

LIGHTNING DATA CENTER MINUTES

Denver, CO

October 9, 2026

Monthly Quote: "All of a sudden, out of nowhere, just a flash of white light totally taking up my vision." - Dante Lombardi, July 1, 2026 via CBS Colorado. See text of minutes.

Members present: Clark, Crow, Langford, Gertling, Stemple, Taylor and Yarnell. The LDC has two guests at the meeting: Loraine Swanson and Alyssa MacLean. Meeting began at 11:50 AM and ended at 1:35 PM.

1. The LDC is accepting donations, either as cash or check. If you donate via check, please make your check payable to Steve Clark at 755 S. Clinton Street, #2A; Denver, CO 80247. He will cash the check and keep the cash holdings specifically for the LDC. When the LDC incurs expenses, Steve will pay for services rendered through his bank account using the cash from LDC's cash holdings. A log is maintained detailing the inflow and outflow of monies. The LDC currently has \$1089.00 in cash.
2. I do not know if there will be a meeting in November. I will be away on travel on November 11 and I am looking for someone to chair the meeting. I should know by the end of October.
3. Loraine Swanson gave a brief summary of the late Carl Swanson's contributions to the LDC. As you may recall, Carl passed away last year on October 9, 2025. Over a ten-year period, he collected lightning strike data for 56 lightning incidents where approximately 95 people were struck in Colorado and Tennessee. He actively recruited first responders in both states to contribute their reports. Carl wrote a four-part draft report with Loraine's help for LDC's use. In the first part, the paper noted there were 27 people with visible injuries and 8 fatalities. Among other things, the data showed inconsistencies in the assessment, treatment and documentation of lightning patients, which mirrors what lightning survivors have been saying. The second and third parts address these same concerns through what might be said in a presentation to the first responder community and to lightning survivors, respectively. The fourth part is a summary of the data and the findings. I have attached the report, as written, to the bottom of these minutes. I welcome the thoughtful feedback from the LDC membership.
4. The semi-annual conference of the Lightning Strike and Electric Shock Survivors International (LS&ESSI) group took place on October 8-10, 2026 in Lynchburg, Virginia, which I attended for a while via Zoom. On Friday morning, survivors told their stories, followed by Amy Smith, Director of Education and Engagement with the Brain Injury Association of Virginia. She said brain injuries are either "traumatic brain injury", resulting from an external force or "non-traumatic brain injury", where the injury occurs from within. She then gave a rundown of some of the neurological and behavioral sequelae that can be caused by brain injury. I was unable to attend the rest of the conference due to other things I needed to do. The next LS&ESSI meeting is tentatively scheduled for May 20-22, 2027 in Greenville, South Carolina.

- Late in the meeting, we met briefly with Alyssa MacLean, MD. She performs mock scenario training events for residents at the University of Colorado Hospital when a patient transitions from an ambulance into the emergency bay at the hospital using mannequins. On October 15, she will be running a scenario for a lightning patient brought in for treatment. The next three images show the hypothetical scenario as it unfolds.

