The American Red Cross Scientific Advisory Council is a 50-member, voluntary committee of healthcare, public health, aquatics, preparedness, public safety and educational professionals that establishes and assures the scientific basis for Red Cross programs, products and public guidance. The Council advises the Red Cross to ensure programs are fully current with the latest science, address current needs and are prepared for future changes. Members of this independent panel are nationally-recognized experts with sub-specialties in such diverse fields as emergency medicine, occupational health, sports medicine, school health, EMS response, aquatics, disaster health and emergency preparedness.

The Council members are organized into the following six groups:

- **Aquatics Subcouncil**
- **First Aid Subcouncil**
- **Nursing and Caregiving Subcouncil**
- **Preparedness and Disaster Health Subcouncil**
- **Resuscitation Subcouncil**
- **Education Committee**
The Aquatics Subcouncil reviews ways to keep people safe around water, including lifeguarding techniques; swimming instruction; causes, recognition and prevention of water emergencies; rescue, resuscitation and transport.

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**Linda Quan, MD, FAA**
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**William Dominic Ramos, MS, PhD**
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Scientific Reviews

Cues to recognize non-swimmers in an aquatic venue (New)
Reviewer: Lees, Terri.

Question and Importance
Is there a specific color or color/pattern “identifier” that will reduce the time it takes a trained lifeguard to identify a non-swimmer in a pool environment? This question was approached in three steps: (1) Is color a functional search feature in visual search? (2) What characteristics of color make it functional as a search feature? (3) Are there limitations to using color as a search feature? There are no widespread research-based conventions to guide the use of color and swim devices to help distinguish swimmers from non-swimmers in an aquatic environment.

Scientific Foundation and Discussion
Seventeen key studies were analyzed for research on identifiers; important elements are feature, chromaticity, conspicuity and color contrast. Researchers found no studies that were conducted in aquatic environments, which are constantly in flux as swimmers and non-swimmers move about.

Color is a functional search feature, possessing luminance, contrast, uniqueness and fluorescence. Contrasting colors can positively affect conspicuity. The greater the contrast in color, the easier it is to identify/recognize the target. Contrast is enhanced by using colors not normally found in the environment. The use of fluorescent colors for enhancing daytime visibility/conspicuity has been well established in the literature. Conversely, color can undermine recognition with ill-considered use of: background colors; size of the display; the number of other, similar non-target color distractors; and the finding that color may decrease search time without affecting recognition.

Fluorescent yellow was found to be the best-detected color. Fluorescent orange was found to be best-recognized against three different natural backgrounds. It has not been demonstrated which colors/patterns work best in the aquatic environment (that is, pools and open water).

Recommendations
(1) Use fluorescent colors, yellow-green and orange, with non-swimmer identifiers. These colors are unique to the environment, though they have not been studied in the aquatic environment.
(2) Use swim caps instead of wrist bands or necklaces. In visual search, the larger the color identifier, the quicker the response time.

Council Action
Approved.

Future Research
The Aquatics Subcouncil recommends further research to address the question: “Will wearing a uniquely colored cap reduce the time it takes an experienced or an inexperienced lifeguard to locate a person (a non-swimmer, in this situation) in the aquatic environment?”
**What is the most effective type of rescue equipment for a layperson/bystander to use to help a person needing aquatic rescue? (New)**
Reviewer: Beale, Angela.

**Question and Importance**
Bystander rescue and resuscitation of drowning victims may contribute to a positive outcome. Bystanders are prepared to take responsibility to rescue a drowning victim in spite of significant dangers.

**Scientific Foundation and Discussion**
Eleven studies of several different types were analyzed for key points that apply to this study question. Results of studies should be viewed with some caution due to specific methodological limitations: sample populations; population demographics; paucity of literature; and the possibility of measurement errors. Little data exist to identify which rescue skills and equipment work best when performed and used by the layrescuer/bystander. Limited research shows that throw ropes and lines can be effectively used by bystanders. There is no research comparing one type of equipment to another.

However, key studies and experts support recommendations that bystanders be aware of safe, noncontact rescue techniques, such as throw lines or life buoys. Safe rescue knowledge and “reaching assists” should be promoted: “talk, reach, throw, wade, row and tow” and “reach and throw, don’t go.”

**Recommendations**
1. Target interventions are needed to help address shortcomings, especially in high-risk activities such as kayaking.
2. Public-access water safety programs should teach rescue techniques without placing the rescuer at risk (that is, “reach and throw, don’t go” techniques).
3. Layperson/bystander rescue skills should be part of water safety classes and guidelines to increase effective bystander intervention and reduce the drowning rate.

**Council Action**
Approved.

**Future Research**
The Subcouncil recommends further research to:
1. Compare these findings with other demographic variables (that is, the location of studies).
2. Evaluate public access water safety programs in terms of participants learning to use a variety of rescue equipment so that they can select a rescue device suitable for them.
3. Evaluate the use of bystander rescue equipment with scientific interventions.

**Are people with autism spectrum disorder at a greater risk for drowning? (New)**
Reviewer: Kublick, Louise.

**Question and Importance**
Drowning is frequently identified as a leading cause of death in children who have autism. Autism is a complex developmental disability that typically appears during the first three years of life and affects a person’s ability to communicate and interact with others. Autism Spectrum Disorder (ASD) is defined by a certain set of behaviors, which affect individuals differently and to varying degrees. Currently, 1 in 68 children are diagnosed with autism spectrum disorder, and ASD affects tens of millions worldwide.

**Scientific Foundation and Discussion**
Literature search provided six PubMed articles and an additional three from a general search. Key studies were analyzed for relevant content. The study found that children with ASD do have a greater risk of drowning.

One of the characteristics of ASD is elopement or “wandering,” defined as a dependent person exposing him or herself to potential danger by leaving a supervised, safe space or the care of a responsible person. Nearly half of all children with ASD (48 percent) attempted to wander from a safe environment, a rate nearly 4 times higher than their unaffected siblings.
It is unclear whether the rate was due to higher drowning risk when partaking in supervised swimming activities appropriate for swimming level or due to getting in unsupervised bathing activities or entering the water without supervision planning for person to enter the water. As such the findings may not relate to swimming risk but need for those with ASD to have greater supervision when around the water. It is also unclear whether the drowning victims with ASD had received any prior instruction related to water safety. Did they know how to swim but were not able to transfer this knowledge to a new setting; or were they non-swimmers? If they had taken swimming lessons, how far had they progressed?

