Analyzing Discourse: Lightning Safety Protocols for Indoor Swimming Pools

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This paper examines the controversy surrounding the closure of indoor swimming pools in the event of a thunderstorm, especially the risk of lightning strikes. Some argue for caution and advocate for pool closures to mitigate potential risks, while others argue that grounded indoor swimming pools can minimize risks and remain safely open. This paper attempts to comprehensively understand the factors affecting indoor swimming pool safety decisions in the event of a thunderstorm by analyzing them from various perspectives such as safety guidelines and regulatory requirements.

Swimming is a cherished leisure activity enjoyed by millions around the world. However, ensuring the safety of swimmers, especially in adverse weather conditions such as thunderstorms, poses a significant challenge. Outdoor swimming pools are typically closed during these weather events due to the risk of lightning, but the situation with indoor pools is more complex. Some facilities choose to close indoor swimming pools as a precautionary measure, while others rely on safety measures and grounding systems to effectively manage risks.

Existing articles and literature on indoor swimming pools and lightning hazards reveal a wide spectrum of perspectives. While experts argue for the safety of well-maintained indoor swimming pools, institutions like the Young Men's Christian Association (YMCA) and Federal Emergency Management Agency (FEMA) advocate caution, recommending measures such as avoiding plumbing and windows during lightning storms. Regulatory documents, like the National Electric Code (NEC), stress the necessity of grounding electrical systems to mitigate lightning damage. Nevertheless, concerns persist regarding the adequacy of older swimming pool infrastructure, prompting questions about the effectiveness of safety measures. As stated by the American Red Cross in the ACFASP(Advisory Council on First Aid, Aquatics, Safety, & Preparedness) Scientific Report, "The existing lightning safety recommendations and practices primarily depend upon logical conjecture and expert opinion as does this advisory." "...there appear to be no studies upon which several agency policies are based beyond logic and risk management principles."(228, 4, 2010) Despite the gap between scientific evidence and recommendations, adherence to existing lightning safety guidelines is urged due to the potential severity of lightning strikes. However, there is a call for further scientific studies to provide a more solid basis for recommendations concerning swimming pools and lightning.

Several sources emphasize the critical importance of implementing lightning safety protocols in indoor swimming pools due to the potential risks posed by thunderstorms. The YMCA of the USA, The National Lightning Safety Institute, and Redwoods all recommend temporary closures during lightning storms to prioritize patron safety. Swanson and Clark (2016) highlight the inherent dangers patrons face during thunderstorms, emphasizing that being indoors does not guarantee safety, particularly in improperly grounded pool structures. They advocate for clear evacuation procedures and education on lightning hazards. Traxler (2018) discusses the

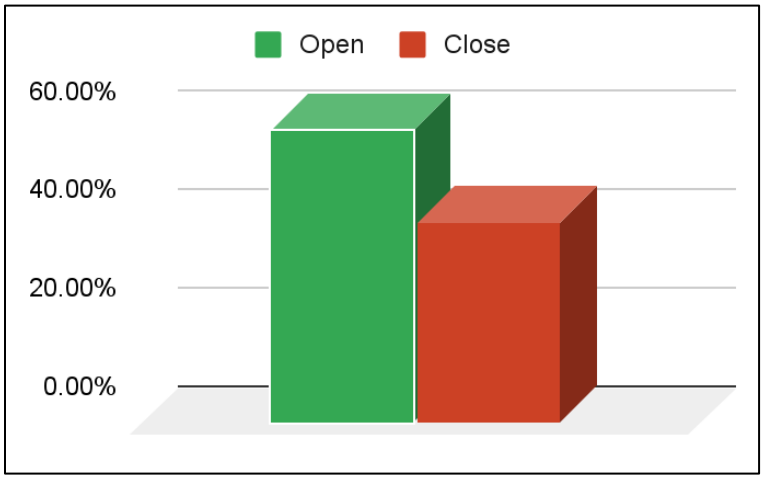
proactive closure of the Mitchell Indoor Aquatic Center during lightning storms, based on the American Red Cross' recommendation. Despite arguments for keeping pools operational, officials prioritize safety and adhere to lightning safety guidelines. Overall, these sources underscore the paramount importance of prioritizing patron safety and implementing clear lightning safety protocols in indoor swimming pools.

