

Proceedings

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**American
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Scientific
Advisory Council

The Scientific Advisory Council

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, first aid, resuscitation, pediatrics, cardiology, occupational health, sports medicine, school health, EMS response, aquatics, disaster health and emergency preparedness.

The Council members are organized into the following five groups:



Aquatics Sub-Council



First Aid Sub-Council



Preparedness and Disaster Health Sub-Council



Resuscitation Sub-Council



Education Sub-Council

David Markenson, MD, MBA, FCCM, FAAP, FACEP, FACHE is Co-Chair Chief Medical Officer (CMO) of the Scientific Advisory Council

Eunice (Nici) Singletary, MD, FACEP is Co-Chair Volunteer of the Scientific Advisory Council

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Aquatics Sub-Council

The Aquatics Sub-Council reviews ways to help 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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Aquatics Centennial Campaign

The Aquatics Centennial Campaign, launched on Memorial Day 2014, continues to expand and generate enthusiasm in communities across the country. As an “ecosystem of water safety,” the campaign provides resources to help Red Cross training providers make swim lessons and aquatics safety programs and trainings available, accessible and affordable. The focus is on communities that have experienced especially high drowning rates.

As of January 2020, the campaign is underway with 59 Licensed Training Providers at 213 participating aquatics facilities located in 108 communities across the country, from Kenai Peninsula, Alaska to Key West, Florida.

As of December 31, 2019, through our Licensed Training Provider partners, we have:

- Delivered 98,690 sets of lessons (including more than 785,000 individual lessons) to children and adults, teaching them the life skill of swimming. These are families who likely wouldn't otherwise participate in this lifesaving training.
- Developed 2,071 future lifeguards through Junior Lifeguarding.
- Trained 2,041 lifeguards, water safety instructors, and lifeguard managers, and 8 instructor trainers.
- Equipped 17,375 parents and caregivers with water safety knowledge and skills. 681 parents and caregivers also received focused pediatric CPR/AED training, many resulting in certification.

Triennial Review

Lightning Safety for Aquatic Facilities

Reviewer: Stephen Langendorfer, PhD

Question

What is the best way to protect individuals in aquatic facilities from the potentially severe consequences of being struck by lightning?

Discussion and Findings

Originally framed at the level of a guideline to evacuate *indoor* pools in the event of a possible lightning strike, this question was expanded to include management of risk with strategies such as evacuation at all aquatic facilities, including *outdoor* pools and water parks.

Two definitive NATA (National Athletic Trainers' Association) position statements on sudden death and lightning emphasize the importance of immediately evacuating outdoor aquatic facilities upon detecting the first sound of thunder (not waiting for the 30-second interval from flash to thunder, as was previously recommended); sheltering patrons in sturdy, walled buildings with electricity and plumbing; and maintaining a lightning Emergency Action Plan (EAP). This NATA position was supported by information on the National Oceanic and Atmospheric Administration (NOAA) and National Weather Service (NWS) websites.

Taking this information into account, Council members discussed the appropriate levels for lightning-related recommendations and voted unanimously to revise and retain their recommendation at the standard level: Outdoor aquatic facilities must be evacuated at the first sound of thunder. Since the review of relevant literature uncovered no new information regarding indoor aquatic facilities, the recommendation at a guideline level of a conservative strategy for their evacuation remains unchanged. Following some discussion, this recommendation was likewise approved, although not unanimously. The Council unanimously approved the recommendation to monitor weather conditions as an option.

Recommendations: Standard

This Sub-Council review provided updated information at the standard level. All outdoor aquatic facilities must have an Emergency Action Plan (EAP) with a specific section on lightning safety that involves:

- Clearing aquatic facilities upon the initial sound of thunder.

- Planning for patron shelters in robust, strong buildings or metal-roofed automobiles (not gazebos, picnic or other open structures).
- Posting lightning EAP policy at the facility.

Recommendations: Guidelines

Indoor aquatic facilities *should* remove patrons from the water (and showers, spas or other areas exposed to plumbing) during electrical storms due to the possibility that a high-voltage lightning strike could overwhelm ground fault electrical systems.

Recommendations: Option

Weather forecasts should be monitored, especially by indoor facilities without direct observation of the weather.

Council Action

The Council approved the recommendations.

Scientific Advisory Council Q&A: Exposure to Pool Chemicals

Reviewers: Nathan Charlton, MD and S. Robert Seitz, MEd, RN, NREMT-P

Question

What is the best way to prevent exposure to caustic pool chemicals and to administer first aid if exposure accidentally occurs?

The Aquatics Sub-Council collaborated with the First Aid Sub-Council in an examination of strategies for preventing exposure to pool chemicals and providing first aid if exposure occurs. See the First Aid Sub-Council's Q&A for a detailed discussion of this topic, as well as the Answer and Council Action.

Other Activities

- **Water Safety USA:** The Red Cross is a key participant in this group of nonprofit and governmental organizations, which are committed to enhancing water safety messaging in the United

States. One current focus is on messages related to life jacket use for boating and swimming.

Water Safety USA is also leading the effort for the development of a **National Water Safety Action Plan**. The goal is to develop a national plan with models for a water-smart nation, state, and county or community. It presently calls for creating six committees (Fencing/Barriers, Water Competency and Swimming, Supervision/Lifeguards, Surveillance, Life Jackets, and Rescue/CPR) and is working on identifying co-chairs and members for each committee. Members will include stakeholders such as teens, individuals with special needs, diverse populations, parents, legislators, industry representatives, lifeguards, public health and CDC officials, physicians and other medical professionals. The next step is to design and conduct a scoping exercise for each committee. Funding for one to two years is nearly achieved.

- **Water Safety Education in Schools:** Water Safety Advocates including the Red Cross are working to reduce drownings through water safety education in schools. Starting in Florida, in collaboration with WaterSmartFL, their Action Plan is to:

- Work with lawmakers to require schools to teach students from Pre-K through 12th grade to prevent, recognize and respond to aquatic emergencies.
- Utilize public/private partnerships to show industry support to legislators.
- Assist with the development of a curriculum framework for schools in grades Pre-K through 12.

Two identical bills have been filed in the Florida House and Senate for the 2020 session: House Bill 325 sponsored by Representative James Bush III, and Senate Bill 608 sponsored by Senators Jason Pizzo and Joe Gruters. Advocates will help educate committee members about the importance of teaching water safety in schools.

- **Commitment to Diversity:** The Sub-Council is committed to the work of **Diversity in Aquatics**, helping to advance its mission “to empower and improve the quality of life and reduce the risk of unintentional drowning deaths in historically underrepresented communities and vulnerable populations through water safety education and promotion of aquatic physical activity as a healthy lifestyle.”

The Sub-Council is also supporting efforts to build the **National Aquatics Diverse Partners Alliance (NADPA)** with the Red Cross Office of Diversity and Inclusion Services. NADPA brings together organizations that serve communities disparately affected by drowning and that have strong community ties and a national chapter structure.

