SPECIAL SECTION

WILDERNESS MEDICINE

GUEST EDITOR: WILLIAM BINDER, MD

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15 From the Mountain Top to the Sea Bottom: Training and Preparing for Wilderness, Environmental Medical Events
WILLIAM BINDER, MD, MA, FACEP
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16 Wilderness Dermatology: Bugs, Plants, and Other Nuisances That May Ruin Your Hike
DOMINIC J. WU, MD; JENNIFER LEE, MD; AFTON CHAVEZ, MD; JOHN C. KAWAOKA, MD

23 Sailing Injuries: A Review of the Literature
ANDREW NATHANSON, MD, FACEP, FAWM

28 Accidental Hypothermia: ‘You’re Not Dead Until You’re Warm and Dead’
JOHN L. FOGGLE, MD, MBA, FACEP

33 A Free Diver with Hemoptysis and Chest Pain
CHANA RICH, MD; KRISTINA MCA TEER, MD; VICTORIA LEYTIN, MD; WILLIAM BINDER, MD

37 Learning from the Outside In: Incorporating Wilderness Medicine into Traditional Emergency Medicine Education
DANIEL COLEMAN, MD; CHANA RICH, MD; HEATHER RYBASACK-SMITH, MD

42 Climate Change: A Review of a Public Health Opportunity for the Northeast
RENEE N. SALAS, MD, MPH, MS
9 COMMENTARY
Why do doctors overprescribe antibiotics?
EDWARD FELLER, MD, FACP, FACG

12 RIMJ AROUND THE WORLD
Santa Cruz Mountains, California
Scottsdale, Arizona

66 RIMS NEWS
Are you reading RIMS Notes?
Working for You

78 BOOK REVIEW
Your Heart, My Hands:
Cardiac surgeon Arun Singh’s memoir an engrossing immigrant saga of struggles, successes — in life and in the OR
KENNETH S. KORR, MD, FACC

YOUR HEART, MY HANDS
THE REMARKABLE LIFE OF ONE OF AMERICA’S MOST PROLIFIC CARDIAC SURGEONS
ARUN SINGH, MD
With JOHN HANC. Foreword by DELOS COSGROVE, MD
IN THE NEWS

72 PARTNERS HEALTHCARE
files application with RIDOH on CNE acquisition

72 CARE NEW ENGLAND STATEMENT
on Partners CEO resignation

72 LIFESPAN STATEMENT
regarding Partners application to acquire CNE

73 KENT HOSPITAL
dedicates Simulation Training Lab

73 SOUTH COUNTY HEALTH
plans Centennial events

73 CLINICA ESPERANZA/HOPE CLINIC
seeks volunteers

74 VA MEDICAL CENTER
study to identify veterans at risk for suicide

74 RHODE ISLAND HOSPITAL
researchers evaluating Troriluzole to slow Alzheimer’s disease

75 WOMEN & INFANTS
awards research grants to Drs. Brousseau, Ribeiro

76 URI RYAN INSTITUTE
initiates clinical trial to study role of the brain’s blood vessels in Alzheimer’s disease

76 RHODE ISLAND HOSPITAL
participating in TANGO clinical Alzheimer’s disease trial
WAFIK EL-DEURY, MD
appointed associate dean for Oncologic Sciences at Brown/Lifespan

AUDREY TYRKA, MD, PhD
named Co-Chair of the ACNP Women’s Task Force

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appointed chief physical medicine and rehabilitation department at RIH

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receives Selya Award for Excellence in Research

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named Cancer Prevention Champion by CDC for HPV vaccine prevention efforts

OBITUARIES
Robert “Bob” Earle Nadeau, MD
Sonia Sprung, MD
Edgard Turnier, MD
John Yasher, MD
CONTRIBUTIONS

46 Childhood Cancer in Rhode Island
   NICOLE MUHLBAUER MD, MPH
   JUNHIE OH, BDS, MPH
   THOMAS RENAUD, MD
   JENNIFER WELCH, MD

50 Increasing Syphilis in Rhode Island: Return of an Old Foe
   ANTONIO JUNCO-FERNÁNDEZ, MD
   MADELINE C. MONTGOMERY, MPH
   CHRISTINA CROWLEY, MPH
   THOMAS BERTRAND, MPH
   THEODORE P. MARAK, MPH
   MICHAELA A. MAYNARD, MPH, MSN, NP-C
   CAROLINE GUMMO, MHS
   TIMOTHY P. FLANIGAN, MD
   PHILIP A. CHAN, MD, MS

CASE REPORT

55 Acute Respiratory Failure from Cement Exposure: A Case Report and Review of the Literature
   SHIHAB ALI, MD
   RACHEL WIGHTMAN, MD
   JASON HACK, MD

58 An Infectious Triple Play: Three Separate Infections in an Elderly Patient
   BURTON HUI SHEN, MD
   THOMAS A. BLEDSOE, MD

IMAGES IN MEDICINE

60 Unilateral Birdshot Chorioretinopathy in an Elderly Patient
   RONALD K. AKIKI, BA
   BRITNEY STATLER, MD
   PAUL B. GREENBERG, MD, MPH
   ROBERT H. JANIGIAN, MD

PUBLIC HEALTH

62 HEALTH BY NUMBERS
   Health of Caregivers in Rhode Island
   TRACY L. JACKSON, PhD, MPH
   TARA COOPER, MPH
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"Do antibiotics cure the common cold or acute viral upper respiratory infections?"

When asked, even preclinical medical students typically answer “No” correctly. Yet, data indicate that as many as 50% of primary care physicians commonly prescribe antibiotics in these settings.1

A 2016 Centers for Disease Control and Prevention (CDC) report estimates that more than 30% of antibiotics dispensed to outpatients are not needed or are inappropriately prescribed.2 Similar rates occur in hospital settings.3 Examples of this rampant misuse include6,5 prescribing antibiotics for [1] disorders not caused by bacteria; [2] bacterial culture results reflecting colonization or contamination rather than infection; [3] broad-spectrum antibiotics when a narrow spectrum is preferable; [4] therapy duration longer than required; [5] prescriptions at wrong doses; [6] in minor illnesses, prescribing antibiotics before culture results are available or prescribed without diagnostic testing despite evidence that clinical outcomes for cough and sore throat are no different for delayed or immediate antibiotics.5

Unneeded antibiotic prescriptions may decline with expanded use of point-of-care testing including rapid strep tests and throat swabs for influenza.

Why do such poor decisions occur?

Frequently, medical errors, including overtreating and overtesting, are due to cognitive or interpretive mistakes rather than lack of knowledge. Some error-prone cognitive factors include the human attempt to simplify complex decisions and a willingness to judge incomplete, incomprehensible or contradictory information to satisfy pre-formed beliefs or expectations. These flaw-engendering influences are common, affecting prescribing decisions in specific situations where their contributions to decision-making range from major to negligible or absent.


Which situations in a physician’s day increase overprescribing?

Specific situations increase the likelihood of poor decisions, such as over-prescribing, which tends to increase with fatigue, hunger, interruptions, inattention, sleep deprivation and a rushed, time-pressured environment. Commonplace actions such as thinking about an upcoming vacation can impair decision quality.7 Physicians are more likely to opt for unnecessary antibiotic therapy at the end of a long shift due to decision fatigue from cognitive overload after too many tough mental choices increase impulsive, oversimplified or poorly reasoned choices. In a survey of 21,867 records of patients with presumed viral upper respiratory infection, physicians were 26% more likely to prescribe unneeded antibiotics in the 4th hour of a shift compared to the 1st hour.8

Which doctors are more likely to overprescribe?

Individual personality traits influence the probability of overuse of unneeded health services, including physicians who are risk averse, lack confidence in their diagnostic skills, tolerate uncertainty poorly, are indecisive or fear malpractice.9 Overprescribing doctors tend to be less well trained, less motivated and less professional or burned out. Specific medical practice patterns potentiate overuse, including herding, defined as alignment of thoughts or behaviors on decision-making in a group; inbreeding of a medical group or hospital when members have all trained in the same environment of too liberal antibiotic use; unwillingness to upset the status quo when other physicians have previously prescribed antibiotics inappropriately.5

Why do doctors overprescribe antibiotics?

EDWARD FELLER, MD, FACP, FACG
What are patient-based facilitators of overprescribing?
Hoffman, et al assessed 35 studies exploring patient expectations of benefits and harms of diverse interventions, including screening, testing or treatment. Patients overestimated benefits and underestimated harms for two-thirds of widely varied interventions, including antibiotic decisions. Like physicians, patients facing common medical decisions are also frequently inaccurate in assessing how well informed they are, systematically perceiving they are more knowledgeable than they actually are. Some patients request or demand unnecessary care.

Health-systemic barriers to reduce overprescribing
Aspects of the USA healthcare system facilitate overprescribing, including a payment system overvaluing interventions compared to talking to patients; lack of economic disincentive to overtreat; cultural beliefs that more is better; direct-to-consumer media which may mislead, creating a perception of a need for antibiotics. Also, physician adherence to evidence-based practice guidelines varies widely. Doctors’ complaints about guidelines include inertia, habit, lack of awareness, time, agreement, familiarity or belief in the efficacy of “cookbook” medicine with multiple, often contradictory guidelines. Thus, accurate knowledge of antibiotic recommendations is not always a strong predictor of prescribing behavior.

Misuse of antibiotics is the major culprit leading to the development of antibiotic-resistant organisms, which cause an estimated 2 million illnesses and 23,000 deaths annually in the United States. The CDC and the Infectious Diseases Society of America recommend that all hospitals create antibiotic stewardship programs which include quality measures, responsible leaders committed to improved antibiotic use, monitoring prescribing and resistance data, physician and staff education, guidelines for diagnosis and treatment of infections which include dose optimization and duration of use, when antibiotics are not needed, hospital formulary preauthorizations for selected antibiotics, antibiotic order forms and prospective review of clinical data. The Rhode Island Department of Health (www.health.ri.gov) has extensive, useful information on antibiotic-related issues for the general public and health practitioners.

Prolonged, effective, multi-modal efforts to optimize antimicrobial stewardship with nationwide infection control programs can reduce the epidemic of antimicrobial-resistant bacteria. Current program guidelines reflect state-by-state and local hospital system decisions. Potential benefits of widespread, robust antibiotic stewardship improvements would be reduction of health care costs and better resource utilization presumably leading to positive effects on quality of care and patient outcomes.

References

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SANTA CRUZ MOUNTAINS, CALIFORNIA

Hiker and marathon runner James Thornton, Esq., at right, checks the Wilderness Medicine issue of the Rhode Island Medical Journal while hiking with his brother-in-law, Kenneth S. Korr, MD, in the Santa Cruz Mountains amid the coastal Redwoods near Monterey, California.
SCOTTSDALE, ARIZONA

[Left] Steven R. DeToy with Heather A. Smith, MD, MPH, demonstrates how to access the Journal archives from his phone.

[Above L–R] Michael Migliori, MD, RIMS Chair of Public Laws, and Ophthalmologist-in-Chief at Rhode Island Hospital; Heather A. Smith, MD, MPH, a Member of the AMA Council on Legislation and Ob/Gyn physician at Women & Infants; and Steven R. DeToy, RIMS Director of Government and Public Affairs, participated in the AMA State Advocacy Summit, held in Scottsdale, Arizona, January 10 through 12.

The Summit provides the opportunity for state and national specialty society physician leadership, national experts, state legislators and regulators, and medical society staff meet to share their organizations’ priorities, concerns, and tactics with advocacy leaders from across the country, and to discuss the challenges and opportunities likely to be part of the upcoming legislative sessions.

Wherever you may be, or wherever your travels take you, check the Journal on your mobile device, and send us a photo: mkorr@rimed.org.
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From the Mountain Top to the Sea Bottom:
Training and Preparing for Wilderness, Environmental Medical Events

WILLIAM BINDER, MD, MA, FACEP
GUEST EDITOR

In this issue of the Rhode Island Medical Journal (RIMJ) we are pleased to present several wide-ranging topics in wilderness and environmental medicine. Human interaction with the natural environment has led to a burgeoning interest in wilderness medicine, a multi-specialty area of interest that requires an ability to diagnose and improvise in areas where resources may be scarce. DOMINIC WU, et. al. discuss dermatologic misfortunes that may impact outdoor travel. Sailing, one of the most ancient means of transport through the most vast, uninhabited regions on earth, is frequently the source of injury. ANDREW NATHANSON discusses the wide range of injury and illness incurred while sailing, when resources and space are limited and definitive care may be days to weeks away. JOHN FOGGLE, who recently toured Antarctica, reviews the modern management of hypothermia, and DANIEL COLEMAN, et. al. provide a fascinating discussion of the impact of wilderness medicine on medical education. CHANA RICH, et. al. provides a wonderful clinical contribution from the Brown University Emergency Medicine Department of a case of free diving off the coast of Rhode Island and alveolar hemorrhage.

In a slight departure from previous issues of RIMJ, we are fortunate to have a non-Rhode Island author contributing to this issue. RENEE SALAS, who completed her fellowship in Wilderness Medicine at Massachusetts General Hospital, and who was a former colleague of mine, has become increasingly involved with the Harvard Global Health Institute. Dr. Salas was the recent lead author of the Lancet’s Countdown U.S. Brief on Health and Climate Change, and reviews the impact of climate change on health and economies here in the northeast. Her sobering discussion will help us plan for the impact of climate on the health of our patients in New England and in Rhode Island.

We hope you enjoy this RIMJ focus section issue on the rapidly developing field of wilderness medicine that is unfolding on myriad educational, research, and technical fronts across the medical, societal and global climatological spectrum as these articles outline.
ABSTRACT

Spending time outdoors can be rewarding. However, exposure to the sun, insect bites, and plant exposures may result in a wide range of dermatologic manifestations. In this article, we describe potential cutaneous manifestations of common wilderness exposures in New England including photodermatoses from prolonged sun exposure, phytodermatoses from plant exposures, and arthropod-bite reactions from common insects (mosquitoes, spiders, ticks, hymenoptera, mites and chiggers). The article will also address preventive and treatment strategies which may help physicians and their patients better prepare for spending time in the wilderness.

KEYWORDS: dermatology, wilderness, phototoxicity, arthropod reactions, plant exposure

INTRODUCTION

Although hiking, biking, and other outdoor activities are wonderful physical activities and can enhance one’s mental wellbeing, it is vital to take appropriate preventative measures to ensure the most enjoyable experience possible. Environmental exposure to the sun and altitude puts one at risk of sunburn and both acute and chronic skin damage. Insect bites can induce an array of dermatologic manifestations that, if not appropriately managed, may result in serious medical complications. Plant exposures can result in multiple cutaneous manifestations including allergic contact dermatitis, phytophotodermatitis, irritant contact dermatitis, and contact urticaria.

SUN EXPOSURE

Prolonged ultraviolet (UV) radiation exposure may result in cutaneous manifestations including sunburn, aging, and malignancies. Approximately 1 in 5 people in the United States may develop skin cancer in their lifetimes. Both UVA and UVB radiation may cause skin cancer, with UVA primarily responsible for chronic skin changes such as photaging, wrinkling, and lentigines. Even on cloudy days, up to 80% of harmful UV radiation can reach the skin. As one reaches higher in altitude, the total amount of UV radiation exposure increases as much as 30% for every 1000 meters.

a. Sun Protection

All people older than 6 months of age, regardless of skin color, should apply a broad-spectrum and water-resistant sunscreen of at least SPF 30. It is also important to re-apply sunscreen at least every 2 hours, and after each water exposure. Patients should seek shade when possible, avoid sun at peak hours between 10am–2pm, and wear sun protective clothing including broad-brimmed hats and sunglasses. The American Academy of Pediatrics recommends that children younger than 6 months of age should have minimal exposure, wear appropriate clothing and have adequate shade.

b. Drug-induced Phototoxicity

Some medications can induce phototoxic rashes that resemble sunburns after sun exposure. Common offenders include NSAIDs, quinolones, tetracyclines, and diuretics. This side effect is thought to be due to UV light absorption by the medication, leading to free radical formation and cellular damage in sun-exposed areas. The severity of the effect is often dose-dependent and linked to the duration and intensity of sun exposure. The phototoxic rash often occurs within 30 minutes of UV exposure and begins with burning and pruritus, with or without wheals, and further develops into a bright red edematous photodistributed rash. This may progress to erythema, hyperpigmentation, edema, and even blistering.

Management is supportive and involves prevention strategies such as sun protection, limiting sun exposure, and dose reduction or elimination of the offending medication. Cool compresses and ice packs may offer significant relief. Similar to sunburns, the patient should maintain hydration and use gentle emollients.

INSECTS

In the northeast United States, the most common cutaneous complaints from insect exposure are due to mosquitoes, mites and chiggers, gypsy moths, fleas, spiders, hymenoptera, and ticks. Their bites may contain toxins and irritants that can cause a wide range of dermatologic manifestations.
symptomatic reactions. First-generation antihistamines may help patients with more severe and persistent pruritus. However, these medications are more sedating than second-generation agents, but tend to be more effective for pruritus.

b. Spiders
Most spider bites encountered in the U.S. are harmless and may induce a brief localized skin reaction that spontaneously resolves. However, black widow (Latrodectus mactans) and brown recluse (Loxosceles reclusa) spider bites may require more directed medical care (Table 2).

Female black widow spiders are more commonly found in the South up to Southern New England and in the West. Their bites contain a venom containing α-latrotoxin, which leads to a large release of acetylcholine. The bite site typically appears as a painful pink edematous papule or plaque with central fang marks with possible central clearing. The victim may then experience muscle spasms and cramps within an hour in the chest or abdomen that may mimic a myocardial infarction. Treatment options include intravenous benzodiazepines for muscle spasms and narcotic pain medications. Antivenom can be considered up to 48 hours after a bite if severe pain persists after routine therapy.

Brown recluse spiders are rare in the Northeast. The bite itself may be only slightly painful. However, soon after the bite, a tender erythematous halo rash may develop. In many cases, this progresses to central necrosis, sometimes even requiring a skin graft. It is thought that sphingomyelinase D in the venom triggers platelet aggregation and activates thromboxane B2 which leads to skin necrosis. Treatment options are controversial; however, most experts suggest that overly aggressive management, such as excising the bite site to prevent necrosis, is harmful and not indicated. Most suggest proper wound care and minor debridement, with or without antihistamines or dapsone.

c.Ticks
Ticks can carry a multitude of diseases including Lyme disease (Table 1). Tick bites are typically not painful, as their saliva contains anesthetic and anticoagulant factors. Lyme disease typically presents with the erythema migrans rash [red macule or thin plaque that slowly expands outwards with central clearing resembling a target]. The incidence of Lyme disease has increased since 2007, and the geographic distribution has broadened from primarily New England, the Mid-Atlantic States, and Wisconsin to include adjacent states. If the tick is identifiable as I. scapularis, has been attached to the host for more than 36 hours and is engorged in a Lyme-endemic area, prophylactic treatment with a single dose of doxycycline 200 mg orally may be administered within 72 hours of tick removal (if no other contraindications).

Ticks should be removed carefully using a pair of forceps or a tick-removal device by grasping the tick as close to the skin as possible and removing the parasite with gentle, steady traction perpendicular to the skin without twisting. Tick bites may be prevented by wearing clothing treated with permethrin. Applying DEET-containing insect repellants, tucking pants into socks, wearing long-sleeved clothing and pants, and performing daily tick checks can help to reduce potential exposure.

d. Hymenoptera (Bees, Wasps)
Stings from bees and wasps can be incredibly painful, and may even provoke anaphylaxis. Their stings often produce immediate burning and pain at the site, followed by an erythematous wheal. This usually resolves spontaneously within a few hours. However, some individuals have a more exaggerated response, such as swelling greater than 6 inches in diameter lasting up to 7 days. More severe local reactions in select individuals may be due to venom-specific IgE antibodies in sensitized victims.

To remove a bee or wasp sting, the victim should ideally use a straight, hard surface such as the edge of a credit card to nudge out and remove the stinger. One should avoid using fingers or tweezers to remove the stinger, as this may squeeze additional venom into the stinging site. Some stings, such as that of the honeybee, have venom sacs and attached musculature that may continue to pump venom if the sac is not removed. Intradermal skin allergy testing can be performed with dilute quantities of venom to identify individuals at high risk of anaphylaxis to venom. These individuals at risk for hymenopteran anaphylaxis have the option of undergoing venom immunotherapy which has been shown to be effective. They should always carry a preloaded epinephrine device for emergency administration.
### Table 1. Tick-borne Illnesses

<table>
<thead>
<tr>
<th>Disease/Organism/Vector</th>
<th>Vector image</th>
<th>Cutaneous findings and clinical photo</th>
<th>Non-cutaneous findings/Tests</th>
<th>Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rocky Mountain Spotted Fever</strong></td>
<td><img src="image" alt="Dermacentor variabilis" /></td>
<td>Rocky Mountain Spotted Fever rash</td>
<td>Non-cutaneous findings: -Fever -Myalgias -Nausea, vomiting -Headaches</td>
<td>Doxycycline (even in children &lt;8) May use chloramphenicol if pregnant</td>
</tr>
<tr>
<td><strong>Organism:</strong> Rickettsiae Rickettsii</td>
<td></td>
<td></td>
<td>Tests: -Serology with indirect immunofluorescence assay (IFA) -ELISA</td>
<td></td>
</tr>
<tr>
<td><strong>Tick vectors:</strong> Dermacentor andersoni</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Dermacentor variabilis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cutaneous findings:</strong> may not develop until 2-5 days after systemic symptoms present</td>
<td>-Red, purple macules on wrists, ankles, forearms that later become hemorrhagic on trunk, hands, feet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Organism:</strong> Babesia microti</td>
<td>See Lyme disease</td>
<td>In severe infection, can have petechiae and ecchymoses</td>
<td>Non-cutaneous findings: -Flu like symptoms -Fatigue -Fever -Chills -Myalgias -Occasionally mild hepatomegaly or splenomegaly</td>
<td>Treatment: Atovaquone and Azithromycin for 7-10 days For severe disease treat with clindamycin IV and quinine</td>
</tr>
<tr>
<td><strong>Tick vector:</strong> Ixodes scapularis</td>
<td></td>
<td></td>
<td>-Dark-colored urine due to hemolytic anemia</td>
<td></td>
</tr>
<tr>
<td><strong>Organism:</strong> Borrelia Burgdorferi</td>
<td></td>
<td></td>
<td>Tests: -CBC to look for hemolytic anemia -Reticulocyte count</td>
<td></td>
</tr>
<tr>
<td><strong>Tick vectors:</strong> Ixodes scapularis</td>
<td></td>
<td></td>
<td>-Definitive diagnosis by Giemsa or Wright stains of blood smears which show ring forms and tetrads</td>
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<tr>
<td>Ixodes pacificus</td>
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<td>Ixodes ricinus</td>
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</table>
Table 1. Tick-borne illnesses (continued)

<table>
<thead>
<tr>
<th>Disease/Organism/Vector</th>
<th>Vector image</th>
<th>Cutaneous findings and clinical photo</th>
<th>Non-cutaneous findings/Tests</th>
<th>Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anaplasmosis</strong>&lt;br&gt;Organism: <em>Anaplasma phagocytophilum</em>&lt;br&gt;Tick vector: <em>Ixodes scapularis</em>&lt;br&gt;<em>Ixodes pacificus</em>&lt;br&gt;See Lyme disease&lt;br&gt;Usually no exanthem, so presence of cutaneous findings should raise suspicion for other diseases or coinfection</td>
<td></td>
<td></td>
<td>Non-cutaneous findings:&lt;br&gt;-Fever&lt;br&gt;-Malaise&lt;br&gt;-Myalgia&lt;br&gt;-Headache&lt;br&gt;-Nausea, vomiting&lt;br&gt;-Confusion</td>
<td>Doxycycline in adults and children &gt; 8 yo</td>
</tr>
<tr>
<td><strong>Ehrlichiosis</strong>&lt;br&gt;Organism: <em>Ehrlichia chaffeensis</em>&lt;br&gt;Tick vector: <em>Amblyomma americanum</em>&lt;br&gt;Female lone star tick†&lt;br&gt;Females: characteristic dorsal white spot&lt;br&gt;Male: scattered spots/streaks around perimeter of body</td>
<td>Exanthem present in 10% of cases&lt;br&gt;-Faint, blanching generalized erythema&lt;br&gt;-Erythematous macules, papules, petechiae</td>
<td></td>
<td>Non-cutaneous findings:&lt;br&gt;-Fever&lt;br&gt;-Malaise&lt;br&gt;-Myalgia&lt;br&gt;-Headache&lt;br&gt;-Nausea, vomiting&lt;br&gt;-Confusion&lt;br&gt;-Meningoencephalitis&lt;br&gt;-Cranial nerve palsies</td>
<td>Doxycycline in adults and children &gt; 8 yo</td>
</tr>
</tbody>
</table>

**e. Mites and Chiggers**

Mites are small arthropods with eight legs whose bites may cause pruritic papules. Its six-legged larval form is called the chigger, which appear as tiny red insects that crawl around until they reach a barrier such as lining of a sock. The mite’s saliva sometimes provokes an allergic reaction from the human host, producing a pruritic papule. Mite and chigger bites classically present as grouped 1–2 mm pruritic red papules with an abrupt demarcation line around borders of clothing such as around the ankles.