**Recommendations**
Current swimming instruction strategies and approaches need to be reviewed and evaluated to ensure that they are reflective of the specific and unique needs of this population and that water safety and water competency are being taught as effectively as possible.

**Council Action**
Approved.

**Future Research**
The Subcouncil recommends further research to consider:

1. Class size, water temperature and instructor training are among the many factors that can impact teachers’ ability to teach those with a disability to swim.
2. The general characteristics of ASD can present significant barriers within a traditional learn-to-swim setting.
3. Programs are needed to identify and develop which water safety and water competency skills would benefit this population the most.

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**Questions and Answers**

**Should cervical collars be routinely used in lifeguard rescues? (Revised)**

**Discussion**
A literature review did not provide any evidence related to cervical collars used by lifeguards. The non-aquatic literature is very limited with mostly cadaver and volunteer studies; none of these determined whether the use of a collar improved or worsened outcome. As such, there is no evidence to support either a treatment Standard or treatment Guideline. The use of backboards will be investigated for discussion at the next Council meeting.

**Recommendation**
Spinal immobilization during water rescue should be performed using manual in-line stabilization with a head immobilizer.

**Council Action**
Approved as Option.

**What are safe and unsafe methods of breath holding underwater? (Revised)**

**Discussion**
Different types of controlled underwater breath holding are associated with a range of risks. These include:

- Just going underwater for a short period of time, less than a minute: Generally safe.
- Going underwater to stay under for an extended period of time (longer than a minute) without any kind of prior hyperventilation (generally more than two deep breaths in fast repetition): Generally unsafe.
- Hypoxic training for competitive swimmers: Can be unsafe and is not proven to be effective.
- Training at altitude. Generally safe and effective.
- In SCUBA diving, holding one’s breath and ascending from depth: Extremely dangerous.
- Glossopharyngeal inhalation or “lung packing”: Extremely dangerous.
**Recommendations**
With regard to submersion and breath-holding activities in an aquatic facility:
(1) The lifeguard needs to be aware of and to monitor patrons who go underwater.
(2) A patron should not be allowed to swim more than 25 yards on a single breath. If a patron attempts to do so, the lifeguard is directed to stop him/her and explain the facility’s policies and the reasons behind them.
(3) If a patron is static underwater for more than five seconds, the lifeguard is to enter the water and bring the patron up. If the patron was attempting a breath-holding activity, the lifeguard will explain the facility’s policies.
(4) If the lifeguard observes a patron trying to hyperventilate before submerging, the lifeguard is to stop the patron from submerging and explain the policy.
(5) Signage showing rules and regulations will contain language prohibiting extended breath-holding activities.

**Council Action**
Approved.

**Should participants be allowed to wear swim goggles during American Red Cross Lifeguarding Instruction courses? (Revised)**

**Discussion**
The use of swimming goggles to reduce eye irritation is widespread and appropriate during many recreational and competitive aquatic activities.

**Recommendation**
(1) The use of goggles during aquatic instruction should be allowed, but goggles should be avoided during submersion or potential contact activities.
(2) Swimmers must be able to perform basic water-competency skills without goggles, such as entry, submersion and flotation.

**Council Action**
Approved.

**Research**

**The Centennial Study: a research project connected to the campaign to reduce drowning rates**
Reviewers: Ramos, Bill and Beale, Angela, Anderson, Austin and Bidulescu, Aurelian.

**Scientific Foundation and Discussion**
Our goal is to measure the impact of the Centennial Campaign’s Aquatic Program interventions. To assess the Campaign’s effectiveness, drowning rates will be assessed longitudinally. In addition, the effect on participants’ behavior using the Reasoned Action Approach (RAA) to measure intentions. Influencing factors will be assessed for attitude – consequences of the act, perceived-norms – social referents, and self-efficacy – facilitators, hindrances.

**Methodology**
A pre/post survey design was constructed using standard RAA approach. Youths ages 5-18 years and adults older than 18 were surveyed. Data is being collected primarily during the summer, evaluated after September, with a preliminary report planned for January 2015. The survey will be repeated for second year, 2015-16 with a total of five years data collection in all. The drowning rate study will be developed later. The study sponsor is the Indiana University School of Public Health.

**Results**
First year results due out January 2015.

**Future Research**
N/A
Can it be safe for a person with a tracheostomy to participate in in-water aquatic activities?
Reviewer: Kublick, Louise.

Scientific Foundation and Discussion
Accessibility has become an expectation, including for swimmers with tracheotomies. At the same time, this accessibility could lead to risk for both individuals and facilities.

Methodology
A survey was created using a mixed methods approach that included yes/no, multiple-choice and open-ended questions. Snowballing technique was used to illicit a greater sample size and support a diversity of participants by widening the profile of facilities involved. Data collection is ongoing. Sampling was not randomized. The overall sampling size was vague, due to snowballing. It is unknown how much of this participation takes place with the knowledge and support of physicians/respiratory therapists.

Results
Response rate was 47 percent (31 unique responses from 66 unique email addresses at agencies/organizations in Canada and the U.S.).
• Fifty-two percent of respondents (16) have permitted an individual who has a tracheotomy to participate in an aquatic activity; 81 percent (13) continue to offer this service, yet the three who no longer offer this service did not discontinue offering it as a result of an incident.
• Precautions: in-water support and specialized equipment were the most common precautions taken.
• All (100 percent) respondents feel that involvement in aquatics improves sense of well-being for this population.
• Eighty-three percent of respondents who permit swimmers with tracheotomies do not have any policies in place to govern this activity.
• Ninety-three percent of the agencies who do not provide this service are interested in the results of the survey.

Future Research
Guidelines need to be developed which are reasonable for families and possible for aquatic facilities; they should provide a benchmark to inform individual decisions based on individual needs and risks.

Lifeguard Rescue Reporting Survey
Reviewer: Fielding, Roy.

Scientific Foundation and Discussion
Lifeguarding has been an important part of Red Cross Aquatics, but never has data been collected on how what's actually taking place in the field matches up with the educational program, materials, etc. Since 2009, a survey has been made available and circulated to pools and waterparks throughout the U.S. This survey is innovative in that it collects information from the rescuer directly rather than pool management. The 2014 survey is open for data collection from around the United States. Two articles based on the 2013 survey will be published in the February 2015 issue of the International Journal of Aquatic Research and Education (IJARE). One describes the development of the survey and lessons learned. The other article provides an overview of results.

Methodology
The following survey areas were examined:
• What really takes place in a rescue?
• How did the guard recognize the victim needed help?
• What equipment was needed?
• What other individuals were involved?
• What first aid was given and needed?
• How far did they have to travel on land to the victim?
• How far did they swim to the victim, and at what depth?
• What first aid was given during a rescue?