The American Red Cross has collaborated or plans to collaborate with its partners in diversity to present the following symposiums, webinars and other events:

- ARC/DIA Aquatic Symposium Series (Philadelphia, PA)
 - “Beyond the Lifeguard Chair” (September 19, 2019)
 - “Rowing Is the New Normal” (February 20, 2020)
 - “Water Safety Festival” (TBA, Goal of May 15, 2020)
- NADPA/DIA Webinars for Diverse Communities
 - 2020 NADPA Water Safety Kick-Off: Advancing Swim Instruction and Water Safety in Diverse Communities 4.0
 - Collaborative Development of a Webinar for Water Safety Ambassadors
- International Water Safety Day (IWSD) 2020
- 4th NADPA Aquatic Summit at DIA

- **CARES (Cardiac Arrest Registry to Enhance Survival) and Drowning:** Cardiac arrest associated with drowning is a major public health concern, and neurologically favorable survival after drowning remains low. In a study of drowning victims identified in the CARES database, *Bystander Cardiopulmonary Resuscitation in Cardiac Arrest Following Drowning*, by Joshua M. Tobin, MD, et al, researchers concluded that:

- Bystander CPR, witnessed drowning and younger age were associated with neurologically favorable survival.
- Public location of drowning, male gender and shockable rhythms were not associated with favorable neurological survival.
- AED application prior to EMS was associated with a decreased likelihood of favorable neurological outcome.

- **International First Aid Guidelines for Drowning:** An important Aquatics Sub-Council goal is to develop First Aid Drowning Guidelines for 2020. To meet this goal, reviewers and other experts from countries including the USA, UK, New Zealand, Portugal, Spain, and Switzerland conducted scientific reviews on:

- How to recognize a drowning.
- How to safely rescue a drowning victim.
- What factors influence implementation of water safety training.
- Which learning modalities impact patient, learner and/or societal outcomes.



Researchers are now in the process of developing recommendations which will be published in a new chapter on Drowning for the First Aid Guidelines manual.

- **Current Aquatics Programs:** More than 330,000 lifeguards are trained each year using the Red Cross Lifeguarding program. Nearly 15,000 new water safety and basic swim instructors were certified through Red Cross training and more than 2.3 million sets of Red Cross swim lessons and water safety classes were taught at 3,281 aquatic facilities across the U.S. and on installations overseas.

The Red Cross and the Pool and Hot Tub Alliance (phta.org) have jointly developed and continue to support the Home Pool Essentials course that is designed to teach home pool owners the basics of pool and hot tub maintenance, along with strategies for creating a safer pool environment.

Future Work

The Sub-Council sought and received unanimous approval for three Q&A's, which could potentially be upgraded to scientific reviews.

- **Q&A:** What is the efficacy of dry land water-safety instruction?
- **Q&A:** Should breaths or compressions be provided first to a drowning victim? How many breaths should be provided?
- **Q&A:** What are the best evidence-based scanning techniques for lifeguards to recognize drowning?



First Aid Sub-Council

The First Aid Sub-Council's range of study is broad, including the care at every scale of emergency, from providing self-care to the care rendered by professional emergency responders or by lay persons providing care on the roadside, in the wilderness, in a shelter; everything up to the care provided by Emergency Medical Services or at a hospital. Sub-Council members serve on a variety of international scientific bodies including the International Liaison Committee on Resuscitation (ILCOR) First Aid Task Force and as authors of the joint American Red Cross/American Heart Association First Aid Guidelines Update and International Federation of the Red Cross (IFRC) First Aid Guidelines.

The First Aid Sub-Council membership includes a research interest subgroup that identifies gaps in scientific evidence for first aid, and designs and implements research studies to address those gaps.

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Scientific Advisory Council Q&A: First Aid for Acid Attacks

Reviewers: Craig Goolsby, MD and Elizabeth Kennedy Hewett, MD

Question

What is the best way to provide first aid for a person injured in an acid attack?

Discussion and Findings

Acid attacks, which are frequently directed toward women, are on the rise around the world, making it important to identify their optimal management. While

guidance on household and industrial accidents exists, there is little data on intentional attacks. A literature review identified three key studies that addressed management of acid attacks.

Answer

While acid attacks are typically not immediately fatal, it's critical to act quickly to reduce injury and threat to life:

- People who sustain acid attacks should immediately remove overlying clothing and jewelry if able.
- Apply clean water to exposed skin and eyes for at least 15 minutes. If possible, the individual should shower. If a pH is able to be measured, continue decontamination with water until a neutral pH is reached. Note: Although other decontamination agents exist, water is most readily available, least expensive, and proved just as effective in limited studies.
- Due to the risk of complications, seek prompt medical attention at a hospital. If possible, continue decontamination efforts during transport.
- First aid providers should wear appropriate personal protective equipment, or PPE (e.g., gloves, goggles, gowns), to prevent accidental self-contamination.
- Greater education about acid attack first aid is encouraged. One study indicated that education decreased delay to decontamination with water and thus final burn severity.

The researchers hope to publish these conclusions in a peer-reviewed journal.

Council Action

The Council unanimously approved the answer.

Scientific Advisory Council Q&A: Recognition of Narcotic Overdose by Laypersons

Reviewers: Matthew J. Levy, DO and David C. Berry, PhD, MHA

Question

Are untrained first aid providers able to recognize narcotic overdose requiring naloxone administration?

Discussion and Findings

It is critical to act quickly in cases of narcotic overdose, but people who are not trained medical professionals may have difficulty recognizing the symptoms. After screening over 2000 studies, primarily ones connected to opioid education and naloxone distribution programs, the reviewers identified several signs recognizable by laypersons.

Answer

Research indicated that depressed mental status, unresponsiveness and abnormal breathing (e.g., snoring) were narcotic overdose signs that untrained bystanders were able to recognize. There was no evidence to indicate that they could recognize other common symptoms such as miosis (small contracted pupils).

Council Action

The Council unanimously approved the answer.

Scientific Advisory Council Q&A: FDA Expiration Extensions

Reviewer: Angela Holian, PharmD

Question

What does an FDA expiration extension mean, and what does it mean for first aid providers?

Discussion and Findings

During critical medication shortages, the FDA may approve the use of certain lifesaving drugs past their expiration date, based on stability information provided to the agency by the manufacturer. The FDA reviews this data and assigns extended expiration dating to specific medication lot numbers. The agency lists these medications on their website (<https://www.fda.gov/drugs/drug-shortages/search-list-extended-use-dates-assist-drug-shortages>).

Answer

Medications should be used according to FDA recommendations, including paying attention to expiration dates. However, during critical drug shortages, which can lead to life-threatening emergencies, the agency approves the use of some medications past their expiration date so first aid providers can prescribe them for their patients.

Council Action

The Council unanimously approved the answer.

Scientific Advisory Council Q&A: Frequency of Naloxone Administration for Overdose

Reviewers: Angela Holian, PharmD and Joshua M. Tobin, MD

Question

Following an initial dose of naloxone for narcotic overdose, when should additional doses be administered?

Discussion and Findings

According to current FDA-approved product labeling, after an initial dose of naloxone is given to an individual with suspected opioid overdose, additional doses can be given every 2 to 3 minutes if the person does not respond or responds and relapses into respiratory depression. Administration should continue at these intervals until emergency medical assistance arrives.

In addition to FDA labeling, a growing body of evidence from available studies supports re-administration of naloxone every 2-3 minutes. Accordingly, reviewers are making a revision to the previous SAC recommendation for additional doses every 4 minutes.