These bites tend to be self-limited and may be treated symptomatically for more severe reactions. Prevention and treatment strategies are similar to those for mosquitos.

**PHYTODERMATOSES**

Exposure to plants may result in a variety of cutaneous manifestations including phytophotodermatitis, irritant contact dermatitis, allergic contact dermatitis, and contact urticaria.

**a. Phytophotodermatitis**

Phytophotodermatitis is a cutaneous eruption resulting from the exposure of skin to photosensitizing agents from plants such as furocoumarins (eg. psoralen) which react with UV radiation. Some plants that are known to cause phototoxicity include lemon, lime, celery, carrots, dill, and anise. A common presentation is a patient who squeezed limes outdoors and subsequently developed a burning, erythematous rash. Wild parsnip (*Pastinaca sativa*) is found throughout New England and may cause a severe phytophotodermatitis reaction.

Cutaneous manifestations include burning and painful, bullous, erythematous eruptions, which may result in chronic skin hyperpigmentation. Treatment is mostly symptomatic [with cool compresses and oral antihistamines if needed], and prevention involves avoidance of triggers. With appropriate sun protection and time, the post-inflammatory hyperpigmentation should resolve spontaneously.

**b. Irritant contact dermatitis**

There are two main categories of irritant contact dermatitis (ICD) from plant exposures: mechanical (physical injury), and chemical.

Mechanical ICD is a result of physical trauma to the skin caused by a plant’s trichomes (hairs), spines, glochids (barbed hairs), or thorns. These defense mechanisms may breach the epidermis and trigger a papular eruption. A classic example of this are cacti which contain spines and sometimes glochids, which, if a person is exposed, may present as erythematous papules and nodules that spontaneously resolve with time.

Chemical ICD is often provoked by plant chemicals such as calcium oxalate that may be transferred to the epidermis after physical contact with a plant, resulting in subsequent inflammation. Daffodils commonly cause erythema, dry skin, as well as scaling of the finger tips among florists due
### Table 2. Arthropod and Snake Reactions

<table>
<thead>
<tr>
<th>Organism and image</th>
<th>Presentation</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scorpion</td>
<td>Pain and paresthesias of bite site - May have neurological or cardiopulmonary complications</td>
<td>- Remove stinger - Supportive care - Ice - Antihistamines</td>
</tr>
<tr>
<td>Bees, wasps, hornets</td>
<td>Ranges from pain and local edema at site of bite to urticaria, respiratory distress, anaphylaxis</td>
<td>Remove stinger, symptomatic care</td>
</tr>
<tr>
<td>Fire ants</td>
<td>Line or ring of pustules with surrounding red or hemorrhagic halo - May have neurologic systemic symptoms, anaphylaxis</td>
<td>Symptomatic care</td>
</tr>
<tr>
<td>Snake bite</td>
<td>- Crotalidae: rattlesnake, copperhead, and cottonmouth moccasin - Elapidae: coral snake (touching red and yellow bands)</td>
<td>Emergency: visit closest emergency department. Antivenom, tetanus prophylaxis, possible antibiotics</td>
</tr>
<tr>
<td>Gypsy moth</td>
<td>- Eczematous, pruritic dermatitis - Urticaria</td>
<td>- Strip bite site with adhesive tape to remove caterpillar hairs - Wash site with soap and water - Topical or oral steroids for severe reactions</td>
</tr>
<tr>
<td>Io moth</td>
<td>- Immediate pruritus and stinging of involved skin</td>
<td>Same as gypsy moth</td>
</tr>
<tr>
<td>Puss caterpillar</td>
<td>- Intense burning pain - Hemorrhagic linear track marks</td>
<td>Same as gypsy moth</td>
</tr>
<tr>
<td>Saddle back caterpillar</td>
<td>- Immediate painful stinging - Redness - Edema</td>
<td>Same as gypsy moth</td>
</tr>
<tr>
<td>Black widow spider</td>
<td>- Acute edema - Pain - Symptoms resembling a surgical abdomen</td>
<td>Antivenom - Benzodiazepines - IV calcium gluconate</td>
</tr>
<tr>
<td>Brown recluse spider</td>
<td>- Violin-shaped marking on head</td>
<td>- Erythema - Bullae - Necrosis - Possible disseminated intravascular coagulation</td>
</tr>
</tbody>
</table>

### References
While enjoying the wilderness, it is important to protect your skin and to have the necessary tools to decrease morbidity should a dermatological issue arise during your outdoors adventure. The authors of this article suggest stocking your dermatology wilderness pack with the following items for prevention and treatment.

### Prevention
- Broad brimmed hat
- UV protective long-sleeved clothing
- Broad-spectrum sunscreen with an SPF of 30 or more
- Sunglasses
- DEET-containing insect repellent
- Permethrin-treated clothing

### Treatment
#### (Ointments)
- Hydrocortisone 1% cream or ointment
- Vaseline
- Neosporin or other antibiotic ointment
- Anti-itch creams such as Sarna
- Clobetasol 0.05% ointment
- Hydrocortisone 2.5% ointment
- Mupirocin antibiotic ointment

#### (Oral medications)
- Antihistamines (e.g., Zyrtec, Benadryl, Claritin, Allegra)
- Prednisone 10 mg tablets
- Doxycycline 100 mg tablets

#### Dressings
- Band-aids
- Gauze
- Medical Tape
- Ace bandage
- Tegaderm dressing

---

### Table 3. Wilderness Dermatology Kit

While enjoying the wilderness, it is important to protect your skin and to have the necessary tools to decrease morbidity should a dermatological issue arise during your outdoors adventure. The authors of this article suggest stocking your dermatology wilderness pack with the following items for prevention and treatment.

<table>
<thead>
<tr>
<th>Category</th>
<th>Over-the-counter</th>
<th>Prescription-Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention</td>
<td>• Broad brimmed hat</td>
<td>These items may require prescriptions from your doctor. Consider these items based on discussions with your doctor.</td>
</tr>
<tr>
<td></td>
<td>• UV protective long-sleeved clothing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Broad-Spectrum sunscreen with an SPF of 30 or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sunglasses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• DEET-containing insect repellant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Permethrin-treated clothing</td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>• Hydrocortisone 1% cream or ointment</td>
<td></td>
</tr>
<tr>
<td>(Ointments)</td>
<td>• Vaseline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Neosporin or other antibiotic ointment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Anti-itch creams such as Sarna</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Clobetasol 0.05% ointment</td>
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<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td>• Mupirocin antibiotic ointment</td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>• Antihistamines (e.g., Zyrtec, Benadryl, Claritin, Allegra)</td>
<td></td>
</tr>
<tr>
<td>(Oral medications)</td>
<td>• Prednisone 10 mg tablets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Doxycycline 100 mg tablets</td>
<td></td>
</tr>
<tr>
<td>Dressings</td>
<td>• Band-aids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gauze</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Medical Tape</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ace bandage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tegaderm dressing</td>
<td></td>
</tr>
</tbody>
</table>

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**CONCLUSION**

Hiking and spending time outdoors is a healthy and potentially therapeutic pastime. Exposures to insects, plants, and the weather, however, can result in a multitude of symptomatic dermatologic manifestations. Equipping oneself with the knowledge of potential exposures and prevention and treatment strategies can help physicians prepare patients to make the most out of their time in the wilderness.

**References**


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Sailing Injuries: A Review of the Literature

ANDREW NATHANSON, MD, FACEP, FAWM

ABSTRACT

Sailors are at risk for acute injuries, overuse injuries, environmental injuries, and sailing-related illnesses. Sailing-related injury rates vary from 0.29 to 5.7 per 1,000 hours which is lower than many other land-based sports. However, the fatality rate of 1.19 per million sailing-days is relatively high. The most common injuries are contusions and lacerations predominantly to the upper and lower extremities. Falls and impacts from various parts of the sailboat are the most common mechanisms of traumatic injury. High winds, operator inexperience, and operator inattention are the most common contributing factors for injury. Among Olympic-class sailors, overuse injuries to the back (29–45%) and knees (13–22%) are commonly reported. As many as seventy-three percent of sailing-related deaths are due to drowning as a result of falls overboard (39–44%) or capsizing the vessel (20–40%). Eighty-two percent of sailing-related drowning victims in US waters were not wearing a lifejacket. Leading contributing factors to fatal sailing accidents are high winds (12–27%), alcohol use (10–15%), and operator inexperience (8%).

KEYWORDS: sailing, injury, illness, fatalities

INTRODUCTION

By far the largest wilderness areas on earth are oceans and lakes which cover over 71% of the planet’s surface. For over 5,000 years, humans have used sailing craft as an efficient means of traversing these waterways in order to fish, transport goods, and explore distant lands. Although the invention of steam engines in the late 18th century gradually made commercial sailing obsolete, sailing soon transitioned into a recreational pastime, first in Europe, then in the United States. Sailboat racing was first formalized in 1851, when the schooner America defeated 14 British entries in a race around the Isle of Wight in what has since become the America’s Cup, considered the oldest international sporting event in the world.1

Present-day sailing encompasses a broad spectrum of activities from day-sailing on a lake, to around-the-world racing. Sailboats range in size and complexity from single-handed 2.4 m Optimist training dinghies, to 30 m “maxi” racing boats sailed by a crew of 22, and capable of speeds in excess of 30 mph. In 2011 the US Coast Guard (USCG) estimated that 3.7% of all US households owned a sailboat, and that there were 154 million sailing person-hours in US waters.2

The physical demands of sailing vary greatly depending on the type of vessel, the windspeed, whether cruising or racing, as well as the crew member’s position on the boat. In dinghies, the sailor spends significant energy levering his or her body “hiking” over the side of the boat to keep it from capsizing. In keelboats the most demanding activity is turning winches to pull in lines under tension.

Sailors are at risk of injury and illness from a variety of causes. Environmental risks include solar exposure, hypothermia, immersion injuries, and motion sickness. Acute injuries are often caused by falls, direct impact from various parts of the boat, and from lines under tension. Finally, overuse injuries can be sustained by repetitive activities such as “grinding” winches, steering the vessel, and hiking.

Medical care for injury or illness aboard a sailboat presents some unique “wilderness” challenges, particularly when far offshore. Definitive medical care may be days away, supplies are limited, space below-deck is often cramped and poorly lit, and the motion of the vessel can be violent and unpredictable. Evacuation at sea is often dangerous and not always an option. Compounding these challenges is the fact that injuries are most likely to occur during stormy weather when crew members are fully engaged in sailing the boat and may be fatigued or seasick.

Injury rates, mechanisms of injury and types of injury have been found to vary significantly according to the type of sailboat and type of sailing. For ease of study, the medical literature and the US Coast Guard generally categorize sailboats into two groups; vessels greater than 6m in length equipped with a weighted keel for stability and usually motorized, known as keelboats, and smaller, non-motorized dinghies and catamarans which are dependent on crew weight for stability and are easily overturned. Most studies focus on a particular class of sailboat or regatta, so findings may not be generalizable, and comparisons of injury-rates between studies is difficult due to differing definitions of injury and methodologies.
METHODS
A search was performed using PubMed with the terms ‘sail’, ‘sailing’, ‘yacht’, ‘yachting’, and ‘injury’, ‘injuries’, or ‘medical’. Studies were limited to the English language literature between 1990 and 2018. A total of 27 articles were retrieved, from which 14 were selected. Public access USGC Data-bases were also reviewed.

SAILING INJURIES
Injury Rates, Types of Injury and Mechanisms of Injury

Dinghies
In a study of the 2016 Olympic summer games (raced in 10 classes of smaller boats), 21 out of 360 sailors (5.5%) suffered an injury; only two of those injuries resulted in time-loss from sports participation. This compares favorably to an average injury rate of 9.5% for all Olympic athletes, ranking sailing 26th out of 40 sports regarding risk of injury. Injury rates at an international 2014 Olympic-class regatta, and among elite dinghy sailors in New Zealand, and novice dinghy sailors in Germany have been reported as 0.59 per 1,000 hours, 0.2 injuries per year and 0.29 per 1,000 hours, respectively. (See Table 1.) The newer, faster, and less stable Olympic-class boats, the 49er and Nacra 17, have higher rates of acute injuries than the other classes.

The most frequent [but least severe] acute injuries aboard dinghies sailed by elite as well as novice sailors are contusions (9–55%) which are often caused by falls and contact with various parts of the boat during rapid turning maneuvers in confined quarters. Hand injuries (6–31%) including lacerations, fractures, finger dislocations and rope burns from handling lines, the tiller or the center-board are also common. Head injuries, which appear to be more common among intermediate (11%) than more advanced (3%) sailors, are often caused by impact from the low-hanging boom and are among the most severe. Boom-related trauma can cause scalp or facial lacerations, contusions, fractures, and concussions. Capsizing (13–52%) and collisions with other boats or objects (3–23%) are other common mechanisms of injury.

Overuse injuries, particularly among elite competitive racers, are very common and, in some studies, outnumber acute injuries. Hiking in a straight leg position places high static and dynamic loads on the extensor mechanism of the leg, particular the knees, as well as the back. Low back pain (29–45%) and knee pain (13–22%) are consistently the most common chronic conditions reported by dinghy racers.

Table 1. Summary of Dinghy Sailing Injury Studies

<table>
<thead>
<tr>
<th>Study Population (Study Design)</th>
<th>Soligard(^3)</th>
<th>Schaefer(^4)</th>
<th>Tan(^4)</th>
<th>Nathanson(^7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olympic Games (Prospective)</td>
<td>2016</td>
<td>Novice sailors (Survey)</td>
<td>Elite Dinghy Racing (Survey)</td>
<td>Dinghies mixed population (Internet Survey)</td>
</tr>
<tr>
<td>Average Age (SD)</td>
<td>24 (6)</td>
<td>40 (13)</td>
<td>238</td>
<td>341</td>
</tr>
<tr>
<td>Male Gender</td>
<td>57%</td>
<td>57%</td>
<td>83%</td>
<td></td>
</tr>
<tr>
<td># Injuries</td>
<td>21</td>
<td>238</td>
<td>341</td>
<td>397</td>
</tr>
<tr>
<td>Injury Rate</td>
<td>0.29/1,000 hours</td>
<td>0.59/1,000 hours</td>
<td>4.6/1,000 days</td>
<td></td>
</tr>
<tr>
<td>Type of injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laceration/Abrasion</td>
<td>29%</td>
<td>33%</td>
<td>5%</td>
<td>31%</td>
</tr>
<tr>
<td>Fracture</td>
<td>5%</td>
<td>1%</td>
<td>8%</td>
<td>2%</td>
</tr>
<tr>
<td>Sprain/Strain</td>
<td>29%</td>
<td>1%</td>
<td>45%</td>
<td>16%</td>
</tr>
<tr>
<td>Contusion</td>
<td>14%</td>
<td>55%</td>
<td>9%</td>
<td>41%</td>
</tr>
<tr>
<td>Dislocation</td>
<td>4%</td>
<td>1%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Concussion</td>
<td>4%</td>
<td>1%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Burns</td>
<td>4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>9%</td>
<td>2%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Chronic/overuse</td>
<td>14%</td>
<td></td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Body Part Injured</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head/Neck</td>
<td>0%</td>
<td>32%</td>
<td>6%</td>
<td>12%</td>
</tr>
<tr>
<td>Back/trunk</td>
<td>33%</td>
<td>2%</td>
<td>33%</td>
<td>5%</td>
</tr>
<tr>
<td>Upper extremity</td>
<td>24%</td>
<td>39%</td>
<td>28%</td>
<td>39%</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>38%</td>
<td>27%</td>
<td>34%</td>
<td>44%</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Injury rate for sailing and land-based training

Figure 1. Part of dinghy associated with injury, n = 397

With permission from Wilderness and Environmental Medicine
Keelboats

A study of the 2003 America’s Cup reported an injury rate of 2.2 per 1,000 hours of sailing, while the injury rate for land-based conditioning was 8.6 per 1,000 hours. Bowmen and grinders had the highest rates of injury while sailing, and helmsmen the lowest.9 A study of an amateur around-the-world race, and an Internet-based survey of intermediate/advanced sailors found injury rates of 9 and 4.6 per 1,000 sailing days, respectively.10,7 [See Table 2.] By comparison, in studies using similar definitions of injury, recreational alpine skiing was found to have an injury rate of 4 per 1,000 hours, and men’s collegiate soccer 17 per 1,000 hours.11,12

As with dinghy sailing, contusions are common among keel-boat sailors (12–40%), as are lacerations (5–26%).9,7 Many of these injuries are the results of falls (30%) which can be attributed to walking on a wet, lurching, and steeply angled deck, often cluttered with lines, winches, and hatches.7 Impact from rigging, flogging sails and other crewmembers is another cause of injury. [Figure 2] In a study of a mixed population of keelboat sailors, leg contusions (11%) and hand lacerations (8%) were most common.7 In the 635-nautical mile Newport to Bermuda race, 47% of injuries were found to be to the hand/fingers, mostly from operating winches and handling lines under high tension.13 Probably due to the heavier forces involved, fractures have been found to be more common on keelboats (5.7%) as compared to dinghies (2.4%).7 Burns from hot liquids, foods and the engine have also been widely reported in off-shore sailing.10,13 During the 2001–02 Volvo around-the-world race, one-third of injuries occurred below-decks likely due to the forceful and erratic movements of those yachts in heavy weather.14

In offshore racing, helmsmen/women can develop carpal tunnel syndrome from gripping the wheel for prolonged periods of time. Chronic/overuse injuries to the shoulder, elbow, and back are common among grinders in both near and offshore sailing.14

Risk Factors for Injury and Severe/Fatal injuries

Studies of recreational and competitive dinghy and keelboat sailing have consistently identified high winds as a leading contributing factor for injury.4,6,7,13 Not only do stronger winds place exponentially higher loads on rigging, and increase risk of capsize, they can also create large and hazardous seas. Turning maneuvers [i.e. tacks, jibes] have also been identified as contributing factors for injury in sailing craft of all sizes, likely because the boom crosses the boat overhead, and sails and lines must be released on one side of the boat and pulled in on the other.6,7

### Table 2. Summary of Keelboat Sailing Injury Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Neville9</th>
<th>Nathanson7</th>
<th>Price10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>America’s cup keelboats (Prospective)</td>
<td>Keelboats (Internet Survey)</td>
<td>Amateur Around-the-world race (Prospective)</td>
</tr>
<tr>
<td># Injuries</td>
<td>220</td>
<td>1,226</td>
<td>299</td>
</tr>
<tr>
<td>Injury Rate</td>
<td>5.7/1,000 hours#</td>
<td>4.6/1,000 days</td>
<td>9/1,000 days at sea</td>
</tr>
<tr>
<td>Type of injury</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laceration/Abrasion</td>
<td>5%</td>
<td>26%</td>
<td>12%</td>
</tr>
<tr>
<td>Fracture</td>
<td>2%</td>
<td>6%</td>
<td>12%</td>
</tr>
<tr>
<td>Sprain/Strain</td>
<td>68% ^</td>
<td>17%</td>
<td>10%</td>
</tr>
<tr>
<td>Contusion</td>
<td>12%</td>
<td>40%</td>
<td>36%</td>
</tr>
<tr>
<td>Dislocation</td>
<td>2%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Concussion</td>
<td>3%</td>
<td>7% *</td>
<td></td>
</tr>
<tr>
<td>Burns</td>
<td>2%</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>13%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Chronic/overuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Part Injured</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head/Neck</td>
<td>14%</td>
<td>11%</td>
<td>12%</td>
</tr>
<tr>
<td>Back/trunk</td>
<td>20%</td>
<td>11%</td>
<td>21%</td>
</tr>
<tr>
<td>Upper extremity</td>
<td>40%</td>
<td>40%</td>
<td>22%</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>25%</td>
<td>38%</td>
<td>17%</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>27%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Injury rate includes land-based training, ^ Including chronic/overuse injuries, * *Head injuries No LOC"

![Figure 2. Part of keelboat associated with injury, n = 1,226](image-url)
While the majority of sailing injuries in most studies are of relatively minor, severe injuries do occur and sailing-related fatalities are more common than in most land-based sports. In a study of 841 sailing injuries reported to the USCG requiring more than first aid, operator inattention (22%) and inexperience (11%) were identified as the leading preventable factors. An analysis of 70 severe injuries requiring evacuation or hospitalization, found that high winds were a contributing factor in 35% of cases, and that 25% of these injuries were fractures, 16% soft tissue injuries, and 14% concussions. Injury patterns for severe injuries included: planned and accidental jibes where the sailor was struck by the boom, or mainsheet; collisions with other boats; dismasts; and falls through open hatches or companionways.

A study of annual USCG Boating Accident Reports from 2000–11 found that there were 271 sailing-related fatalities in US waters during the time period, as compared to 197 football-related deaths. Drowning was found to be the most common cause of death (73%) followed by trauma (10%), and hypothermia (4%). Falls overboard (41%), capsizing (29%), sinking (7%), and collisions (5%) were leading accident mechanisms. Among those who drown, 82% were not wearing a lifejacket. Using exposure data from the 2011 USCG National Recreational Boating Survey (a large-scale, population-based, weighted survey), a fatality rate of 1.19 deaths per million sailing person-days was calculated, which is similar to a calculated rate of 1.06 deaths per million skiing/snowboarding-days.