Results
The full report can be seen at www.water-rescue.uncc.edu under the “Water Rescue Results” section.
Future Research
There are plans to continue working with the Canadian Red Cross to compare U.S. and Canadian data and report back in a bilingual report. The French version is being created in order to expand the pool of the survey’s potential users. As longitudinal data continues to be collected, staff will explore further avenues to promote the reporting system.

Triennial Review
What scientific evidence exists to support setting a minimum age for swimming lessons? The Subcouncil feels this review will address statements made by training sites such as infant drown-proofing programs. This scientific review will be presented at January 2015 Council meeting.

Subcouncil Business

Centennial Events. The Aquatics Sub Council is celebrating the 100th anniversary of the Red Cross lifesaving and water safety program, which added the reduction of drowning to its mission in 1914. The Subcouncil helped to create the largest collection of Red Cross water safety history memorabilia currently on display at the International Swimming Hall of Fame (ISHOF) in Fort Lauderdale, Florida. The Red Cross Centennial Team (Director, Connie Harvey) also produced a video about the Red Cross that is running at the ISHOF. The video is a tribute to “Commodore” Wilbert E. Longfellow, who dedicated his life to water safety as a teenager and, together with the Red Cross, was said to have reduced the drowning rate by 50 percent in his time. A second Red Cross-produced video highlights famous American waterman and Red Cross safety instructor Bob Burnside, who has worked as a Los Angeles County lifeguard since 1951, and who founded the United States Life Saving Association in 1964. The Red Cross Centennial Campaign set goals to: reduce the drowning rate by 50 percent in 50 at-risk cities; teach 50,000 more children and adults how to swim; develop 1,000 new lifeguards; and train parents and caregivers in hands-on water safety. The effectiveness of this program will be assessed.

Model Aquatic Health Code. Public comment for Bather Supervision and Lifeguarding section closed the end of May 2014. Comments are being considered by the steering committee, which will produce a final draft in fall 2014.

World’s Largest Swim Lesson. The Red Cross is collaborating with other water safety and training organizations to build awareness about importance of teaching children to swim to help prevent drowning. The goal for the event, held June 20, is a world record for the number of participants in a single swim lesson.

Recent/Upcoming Releases and Publications


Council Statement: Safe Aquatic Outings. May 2014; IJARE.

Future Activity

Dry Drowning and Secondary Drowning. Dr. Quan will produce a statement and talking points about these subjects.
The First Aid Subcouncil’s range of study is broad, including the care of victims in every scale of emergency, from caring for one’s self to care rendered by professional emergency responders or by laypersons providing care on the roadside, in the wilderness, in a shelter: everything up to the care provided at a hospital. The Subcouncil also serves as part of the International Liaison Committee on Resuscitation (ILCOR) First Aid Taskforce and helps to review the International First Aid Guidelines.

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Scientific Reviews

Non-Opioid agents for analgesia administered by lay responders (New)
Reviewer: Kaplan, Lewis J, MD.

Question and Importance
First aid for injuries is often administered by lay responders before trained responders arrive. Are non-opioid agents such as aspirin appropriate in these circumstances?

Scientific Foundation and Discussion
Literature review: Data was sought in PubMed, scholarly manuscripts and the lay press, as well as professional and lay society recommendations. The only data found related to pain relief was the use of topical ice for orthopedic injury. Evidence was not found on the use, outcomes, complications, harms, cost and advisability of non-opioid agents.

Recommendations
There is insufficient data for a recommendation or statement. The Subcouncil recommends that the subject be reconsidered and narrowed in a way that can be studied.

Council Action
Approved.

Future Research
Research is needed on what can and should be provided for pain control subsequent to injury – and in what settings – by lay individuals, for those injuries which are treated at site/home without seeking further medical care and those in which further care may be delayed such as in wilderness settings and when one cannot wait for Emergency Medical Services personnel.

Use of a cold therapy compression wrap to decrease symptoms of acute closed soft tissue injury (New)
Reviewer: Berry, David, PhD.

Question and Importance
Is there data to support the commonly held-belief that topically-applied cold therapy should be used in a first-aid setting?

Scientific Foundation and Discussion
Twenty-eight studies were included in a qualitative synthesis, no studies included in a quantitative synthesis. Many studies conducted before 2000 were unclear as to how the cryotherapy physical agent(s) was applied to the patient. Most studies included patients seen in the emergency department between a 24-48 hours post injury. Studies did not address the concept of “first aid.” When barriers to cryotherapy were reported, the details were typically poor. Cryotherapy physical agents – and therefore body positions – varied between studies, and the data on how much time the cold was in contact with the subjects also were variable. Some of the studies also compared cryotherapy vs heat.

Cryotherapy is a basic approach to the early treatment of many different types of injuries and conditions, including acute closed soft tissue injuries which may be encountered by the first aid provider. Many studies have examined the effects of cryotherapy in conjunction with other therapies that are beyond the scope of practice of a lay first aid provider. Many of the studies used were conducted well after the traumatic event occurred.

Numerous clinical studies of the use of cryotherapy for various injuries and situations have shown a positive effect on pain relief and on recovery. However, there is limited evidence examining the application of cryotherapy in a first aid setting.
**Recommendation: Cryotherapy**
To be effective, cryotherapy should be started within 24-36 hours following the traumatic event and continued for a minimum of three days. Cryotherapy appears to be more effective than heat therapy for complete and rapid recovery of acute ankle sprains.

**Council Action**
Approved.

**Recommendations: Guidelines**
1. Acute closed soft tissue trauma should be treated with a thin barrier mediating direct contact with the patient.
2. In certain situations – where acute closed soft tissue trauma causes excessive pain, swelling, the inability to ambulate or the person demonstrates signs of shock or a compromise to the airway, breathing or circulation – the patient should immediately be referred to a qualified health care professional.
3. The duration of cryotherapy should be adjusted according to individual needs (for example, age, size of injury site, current exposure to cold, location over tissue) and the situation (which includes individual effects and perceptions).

**Council Action**
Approved as Guidelines.

**Future Research**
None.

**Questions and Answers**
In children with symptoms of an upper respiratory infection who have difficulty breathing, does the use of a humidified environment/humidifier compared to no humidified environment/humidifier affect difficulty breathing, respiratory distress, patient comfort, recognition of acute illness, and/or patient/family satisfaction and/or change the need for hospital admission and advanced medical care? (New)

**Discussion**
This long-standing tradition of care has a low cost and is perceived to carry a low risk of side effects or toxicity. As such, researchers have little incentive to pursue the issue. No studies show any benefit and no studies have shown harm from humidifiers or a humidified environment in children with difficulty breathing and upper respiratory illnesses.

