



# Clinical Update

## For Telephone Triage Nurses

June 2017

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### Did You Know...?

Drowning usually happens quickly and quietly:

- ✓ Children struggle only 15-20 seconds before final submersion.
- ✓ Adults can struggle for about 60 seconds.



## “Dry” Drowning: Sailing Through Parental Concerns

The summer months can bring an increase of calls regarding children and water submersion incidents. We all have heard the occasional media report about children who seemed fine right after a submersion event and then developed trouble breathing hours later. These reports often use terms such as “dry” drowning or “delayed” drowning. Parents worry this might happen to their child after a brief minor water incident. So, what are the facts triagers need to know regarding these testimonials?

### Drowning Definition and Terms

The World Health Organization now uses one universal definition for drowning. Drowning is “the process of experiencing respiratory impairment from submersion/immersion in liquid.” They recommend not using terms such as “near, wet, dry, delayed, or secondary” to describe drowning. These terms create confusion, and their use hinders accurate data collection and reporting.<sup>4</sup>

However, the following confusing terms still appear on the Internet and in other media:

- *Delayed or Secondary Drowning*: A delayed onset of respiratory distress or other hypoxic complications of drowning. (See “Delayed Onset of Symptoms” below). This is what some parents worry about and prompts calls. They may label this concern as “dry” drowning.
- *Dry Drowning*: In the medical world, dry drowning is suffocation from reflex laryngospasm that occurs during the drowning process. No water is aspirated into the lungs. Fatal dry drowning appears to be very rare (2%), as the vast majority of drowning victims have evidence of aspirated water on autopsy (98%).<sup>1</sup> Reports concluding delayed symptoms are from “dry” drowning might be inaccurate due to confusion over the term’s meaning. **Regardless of true medical definitions, neither “delayed” nor “dry” drowning happen with minor water events.**

### Drowning Outcomes

Depending on the length of submersion and when the drowning process is interrupted, the outcome can range from no injury at all to severe injury or death. A brief entry of liquid into the airway and subsequently cleared by coughing is harmless. Most drowning victims will recover spontaneously, and more than 94% of lifeguard rescues did not need any further medical attention.<sup>5</sup> However, at the other end of the spectrum, water aspiration can lead to hypoxemia, lung damage and neurologic impairment. The degree of anoxic damage determines final outcome.

### Delayed Onset of Symptoms

Pulmonary changes from water aspiration can happen immediately or can be delayed. Following a major submersion event, pulmonary deterioration and pulmonary edema have been reported as long as 12 hours afterwards. Children usually develop symptoms within 7 hours.<sup>3</sup> Initially, victims can be asymptomatic with normal chest x-rays and oxygen saturations. Lung damage from hypoxia and aspiration can cause surfactant destruction, atelectasis and Acute Respiratory Distress Syndrome (ARDS) later on. Late onset neurological deterioration secondary to cerebral edema also has been described. Asymptomatic patients of a major submersion event should be watched in the ED for 4-8 hours,<sup>2,3</sup> although the delayed onset of symptoms is rare (5%).<sup>2</sup>

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### Vomiting Water After a Submersion Incident

- Drowning victims swallow much more water than they aspirate.
- Vomiting water after immersion may be a soft marker for a more serious event. It occurs in 30-85% of drowning victims.<sup>4</sup> Vomiting usually means the victim has been unable to keep their mouth above water for a significant period of time.
- Therefore, all children who vomit water after being submerged deserve to have their lungs examined to be sure they haven't also aspirated water.

### Hyponatremia and Water Intoxication (Especially in Kids Under 12 Months)

- Swallowed water can lower the blood sodium (hyponatremia) and cause water intoxication.
- Babies under 12 months are at greatest risk of this because their immature kidneys may not be able to keep up with the water load.
- If they swallow lots of water, they need their electrolytes checked.
- Symptoms of hyponatremia are twitching, irritability, strange behavior, a confused look, "zoning out", and seizures.

### Triage Implications - Go to ED Now

- Persistent or new coughing, trouble breathing, vomiting, and/or abnormal behavior should all be seen now. (See our Drowning guideline)
- Risk factors that may indicate a more serious submersion event also warrant ED referral, even if asymptomatic now:
  - Alcohol or drug ingestion (alcohol use present in 50% of teen drownings)
  - Breathing had stopped or was limp when pulled out of the water
  - CPR required
  - Caller's report doesn't sound credible or story is inconsistent (R/O: NAT, neglect)
  - Chronic medical problems (such as epilepsy, diabetes type 1, heart disease or arrhythmias, intellectual disabilities, autism, etc.). These patients are at higher-risk.
  - Unwitnessed submersion event

### Triage Implications – Home Care

- If a child coughed briefly and is acting normally (asymptomatic) now after a brief witnessed submersion, it is safe to watch that child at home.
- Provide reassurance for minor water events. An example is a child who briefly chokes on some water and then seems fine. Neither "dry" nor "delayed" drowning happen with a brief witnessed dunk underwater nor a minor wave splash to the face. Again, these drowning complications are only associated with more serious submersion incidents.
- Just to be cautious, however, instruct parents to watch their child for any development of symptoms over the next 24 hours with any submersion event.
- Also, educate parents regarding water safety and drowning prevention. This is key to keeping children safe. **Remind callers to keep younger children within an arm's length when around any water and provide undistracted supervision at all times.**

### References:

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