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American Red Cross Scientific Advisory Council

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American Red Cross Scientific Advisory Council: Guidelines for Group Aquatic Outings

Editor's Note: This print version of the scientific review, "American Red Cross Scientific Advisory Council: Guidelines for Group Aquatic Outings," was abbreviated due to space limitations in the print journal. The complete version of this scientific review including all the cited references and the summary of each is published in the online issue at http://journals.humankinetics.com/IJARE.

Questions to be Addressed

- What are appropriate/minimum guidelines for licensed daycares, elementary schools, and other child service providers (Salvation Army, churches, etc.) to follow as they prepare for a safe aquatic outing?
- What are minimum staff/child ratios for supervision (excluding trained lifeguards) of children during aquatic outings?
- Should some level of aquatic training be required of nonaquatic supervisory staff accompanying children on aquatic outings?

Introduction/Overview

Drowning is a leading cause of accidental death that disproportionately affects children. Though drowning deaths do not occur in epidemic proportions, the drowning of even one child is an incomprehensible tragedy and immeasurable loss to the parents and family. Much has been written about ways to prevent childhood drowning. Strategies include but are not limited to secure fencing, lifeguard supervision, lifejackets for weak or nonswimmers, learning to swim, and, most importantly, parental supervision. But what of the times when parents are not part of the solution providing supervision–times such as when the child is at school or with a daycare provider.

Each year, as schools come to a close, teachers search for fun and exciting activities for that last field trip of the year, and daycare agencies and child service providers are organizing summer activities. One of the most popular activities is an aquatic outing. Unfortunately, and all too often, preplanning is poor or nonexistent, and child care staff and teachers tend to rely solely on lifeguards rather than providing active supervision for their charges. The consequences of poor planning and inattention by staff can end in tragedy. In Dallas, Texas, two children nearly

drowned during an aquatic outing attended by 55 other children ages 6 and 7. A 5-year-old kindergarten student drowned when he and 107 other students attended an aquatic outing at a local pool. A 7-year-old girl drowned while attending a day camp with 38 other campers and 6 counselors. These are only a few examples of the dozens of swimming pool drownings that are recorded every year in the United States between Memorial Day (May) and Labor Day (September).

Should parents not have an expectation of safety when the school or daycare has charge of their child? Should parents not have an expectation that proper preplanning and adequate supervision have been addressed before an aquatic outing? The purposes of this paper are to educate parents, daycare providers, teachers, and elementary school principals about the potential risks of drowning, to provide guidelines for systematic preplanning, and to recommend ratios for staff supervision for aquatic outings.

Search Strategy and Literature Search Performed

Keywords Used: Aquatic safety, child care guidelines, child drowning, drowning prevention

Inclusion Criteria (time period, type of articles and journals, language, methodology). All agencies with an interest in preventing child drowning; agencies committed to child safety; legislation related to drowning prevention; articles referencing supervision as a prevention strategy in child drowning.

Exclusion Criteria (e.g., only human studies, foreign language). None

Databases Searched and Additional Methods Used (e.g., references of articles, texts, contact with authors). The literature review process began with inquiries to agencies and associations that might have relevant information about the question. The information solicited included any minimum requirements for lifeguard supervision during group outings to an aquatic environment, minimum staff/child supervision ratios for groups attending an aquatic outing and relevant information about the safety requirements of the aquatic facility. This information is to be used to support the final guidelines and recommendations set for by the Scientific Advisory Council (SAC).

