

**LIGHTNING DATA CENTER  
MINUTES  
JANUARY 11, 2008  
ST. ANTHONY CENTRAL HOSPITAL, DENVER, CO  
[www.stanthonyldc.org](http://www.stanthonyldc.org)**

Monthly Quote: From a popular song by Bing Crosby entitled "Pennies From Heaven" (ca: 1933) was a line: "When you hear thunder, don't run under a tree..." proving there was correct lightning safety advice 75 years ago. Quote submitted by Gil McDonough.

1. Meeting began at 11:45 AM and adjourned at 1:00 PM.
2. Members present: McDonough, Hermann, Thibault, Stines, McFarland, Pilon, Hinze, Reeder, Gift, Cui-Gift, Marshall, Langford, Aragon, Garell, Brocious, Carley, Carmiso, Callahan, Nibbe, Clark, Wallace, Wachtel, Yarnell, Keen, and Glancy. Gil McDonough moderated the meeting.
3. A special "thank you" to all the nurses and the Flight for Life personnel that attended this meeting. As Gil said, the meetings are free and you all are welcome to come to future meetings. And yes, a free lunch is provided.
4. Gil announced the group working on the Lightning Safety Poster being prepared for the U.S. Forest Service will meet with St. Anthony's legal department next week to discuss legal issues with the poster.
5. Gil said he had seen the television show "20/20" last December, which dealt with the problems of air travel. A 15-minute segment was devoted solely to the impact of lightning on air travel. The show made note of instances where lightning would strike an aircraft, causing it to explode and/or crash, and the subsequent technological improvements since then. Gil wondered if an airplane flying through a cloud would disturb the airflow in the cloud. Steve Clark seemed to think not, but did note that if the plane flew through a region of supercooled water, that there could be increased amount of ice particles caused by the impact of the plane against the droplets. Rich Keen thought the charge potential would be reduced if the plane exhibited corona discharge from pointed surfaces on the airframe (wingtips, antennae, etc.).
6. This month's featured speaker was Glenn E. Herrmann, M.D. Dr. Herrmann is a plastic and reconstructive surgeon who earned his B.S. from the University of Colorado in 1995 and earned his M.D. in 1997. Following that, he had a 6-year fellowship, split between the University of Florida and the University of Illinois. He currently is in private practice, with an office in the Denver metro area.

Glenn first discussed the differences between man-made electricity and lightning as they relate to burns. For any burn, the damage potential is a function of three things: The amplitude of the current, the amount of time the current is applied to the body, and the current's pathway in the body. In general, he has found that burns caused by lightning tend to be less severe than those caused by man-made electricity. Although the voltages and currents with lightning are many

times higher than those made by man, it is the relatively short duration of the lightning flash (1 to 100 ms), which reduces the severity of lightning burns. Also, lightning is a DC current. Some of the effects of lightning on people are: cardiopulmonary arrest, respiratory paralysis, CNS injury, amnesia, autonomic dysfunction, brain swelling, global brain damage, and ruptured eardrums. Dr. Herrmann also mentioned some people get Lichtenburg figures on their skin after being struck. He thinks these are caused by the displacement of red blood cells from superficial blood vessels.

Next, Dr. Herrmann discussed the damage potential from electrocution. Most electrocutions are a result of AC current. The heart and the nervous system are the most vulnerable in electrocutions since AC current tends to pass into and through the body; whereas lightning current tends to travel along the skin's surface. An AC current as low as 0.1 amps applied for 2 seconds can cause death. An AC current as low as 10 milliamps can cause paralysis. Skeletal muscles can be stimulated to tetany by alternating currents in the frequency range of 40 to 110 hertz. Tetany is the involuntary contraction of the muscles caused by the direct contact of the skin with the live wire.

Finally, Glenn discussed what happens after a person is burned. Typically, they are admitted to the burn unit, whose sole purpose is to heal the victim. This is done by the use of skin grafts and negative-pressure suctions. The suction devices promote healing of the burn area by accelerating the formation of a substrate upon which new skin cells form along with the corresponding circulation system. Initial healing usually occurs within 5 to 10 days. If a person's bones have been heated due to electric shock and the skin above the bone is burned, the muscle adjacent to the bone also becomes hot and needs to expand, but cannot. A muscle release, a cut in the burn area down to the affected muscle, is done to allow the muscle to expand. Failure to perform this procedure can lead to deformity and/or debilitation of the patient. Once the person is healed, they are referred to a plastic surgeon for cosmetic and/or restorative surgery. Dr. Herrmann showed us several examples of people that had undergone plastic or reconstructive surgery, including oral surgery and the use of prosthetic devices.

Thank you, Dr. Herrmann, for a most informative presentation.

7. Sue Wiggins was presented her annual Christmas present by Gil at the conclusion of the meeting. As always Sue, thank you for your unending support you have given the LDC over the years!
8. These minutes do not represent official positions of LDC or its members. They simply reflect the comments made at the meeting.
9. Next meeting: Friday, February 8, 2008 at 11:30 AM in the Main Auditorium of St. Anthony Central Hospital.

Respectfully submitted,

Steven E. Clark, Consulting Meteorologist