Answer

Following an initial dose of naloxone for overdose, reviewers are changing the recommendation for frequency of additional doses from every 4 minutes to every 2–3 minutes.

Council Action

The Council approved the answer with abstentions.



Scientific Advisory Council Q&A: Exposure to Pool Chemicals

Reviewers: Nathan Charlton, MD and S. Robert Seitz, MEd, RN, NREMT-P

Question

What is the best way to prevent exposure to caustic pool chemicals and to administer first aid if exposure accidentally occurs?

Discussion and Findings

Caustic chemicals are used to keep pools clean and safe, but these chemicals can be hazardous. Inadvertent exposure may cause a variety of health problems, including inhalational injuries, chemical burns, and eye irritation. In collaboration with the Aquatics Sub-Council, the reviewers examined the literature relating to pool chemical exposure and first aid. The evidence pointed to immediate removal from the source as the key component of first aid, along with copious irrigation with clean water and other steps. Importantly, researchers also identified safe practices for handling pool chemicals to prevent harmful exposure.

Answer

Following eye, skin or inhalational exposure to pool chemicals, the victim should be removed from the source, taken to an area with fresh air, and contaminated materials (e.g., clothing, contact lenses, jewelry) should be removed. Irrigation of the exposed area with uncontaminated fresh water should take place immediately for at least 15 minutes. If symptoms do not resolve during that time or grow worse, the affected person should be evaluated by trained medical personnel.

To prevent accidental exposure to caustic chemicals from occurring, follow these safety measures:

Safe Practices for Handling Pool Chemicals

- Never mix chemicals together unless the instructions say to do so.
- Always read and reread instructions on any chemical container.

- Always store pool chemicals in their original containers.
- Make sure pool chemicals are stored separately in a well-ventilated and dry area.
- When opening a pool chemical container, be prepared to move away immediately after opening the container. Let the container be ventilated for a period of time before approaching.
- If any type of mechanical chlorinator is used, use only the chemicals recommended for use in it. A fire or explosion may result if this warning is not heeded.
- Always mix chemicals into water, not water into chemicals.
- If you use the same bucket to add different chemicals to the pool water, be sure it is clean and dry before introducing a new chemical.
- Do not put wet scoops into dry chemicals.
- Have a full bucket (labeled) of plain water available in case of a chemical spill. Know what to do in case of emergency.
- Always have the Poison Control Center phone number posted and on hand near the pool: 1-800-222-1222.

Council Action

The Council unanimously approved the answer.

Scientific Advisory Council Q&A: Bleeding Control Manikins

Reviewers: Nathan Charlton, MD; Sarita A. Chung, MD; Craig Goolsby, MD; Matthew J. Levy, DO; CDR Thomas E. Sather, EdD

Question

What are the essential elements of a hemorrhage control manikin or other hemorrhage control trainer?

Discussion and Findings

Evidence indicates that hands-on training on hemorrhage control manikins improves the skills of wound packing

and tourniquet application compared with didactic education (i.e., lectures in which students are passive listeners). In discussion, it was also pointed out that pool noodles can be used in hands-on skill practice to train laypeople to act as immediate responders in emergencies. Going forward, researchers will examine education effectiveness, skill retention, and long-term benefits of first aid education (e.g., Cardiopulmonary Resuscitation [CPR], Stop the Bleed) using manikins (high-fidelity) versus pool noodles (low-fidelity).

The Red Cross Scientific Review from 2017 and the updated Triennial Review in 2019 advocated for the use of feedback devices in CPR training, but there is no evidence to support their use in hemorrhage control.

Answer

An effective hemorrhage control manikin or other hemorrhage training device should have the following features:

- Durable product that will withstand repetitive use.
- Dimensions that would allow for appropriate application of a tourniquet.
- Dimensions that would allow for appropriate application of direct manual pressure.
- Portability to allow for transport.
- Location indicator of wound and directional indicators.

Council Action

The Council unanimously approved the answer.

Triennial Review

Medical Gloves for First Aid

Reviewers: Morgan Hillier, MD and Jeffrey S. Upperman, MD

Question

What gloves are best for first aid providers?

Discussion and Findings

Gloves are essential to protect healthcare workers

against exposure to germs and bodily fluids. In a literature review, researchers identified eight new studies regarding what gloves are safe, effective and feasible for first aid providers. The data were consistent with previously reviewed information.

With the prevalence of latex allergies in healthcare workers ranging from 0.6% to 15%, depending on the specific definition, latex-free gloves continue to be the rule. Regulatory bodies also continue to ban powdered gloves and absorbable powder in gloves for healthcare providers. No new policy changes were identified.

Recommendations: Standards

Latex-free gloves should be used for first aid. Although latex-free, vinyl gloves should not be used for first aid.

Recommendations: Guidelines

Nitrile gloves are recommended when handling blood or other potentially infectious body fluids.

Recommendations: Options

Gloves should be stored in their original packaging, away from direct heat or sunlight when possible. Do not use gloves beyond their expiration date, or if they are cracked, discolored or otherwise degraded.

Council Action

The Council voted unanimously to approve the recommendations and retire the question. A more specific future question comparing nitrile gloves with other non-latex, non-vinyl gloves may be addressed as new products are developed.

Triennial Review

Epinephrine for Anaphylaxis

Reviewers: Jestin Carlson, MD and S. Robert Seitz, MEd, RN

Question

What is the best way to use epinephrine auto-injectors to treat anaphylaxis?

Discussion and Findings

Epinephrine auto-injectors (EAI) are the first-line



treatment for anaphylaxis, a serious, potentially fatal allergic reaction. Reviewers identified five recent studies on EAI and anaphylaxis in their updated literature search, and none provided new evidence to change current recommendations.

Recommendations: Standards

None.

Recommendations: Guidelines

Laypersons should be trained to assist with epinephrine administration by auto-injector or (where state regulations permit) to administer epinephrine by auto-injector when a person indicates he or she is having a severe allergic reaction and provides a prescribed EAI. Treatment should be given if symptoms are present despite lack of low blood pressure, dizziness, fainting or collapse.

Recommendations: Options

- If signs or symptoms of anaphylaxis persist, administer a second dose of epinephrine by auto-injection within 5 to 15 minutes after the initial dose.
- Administration of EAI using undesignated stock epinephrine by trained first aid providers to people with suspected anaphylaxis is permitted when they are in a state with legislation permitting this and when acting on behalf of an entity/organization with a program for the use of undesignated stock EAI.

Council Action

The Council voted to approve the recommendations and retire the question.

Triennial Review

Heat-Related Illness

Reviewers: David C. Berry, PhD and Deanna Colburn Hostler, DPT, PhD

Question

What are the characteristics and signs and symptoms of Exertional Heat Illness, or EHI (i.e., exercise-associated muscle cramps, heat exhaustion, exertional heat stroke),

that can be recognized by a lay first aid provider, and what are the recommended interventions by first aid providers for each of these conditions?

Discussion and Findings

There is no new research to support a change in the description of the signs and symptoms of the three levels of EHI, and no new research to support any change in their treatment. ILCOR recently completed a systematic review of first aid cooling techniques for exertional heat stroke and hyperthermia and concluded that whole body (from the neck down) water immersion continues to be the best practice. When water immersion is not available, other cooling techniques (e.g., commercial ice packs, showers, ice sheets, fanning), although less effective, should be initiated immediately.