The leading operator-preventable contributing factors for fatal sailing accidents were alcohol use (keelboats 15%, dinghies 10%), operator inexperience (8%), and improper look-out/inattention (keelboats 10%, dinghies 5%). The leading non-preventable contributing factors were high winds (keelboats 12%, dinghies 27%), hazardous waters (keelboats 9%, dinghies 10%), and equipment failure (keelboats 4%, dinghies 6%).

SAILING-RELATED ILLNESSES/ENVIRONMENTAL INJURIES

Although any illness which occurs on land may also occur at sea, prolonged exposure to the elements, confined living quarters, poor hygiene, and the motion of the vessel predispose sailors to a number of disorders. Seasickness is the most common illness directly attributable to sailing (8%–15% of all illnesses) and is directly correlated to stormy conditions. Though almost never fatal, it is often incapacitating which can result in safety concerns among short-handed crews in heavy weather. Seasickness usually resolves after 3 days of a constant sea-state and its symptoms can be moderated or prevented by the use of medications which are most effective when taken before embarkation or at the very first onset of symptoms. Scopolamine, the most effective medication, has strong anticholinergic side effects and can cause urinary retention, psychosis, blurred vision, and dry mouth.

Among 360 novice, round-the-world sailors, dermatologic conditions accounted for 21% of medical cases. Sunburn, boils to the buttocks (from sitting on deck), cellulitis, and tinea infections featured prominently. Upper respiratory infections were reported to cause 18% of illnesses, and gastroenteritis, including a cluster of cases on one boat, caused 15% of illnesses.

CONCLUSIONS

Although the majority of sailing injuries are minor and injury rates are low, the risk of death, predominantly from drowning, is higher than that of many land-based competitive sports. While many sailing-related injuries are soft tissue injuries that require nothing more than first aid, some are more severe. Among this latter group, some injuries could be prevented by more ergonomic sailboat design, use of gloves, and use of helmets.

Fatal sailing accidents often occur when sailors unexpectedly find themselves in the water after falling overboard or capsizing. Falls overboard on keelboats can largely be prevented by wearing tethers which should be worn on-deck in stormy conditions, or whenever sailing at night. Dinghy sailors should be cautious when sailing in high winds, and wear insulating clothing in cold water with the expectation that they will capsize. Lifejackets should be worn when sailing, as there is compelling evidence that lifejackets save lives. A before-and-after study in Australia showed a significant decrease [U-26; p = .04] in boating-related drownings once lifejackets were mandated by law. Alcohol use, though likely underreported in many studies, has been found to be a contributing factor to drowning, sailing injuries, and sailing fatalities. Though current RI laws prohibit a boat operator to be intoxicated, the law should be broadened to include passengers, as they are just as likely to fall overboard and drown as is the skipper.

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Accidental Hypothermia: ‘You’re Not Dead Until You’re Warm and Dead’

JOHN L. FOGGLE, MD, MBA, FACEP

INTRODUCTION
The classic teaching in medical school regarding hypothermia is “you’re not dead until you’re warm and dead.” More precise definitions than the medical school axiom exist. Hypothermia is a drop in core body temperature <35°C, (or per history or trunk palpation when an initial core temperature measurement is unavailable) due to cold exposure which, if not reversed, can lead to mental and physical impairment, hypoxemia, hypotension, acidosis, unconsciousness, arrhythmia, and death. Modern approaches to rewarming have improved survival from accidental hypothermia. This article reviews the epidemiology and classification of accidental hypothermia and reviews traditional and recently developed warming techniques that reduce morbidity and mortality in the setting of severe accidental hypothermia.

EPIDEMIOLOGY
The exact incidence of hypothermia deaths in the United States is unknown, and existing data is likely underestimated. The Centers for Disease Control and Prevention (CDC) reports nearly 17,000 hypothermia-related deaths in the United States between 1999 to 2011. Of the almost 1500 annual deaths, approximately 2/3 are male and nearly half of those who succumb are elderly. Fifty percent of deaths are from accidental causes. [1]

Common risk factors for accidental hypothermia include homelessness, poverty, mental illness, extremes of age, diabetes, cardiovascular disease, and alcohol and illicit drug use. Recreational activities related to climbing and skiing, resulting in cold exposure, and water sports, resulting in cold immersion, make up another large cohort of hypothermia cases.

CLASSIFICATION
There are a number of different classification systems used to organize the physiologic response to hypothermia. All are based on core temperatures, which can be determined by low-reading rectal or esophageal thermometers, or through epitympanic measurements. Epitympanic measurements may be considerably lower than the actual core temperature if the environment is very cold, or if there is water or snow in the external auditory canal. [2,3] Rectal temperatures can lag behind the true core temperature, especially in severe hypothermia. [4,5,6] The most accurate measurement, especially during rewarming, is an esophageal probe in the lower one-third of the esophagus, but this is only an option in an intubated patient.

The most common hypothermia classification system used in the United States is a three-stage system relying on the single lowest core temperature measurement:

- MILD 32–35°C (90–95°F)
- MODERATE 28–32°C (82–90°F)
- SEVERE <28°C (<82°F)

The Four-stage Swiss System [see Table 1] is used to estimate core temperature at the scene, with stages based on clinical signs that roughly correlate with the core temperature. [7] The Swiss classification splits the severe group into “unconscious” [24–28°C] and “no vital signs” [<24°C] and can be used to guide treatment once a core temperature is measured. One of the limitations of both the Swiss model, as well as other systems, is that there is much overlap and clinical findings may not correspond to classification. [8]

Each of the classification systems correspond to the physiologic response to hypothermia. In mild hypothermia, the initial response to a decrease in core temperature is peripheral vasoconstriction and increased metabolic heat production from shivering. [9] Cardiac output and respiratory effort

<table>
<thead>
<tr>
<th>Stage</th>
<th>Core Temperature</th>
<th>Clinical Findings</th>
<th>Treatment Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT-I</td>
<td>32–35°C</td>
<td>Conscious, shivering</td>
<td>Warm environment and clothing, warm liquids</td>
</tr>
<tr>
<td>HT-II</td>
<td>28–32°C</td>
<td>Impaired consciousness, not shivering</td>
<td>Active external, warmed fluids, minimally invasive internal rewarming</td>
</tr>
<tr>
<td>HT-III</td>
<td>24–28°C</td>
<td>Unconscious, vitals signs present</td>
<td>All of the above plus airway control; consider ECMO or CPB if patient deteriorates</td>
</tr>
<tr>
<td>HT-IV</td>
<td>&lt; 24°C</td>
<td>No vital signs</td>
<td>Restore vital signs via CPR or defibrillation if possible, followed by ECMO or CPB</td>
</tr>
</tbody>
</table>

ECMO denotes Extracorporeal membrane oxygenation, CPB is Cardiopulmonary bypass, and CPR is Cardiopulmonary resuscitation.
increase, as does oxygen consumption. When the core temperature drops below 32° C, metabolic activity decreases and bradycardia and diminished myocardial contractility is noted. Additionally, hypoventilation with concomitant carbon dioxide retention, hypoxia, and respiratory acidosis can occur.

As core temperature drops below 30° C, multiple organ systems are affected. Cardiac irritability results in dysrhythmias, and diminished brain metabolism results in increased irritability, confusion, apathy, and lethargy, and can proceed to somnolence and coma. [10] Other systems are impacted as well. Coagulopathy, renal dysfunction and cold diuresis occur, and endocrine and immunologic changes are seen in hypothermic patients. [9,11]

MANAGEMENT OF ACCIDENTAL HYPOTHERMIA
The rationale for aggressive treatment in accidental hypothermia is that the brain can tolerate cardiac arrest for up to 10 times longer at 18°C than at 37°C. [12] A full neurological recovery may be possible even after prolonged cardiac arrest as long as asphyxia does not precede the development of severe hypothermia. It is essential to recognize that unless there are obvious lethal injuries, a fatal illness, prolonged asphyxia, or if the chest is incompressible, survivability is possible in a hypothermic victim even when there are fixed pupils or early signs of rigor mortis.

PASSIVE REWARMING
The principles of treating mild hypothermia in victims who still have a carotid pulse and active respirations, [Swiss Hypothermia Stage I], with core body temperatures of 32-35°C, remain straightforward and uncontroversial. Such a patient is conscious and is likely shivering, although they may be lethargic and bradycardic. Passive external rewarming should begin in the field, even before emergency department arrival. It constitutes removing wet garments along with insulating the victim by using dry clothing, sleeping bags, or blankets. It is important to note that victims will continue cooling, which is known as “afterdrop,” after removal from a cold environment. This can result in a worsening Swiss Hypothermia Stage with life-threatening cardiac arrhythmias.

ACTIVE EXTERNAL REWARMING
Warm blankets and warm bags of saline especially to the core (axilla, back, chest, and groin), as well as warm (40°C), humidified oxygen delivery by mask, are the initial recommended emergency department treatments for Swiss Hypothermia Stages I and II. Impaired consciousness and the absence of shivering are expected in Stage II. Passive adjuncts like raising the ambient room temperature to >32°C and contact rewarming with a Bair Hugger® also facilitate external rewarming, while warm water immersion (40°C) is mostly impractical in an emergency department setting.

ACTIVE INTERNAL REWARMING
Active internal rewarming starts initially with warm parenteral fluids. Large volumes of IV fluids are essential during the rewarming process as vasodilation causes expansion of the intravascular space. It is at this stage, [Swiss Hypothermia Stage II], where cardiovascular instability may occur and the patient’s heart rhythm may progress from bradycardia to atrial fibrillation.

The first step in an unconscious patient who has vital signs [Swiss Hypothermia Stage III] is endotracheal intubation to protect the airway and to oxygenate the patient with warmed, humidified oxygen by ET tube (40-50°C). Nasogastric tube and bladder catheter lavage with 500cc NS at 40°C usually follows. Although there is a risk that overstimulation of an unconscious, severely hypothermic patient with endotracheal intubation may trigger ventricular fibrillation, the minimal risk outweighs the obvious benefits. [13]

Rhythm deterioration into ventricular fibrillation and asystole [Swiss Hypothermia Stage IV] will force a change in management. Defibrillation should be attempted, but it may not be successful until the core temperature rises to greater than 30°C. Similarly, the hypothermic heart may be unresponsive to cardiovascular resuscitation medications.

Centrally rewarming the heart helps prevent peripheral vasodilatation and cardiovascular collapse. Invasive treatments include delivery of warm fluids [1L NS at 40°C] via peritoneal lavage and/or via pleural lavage following bilateral thoracostomy, or with mediastinal irrigation after a thoracotomy. While case reports demonstrate successful resuscitations after prolonged CPR and active internal warming with peritoneal and pleural lavage, these techniques have shown relatively limited improvements in morbidity and mortality. [14,15,16]

Conventional techniques of rewarming are no longer the standard of care in level 1 trauma centers. Extracorporeal assisted warming [ECAR] has supplanted traditional methods of blood warming. ECAR, also called extracorporeal life support or ECLS, is a technology related to cardiopulmonary bypass [CPB], which was first utilized in 1953 by Gibbon to close an atrial septal defect in an 18-year-old. [17] ECAR has been successfully utilized in humans since 1967. [18,19] ECAR using extracorporeal membrane oxygenation [ECMO] provides vascular rewarming and augments oxygenation, ventilation, and cardiac output using portable mechanical circulatory support systems. Veno-arterial ECMO and CPB can raise body temperature by 6°C/hr and 9°C/hr, respectively, and have been shown to be much more effective than other rewarming techniques. [20] In one small subgroup analysis of patients suffering hypothermic cardiac arrest,
survival among those warmed with conventional techniques was 14%, while those undergoing ECAR had an over 80% survival rate. [21] ECMO has numerous advantages over earlier cardiopulmonary bypass approaches to rewarming: 1) it is usually instituted using femoral cannulation in severe hypothermia under conscious sedation; 2) ECMO may be used for greater than a week whereas CPB is usually used for only a few hours; and 3) ECMO allows time for recovery of the lungs and heart in severe hypothermia and appears to reduce ischemia-reperfusion injury and prevents diastolic dysfunction. [22, 23]

Veno-arterial ECMO, usually with deoxygenated blood from the femoral vein going through the circuit with oxygenated blood being delivered to the femoral artery, has become the preferred ECMO method over veno-venous ECMO when there is severe hypothermia and refractory cardiac arrest (see Figure 1). Percutaneous vascular access can be obtained during traditional CPR via femoral cannulae connected to a circuit that pumps blood through an oxygenator and heat exchanger, then back into the patient. It facilitates chest wall access for ongoing CPR, allows for cardiovascular support with a stepwise, swift, controlled increase in the patient’s body temperature, and it can be instituted rapidly using a groin incision in the emergency department. [23,24]

ECMO can be ended when the core temperature is greater than 37°C and there is a spontaneous, stable cardiac rhythm. It also can be terminated when there is failure to wean from ECMO, specifically when there is persistent asystole or refractory ventricular fibrillation and a core temperature of greater than 36°C. That patient is often defined as “warm and dead.” Patients who suffer cardiac arrest prior to hypothermia and those who asphyxiate, as well as those who are frozen solid and have a non-compressible chest, have very poor outcomes regardless of the means used to rewarm, and they can be considered dead if they are without vital signs. While core temperature is not necessarily predictive of outcome, poor prognostic signs include potassium levels greater than 10 mmol/L in adults, and >12 mmol/L in children, severe acidosis (pH< 6.5), coagulopathy, as well as severe traumatic injury. [21,25]

CASE REPORTS OF SEVERE HYPOThERMIA

The lowest recorded temperature [13°C] with full recovery involved a sea immersion of a 7-year-old girl in Sweden in 2011. [26] There are numerous other case reports, with age ranges from 2½ to 65, showing successful resuscitation with neurologically intact survival from Swiss Stage Hypothermia Class IV and with no vital signs initially and extremely low core temperatures after prolonged CPR. All made full recoveries after treatment and rehabilitation, overcoming enormous odds against survival. The following are several case reports of patients with extremely low core temperatures, all believed to be incompatible with possible survival (<20°C).

Case 1: Core temperature of 13.7°C in cold water immersion in Norway
A 29-year-old female skier fell into a waterfall gully flooded by icy water. She was lifeless for approximately 45 minutes. CPR and endotracheal intubation were initiated shortly after rescue. She had 9 hours of resuscitation and rewarming, with ECMO needed for 5 days, but had a full recovery. [27]
blood rewarming is indicated in any patient who has a cold
aggressive management with CPR and rapid extracorporeal
have been and can be successfully resuscitated. Therefore,
outcome; and 2) patients with core temperatures below 14°C
ted, data suggest: 1) the duration of CPR does not predict
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Trauma Centers.
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near-complete recoveries except for one who has severe
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near-drowning prior to the onset of severe hypothermia. [29]
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diac arrest — report of a case and review of the literature.
cardiac massage and mediastinal irrigation in hypothermic car-

CONCLUSIONS
While the data to support when to use ECMO may be lim-
ited, data suggest: 1) the duration of CPR does not predict
outcome, and 2) patients with core temperatures below 14°C
have been and can be successfully resuscitated. Therefore,
aggressive management with CPR and rapid extracorporeal
blood rewarming is indicated in any patient who has a cold
exposure or cold water immersion and presents to an emer-
gency department in severe accidental hypothermia with no
vital signs and no lethal signs of injury, and has no evidence
that asphyxia preceded the hypothermia. That patient should
be seen as having the potential for a full recovery. Unless a
patient has findings incompatible with life, then the axiom
is true: “You’re not dead until you’re warm and dead.”

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Case 2: Core temperature of 16.9°C in avalanche burial in Poland
A 25-year-old woman was buried under 40 cm of snow in a
vertical position for nearly 2 hours, but was able to breathe.
She had a GCS of 11 upon extrication, and then developed
ventricular fibrillation (VF) cardiac arrest. Three unsuccessful
shocks were delivered and manual CPR was started and
continued during evacuation, followed shortly thereafter
with endotracheal intubation, with persistent VF. ECMO
was implemented upon hospital arrival and the patient was
successfully defibrillated after rewarming to 24.8°C. ECMO
support was required for 91 hours. [28]

Case 3: Median core temperature of 18.4°C in seven boating accident victims in Denmark
Thirteen teenagers and two adults, ages 15–45, were
immersed in 2°C seawater after a boating accident. One
drowned, and seven patients had severe accidental hypother-
mic circulatory arrest. All were successfully resuscitated
using a treatment approach that included extracorporeal
rewarming, followed by intensive neuro-rehabilitation.
Seven other hypothermic victims, with core temperatures
as low as 23°C, did not suffer circulatory arrest and sur-
vived the accident with non-invasive management. All of
the survivors who received extracorporeal rewarming made
near-complete recoveries except for one who has severe
cognitive dysfunction felt to be the result of asphyxia from
near-drowning prior to the onset of severe hypothermia. [29]
Numerous case series and reviews support these anec-
dotes and case reports and conclude that patients with
severe hypothermia and cardiac arrest treated with ex-
corporeal rewarming have successful resuscitation rates of
up to 50%.[30,31,32] Although there are no reliable tools
available to predict who eventually will survive to discharge
after ECLS, these case series and a recent meta-analysis sug-
gest that success rates might be even higher if certain exclu-
sion criteria are used to determine candidates for prolonged
CPR and ECMO, including: 1) asphyxia that precedes severe
hypothermia with cardiac arrest and 2) severe hyperkalemia
(>12 mEq/L), as extremely high potassium levels have been
associated with a poor prognosis and death.[33,34] The high-
est recorded serum potassium in a successful severe hypo-
thermia resuscitation is 11.8 mEq/L.[35] Age greater than 65
has also been used as an exclusion criteria in some Level 1
Trauma Centers.


A Free Diver with Hemoptysis and Chest Pain

CHANA RICH, MD; KRISTINA MCAEER, MD; VICTORIA LEYTIN, MD; WILLIAM BINDE, MD

Case Reports from the Alpert Medical School of Brown University Residency in Emergency Medicine

DR. CHANA RICH: Today’s patient is a 24-year-old man who presented to the Emergency Department (ED) with a cough and hemoptysis. The patient was freediving (breath-hold diving) in order to spearfish and had submerged to 50 feet while using an 11-pound belt. The patient ascended without expiration and developed chest pain. Upon surfacing, he coughed up approximately 5 tablespoons of bright red blood. After a brief rest on the boat, he dived to a depth of 30 feet in order to catch a large striped barracuda. Upon surfacing the second time, the patient had pleuritic chest pain and mild shortness of breath.

Due to his symptoms, the patient presented to the ED. He did not complain of headache, visual changes, ear pain, nausea, joint or muscle pain, and he had no additional episodes of hemoptysis. Vital signs revealed BP 127/68 mm Hg, heart rate 53, respiratory rate 16, and the patient had an oxygen saturation of 98% on room air. On exam, he was comfortable and non-toxic appearing and was in no distress. His lungs were clear to auscultation bilaterally; his cardiac exam revealed a normal s1s2 and he had a regular rate and rhythm with no murmurs. There was no crepitus. The remainder of his physical exam was unremarkable.

DR. WILLIAM BINDER: Free-dive spearfishing at 50 feet must cause significant pressure changes as our bodies are subject to almost 3 atmospheres of pressure. What disorders occur at increased atmospheric pressure?

DR. RICH: Spearfishing and other underwater activities may be done while freediving, snorkeling, or scuba diving. Our patient and his friends were freediving, or breath-hold diving. Unlike scuba diving, breath-hold divers do not use supplemental air underwater. Divers face a unique set of underwater hazards in addition to the general aquatic problems such as drowning, hypothermia, water-borne infectious diseases, and interactions with hazardous marine life. When diving deep, free divers are exposed to increased pressure, causing a spectrum of injuries to the body.

Pressure contributes either directly or indirectly to the majority of serious diving-related medical problems. As a diver descends underwater, absolute pressure increases much faster than in air. The pressure change with increasing depth is linear, although the greatest relative change in pressure occurs nearest the surface, where it doubles in the first 33 feet of sea water from 1 to 2 atmospheres of pressure. The body behaves as a liquid and follows Pascal’s law; pressure applied to any part of a fluid is transmitted equally throughout the fluid. When a diver submerges, the force of the tremendous weight of the water above is exerted over the entire body. The body is relatively unaware of this change in pressure.

While this is true of the body, the spaces within the body containing gas [air], including the lungs, sinuses, intestines, and middle ear, follow a different law. The gases in these spaces obey Boyle’s law; the pressure of a given quantity of gas at constant temperature varies inversely with its volume. Therefore, as one dives deeper, the volume of air in the middle ear, sinuses, lungs, and gastrointestinal tract is reduced, but upon ascent, the volume expands. Inability to maintain gas pressure in these body spaces equal to the surrounding water pressure leads to barotrauma.

Barotrauma can potentially involve any area with entrapment of gas in a closed space. In addition to sinuses, lungs and the GI tract, barotrauma can occur in the external auditory canal, in the teeth, the portion of the face under a face mask, and skin trapped under a wrinkle in a dry suit. The tissue damage resulting from such pressure imbalance is commonly referred to as a “squeeze.”

Illustration 1. Pascal’s Law: pressure applied to any part of a fluid is transmitted equally throughout the fluid.
Source: https://upload.wikimedia.org/wikipedia/commons/thumb/2/27/Pascals-law.svg/2000px-Pascals-law.svg.png
DR. ELIZABETH SUTTON: How does this account for the patient’s hemoptysis?

DR. RICH: There are two possibilities accounting for the patient’s chest pain and hemoptysis. Pressure-related injury to the lung can occur on descent, or as a diver ascends to the surface. If one were able to completely exhale, the absolute minimum lung volume remaining is called the residual volume (RV). Lung squeeze occurs when the diver descends to a depth at which the total lung volume is reduced to less than the residual volume. The increased pressure on the pulmonary vascular bed can damage the integrity of the pulmonary capillaries. At this point, transpulmonic pressure exceeds intraalveolar pressure, leading to transudation of fluid or blood from ruptured pulmonary capillaries. [1] Patients can exhibit signs of pulmonary edema and hypoxemia. This is the reason that many free divers cough up blood after a deep dive, although there are a number of case reports of lung squeeze with repetitive shallow dives with brief surface intervals. [2]

Despite this presumed mechanism of barotrauma of descent, free divers are able to dive to depths beyond those that should cause mechanical damage to the lungs. Other physiologic mechanisms must play a role, although the exact pathophysiology of this condition remains unclear. When diving deep, the chest cavity itself gets smaller and there is central pooling of blood in the chest from the surrounding tissues. The central pooling of blood in the chest equalizes the pressure gradient when the RV is reached and thereby decreases the effective RV. These mechanisms allow the lungs to be compressed down to about 5% of total lung capacity in highly trained breath-hold champions. [3] An individual’s anatomy, physiologic reserves, underlying pathology and the conditions of the day all play a role in the development of pulmonary barotrauma. [3]

Alternatively, and perhaps more likely, the patient suffered alveolar injury upon ascending. As a diver ascends, the pressure within the alveoli of the lung increases as the pressure around the diver decreases. If intrapulmonary gas is trapped behind a closed glottis, as the diver ascends and the surrounding pressure decreases, the volume of the intrapulmonary gas increases in accordance with Boyle’s law. Increased pressure within the lung causes an increase in trans-alveolar pressure leading to overexpansion injury, alveolar rupture, and intraparenchymal hemorrhage. [4] A situation of rapid ascent to the surface, such as if a diver runs out of air, panics, or drops his weights, is often the cause of pulmonary barotrauma of ascent. Divers who hold a breath as they ascend and those with obstructive airway diseases, such as asthma or chronic obstructive pulmonary disease, are at increased risk. This was likely the case with our patient – he did not exhale and relieve the building pressure as he ascended, causing his pulmonary barotrauma.