Many inconsistencies and misconceptions exist regarding the lightning safety protocol for indoor swimming pools. Pool operators may assume patrons are safer from the elements in an indoor pool because it is indoors. This assumption, however, is not necessarily accurate. Some examples of inconsistent protocols are highlighted by Swanson and Clark (2016): "Patrons are evacuated only when lightning is 2 miles away and closing. Patrons are allowed back in the pool when 10 seconds have elapsed after the sound of thunder. Some agencies do not evacuate their indoor pools at all. Some agencies vacillate between evacuating and not evacuating the pool."

To illuminate current practices, the internship supervisor Zachary Altman and the author conducted two distinct polls within the Aquatic Directors & Managers Facebook Group and the AOAP (Association of Aquatic Professionals). These polls are integral to our ongoing project, which aims to scrutinize whether indoor pools should be closed during thunderstorms or remain operational.

Figure 1

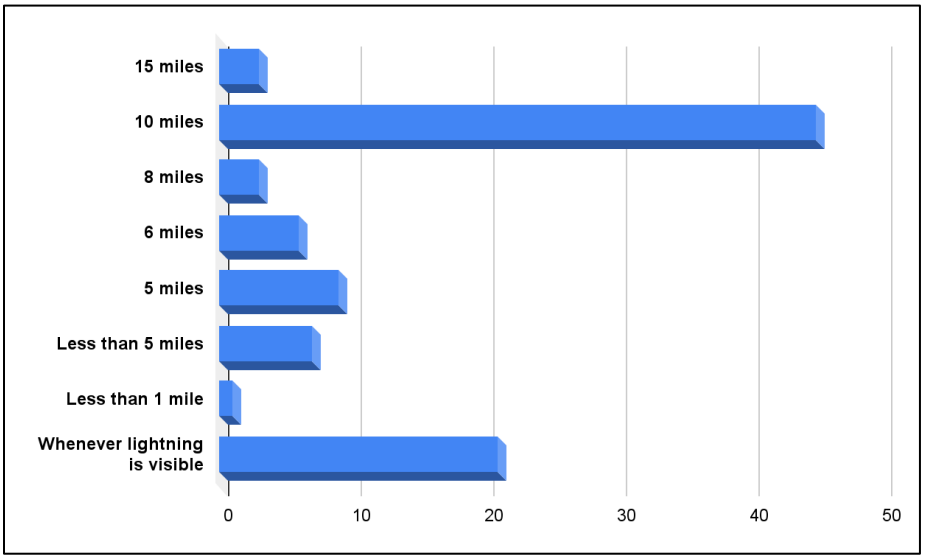
Opinions on Indoor Pool Closure



Note. From the Facebook poll, we garnered responses from 289 individuals, unveiling a divided opinion: 117 (40.5%) advocated for the closure of indoor pools during thunderstorms, while 172 (59.5%) argued they should remain open.

Figure 2

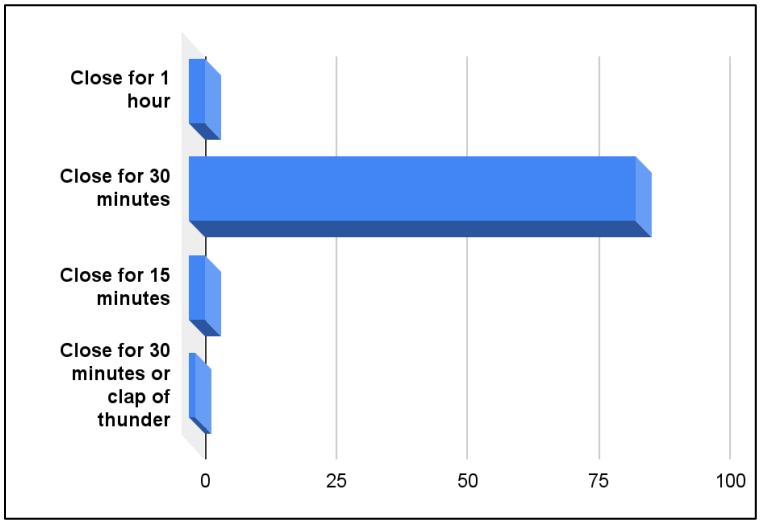
Variability in Opinion on Pool Closure Distance During Lightning Strikes.



Note. Analyzing the poll data reveals different views on how far pools should close during bad weather. Most (45) suggest a 10-mile limit, but some say 15 miles, 8 miles, or even less. A few (21) think pools should close when lightning is visible, prioritizing immediate safety. These diverse opinions highlight the challenge of deciding when to close pools to keep people safe.