Though all studies done to evaluate this practice have been done in a health care setting and showed no benefit, the practice is likely to persist because no dangers are generally believed to accompany it. While there is no evidence of direct harm, complications from this practice have been described, and parents and care providers should be made aware of them. For instance, case reports of unintentional hot water burns to children exist.

Database searches of the literature produced 61 records and two more were identified from other sources. All studies were done in an emergency room or urgent care setting; no studies were conducted in the home environment. Metrics used in the studies were croup score, whether a patient was admitted, and the length of stay. Comfort and satisfaction, for both patient and family, have not been studied.
Recommendation: Standard
If a humidifier or humidified environment is used to treat a child with symptoms of an upper respiratory infection, it should be done in a manner that is mindful of the risk of exposure to scalding and burns and with an adult nearby for supervision.

Council Action
Approved as Standard.

Recommendation: Guideline
There is no evidence to support the efficacy of a humidifier or humidified environment for use in children with symptoms of an upper respiratory infection with difficulty breathing.

Council Action
Approved as Guideline.

In adult patients with the sensation of foreign body in the eye [which excludes chemical exposure], does flushing with water or saline, compared to not flushing affect the need for advanced medical care, pain, patient satisfaction or ongoing injury? (New)

Discussion
There were 182 articles touching on the topic and 13 that focused more directly on the topic. The evidence neither supports nor refutes flushing with saline or non-saline solutions.

Buffered solutions were safer and less painful than tap water when used to rinse the eye in response to sensing a foreign body. The cells flushed with a buffered saline solution caused less damage to the epithelial cells of the eye, resulting in a quicker healing and recovery.

One study that examined self-medication initial treatments used by the general public to address acute ocular emergencies found that patients often attempt to treat conditions that require ophthalmologic emergency care by self-medicating with homemade or manufactured products. The most widely used products include boric acid, normal saline, leaf infusions and breast milk. These observations were independent of educational level, gender, age or the nature of the ocular condition. Self-medication is a culturally-driven practice that is used even in cases of acute ocular injuries. The support for these practices is limited, and the potential for harm is greater than the potential to help. Thus, it is important to widely disseminate information about best practices when rinsing the eye.

Flushing eyes with tap water can be very painful. People find it difficult to flush their eyes with tap water for the recommended 15 minutes. The water is often too cold or too hot to tolerate. The presence of chemicals and contaminants in tap water can exacerbate the problem. Flushing with tap water can damage the epithelial layer of the eye. A study conducted by the Louisiana State University Health Sciences Center and the Kentucky Lions Eye Center found that flushing with tap water (because it is incompatible with the pH of the eye) can further disrupt the eye’s protective epithelial cell layer and cause additional corneal cell damage.

Recommendations: Guideline
The Council supports the following from the American Association of Ophthalmology.

If you get a particle or foreign material in your eye:
• DO NOT rub the eye.
• Lift the upper eyelid over the lashes of your lower lid.
• Blink several times and allow tears to flush out the particle.
• If the particle remains, keep your eye closed and seek medical attention.

Council Action
Approved as Guideline.
Research

Impact of First Aid App during natural disasters and self-resiliency
Reviewers: Burke, Rita, Pellegrino, Jeffrey, Chung, Sarita and Upperman, Jeffrey

Scientific Foundation and Discussion
The First Aid app that is currently on the Red Cross website is being evaluated to explore the quantity and quality of the interactions and patterns during natural disasters.

Methodology
The investigative team plans to determine patterns of increased and specific usage when natural disasters occur (tornadoes, hurricanes and earthquakes). The First Aid app is also being compared to the Disaster app that is already on the site. Parameters measured will include: population, geography, general usage, comparison of disaster and non-disaster zone usage, and behavior over time.

Results
N/A

Future Research
The Council approved continued work on this project.

Re-examining core competencies of effective first aid education

Scientific Foundation and Discussion
This study is a review of first aid needs in the field, based on injuries reported, aimed at improved understanding of what the core content should or could be for effective first aid education.

Methodology
The source is a compendium of national and international first aid competencies. There will then be a de novo review to determine injuries that are most germane to the United States context and which ones first aid instruction would be expected to reduce.

Results
N/A

Future Research
The Council approved continued work on this project.

Usability of the First Aid simulation learning training

Scientific Foundation and Discussion
A beta version of the online training model for simulated learning is being analyzed and tested to determine the difficulty different groups might have in learning different concepts. Based on results, blended learning approaches could lead to a refinement of format and content to make learning more and effective.

Methodology
N/A

Subcouncil Business
None.

Recent/Upcoming Releases and Publications
None.

Future Activity
None.
The Nursing and Caregiving Subcouncil addresses nursing and caregiving issues from an interdisciplinary perspective. The focus is on the knowledge and skills necessary to ensure health and safety when providing person-centered, culturally sensitive, evidence-based care to others.

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Scientific Reviews

Preventing pressure sores with memory foam type mattresses (New)

Question and Importance
Adult patients who are immobilized and receiving home care are at risk of developing pressure sores. A new type of foam mattress described as maintaining a memory of the individual’s body impression might be better than other mattresses in preventing pressure sores.

Scientific Foundation and Discussion
No studies could be found on the home-bound patient population.

Recommendation
Due to a lack of evidence, there is no recommendation.

Council Action
This issue was withdrawn.

Recommended guidelines for work hours of disaster workers (New)

Question and Importance
What are the recommended guidelines for work hours of disaster workers? Protecting the health of disaster workers should be a priority. Research in other areas links fatigue from work hours/schedules to risks in worker and patient/client safety.

Scientific Foundation and Discussion
A review of guidelines may lead to recommendations for policy and training for disaster workers.

Methodology
The Subcouncil is currently conducting a scientific review of the literature.

Recommendations
N/A

Council Action
Approved.

Impact of training for family caregivers on quality of life of persons with dementia (New)

Question and Importance
For family caregivers of persons with dementia, does training on dementia improve quality of life for the care recipient?

Scientific Foundation and Discussion
None

Recommendation
None

Council Action
This issue was withdrawn.
Questions and Answers
None.

Research
None.

Triennial Review
None.