The following agencies responded to inquiries:

- Amateur Swimming Association
- American Camping Association (ACA)
- Boy Scouts of America (BSA)

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- ILSA Sweden
- International Life Saving Federation
- Iran Life Saving and Diving Federation
- Irish Water Safety
- National Recreation and Parks Association (NRPA)
- New South Wales Department of Education and training
- Redwoods Group (insurer of YMCAs)
- Royal Life Saving Society
- Royal Life Saving Society, Australia
- Salvation Army
- YMCA

In addition to these agencies, information was sought (via Google search) from:

- American Academy of Pediatrics
- American Public Health Association
- Center for Disease Control and Prevention
- Consumer Product Safety Commission
- Health News Digest
- Maternal and Child Health
- The National Association of Elementary School Principals (no response)
- National School Age Care Alliance
- National Resource Center for Health and Safety in Child Care and Early Education
- World Health Organization

Networking with aquatic professionals added a few other resource materials for this review:

- Manitoba School Board Associations
- Morrongiello et al. (2013)
- Seine River School Division
- Petrass et al. (2011)
- Christian's Bill

Of major interest was a coroner's inquest into the drowning death of a 5-year-old kindergartener attending an aquatic outing with 107 other children from the same school (In the Matter of: "The Fatality Inquiries Act" and "In the Matter of: Joshua Harder, Deceased"). This inquest led to updates of the Public Health Act and to generation of the Swim Safe Programs* A Reference Guide for Schools developed in collaboration with Seine River School Division.

Table 1 Description of Library Search Performed

Identification	• Records identified through database searching (n = 10)
	• Additional records identified through other sources (n = 19)
Screening	• Records after duplicates removed (n = 29)
	• Records screened (n = 28)
	• Records excluded (n = 1)
Eligibility	• Full-text articles assessed for eligibility (n = 29)
	• Full-text articles excluded, with reasons (n = 0)
Included	• Studies included in qualitative synthesis (n =)
	• Studies included in quantitative synthesis (n =)

Scientific Foundation

There is little doubt that lack of supervision is a major risk factor for drowning. The American Academy of Pediatrics stance on drowning prevention suggests that supervision be close, constant, and capable (p. 180). Unfortunately, parents and caregivers seem to underestimate the extent of supervision needed to keep young children safe around the water (Morrongello et al., 2013). The Center for Disease Control (Morbidity and Mortality Weekly Report, 2012) states that "Parents and caregivers of children and participants in and supervisors of activities in or near water, should be aware of drowning hazards, use appropriate prevention strategies, and be prepared with lifesaving skills . . . ". The International Life Saving Federation includes the absence of parental supervision as a drowning risk factor in children under the age of 5. Petrass, Blitvich, and Finch (2011) studied unintentional drowning in Australia over a nine year period and found that lack of supervision was a contributing factor in 71.7% of all unintentional drowning in children ages 0–14. The U.S. Consumer Product Safety Commission (CPSC) states clearly not to allow a young child near a pool without an adult. It would seem intuitive, based on these guidelines and recommendations, that in absence of the parent, there is an expectation of adult supervision whenever children are in or near the water.

There are no national standards written to address the scope of this question, mainly because there is no scientific evidence to support standards relating to specific staff/child ratios for an aquatic outing. Certain agencies have established their own guidelines for supervision of all programs including aquatics but few agencies in the United States have established specific staff/child supervision ratios. The Boy Scouts of America (BSA) defer to state pool codes for required lifeguard supervision at pools. However, when lifeguards are not provided by host agencies, the BSA maintains that the adult supervisor must assign at least two rescue personnel, with additional numbers to maintain a ratio of 1 staff for every 10 campers. The American Camping Association (ACA) does not specify staff/to camper ratios due to the great variety of aquatic venues (pools, lakes, shallow water pools) as well as the camper population served. The Redwoods Group, an insurer of YMCAs, replied via e-mail that they do not have specific ratios for supervision but rely on other

agencies such as state licensing agencies and the American Camping Association to establish minimum ratios. They do recommend the aforementioned standards as the minimum, and that more staff be assigned for individuals with disabilities. The YMCA Aquatic Safety guidelines recommend that lifeguard/patron ratios be adjusted based on a number of factors but they do not address child supervision ratios for groups visiting the venue.