Biophone EMS Report: We are coming emergent with a 20-30 y.o. F who sustained an unwitnessed lightning strike while taking shelter under a tree during a thunderstorm. Bystanders started CPR immediately. On our arrival, we continued CPR and intubated the patient. We did get ROSC after 2 rounds of CPR and 2 doses of epi. We started two large bore IVs and have fluids running. Last set of vitals BP 100/74; HR 140 and its getting more difficult to bag her. We'll be there in 5 minutes.																				
Bedside EMS Report: This is a 20-30 yo F that sustained a lightning strike that went into cardiac arrest. Bystanders started CPR immediately. We approximate that she had 7 minutes of CPR before our arrival, and ROSC was achieved after intubation, 2 rounds of CPR with 2 of Epi. (11 min CPR total). During transport, she became more difficult to bag. Last set of vitals 100/74 with a HR 140.																				
Scenario Script <ul style="list-style-type: none"> Patient: unresponsive and intubated 																				
SCENE 1 STATE 1 Pt arrival VITAL SIGNS: <table border="1"> <thead> <tr> <th>Rhythm</th><th>HR</th><th>BP</th></tr> </thead> <tbody> <tr> <td>ST w/ PVCs</td><td>140</td><td>90/60</td></tr> <tr> <th>RR</th><th>SpO2</th><th>EtCO2</th></tr> <tr> <td>20</td><td>87</td><td>NA</td></tr> <tr> <th>Temp</th><th colspan="2">Special</th></tr> <tr> <td>35.8</td><td colspan="2">NA</td></tr> </tbody> </table> <p> X - No signs of external hemorrhage A - intubated B - breath sound absent on left C - 2+ in all extremities D - GCS 3, pupils pinpoint 2mm, minimally reactive to light E - Temperature requested, log roll FAST - negative Chest Xray - L pneumo, rib fxs Pelvis Xray - Negative PATIENT STATE: Unresponsive </p>	Rhythm	HR	BP	ST w/ PVCs	140	90/60	RR	SpO2	EtCO2	20	87	NA	Temp	Special		35.8	NA		LEARNER ACTIONS <ul style="list-style-type: none"> Perform primary assessment Place c-collar Recognize tension pneumo Place chest tube Place patient on monitor and obtain BP, confirm/obtain IV access Perform adjuncts to primary assessment (FAST negative) Warm room, warm blankets 	OPERATOR CUES/NOTES <p>TRIGGER: Chest tube placed</p>
Rhythm	HR	BP																		
ST w/ PVCs	140	90/60																		
RR	SpO2	EtCO2																		
20	87	NA																		
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SCENE 1 STATE 2: VITAL SIGNS: <table border="1"> <thead> <tr> <th>Rhythm</th><th>HR</th><th>BP</th></tr> </thead> <tbody> <tr> <td>ST</td><td>105</td><td>98/72</td></tr> <tr> <th>RR</th><th>SpO2</th><th>EtCO2</th></tr> <tr> <td>20</td><td>95%</td><td>NA</td></tr> <tr> <th>Temp</th><th colspan="2">Special</th></tr> <tr> <td>35.8</td><td colspan="2"></td></tr> </tbody> </table> <p> PATIENT STATE: Intubated History unavailable Secondary Assessment: Head to toe unremarkable except: - bloody drainage from bilateral ears, bilateral tympanic membrane rupture - Chest 2%TBSA partial thickness (2nd degree) burns - Abdomen 1 % TBSA partial thickness (2nd degree) burns - Right foot 1 %TBSA full thickness (3rd degree) burns </p>	Rhythm	HR	BP	ST	105	98/72	RR	SpO2	EtCO2	20	95%	NA	Temp	Special		35.8			LEARNER ACTIONS <ul style="list-style-type: none"> Perform secondary survey Initiate warm LR at 500 mL/hr Sedation Management Consider Tetanus Consider Foley 	OPERATOR CUES/NOTES <p>TRIGGER: Patient stabilized, team lead states need to go to CT</p>
Rhythm	HR	BP																		
ST	105	98/72																		
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SCENE 1 STATE 3:	LEARNER ACTIONS	OPERATOR CUES/NOTES																		
<p>VITAL SIGNS:</p> <table><tr><th>Rhythm</th><th>HR</th><th>BP</th></tr><tr><td>VT</td><td>132</td><td>85/70</td></tr><tr><th>RR</th><th>SpO2</th><th>EtCO2</th></tr><tr><td>20</td><td>95%</td><td>NA</td></tr><tr><th>Temp</th><th colspan="2">Special</th></tr><tr><td>35.8</td><td colspan="2"></td></tr></table>	Rhythm	HR	BP	VT	132	85/70	RR	SpO2	EtCO2	20	95%	NA	Temp	Special		35.8			<ul style="list-style-type: none">Repeat primary and secondary survey, as neededRecognize unstable VT with a pulse and manage appropriately (cardiovert, amio)	<p>TRIGGER: Patient stabilized</p>
Rhythm	HR	BP																		
VT	132	85/70																		
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<p>PATIENT STATE: Intubated</p> <p>X- No signs of external hemorrhage</p> <p>A - Intubated</p> <p>B - breath sound present bilaterally</p> <p>C- 2+ in all extremities, no long bone fractures, pelvis stable, abdomen soft, FAST Negative</p> <p>D- GCS 3, pupils pinpoint 2mm, minimally reactive to light</p> <p>E - Temperature requested</p> <p>Secondary Assessment: Unchanged</p>																				
<p>FACILITATOR – PATIENT – Imbedded Actor - CUES/NOTES</p> <ul style="list-style-type: none">Patient: N/A																				