Subcouncil Business
Nursing Quality Indicators Project. The Subcouncil has continued work on the Nursing Quality Indicators Project. The original study question was: The impact of the quality of nursing care in disaster shelters on client/patient outcomes. After discussion, the Council requested that this research approach be reframed, and presented at the January 2015 Council meeting.

Children in Disaster Shelters. The Subcouncil has continued work on a research review to determine the variables in nursing care that impact the physical and mental health and safety of children in disaster shelters. The research is expected to be presented at the January 2015 Council meeting.

Cultural Sensitivity Training. The Subcouncil has continued work on a research review regarding cultural sensitivity training of Certified Nurse Assistants (CNAs), personal care aides and home care aides of home-bound elderly. The goal is to determine whether this training improves activation of a patient or patient’s family compared to either activation prior to cultural sensitivity training or to those who had not been trained. The research is expected to be presented at the January 2015 Council meeting.

Stress Management for Health Care Workers. The Subcouncil has been discussing the effectiveness of self-care modalities for health care personnel in managing stress, but feedback from the Council suggested that the issue as stated is too broad to pursue.

Recent/Upcoming Releases and Publications
Nurse Assistant Training Publications. These materials were revised in 2012, and are due for revision again next year in 2015.

Caregiver Course Materials: These materials are out of date and major revisions are needed. They were removed from distribution in 2013 and when the project is resumed there will be a sharper focus.

Future Activity
None.
Preparedness and Disaster Health Subcouncil

The Preparedness and Disaster Health Subcouncil looks for the best ways to prepare for emergencies of every kind, from those that occur in the home to regional disasters, including how to train people to be more resilient after hardship, and how to keep communities whole and businesses operating. The Subcouncil also addresses how to provide acute and chronic medical and mental health care under disaster conditions, both for victims and for the emergency staff caring for them.

James A. Judge II, EMT-P, CEM, BPA
Preparedness and Disaster Health
Subcouncil Chair
   Emergency Management Director for Volusia County, Florida

Judith K. Bass, PhD, MPH
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Richard Bissell, PhD, MS, MA
   Professor of Emergency Health Services and Graduate Program Director at the University of Maryland, Baltimore County

Frederick (Skip) M. Burkle, Jr., MD, MPH, DTM, FAAP, FACEP
   Senior Fellow and Scientist in the Harvard Humanitarian Initiative, Harvard School of Public Health; Senior International Public Policy Scholar, Woodrow Wilson Center for International Scholars; Senior Associate Faculty Member, Department of International Health at Johns Hopkins University Medical Institutes

Steven Jensen, PhD
   Advisor in Emergency Management and Lecturer at California State University at Long Beach

Thomas D. Kirsch, MD, MPH, FACEP
   Director of the Center for Refugee and Disaster Response and Associate Professor at the Johns Hopkins Bloomberg School of Public Health, School of Medicine and Whiting School of Engineering

John R. Lindsay, MCP
   Associate Professor in the Applied Disaster and Emergency Studies Department at Brandon University

Rebecca S. Noe, MN, MPH, FNP-BC
   Epidemiologist at the Centers for Disease Control; Project Officer for American Red Cross-CDC Disaster Mortality and Shelter Morbidity Surveillance Systems

Scott C. Somers, PhD, EMT-P
   Member of the Phoenix, Arizona Fire Department; Certified Emergency Paramedic; Hazardous Materials Specialist with FEMA Urban Search and Rescue

Erika S. Voss, CBCP, CHS-III, CORE, MBCI
   Senior Continuity Manager, Microsoft Corporation
Scientific Reviews

Smoke detectors for home use (New)
Somers, Scott.

Question and Importance
The study will try to determine the type(s) of smoke detectors that the Council should recommend for home use and where they should be installed.

Scientific Foundation and Discussion
Issues to be considered: the reliability of a model, the usability of the system and the behavior of those in the home. Durability and dead batteries are an important issue in this area — 24 percent of homes have nonfunctioning detectors — and the newer 10-year battery models will also be considered.

Recommendation
Conduct a scientific review of the literature.

Council Action
Approved.

Questions and Answers
None.

Research

Impact of Red Cross mobile apps
Reviewers: Bissell, Rick, Jensen, Steven, Kirsch, Thomas, Goldfeder, Matt and Lindsay, John.

Scientific Foundation and Discussion
There is an ongoing study of the apps that the Red Cross uses to provide information to the general public in emergency situations.

Methodology
Matt Goldfeder (Director of Preparedness and Donor-Led Product Development) has developed some qualitative information that supports new insights on communication and effectiveness during disasters, which is being incorporated into the ongoing study.

Results
N/A

Future Research
The Council approved continued work on this project.

Pillowcase Project
Reviewers: Goldfeder, Matt and Bissell, Rick.

Scientific Foundation and Discussion
This project, a preparedness education program for elementary school children, is adding an app to its curriculum. Currently under development, the app is intended to engage specific populations of children around preparedness and safety issues that are important to their circumstances. There is a common denominator, however, which is to successfully reach children via an interactive, entertainment-like instrument, as opposed to dry, one-way instruction. A contractor from the Disney Company is consulting with the Red Cross on the app development.

Methodology
Trial implementation has been organized in several states around the country by Liz DiGregorio. Dr. Bissell will be at the Yankton Sioux Indian Reservation in South Dakota and hopes to pick up qualitative data on how this unfolds in an environment that is atypical of many others in the United States.

Results
N/A

Future Research
The Council approved continued work on this project.
Earthquake Protection Paper
Reviewer: Bissell, Rick, Lindsay, John, Jensen, Steven and Kirsch, Thomas.

Scientific Foundation and Discussion
Several papers are in preparation arising from data collected on the Feb. 22, 2011, earthquake in New Zealand.

Methodology
N/A

Results
The first paper is about to go out to colleagues for review, and projected submission for publication is October 2014.

Future Research
The Council approved continued work on this project.

Triennial Review
Rebecca Noe from the Subcouncil works at the Centers for Disease Control and Prevention (CDC), a federal partner that is very interested in the topic of tornadoes. The CDC continually gets questions from the media and from the Federal Emergency Management Agency (FEMA) relating to helmets and also to vehicles in tornado conditions. Some experts from Kent State University have been consulted. A recommendation on whether to participate in this triennial review will be presented at the January 2015 Council meeting.

