American Red Cross

Scientific Advisory Council

ARC SAC Scientific Review
Water Temperature for Aquatic Instruction

Overall Recommendation:

Water temperature is a major factor in participant comfort and overall success of an American Red Cross Aquatic Instructional programs. Water that is too cold can lead to chilling and discomfort and result in limiting the time spent on necessary practice. Likewise, water too hot can lead to overheating and discomfort in limiting the time spent on necessary practice. In summary, the weight of the evidence suggests that for each person there is a water temperature range in which he/she is most comfortable at rest and at different levels of exercise intensity. The number of possible interactions (age, gender, subcutaneous fat thickness, surface area to mass ratio) makes it nearly impossible to set a specific standard for each person / activity in the water and, therefore, only general guidelines will be given. For water temperatures below the guidelines suggested for a particular activity an instructor may chose to decrease the time of the session and increase number of sessions, increase the intensity of the activity if appropriate, and/or providing safe body or head covering. The most important factor is that American Red Cross Aquatic Instructors are able to recognize when a student needs to end an in or out water session because the early onset of temperature related issues regardless of water temperature.

Recommendations and Strength:

Standards:

None

Guidelines:

Based on studies in a controlled environment (defined as an indoor pool with controlled humidity and air temperature), and with most of the consideration given to the level of intensity of the activity (as the activity intensity increases thermal balance can be achieved at the lower end of the range) and the immersion time (as immersion time increases core temperature decreases)

Infant / preschool aquatics (20 to 30 minutes*)

Water temperature - water temperature should be ≥32° C (89.6º F)

Learn to swim up to ages 6- 15 (30 to 45 minutes*)

Water temperature - water temperature should be ≥ 29° C (84.2º F)

Junior Lifeguard ages 11-14 (45 to 60 minutes*)

Water temperature water temperature should be ≥29° C (84.2º F)

Lifeguard training up to ages 15 – 55 (60 to 120 minutes*)

Low intensity activity-water temperature should be 29° to 32°C (84.2° to 89.6 F)

Approved by ARC SAC January 2012

Intense activity – water temperature should be 26° to 28° C (78.8° to 82° F)

Water Safety Instructor up to ages16- 55 (60 – 120 minutes*)
Low intensity activity-water temperature should be 29° to 32°C (84.2 ° to 89.6°F)
Intense activity – water temperature should be 26° to 28°C (78.8° to 82° F)

* Student immersion time per session.

Options:
Instructors should watch for signs of hypothermia or hyperthermia as an indication that it is time to end the session. For water temperatures below the recommended ranges the following options are suggested:

1) Add clothing that does not compromise safety
2) Covering the head that does not compromise safety
3) Limit the amount of time in the water

Summary of Scientific Foundation:
It would seem appropriate than to have temperature ranges for aquatic instructional programs adjusted based on activity level and age of the participant. Younger children and older adults need warmer water for thermal comfort and balance. The lower the intensity of the effort, the higher will be the accepted ranges. Participants learning to swim (low intensity or limited activity) need warmer water than more proficient swimmers, participating at a higher level of intensity. The duration of the lesson will have to be based on the other parameters and also be related to current thoughts about learning theory.

Information for the ARC Instructors and Program Staff

American Red Cross Aquatic Instructors should to be able recognize and care for body temperature issues whether the individual is getting too hot or too cold. All of the studies found related to individuals immersed in varying water temperatures were in controlled indoor environments. Instructors need to be aware that other factors including full body immersion, air temperature, humidity and velocity of the wind can have tremendous effect on the students in the water. American Red Cross Instructors should be able to recognize the early warning signs of temperature related issues and how to address them. Stopping these issues as early as possible is critical.

Conditions of Concern:
Hypothermia: If the student shows any of the signs of shivering, numbness, glassy stare or weakness during any in or out of water activity the activity should be stopped immediately for that student. Carefully move the student to a warm place and slowly allow the student to warm and eliminate any of the above symptoms.

Heat Exhaustion: If the student shows any of the signs of cool, moist, pale, ashen, flushed skin, headache, nausea, dizziness, weakness, exhaustion, and/or heavy sweating during any in or out of water activity the activity should be stopped immediately for that student. Carefully move the

student to a cool place and slowly allow the student to cool, give cool water to drink to eliminate any of the above symptoms.

Terms:

1) Hypothermia: A life-threatening condition in which the body's warming mechanisms fail to maintain normal body temperature and the entire body cools.

2) Heat Exhaustion: The early stage and most common form of heat-related; often results from strenuous work or exercise

Implications for Program Design, Modification and/or Delivery

The above are guidelines for varying levels of instructions and water temperature recommended for the different type of activities. The American Red Cross Water Safety Instructor manual page 8 states: "According to the Aquatics Exercise Association (AEA), a comfortable water temperature for swim classes is between 83º – 86º F (28.3º to 30º C) if they are kept on task and active". On page 115 of the WSI manual it states: "Maintain a water temperature of at least 83º F (28.3 º C), which is more comfortable for young children" for up to a 30 minute session. Under Preschool Aquatics on page 148 it states: "Typically, water that is at least 83º F (28.3º C) is more comfortable for young children". The ARC Lifeguarding Instructor manual has recommended In-Water skill sessions ranging from ranging from 40 minutes to 140 minutes but does not speak of the instructor observing the student's comfort level regarding water temperature. It is recommended that in future editions of these materials they be updated with the most current information available.

Facility operators understand that it is impossible to have everyone using an aquatic facility be happy with the water temperature if you have only one swimming pool. The guidelines above will help give instructors and facility operators a tool for helping find the best temperature for the water based on a majority of the activities and/or making change to a time frame for the different levels of activity. Some states swimming pool regulatory codes speak of maximum temperatures for heated pools being 90º F (32º C), if the pool exceeds this temperature it must close. Other regulatory codes state that pregnant women; elderly persons, and persons suffering from heart disease, diabetes, or high or low blood pressure should not enter the spa/hot tub without prior medical consultation and permission from their doctor for water temperature exceeding 90º F (32º C). For water temperatures below the guidelines suggested for a particular activity an instructor may chose to decrease the time of the session, increase the intensity of the activity if appropriate, and/or providing safe body or head covering. Aquatic Instructors must understand that the ability to change water temperatures in a swimming pool is **not** an easy, quick, or inexpensive process. Swimming pool operators need to take all factors into account when trying to pick suitable water temperature for an aquatic venue.