When I spoke with Alyssa earlier, she asked if there was a way to determine if a patient was hit by lightning when the patient does present with clear and obvious evidence thereof, I told her, after clearly telling her I am not a physician, to check for ruptured eardrums and look for Lichtenberg figures (ferning patterns) on the skin, as indicators of being struck by lightning. I will follow up with her after the 16th to find out how it went.

- Dr. Mikhail Shmatov sent us an article titled: "Possible Aerial Detection of Gamma Rays from Swarms of Ball Lightning in Tropical Thunderheads". During the ALOFT (Airborne Lightning Observatory for FEGs and TGFs) aircraft campaign in June 2023, gamma rays were detected from more than 500 ball lightning during 9 out of 10 aircraft flights which suggests ball lightning is not as rare as some think. This research is important because it increases our understanding of the nature of the glow of ball lightning and the radiation hazard of ball lightning. The research may have implications in fusion studies.
- LDC member Sharon Taylor has volunteered to help spread the lightning safety message and advocate for the first responder community in the area where she lives. When first responders arrived after lightning struck a tree by her house, they did not examine her even though she complained she was having difficulty breathing. Thank you, Sharon.

8. This past summer, two sets of golfers and another man, not a golfer, were all very lucky.

On June 30, 2026, some golfers at the Fox Hollow Golf Course in Lakewood, Colorado had a close call with lightning. The golfers noticed thunder in the area but did not think the storm was as close as it was. A flash of lightning struck nearby and they ducked down and then hurried to safety. As they were leaving, they noticed smoke from the other side of a hill about 200 yards away. Fortunately, no one was hurt.

On August 7, 2026, one golfer was taking shelter under a tree during a heavy rainstorm with an umbrella and a set of golf clubs. He was recording video of his friends that were struggling to push a golf cart up a hill on the rain-slickened grass, while the videographer was laughing his head off. Lightning struck very near where he was and it was captured on the video. The videographer was fortunate to have survived with only hearing loss and temporary numbness.

On August 27, 2026, a man was walking on a sidewalk heading underneath a tree when lightning hit the tree and caused him to collapse. Fortunately, he was able to get up and was walking when he was called inside by a resident who saw the incident. Security camera footage captured the event. The survivor said he was walking to his car which was about 10-20 feet away when he felt the charge and collapsed. He was taken to Staten Island University Hospital where he was kept overnight for observation. The doctors found little in the way of physical evidence and he was released the next day.

9. Another individual was not so lucky. On September 8, 2026, a 20-year old Michigan man was on a walking path when lightning struck and killed him in Celebration, Florida. Bystanders attempted CPR. EMS responded at about 6:25 PM to a call about an unresponsive man on a walking path behind a hotel at the 700 block of Bloom Street. He was taken to AdventHealth Celebration, where he was pronounced dead.
10. Barb Stemple's dog Snickers, her companion for 18 years, passed away recently. This is an especially difficult loss for her as the dog was her source of comfort during lightning storms. She is presently looking for another support dog, but she is concerned whether a different dog will understand lightning the way she felt Snickers did.
11. DC welcomes your questions. Please send them via e-mail to Steve Clark at sclarktoto@gmail.com. Your medical questions will be forwarded to Dr. Phil Yarnell for his review and will usually be taken up for discussion in the next month's meeting. Please be advised any questions posed are for the general consideration by the group and any answers given do not constitute a formal medical opinion. If a formal evaluation is requested, arrangements can be made directly with Dr. Yarnell. If you have a medical emergency, please call 911 or your local EMS.
12. Questions, comments, error notifications, and critiques of these minutes are welcome. Please send them to Steve Clark. Please keep the communications professional and respectful. They will be forwarded to the appropriate author(s) of the minutes and addressed accordingly.