Subcouncil Business
Research Methods Consensus Groups. The Subcouncil has been working closely with FEMA, providing technical assistance particularly related to tornado and earthquake protective measures. This work highlights the need to develop a way to agree on the levels of evidence, and thus the value of relevant research. The challenge in developing recommendation for disaster-related work is due to the lack of quantitative evidence in this field. Thus the GRADE system which is based on quantitative evidence, will not be helpful to develop recommendations. To address this challenge, together with FEMA, the Red Cross is establishing consensus groups to include the National Oceanic and Atmospheric Administration (NOAA) and the CDC. These groups will discuss research methods and evidence evaluation for the disaster-related sciences that they are all vitally concerned with, where relevant research – in addition to peer-reviewed journals – can develop ad hoc in the field. The groups hope to come up with a common lexicon and to meet the challenge of developing collaboration among major organizational systems in this field. Dr. Kirsch is trying to arrange funding from the Johns Hopkins University School of Medicine Department of Emergency Medicine.

Future Crises Advisory Committee. The Council has previously discussed forming an active group to look broadly at world matters – the physical, political and cultural – and develop innovative, proactive solutions to some of the most pressing and relevant problems. Stated goals are to support the Red Cross leadership in a time of rapid and widespread global change. The group of experts would: be transdisciplinary, able to develop international networks, promote actionable research, and help to maintain the unique role of the Red Cross in the new 21st century environment. The membership of that group was proposed and the recommendation was approved: Council Chair Dr. David Markenson would be the FCAC Chair. Preparedness and Disaster Health Subcouncil Chair Jim Judge would sit on the group, with Dr. Steven Jensen acting as FCAC Coordinator. Making up the rest of the Committee as Advisors would be Drs. Richard Bissell, Frederick Burkle and Thomas Kirsch.

Recent/Upcoming Releases and Publications

Future Activity
None.
The Resuscitation Subcouncil studies cardio-pulmonary resuscitation (CPR), choking, advanced cardiac life support, and both basic and advanced resuscitation, as well as defibrillation and the optimized use of Automated External Defibrillators (AEDs).

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**CPR Subcouncil Chair**  
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Joseph W. Rossano, MD  
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Joan E. Shook, MD, FAAP, FACEP  
Professor of Pediatrics in the Pediatric Emergency Medicine Section at Baylor College of Medicine
Scientific Reviews

Assessment strategies to determine presence of cardiac arrest (New)
Reviewers: Millin, Michael, Jones, Wendell, Berrett, Oliver, Scordino, David, Margolis, Asa, Azzam, Kristin, Westemeyer, Heather and Bradley, Richard.

Question and Importance
It is vital to perform chest compressions on anyone in cardiac arrest, but there have been conflicting recommendations about how to determine that condition: whether by breathing assessment or pulse check or both. How should those trained in CPR respond to when a victim is suspected of cardiac arrest?

Scientific Foundation and Discussion
All studies found were retrospective and included human simulation studies. Twelve papers met the study criteria: eight had a quantitative synthesis (three on pulse check, five on breathing assessment). Four other studies indirectly support the findings. While no studies tested the three candidate signals for cardiopulmonary resuscitation (CPR) head-to-head, the literature still provides a number of independent factors to consider.

Patients were more likely to survive if chest compression was begun as soon as the rescuer detected respiratory failure. However, some patients in ventricular fibrillation continued normal respiratory patterns for as long as 12-15 seconds. When patients were struggling to breathe (agonal breathing), they were almost certainly in cardiac arrest, though lay people only recognized the connection 40-80 percent of the time. When Emergency Department (EDS) dispatchers added agonal breathing to their protocols, more cases of cardiac arrest were recognized and bystanders provided more CPR interventions. When rescuers were assisted by a dispatcher over the phone, failure to use pulse check delayed CPR for up to four minutes after cardiac arrest was determined. In one study of pulse check in patients on cardiac bypass with no pulse, rescuers recognized the lack of pulse in only 90 percent of cases. In practice, bystanders try to determine whether someone who is in distress is in arrest using any or all of these indicators, often in an unsystematic process.

No studies show that checking for a pulse is superior over a breathing check. Studies of when to start CPR conclude that checking a pulse can detect cases missed due to failure to recognize agonal breathing.

Recommendations: CPR Assessment
If there is any doubt whether a patient is in cardiac arrest, then chest compressions (CPR) should be performed. Professional rescuers may consider using any of the following techniques simultaneously to recognize that someone needs of CPR:
(1) Pulse check and recognition of no pulse.
(2) Checking for respirations and recognition of no breathing.
(3) Detection of agonal breathing.

Council Action
Approved.

Recommendation: Guideline
Rescuers should understand that detecting cardiac arrest can be difficult; and if there is any doubt, start CPR.

Council Action
Approved as Guideline.

Recommendations: Options
(1) Professional rescuers, when caring for an unresponsive person, may consider a simultaneous pulse and breathing check to evaluate for cardiac arrest.
(2) Untrained and lay rescuers, when caring for an unresponsive person, may consider starting CPR.

Council Action
Approved as Options.
Age guidelines for managing children with obstructed airways (New)
Reviewers: Cassan, Pascal, Rossano, Joseph, and Meyran, Daniel.

Question and Importance
The management of children with obstructed airways uses age classifications to tailor treatments to age-related stages. What ages should be used to distinguish between children and (on the younger end) infants and (on the older end) children in puberty?

Scientific Foundation and Discussion
After a literature review, 39 full text articles were screened but excluded for reasons. There was no compelling evidence or targeted research to mark age transitions in managing children with obstructed airways.

Recommendations concerning age as a determinant for the management of obstructed airways do show a general consensus: An infant is younger than one year; a child is between one year and puberty (or eight years).

Recommendation
With the absence of evidence, it is reasonable to continue the current stages based on age for the management of obstructed airways: An infant is a child under one year, a child is between one year and puberty (or eight years old).

Council Action
Approved.

Future Research
Further studies are required to assess the age point that signals the transition from infant guidelines to child guidelines for the management of children with obstructed airways. One alternative to using the age (which may not always be known) of a child in distress as a guideline for managing obstructed airway situations would be to evaluate the stature and weight of the casualty as a marker.

Benefits of mechanical compression devices (New)

Question and Importance
Cardiopulmonary resuscitation may involve the use of pneumatic, device-assisted chest compressions. Is there sufficient evidence to determine the value of these approaches compared to manual and traditional CPR?

Scientific Foundation and Discussion
In a literature review, no well-structured randomized control studies were found. There were 17 studies selected for qualitative synthesis. Many studies that failed to achieve statistical significance suggested either some improvement or no difference. Of two studies that did achieve statistical significance, one showed worse outcomes with the mechanical device, the other showed no difference.

Little is known about the other benefits of using mechanical compression devices; such as, avoiding worker injuries, providing CPR in difficult environments and continuing CPR while transporting to a catheter lab.