The international community has a better record for established minimum staff/child supervision ratios for aquatic type activities but there is no consensus. For example, Irish Water Safety established the following pool supervision standards for children ages 1–5, 6–10, and 11 and older:

- Children ages 1–5 years must be accompanied by a responsible adult in the pool.
- Children ages 6–10 years must be accompanied by a responsible adult who must remain in view of a child in the pool.
- Children ages 11 years and older may be unaccompanied.

Notice, however, that there is no mention of how many children ages 1–5 years or 6–10 years that one adult can supervise, and there is no consideration of swimming skill or water competence as part of the recommendation.

A report of the Australian Royal Life Saving Society, Department of Education (2008) found that 5 of 8 states and territories required a minimum of 2 adult supervisors at all times when children are in the water. Supervision ratios for swimming activities vary between states and territories, ranging from a 1:5 ratio for preschool and preparatory students to 1:16 for children ages 3–6. The Royal Life Saving Association "Keep Watch at Public Schools" Program policy provides more stringent supervision guidelines:

- Children under 10 years are not allowed entry to the facility unless under the active supervision of a person 16 years or older ("active supervision" is defined as dressed and ready for action including unexpected entry to the pool).
- Parents and guardians should actively supervise their children at all times.
- For 0–5 year olds and nonswimmers, a parent or guardian is in the water at all times within arms' reach of the child.
- For 6–10 year olds, constant and active adult supervision is required.
- For 11–14 year olds it is recommended that a parent or guardian check up on their child ("check up" by physically going to the point where the child is, in, or around the water).

In the U.S., individual states currently establish standards for staff/child ratios which are included in the Child Care Licensure Regulations. A total of 28 of 50 states (56%) have guidelines for supervision for aquatic activities. Of these states, 15 (30%) have staff/child ratios that differ from those established for a normal day time routine. Unfortunately, there is no continuity among the standards in regards to age range, or staff/child ratio. Age groupings vary across states and range from generalizations like "toddlers up to 3 years" to specific increments such as "children 48–59 months." Some states selected school labels such as "preschool to kindergarten" instead of specific age ranges. Connecticut is the only state that has

Table 2 The Swedish Life Saving Association Age Group and Supervision Recommendations

Program	Age range	Ratio
Baby swim	Starting at 6 weeks up to 2 years	1:1
Toddler swim	Ages 2–4	One parent and 1 teacher for each 8–10 children
Swim School	Age 5 and up	1 swim teacher /8 or 2/12
School Swim (where school or municipality has responsibility)	School years 1–9	NA
Children with special needs	Any	2 teachers/6 children
Adult swim school	19 years and up	1/10

established a maximum number of children (i.e., 20) allowed to attend an aquatic outing as a group.

Several states added criteria based on swimming competence (swimmer/nonswimmer) but did not define what "swimming competence" means. Texas requires a lifeguard be present only if children are swimming in water more than 2 feet deep. Tennessee addresses the supervision issue with a very broad, inclusive statement: "The Management of the agency shall maintain a system that enables all children in the agency's care to receive a level of supervision appropriate to their age and their developmental status so as to ensure their health and safety and that allows agency personnel to know the whereabouts of each child in their care." Ohio requires that staff be "actively supervising" but does not define what "active supervision" entails.

Although inconsistencies among states with established supervision ratios made it difficult to propose an across-the-board standard, there were some recurring themes directed at providing a safe aquatic outing experience. These included the following:

- The need for some form of preprogram planning.
  - Program plan implemented.
  - Inclusion of an EAP and documented practice.
  - Safety check completed the day of the event.
  - Child care staff review swimming and water safety rules.
- An acknowledgment that aquatic activities and/or field trips require additional supervision.
  - Children in the water require closer supervision to reduce the risk of drowning.
  - Lifeguards shall not be counted as part of the staff child ratio.
  - If some children are on deck and others in the water, there shall be at least two staff.