13. LDC Disclaimer: These minutes do not represent official positions of the LDC or its members. They simply reflect the comments made at the meeting. Furthermore, the LDC does not implicitly or explicitly recommend or endorse any product or service. Any product or service presented in these minutes is done so for purposes of discussion and analysis. The merit (or lack thereof) is open for the consideration and review by the entire membership.
14. Next meeting: Friday, November 13, 2026 (maybe, see text of minutes), from 11:45 AM to TBA. Meeting topic: TBA.

Respectfully Submitted,
Steven E. Clark
President, Lightning Data Center, Denver, CO

Lightning Links

This is a monthly listing of periodicals, websites, and videos about lightning and allied areas from a variety of sources. A headline or description is listed, followed by the link. Please note that some of the links are perishable, which means you'll need to go to the source for the information.

Lightning Strike & Electric Shock Survivors International.
Link: <https://www.lightning-strike.org/>

Shmatov, M., 2026: Possible Aerial Detection of Gamma Rays from Swarms of Ball Lightning in Tropical Thunderheads. *Journal of Atmospheric and Solar-Terrestrial Physics*. Elsevier Ltd. August 22, 2026.

Airborne Lightning Observatory for FEGs and TGFs (ALOFT) Website
Link: <https://ntrs.nasa.gov/citations/20230005812>

Werthmann, 2026: Colorado Golfers Describe Close Call After Lightning Strike at Fox Hollow: "A Flash of White Light". *CBS Colorado*. July 1, 2026.
Link: <https://www.cbsnews.com/colorado/news/lightning-strike-fox-hollow-golf-lakewood/>

Frankhouse, M., 2026: Cincinnati Golfer Struck by Lightning at Pebble Creek Survived with Temporary Numbness. *1077 WRKR, Townsquare Media, Inc.* August 13, 2026.
Link to Article & Video: <https://wrkr.com/golfer-struck-lightning-cincinnati/>

Fox 35 Digital Staff, 2026: Michigan Man Hit, Killed by Possible Lightning Strike in Florida: Sheriff's Office. Fox 35 Orlando. September 9, 2026.
Link: <https://www.fox2detroit.com/news/michigan-man-identified-after-apparent-lightning-strike-death-florida>

Feldman, J., 2026: Staten Island Man Struck by Lightning Speaks Out After Incident Caught on Video. *VIN News*. September 2, 2026.
Link to Article & Video: <https://vinnews.com/2026/09/02/staten-island-man-struck-by-lightning-speaks-out-after-incident-caught-on-video/>

Emergency Medical Services Treatment of Lightning Strike Survivors

Findings from the Lightning Data Center's First Responders Data Collection Project

Led by Carl E. Swanson III

Supported by Loraine A. Swanson, MPH
October 9, 2026

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White Paper from the Lightning Data Center, October 2026

**Struck Without a Standard: Why Lightning Injury Treatment Needs a Unified Emergency
Medical Services (EMS) Protocol**

Executive Summary

Lightning is one of the most underappreciated causes of traumatic injury in the United States as it is unpredictable, regionally concentrated, and clinically unusual enough that it doesn't fit neatly into standard trauma or cardiac protocols. Drawing on ten years (2015–2024) of EMS-reported incident data

collected by the Lightning Data Center from a sample of Emergency Medical Service (EMS) providers in Tennessee and Colorado, this paper documents a consistent and troubling pattern: the inconsistency is not in outcomes alone, but in how lightning strike victims are assessed, treated, documented, and transported.