Figure 3

Diverse Perspectives on Post-Lightning Strike Pool Closure Duration



Note. Opinions on how long pools should remain closed after bad weather varied. Most (85) favored a 30-minute closure after the last lightning strike, while three opted for an hour. Three respondents suggested a 15-minute closure, and one proposed 30 minutes after the last lightning strike or thunder.

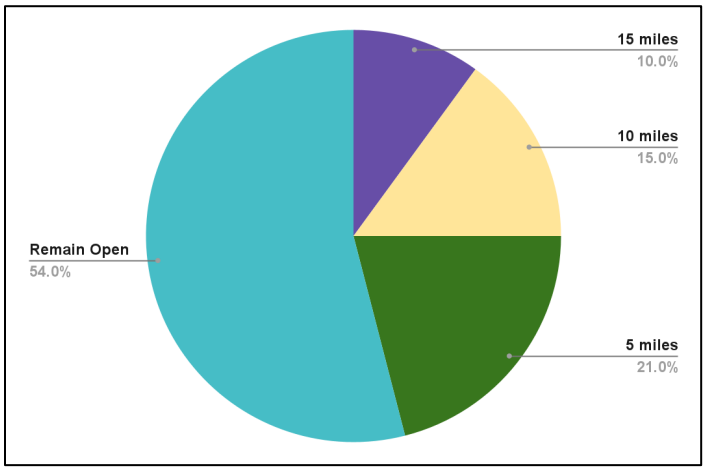
Figure 4

AOAP Indoor Facilities Lightning Closure Survey Results

Note. In the second poll conducted via AOAP, results regarding closure for lightning were as follows: 54.8% of indoor facilities surveyed do not close for lightning, while 45.2% do close for lightning.

Figure 5

Lightning Closure Criteria Among Aquatics Employers Surveyed on AOAP Website



Note. Among the facilities that choose to close during lightning, the closure criteria are distributed as follows: 10% close when lightning is within 15 miles, 15% when within 10 miles, and 21% when within 5 miles. The majority, comprising 54%, do not close for lightning.

These findings underscore the imperative need for clearer guidelines and consensus within the aquatic community regarding lightning safety protocols for indoor swimming pools.

The debate over whether indoor swimming pools should be evacuated during electrical storms has sparked considerable controversy in recent years, with diverging viewpoints shaping the discourse. In a thought-provoking article titled "When Lightning Strikes" published in Aquatics International, Tom Griffiths and Mathew Griffiths argued that “There are no documented reports of fatal lightning strikes at indoor swimming pools. None! Ever! Ninety-five percent of all fatal lightning strikes occur outdoors, not indoors.” They posited that the building shell around the pool and the required electrical "ground fault" system offer sufficient protection for swimmers. Additionally, they expressed concern that forcing patrons to exit the pool during a thunderstorm might inadvertently increase their risk by directing them towards areas with extensive plumbing, such as showers or locker rooms, or even worse, outside to parking lots where the risk from lightning is particularly high.

Moreover, Griffiths and Griffiths likened lightning strikes to shark attacks, emphasizing their rarity. They noted that despite sensationalized media coverage, there is no documented case of a lightning strike killing someone in an indoor pool. This comparison underscores the need for data-driven decision-making and challenges the perception that indoor swimming pools are unsafe during electrical storms.

In response to Griffiths and Griffiths' assertions, Richard Kithil, President and CEO of the National Lightning Safety Institute (NSLI), presented two rebuttal articles on the NLSI website (Stephen J. Langendorfer, Editor International Journal of Water Research and Education). Kithil advocated for a conservative and liability-oriented approach, emphasizing that the absence of lightning-related injuries or fatalities in indoor pools does not guarantee immunity from such occurrences. He cautioned that “...lightning is notoriously ‘fickle’, that electrical ground fault systems, especially older ones, might be overwhelmed by the high voltage of a lightning strike and that liability issues arising from a sound risk management system should dictate being conservative and removing patrons. (Langendorfer, Editor International Journal of Water Research and Education)". Kithil further pointed out that while some organizations like the YMCA and NCAA have guidelines for closing indoor pools during lightning storms, such policies are not universally adopted (YMCA Services Corporation, 2003).

Additionally, I received an email from Kithil, who pointed out disparities in the implementation of lightning safety policies and highlighted the existence of individuals who lack

knowledge, often referred to as "Deniers". He emphasized the obligation to warn about the potential risks of swimming in a lightning storm and the potential liability and lawsuits that could arise from neglecting safety measures. Kithil's suggestion was that if thunder was heard suggesting that lightning was close, the activity should be stopped. In addition, he suggested that the relatively low number of lightning-related incidents in indoor swimming pools may be due to the widespread adoption of recommendations from several organizations. Finally, Kithil emphasized the simplicity of safety measures in the face of the lightning threat and urged customers to be careful and comply with guidelines for their protection.