Recommendation: Mechanical Compression Devices
There is limited evidence to evaluate the harm or benefit of mechanical compression devices when compared to manual CPR. Further research is appropriate and necessary. Use of these devices should be optional based on preference.

Council Action
Approved.

Recommendation: Option
While delivering CPR, health care providers – as contrasted with lay rescuers – may consider avoiding the use of a mechanical compression device.

Council Action
Approved as Option.

Future Research
More investigation is needed into the other benefits or problems of using mechanical compression devices.
Questions and Answers

For unconscious people receiving basic life support – but not in cardiac arrest – does delivering chest compressions produce negative effects? (New)

Discussion
The studies reviewed were conducted among a broad spectrum of actual aid providers giving chest compressions in real-world situations. The studies showed no pattern of significant complications following the delivery of CPR chest compressions to patients who were not in cardiac arrest. The few complications that were observed (< 2 percent) were predominantly rib fractures, with little visceral organ damage. Animal studies showed no irreversible tissue damage.

Recommendation
Lay rescuers should not withhold chest compressions for people with possible cardiac arrest.

Council Action
Approved as Standard.

Recommendation
AEDs are preferable that attenuate the strength of the electric shock with pediatric pads. However, if such an AED is not available, an AED with adult pads should be used. Given how critically important it is to use an AED promptly, the public message should be kept as simple as possible to avoid uncertainty and delay. For example, “If an AED is available, use it on a child, even on an infant, who is in cardiac arrest.”

Council Action
Approved as Guideline.

Subcouncil Business
Subcouncil Name Change. It was proposed that the name of the CPR Subcouncil be changed to the Resuscitation Subcouncil. The Council approved.

Basic Life Support for Unconscious People. The Council approved the following question for a Scientific Review: For unconscious people receiving basic life support – but who are not in cardiac arrest – does delivering chest compressions produce negative effects?

High performance CPR. The topic of high performance CPR was previously was approved for Scientific Review and is in progress.

Impedance threshold devices. The topic of impedance threshold devices previously was approved for Scientific Review and is in progress.
Future Activity

A number of projects are on track and progress will be reported at the January 2015 Council Meeting:

• Scientific Review of the harms of chest compression.
• A research project to evaluate the Cardiac Arrest Registry to Enhance Survival (CARES) database and evaluate the prevalence of – and factors associated with – bystander CPR in children.
• A research project to evaluate the CARES database to evaluate the use of CPR adjuncts and determine the association of these adjuncts with outcome.
• Convene a summit to set a minimum standard for BLS, ALS and PALS certification.
• Proposal for a study to evaluate CPR skill retention in a blended learning environment.

Council Action

The proposed agenda was approved.
The Committee, which is made up of selected Council members, helps to identify not only the most effective methods for teaching skills and procedures, but also ways to instill in people the confidence and desire to step forward and use these techniques to help those in need.

**Committee Business**

Though not designated as a Subcouncil, the Education Committee has been expanding its activity, and will actively and on request coordinate with other Subcouncils in helping to identify the research most likely to be communicated to – and used by – those that need it. This in turn will help the Red Cross advance its mission. The Committee also hopes to be useful in the ongoing conversations about honing the Red Cross research agenda, and to help the Nursing and Caregiving Subcouncil hone its research agenda for the December 2014 meeting.

Some areas of emphasis that will help coordinate the Education Committee’s near-term work with the rest of the Council:

- **Simulation outcomes.** Jonathan Epstein and his team are developing simulations to study how Red Cross messages, apps and products might fare once they are in the public market. These will also have long-term educational impacts.

- **Self-Efficacy.** Some people in Red Cross programs may face personal barriers to providing care. Helping them to understand their actual skills and competencies can be important.

- **Retraining.** How and when to retrain people in Red Cross programs is not easily summarized. There will be work done with the Resuscitation Subcouncil to look for patterns and other factors that correlate with better outcomes.

- **Red Cross instructors.** Peer feedback, self-motivation and local culture are some of the domains that will be examined to identify quality instructors, who also need to be able to evaluate their students and assess situational learning variables.

**GRADE as a Research Evaluation Tool**

*(being conducted in conjunction with First Aid Subcouncil)*

**Background**

Since 2000 a working group of international scientists has developed a system for evaluating the strength of research and the evidence it is based upon. A number of organizations have endorsed or are using the system—Grading of Recommendations Assessment, Development and Evaluation—known as GRADE. According to the GRADE website, some of these organizations are: ILCOR, The Cochrane Collaboration, The World Health Organization, the Agency for Healthcare Research and Quality, and the Scottish Intercollegiate Guidelines Network (Scottish).

In the last several years, a consensus has been growing among various external research communities as to GRADE’s value. As more organizations adopt or modify the system for their own use, GRADE is becoming a standard. The Council has been evaluating GRADE and a few other comparable scientific review processes for several years. These deliberations found GRADE to be superior to other major systems that might be candidates for such a standard, but they also identified a number of challenges and misgivings about using GRADE as the primary evaluation tool for Council reviews.

**Discussion**

The GRADE software is not user-friendly. Cumbersome to use and difficult to train volunteers how to use it, it was designed for professional researchers seeking to rank primarily quantitative evidence, such as random controlled trials (RCTs). GRADE is sometimes used to aggregate results into a meta-study format without using proper meta-analysis techniques, leading to conclusions that are not supported by any one of the individual studies. The Cochrane Collaborative found GRADE inadequate for evaluating the “disaster” literature, and established a specialized offshoot of their own system called Evidence Aid.
The GRADE target user contrasts with Council researchers, who work as volunteers and face a heterogeneous range of evidence across the various disciplines that make up emergency/disaster science. Many of the studies in these disciplines include only observational designs and/or qualitative variables and lack quantitative evidence. Considerable resources would be required for the Council to modify and run a GRADE-like system.

For the purpose of developing guidelines, the current system in use by the Council is as rigorous as GRADE. As originally planned, all Council reviews should be conducted by two principal reviewers who see all the studies reviewed. Furthermore, the review should include a complete classification table that specifies the research design and its built-in reliability level for each study with identification of biases and limitations. There must also be an effective summary for all studies. Thus the current system is well-designed to provide reliable conclusions and guidelines. The subcouncils need to work to ensure that the reviews are conducted along the originally planned parameters.

