



FINAL REPORT

June, 2021

Conclusions

Snorkel Induced Rapid Onset Pulmonary Edema (SI-ROPE)

- Snorkel Induced Rapid Onset Pulmonary Edema (SI-ROPE) is a common factor in snorkel-related drowning and near-drowning events.
- Risk factors associated with the development of SI-ROPE are:
 1. Degree of the snorkel's resistance to inhalation
 2. Certain pre-existing medical conditions
 3. Increased exertion
- Among survey participants,
 - Aspiration (inhalation of water) was rarely the trigger or even a factor in near-drowning incidents while snorkeling
 - Lack of swimming or snorkeling experience was rarely a factor in snorkelers getting into trouble
 - Almost all events took place where the person could not touch bottom
 - 38% used a full-face mask. 90% of those who wore a full-face mask considered it a contributing factor to their trouble.

The typical sequence of a SI-ROPE drowning was:

1. Sudden shortness of breath, fatigue, loss of strength
2. Feeling of panic, doom, need for assistance
3. Diminishing consciousness

While able to identify with confidence the existence and process of SI-ROPE, the Study was unable to confirm a correlation between recent prolonged air travel and SI-ROPE. However, data and physiological functions strongly support that possibility. There is potential for additional studies to address this, and we encourage further research in this field.

Next Steps

Because snorkel related incidents often occur quickly and without obvious struggle, it is difficult for an observer to distinguish between someone in distress from someone enjoying snorkeling.

Responsibility for personal safety lies primarily with the snorkeler

The Snorkel Safety Study was tasked with proposing safety messages; however it was not tasked with implementation.

Proposed Safety Messages

Recreational snorkeling is not a benign low-risk activity. This is true both for inexperienced and experienced swimmers and snorkelers. The risk of drowning is higher among visitors.

- Swim with a buddy.
- If you can't swim, don't snorkel.
- Choose snorkel devices thoughtfully. Avoid constrictions in bore size or mouthpiece caliber, which may increase resistance to inhalation.
- Stay where you can touch the bottom comfortably.
- If in doubt about your cardiovascular health – don't go out.
- It may be prudent to wait several days after arrival in Hawai'i by air before snorkelling.
- Beware of drifting away from your base, check your location frequently.
- Shortness of breath can be a sign of danger. Stay calm, remove snorkel, breath slowly and deeply, stand up, get out of water immediately.

Suggested actions

- Advise emergency responders of the SI-ROPE phenomenon and the likely involvement of pulmonary edema unrelated to aspiration in snorkel-related cases.
- Develop a statewide public education program addressing snorkeling safety, with special emphasis at places commonly used for snorkeling.