- An acknowledgment that the facility must meet criteria for a safe facility.
  - Based on state and local regulations.
  - With certified lifeguard.
- Some form of training for staff and or water safety personnel (not lifeguards).
  - Water safety and swimming rules.
  - At least two years of experience the activity s/he is supervising.
  - CPR.
  - In water over 4 feet deep, only adults who can swim will be counted in the staff/child ratio.
- A certain level of training for lifeguards supervising the outing.
  - Presence of trained certified lifeguards.
- An acknowledgment that age, skill, type of venue, and water depths play a role in staff/child ratios.
  - Swimmers and nonswimmers.
  - Wearing personal floatation devices (PFDs).
  - Children in water shallower/deeper than 2 feet.
  - If water is over the chest of the child who cannot swim, there will be 1:1 supervision.
  - Children who cannot swim 15 yards unassisted.
  - Nonswimmers of age 3 and older in water chest deep require more supervision.
- The need for some form of swimmer/nonswimmer identification.
  - A child will be restricted to an area of the pool or beach that is within the child's swimming skill or water competence.
  - There shall be a system of checking to ensure that each child is safe in the water.
  - Each child is tested by a certified lifeguard.
  - Before a child can enter water over his/her shoulders, s/he will be tested by a staff member.

Some action has already been taken in the area of preventing further drowning during aquatic outings. A coroner's inquest into the drowning death of a kindergartner at a school aquatic outing yielded new recommendations and updates of existing documents to improve preplanning, lifeguard standards, school staff supervision, and emergency planning and response in Manitoba and Seine River School Division. The outcome was a written document ("Swim Safe Programs: A Reference Guide for Schools") that includes but is not limited to the following requirements:

- The completion of a swim trip preparation check list.
- Swim day controls.
  - Review rules and responsibilities of staff and volunteers.
  - Review EAP.
  - All nonswimmers (kindergarteners, first graders, and second graders) have government-approved PFDs and must be worn at all times.

- Certified lifeguards review the rules with students.
- Certified lifeguards conduct the endurance test (see resource form).
- Buddy system in effect and tested every 15 min.

- Adequate Supervision defined.
  - One teacher for each 25 students.
  - Recommended: One qualified lifeguard for each 25 students in or near the water. Additional adult supervisors are required when students are in or near the water.
    - For grade(s)

      K—adult:child ratio is 1:4

      1–4—adult:child ratio is 1:6

      5–8—adult:child ratio is 1:8

      9–12—adult:child ratio is 1:12
  - When students are in or near the water, adult supervisors must position themselves so that the students are in clear sight and they can provide immediate assistance if required.

"Christian's Bill," signed into law on Tuesday July 24, 2012, requires that camps and recreational programs in Connecticut comply with the following:

- Determine each child's swimming ability at the first swimming session to identify and classify nonswimmers and at-risk swimmers.

- Confine children to swimming areas within the limits of their assessed swimming skills.

- Adhere to Department of Public Health promulgated regulations, establishing a system to have Coast Guard approved PFDs for minors designated as nonswimmers or at-risk swimmers.

- Allow programs to require parents, guardians, and custodians to provide PFDs for their minor children.

It is evident that there is no consistency in requirements for planned outings or staff to child ratios. Even a frequency table of the information provided by State Child Care Licensing only provides generalities for a variety of age groups. Therefore, the overall recommendation is to provide some guidance via options to plan for and provide supervision of children at aquatic outings.

Limitations

We were not able to review all of the State Swimming pool codes. We are aware that NY State has requirements for camps that provide swimming and aquatic activities.

Knowledge Gaps and Future Research Needed

We did not have access to statistics and analyses of all drownings that have occurred during aquatic outings embarked upon by preschools, daycares, elementary schools, and day camps.

Overall Recommendation Resulting From Scientific Review

It is recommended that any government or private entity that has responsibility for the supervision of young children, and who in the course of their programming intends to include aquatic outings, should develop a written safety plan that identifies safety measures and an appropriate supervision plan for all students attending an aquatic outing.

Recommendations and Strength (using table below):

Standards

None supported by scientific review.