Most consumers and users of the Guidelines do not consult the full scientific review, or the final slide deck, for a given study; so the summary itself must be detailed and reliable. The Scottish Intercollegiate Guidelines Network system seems to be the most reliable at creating guidelines and study criteria for the type of science the Council reviews and conducts. The National Environment Management Strategies Program (NEMSP) is also considering a guideline writing process that might be useful to the Council, in part because it possesses no structural bias against qualitative studies.

Next steps

1. Dr. Markenson will review the templates used by Council researchers/reviewers, and revise them in light of this discussion on GRADE. They have been modified over the years and perhaps need to be refocused as a step-wise process for the person doing the review.

2. The Red Cross will establish communication with Eddie Lange to explore the possibility of modifications to GRADE that would address the Council’s needs.

3. An inquiry will be made as to what other organizations may be in the same situation, especially in terms of a focus on observational, epidemiological and qualitative research designs to see if there are opportunities to collaborate on mutual issues.

4. Steps will be taken to bring some key Red Cross partners/stakeholders into the effort so they will be more likely to understand and buy into the final decision(s).

5. The Committee will evaluate whether the Council Guideline process could be tightened up by incorporating pieces and/or principles of the Scottish system.

6. The Council and staff will consider the implications of a major organization like the Red Cross eventually rejecting the GRADE system as it becomes more of a de facto standard. Could Leadership have a role in discussions at that higher level? Staff should ensure that current practice is compliant with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Council and Leadership should consider whether to go public with this dilemma, perhaps with an editorial about “External Validity: Not for sale.”
Operation of the Council

The Council’s professional diversity gives it an important advantage: a broad, multidisciplinary foundation for evaluating the scientific evidence for emergency response methods and techniques in emergency procedures, disaster actions, nursing care, water instruction and drowning prevention, and in the educational methods used to teach this information.

In addition to being experts in their own specialties and conducting original research outside of the Red Cross, the Subcouncil members are also knowledgeable in evaluating scientific literature, research methods, study designs and evidence grading, so they can fairly judge the quality and strength of the research they review.

The Scientific Review Process

Council members continuously monitor their fields of expertise for important developments in emerging science and bring these events to the attention of the Council.

Council action can also begin elsewhere, such as when a new technology or product enters the field, or with an inquiry from a local Red Cross chapter or instructor about how best to handle a particular situation or emergency.

Once a subject merits further investigation, a Subcouncil proceeds on a structured course that may include Scientific Review followed by guideline creation, Council Answers or Advisories. Two or more members of the appropriate Subcouncil are assigned to thoroughly research relevant reference materials, formal clinical trials, published texts, expert opinion, and other available evidence based sources through a structured review process. The Council also has a rigorous conflict of interest process to assure only scientific evidence is included in the discussions and recommendations.

The Subcouncil discusses this scientific information and, when warranted, forwards the research and its opinion to the full Council in the form of a recommended final product such as a Scientific Review, Advisory or Council Answer. The full Council hears the recommendations presented by the Subcouncil, and all participating members vote for approval or other action.

Following this rigorous Scientific Review, the Council votes on whether to accept the review including the proposed recommendations, each of which is assigned a strength.

This strength is an assessment of the current state of scientific and medical research on the subject of the recommendation. The different strengths are classified as follows:

- **Standards** – Very strong evidence is available from well designed, prospective, randomized, controlled studies.
- **Guidelines** – Current evidence is somewhat less robust, such as non-randomized cohort studies, case-control studies or retrospective observational studies.
- **Options** – Evidence includes current expert opinion, best practices, etc.

Lastly, the Council drafts any recommended changes to existing Red Cross materials and programs including suggestions for implementation by the Red Cross. After being issued, recommendations and their assigned strengths come under regular Council review, and may be updated as new evidence and other scientific advances become available.

An approved recommendation is also made available to the public at large through a variety of news media and on Red Cross websites, free of charge.

Council Follow-up

The Red Cross field organization serves as a resource for the Council, allowing it to quickly augment its scientific and medical expertise with actual data from the field. Many Council members themselves work in the field with the Red Cross and other organizations, gathering firsthand knowledge of what works best under actual emergency conditions.
The Council seeks feedback on the effectiveness of all its recommended techniques after they are issued to the field. A range of follow-up processes includes scrutiny of program feedback from the instructors and students and on-going, proactive reviews. For example:

- **Disaster Health** – Fatality data after disasters including house fires are captured after each event.

- **Aquatics** – Data are collected on rescues by lifeguards not only in the United States but also in Canada.

- **First Aid** – National and international data on injuries and illnesses are reviewed to establish where education is needed. Surveys are conducted in the field to determine how recommended techniques are being taught, if they are clearly understood, and how well the techniques are remembered. This last aspect is very important. For example, these surveys have determined that occasional short refresher courses have a major impact on trainees’ recall of course material and proper technique.

Every new recommendation is reviewed and updated three years after being issued, and all recommendations are reviewed in the light of new research such as ILCOR every five years.

**Scientific Advisory Council Recommendations**

The Council regularly issues rulings on establishing the standard in first aid care, resuscitation, aquatics, preparedness and disaster health, and nursing and caregiving. Some of the issues that the Council has advised on include the following:

Aspirin Administration for Chest Pain by Lay Responders

Chain of Drowning Survival

Circle of Drowning Prevention

Compression-only CPR

CPR Skill Retention

Critical Incident Stress Debriefing (CISD)

Drowning and Lack of Efficacy of Abdominal Thrusts

Hand Hygiene for the General Public

Hyperthermia

Infant AED

Mask Use for Influenza

Mild Traumatic Brain Injury/Concussion

Lightning and Pool Safety

Minimum Age for Swimming Lessons

Swimming Competency

Stroke Assessment Tools

Supervision around the Water

Topical Hemostatic Agents

Tourniquet Use

Use of Epinephrine Auto-Injectors for Anaphylaxis

**Leadership of the Scientific Advisory Council**

Within the Red Cross organization, the Council is part of the Preparedness, Health and Safety Services Division, with the Council Chair reporting directly to the Division President.

**Council Chair**

David Markenson, MD, MBA, FCCM, FAAP, FACEP, EMT-P

Chief Medical Officer, Sky Ridge Medical Center

**Vice-Chair**

Linda Quan, MD, FAAP

Pediatric Emergency Physician at Seattle Children’s Hospital; Professor of Pediatrics at the University of Washington School of Medicine
The American Red Cross Scientific Advisory Council is a panel of nationally recognized experts in emergency medicine, sports medicine, emergency medical services (EMS), emergency preparedness, disaster mobilization and other public health and safety fields. The Council ensures that all Red Cross programs are fully current with the latest science, address current needs, and are prepared for future changes.

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