Exercise-Associated Muscle Cramps

Exercise-associated muscle cramps are muscle spasms, which can be intense and debilitating and occur typically in the legs, arms, and abdomen.

Recommendations: Standards

None.

Recommendations: Guidelines

Interventions by first aid providers should include:

- Rest. Stop activity associated with muscle cramping.
- Ice the affected muscles.
- Gently stretch affected muscles.
- Massage cramping muscles.
- Drink cool fluids. Fluids should ideally contain carbohydrates and electrolytes and be at recommended temperatures of 10-15 degrees C (50-59 degrees F).
- Do not resume exercise until symptoms have resolved.

Recommendations: Options

None.

Exertional Heat Exhaustion

Exertional heat exhaustion is an inability to cope with

heat stress and is characterized by fatigue, nausea and/or vomiting, loss of appetite, dehydration, heat cramps, dizziness with possible fainting, elevated heart and respiratory rate, and skin that is pale, cool and clammy, or slightly flushed. The person may be weak and unable to stand but continues to have a normal mental status.

Recommendations: Standards

None.

Recommendations: Guidelines

Interventions by first aid providers should include:

- Remove the person from the hot, humid environment.
- Remove excess sports equipment and clothing.
- Lay the victim in a cool place.
- Begin cooling with cold or cool water combined with fanning.
- Encourage the victim to drink cool fluids. Fluids should ideally contain carbohydrates and electrolytes and be at recommended temperatures of 10–15 degrees C (50–59 degrees F).
- Exercise should not be resumed until all symptoms resolve and the person’s hydration status has returned to normal. This often occurs within 24 hours. Same day return to play is not advised.
- If a person with suspected exertional heat exhaustion is unable to tolerate oral rehydration or develops any change in mental status, contact 9-1-1 immediately.

Recommendations: Options

None.

Exertional Heat Stroke

In the spectrum of heat illness, heat stroke is the life-threatening emergency. Victims have exaggerated heat production and an inability to cool themselves. Signs include high body temperature; flushed skin; alteration in sweating; rapid breathing and/or heart rate; and, importantly, changes in consciousness. The

practical and key field assessment is to recognize altered mental state or behavior in the context of heat stress.

Recommendations: Standards

Address life threats with first aid interventions including:

- Assess the person’s temperature and check for signs of central nervous system (CNS) dysfunction (confusion, agitation, irritation, slurred speech, delirium, etc.). A core body temperature greater than 40 degrees C/104 degrees F combined with CNS dysfunction indicates heat stroke.
- Immediately initiate active cooling with whole body (from the neck down) water immersion (1-26 degrees C/33.8-78.8 degrees F) until a core temperature of less than 39 degrees C (102.2 degrees F) is achieved. When water immersion is NOT available, any other active cooling techniques (e.g., ice packs, ice sheets, hands and feet cold water immersion) that provide the most rapid cooling should be initiated. If no active cooling technique is available, immediately move the person to a cooler environment.
- Contact 9-1-1.
- Continue active cooling until there is a resolution of symptoms or for a reasonable amount of time, such as 15 minutes, as the benefit is more plausible than the harm.
- Transfer to the hospital while continuing to cool if necessary.

Recommendations: Guidelines

None.

Recommendations: Options

None.

Council Action

The Council voted unanimously to approve the recommendations for all three levels of Exertional Heat Illness—exercise-associated muscle cramps, heat exhaustion, exertional heat stroke—and, given the lack of any new evidence, to retire the question.



Other Activities

- **First Aid for Severe Trauma (FAST) Curriculum Development and Implementation:** The Sub-Council has received a \$2.4 million grant from the Department of Homeland Security to develop a trauma education program for high school students. More than 100 children so far have been taught in pilot programs in multiple cities. Data collection is underway, and a publication is currently under review.

Publications and Presentations

Goolsby C, Rojas L, Moore K, Kretz E, Singletary E, Charlton N. “Layperson Ability and Willingness to Use Hemostatic Dressings: A Randomized, Controlled Trial.” *Prehosp Emerg Care*. 2019 Nov-Dec;23(6):795-801. doi:10.1080/10903127.2019.1593566. Epub 2019 Apr 9.

Soar J, Maconochie I, Wyckoff MH, Olasveengen TM, Singletary EM, et al. 2019 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. *Resuscitation*. 2019 Dec; 145:95-150. doi:10.1016/j.resuscitation.2019.10.016. Epub 2019 Nov 14. PMID:31734223.

Charlton NP, Pellegrino JL, Kule A, Slater TM, Epstein JL, et al: 2019 American Heart Association and American Red Cross Focused Update for First Aid: Presyncope: An Update to the American Heart Association and American Red Cross Guidelines for First Aid. *Circulation*. 2019 Dec10;140(24):e931-e938. doi:10.1161/CIR.0000000000000730. Epub 2019 Nov 14. PMID:31722559.

Members have also given numerous National and International presentations, including at the Cardiac Arrest Survival Summit in Seattle (December 2019).

Future Work

The Sub-Council sought and received Council approval for one Q&A, three triennial reviews and two position

statements, all to be presented at the June 2020 Council meeting:

- **Q&A:** What is the appropriate treatment sequence for control of life-threatening hemorrhage? (Lead Members, with external collaboration if indicated: Matthew Levy, DO; Craig Goolsby, MD; Nathan Charlton, MD)
- **Triennial reviews:**
 - Comparison of storage of an avulsed permanent tooth in a storage solution prior to reimplantation versus reimplantation into the socket for tooth survival or viability or success of immediate reimplantation (Morgan Hillier, MD; Nathan Charlton, MD; Aaron Orkin, MD)
 - Recommended minimum contents for a Red Cross Stop the Bleed kit for layperson use, family use, or multi-casualty use (Sarita Chung, MD; Craig Goolsby, MD; Elizabeth Kennedy Hewett, MD)
 - Should laypersons be taught how and when to assist patients with administering glucose during a diabetic emergency (Nici Singletary, MD)
- **Position Statements:**
 - First aid curriculum in schools (Elizabeth Kennedy Hewett, MD; Jeffrey Upperman, MD)
 - Naloxone distribution and availability (Michael Millin, MD; Aaron Orkin, MD; Angela Holian, PharmD; Nathan Charlton, MD)
- **Research:** The Sub-Council also sought and received Council approval for undertaking new SAC-Conducted Research into comparing the educational effectiveness, skill retention, and long-term benefits of first aid education (e.g., Cardiopulmonary Resuscitation [CPR], Stop the Bleed) using manikins (high-fidelity) versus pool noodles (low-fidelity) (Craig Goolsby, MD). Results will be presented in June 2022.



Preparedness and Disaster Health Sub-Council

The Preparedness and Disaster Health Sub-Council 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. As well, the Sub-Council addresses opportunities to provide acute and chronic medical and mental health care under disaster conditions, both for victims and for the emergency staff caring for them. It also routinely answers questions from local chapters and assists with media inquiries on a variety of topics.

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Triennial Review

Critical Incident Stress Debriefing (CISD)

Reviewer: Lauren M. Sauer, MSc, with assistance from Sophia Shea, MPH

Question

What is the science in favor of or against the Critical Incident Stress Debriefing (CISD) model? Should CISD be recommended for rescuers following a traumatic event?