DR. KRISTINA MCATEER: What were your next diagnostic steps for this patient?

DR. RICH: Laboratory studies were normal and an ECG revealed sinus tachycardia without signs of ischemia or right heart strain (no ST depression or T-wave inversions in V1-V4). The chest X-ray [Figure 1] reveals bilateral, patchy, airspace disease.

DR. JAMES RAYNOR: Did the patient require positive airway pressure or other airway management?
**DR. RICH:** The patient was placed on supplemental oxygen and was admitted to the ICU for observation and supportive care. A CT scan ([Figure 2](#)) was performed in order to evaluate for any underlying pulmonary parenchymal disorders and a repeat chest X-ray was obtained the following morning which demonstrated no appreciable change.

**Figure 1.** Chest X-ray reveals bilateral, patchy, airspace disease.

**Figure 2.** Single image from chest CT scan showing bilateral patchy airspace disease.

**DR. OTIS WARREN:** It appears that this patient did quite well. However, did he risk other consequences from his pulmonary barotrauma?

**DR. RICH:** Yes, this patient was quite fortunate. The intrapulmonary pressure can become so elevated that air is forced across the pulmonary capillary membrane. Pulmonary interstitial air can dissect along bronchi to the mediastinum causing pneumomediastinum. Air from the mediastinum can track down the esophagus and great vessels causing retroperitoneal emphysema or pneumoperitoneum. [5] Mediastinal air can track superiorly to the neck, resulting in subcutaneous emphysema. Rarely, air may reach the visceral pleura, causing a pneumothorax.

One of the more concerning consequences of pulmonary barotrauma is due to an air embolism. If air enters the pulmonary vasculature, it can travel to the heart and embolize to other parts of the body. While a frequent cause of air embolism is iatrogenic secondary to interventional procedures, many other causes, including blunt and penetrating trauma, childbirth, and diving can lead to an air embolism. Clinical manifestations and severity of illness can range from asymptomatic to sudden onset circulatory collapse and are dependent upon the amount of air as well as the location of the air bubble. [6]

In our patient, due to his chest pain and hemoptysis suggesting alveolar injury, air embolism was a primary concern. Venous air embolism is less likely to cause severe symptoms. However an arterial gas embolism (AGE) can be devastating. Approximately 4% of divers who suffer an arterial gas embolism die immediately from total occlusion of the central vascular bed. [7,8] Furthermore, AGE patients who survive and present to the hospital frequently suffer neurologic deficits. Air entering the pulmonary vasculature can result in a cerebral air embolism (CAE) which can cause seizures, stroke, and death. [9]

**DR. VICTORIA LEYTIN:** What treatments are available for patients suffering from an air embolism?

**DR. RICH:** All cases of AGE must be considered for hyperbaric oxygen treatment as rapidly as possible. Treatment is required even if manifestations resolve prior to reaching an ED in order to prevent progression of subtle neurologic deficits that are not immediately detected. [10] Our patient showed no signs of right heart strain and had no neurologic deficits. He remained hemodynamically stable and had no respiratory distress. He was discharged on hospital day 2. The patient had no shortness of breath and was at his baseline after 2 weeks, and a follow up X-ray at that time revealed complete resolution of the bilateral infiltrates.
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Learning from the Outside In: Incorporating Wilderness Medicine into Traditional Emergency Medicine Education

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KEYWORDS: Wilderness Medicine [WM], outdoor education, resident education, wellness, emergency medicine

INTRODUCTION

Experiential education is a well-established method of learning, in which learners are purposefully engaged in direct experiences and focused reflection to promote the development of meaningful knowledge, skills and values essential to their jobs and place in the community. The link between experience and education was formally introduced and written about by John Dewey in the early 20th century, but one of the most well-known leaders in this field was Kurt Hahn, the founder of Outward Bound. Even into the present day, Outward Bound programs revolve around wilderness activities, such as hiking, mountaineering, and paddle sports, among many others. Hahn used the principles of experiential education as the cornerstone of these experiences, hoping the endeavors would build leadership among its participants, develop them as a whole person, and create citizens who could make right, just, and independent decisions.

Wilderness and austere medicine (WM) is the discipline of medicine characterized by the provision or improvisation of patient care in the remote setting, or when resources and manpower are limited. This encompasses not just the provision of care at altitude or in the backcountry, but travel and expedition medicine, dive medicine, military medicine and EMS/search and rescue. WM has developed over the last few decades into an academic specialty in its own right with societies, conferences, research base and journal, textbooks, certifications and fellowship training. WM is a recognized sub-specialty of emergency medicine with 15 fellowships as of 2017.

While often associated with emergency medicine, the principles of WM are multi-disciplinary and come from the fields not only of emergency medicine but surgery, toxicology, sports medicine, military and travel medicine, to name a few. Practitioners of WM come from all medical backgrounds and practice in a variety of settings, limited not just to backcountry travel but international travel, disaster and relief work, cruise ship medicine and EMS. WM education focuses on the gaps in traditional medical curriculum and relies heavily on out-of-classroom coursework and experiential education.

Experiential learning has formed the foundation of most WM courses [e.g. Wilderness First Responder, Advanced Wilderness Life Support, etc.] through the use of standardized patients, simulation dummies, and moulage. Such methods are essential because WM typically involves small numbers of patients and rarely encountered scenarios. Whereas traditional medical education provides ample opportunity to manage conditions like heart failure and asthma in the hospital, there are
very few, if any, opportunities to manage patients with wilderness-specific conditions such as envenomations, or to treat patients in an austere environment. WM also encompasses many sub-disciplines of emergency medicine, including toxicology, disaster medicine, and EMS/pre-hospital care, which often involve scenarios not usually encountered during typical emergency medicine training. Most providers are not involved in the medical decision making or practical aspects of patient evacuation, especially the lengthy and arduous transports needed for remote patients.

Over the past two decades, the Medical Wilderness Adventure Race (MedWAR) has become an increasingly popular way for medical providers to expand their knowledge base and put their wilderness/austere medicine knowledge and skills to the test. Since the early 2000s, these races have brought the simulated scenarios of WM courses into the context of a competition. Race participants engage in various outdoor activities, such as orienteering, paddling, and biking, while being intermittently challenged with a variety of WM situations that encompass the entire breadth of wilderness practice. With its inception, there was also the hope that the MedWAR races would lead to interagency alliances, including search and rescue (SAR) teams, park rangers, outdoor activity guides, and WM education organizations.

A two-year retrospective in 2003 noted that participants felt these races provided not only a boost in medical confidence, but also engendered teamwork and effective communication. Interestingly, while a number of racers felt that they had somewhat increased their knowledge base, they felt strongly that the experience itself was more important for their growth as medical professionals. Other lessons learned included difficulties with the written portions of the race and comments on the physical activities as being either too difficult or easy, and the medical challenges too complex or simple (even within the same race). In short, these races offer unique opportunities for providers to practice in a pressured, time-sensitive situation, acquire new skills, and develop relationships that are essential to providing timely, high-quality care.

THE BROWN WILDERNESS MEDICINE COMPETITION

The Warren Alpert Medical School of Brown University has a four-year emergency medicine residency. All accredited residency programs have an Accreditation Council for Graduate Medical Education (ACGME) mandate for resident education, which is met predominantly through weekly conferences and didactic education, although there is significant variation among different programs. In an effort to promote resident education and engagement, one conference day per month is spent in the simulation center. This offers residents a chance to develop life-saving skills in an appropriately controlled setting, often with rarely encountered conditions and scenarios. In 2017, a group of residents at Brown developed an off-campus wilderness medicine event adapted from the MedWAR model, to replace a monthly simulation day.

This race was established with five main goals:
1) Increase learner engagement through experiential learning.
2) Exposure to the basic tenets of wilderness medicine.
3) Development of relationships across multiple learning levels, including medical students, residents, and attending physicians.
4) Deepen relationships between our program and local EMS and SAR resources.
5) To promote resident wellness through engagement in wilderness activities.

HOW THE RACE WORKS

For both 2017 and 2018, the competition has been held at Lincoln Woods State Park (LWSP) in Lincoln, RI. LWSP was chosen for its close proximity to the main residency teaching site and many options for outdoor activities, including hiking/running, rock climbing, paddle sports and mountain biking – perfect for the physical variety that is key to these wilderness medicine races. Residents, mid-level providers and medical students are split into teams of four and given a
very basic map of the park with the general location of 10–12 “stations,” multiple choice questions and a variety of physical challenges. They must decide as a team how to find and complete as many stations and questions as possible within the allotted time.

Teams are required to plan and prepare a pre-packed med kit, which must include all equipment, supplies, and medications (pre-labeled syringes/bottles) they anticipate requiring to complete the stations as well as to care for real-world minor injuries. Following the competition, a debrief cookout allowed participants and facilitators to reflect on the experience, lessons learned and discuss the details of the scenarios. Small prizes were awarded to the top three teams.

The core of the event is the stations, each of which presents participants with a hands-on austere-medicine scenario. These stations are created and run by attending emergency medicine physicians and local EMS personnel, often with the assistance of medical student volunteers. Examples of scenarios from this past year included a drowning requiring water rescue, a penetrating eye injury while skiing, a fall on steep terrain actually requiring low-angle rescue by a high-angle tech rescue team, and a crush injury requiring extrication and management of a threatened limb. These stations are designed to have five critical actions, each of which must be completed to get full marks, one point for each critical action. For example, the drowning requiring water rescue station required:

1) Evaluate for the scene safety: Is it OK to enter water and rescue victim?
2) Improvised spinal immobilization
3) Control bleeding from leg injury w/ improvised tourniquet
4) Splint fracture
5) Treat for hypothermia

Additional points were awarded to the teams that completed their stations the fastest.

For the written portion of the competition, multiple choice questions on a variety of wilderness/austere medicine topics were placed along the course. Many questions utilized visual stimuli. Example questions included picture ID of poisonous plants and physical exam findings and wilderness survival knowledge.

INTEGRATION OF LEARNING AND WELLNESS

Overall, the goals set forth by organizers were accomplished; learners were engaged in the outdoor classroom and exposed to a variety of austere scenarios including search and rescue and tactical medicine. There was a great deal of engagement and camaraderie between EMS and physicians/learners and wellness was promoted in the pursuit of outdoor recreation and physical activity, teambuilding and friendly competition.

A cornerstone of the Brown Wilderness Medicine Race is integration of senior and junior providers/students within teams and scenarios, as well as with EMS personnel and EM faculty in unexpected and unfamiliar scenarios. Whereas typical simulation days are held indoors in a controlled environment, this race enabled cross-functional interaction during stressful medical scenarios. For example, during the low-angle rescue scenario mentioned above, patient was in a simulated ravine, unable to be initially assessed by the physicians. Personnel from the Fire Department taught and assisted residents with harness and safety gear, and provided a safe way for them to reach the patient and begin evaluation. The residents had to begin the scenario with remote patient evaluation as they awaited safe transport to the patient. During the debrief, participants had the opportunity to ask questions about the intricacies of technical rope rescue, Fire Department experience with such rescues and discuss how knowledge about the extrication could improve hospital care. The Fire Department also learned from the providers and were given hands-on instruction on patient care and assessment during the scenario. Both parties reported a great deal of benefit from working together and learning a different perspective on the scenario. EMS work and rotations notwithstanding, there are few times during training where residents may have access to such insight.

Another benefit of the model was the interaction between
learners and faculty, which were both EM attendings and senior EMS providers. The MedWARs event facilitated both casual interaction and more camaraderie than is usually found in the hospital setting. Additionally, EMS providers and physicians readily interacted and learned from each other during the training event, which is uncommon in traditional residency training and was described in feedback to be mutually beneficial.

From a health and wellness standpoint, the Brown Wilderness Medicine Race allowed all involved to break out of their usual routines, the demands of which often lead to stress. Burnout is prevalent among residents, and is particularly high among emergency physicians. In a prospective study, 45% of 2nd year residents report some symptoms of burnout, and 65% of attending emergency physicians reported symptoms of burnout, often associated with unhealthy coping behaviors such as overeating, alcohol, and drug use.7,8

Outdoor activities often provide an important outlet for health care providers, who often pursue adventurous endeavors outside of the hospital. Regular outdoor activity – even just walking – has shown a variety of health benefits, including weight management, blood pressure control, and lowering the risk of vascular catastrophes, such as myocardial infarction and stroke.9 Increasingly, interventions are sought by health care organizations and residency programs to promote wellness and reduce burnout and stress.10,11 The MedWAR race enabled attending physicians and residents to engage in, and share, their knowledge regarding activities they found personally and professionally rewarding. Simultaneously, the race contributed to the participant’s work-life balance, an essential component of a long and healthy career in medicine. Gawande has reported on the deleterious effect of computers impact on the physician’s work day; experiential learning may be an antidote to physician burnout and stress.12

LESSONS LEARNED
The response to the first Brown Wilderness Medicine Race in 2017 was very positive. Participants greatly valued the realism of the faculty-developed scenarios and enjoyed learning outside of the confines of weekly conference and the simulation center. As with the MedWAR races, there was also a general feeling that the experience itself was as important as the educational aspect of the day. The race also did a great job of fostering provider bonding and camaraderie.

In 2018, the race was run in a similar manner, with some changes based on first-year course feedback. Improvements included assignment of a starting station expanding the course to different areas of the park. In the 2018 race, local EMS agencies created and ran stations and incorporated technical rescue components run by the Fire Department to foster additional exposure to the unique pre-hospital environment. The physical aspects of the race were extended by increasing the distance between some stations. Feedback regarding the physical activity part of the race was mixed, some groups were very tired by the end, whereas others wanted even more of a physical challenge.

The addition of technical rescue also had some unintended consequences including longer wait times for scenarios and more down time for both teams and faculty. Participant teams were found to cluster around the technical stations, both because they took longer to complete and because teams were very keen on completing those stations. While it was not expected that all teams complete all stations, this did result in inequity felt amongst faculty at less popular stations. Setting clear expectations for faculty including expected down time proved very important to keeping faculty both engaged and feeling appreciated for time spent.

CONCLUSIONS
With the overwhelmingly positive response from these first two years, the Brown Wilderness Medicine Race has become a permanent yearly fixture in the educational curriculum. Regarding race specifics and logistics, we fully expect this to vary year-by-year, not only because race leadership will turn over, but also because feedback will continue to vary. A key difference between this race and the MedWAR races is that all residents who would normally attend weekly conference are expected at this event. Whereas MedWAR self-selects participants who have a specific interest in wilderness medicine and physical activity, these might not be important to the participants in the Brown Wilderness Medicine Race. Based upon all of these variables, it will be difficult to develop an experience that caters to all tastes, but perhaps the most important aspect of the race is that it develops teamwork and communication skills necessary during all medical scenarios.
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Climate Change: A Review of a Public Health Opportunity for the Northeast

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KEYWORDS: climate change, public health, heat illness, global warming

INTRODUCTION
The connection between climate change and health has been called the greatest public health threat of our time.1 The Northeast (NE) is especially vulnerable. Average temperatures in the NE are expected to rise >3.6°F (2°C) higher than in the pre-industrial era and far more quickly than in the other contiguous states in North America. The region faces higher sea level rise and worse flooding than other regions of the United States (U.S.) with negative human health and economic impacts in the region. At present, the key mitigating mechanisms to ameliorate the health effects of climate change is through decreasing greenhouse gas (GHG) emissions and developing evidence-based adaptation interventions.

STATE OF CLIMATE CHANGE IN 2018
The consensus among 97% of climate scientists is that climate change is occurring and is human caused.2 Most contrarian research has significant methodological flaws.3 The planet is already 1.8°F (1°C) warmer than the pre-industrial baseline. Meanwhile, 2018 is on track to be the fourth hottest year on record, surpassed only by the preceding three years. The warmest 20 years have occurred in the past 22 years.4
Climate change leads to the following exposure pathways, among others: extreme heat, rising sea levels, extremes of precipitation, and more extreme weather (Figure 1).5-7 The U.S. had 16 billion-dollar weather and climate disasters in 2017 with an estimated total of $313 billion dollars in damages.5 Worldwide, a number of catastrophic extreme weather events are related to climate change.6
During the 2016 Paris Agreement, 194 countries joined together to declare action on climate change. This body reconvened in December 2018 at the 24th Conference of the Parties (COP24) to outline the specifics of implementing the reduction of GHGs. While a consensus was reached, the current committed action will not be sufficient to reduce global GHG emissions to a level that will keep the planet below the necessary 2.7°F (1.5°C) as outlined by a special report in October 2018.9 This report by the Intergovernmental Panel on Climate Change (IPCC) gave an urgent call that global GHG emissions must be cut in half by 2030 to attempt the goal of 2.7°F (1.5°C). We are currently on track for 5.4°F (3°C).
Climate change leads to a broad range of negative health impacts (Figure 1).12 Recent emerging health concerns, such as an association between increased heat and microbial...
resistance to antibiotics, reveal that our understanding of these health risks is still in its infancy.\textsuperscript{9} Importantly, climate change disproportionately harms the health of the most vulnerable, including children, the elderly, and those with chronic medical conditions, as well as people of lower socioeconomic classes. Recent reports from key agencies, such as the \textit{Lancet} Countdown, World Health Organization (WHO), and U.S. Global Change Research Program (USGCRP), outlined these health impacts globally and for the U.S.\textsuperscript{5,7,14}

The \textit{Lancet} Countdown is an interdisciplinary research consortium tracking the impact of climate change on health in 41 indicators over five domains.\textsuperscript{6} It also stresses the potential for cascading disruptions to public health infrastructure that may overwhelm existing health services. The WHO report highlights that air pollution from the burning of fossil fuels leads to seven million deaths annually, suggesting that climate change is a public health emergency.\textsuperscript{11} World-wide, the U.S. has the second highest carbon emission from the burning of fossil fuel, creating disproportionate health impacts in developing countries.\textsuperscript{3,14,15}

Two recent reports stress that the health impacts of climate change are not only occurring in distant lands, but also in the U.S. The companion 2018 \textit{Lancet} Countdown Brief for the U.S. highlights that Americans have increased exposure to more frequent and longer heat waves, increasing extreme weather, and worsening climate-sensitive vector-borne diseases.\textsuperscript{5} In addition, the USGCRP’s second volume of the National Climate Assessment, released in November 2018, also outlines that the health of every American is at risk and emphasizes the unique geographic vulnerabilities.\textsuperscript{7}

\section*{THE NORTHEAST: UNIQUE CLIMATE CHANGE AND HEALTH CHALLENGES}

\subsection*{Extreme Heat}

The NE is predicted to have the largest temperature increase for the contiguous U.S. – nearly 3.6°F (2°C) warmer by 2035 and over 5°F (2.8°C) by 2050 compared to present day averages.\textsuperscript{7} This temperature rise will be nearly 20 years ahead of the predicted global rise to 3.6°F (2°C).\textsuperscript{14} Therefore, benefit from understanding regional consequences of limiting the global mean temperature increase to well below 2°C above pre-industrial levels, a limit agreed upon at the United Nations Climate Summit in Paris in December 2015. Here, we analyze climate model simulations from the Coupled Model Intercomparison Project Phase 5 (CMIP5 Annual temperatures in New England have already increased by about 3°F (1.7°C) since the beginning of the 20th century.\textsuperscript{7} The seasons in the NE are also becoming less distinct as the winter months are warming three times faster than summers, while the health risks for heat appear to be most significant at the start of the summer. In addition, those residing in cities are especially at risk due to the phenomenon of urban heat islands – areas of increased temperatures in urban areas in comparison to outlying suburban, exurban and rural locations.

The connection between extreme heat and health is well established, as elevated temperatures can lead to heat stroke, cardiovascular, renal, and respiratory disease, worsening mental health issues, and adverse birth outcomes.\textsuperscript{5,7,12} One study of Rhode Island (RI) found increased morbidity, mortality, and emergency department (ED) utilization with increased temperatures.\textsuperscript{17} The increase in ED visits occurs rather abruptly when maximum ambient temperature is > 80°F. Between 2005–2012, all cause ED visits increased by 1.3% with the strongest association at the extremes of age. Heat-related ED visits increased by 23.9% when the daily maximum temperatures increased by 10°F (from 75°F to 85°F), while all cause mortality increased by 4%. It is predicted that the NE will experience 650 excess deaths annually by 2050 and then upsurges from approximately 960 in a moderate climate model to 2,300 excess deaths in the extreme model per year by 2090 from heat.\textsuperscript{7}

\subsection*{Ocean Warming}

The ocean is warming three times faster along the Northeast Continental Shelf compared to the global rate, with the Gulf of Maine increasing 99% more than the global average the last decade.\textsuperscript{7} In 2012, the NE experienced the most intense warming event as the ocean rose to 3.6°F (2°C) above average. As ocean temperatures increase, conditions for harmful algae blooms are growing more favorable and have been increasing in both frequency and duration in the Gulf of Maine.\textsuperscript{7} Conditions for \textit{Vibrio} are also more favorable and have expanded to the north. Both of these potentially leave more Americans exposed to toxins and bacteria through direct contact or ingestion of contaminated seafood.\textsuperscript{5,7}

\subsection*{Sea Level Rise and Extreme Weather}

Ocean levels are not rising equally due to a variety of factors, and the NE has experienced some of the highest rates of sea level rise.\textsuperscript{7} It is predicted that by the end of the century, sea levels could rise to more than 11 feet on average in this region. As sea levels rise, high tide flooding has increased by 100–200% in some areas with more nuisance flooding. Over the past 20 years, the NE has also experienced some of the largest increases in precipitation during the spring and fall seasons.\textsuperscript{16} Increased precipitation and flooding risks, coupled with more frequent power outages, create ideal mold conditions, which has implications for respiratory conditions.\textsuperscript{7}

The NE experiences nearly year-round storms from Nor’easters, occurring September to April, and from Atlantic hurricanes, occurring June to September.\textsuperscript{7} This is especially concerning as Atlantic hurricanes are of higher intensity and produce increased precipitation.\textsuperscript{17} Extreme weather can result in healthcare issues related to direct trauma and disruptions in the healthcare system.\textsuperscript{11} For instance, due to the aging infrastructure of NE urban centers, the region is
increasingly vulnerable to flood dynamics. It is predicted that climate-related hazards may cause upward of $11–17 billion dollars per year of damage.7 Many northeast cities – Boston, New York, Philadelphia, Portland, Providence, and others – have begun to plan for climate change as they seek to upgrade aging infrastructure, including water systems. Many NE cities have combined sewer systems, which can lead to drinking water contamination and subsequent gastrointestinal illness during flood events. Massachusetts has seen an increase in gastrointestinal illness related to heavy rains and runoff and Maryland has noted increased cases of Campylobacter and Salmonella during heavy precipitation.19, 20 These vulnerabilities reinforce that healthcare systems must be prepared for contingencies and remain resilient during extreme weather.