Our review of 56 documented incidents, representing approximately 95 people struck, 27 visible injuries, and 8 fatalities, found no shared clinical language, no consistent documentation of core interventions like CPR and defibrillation, and wide variation in transport and disposition decisions for clinically similar presentations. These findings echo recent clinical literature calling for a standardized lightning injury treatment protocol, and they provide ground-level, incident-by-incident evidence of exactly the gap that literature describes.

This paper is intended to do two things: present the data plainly, and make the case to EMS field leadership, state EMS offices, and protocol-writing bodies that the time to standardize treatment protocols for first responders and emergency medical service providers is now.

1. Why Lightning Injuries Are Different

Lightning strikes don't behave like other traumatic injuries, and that's precisely what makes inconsistent protocols so costly.

- Injuries are often invisible. Unlike blunt trauma or burns from fire, lightning injury can leave no external mark at all, even when it has caused serious internal, neurological, or cardiac effects.
- "Reverse triage" applies. In a multi-casualty lightning event, the patient who appears dead (in cardiac or respiratory arrest) is often the most salvageable, because lightning-induced cardiac standstill can be reversible with prompt CPR — the opposite of triage logic used in most other mass-casualty settings.
- Presentations vary wildly by mechanism. A direct strike, a side flash, ground current, and contact injury can all produce different injury patterns from the same storm, the same call.

These features mean that without a shared, lightning-specific protocol, individual responder judgment, however well-intentioned, fills the gap, and that judgment will naturally vary.

2. About This Data

The Lightning Data Center has tracked EMS-reported lightning casualty incidents since 2015, drawing on:

- Direct incident reports from EMS and fire agencies
- Hospital and emergency department follow-up where available
- Verified media reporting, used only to supplement and corroborate first-responder accounts

This paper draws on incident-level records from 2015–2024 across Tennessee and Colorado, two states selected for the consistency and duration of available reporting. In total, the dataset includes 56 incident records from the main yearly logs and 4 fully detailed cases from a supplemental 2015 incident log.

Limitation: This is an observational dataset built from varied reporting sources, not a controlled registry. Its value is not in precise epidemiological rates but in revealing systemic patterns in how incidents are assessed, treated, and recorded — which is the paper's focus.

3. What the Data Shows

3.1 No shared clinical language

Reviewing the "level of consciousness" field alone, responders recorded patient status using at least nine different formats for what was often the same underlying assessment; full phrases, abbreviations, and shorthand that varied agency to agency. When a basic orientation assessment can't be written down the same way twice, it cannot be reliably compared, audited, or used to flag patients who are deteriorating.

3.2 Core interventions are inconsistently documented

Across the dataset, whether CPR or a defibrillator was used was left entirely unrecorded in roughly two-thirds of incidents (not marked "not performed," simply blank). This is not necessarily evidence that care was withheld; it is evidence that there is no standard requiring these fields to be completed, which means the data needed to evaluate protocol adherence or outcomes simply doesn't exist for most cases.

3.3 Fatal cases show uneven resuscitation documentation

Of the 8 fatalities recorded, 5 had CPR documented as having been administered; 2 had no CPR status recorded at all. Given that lightning-induced cardiac arrest is frequently reversible with prompt, sustained resuscitation, the absence of consistent documentation around resuscitation attempts represents a meaningful gap both for evaluating care in the moment and for building the evidence base for future protocol refinement.

3.4 Strike mechanism is inconsistently classified

"Type of strike" entries ranged from clear clinical categories (side flash) to single uncoded letters with no corresponding legend. Since injury pattern and severity can differ meaningfully by mechanism, inconsistent classification limits the ability to correlate mechanism with outcome, a correlation that would directly inform protocol design.

3.5 Disposition decisions vary for similar presentations

The dataset includes cases where multiple patients struck in the same incident had different outcomes in terms of transport versus refusal of care. In one incident, five patients struck by a single side flash all declined treatment on scene. Because lightning injury severity is not always apparent on initial presentation, variation in whether patients are transported, observed, or released reflects the absence of agreed field criteria for when transport should be mandatory regardless of apparent severity. Reliance on the patient to determine if emergency treatment is needed should not be acceptable unless it is an informed and educated decision.