Discussion and Findings

Debriefing traditionally has been used to factually review an incident individually or with a group to determine what occurred during a traumatic event and improve future performance in similar situations. The scientific review of the CISD/CISM (Critical Incident Stress Debriefing/Critical Incident Stress Management) intervention was conducted to determine the efficacy of this approach in lessening or mitigating the development of post-traumatic stress disorder (PTSD).

An extensive literature review revealed that available studies supporting CISD/CISM were primarily subjective anecdotal articles with neither a control group nor random assignment of subjects. A small study supported CISD for the reduction of alcohol consumption in volunteer firefighters, but it focused on only one specific type of traumatic event and the intervention did not reduce PTSD symptoms. Another described CISM intervention for eight weeks with 38 police officers; there was no statistical difference between the control and treatment group, although officers viewed the intervention as helpful and reported that it should continue.

The reviewers noted knowledge gaps that need to be addressed going forward: Impact of training on effectiveness; appropriate population for receiving CISD/CISM; and long-term outcomes.

Recommendations: Standards

There is no convincing evidence that psychological debriefing or group debriefing are effective in reducing PTSD. CISD/CISM interventions have not been shown to be effective in either eliminating or lessening the development of PTSD and should not be used for rescuers following a potentially traumatizing event.

Recommendations: Guidelines

None.

Recommendations: Options

None.

Council Action

The 2019/2020 analysis of the CISD/CISM literature reaffirmed the 2006 SAC scientific review and 2010 update. Reviewers will consult with members of other Sub-Councils as needed and conduct future research into whether there are scientifically validated best practices, such as cognitive behavioral therapy, to protect the mental health of disaster and first responders following a traumatic event. Issues to be addressed are burnout, PTSD and other psychological distress.

Seniors Policy: Guidance for Older Adults

In *Closing the Gaps: Advancing Disaster Preparedness, Response and Recovery for Older Adults*, the Sub-Council and the American Academy of Nursing (AAN) presented findings related to disaster preparedness among older adults, and made recommendations to help this population prepare for the immediate dangers and aftermath of catastrophes.

Older adults consistently experience more casualties after natural disasters compared to younger age groups. Numerous factors—chronic health conditions, dependence on assistive devices (walkers, glasses, etc.), social isolation, gaps in caregiver preparation, etc.—make seniors more vulnerable.

To address these deficiencies, researchers made a series of recommendations, including:

- Older adults and their caregivers should be provided with access to information about emergency/disaster preparedness and develop customized emergency plans.
- If seniors require mobility aids such as walkers, steps should be taken to eliminate barriers to evacuation.
- Ensure access to at least a 30-day supply of medication during emergencies.
- Maintain a support network that can be called upon during disasters and impending emergencies.
- If reliant on power to charge cell phones or other mobile devices, contact the electricity company in advance to discuss options for alternative power sources.
- Local governments should leverage data sources such as registries to identify at-risk individuals to ensure that emergency responders can more easily prioritize their search and rescue efforts following a disaster or emergency.

Home Fire Campaign

The American Red Cross Home Fire Campaign, launched in October 2014, helps save lives by installing free smoke alarms in homes that don't have them; educating people about home fire safety; and helping families prepare for how to respond to a home fire. As of January 2020, this national Red Cross initiative with local fire departments and community partners, has installed over 2 million smoke alarms and saved more than 700 lives.

From the beginning, evaluation has been a core component of the campaign; data collection by the National Opinion Research Center (NORC) at the University of Chicago has informed its development and subsequent refinements to the program. NORC evaluations have demonstrated that the Home Fire Campaign is effective in increasing the number of smoke alarms in homes and the likelihood that families have fire escape plans. Importantly, their follow-up indicates

that these outcomes are long-term, lasting up to two years after a household receives an intervention.

Community Preparedness Education

Among programs that are widely available to advance community-based preparedness activities:

- **Be Red Cross Ready** is a set of standardized presentations about basic Red Cross principles that is offered to community groups. People recognize that preparation is important and want to be prepared for disasters such as home fires, hurricanes, wildfires, earthquakes, winter storms, and floods; however, few are prepared. Messaging needs to move people through three stages—Primal, Processing, and Pragmatic—to help them plan for emergencies more effectively. Rebranding is necessary since Be Red Cross Ready is misunderstood as a tagline, while there is a high level of Red Cross brand recognition and confidence.
- **Ready Rating™** provides a framework to help businesses, organizations, and schools prepare for emergencies. A free membership program with an extensive set of web-based resources, Ready Rating helps streamline and clarify the process by which organizations can be prepared if disaster strikes. Thousands of organizations from commercial businesses to houses of worship, schools, non-profits and even some government agencies have used the online *ReadyGo Assessment* or the more in-depth *ReadyAdvance Assessment* to measure the quality of their emergency response plans and help improve their level of preparedness.

Children's Preparedness Education

Two ongoing Red Cross initiatives supported by the Scientific Advisory Council target young children:

- **Prepare with Pedro**, developed in partnership with the Federal Emergency Management Agency (FEMA), is a free publication packed with disaster preparedness



activities for children ages 5 to 7. Some 50,000 children have received a copy of the Prepare with Pedro storybook, which uses a traveling penguin to teach students how to stay safe.

- **The Pillowcase Project** has been providing disaster education to US children in grades 3 to 5 since 2013. Using age-appropriate materials, this program has taught over 1 million young students personal and family preparedness and safety skills, local hazards, and basic coping strategies.

Other Activities

- **Harmonizing Preparedness Messages:** The Sub-Council continues to review Red Cross messaging and messaging in materials produced by other partners, including FEMA and the International Federation of Red Cross and Red Crescent Societies (IFRC), to make sure they are consistent.
- **Understanding Social Disparities:** A variety of disparities—characterized by many factors including socioeconomic status, ethnicity, age, and access to care—can have a substantial negative impact on Red Cross preparedness and disaster planning activities. The Sub-Council will be reviewing literature from related areas for insights into how programs can be adjusted to reduce disparities.

Publications and Presentations

Recent and upcoming releases and publications from the Sub-Council include the following:

- *Next Generation Core Competencies.* Contributing paper for the UN Global Assessment Report on Disaster Risk Reduction, 2019 June. Feldmann-Jensen S, et al. *J Emerg Mgmt*; 2019 Jan/Feb;17(1): 17-25.
- *Closing the Gaps: Advancing Disaster Preparedness, Response and Recovery for Older Adults.* 2020 January. Prepared by the Preparedness and Disaster Health Sub-Council and the American Academy of Nursing (AAN). Available at: <https://www.redcross.org/content/dam/redcross/training-services/scientific-advisory-council/253901-03%20BRCR-Older%20Adults%20Whitepaper%20FINAL%201.23.2020.pdf>
- *The Woolsey Fire: A Catalyst for Change.* Los Angeles Emergency Preparedness Foundation. 2019 December. Prepared by Dr. Steven J. Jensen, Dr. Shirley Feldmann-Jensen and Brent Woodworth. Available at: <https://static1.squarespace.com/static/5d94c3a0d2066e75276ca3d8/t/5dc5bd69ab7673549c167020/1573240173508/>
- Therkorn J, et al. Impact of air handling system exhaust failure on dissemination pattern of simulant pathogen particles in a clinical biocontainment unit. *Indoor Air.* In press.
- Bhadelia N, et al. “Evaluating promising investigational medical countermeasures: Recommendations in the absence of guidelines.” *Health Security*; 2019 Feb 19.
- Kogutt BK, et al. “Simulation of a spontaneous vaginal delivery and neonatal resuscitation in a biocontainment unit.” *Health Security*; 2019;17(1):18-26.
- Sauer LM, et al. “Application of the incident command system to the hospital biocontainment unit setting.” *Health Security*; 2019;17(1):27-34.
- Kraft CS, et al. “The special pathogens research network: Enabling research readiness.” *Health Security*; 2019;17(1):35-45.
- McLellan S, et al. “Ebola in the DRC one year later—Boiling the frog? *International Journal of Infectious Diseases*; 2019 August 1;85:212-3.
- Therkorn J, et al. “Development and comparison of complementary methods to study potential skin and inhalational pathogens during personal protective equipment doffing.” *Clinical Infectious Disease*; 2019 Sep 13;69.