**Air Degradation**

Air quality has improved in the NE over recent decades, yet climate change threatens to unravel this achievement. For example, as the NE experiences higher temperatures, it will worsen ground-level ozone concentrations and lead to hundreds of excess deaths by 2050 from the baseline estimate in 2000.7 While the NE is immune to wildfires, climate change is intensifying wildfires in the western U.S. and Canada, and smoke can travel thousands of miles. Worsening air quality in the NE from increased smoke particulate matter, worsening pollen levels due to higher CO2 levels, and increased ozone all pose significant health risks, especially for those with underlying lung pathology.

**Climate-sensitive Vector Borne Diseases**

As the conditions for vectors, especially arthropods, are altered by climate change, the risk of transmission to humans is heightened. The ticks and mosquitoes known to transmit two key climate-sensitive vector-borne diseases in the NE, Lyme disease and West Nile virus, are expected to continue moving further north.7 By 2065–2080, the transmission of Lyme in the NE could start nearly three weeks earlier in Maine and Pennsylvania (compared to baseline 1992–2007). Cases of neuro-invasive West Nile may increase by 210 to 490 cases per year.

**OPPORTUNITIES TO MINIMIZE MORBIDITY AND MORTALITY IN THE NORTHEAST**

**Mitigation**

The reduction of GHG emissions, notably through converting from fossil fuels to renewable energy sources like wind and solar, can positively impact healthcare by reducing air pollution and minimizing climate change. In a best-case scenario, mitigation can result in a moderate climate change model and could save $21 billion and prevent nearly 1,400 premature deaths annually from heat alone. Given the current lack of federal commitment to this issue, action will likely reside on local and state levels. However, the current local and state commitments are only meeting half of the U.S. Paris Agreement commitments.5 While states in the NE are reducing the carbon intensity of the energy system [Figures 2 and 3][21], urgent and aggressive action is needed in order to maintain global temperature rise below 2.7°F (1.5°C).[9]

The health sector can assume leadership in the field by modeling the behavior needed to reduce morbidity and mortality. Healthcare systems can honor U.S. Paris Agreement commitments and reduce GHG emissions by reducing...
fossil fuel use. A physician messenger transmitting the key message that climate change is first and foremost a public health issue has been found to increase the engagement of the public and depoliticize it.10

Adaptation
Adaptation interventions can help minimize the harm climate change is causing to health. Philadelphia and New York City have implemented policies and alterations in its infrastructure, including opening cooling centers, protecting utility services from overload, and planting over one million trees to develop an urban canopy – that will reduce mortality from heat.22 In addition, health systems must focus on climate resiliency to ensure that these systems can face the numerous challenges of climate change as it threatens to disrupt efficiency, infrastructure, supply chains, and function.

CONCLUSION
Climate change is the greatest public health opportunity of this generation. Advocating for renewable energy and research into evidence-based adaptation interventions is in line with the Hippocratic oath. There is nothing political about protecting the health of patients.

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ABSTRACT
The incidence rate of childhood cancer is increasing in the United States. We sought to describe the epidemiology of childhood cancer in the state of Rhode Island. Data from the Rhode Island Cancer Registry was reviewed to assess incidence and trends in childhood cancer for individuals age 0–19 years from 1995–2015. Cancer mortality was based on deaths with cause of deaths associated with malignant cancers filed with the Rhode Island Vital Records and CDC National Center for Health Statistics. We found that pediatric cancer is increasing in Rhode Island. Between 1995–2015, there were 1,090 new diagnoses of childhood cancer. Leukemia, tumors of the central nervous system, and lymphomas are the most common types of cancer in children in the state. Additionally, the overall mortality rate from childhood cancer is decreasing. In conclusion, the childhood cancer trends in Rhode Island are consistent with the national data.

KEYWORDS: childhood cancer, pediatrics, malignancy, incidence, mortality

INTRODUCTION
Each year approximately 15,000 children are diagnosed with cancer in the United States, thus it compromises 1% of all cancer diagnoses in the United States. Pediatric cancer is a composed of a heterogenous group of diseases in which each subtype has a unique behavior and biology. This necessitates specific guidelines and recommendations for diagnosing, staging, and treating individuals with pediatric cancer.

Pediatric cancer is the leading disease-related cause of death for children in the United States. It is estimated that 1,800 children die each year.1 However, over the past fifty years, development of innovative treatments has led to improvements in childhood mortality from malignancy. In the 1970s, only half of all children diagnosed with a pediatric cancer would survive five years from the time of diagnosis. In the current era of treatment, it is estimated that over 80% will be survivors at five years. There is a growing population of pediatric cancer survivors entering adulthood with morbidities directly related to the treatment received decades prior.

RESULTS
Between 1995–2015, there were 1,090 new diagnoses of childhood cancer in the state of Rhode Island.

During this time, there was a significant increase of 1.1% in pediatric cancer incidence annually (Figure 1). From 1995–2014, there was an increase of 0.8% on average in all childhood cancers nationally. The Rhode Island data aligns with the national trends.

The annual percentage change indicates an upward trend for all age groups. For those age 0–14, this is not statistically significant. However, the increase in childhood cancer in individuals age 15–19 years reaches statistical significance (Figure 2).

Leukemia represents 24% of all childhood cancers, the majority of which are acute lymphoblastic lymphomas.
The second most common pediatric cancer diagnoses are tumors of the central nervous system, which represent 19% of all childhood cancer. Brain tumors are the most common central nervous tumors, followed by spinal tumors. Lymphomas, which represent 13% of all cancers, include Hodgkin and non-Hodgkin lymphomas with Hodgkin lymphomas being more common. The less common pediatric cancer diagnoses include malignant epithelial tumors, melanomas, germ cell tumors, bone tumors, hepatic tumors, renal tumors, retinoblastoma, and others that cannot be classified (Figure 3).

There is a relationship between cancer subtype and age. Leukemias tend to decrease with age, whereas lymphomas increase with age. These trends are noted in both males and females. Neuroblastoma, kidney tumors, and retinoblastoma are nearly exclusive to younger children. Alternatively, bone tumors are most common in children age 5–9 years. Lymphomas, malignant epithelial tumors, and germ cell tumors frequently occur in older children (Figure 3).

Males and females develop childhood cancer at similar rates. The most common cancers in both males and females are leukemias, central nervous tumors, and lymphomas. Leukemias are more commonly diagnosed in males than females; females have a higher incidence of malignant epithelial neoplasms and melanomas. (Figure 4).


**DISCUSSION**

The trends of childhood cancer in the state of Rhode Island are similar to the national trends regarding cancer-specific incidence rate and the demographic characteristics associated with cancer subtypes. Leukemia, central nervous system tumors, and lymphomas are the most common pediatric cancers in both males and females. Neuroblastoma, kidney tumors, and retinoblastoma are nearly exclusive to younger children. Alternatively, bone tumors are most common in children age 5–9 years. Lymphomas, malignant epithelial tumors, and germ cell tumors frequently occur in older children (Figure 3).
Figure 3. Incidence of Childhood Cancers in Rhode Island by Cancer Type (ICCC) and Age, 1995–2015

Figure 4. Incidence of Childhood Cancer (ICCC) and Sex, 1995–2015
system tumors, and lymphomas are the three most common cancers of childhood within the state and nationally. The progress towards improved overall survival and decrease in cancer-related mortality in children is appreciated as well.

Unlike many adult malignancies for which lifestyle and environmental risk factors have been well-elicited, further investigation is needed to understand environmental risk in childhood. The carcinogenic effects of ionizing radiation and chemotherapy in childhood are well-described.\(^2\) The influence of parental occupations, pesticides, volatile organic compounds, nitrites, and exposure to roadway traffic reveal an association to pediatric cancer.\(^3,4\) However, findings in other studies do not reveal an association.

A small number of childhood cancers have known genetic causes. Syndromes predisposed to developing a childhood malignancy include, but are not limited to, Down syndrome, neurofibromatosis, Beckwith-Weidemann syndrome, ataxia-telangiectasia. Guidelines exist for treatment and counseling patients with such genetic conditions. However, for the majority of pediatric cancers, there are not identifiable risk factors. Consequently, there are no developed recommendations for screening children for this rare group of diseases.

Although the causes of most childhood cancers are unknown, the treatment of pediatric cancer has significantly improved over the past five decades. For example, acute lymphoblastic leukemia is no longer regarded as an incurable; today’s anticipated overall survival approaches 90%.\(^5\)

As incidence of childhood cancer is increasing and the overall mortality is decreasing, there is a continually growing population of childhood cancer survivors. They face unique challenges as they enter adulthood such as heart disease, infertility, and secondary malignancies. Transition of care from a pediatric to adult care is particularly challenging for the adolescent and young adult population. Many report no mechanism for transition of care from pediatric to adult-focused providers.\(^6\) In addition to access to care, many survivors enter adulthood with co-morbid conditions related to their treatment. Surveillance and monitoring of the late effects in this group of patients required comprehensive longitudinal care.

### Table 1. Childhood Mortality Rate in Rhode Island and the United States (1995–2014)

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<th>Year</th>
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<th>U.S.</th>
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Increasing Syphilis in Rhode Island: Return of an Old Foe

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ABSTRACT
The number of people diagnosed with syphilis has increased significantly in the United States over the last decade. In Rhode Island, the number of new diagnoses has increased more than four-fold since 2008. Syphilis disproportionately impacts gay, bisexual, and other men who have sex with men (MSM), with those from African American and Hispanic/Latino communities most affected. Given these trends, physicians need to be aware of current prevention, diagnosis, and treatment practices for syphilis, especially when working with populations who are most at risk.

KEYWORDS: syphilis, prevention, screening, MSM, Rhode Island

INTRODUCTION
Syphilis is a sexually transmitted disease (STD) caused by the bacterium Treponema pallidum. Transmission typically occurs through direct contact with a syphilis chancre during condomless vaginal, anal, or oral sex, and complications of the disease may appear in untreated patients. Syphilis is highly sensitive to penicillin and successful treatment largely results in cure. At the beginning of the twenty-first century, the number of reported syphilis cases reached a historic low in the United States (US). However, the number of reported syphilis cases in 2017 rose to 30,644. Increasing numbers of congenital infections are also being reported (from 334 in 2012 to 918 cases in 2017). Men, and especially MSM, accounted for almost 90% of all cases of reported syphilis in 2017 (Figure 1). A large number of new syphilis diagnoses also occur among people living with HIV (PLWH); 45.5% of MSM with P&S syphilis in 2017 were HIV positive. Racial and ethnic minority populations are also disproportionately affected by syphilis in the US. African American, Native Hawaiian and other Pacific Islander, and Hispanic/Latino populations.

EPIDEMIOLOGY OF SYPHILIS
In the US, a total of 6,103 primary and secondary (P&S) syphilis cases were reported in 2001, the lowest number of cases ever. However, the number of reported P&S syphilis cases in 2017 rose to 30,644. Increasing numbers of congenital infections are also being reported (from 334 in 2012 to 918 cases in 2017). Men, and especially MSM, accounted for almost 90% of all cases of reported syphilis in 2017 (Figure 1). A large number of new syphilis diagnoses also occur among people living with HIV (PLWH); 45.5% of MSM with P&S syphilis in 2017 were HIV positive. Racial and ethnic minority populations are also disproportionately affected by syphilis in the US. African American, Native Hawaiian and other Pacific Islander, and Hispanic/Latino populations.

Figure 1. Rates of reported primary and secondary syphilis cases in the US in 2017 by sex and sexual behavior. (n= 30,644). MSM (Men who had Sex with Men only); MSM&W (Men who had Sex with both Men and Women); MSW (Men who had Sex with Women only); W (Women); MX (Men without information about sex of sex partner).

had significantly higher rates of syphilis compared to white populations in 2017.1

In RI, there were a total of 71 cases of P&S syphilis in 2017.1 The municipalities with the most reported syphilis cases were Providence, Central Falls, and Pawtucket.6 Syphilis cases in RI were highest among young adults, with persons aged 20–29 years most affected. There have been no cases of congenital syphilis reported in RI in the last six years.1 Although the number of new HIV diagnoses has declined by 31% over the last 10 years, the number of infectious syphilis cases (including primary, secondary, and early latent) has increased by 468%, from 25 cases in 2008 to 142 cases in 2017 [Figure 2].1,6 The opposite trends in HIV and syphilis prevalence may be due to advances in HIV treatment and prevention, including pre-exposure prophylaxis (PrEP), which is very effective in preventing HIV but does not protect against other STDs.7 Other factors may include increased risky sexual behaviors such as condomless sex.4 Widespread use of the internet and mobile apps to meet sex partners may also be associated with STD transmission, particularly among MSM.9

**CLINICAL MANIFESTATIONS**

The natural history of syphilis includes primary, secondary, latent, and tertiary stages.5 However, symptoms of syphilis may not always fall into clearly defined categories and previously rare presentations are becoming more frequent with increasing rates of infection.5,10,11 The classic symptom of primary syphilis is a painless chancre, which may be present in the oropharynx, genitalium or rectum.11 Chancre may be easily missed, as they are typically painless and may be located within the oropharynx or rectum. Transmission normally occurs during condomless vaginal, anal or oral sex, through direct contact with chancres, which have a high concentration of *T. pallidum* and are extremely infectious.5 In addition, *T. pallidum* can cross the placenta during P&S syphilis. Though very rare, the infection can also be transmitted through transfused blood.5 Secondary syphilis symptoms are observed in approximately 25% of infected individuals and typically present four to eight weeks after infection.5,12 Symptoms may include a maculopapular rash involving the trunk and extremities, the palms of the hands and soles of the feet, and mucous patches in or around the mouth, vagina, or penis. Fever, muscle and joint pain, and nodular lesions may also occur.11 During the latent phase, syphilis enters a dormant state, which may last for years. During this time, syphilis is rarely transmitted.5 Up to 25–40% of untreated syphilis infections progress to late or tertiary disease, which may occur 3–15 years after the initial infection. Symptoms of tertiary syphilis include infiltration of skin, bone, or liver tumors (gummas); cardiovascular syphilis that affects the aorta and causes aneurysms or valvulopathy; and disorders of the central nervous system (neurosyphilis).14 Manifestations of neurosyphilis may include general paresis, tabes dorsalis, and ocular syphilis. General paresis is a progressive illness that usually occurs 10–25 years after infection, with typical findings of dysarthria and intentional tremors of the face, tongue, and hands.5 Tabes dorsalis is a condition of the posterior columns of the spinal cord. The most common symptoms include sensory ataxia, pupillary irregularities and lancinating pains of the limbs, back or face. Importantly, increased prevalence of ocular syphilis is being observed across the US; these cases typically present as posterior uveitis and panuveitis.10 Vertical transmission from mother to child during pregnancy results in congenital syphilis. Approximately 80% of untreated syphilis infections in pregnant women lead to fetal infection through placental transmission, and up to 40% of fetal infections result in stillbirth or death of the infant.1,15

**DIAGNOSIS AND TREATMENT**

Given that syphilis may not always present with symptoms, it can be difficult to diagnose. Therefore, screening for syphilis should be a routine part of healthcare for sexually active persons, especially MSM and PLWH. In addition, all pregnant women should be tested for syphilis during the first trimester with rescreening in the third trimester if at risk.16 *T. pallidum* cannot typically be cultured. The CDC
For the diagnosis of neurosyphilis, a lumbar puncture should be performed with cerebral spinal fluid analysis (CSF) including white blood cell (WBC) count, protein concentration, and a VDRL test. A diagnosis of neurosyphilis is based on a reactive CSF-VDRL or a WBC-CSF of more than five microliters. A CSF VDRL is highly specific, but not sensitive (i.e. a negative result does not rule out neurosyphilis).

Penicillin continues to be the most effective treatment for all stages of syphilis. The recommended treatment of primary, secondary, and latent syphilis of less than one year duration is Benzathine penicillin G 2.4 million units intramuscular (IM) in a single dose. This is distinct from regular formulations of penicillin G, which are shorter-acting. Treatment of syphilis infection of more than one year includes parenteral Benzathine penicillin G weekly for three weeks. Other antibiotics that are generally effective for early or late syphilis include tetracycline, doxycycline, and ceftriaxone. The treatment of neurosyphilis is aqueous crystalline penicillin G 18 to 24 million intravenous [IV] or Procain penicillin G 2.4 million units intramuscularly plus probenecid. Intramuscular doses of penicillin do not achieve high enough levels in the CSF to effectively treat neurosyphilis.

**ADDRESSING SYPHILIS IN RHODE ISLAND**

Addressing syphilis requires awareness among PCPs and practitioners across multiple medical subspecialties. Socioeconomic status, low awareness, stigma, and access to healthcare may limit STD testing. Providers should be familiar with taking a sexual history and delivering prevention messages as needed, especially among MSM who are at higher risk for acquiring syphilis. A survey of MSM conducted by the RI Department of Health (RIDOH) found that approximately 33% of MSM are not “out” to their doctors [i.e., have not disclosed their sexual behaviors]. In response, RIDOH developed an educational website [www.health.ri.gov] entitled “Sexual Health Information for Gay Men” that provides information to MSM on how to talk to providers about sexual health, where to access free condoms, and advice on syphilis testing. In addition, RIDOH offers partner notification services (PNS) to all primary, secondary, and early latent syphilis diagnoses based on current CDC recommendations. PNS is effective in promoting HIV/STD testing among sexual partners to facilitate diagnosis and treatment and to prevent further transmission. Syphilis screening is also a routine part of prenatal care in RI.

To address increasing syphilis cases, the CDC recommends condoms, routine testing, and prompt treatment once diagnosed, as well as treatment of sexual partners. PCPs should be the primary site for clinical care. There are also several safety-net options for testing and treatment in RI which include the RI STD Clinic at The Miriam Hospital and urgent care centers. Other safety-net clinics located in areas with high rates of Hispanic/Latino populations, such
as Clinica Esperanza and RI Free Clinic, facilitate access for these populations.

With rising rates of syphilis, RIDDH has invested in efforts promoting safer sex behaviors and STD screening among high-risk groups. Public education STD prevention messages have been viewed approximately 1.5 million times on various social media sites such as Facebook, Instagram, and YouTube. Throughout RI, there are eighty-five community settings that distributed 500,000 free condoms in 2017. Of the 142 cases of infectious syphilis reported to the RIDDH in 2017, 106 (75%) were interviewed by RIDDH for the purposes of partner services. In 2017 The Miriam Hospital STD Clinic, with support from the RIDDH, provided 2,582 syphilis tests and identified 60 new cases of infectious syphilis. In the fall 2018, the RIDDH launched the Right Time sexual health app, which contains local resource information for socially active individuals to access condoms, HIV/STD and family planning services.

The RIDDH also has a robust STD surveillance system across the state. This system is based on case reports submitted by diagnosing health care providers and clinical laboratories. Cases must be reported within four days of diagnosis using a confidential care report form (http://health.rigov/forms/reporting/cases/SexuallyTransmittedDiseases.pdf). A report will trigger partner services by RIDDH staff. The most recent RI HIV/STD Surveillance Report is available online (http://health.rigov/publications/surveillance/2016/HIVSTD.pdf). Additional resources are also available online as needed (http://www.health.rigov/publications/resource-guides/HIVSTDViralHepatitisProgramClinicalResources.pdf). The RIDDH also maintains a registry of all syphilis laboratory results and treatment histories which may be needed to accurately assess and treat, and can be accessed by calling RIDDH at 401-222-2577.

CONCLUSIONS

Syphilis has significantly increased in the US over the last decade, including in RI. Greater awareness is needed among medical providers, especially those that care for underserved populations including MSM. There are many barriers to effective care which disproportionately impact these populations in RI. Focused research and public health initiatives directed at understanding and eliminating barriers to care are needed in order to improve syphilis prevention, early diagnosis, and treatment. PCPs have a unique opportunity, together with other providers, to lead the public health effort to eliminate syphilis transmission in RI.
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Acute Respiratory Failure from Cement Exposure: A Case Report and Review of the Literature
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ABSTRACT
Cement is widely used in construction. Acute exposures with immediate sequelae have been infrequently described. This case report describes a man who developed multifocal pneumonitis with acute respiratory distress syndrome (ARDS) and respiratory failure one day after cement dust exposure. Chromium, cobalt, and nickel components in cement may cause pulmonary tissue irritation. Sand and gravel in cement may cause direct abrasive injury. Inhalation may cause direct thermal injury through an exothermic reaction. The silicon dioxide component has been shown to cause pulmonary injury through cytokine-mediated inflammation. Cement batches for smaller-scale construction jobs are often mixed onsite increasing exposure risk. Implementation of personal protective equipment has been shown to reduce respiratory symptoms among cement workers, underscoring the need for occupational health standards and further research.

KEYWORDS: acute, respiratory, failure, cement, exposure

INTRODUCTION
Concrete is one of the main substances used in the modern construction process in developed countries. Concrete is a composite material composed of coarse gravel, crushed granite or limestone, and sand (collectively called the aggregate) bonded together with cement and water. Portland cement is the most widespread form of cement.1 It is a mixture made primarily of calcium oxide and silicon dioxide with smaller amounts of chromium, cobalt, and nickel.2 When the aggregate is mixed with dry Portland cement and water, the mixture forms a slurry that can be easily molded into shape. The mixture chemically reacts with water to gradually harden over time.1

Concrete workers are exposed to concrete and cement dust and its potential toxicologic effects during the mixing, pouring, and cleaning processes.3,4 Cement dust is irritating to the respiratory tract.4 Long-term exposure to cement dust inhalation is correlated with increased prevalence of chronic cough and wheezing and lower peak expiratory flow rates, forced expiratory volume in 1 second (FEV1), and vital capacity.6,9 Environmental exposure to cement dust may also be an independent risk factor for developing respiratory tract cancers.10 There are limited published cases on the acute effects of cement dust inhalation. We present a case of multifocal pneumonitis induced by acute cement-dust inhalation which resulted in acute respiratory distress syndrome.

CASE REPORT
A 47-year-old male construction worker with a history of diabetes, hypertension, hyperlipidemia and cigarette smoking presented to the Emergency Department (ED) with shortness of breath that began the day prior. He reported that the day before he mixed concrete all day and was repeatedly enveloped in a cloud of concrete dust. Later at home he developed progressively worsening shortness of breath and associated chest pain with continued cough. He had no prior history of lung disease.

On arrival, his vital signs were: blood pressure, 145/86 mmHg; heart rate, 115/min; respiratory rate, 24/min; O2 saturation of 84% on room air; temperature, 99.2° F. He was in mild respiratory distress with diffuse basilar rhonchi. He had no wheeze.

His oxygen saturation did not improve with oxygen via non-rebreather, and he was placed on bilevel positive pressure ventilation (BPPV) with improvement in his oxygen saturation to 97% and mild improvement in his work of breathing.

An electrocardiogram demonstrated sinus tachycardia. Initial basic metabolic panel, B-type natriuretic peptide (BNP), and troponin were normal. Lactate was 1.0 mEq/L. Complete blood count was notable for leukocytosis to 25 x10⁹/L without any left shift. D-dimer was elevated at 423 ng/mL. His venous blood gas was pH 7.39, pCO₂ 45 mmHg, and pO₂ < 30 mmHg with venous O₂ saturation of 49%. His HIV returned negative. His initial chest x-ray showed bilateral, multifocal airspace disease (Figure 1). A chest computed tomography angiogram (CTA) was read as “bilateral multifocal airspace disease with ground-glass opacities” (Figure 2). No pulmonary emboli were identified. The radiologic differential diagnosis included pneumonia, aspiration, pulmonary hemorrhage, and acute respiratory distress syndrome (ARDS).