4. How This Connects to Clinical Literature

These findings are not occurring in a vacuum. Recent clinical review work on lightning injuries has identified recurring pitfalls in lightning victim assessment and treatment and has proposed a structured treatment protocol intended to standardize care¹. The Lightning Data Center's incident-level findings provide real-world, field-level corroboration of the gap that literature identifies. Not from a hospital chart review, but from the EMS response itself, where the first and often most consequential decisions are made.

5. What Standardization Would Change

A standardized EMS lightning injury protocol would not replace clinical judgment, but rather it would give that judgment a consistent foundation. Based on the gaps identified above, such a protocol should address:

1. A shared, structured consciousness/severity assessment specific to lightning injury presentations, reducing reliance on ad hoc shorthand.
2. Mandatory documentation fields for CPR, defibrillation, and cardiac status on every lightning-strike response, regardless of apparent severity. "Not performed" and "unknown" should be explicit options, not blanks.
3. Reverse-triage guidance for multi-casualty lightning events, ensuring patients in apparent cardiac arrest are not deprioritized.
4. Receipt of key interventions such as a prompt neurological assessment².

1 van Ruler R, Eikendal T, Kooij F ...**A shocking injury: A clinical review of lightning injuries highlighting pitfalls and a treatment protocol**, Injury, 2022; 53, 3070-3077

2 Jensen, J.D. · Thurman, J. · Vincent, A.L. **Lightning injuries**. Statpearls. StatPearls Publishing LLC., Treasure Island (FL), 2021

5. Standardized strike-mechanism classification to support future research correlating mechanism with outcome.
6. Clear transport criteria for lightning strike patients, acknowledging that injury severity is frequently not apparent on scene.

6. A Call to Action

This paper is a starting point, not a finished protocol. The Lightning Data Center is sharing these findings with:

- State and regional EMS offices, to inform local protocol review
- Emergency medicine researchers, to support further study correlating documentation gaps with patient outcomes
- EMS training programs, to incorporate lightning-specific assessment into existing severe-weather and environmental injury curricula
- Survivors and survivor communities, whose lived experience of inconsistent care is reflected in, and validated by, this data

We invite EMS agencies, researchers, and policymakers to use these findings as part of the evidence base for developing and adopting a standardized lightning injury protocol — and we welcome collaboration from any organization working toward that goal.

Appendix A: Summary Data Table

Metric	Value
Years covered	2015–2024
States covered	Tennessee, Colorado
Total documented incidents	56 (+ 4 detailed 2015 cases)
Total persons struck	~95
Total injured	27
Total fatalities	8
Incidents with CPR status undocumented	~63%
Incidents with defibrillator status undocumented	~71%
Distinct formats used for "level of consciousness"	9

Appendix B: Acknowledgments

[Space to credit reporting EMS agencies, partner fire departments, and any survivors who contributed incident detail.]

For questions about this data or to contribute incident reports, contact the Lightning Data Center at [contact info].

Presentation to Emergency Medical Services Personnel

"We Know How to Treat Lightning Strikes. The Problem Is We're Not All Doing It the Same Way."

In July 2016, two 23-year-old men were sheltering under a tree at a golf course in Arvada, Colorado, standing about six feet away. Lightning struck. One man walked away. The other didn't make it. A bystander's daughter, who happened to have lifeguard training, started CPR before EMS even arrived. Here's the question I want you to sit with: if that happened in your county, today, would your EMS crew's response look the same as the crew three counties over? Based on ten years of incident records reviewed by the Lightning Data Center, the honest answer is: "probably not."