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- Errett N, et al. “An integrative review of the limited evidence on international travel bans as an emerging infectious disease disaster control measure. *J Emerg Mgmt*. In press.

Other selected media: US News and World Report, Auto Club, Emergency Management Magazine, Make Change, Kiplinger’s, Market Watch, NBC-Better, Where to Retire, Weather Nation.

Future Work

The Sub-Council sought and received Council approval for one Q&A, the results of which will be presented at the June 2020 meeting:

- **Q&A:** Are there scientifically validated best practices for protecting the mental health of disaster and first responders following a traumatic event? (Lead: Lauren M. Sauer, MSc)



Resuscitation Sub-Council

The Resuscitation Sub-Council evaluates science related to cardiopulmonary resuscitation (CPR), choking, basic life support in children and adults, advanced cardiac life support, pediatric advanced life support, and the optimized use of automated external defibrillators (AEDs).

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Bryan M. White, Lt Col, USAF, MD, FACC,

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CARES Program Update

The Cardiac Arrest Registry to Enhance Survival (CARES) has expanded to include 27 state-based registries and the District of Columbia, and currently includes over 425,000 records. Five new states joined the program in 2019, and significant existing state expansion is anticipated in Texas, Florida and California. CARES now represents a catchment area of approximately 139 million people, or 40% of the US population. This includes an increase of approximately 10 million in population catchment in the first six months of 2019.

CARES aggregates data from more than 1800 EMS agencies and over 2200 hospitals across the country to inform knowledge about out-of-hospital cardiac arrests. The program has generated a wide variety of National Data Sharing Projects:

- Disparities in Receipt and Utilization of Dispatch-Instructed CPR
- Loss of Labor Productivity following OHCA
- Impact of CPR and AED Legislation on Survival after Sudden Cardiac Arrest
- Machine-Based Learning Applications for the Exploration of OHCA Care
- Association of Sex/Gender with OHCA Characteristics, Hospital Interventions, and Survival Outcomes
- Predictive Modeling of Elderly OHCA Survivors to Guide Clinical Care and Facilitate Effective Communication
- Relationship Between Field ROSC and Rate of Field Termination
- Social Deprivation and Survival after OHCA in American Adults: A Retrospective Cohort Study
- The Association between Scene Time Arrival and Neurologic Outcomes following OHCA in the US
- Conventional vs Compression Only CPR (Pediatric)
- Airway Management after OHCA (Pediatric)
- Public Health Impact of Drug-Related OHCA
- Left Heart Catheterization Trends
- Patient, Facility, and Geographic Factors Associated with Resuscitation Efforts in Dialysis Clinics
- Airway Interventions in Drowning Victims

The analysis of CARES data has also led to State Data Sharing Projects; the publication of numerous articles in scientific journals (see Publication List below); and grants and grant proposals.

Scientific Review

Telephone CPR

Reviewers: Bruce Barnhart, MSN, RN; Bryan F. McNally, MD; Joseph Rossano, MD

Question

In adult and pediatric cardiac arrest (CA), does Dispatcher-Assisted CPR (DA-CPR) compared to no DA-CPR improve outcomes?

Discussion and Findings

Seven out of ten cases of cardiac arrest occur in the home, out of the immediate reach of trained care providers. When professional rescuers are not available, it has been demonstrated that Bystander CPR (BCPR, or CPR performed by laypersons) saves lives - yet fewer than half of all patients ever receive BCPR, and increasing the BCPR rate has proven difficult. In DA-CPR, rescuers perform CPR under the telephone guidance of trained dispatchers. Dispatcher-Assisted CPR can deliver Just-In-Time CPR to a victim in need and prolong a person's life while awaiting EMS. The risk of harm if a patient is not in CA is generally low.

An extensive database search revealed 18 studies relevant to the outcomes of DA-CPR. Findings included:

- DA-CPR consistently increased performance of BCPR.
- There were consistent survival benefits and frequently good neurological outcomes with DA-CPR compared to no CPR.
- There was no survival benefit or worse outcome with DA-CPR vs spontaneous BCPR.
- Pediatric results, which were often mixed with adult cases in studies, indicated that DA-CPR increased the performance of BCPR. BCPR with or without Dispatcher Assistance resulted in better outcomes than no CPR in children.



In spite of certain limitations in the studies, which were essentially observational, before/after, and registry-based retrospective cohort studies with low certainty of evidence, the preponderance of evidence indicates that DA-CPR is associated with improved provision of Bystander CPR and may be associated with improved survival. Going forward, programs should be developed and dispatchers should be trained in this area.

Implications for future Red Cross programs and materials are the following:

- **Courses:** Consider developing a comprehensive educational and quality improvement assurance program to implement and maintain a Dispatcher-Assisted CPR program.
- **Apps:** The Red Cross First Aid App could be amended to add instructions to call 9-1-1 and put the phone on speaker while performing CPR, and to be ready to start CPR if the dispatcher instructs them to do so.
- **Public Messaging:** Reviewers were unable to find any Red Cross fact sheets on CA in general or on DA-CPR. The recommendation is that these materials be developed and published where they can be easily accessed on the Internet.

The Takeaway:

- DA-CPR is suitable for anyone willing and able to be coached to start CPR when told to do so.
- Any CPR is better than no CPR.
- Getting CPR instructions assertively delivered Just-In-Time has been shown to increase Bystander CPR and may increase survival.

Recommendations: Standards

Dispatcher-Assisted CPR shall be implemented as part of community strategies to improve the provision of Bystander CPR.

Recommendations: Guidelines

A comprehensive educational and quality improvement assurance program should be part of the implementation and maintenance of a Dispatcher-Assisted CPR program.

Recommendations: Options

None.

Council Action

The Council unanimously approved the recommendations.

Triennial Review

Infant Basic Life Support (BLS)

Reviewers: Joseph Rossano, MD; Wendell Jones, MD; Bruce Barnhart, MSN, RN, CEP

Question

For infants under one year in cardiac arrest, does any specific BLS sequence, including whether or not to give ventilations before first compressions, compression-to-ventilation ratio, hand placement, and depth of compression, lead to different outcomes when compared to currently approved techniques?