The patient’s respiratory distress worsened and he was intubated in the ED. Post-intubation arterial blood gas was
pH 7.31, pCO2 48 mmHg, pO2 64 mmHg, O2 sat 90%. His PAO2/FiO2 was 160, meeting the definition for ARDS. He was admitted to the medical intensive care unit with ARDS secondary to multifocal pneumonitis versus pneumonia.

Although afebrile, the patient was empirically treated with antibiotics with ceftriaxone and azithromycin and with intravenous steroids. Blood cultures were negative. He was maintained on lung-protective ventilation with tidal volumes of 6 ml/kg of ideal body weight and gradually improved and was extubated on hospital day three. By hospital day six, the patient was on room air, and he was discharged on a prednisone taper with a discharge diagnosis of multifocal pneumonitis. On a follow-up visit approximately one month after discharge the patient continued to feel well and denied any ongoing shortness of breath or respiratory complaints.

**DISCUSSION**

The long-term respiratory effects of chronic exposure to concrete dust have been previously reported in multiple studies. In addition to respiratory disease, topical exposure to concrete can cause severe second- to third-degree burns due to the severe alkalinity of cement mixed with water. Although
not an occupational exposure, ingestion of cement can cause significant gastrointestinal injury through alkaline burns, an exothermic heat reaction, and solidification. Ingested cement should be emergently removed with endoscopy.2

This case describes the acute effects of cement-dust exposure in which a patient with no prior pulmonary disease developed multifocal pneumonitis with acute respiratory distress syndrome one day after exposure to cement dust. There are few existing reports on the acute respiratory effects of cement exposure. A study involving workers in a cement factory in Iran found that the most common acute respiratory symptoms among exposed workers were subjective shortness of breath and nasal congestion.12 Cross-sectional studies in cement factories in Ethiopia13 and in Tanzania14 found that workers exposed to cement dust had an acute decrease in their peak expiratory flow (PEF). None of these prior studies reported any cases of acute respiratory failure or ARDS from cement exposure.

Given the paucity of reports on acute respiratory failure from cement inhalation, we can only theorize on the mechanism of lung injury. There may be an allergic or irritant component; cement exposure is known to cause allergic dermatitis and the chromium, cobalt, and nickel components are known irritants. Furthermore, the exact composition of metals can be variable across brands and individual batches, with some batches containing more irritants. The sand and gravel in concrete may cause direct abrasive injury.2,4 When mixed with water, cement undergoes an exothermic reaction that may cause direct thermal injury to lung tissue.2 Chromium can cause pulmonary irritation through local deposition of chromium salts.15 Silicon dioxide is a component of Portland cement.1,2 Inhaled silica can cause pulmonary toxicity through cytokine-mediated inflammation. Chronic exposure can cause progressive lung fibrosis.16

Most modern concrete is prefabricated at offsite facilities using machinery, thereby limiting exposures at this stage. Cement workers are exposed to cement dust primarily during the pouring and cleaning processes.4 However, batches for small jobs are often mixed onsite, increasing exposure risk. Internationally, dust exposure to workers without sufficient personal protective equipment and workplace safety standards is a major concern.10,12,14

CONCLUSION

Implementation of proper personal protective equipment (PPE) has been shown to reduce the rates of chronic respiratory symptoms among cement workers, underscoring the need for dust control measures and occupational health standards.17 Given the widespread use of cement and concrete in the industrialized world, additional research is needed to identify the acute and long-term health effects of cement dust exposure on concrete workers and to develop appropriate preventative countermeasures for safety.

References


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CASE REPORT

An Infectious Triple Play: Three Separate Infections in an Elderly Patient

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INTRODUCTION

Each year in the United States, there are over 700,000 healthcare-associated infections (HAIs). These infections include central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), surgical site infections, Clostridium difficile infections, and methicillin-resistant Staphylococcus aureus bloodstream infections. While the Centers for Disease Control (CDC) reports an overall downward trend in all of these areas, HAIs continue to be significant sources of morbidity and mortality for hospitalized patients. In 2011, the CDC estimated about 75,000 patients with concurrent HAIs died during their admission.

HAIs can be caused by a variety of different pathogens. Two of the more common HAIs include C. difficile and respiratory viruses. C. difficile is the most commonly reported HAI in the United States, with an estimated 450,000 cases in 2011. Furthermore, nosocomial respiratory viral infections are underappreciated HAIs and causes of morbidity and mortality in hospitalized patients, with an estimated 15,000 adult cases yearly. Despite prevention efforts among hospitals, HAIs continue to present problems for hospitalized patients.

CASE REPORT

A 96-year-old woman presented from her assisted living facility with fever and chills. She had a baseline history of severe dementia, urinary incontinence, and hypertension. She was in her usual state of health until three days prior to admission. The patient was noticed to have pink-tinged urine in her brief. She went on to develop lethargy, fever, and chills. Given the concern for a urinary tract infection, the patient was sent to the hospital for further evaluation. She did not have any coughing, rhinorrhea, shortness of breath, abdominal pain, nausea, emesis, diarrhea, or lower extremity edema. She had not been hospitalized or used antibiotics in the last three months. Upon arrival to the emergency room, her vital signs were: 102.5 degrees Fahrenheit, blood pressure 190/80, and heart rate over 100. Her physical exam was normal aside from her dementia.

Her urinalysis showed 3+ leukocyte esterase, 62 WBCs, and a positive nitrite level. Her rapid influenza PCR was negative for both Influenza A and B. Her white blood count was 15.5x10^9/L, with a differential of 85.4% neutrophils, 5.4% lymphocytes, 8.8% monocytes, 0.2% eosinophils, and 0.3% basophils. She was treated empirically with vancomycin and ceftriaxone for urinary tract infection with presumed systemic involvement and admitted to the hospital.

On hospital day two, her WBC increased to 22.4 x10^9/L. Her urine and blood culture grew Escherichia coli that showed no resistance to antibiotics. Vancomycin was discontinued. Her fever resolved. She had no dysuria, and her physical exam was at her baseline according to her family.

On hospital day six, her temperature spiked to 100.9 degrees Fahrenheit. Bilateral rhonchi were noted on her physical exam, and she developed an intermittent non-productive cough. A new respiratory viral panel was positive for influenza B infection, and the patient was started on oseltamivir. The blood cultures showed no growth after five days.

On hospital day seven, her fever continued to increase to 103.2 degrees Fahrenheit. She had an episode of non-bloody, non-bilious vomiting with new tenderness in her lower abdominal quadrants. She had no guarding or rebound, and had normoactive bowel sounds. An abdominal x-ray showed no evidence of obstruction or free air; however, it did show signs suggestive of fecal loading in the rectum. The patient received an enema and manual disimpaction.

By hospital day eight, her WBC increased to 12.1 x10^9/L as she developed multiple episodes of watery, non-bloody diarrhea. Her antibiotics were expanded to include piperacillin-tazobactam to cover broadly for abdominal sources of infection. C. difficile toxin PCR was positive. Piperacillin-tazobactam was then discontinued, and she was started on oral metronidazole. She completed a five-day course of oseltamivir for influenza. By hospital day nine, the patient’s vital signs normalized. She was afebrile and back to her clinical baseline. She continued her treatment for C. difficile and was transferred to a skilled nursing facility.
This case of a patient admitted to the hospital with *E. coli* bacteremia secondary to a urinary tract infection and two subsequent HAIs illustrates the ongoing need for policy aimed at reducing HAI. While her hospital stay was relatively short, her additional infections put her at greater risk for increased morbidity and mortality. Additionally, her length of stay in the hospital was prolonged due to HAI. Occam’s razor encourages one to seek a single unifying diagnosis, but given her age, multiple comorbidities, and evolving clinical course, there was a need for keeping a broad differential and for maintaining an open mind toward new diagnoses. Using the frequency of five nosocomial viral infections per 10,000 adult admissions and the 61 *C. difficile* infections out of 11,282 patients, the probability of any patient acquiring both of these two nosocomial infections, assuming they are acquired independently of each other, would be less than 3 in 1,000,000. This patient had advanced age and treatment with multiple antibiotics, which would increase her susceptibility. The diagnostic work-up could have stopped at either the respiratory viral panel or the *C. difficile* PCR, but doing so may have missed a potentially life-threatening infection.

References

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Unilateral Birdshot Chorioretinopathy in an Elderly Patient

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KEYWORDS: Birdshot chorioretinopathy, posterior uveitis, autoimmune, uveitis, HLA-A29

INTRODUCTION

Birdshot chorioretinopathy (BSCR) is a poorly understood bilateral posterior uveitis strongly associated with the human leukocyte antigen (HLA)-A29. Herein, we report an unusual case of unilateral BSCR in an elderly patient.

CASE

A 69-year-old male was referred for evaluation of focal hypopigmented choroidal lesions in the right eye. The lesions were unchanged when compared to fundus photography from a previous eye exam three years earlier; however, the patient complained of vague right eye discomfort prompting referral. Past ocular history was notable only for refractive error/presbyopia. Past medical history included hypertension, hyperlipidemia, and prostate cancer undergoing radiation. On exam, visual acuity was 20/20 bilaterally with normal intraocular pressures and no afferent pupillary defect. Slit-lamp biomicroscopy was notable for 1+ nuclear sclerotic cataracts. On dilated fundus exam, there were cream-colored choroidal lesions within the posterior pole extending to the mid-periphery of the right eye; no vitreous cells, disc edema, vascular sheathing or cystoid macular edema was present. The left eye fundus was unremarkable [Figure 1]. Optical coherence tomography and fluorescein angiography were unremarkable bilaterally. On indocyanine green angiography, there were hypocyanescent choroidal lesions within the posterior pole and mid-periphery of the right eye, measuring ¼ to ½ disc diameter in size [Figure 2]; left eye was unremarkable. Additional testing included a normal CBC, a non-reactive RPR/FTA-ABS, normal ACE/lysozyme, positive HLA-A29 and normal MRI orbits and brain. An electroretinogram (ERG) was unremarkable. A hematology consultation was obtained; however, given the normal CBC, the low suspicion for indolent lymphoma or Waldenström’s macroglobulinemia, no further work-up was recommended. Given the
patient’s asymptomatic status, excellent visual acuity and lack of inflammation, the patient was observed.

DISCUSSION

Birdshot chorioretinopathy classically occurs in middle-aged Caucasian individuals and presents as bilateral chorioiditis in the presence of ≤1+ anterior vitreous haze, ≤2+ vitreous haze and ≥3 peripapillary ill-defined choroidal lesions. Although our patient’s exam and imaging are similar to previously reported cases, the monocular aspect of this case is atypical and warranted evaluation for an alternate etiology, including sarcoidosis and syphilis. Primary intraocular lymphoma was also considered but was deemed unlikely in the setting of absent vitritis and unremarkable serology.

In 2013, Zucchiatti et al. reported 18 cases of HLA-A29 positive uveitis; four patients exhibited unilateral disease. Three of these four patients presented with keratic precipitates and were subsequently diagnosed as Fuch’s uveitis, granulomatous panuveitis and HSV panuveitis, respectively. The fourth patient was diagnosed as scleritis and displayed no retinal abnormality. The asymptomatic nature of our patient’s retinopathy suggests a mild BSCR variant, which may underlie the unilaterality of the findings.

Birdshot chorioretinopathy can result in vision loss secondary to cystoid macular edema and slow progression of chorioretinal atrophy. Therefore, early diagnosis and identification of complications is crucial to insure timely treatment with intraocular or systemic immunosuppression. Patients should be monitored for progression of disease with repeat ocular imaging, electroretinogram (ERG) and/or visual field testing as progression often occurs despite lack of inflammation on exam. This case suggests that BSCR should remain a consideration in HLA-A29 positive individuals who present with unilateral creamy peripapillary choroidal lesions with or without inflammation.

References


Disclaimer

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

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IMAGES IN CLINICAL MEDICINE

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Health of Caregivers in Rhode Island

TRACY L. JACKSON, PhD, MPH; TARA COOPER, MPH

Approximately 44 million adults in the United States serve as a caregiver for a family member or friend.1 Caregiving duties generally consist of assisting with activities of daily living, household tasks, and providing medical care.2 Prior research has found caregiving was associated with stress, depression, worsening physical health, substance use, and lack of preventative care.3,4,5,6 With the increasing age structure of the population, the demand for caregivers is expected to increase in upcoming years. The state of Rhode Island has one of the oldest populations in the nation, and thus the burden of caregivers may be of particular concern. The purpose of this analysis was to measure the burden of caregiving in RI and to assess health indicators associated with caregiving.

METHODS

Data were from the 2017 RI Behavioral Risk Factor Surveillance System [RIBRFSS]. The RIBRFSS is a telephone survey of non-institutionalized adults ≥18 years that is administered by the RI Department of Health [RIDOH] with support from the Centers for Disease Control and Prevention (CDC) and is used to measure risk behaviors and health. Data obtained from the survey sample are weighted to obtain statewide population estimates.

Caregiving was measured with the question: “Did you provide regular care or assistance to a friend or family member who has a health problem or disability in the last 30 days?” Those who answered “yes” were defined as caregivers and were asked a series of follow-up questions about the caregiving recipient and the duration and nature of the care given. Those who are not currently caregivers were asked if they anticipate they will become one within the next two years.

Descriptive analyses were conducted to measure the prevalence and details of caregiving and the demographic characteristics and health of caregivers in the state. Logistic regression analyses adjusting for age, sex, race/ethnicity, education level, and relationship status were conducted to examine the association between caregiving and health indicators. Health indicators of interest included fair/poor general health [measured from: “Would you say that in general your health is – Excellent, Good, Fair, or Poor?”], chronic disease diagnosis [diabetes, myocardial infarction, angina/coronary artery disease, stroke, cancer, asthma, COPD, arthritis/gout/lupus/fibromyalgia, or kidney disease], history of depression, frequent mental distress (FMD; ≥14 days in the last 30 days where mental health was not good), inadequate social support [response of sometimes/rarely/never to “How often do you get the social and emotional support you need – Always, Usually, Sometimes, Rarely, or Never?”], binge drinking ≥4 drinks for females or ≥5 drinks for males, in one sitting in the last 30 days; current cigarette smoking; and current marijuana use.

RESULTS

Overall, 22.1% of RI adults – an estimated 159,477 individuals – reported serving as a caregiver for a family member or friend in the last 30 days. Of those not currently providing care, 14%, or an additional 71,973 adults, anticipate they will become one within the next two years. The average age of caregivers in RI is 51 years and they are most likely to be female [59%] and white [82%; Table 1]. About half [56%] of caregivers are employed and 65% have greater than a high school level of education.

Details about caregiving recipients and the workload of caregivers are displayed in Table 2. The most common individual caregivers provided care for was their parent or their partner’s parent [39%], followed by their partner [14%], a friend [13%], and a child or grandchild [12%]. The most common conditions that necessitated the care were old age [12%], cognitive impairment [9%], and cancer [8%]. Most caregivers [79%] help with managing household tasks (e.g., chores) and about half [53%] help with personal care (e.g., bathing). Length of time providing care varied with about a third [34%] serving as a caregiver for ≥5 years and about 19% serving as a caregiver for less than 30 days.

Analysis of health outcomes revealed poor mental health was common among caregivers with 30% reporting a history of depression, 22% suffering from FMD, and 33% reporting they do not get the social/emotional support they need [Table 3]. Adjusted logistic regression analyses revealed that differences between the mental health of caregivers and non-caregivers remained significant even when controlling for demographic variables. Caregivers had more than twice the odds of FMD [Adjusted odds ratio [AOR]=2.14, 95% Confidence Interval [95% CI]=1.60-2.85] and were also significantly more likely to report history of depression, and that they do not usually get needed social/emotional support. Analysis of general health indicators found caregivers were more likely to report fair/poor overall health and have a chronic disease, but there were no differences between caregivers and non-caregivers in prevalence of obesity. Analysis of risk behaviors revealed caregivers were more likely than non-caregivers to smoke cigarettes and use marijuana, but less likely to have binge drank in the last month. There were no differences between the two groups in exercise rates or health care utilization.
Additional analyses found associations between caregiving and negative mental health outcomes tended to increase with increasing time spent as a caregiver. For example, prevalence of FMD increased from 13% in non-caregivers to 17% in those who have been caregiving less than 6 months, to 24% among those who have been caregiving for 6 months or more. Those who have been caregiving for ≥6 months were also more likely to report inadequate social support (35%) when compared to those who have been caregiving for less than 6 months (26%).

### DISCUSSION

Data from the RIBRFSS revealed an estimated 159,477 Rhode Island adults are currently serving as caregivers for a family member or friend and nearly 72,000 who are not currently a caregiver anticipate becoming one within the next two years. Caregivers reported several poorer physical and mental health outcomes when compared to non-caregivers. This high burden, both in the prevalence of caregiving and the negative health effects associated with it, highlight the need to focus on the health of caregivers.

<table>
<thead>
<tr>
<th>Relationship of caregiving recipient to caregiver</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent/partner's parent</td>
<td>39.3%</td>
</tr>
<tr>
<td>Partner</td>
<td>14.1%</td>
</tr>
<tr>
<td>Non-relative/friend</td>
<td>12.8%</td>
</tr>
<tr>
<td>Child/grandchild</td>
<td>11.9%</td>
</tr>
<tr>
<td>Sibling/spouse's sibling</td>
<td>9.5%</td>
</tr>
<tr>
<td>Other relative</td>
<td>8.6%</td>
</tr>
<tr>
<td>Grandparent</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

### Table 1. Demographic characteristics of caregivers and non-caregivers in Rhode Island, 2017

<table>
<thead>
<tr>
<th>Race/Ethnicity*</th>
<th>% of caregivers</th>
<th>% of non-caregivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic White</td>
<td>81.5%</td>
<td>74.9%</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>4.4%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>9.2%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Non-Hispanic other race</td>
<td>5.0%</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relationship status*</th>
<th>% of caregivers</th>
<th>% of non-caregivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married/partnered</td>
<td>56.7%</td>
<td>51.4%</td>
</tr>
<tr>
<td>Single/divorced/separated/widowed</td>
<td>43.3%</td>
<td>48.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education*</th>
<th>% of caregivers</th>
<th>% of non-caregivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>12.9%</td>
<td>12.9%</td>
</tr>
<tr>
<td>High school graduate</td>
<td>22.4%</td>
<td>28.5%</td>
</tr>
<tr>
<td>Some college/College grad</td>
<td>64.8%</td>
<td>58.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income Level</th>
<th>% of caregivers</th>
<th>% of non-caregivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$25,000</td>
<td>25.1%</td>
<td>25.4%</td>
</tr>
<tr>
<td>$25,000-$49,999</td>
<td>22.3%</td>
<td>21.9%</td>
</tr>
<tr>
<td>$50,000-$74,999</td>
<td>14.3%</td>
<td>15.1%</td>
</tr>
<tr>
<td>$75,000+</td>
<td>38.3%</td>
<td>37.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment status</th>
<th>% of caregivers</th>
<th>% of non-caregivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td>56.3%</td>
<td>57.7%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>5.7%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Homemaker/Student/Retired</td>
<td>27.3%</td>
<td>28.0%</td>
</tr>
<tr>
<td>Unable to work</td>
<td>10.7%</td>
<td>8.2%</td>
</tr>
</tbody>
</table>

### Table 2. Details of caregiving provided by RI caregivers

<table>
<thead>
<tr>
<th>Major health problem necessitating care</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old age/infirmity/frailty</td>
<td>12.2%</td>
</tr>
<tr>
<td>Dementia/Cognitive impairment</td>
<td>8.8%</td>
</tr>
<tr>
<td>Cancer</td>
<td>8.0%</td>
</tr>
<tr>
<td>Heart disease/stroke/hypertension</td>
<td>6.1%</td>
</tr>
<tr>
<td>Mental illness</td>
<td>5.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of time caregiver has been providing care</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30 days</td>
<td>18.5%</td>
</tr>
<tr>
<td>1 –5 months</td>
<td>10.9%</td>
</tr>
<tr>
<td>6 months –2 years</td>
<td>16.8%</td>
</tr>
<tr>
<td>2 –4 years</td>
<td>19.8%</td>
</tr>
<tr>
<td>5+ years</td>
<td>34.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># hours per week caregiver provides care</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤8 hours</td>
<td>61.0%</td>
</tr>
<tr>
<td>9 –19 hours</td>
<td>13.0%</td>
</tr>
<tr>
<td>20 –39 hours</td>
<td>8.6%</td>
</tr>
<tr>
<td>40+ hours</td>
<td>17.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Types of care provided</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing household tasks</td>
<td>79.3%</td>
</tr>
<tr>
<td>Managing personal care</td>
<td>52.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support services needed most</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes about giving care/medications</td>
<td>2.2%</td>
</tr>
<tr>
<td>Help in getting access to services</td>
<td>8.2%</td>
</tr>
<tr>
<td>Support groups/individual counseling</td>
<td>5.5%</td>
</tr>
<tr>
<td>Respite care</td>
<td>2.3%</td>
</tr>
<tr>
<td>None of the above</td>
<td>81.9%</td>
</tr>
</tbody>
</table>

*p<.05 indicates significant difference between caregivers and non-caregivers
Source: 2017 RIBRFSS

*Note: not all percentages are intended to add up to 100%, Source: 2017 RIBRFSS
The findings that caregivers have higher rates of depression, stress, and poorer health are supported by prior research.\(^1\)\(^,\)\(^3\)-\(^6\) Other studies have found caregiving was also associated with increased substance use and lack of preventative healthcare.\(^2\)\(^,\)\(^7\) Prior research indicates caregivers often feel unprepared to provide the needed care and would like more information and help with caregiving topics.\(^1\)\(^,\)\(^5\)\(^,\)\(^6\) Medical professionals who interact with caregivers should be aware of this burden and work to evaluate caregiver stress. Some resources to evaluate caregiver needs include a toolkit\(^7\) and assessment measures\(^8\) available from the Family Caregiver Alliance. Providers should be aware of organizations such as the Alzheimer’s Association and AARP that have support groups and other information available for caregivers.

This study has several limitations. First, data were self-reported and thus, may be prone to recall bias. Additionally, it is possible some unmeasured confounders are responsible for the association between caregiving and poor health. For example, having a family member in poor health, aside from the caregiving aspect, may be a source of stress for respondents and responsible for some of the health problems. However, a study conducted by AARP found that 22% of caregivers reported their health had gotten worse as a result of caregiving, further indicating caregiving itself may be harmful to health.\(^1\)

Future research on caregivers in RI should focus on additional health measures and in identifying the best methods to help caregivers. The caregiver module is not routinely included on the RIBRFSS; however, including it in future years, would allow for analysis of items such as sleep, cancer screening, and life satisfaction that were not included on the 2017 survey. Having multiple years of caregiver data would also allow for subgroup analysis to see if health indicators varied based on age and sex of caregiver, length of time caregiving, health condition of caregiving recipient, etc.

The results of this study highlight the need to focus on caregiver health. Caregivers can experience high rates of mental distress and other health problems and their needs should not be overlooked.

### References


### Acknowledgments

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### Authors

Tracy L. Jackson, PhD, MPH, is a Senior Public Health Epidemiologist in the Center for Health Data and Analysis (CHDA) at RIDOH.

Tara Cooper, MPH, is a Health Program Administrator who leads the RIBRFSS within CHDA.