Guidelines

It is recommended that any government or private entity that has as its responsibility the supervision of young children, and who in the course of their programming, intend to include aquatic outings should develop a written safety plan that identifies safety measures and appropriate supervision of all students attending an aquatic outing.

Options

The plan should include but should not be limited to the following:

- Program plan implemented
  - Include a preparation checklist
- Inclusion of an EAP and documented practice
- Safe Swim Day checklist
  - Review rules and responsibilities of staff and volunteers
  - Review EAP
  - Confirm established staff/student ratios (see options below)
- Upon arrival checklist
  - Certified lifeguards review the rules with students
  - Certified lifeguards conduct water competency test and assign children to ability groups
  - Water competency must include

    Entry with total submersion

    Recovery to the surface and remain there for at least one minute (floating or treading)

    Orientation—position to be able to turn 360° and orient to the exit

    Propulsion—level off and move on front and/or back position for at least 25 yards

    Exit from the water

- Staff/child ratio for aquatic outings (based on the assumption that children are nonswimmers, that all supervisors are in the water with the children, and that groups that include individuals with cognitive, behavioral, or medical issues require more supervision).

The strength of all recommendations and conclusions is related to the scientific evidence upon which they are based. All recommendations therefore derive from critical review of the available literature and the strength of their design, standard reference material, textbooks, and expert opinion. All recommendations are weighted based upon the source and strength of the scientific evidence and are classified into one of three groups—Standards, Guidelines, or Options.

Treatment Standards represent the strongest recommendations and have a high degree of scientific certainty. These recommendations result from strong evidence obtained from well designed, prospective, randomized controlled studies.

Treatment Guidelines provide a moderate degree of scientific certainty and are based on less robust evidence such as nonrandomized cohort studies, case-control studies, or retrospective observational studies.

Treatment Options result from all other evidence, publications, expert opinion, etc. and are the least compelling in terms of scientific evidence.

Table 3 Recommended Staff: Child Ratios Based on Water Depth

In Water ≤ 18 Inches Deep	
Age range in months	Staff/child ratio
6–23 months	1:1
24–35 months	1:2
36–47 months	1:4
48–59 months	1:5
Over 60 months	1:8
In Water > 18 Inches Deep	
Age range in months	Staff/child ratio
6–35 months	1:1
36–47 months	1:2
47–60 months	1:3
Over 60 months	1:5

Implications for American Red Cross Aquatic Programs

- Learn to swim programs that include skills referenced for "water competency".
- Basic Water Rescue for supervisors of young children.
- Lifeguard training programs.
- Design a model work book including Safe Swim Day checklists.

Table 4 Definitions for Levels of Evidence in Scientific Reviews

Level of Evidence	Definitions*
Level 1a	**Experimental and population-based studies –** Population-based, randomized prospective studies or meta-analyses of multiple higher evidence studies with substantial effects
Level 1b	**Smaller experimental and epidemiological studies –** Large nonpopulation based epidemiological studies or randomized prospective studies with smaller or less significant effects
Level 2a	**Prospective Observational analytical** – Controlled, nonrandomized, cohort studies
Level 2b	**Retrospective/historical observational analytical –** Nonrandomized, cohort or case-control studies
Level 3a	**Large descriptive studies** – Cross-section, ecological, case series, case reports
Level 3b	**Small descriptive studies** – Cross-section, ecological, case series, case reports
Level 4	**Animal studies or mechanical model studies**
Level 5	**Peer-reviewed articles** – State of the art articles, review articles, organizational statements or guidelines, editorials, or consensus statements
Level 6	**Nonpeer reviewed published opinions –** Such as textbook statements, official organizational publications, guidelines and policy statements which are not peer reviewed and consensus statements
Level 7	**Rational conjecture** (common sense); Common practices accepted before evidence-based guidelines
Level 1–6E	**Extrapolations** from existing data collected for other purposes, theoretical analyses which is on-point with question being asked. Modifier E applied because extrapolated but ranked based on type of study.

Note. * See article for full details.