Note: Compression only CPR and newborn resuscitation are not considered in this review

Discussion and Findings

Based on a review of literature published since 2011, there are no strong data that would warrant changes to the current recommendations. Sub-Council researchers identified 20 new studies that were deemed relevant, but most had significant limitations. For example, nearly all were simulation studies performed in artificial settings, usually by parents or grandparents.

The hand placement techniques compared were: two-fingers, two-fingers flexed, two thumbs with hands encircling the chest, two-thumb non-encircling, and palm of hand. Reviewers found that the two-thumb encircling technique was associated with greater depth of compression than the two-finger techniques; study

participants also found that the two-thumb encircling technique was less tiring than the two-finger technique. Other techniques were likewise generally associated with improved chest compression performance (depth, rate, fatigue) in comparison to the two-finger technique, and some were associated with better performance compared to the two-thumb encircling technique.

An imaging study of CT scans suggested that current recommendations for compression depth may be too deep for some children. Some research also indicated that compression depth aimed at a targeted blood pressure led to improved outcomes compared to a specific compression depth (e.g., 4 centimeters for infants). In one simulated study of two rescuers performing infant CPR, the compression-to-ventilation ratio of 3:1 was preferred over 9:1 and 15:2.

Council discussion followed presentation results, with members agreeing that the optimal technique for performing CPR in infants remains unknown. This is reflected in recommendations from various organizations.

Implications for Red Cross Teaching: The encircling two-thumb technique should be taught for single rescuer infant CPR. Teaching the two-finger technique may be continued for rescue of conscious choking infants.

This meta-analysis will be published in the journal *Resuscitation* in 2020.

Recommendations: Standards

None.

Recommendations: Guidelines

None.

Recommendations: Options

There are several techniques that may be superior to the two-finger technique for a single rescuer, including two-thumbs with hands encircling the

chest, which can be considered for the provision of chest compressions in infants.

Council Action

The Council voted unanimously to approve the recommended option.

Triennial Review

Infant AED

Reviewers: Joseph Rossano, MD and Andrew MacPherson, MD

Question

Should an automated external defibrillator (AED) be used on an infant (under 12 months) with suspected cardiac arrest?

Discussion and Findings

A literature review revealed only two new case studies of successful AED use in infants. Given the limited additional data since the last approval, the Sub-Council recommended that the prior recommendations be reaffirmed.

Recommendations: Standards

AEDs should be used on infants with suspected cardiac arrests.

Recommendations: Guidelines

AEDs that attenuate the energy dose (e.g., via application of pediatric pads) are recommended for infants if they are available. If an AED with pediatric pads is not available, the AED with adult pads should be used for infants.

Recommendations: Options

None.

Council Action

The Council unanimously reaffirmed the prior recommendations.



Publications and Presentations

Recent and upcoming releases and publications from the Sub-Council include the following:

Naim MY, et al. Race/ethnicity and neighborhood characteristics are associated with bystander cardiopulmonary resuscitation in pediatric out-of-hospital cardiac arrest in the United States: A study from CARES. *J Am Heart Assoc.*

Coute RA, et al. Disability-adjusted life years following adult out-of-hospital cardiac arrest in the United States. *Circ Cardiovasc Qual Outcomes.*

Chan PS, et al. Association of neighborhood, race and income with survival after out-of-hospital cardiac arrest. *J Am Heart Assoc.*

Tobin, JM, et al. Bystander CPR is associated with improved neurologically favourable survival in cardiac arrest following drowning. *Resuscitation.*

Chen J, et al. Higher Walk Score is associated with higher rates of bystander automated external defibrillator use in street-level cardiac arrest from Cardiac Arrest Registry to Enhance Survival Registry. *J Cardiovasc Med.*

Griffis H, et al. Characteristics and outcomes of Automated External Defibrillator use in pediatric cardiac arrest in public settings: The influence of neighborhood characteristics. *Resuscitation.* (Anticipated 2020 publication.)

Millin M, et al. Comparing the two-finger versus two-thumb technique for single person infant CPR: A systematic review and meta-analysis. *Resuscitation.* (Anticipated 2020 publication.)

Tobin, JM, et al. Outcome of conventional cardiopulmonary resuscitation in cardiac arrest following drowning. *Prehosp Disaster Med.* (Anticipated 2020 publication.)

Future Work

Work on the update of Manikins Required for CPR Training is ongoing and is anticipated to be completed and approved soon.

The Sub-Council sought and received Council approval for one Q&A, two scientific reviews and one triennial review, all to be presented at the June 2020 meeting:

- **Q&A:** In Guidelines for CPR, how does C-A-B (chest compressions first, followed by airway and breathing) compare to A-B-C (airway and breathing first, followed by chest compressions)? (Lead: Joseph W. Rossano, MD)
- **Scientific review:** What are the guidelines for termination of resuscitation in the field? In adult non-traumatic out-of-hospital cardiac arrest victims, does transporting the patient to the hospital prior to return of spontaneous circulation (ROSC)—compared to not transporting patients until ROSC is achieved—lead to improved outcomes? (Lead: Bruce McNally, MD)
- **Scientific review:** In cases of sudden cardiac arrest, what is the proper placement and use of an automated external defibrillator (AED)? (Lead: Andrew MacPherson, MD)
- **Triennial review:** Compression-Only CPR vs conventional CPR in adults (Lead: Michael Millin, MD; Joseph Rossano, MD).



Education Sub-Council

The Education Sub-Council works to engage members of every other Sub-Council in identifying effective methods for teaching skills and procedures to individuals and populations. We also seek the best ways to instill or build in people the confidence and desire to step forward and use those competencies to help people in need.

Jeffrey L. Pellegrino, PhD, MPH, EMT-B/FF, EMS-I

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Defense Health Agency, Education and Training (J-7)

Scientific Review

Motivation to Help

Reviewers: Brian Miller, MS; Rita Burke, PhD, MPH; Jeffrey L. Pellegrino, PhD, MPH

Question

What are the motivations that lead lay rescuers to act in first aid emergencies?

Discussion and Findings

Following two initial phases of inquiry into first aid

education and motivation, reviewers launched Part 3 of an investigation into what motivates bystanders to provide first aid in emergencies. Following an extensive literature review, they identified four qualitative studies and one quantitative one that addressed this topic.

Distilling the results of this research, reviewers identified two primary types of motivation:

- **Intrinsic:** Sense of humanity, emotional and cognitive preparation, sense of personal responsibility, sense of empowerment to act, and sense of duty.
- **Extrinsic:** Sense of community responsibility, training, and social pressure to act.

In a closer examination into the motivation of those who acted in emergencies, it emerged that emphasizing the action itself rather than the decision to act was critical. An Australian study of Dispatcher-Assisted CPR (424 EMS phone records) demonstrated that the dispatcher’s wording was particularly important. For example, when he or she told the bystander you “will do” rather than you “want” to perform an intervention, they were more than twice as likely to act.

Limited evidence and knowledge gaps in the available studies—small numbers, lack of comparison groups, little demographic diversity, etc.—did not permit researchers to make definitive recommendations as standards or guidelines. However, the review did suggest an option to consider and pointed the way to future research that should focus on:

- Comparison of situations in which bystanders intervened in an emergency with those who did not.
- Investigation of whether motivation crosses different cultures and sociodemographic groups.