Despite the ongoing debate, there is a notable absence of direct guidelines from expert organizations such as the AMS (American Meteorological Society) regarding the specific risks associated with lightning and indoor pools. Stephen J. Langendorfer, the Editor of the International Journal of Water Research and Education, expressed intrigue over this oversight, suggesting that scientific organizations with expertise in lightning safety should take the lead in providing clear recommendations. Langendorfer posited that until such standards are established, aquatic professionals should exercise caution and consider closing indoor facilities during electrical storms to prioritize the health and safety of patrons. He underscored the importance of providing safe areas away from plumbing for patrons during thunderstorms and emphasized that the primary concern should be patron safety rather than liability concerns. This perspective highlights the need for careful consideration and risk assessment in decisions regarding indoor swimming pool safety during thunderstorms. Transitioning from Langendorfer's perspective, DeRosa's study reveals the fragmented approach to indoor swimming pool safety during thunderstorms, highlighting the lack of consensus and uniformity in safety practices across facilities.

In a study conducted by Shawn DeRosa, this study explores into expert opinions on how swimming facilities respond to lightning storms and the urgency of updating procedures to address identified safety concerns. With visitor safety being paramount, the examination focuses on understanding how swimming facilities have handled electrical storms in the past. Despite the passage of time, minimal changes in practices were observed, revealing a lack of consensus on the best approach to dealing with anticipated electrical storms. This lack of uniformity across facilities underscores the need for clearer safety guidelines. The study also revealed that 80% of surveyed individuals adhere to safety organization recommendations, highlighting a lack of consistency in the advice provided by these entities. Consequently, facility operators are left grappling with uncertainty when making safety decisions. As DeRosa emphasizes, "This leaves operators to wonder: Which is it? Is it safe to count seconds from flash to bang, or should we move indoors immediately, assuming that audible thunder indicates we are within striking distance?" The findings underscore the necessity of establishing concrete safety protocols. Furthermore, the study identifies areas where operators may unintentionally compromise the safety of staff and customers, such as deficiencies in bonding and grounding measures. As

DeRosa points out, "Some troubling findings in my survey bring this into more stark relief, showing where operators may inadvertently place staff and clients at risk." A significant portion of surveyed individuals lacked awareness regarding these essential safety measures. As DeRosa concludes, "These findings underscore the importance of establishing specific guidelines to ensure appropriate responses to electrical storms in swimming facilities."

Moreover, the decision of some facilities to keep indoor swimming pools open during thunderstorms is based on considerations of grounded systems and regulatory compliance. While safety guidelines advocate caution and closure, some facilities choose to keep indoor swimming pools open for reasons of grounded systems and regulatory compliance. However, actual accidents show potential risks associated with indoor swimming pools in the event of a thunderstorm and highlight the need for careful risk assessment and the implementation of appropriate safety measures. "Proponents of closing indoor swimming pools during electrical storms base their logic upon the existing lightning safety recommendation that persons should avoid contact with water or plumbing during lightning storms of which indoor swimming pools would be prime examples." (ACFASP Scientific Report: Lightning Safety for Indoor Swimming Pools)

The debate surrounding the closure of indoor swimming pools during thunderstorms has revealed various perspectives and considerations. Through this, it has been reaffirmed that the safety of swimmers must always be paramount. At the heart of the debate lie discussions on the effectiveness of safety measures, the structural integrity of indoor swimming pools, and understanding potential risks. While some argue that safety measures are sufficient, actual incidents continue to occur, emphasizing the need for careful risk assessment and robust safety procedures. The absence of clear guidelines from expert organizations such as the American Meteorological Society (AMS) highlights the complexity of the issue.

Considering these facts, it becomes evident that prioritizing safety is crucial. While awaiting clearer guidelines, advocating for temporary closure of indoor swimming pools, and providing safe spaces aligns with a safety-first approach. It is believed that through such measures, the safety of patrons can be ensured to the best of our ability. While the debate may persist, decisive actions for safety must be taken. Moving forward, collaborative efforts with experts are needed to develop comprehensive guidelines. This will enable adherence to best practices in safety management and facilitate ongoing dialogue to create a safe environment. Additionally, there is a need for comprehensive programs and education addressing indoor swimming pool safety issues to enhance understanding and response capabilities. This will contribute to ensuring the safety of both patrons and staff while resolving the debate.

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