning incidents to people occur in recreation settings. A major means of improving lightning safety is through the school systems. We expect the NCAA lightning policy will "trickle down" to the secondary schools athletic venues.

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## **A BRIEF INTRODUCTION TO NLSI**

1. **Summary.** NLSI's lightning safety advocacy has made a measurable difference for people and for facilities in the commercial, government and industrial sectors.

### **2. Details.**

a. NLSI provides services in the form of safety seminars & workshops, site inspections, and technical consulting studies. NLSI does not sell products of any type.

b. Our World Wide Web page on the Internet attracts some 25-35 e-mails daily. On an annual basis, more than 10,000 readers access the 40-some pages at NLSI's web site. (See us at: <http://www.lightningsafety.com>)

c. NLSI presents its lightning safety message to private and public groups, including municipal, state and federal government organizations as well as other parties interested in safety from natural hazards. Our two day workshop is mandated by the EPA for its' on-scene accident coordinators and remedial program managers. The US Air Force Safety Center has approved the same training program for personnel and weapons safety issues. We expect the Dept. of Energy to adopt our program "Inspection, Maintenance, and Testing of the Lightning Protection System" as a standard training course.

d. NLSI has attracted an international Board of Advisors consisting of members with expert credentials in such fields as electrical engineering, atmospheric physics, risk management, safety, medicine, meteorology and weather modeling, the law, recreation, etc.

e. NLSI performs consulting assignments where our technical associates address "best available technology to mitigate the lightning hazard." Clients have included NASA, major defense contractors, US Navy, Department of Energy, Environmental Protection Agency, electric utility companies, national recreation organizations, etc. NLSI also has performed expert witness work in litigation issues relating to insurance claims due to lightning.

f. A special focus of NLSI's activity is education about the lightning hazard to recreation and school sectors: personal risk here is highest.

g. Some thirty percent of NLSI's activities are performed on a no-cost basis where the benefit of information ranks higher than compensation for costs.

3. **Conclusion.** NLSI serves as a bridge from the science and technical communities to those individuals and organizations needing applied lightning safety assistance. We provide objective information.