- Mining an active database of debriefed lay responders/lifesaving award winners who helped in emergencies to better understand their motivations.

Recommendations: Standards

None.

Recommendations: Guidelines

None.

Recommendations: Options

For educational design, the use of the learning outcomes of intrinsic and extrinsic motivations for action could be built to focus on social and psychological activities of the course.

Council Action

The Council unanimously approved the recommendation and the decision to design future research.

Other Activities

- **Stop the Bleed Educational Assessment Tool (SBEAT):** Stop the Bleed is a national campaign that encourages members of the public to become trained, equipped and empowered to help in bleeding emergencies before first responders arrive on the scene, thus increasing trauma victims' odds of survival. SBEAT examines bystanders' knowledge and cognition for responding with evidence-based guidelines. This validated tool can now be used with other tools to measure intention to aid and skill demonstration to triangulate quality education.
- **Development of a Concussion Tool for Lay Responders:** The Sub-Council has reviewed a study by the British Red Cross aiming to direct the development of a lay responder tool for dealing with head injuries. A qualitative paper has been accepted for publication in a peer-reviewed journal, and researchers are currently working on a second, empirical paper. Internally, the next step is to develop and test different

presentations of the pathways for different audiences (caretakers for the elderly, individuals involved in sports, parents, etc.) using traffic lights/illustrations.

- **New IFRC Guidelines Website:** The 2020 IFRC (International Federation of Red Cross and Red Crescent Societies) Guidelines will soon be presented on a new web platform. Readily accessible online information will include scientific foundations, guidelines and recommendations, first aid steps, and educational methodologies. Links will be developed to tools and resources from across the globe to support creative approaches to better education.
- **Consultations and Collaborations:** As part of an ongoing collaboration with IFRC and GFARC (Global First Aid Reference Center), Dr. Pellegrino helped develop the International Trainer of Trainer course and facilitated two week-long sessions in China and Malaysia. These master courses send the best educators around the world to teach valuable lifesaving skills to empower people to help other people. In addition, later this year the American Red Cross will join the Canadian Red Cross to participate in *Survival 2020: International Red Cross First Aid, Injury Prevention and Aquatics Education Conference* in Calgary, Alberta.
- **International Journal of First Aid Education:** The IJFAE is a bi-annual scholarly journal that features peer-reviewed articles to advance the knowledge and practices of first aid educators and curriculum designers (<http://firstaid-revolution.org>). Please consider submitting the educational implications for clinical guidelines or serving as a peer reviewer.

Publications and Presentations

Recent and upcoming releases and publications from the Sub-Council include the following:

- Kulnik ST, et al. "Confidence and willingness among laypersons in the UK to act in a head injury situation: A qualitative focus group study." *BMJ open*, 9(11).

- Oliver, E. “Democratisation of first aid.” *Emergency Medicine Journal*, 36(11), p.652.
- Gordon E, et al. “Adapting first aid education to fragile contexts: A qualitative study.” *International Journal of First Aid Education*, 2(2), p.45.
- Charlton NP, et al. “2019 American Heart Association and American Red Cross Focused Update for First Aid: Presyncope.” *Circulation*, 140(24).
- Charlton NP, et al. “2019 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations.” *Circulation*, 140:e826-e880.
- “Asia-Pacific region training of trainers.” International Federation of Red Cross/Red Crescent Societies. Kuala Lumpur, Malaysia.
- Pellegrino, JL, Miller B. “Disco-izing CPR education with visual feedback: Different dances for instructors & learners lead to different outcomes.” Cardiac Arrest Survival Summit: Seattle, WA. 2019 Dec.
- Pellegrino JL, Snobelen P. “Learners to actual rescuers: Implications for CPR quality and education.” Cardiac Arrest Survival Summit: Seattle, WA. 2019 Dec.
- Miller B, Pellegrino JL “Matching instruction resources for the job of spreading compression-only CPR to young adult learners.” Cardiac Arrest Survival Summit: Seattle, WA. 2019 Dec.

Future Work

The Sub-Council sought and received Council approval for one Q&A, one scientific review, and one triennial review, all to be presented at the June 2020 meeting. In addition, a manuscript on the tripartite investigation of motivations to act in emergencies is in development.

- **Q&A:** What are the educational implications of a bleeding control trainer? What is the value of a training device to support, demonstrate and validate learning outcomes? (CDR Thomas Sather, EdD and JL Pellegrino, PhD, MPH)
- **Scientific review:** What is the impact of blended learning, including pre-course preparation, on healthcare training courses? (Gamze Ozugul, PhD and Nicholas Asselin, DO, MS)
- **Triennial review:** Evidence for the use of songs to promote learning and skill demonstration of effective compressions for CPR. (Nicholas Asselin, DO, MS and Jeffrey L. Pellegrino, PhD, MPH)
- **Manuscript development:** Based on the tripartite investigation into motivations to act (before and during emergencies), the Sub-Council plans to co-locate opportunities for course development and goals for maximizing people’s motivations to help. (Jeffrey L. Pellegrino, PhD, MPH; Brian Miller, MS; Rita V. Burke, PhD, MPH)

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 Sub-Council 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 to best handle a particular situation or emergency.

Once a subject merits further investigation, a Sub-Council proceeds on a structured course that may be undertaken in the form of a Scientific Review, a Triennial Review, a Council Q&A, or an Advisory. A single Sub-Council member is assigned to lead the structured review process, with a second member helping to select the reference materials, former clinical trials, published texts, expert opinion, and other evidence-based sources that will be considered. (If there is disagreement about the choices, the Sub-Council chair will act as arbiter.) The Council also has a rigorous conflict of interest process in place to assure that only scientific evidence is included in the discussions and recommendations.

The Sub-Council discusses this scientific information, summarizing the available quantitative and qualitative

evidence on a standardized template designed to ensure rigor and precision, and, when warranted, forwards the research and its opinion to the full Council. The final product may include recommendations for a Scientific or Triennial Review (standards, guidelines, or options); Council Answers for a Q&A; or an Advisory.

The full Council hears the recommendations presented by the Sub-Council, and all participating members vote on whether to accept the review, including the proposed recommendations, or to modify or take other action. Each recommendation is assigned a strength, based on an assessment of the current state of scientific and medical research on the subject.

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 recommendations 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:

- Bandage Choice
- Chain of Drowning Survival
- Circle of Drowning Prevention
- Compression-only CPR
- Control of Life-Threatening Bleeding
- CPR Skill Retention
- Critical Incident Stress Debriefing (CISD)
- Dental Avulsion Management
- Drowning and Lack of Efficacy of Abdominal Thrusts
- First Aid Kit Content
- Hypoglycemia Management
- Hyperthermia
- Infant AED
- Medical Examination Gloves for First Aid Providers
- Lightning and Pool Safety
- Minimum Age for Swimming Lessons
- Spinal Motion Restriction
- Swimming Competency
- Stroke Assessment Tools

Leadership of the Scientific Advisory Council

Within the Red Cross organization, the Council is part of the Training Services Division, with the Council Co-Chairs (Co-Chair Chief Medical Officer and Co-Chair Volunteer) reporting directly to the Division President. The purpose of SAC is to serve as an independent scientific and technical advisory group to the American Red Cross.



**American
Red Cross**

Scientific
Advisory Council

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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