### Table 3. Health indicators among caregivers compared to non-caregivers

<table>
<thead>
<tr>
<th>Health indicator</th>
<th>% of Caregivers</th>
<th>% of Non-Caregivers</th>
<th>Adjusted odds ratio (95% CI) Caregivers vs. non-caregivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent mental distress*</td>
<td>21.5%</td>
<td>12.5%</td>
<td>2.14 [1.60 – 2.85]</td>
</tr>
<tr>
<td>Depression*</td>
<td>30.1%</td>
<td>22.0%</td>
<td>1.61 [1.27 – 2.04]</td>
</tr>
<tr>
<td>Do not usually get support*</td>
<td>32.7%</td>
<td>25.9%</td>
<td>1.58 [1.25 – 2.00]</td>
</tr>
<tr>
<td>General Health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair/Poor health*</td>
<td>20.8%</td>
<td>16.3%</td>
<td>1.59 [1.21 – 2.08]</td>
</tr>
<tr>
<td>Have chronic disease*</td>
<td>57.6%</td>
<td>47.2%</td>
<td>1.44 [1.14 – 1.82]</td>
</tr>
<tr>
<td>Obese</td>
<td>32.0%</td>
<td>29.8%</td>
<td>1.10 [0.88 – 1.38]</td>
</tr>
<tr>
<td>Health Risk Behaviors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge drink*</td>
<td>12.3%</td>
<td>18.5%</td>
<td>0.69 [0.49 – 0.97]</td>
</tr>
<tr>
<td>Smoke cigarettes*</td>
<td>16.3%</td>
<td>13.6%</td>
<td>1.34 [1.00 – 1.81]</td>
</tr>
<tr>
<td>Used marijuana*</td>
<td>12.8%</td>
<td>10.2%</td>
<td>1.59 [1.11 – 2.29]</td>
</tr>
<tr>
<td>Did not exercise</td>
<td>26.1%</td>
<td>26.9%</td>
<td>1.00 [0.79 – 1.26]</td>
</tr>
<tr>
<td>Healthcare Utilization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not have annual checkup</td>
<td>15.7%</td>
<td>19.2%</td>
<td>0.89 [0.66 – 1.21]</td>
</tr>
<tr>
<td>Did not receive annual flu shot*</td>
<td>50.1%</td>
<td>46.2%</td>
<td>0.94 [0.76 – 1.16]</td>
</tr>
</tbody>
</table>

Note: Percentages were obtained from descriptive analysis and AORs were obtained from adjusted logistic regression model. Each outcome was measured in a separate model, adjusting for age, race/ethnicity, sex, education level, and relationship status. AORs compare caregivers to non-caregivers.

*indicates statistically significant difference (p<.05) between caregivers and non-caregivers in adjusted model.

Source: 2017 RIBRFSS

The results of this study highlight the need to focus on caregiver health. Caregivers can experience high rates of mental distress and other health problems and their needs should not be overlooked.
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December 3, Monday
Meeting with Sugar Sweetened Beverage Tax Workgroup

December 4, Tuesday
RIMS Physician Health Committee: Herbert Rakatansky, MD, Chair

December 5, Wednesday
Diabetes Prevention Program Stakeholder meeting
OHIC Alternative Payment Model Advisory Committee: Peter A. Hollmann, MD, President
Department of Labor and Training Renaming Ceremony renaming Donnelly Center to Judge Robert Arrigan Rehabilitation Center
Workers Compensation Advisory meeting

December 6, Thursday
OHIC Care Transformation Advisory Committee: Peter A. Hollmann, MD, President

December 10, Monday
OHIC Cost Trends Advisory Committee: Peter A. Hollmann, MD, President

December 11, Tuesday
OHIC Market Stability Workgroup: Peter A. Hollmann, MD, President

December 12, Wednesday
Board of Medical Licensure and Discipline Governor’s Overdose Prevention and Intervention Task Force: Sarah Fessler, MD, Past President
Meeting with Dept. of Health’s Primary Care Physician Advisory Committee Co-chairs regarding Current Care RIM PAC Board of Directors Meeting: Mickey Silver, MD, Chairman
RIMS Public Laws Committee: Michael Migliori, MD, Chairman

December 13, Thursday
Sugar Sweetened Beverage Team Meeting Meeting with Blue Cross Blue Shield of RI: Peter A. Hollmann, MD, President

December 17, Monday
Meeting with RI Primary Physician Corporation/Dept. of Health regarding Diabetes Prevention Program

December 18, Tuesday
OHIC Market Stability Workgroup: Peter A. Hollmann, MD, President
OHIC Health Insurance Advisory Committee

December 19, Wednesday
Primary Care Physicians Advisory Committee Meeting regarding defelonization of opioid-related offenses
OHIC Cost Trends Analysis Group: Peter A. Hollmann, MD, President

December 20, Monday
Meeting with Blue Cross Blue Shield regarding legislation

December 21, Tuesday
Meeting with Senate policy staff regarding 2019 legislation Meeting with Neighborhood Health Plan of RI regarding legislation

January 4, Friday
Diabetes Prevention meeting with RIPCPC

January 7, Monday
Meeting with Senator Miller regarding Perry-Goldner Act

January 8, Tuesday
RIMS Physician Health Committee: Herbert Rakatansky, MD, Chair
OHIC Market Stability Workgroup: Peter A. Hollmann, MD, President

January 9, Wednesday
Governor’s Overdose Prevention and Intervention Task Force: Sarah Fessler, MD, Past President

January 10–12, Thursday–Saturday
AMA State Advocacy Summit: Michael E. Migliori, MD, Public Laws Chair, Heather Smith, MD, AMA Council on Legislation, and Staff [see page 13]

January 10, Thursday
Physician Health Program Governance Committee [RIMS Foundation]: Jerry Fingerut, MD, Chair
State Innovation Model Grant Steering Committee: Peter A. Hollmann, MD, President

January 14, Monday
Conference call with national citizen physician organization

January 15, Tuesday
OHIC Health Insurance Advisory Committee

January 16, Wednesday
Primary Care Physicians Advisory Committee

January 18, Friday
Harm Reduction Task Force: Sarah Fessler, MD, Past President
Diabetes Prevention meeting with RIP CPC

January 22, Tuesday
Market Stability Workgroup: Peter A. Hollmann, MD, President
Legislative Hearings

January 24, Thursday
Department of Health hearing regarding proposed regulatory changes to opioid prescribing regulations.
Legislative Hearings
Speaker Mattiello fundraiser

January 29, Tuesday
Legislative Hearings

January 30, Wednesday
Legislative Hearings
New Legislators Reception: RIMS Board of Directors, RIMS Council, RIM PAC, RIMS Public Laws Committee

January 31, Thursday
Meeting of the Alliance for a Healthy RI Legislative Hearing
Senate President Ruggerio fundraiser
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Neighborhood Health Plan of Rhode Island is a non-profit HMO founded in 1993 in partnership with Rhode Island’s Community Health Centers. Serving over 185,000 members, Neighborhood has doubled in membership, revenue and staff since November 2013. In January 2014, Neighborhood extended its service, benefits and value through the HealthSource RI health insurance exchange, serving 49% the RI exchange market. Neighborhood has been rated by National Committee for Quality Assurance (NCQA) as one of the Top 10 Medicaid health plans in America, every year since ratings began twelve years ago.

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RHODE ISLAND MEDICAL SOCIETY
PROVIDENCE – On December 17, 2018, Partners HealthCare and Brigham Health filed an application with the Rhode Island Department of Health [RIDOH] and Rhode Island Attorney General [RIAG], in accordance with the Rhode Island Hospital Conversion Act, seeking approval of Brigham Health’s planned acquisition of Care New England [CNE]. Partners HealthCare also filed a Notice of Material Change with the Massachusetts Health Policy Commission. The Federal Trade Commission recently announced that it has decided not to challenge the acquisition.

The affiliation calls for CNE to become part of Brigham Health, the Partners-owned organization that operates Brigham and Women’s Hospital, Brigham and Women’s Faulkner Hospital and other entities. It is built on a shared commitment to providing the highest quality local care, physician training and biomedical innovation to Rhode Island. Importantly, it will also stabilize CNE and enable the financially-distressed system to expand its primary care and complex care resources and address much-needed capital improvements.

“This relationship will extend our existing affiliations across the Care New England system, bringing new resources to support patient care and physician training and expanding access to research through clinical trials,” said Elizabeth G. Nabel, MD, President of Brigham Health. “We’re committed to investing in Rhode Island’s healthcare economy by becoming active members of the local business community.”

“Rhode Islanders will benefit greatly from the collaboration of these two health systems,” said Care New England President and CEO James E. Fanale, MD. “Our relationship with Brigham Health will enhance the training of physicians and inspire new research. At the same time, it strengthens our commitment to preserving access and quality of care for all Rhode Islanders.”

Brown affiliation

In addition, CNE, Partners, and Brigham Health finalized an agreement with Brown establishing the university’s Warren Alpert Medical School as the primary academic research and teaching institution of record for the affiliation. Further, Brown’s President will join the CNE Board of Directors as a voting member, and the dean of the Warren Alpert Medical School will be an ex officio member of academic and research subcommittees of that board.

Brown has a longstanding academic medical affiliation with CNE, which is home to Brown’s programs in obstetrics and gynecology and neonatology (at Women & Infants Hospital), in psychiatry (at Butler Hospital), and in family medicine (at Kent Hospital). This new relationship will sustain medical training for healthcare providers and support for biomedical research and innovation that keeps leading physicians in the state.

“Together, we will be even better positioned to prepare our future physicians for the rapidly changing world of healthcare and medical innovation,” Brown President Christina Paxson said. “We will build on our ability to compete for biomedical research grants that will guide the future of medicine and inject new investment and vibrancy into the Rhode Island economy.”

Life span Statement regarding Partners HealthCare’s Application to Rhode Island to Acquire Care New England

From Lawrence A. Aubin, Sr., Chairman, Lifespan Board of Directors

“Like all stakeholders – both public and private – Lifespan will carefully review this application, taking into account the potential impact on Rhode Island patients, communities, health care delivery system and economy. The far-reaching consequences of an out-of-state health care provider taking control of Rhode Island’s second largest health system requires a thorough and thoughtful review by all concerned – the state, other stakeholders and us. Lifespan remains committed to high-quality, patient-centered care delivered here in Rhode Island.”

Care New England statement on Partners CEO resignation

“Care New England Health System (CNE) has worked diligently over the past two years towards a planned acquisition by Brigham Health, a founding member of Partners HealthCare. We expect today’s [January 29] announcement by Dr. David Torchiana, chief executive of Partners HealthCare, that he is stepping down from that position will have no impact on our ability to finalize this important transaction.

“While we wait for the Rhode Island Department of Health and the Attorney General’s office to deem the formal application complete, our sole focus remains on preparing for an affiliation we believe will ensure that high quality, affordable care remains available throughout CNE for the people of Rhode Island. We feel strongly that this affiliation will build on existing clinical relationships between CNE and Brigham Health to ensure ongoing clinical research and educational collaboration in support of the parties’ charitable missions, enable the organizations to more efficiently use their resources, and establish effective and expanded approaches to population health management.”
Kent Hospital dedicates Simulation Training Lab

Kent Hospital recently dedicated the hospital’s first simulation lab (Sim Lab), located in the Graduate Medical Education (GME) Center. The new space is designed to house SimMan® 3G, a life-like adult patient simulator which will provide real-life training to Kent Hospital’s residents and students. The lab, which includes a control room and procedural simulation equipment and ultrasound, was made possible by the generosity of the Luigi Damiano Foundation, represented at the event by Frank Lafazia, DO.

Residents gave attendees a demonstration of SimMan, which breathes, cries, has a pulse, and even bleeds. “This simulation lab space is critical to our continuing goal of quality improvement,” said Kent president and COO Robert Haffey.

“We’re extremely grateful to the Lafazia family and the Foundation for their generous gift,” said Alisa Merolli, MD, the GME Center’s Designated Institutional Officer. “This lab allows our medical students to practice crucial procedures long before they are seeing patients.”

Clinica Esperanza/Hope Clinic seeks volunteers

Primary care, specialty, physicians, nurses, administrative volunteers needed

Providence – Clinica Esperanza/Hope Clinic (CEHC) is a not-for-profit clinic serves the uninsured of Rhode Island. Due to its location in the ‘Valley neighborhood’ of the West Side, many CEHC patients are immigrants and refugees from Central and South America.

Concerned about Health Disparities? Would you like to improve access to Healthcare? If you speak Haitian Creole, Spanish, Farsi, or any West/East African languages, you will be especially welcome here, as “CEHC” is International Health on the RIPTA bus line. Primary care, Specialty, Physicians, Nurses, and administrative volunteers are needed.

Sign up for a volunteer shift and see as many patients are you are comfortable seeing – with no paperwork hassles. Volunteers who wish to work regular monthly shifts are especially needed.

Visit www.aplacetobehealthy.org to learn more, or write vcoordinator@aplacetobehealthy.org to find out which volunteer shifts are available.

South County Health plans Centennial events

From cottage hospital to robotic surgery, a history of healthcare

Wakefield – From its beginning as a cottage hospital inside a home on Kenyon Avenue, South County Hospital has grown over the past 100 years to become South County Health, a major healthcare system dedicated to those who live, work and visit the Washington County communities.

• To commemorate this historical milestone, South County Health will celebrate its Centennial throughout 2019 with a variety of events and activities, offering everyone in the community an opportunity to enjoy what they helped to create. Some of the planned events include: Centennial Kick-off Reception where a permanent historical timeline will be unveiled in the Hospital lobby

• Live performance by Trinity Rep actors, depicting the history of South County Health

• Centennial 5K Road Race from South County Hospital with Centennial celebration festivities

• Robotic technology hands-on demonstration

• The Centennial Ball: A Roaring 20s Affair at The Dunes Club

• Book signing and reception with renowned cardiac surgeon, Dr. Arun Singh More Centennial festivities, event dates and details will be announced throughout the year. In addition, South County Health will commemorate its 100-year relationship with the people and communities of Washington County with South County Stories, a collection of stories, recollections and anecdotes from people whose lives have been touched by the doctors, nurses and medical professionals through the years.
MULTIDISCIPLINARY STUDY TO HELP IDENTIFY VETERANS AT RISK FOR SUICIDE

A research health scientist with the VA Rehabilitation, Research and Development’s Center for Neuro-restore and Neurotechnology, or CfNN, located at the Providence VA Medical Center, has received a VA Career Development Award January 1 for a project titled “Identification of Veterans At-Risk for Suicide: A Multidisciplinary Approach.”

The $1 million award will fund a five-year project. DR. JENNIFER BARREDO, who is also an assistant professor of Psychiatry and Human Behavior at Brown University’s Warren Alpert Medical School, will use magnetic resonance imaging to study patterns of brain activity in Veterans who may be at risk for suicide. Using an advanced machine learning approach, the project aims to develop new ways to identify suicide risk, and develop this into a clinical tool for early detection. New insights into the neurobiology of suicide may also guide the development and optimization of emerging treatments for suicidality in Veterans.

RIH RESEARCHERS PART OF NATIONAL STUDY TO EVALUATE DRUG TRORILUZOLE TO SLOW ALZHEIMER’S DISEASE PROGRESSION

‘T2 Protect AD’ study at RIH Alzheimer’s Disease and Memory Disorders Center measures potential improvement in people with mild to moderate disease

Rhode Island Hospital’s Alzheimer’s Disease and Memory Disorders Center is recruiting participants for a new, national Alzheimer’s disease clinical research study evaluating the potential benefits of an investigational medicine for people with mild to moderate Alzheimer’s.

The Phase 2 study, called T2 Protect AD (Alzheimer’s disease), is evaluating the investigational drug Troriluzole, which may have the potential to protect against, slow down, and eventually improve memory and thinking problems that increase as Alzheimer’s disease progresses. Troriluzole is a drug that modulates glutamate, protecting against neuron loss. Glutamate problems in the brain can lead to brain cell dysfunction and disease, including Alzheimer’s disease.

Troriluzole is related to riluzole, which is used to slightly slow disease progression in patients with amyotrophic lateral sclerosis (ALS), but, unlike its predecessor, it can be taken once a day and has potential for better safety and tolerability.

“We are very excited to be able to participate in this trial,” Troriluzole offers an avenue for therapy targeting an Alzheimer’s-related disease mechanism that is unlike any other investigational medication we have to offer,” said JONATHAN DRAKE, MD, the principal investigator for the study site at Rhode Island Hospital. “It has a proven track record in ALS patients, and has been modified to have fewer side effects. Most importantly, this study will be open to patients with moderate dementia, a population that is currently under-represented in Alzheimer’s disease clinical trials.”

Rhode Island Hospital’s Alzheimer’s Disease and Memory Disorders Center is one of more than 30 sites across the U.S. participating in the T2 Protect AD study. Approximately 292 patients will be randomized nationwide on a 1:1 basis to receive 280 mg of troriluzole or placebo, taken orally at bedtime. The duration of treatment will be 48 weeks.

The study is sponsored by New Haven-based Biohaven Pharmaceutical Holding Company Ltd., and is coordinated by the Alzheimer’s Disease Cooperative Study, an Alzheimer’s disease therapeutic research consortium based at the University of California, San Diego.

To participate in T2 Protect AD, candidates must be between age 50 and 85 and diagnosed with mild to moderate Alzheimer’s disease, and already being treated with donepezil (Aricept), rivastigmine (Exelon) or galantamine (Razadyne) for at least three months, with or without memantine (Namenda). Participants must have a study partner who has regular contact with the clinical trial candidate and is able to attend study visits.
IN THE NEWS

W&I awards research grants to Drs. Brousseau, Ribeiro

Women & Infants Hospital has awarded two approximately $25,000 grants from the Constance A. Howes Women’s Health Innovation Research Fund. The research fund, which has raised more than $500,000, was established in 2014 with contributions from more than 150 donors to honor former hospital president Constance A. Howes and to support research studies that advance women’s health and gender-based research.

The two awardees are E. CHRISTINE BROUSSEAU, MD, MPH, of the Women & Infants’ Department of Obstetrics and Gynecology’s Division of Research; and JENNIFER RIBEIRO, PhD, of Women & Infants’ Program in Women’s Oncology.

Dr. Brousseau’s clinical project is entitled “A Pilot Study to Improve Contraceptive Access to an Under-served Population of Women.” This project focuses on access to preventive health care for women who have been previously incarcerated.

Dr. Ribeiro’s basic science project is entitled “Identification of relevant immune regulators in epithelial ovarian cancer.” This project seeks to identify genes and immune cell populations specifically relevant to epithelial ovarian cancer that help a tumor escape elimination by the immune system.

These investigators, selected from an impressive pool of applicants, presented their projects in December to a panel of scientific advisors and donors to the Constance A. Howes Fund. The fund honors the vision and leadership of Connie Howes, and provides seed funding for pilot studies that propel research ideas to the next level of funding. The fund has supported seven highly innovative projects so far, and leveraged multiple publications and additional grant awards including a large-scale Center of Biomedical Research Excellence (COBRE) grant.

Aetna is proud to support the members of the Rhode Island Medical Society.
URI Ryan Institute initiates clinical trial to study possible role of the brain’s blood vessels in Alzheimer’s disease

In a pioneering clinical trial that will attack Alzheimer’s disease by targeting inflammation in the brain’s blood vessels, researchers at the George & Anne Ryan Institute for Neuroscience have received regulatory approval to initiate the BEACON Study. This URI-sponsored study is the first-ever clinical trial led and conducted entirely within the state designed to treat individuals with mild cognitive impairment probably due to Alzheimer’s disease and those diagnosed with mild Alzheimer’s disease. Alzheimer’s research clinics at Rhode Island Hospital, Rhode Island Mood and Memory Research Institute, and Butler Hospital will be enrolling participants later this year for this uniquely Rhode Island study.

“Keeping this study in Rhode Island was important to us,” said Paula Grammas, PhD, executive director of the Ryan Institute. “This state has a world-class and closely-linked community of researchers and clinicians, which enables us to pull together resources and make progress quickly.”

The study is funded through a grant from the Alzheimer’s Drug Discovery Foundation (ADDF) along with private donations. The ADDF catalyzes and funds drug discovery and drug development for Alzheimer’s disease and related disorders. This research is also made possible by an independent grant from Boehringer Ingelheim Pharmaceuticals, Inc., which is providing the active drug for this study, dabigatran. URI’s Pharmaceutical Development Institute is providing the placebo comparator for this trial.

“The role of the vasculature in Alzheimer’s disease has been grossly under-recognized until relatively recently,” said Dr. Howard Fillit, Founding Executive Director and Chief Science Officer of the Alzheimer’s Drug Discovery Foundation. “As a result, strategies to develop therapeutics to address this important part of the disease have been lacking. We are pleased to work with Dr. Grammas and fund her work using a very novel approach to repurpose an existing drug to treat the vascular abnormalities in Alzheimer’s disease.”

BEACON is a Phase I clinical trial that looks into the possible role of the brain’s blood vessels in Alzheimer’s disease. Grammas’s research has shown that factors such as high blood pressure, diabetes, and stroke can injure blood vessels in the brain, resulting in inflammation that could cause the damage or death of brain cells that occurs in Alzheimer’s disease. The BEACON Study repurposes an existing drug, dabigatran, FDA-approved to reduce the risk of stroke and systemic embolism in patients with non-valvular atrial fibrillation for the treatment and to reduce the risk of reoccurrence of deep venous thrombosis and pulmonary embolism, to suppress one part of the inflammation process associated with Alzheimer’s disease. Results from the BEACON Study are expected in late 2020.

“If the drug shows some effects on the progression of Alzheimer’s disease, it would be the first time we’ve found evidence of a treatment that could slow the disease,” says Grammas. “But even if the study’s results are less conclusive, this is a vitally important step forward in expanding our knowledge of the multiple factors that cause this complex disease. I’m very excited to see what happens.”

The BEACON Study will look at the effects of the drug dabigatran, a direct thrombin inhibitor, to slow down this harmful cascade in the early stages of Alzheimer’s disease. In preclinical studies using rodent models of Alzheimer’s disease, the treatment significantly slowed neurodegeneration, and drugs with similar action slowed the decline of cognitive function. BEACON stands for “Blocking Endothelial Activation to Curb the Onset of Neurodegeneration.”

RIH participating in TANGO clinical Alzheimer’s disease trial

Investigators at Rhode Island Hospital’s Alzheimer’s Disease and Memory Disorders Center are now recruiting volunteers for the TANGO study, a national, multicenter clinical trial. The trial will evaluate the use of a highly innovative approach treating people with Mild Cognitive Impairment or early Alzheimer’s disease (AD) using an immunotherapy drug. The drug, called BIIB092, uses antibodies to target the tau protein that builds up in the brain cells of people with AD. The trial is sponsored by Biogen, a global biopharmaceutical company based in Massachusetts.

Only people with higher levels of amyloid plaques on their PET scans will qualify to participate in this study. In this study, the drug will be given intravenously monthly and 2 out of every 3 people will get BIIB092. People who do not receive the study medicine will get a placebo infusion of salt water. This study will last for about 18 months. Every person joining this study must have a study partner who is able to come to some of the study visits.