The Lightning Data Center looked at EMS-reported lightning casualty data spanning 2015 to 2024 which included 56 documented incidents, about 95 people struck, 27 injured, 8 fatalities. And what jumped out wasn't bad treatment. It was *inconsistent* treatment and inconsistent documentation of treatment, which is its own problem, because if we can't see what was done, we can't learn from it. One of the biggest findings from the data is that many people refuse treatment after being struck by lightning. In one 2022 Colorado incident, five people were struck by a side flash at a park. All five refused treatment on scene. We don't know if that was a well-informed refusal or a gap in how risk was communicated to them because lightning injuries can look deceptively mild at first and still involve serious internal effects.

This lines up with what's in the current clinical literature on lightning injuries. Researchers reviewing these cases in more systematic and complete ways have identified recurring pitfalls in how lightning victims get triaged and treated, and they've proposed a standard treatment protocol specifically to close that gap. What our findings show isn't a counterargument to that, but rather additional proof of exactly the problem they're describing.

None of this is about any one crew doing their job wrong. Every one of these calls was handled by someone doing their best with the information and training they had in the moment. The point is that 'their best' shouldn't have to vary this much from one county to the next and that's why a shared protocol is needed.

Lightning strike survival is often better than people expect. If the right steps happen fast, in the right order, every time, we can continue to improve the care in the field by EMS providers. A standard protocol doesn't replace judgment in the field. It just means that two patients, feet apart, get the same chance.

Delivery notes

- Keep numbers sparse in the spoken version. 3–4 numbers max (95 struck, 8 fatalities, "two-thirds of records") as any more than that and the audience stops listening to the story and starts doing math in their head.
- Use one case, not four. The Arvada case carries the whole talk if you let it.
- Don't over-claim causation. We don't know if different treatment in Arvada would've changed the outcome so don't imply that. The honest, more persuasive claim is about *consistency and documentation*, not about placing blame on a specific call.
- If we can, end with an ask, not just a reflection, something more like "We ask you to join us in adopting [a protocol / a documentation checklist]". A room full of EMS personnel responds better to a concrete next step than to a rhetorical close.

Letter to the Lightning Strike and Electrical Shock Survivors International or other Survivors

To those who were struck by lightning and didn't get the care that reflected the seriousness of what happened to you:

What happened to you was real, and it mattered, even if the response you got in the moment didn't fully reflect that.

Lightning injuries are deceptive. There can be no visible mark, no obvious damage and still, something serious happening inside. Sometimes the person looks fine standing up and is anything but fine inside. That's not just something we are saying to make you feel better. The clinical literature itself describes this as one of the central challenges in treating lightning strikes; injuries that don't look like what they are, patients who get assessed as "stable" when they're not, care that varies wildly from one provider, one county, one state to the next. If your experience didn't match the seriousness of what you went through, that's not a reflection of you misjudging your own pain or minimizing what happened.

We at the Lightning Data Center heard your stories over the years. We started a data collection project in 2015 to see what we could learn. The data we collected over ten years backs this up: across years of incident reports, the same gaps show up again and again. Good people doing their best, with inconsistent ways to document, inconsistent follow-up, no shared standard for what "comprehensive care" should look like for a lightning strike.

You're not alone in this, and you're not imagining the gap.

That gap is exactly what this data is for. Every incident record becomes part of the evidence that demonstrates why EMS systems need to develop a standardized protocol for lightning injuries. That means the inconsistency you experienced isn't just a bad moment that happened and ended. It's information. It's part of what gets used to make sure the next person struck by lightning, in your town or somewhere else entirely, gets a more consistent, more complete response than you did.

The Lightning Data Center appreciates your ongoing partnership. We are committed to sharing the findings of the data collected, advocating for a standard treatment protocol, and continuing to learn from your experiences.

Data Summary for Lightning Casualties: EMS Treatment Variability, 2015–2024

Scope of the data

15. **56 documented incident records** across the yearly TN/CO sheets (2015–2024), plus a separate 2015 "incidents" log with 4 fully-detailed patient cases.
16. Combined, these records account for **~95 people struck, 27 reported as injured, and 8 fatalities**.
17. Data was submitted by a mix of EMS agencies, fire departments, media reports, and direct first-responder accounts — not a single standardized intake form.

