Lifeguard Vigilance Studies

Every second counts in a drowning incident. The longer a victim is submerged, the greater the chance of permanent brain damage or death. According to the National Safe Kids Campaign, the majority of children who survive a potential drowning (92 percent) are discovered within two minutes following submersion, and most children who die (86 percent) are found after 10 minutes. Nearly all who require cardiopulmonary resuscitation (CPR) die or are left with severe brain injury.

If a lifeguard can spot a swimmer in distress within the first ten seconds of a drowning incident, and reach him to initiate aid within an additional twenty seconds, it is unlikely a drowning accident, or severe injury, will occur. Recent test results, however, show that this goal is often unmet.

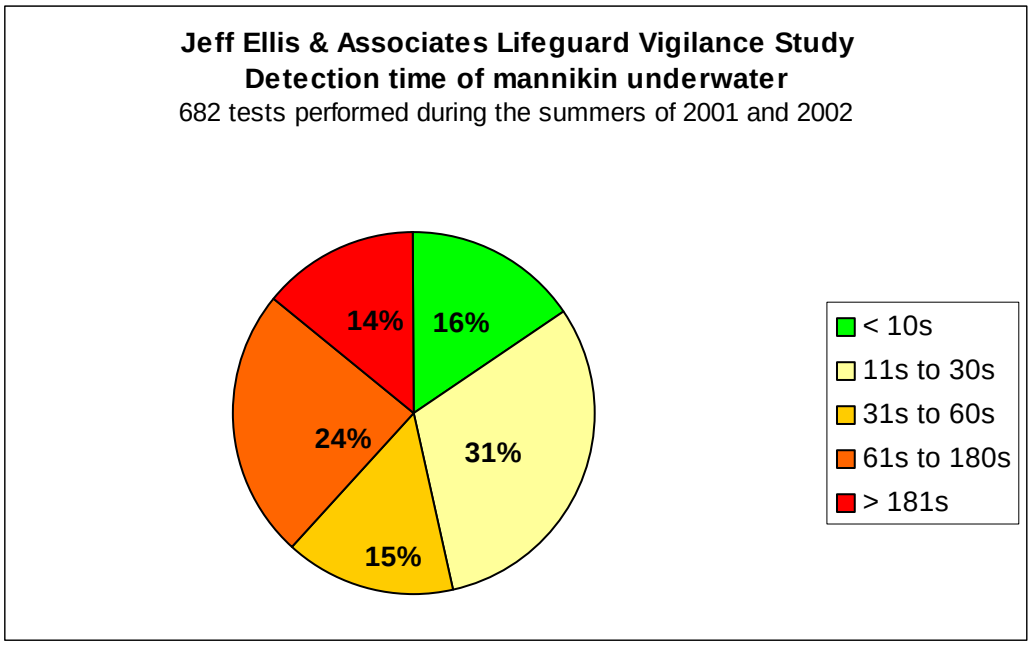
Poseidon Technologies and international aquatics safety experts Jeff Ellis and Associates have revealed the results of two studies on lifeguard vigilance performed in the summers of 2001 and 2002. Commissioned by Poseidon Technologies, the studies were designed to measure actual lifeguard performance in detecting drowning incidents and to identify the factors that influence lifeguard vigilance.

The results point to causes that may be contributing to the hundreds of deaths occurring annually in public, lifeguarded swimming facilities in the United States, and the greater number of serious injuries that near fatalities cause.

Study Format and Results

The studies calculated how quickly lifeguards could spot a swimmer in trouble underwater. A total of 682 tests were performed on-site during the months of June, July and August in 2001 and 2002 at several hundred pools that had no prior knowledge of the study. The pools differed in size and type. In each case, a manikin was placed underwater in the pool; a tester started the clock when it was fully submerged.

The results, summarized in the table below, show that on average it took *one minute and 9 seconds* for lifeguards to spot the manikin. Lifeguards noted the presence of the manikin in the ideal time of ten seconds or less in just 16% of the tests, and in 30 seconds or less in only 31% of the tests. *And nearly 40% of the lifeguards took between one minute and three or more minutes to detect the manikin.*



Jeff Ellis and Associates, who represent approximately 93% of the major U.S.-based waterparks, 800 public swimming pools and other high profile aquatic facilities throughout the world, developed the '10:20' rule. The rule says that if a lifeguard can spot a swimmer in distress within the first ten seconds of a drowning incident, and reach him to initiate aid within an additional twenty seconds, then it remains highly unlikely a drowning accident would occur.

The dramatic test results show that drowning, or near-drowning accidents with potentially serious life-long consequences, would have occurred in the majority of the test cases.

The reason lifeguards cannot always see what happens in the pool is often the result of environmental factors working against them, including noise and heat, as well as long hours on the job and the monotonous nature of their task. Some of these factors have been summarized in a survey of studies on vigilance entitled *Bibliographic Study on Lifeguard Vigilance,* which was completed in September 2001 by vigilance experts at the Applied Anthropology Institute in Paris, France. The institute is renowned worldwide for its work with major airline and car manufacturers, including Airbus.

This latest review supplements existing vigilance studies on lifeguards. It details results of tests on highway drivers, airline pilots and industrial operators, and uses them to draw implications and recommendations for pool lifeguard vigilance. These include:

- Vigilance capacity cannot be maintained at an optimum level for more than 30 minutes. The detection of critical signals (signs of a swimmer in trouble) in this type of task is never 100%.

- Laboratory studies show that the vigilance level will be higher as the number of relevant signals increases and the amount of non-relevant signals (signals other than a swimmer in trouble) decreases. However, drowning incidents with their associated signals are rare, and they occur only randomly. The signal-noise ratio is thus very unfavorable to maintaining vigilance.

- Noise, one of the major environmental factors at a pool, generally has an unfavorable effect on lifeguard vigilance. Moreover, noise hinders the ability to share one's attention and tends to focus it on the signals present in the central vision, to the detriment of those signals present in the peripheral vision.

- The performance of lifeguards can be affected by monotony, stress and fatigue. The particular environment in which the job is performed heightens the fragile nature of the performance.

- Heat is one of the factors that has a major effect on vigilance. Lifeguards are often exposed to heat and to conditions that are not conducive to their performance. When the temperature is over 30°C / 86°F, vigilance is significantly reduced – by 45 percent.

- Performance can be maintained by alternating activities. Lifeguards should perform different activities (for example: vigilance, lessons, maintenance operations) rather than just continuously lifeguarding the pool.

- Breaks have a very positive effect on the vigilance level, whatever their content. For optimum benefit, the frequency and duration of breaks must take into account the time of day: they must be more frequent and shorter when the alertness level is low, such as in the early afternoon.