Finding 1: No consistent documentation of core resuscitation steps

Looking at the fields every sheet tried to track — CPR, Defibrillation, Cardiac Arrest status — the overwhelming pattern is absence of data, not consistent presence or absence of treatment:

Field	Documented "yes/given"	Documented "no"	Left blank / not recorded
CPR	6	13 (0/n)	35
Defibrillator used	3	10 (0/n)	40
Cardiac arrest noted	1	4	51

In **over 60–70% of records**, responders simply didn't record whether these interventions were considered or performed — meaning there's no way to confirm from the record whether a resuscitation protocol was followed or skipped.

Finding 2: Fatal cases show CPR was not uniformly applied or logged

Of the 8 fatalities in the dataset, **5 had CPR documented as administered** and **2 had no CPR data at all** (neither confirmed nor denied) — including one case on the 2016 sheet narrated only through a news article rather than an EMS record, where bystander CPR (not EMS-initiated) was the only resuscitation effort mentioned.

Finding 3: No shared language or scale for assessing patients

The "Level of Consciousness" field — meant to capture a standardized neurological status — instead contains **nine different free-text entries** across records, including:

"Alert," "A/Alert," "A&OX4," "a/o xo," "a/ox4" (five different ways of writing the same Glasgow-style orientation assessment)

"Unconscious," "awake," "1 minute only" "Lucid." (unclear/non-standard entries)

This indicates individual medics or agencies were using their own shorthand rather than a shared assessment scale which makes it impossible to compare neurological severity consistently across incidents.

Finding 4: Strike mechanism terminology is inconsistent

In many cases the strike mechanism (direct strike, side flash, ground current, contact, streamer) either wasn't assessed in the field or wasn't translated into the spreadsheet in a standardized way. Strike mechanism matters clinically (it affects likely injury pattern) and needs to be understood by EMS.

Finding 5: Transport and on-scene-treatment decisions varied widely

Scanning the narrative "Details" fields (50 entries with free text) for treatment-related language:

- **"Treated on scene"** appears 3 times
- **"Transport[ed]"** appears 3 times
- **"Refused" / "declined"** care appears 3 times combined
- One well-documented 2022 Colorado incident involved **5 patients who all refused treatment** after a side-flash event
- IV administration is mentioned 9 times, but with no consistent indication of when it was or

wasn't used for comparable presentations

This shows real variability in *disposition decisions* (transport vs. refusal vs. treat-and-release) for patients with similar strike mechanisms, which is exactly the kind of variability a standardized field protocol could reduce.

How this supports the case for standardized EMS protocols

The data collected is consistent with the conclusion that lightning-strike patients receive inconsistent treatment from EMS. What we do not know from the format of the data collected is this because of **inconsistent documentation or inconsistent assessment language**, which itself is a symptom of the absence of a shared protocol. Findings that could be confirmed with future studies:

1. **No shared severity scale** → can't reliably triage or compare patients across agencies.
2. **No consistent resuscitation documentation** → can't audit whether CPR/AED guidelines (e.g., prioritizing resuscitation of apparently "dead" lightning victims, since cardiac standstill is often reversible) were followed.
3. **No shared strike-mechanism classification** → can't correlate mechanism with outcome to refine future protocols.
4. **Inconsistent disposition decisions** (refuse vs. transport) for similar presentations → suggests no agreed field criteria for when transport is mandatory.

Caveats of this Study

- Sample size is small (n=56 main incidents + 4 detailed 2015 cases), and some years had zero reported strikes, so year-over-year trend claims should be made cautiously.
- Several records are sourced from media articles rather than EMS run sheets, which naturally lowers data completeness and isn't itself evidence of EMS inconsistency. This was noted in the analysis, so it isn't conflated with the EMS documentation gaps above.
- This summary reflects what's recorded in the spreadsheet only; it doesn't independently verify underlying EMS run reports.