According to Dr. Brian Ott, principal investigator at Rhode Island Hospital, “Because changes in tau are more closely related to the degeneration of nerve cells as well as the symptoms of Alzheimer’s disease, we are hopeful that this will be a successful approach to controlling the disease. Among investigational drugs currently under study for AD, BIIB092 is exciting in that it does not aim to reduce amyloid protein buildup in the brain, but is an immunotherapy that targets tau protein.”
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Your Heart, My Hands:
Cardiac surgeon Arun Singh’s memoir an engrossing immigrant saga of struggles, successes – in life and in the OR

KENNETH S. KORR, MD, FACC
RIMJ ASSOCIATE EDITOR

I was driven, first and foremost, to save the lives of my patients. But I also wanted desperately to succeed; to show that I was not the indolent wastrel, the failure that many, most notably my father, had predicted. Indeed, the fear of failure was a presence in my OR almost as palpable as the feel of the scalpel in my hand.

So begins the remarkable story of notable Rhode Island cardiothoracic surgeon Dr. Arun Singh. It is perhaps many stories, a tale of overcoming physical and learning disabilities, the quintessential immigrant’s saga of struggle for success in America, and ultimately a love story – the tough love of a mother for her son, the love and support of a wife for her husband and the love of a physician for his craft and for his patients.

Arun was born in 1944, in Deoghar, in northeast India, during the tumultuous era leading up to the partition of Hindu India and Muslim Pakistan. He was a curious and rambunctious youth whose “most notable childhood talents included a penchant for hopping trains, flying kites and generally getting into mischief.”

He suffered two separate, crippling hand injuries in childhood in rural India, where there was only rudimentary health care and where he had to rely on a regimen of physical therapy, improvised by a dedicated mother with no education and no rehab training but with a great deal of common sense.

He was profoundly influenced by his maternal grandfather, a successful ENT surgeon who encouraged Arun to pursue medicine, not just for the material rewards, but not just for the material rewards, but out of a sense of obligation. “Your doctors helped you when you were a kid, Arun,” he said, during one of my visits. “Now maybe you’ll become a doctor and help other kids.”

Then there was his learning disability. Dyslexia wasn’t recognized as such at the time and like most who suffered from it, it was assumed he couldn’t read or write well, because he didn’t care to or because he was lazy or stupid. It forced...
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century’s first-generation of surgeons
he influenced and educated the 20th
chief of surgery at Johns Hopkins where
accept at the time. Halsted later became
that many American surgeons refused to
reduce mortality rates, a then-new theory
ilization as a way to stop infection and
particularly through his advocacy of ster-
nothing less than invent modern surgery,
the memoir, he relates that Halsted did
Halsted that he read over and over. In
brothers and a book about Dr. William
influenced by two books given to him by
his grandfather, a biography of the Mayo
stuff the Americans have.” He was also
influenced by two books given to him by
his grandfatther, a biography of the Mayo
brosers and a book about Dr. William
Halsted that he read over and over. In
the memoir, he relates that Halsted did
nothing less than invent modern surgery,
particularly through his advocacy of ster-
ilization as a way to stop infection and
duce mortality rates, a then-new theory
that many American surgeons refused to
accept at the time. Halsted later became
chief of surgery at Johns Hopkins where
he influenced and educated the 20th
century’s first-generation of surgeons

In 1967, Arun began his immigrant
journey to America in pursuit of his
goal to become an orthopedic surgeon.
He accepted a surgical internship at
Worcester City Hospital in Massachu-
sets including room and board and the
princely sum of $5000 in salary. He
arrived with $5.00 and a pocketful of
dreams. Unlike the great univer-
sity hospitals of America or Great
Britain, Worcester City Hospital
wasn’t a place where the next
generation of surgeons came for
their training. The residents were
simply a form of cheap labor,
he writes, and ultimately, without
any other real prospects, he
turned down a guaranteed four-
year surgical residency.

Next stop, Columbia Uni-
versity in New York, where a short-
age of residents due to U.S. physicians
enlisting in the Vietnam War allowed
him to secure a coveted surgical resi-
dency. Living in New York City and
training at Columbia were life-changing
experiences for young Dr. Singh. He was
exposed to some of the greatest surgeons
and the newest and most innovative sur-
gical techniques of the time. He practiced
his suturing at home, late into the night,
to overcome the limitations from his
childhood injuries. Realizing that he did
not have the upper-arm strength to be an
orthopedic surgeon, he became enthralled
with the emerging field of cardiac surgery
and felt that this was his true calling.

In his few spare moments, he enjoyed
the excitement of a vibrant metropolis.
He met a young nurse with “pretty brown
eyes and long brown hair,” who became
his guide and ultimately his wife and
soulmate. And, he experienced the subtle
racism of being a brown man in America.
In the men’s room at a black tie holiday
hospital event he courteously handed a
towel to an older surgeon, only to receive
a generous tip in exchange.

The next hurdle in his career was to find
a cardiac surgical fellowship, in a field
where there were only 100 very competi-
tive slots nationwide. Through the efforts
of Dr. Kenneth Forde, an African Carib-
bean surgeon and residency director at
Columbia, he was introduced to Dr. Karl
Karlson at Rhode Island Hospital (RIH)
and in July 1972 he was accepted into a
new two-year cardio-thoracic surgical
residency at RIH and Brown University.

In Rhode Island, he was exposed to the
intricacies of pediatric cardiac surgery
but still kept up his nightly suturing prac-
tice. Following this residency he went
to London for a year, to the Hospital for
Sick Children on Great Ormond Street,
for more advanced training in pediatric
cardiac surgical techniques. Along the
way he and wife Barbara had two sons
and he passed his cardio-thoracic surgical
board exam.

Returning to America in 1975 he
passed up an opportunity at Harvard and
came back to work at RIH to start up a
new program in pediatric cardiac sur-
gery, but with privileges only to operate
on children under two years of age, so as
not to compete with other surgeons. He
received strong community support from
benefactors who wanted a viable pedi-
atrie cardiac surgical program in Rhode
Island, so patients wouldn’t have to go
to Boston for care. But when the program
lost his salary support he was out of a job.
As a compromise he was given full car-
diac surgical privileges to operate on all
patients, but no salary. He was on his own!

During his long and illustrious career,
Dr. Singh has performed more than 15,000
open-heart surgical procedures. He po-
gnantely recalls those that have stood out
most in his memory, usually where things
did not go as planned. He shares the anxi-
ety and soul searching of losing a patient
and the compassion, humility and respect
that he developed for his brave patients
and their families. “I don’t just work
on hearts, I have one, too,” he writes.
Along the way his cases illustrate the
personal and societal challenges related
to drug addiction, the AIDS epidemic and
the “great national shame of the lack
of a cost-effective health care system.”

His is a compelling story and a great read,
especially for those of us in Rhode Island
who have known and worked with him.

Kenneth S. Korr, MD, FACC, is Associate
Professor of Medicine Emeritus at The
Alpert Medical School of Brown University

BOOK REVIEW

102
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Wafik El-deiry, MD, appointed associate dean for Oncologic Sciences at Brown/Lifespan

WAfIk EL-DEIRY, MD, PhD, FACP, from the Fox Chase Cancer in Philadelphia, has been appointed to lead the Brown-Lifespan Joint Program in Cancer Biology and serve as the inaugural associate dean for Oncologic Sciences at Brown University. He will have appointments in the Department of Pathology and Laboratory Medicine and the Department of Medicine.

In his role as the director of the unified cancer biology program, El-Deiry will design, recruit, and lead the cancer biology programs at Brown and Lifespan affiliates Rhode Island Hospital, Hasbro Children’s Hospital and The Miriam Hospital. He will also serve as the inaugural director of the Joint Program in Cancer Biology in the Departments of Pathology and Medicine.

In these roles he will work to develop a basic and translational cancer research program of national and international stature with the goal of advancing cancer diagnosis, treatment and prevention. The program will simultaneously contribute to the training of graduate students and postgraduate fellows, including those from hematology/oncology, pathology, and pediatrics.

In his role in the dean’s office, he will work with the dean and stakeholders at Lifespan hospitals to catalyze and facilitate collaborative, innovative, patient-centered oncologic research across Brown and Lifespan.

JACK A. ELIAS, MD, senior vice president for health affairs and dean of medicine and biological sciences at Brown, said, “We are absolutely delighted to welcome Dr. Wafik El-Deiry to this strategically important leadership role at Brown University, the Warren Alpert Medical School, and the affiliated hospitals. Developing a transdisciplinary, translational cancer biology program with innovative science, and collaboration across institutions can be transformative for our institutions. As a former Howard Hughes Investigator and American Cancer Society Research Professor, Dr. El-Deiry is a person of immense stature in oncology and oncologic sciences. I look forward to watching our programs grow and our oncologic services to the people of Rhode Island expand under his leadership.”

“I am honored and excited to be joining Brown’s Alpert Medical School, and Lifespan,” said El-Deiry. “I look forward to working with outstanding colleagues throughout the university and hospitals to shape an exciting future of collaboration and discoveries that help patients. In the end, patients are our primary focus and always need to be. I look forward to engaging with Brown alumni to share the excitement of the cancer program at Brown.”

Since 2014, El-Deiry has served as deputy director for translational research and co-leader of the Molecular Therapeutics Program at Fox Chase Cancer Center. Prior to that, he served as the chief of hematology/oncology and associate director of the Cancer Institute at Penn State University, and as a tenured professor of medicine, genetics, and pharmacology at the University of Pennsylvania Perelman School of Medicine, and co-program leader at the Abramson Comprehensive Cancer Center.

El-Deiry received his MD and PhD from the University of Miami School of Medicine and completed internal medicine residency and medical oncology fellowship training at the Johns Hopkins Hospital and Johns Hopkins Oncology Center.

El-Deiry has published over 280 papers and is the principal investigator on two National Institutes of Health (NIH) research grants and several industry grants supporting clinical trials. He has been continuously funded by the National Cancer Institute for two decades and currently serves as the chair of an NIH Study Section.

“We recruited Dr. El-Deiry after a competitive national search and believe we have found the ideal physician-scientist leader and role model for our students and fellows,” said HOWARD SAFRAN, MD, chief of the Division of Hematology/Oncology at Lifespan Cancer Institute. “Dr. El-Deiry embodies the 21st century ‘quadruple threat’ of physician, scientist, teacher, and academic leader.”

“We are thrilled to welcome Dr. Wafik El-Deiry to Brown where there is a need to pull together and integrate the cancer biology and clinical research efforts across disciplines and institutions,” said DR. JONATHAN KURTIS, Stanley M. Aronson Professor of Pathology and chair of the Department of Pathology and Laboratory Medicine and director of the Warren Alpert Physician-Scientist MD/PhD and Advanced Training Program at Brown University. “He will also be a major force in teaching and mentoring students, fellows, and faculty in the area of cancer at Brown.”
Appointments

Dr. Audrey Tyrka named Co-Chair of the ACNP Women's Task Force

AUDREY R. TYRKA, MD, PhD, director of the Laboratory for Clinical and Translational Neuroscience (LCTN) and director of research at Butler Hospital, and professor of Psychiatry and Human Behavior at the Warren Alpert Medical School of Brown University, has been appointed co-chair of the Women's Task Force of the American College of Neuropsychopharmacology (ACNP).

Founded in 1961, The American College of Neuropsychopharmacology is a professional, international organization of leading brain scientists. Selected primarily on the basis of original research contributions, membership of the College is drawn from scientists in diverse subfields of neuroscience, including behavioral pharmacology, clinical psychopharmacology, epidemiology, genetics, molecular biology, neurochemistry, neuroendocrinology, neuroimaging, neuroimmunology, neurophysiology, neurology, psychiatry, and psychology.

Dr. Tyrka received her MD and PhD in medicine and psychology through a combined program at the University of Pennsylvania. She completed a psychiatry residency at the Warren Alpert Medical School and further research training in clinical neuroscience at the Mood Disorders Research Program and Laboratory for Clinical Neuroscience at Butler and Brown. Dr. Tyrka is also director of Research Training in the Brown psychiatric residency program and principal investigator of an NIMH-funded R25 research training program.

Alexios Carayannopoulos, DO, appointed chief of new physical medicine and rehabilitation department at RIH

Interventional physiatrist ALEXIOS CARAYANNOPOULOS, DO, MPH, FAAPMR, FAAOE, has been appointed chief of Rhode Island Hospital’s newly created physical medicine and rehabilitation department. An expert in clinical practice and research, Carayannopoulos is nationally known as a leader in both interventional spine and pain medicine.

The new department is focused on building upon existing patient programs to provide integrated, seamless patient care and to standardize care across the continuum with the goal of further reducing readmissions and improving patient outcomes.

Carayannopoulos, a resident of both Barrington and Boston, serves as the medical director of the Comprehensive Spine Center at Rhode Island Hospital and Newport Hospital, and division director of Pain and Rehabilitation Medicine within the Rhode Island Hospital department of neurosurgery.

“We are excited to have Dr. Carayannopoulos’s leadership as we endeavor to better align our physical medicine and rehabilitation services across the hospital,” said MARGARET M. VAN BREE, MHA, DRPH, president of Rhode Island Hospital. “His proven record of leadership for the Comprehensive Spine Center and within the division of neurosurgery made him the ideal person to shape this new department and new era.”

The department has 19 physiatrists who practice across Rhode Island Hospital departments, including the spine center, inpatient rehabilitation unit and the concussion center.

Carayannopoulos is involved in clinical research on spinal cord stimulation and stem cell therapy. He is also a consultant in spinal cord stimulation, working with academia and industry to advance the field of neuromodulation through research and education.

Carayannopoulos earned his bachelor’s degree in English literature with a chemistry minor at Connecticut College. He subsequently served 13 years in the U.S. Navy as a diver, submarine officer and medical officer, rising to the rank of Lieutenant Commander. In the course of his military service he became a doctor of osteopathic medicine, graduating from Nova Southeastern University’s College of Osteopathic Medicine in Ft. Lauderdale, FL. He also holds a master’s degree in public health from Johns Hopkins University, Baltimore, MD.

Carayannopoulos completed his Navy medical training at the National Naval Medical Center in Bethesda, MD, and the Naval Undersea Medical Institute in Groton, CT. He completed his residency at Spaulding Rehabilitation Hospital/Harvard Medical School in Charleston, MA, where he also became certified in medical acupuncture. He completed a fellowship at Dartmouth Medical School in Lebanon, NH, and is currently a fellow of the American Academy of Physical Medicine and Rehabilitation, through which he is dual board certified in physical medicine and rehabilitation as well as pain medicine. He is also a fellow of the American Association of Osteopathic Examiners, which is the organization that supports the distinctiveness and integrity of osteopathic medical licensure.

Carayannopoulos is a clinical associate professor of neurosurgery at the Warren Alpert Medical School of Brown University and has served as a faculty member or visiting lecturer at various clinics and symposiums around the county and internationally. A widely published and award-winning clinician and researcher, he practiced and taught at the Lahey Hospital and Medical Center in Burlington, MA, and at the Emerson Hospital in Concord, MA, before joining Lifespan and Brown in 2014.

Carayannopoulos assumed his new role in December.
Phyllis A. Dennery, MD, named president of Society for Redox Biology and Medicine

Phyllis A. Dennery, MD, pediatrician-in-chief at Hasbro Children’s Hospital is the new president of the Society for Redox Biology and Medicine (SfRBM).

Formed in 1987, SfRBM is comprised of scientists, clinicians, and researchers investigating redox biology, a unifying theme in the pathophysiology of human diseases. Their work focuses on developing medical interventions to improve health outcomes.

As a member for almost 30 years, Dennery has held several leadership positions within the society, including executive council and as associate editor of its flagship journal, Free Radical Biology and Medicine.

“The world’s leading experts in redox biology have long been part of SfRBM because of the organization’s location at a crossroads between the clinical patient perspective, and the most cutting-edge scientific research,” explained Dennery. “I see a tremendous opportunity to expand upon the interaction and collaboration that SfRBM has always afforded around basic and translational science. I am also excited to have an opportunity to foster a strengthening partnership between scientists and the medical community to examine how we can better help patients through redox-related therapies.”

A graduate of Howard University College of Medicine, Dennery joined Hasbro Children’s in 2015. In addition to serving as pediatrician-in-chief and medical director, she is the Sylvia Kay Hassenfeld Chair of Pediatrics at the Warren Alpert Medical School of Brown University and a professor of molecular and cell biology and biochemistry at Brown University.

Among Dennery’s research interests are prematurity-related lung problems and early aging of the lung. She is a member of the National Academy of Medicine, the Association of American Physicians, the Society for Clinical Investigation, the American Pediatric Society and the Society for Pediatric Research, where she served as president in 2007. She has also received numerous professional awards.

Dr. Eric Berthiaume named president of University Gastroenterology

Eric Berthiaume, MD, has been named the president of University Gastroenterology. In his new role, Dr. Berthiaume will be responsible for overseeing the operations of the specialty group and ensuring patients continue to receive the highest level of gastrointestinal care.

He holds a faculty position as a clinical assistant professor of medicine at the University of New England College of Osteopathic Medicine. He completed a fellowship in gastroenterology at Brown University and a residency at the Dartmouth-Hitchcock Medical Center.

Dr. Berthiaume also regularly provides consultative services at Kent County Memorial Hospital and the Roger Williams Medical Center. He earned his medical degree at the University of Cincinnati College of Medicine, and is an alumnus of the College of the Holy Cross in Worcester, Mass.

Elizabeth Decker, DO, joins University Gastroenterology

Elizabeth Decker, DO, has joined University Gastroenterology (UGI).

Dr. Decker received her medical degree from the University of New England College of Osteopathic Medicine in 2011. She trained in internal medicine at St. Petersburg General Hospital and Sacred Heart Hospital in Florida, then returned to Rhode Island to pursue her specialty training in gastroenterology at Kent Hospital.

Dr. Decker will be on staff at Kent Hospital where she will continue to be involved in the Kent Gastroenterology Fellowship as a teaching attending.
Emiko Ishihara, DO, joins Southcoast Physicians Group

**Emiko Ishihara, DO**, has joined Southcoast Physicians Group Family Medicine.

She earned her undergraduate degree from Middlebury College, Middlebury, VT and completed a Post-Baccalaureate Health Profession Program at the University of California in Berkeley, CA. She earned her degree in Osteopathic Medicine at Des Moines University, College of Osteopathic Medicine in Des Moines, IA. Dr. Ishihara earned a Master of Public Health in Population Medicine and completed her residency in Family and Preventive Medicine at Loma University in Loma Linda, CA.

Dr. Ishihara is board eligible by the American Board of Family Medicine and Preventive Medicine. She also holds certification in Lifestyle Medicine Core Competency and X (Suboxone) Waiver.

Her clinical interests include palliative and hospice care, employee wellness programs, HIV/AIDS management, weight management and diabetes prevention, osteopathic manipulation, acupressure and lifestyle medicine.

Mohamad Hamdi, MD, joins The South County Health Center for Women’s Health

**Mohamad Hamdi, MD**, has joined The South County Health Center for Women’s Health.

Certified by the American Board of Obstetrics and Gynecology, Dr. Hamdi received his medical degree from Beirut Arab University in Lebanon and completed residencies in obstetrics and gynecology at American University Beirut and the University of Cincinnati.

Dr. Hamdi, formerly of Women & Infants Hospital of Rhode Island, was Chief of the Department of Obstetrics and Gynecology at UnityPoint Health’s Allen Memorial Hospital in Waterloo, IA. He is a member of the American College of Obstetricians and Gynecologists, reviewer for Obstetrics and Gynecology, and a member of the Association of Professors of Gynecology and Obstetrics.

John K. Czerwein, Jr., MD, named Chief of the Division of Orthopedics at Fatima; Aaron Milam, DPM, named Chief of the Division of Podiatry

Our Lady of Fatima Hospital in North Providence, a CharterCARE affiliate, made the following physician leadership appointments, it was announced recently by Dr. A. Robert Buonanno, Chairman of the Department of Surgery.

**John K. Czerwein, Jr., MD**, has been named Chief of the Division of Orthopedics. He replaces Dr. David Moss who served as Chief for the last 7 years. Dr. Czerwein is a board-certified orthopedic surgeon and graduated from the Chicago Medical School. He completed his residency in orthopedic surgery at Montefiore Medical Center in New York and his orthopedic spine fellowship at the Warren Alpert Medical School of Brown University, where he is also a clinical assistant professor. He is associated with the Center for Orthopedics in Johnston.

**Aaron Milam, DPM**, has been named Chief of the Division of Podiatry. He replaces Dr. Angelo Bigelli who served for 25 years as Chief. A board-certified podiatric surgeon, Dr. Milam joined the medical staff in 1998 and is associated with North Providence Foot & Ankle. He is a graduate of Temple University School of Podiatric Medicine and Health Science and completed his podiatric orthopedic and podiatric surgical residency at West Roxbury Veteran Affairs Medical Center and the Providence Veterans Affairs Medical Center.
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Recognition

Steven Brown, DMD, receives 2018 Hamolsky outstanding physician award

The medical staff of Rhode Island Hospital recently honored STEVEN BROWN, DMD, with the 2018 Milton W. Hamolsky, MD, Outstanding Physician Award. Brown, an oral and maxillofacial surgeon and consultant to the Samuels Sinclair Dental Center, joined the Rhode Island Hospital staff in 2003.

He was nominated for the award by Eileen Danaher, DMD, Sara DiNardo, DMD, and Elizabeth Benz, DMD. Benz is the director and DiNardo the assistant director of Samuels Sinclair Dental Center, which provides dental services to children and to intellectually or developmentally disabled patients of all ages. Their letter praises his clinical skill, his warmth and empathy with his patients, and his love of teaching. The nomination noted Dr. Brown’s history of treating the most complex cases.

Danaher read part of the nomination letter at the January annual meeting of the Rhode Island Hospital Medical Staff Association. “While maintaining a busy practice in East Greenwich, [Brown would] arrive at the hospital to round on patients before and after his scheduled day…Dr. Brown is rarely alone while making rounds in the hospital. He is often followed by plastics, pediatric, dental and ENT residents, all of whom love him. Dr. Brown is constantly teaching and encouraging these residents.”

The letter also noted Brown’s bedside manner that endears him to patients at the dental center, many of whom are medically and behaviorally challenging to treat. Brown, who served for 12 years on active duty in the U.S. Army prior to coming home to Rhode Island, volunteers his services through the Dental Lifeline Network, connecting medically fragile and disenfranchised patients with free care, and the Rhode Island Mission Lifeline Network, connecting medically fragile and disenfranchised patients with free care, and the Rhode Island Mission.

“The Milton W. Hamolsky Physician of the Year Award is meant to honor doctors who have distinguished themselves with skill, leadership and professionalism,” said LATHA SIVAPRASAD, MD, chief medical officer of Rhode Island Hospital. “Dr. Brown meets and exceeds all of these marks, and is an enormously valued member of our dental and surgical teams. Aside from being an excellent clinician, he is known to all here as an outstanding person. He is highly deserving of this award.”

Brown is a resident of West Greenwich, R.I., is also a clinical associate professor of surgery at the Warren Alpert Medical School of Brown University, and is a consultant to the dental assistant program at the Community College of Rhode Island. He is involved in numerous professional societies including the American Dental Association (ADA) and the American Association of Oral and Maxillofacial Surgeons (AAOMS). Brown is a fellow of the Pierre Fauchard Academy and of the International College of Dentists. He has served multiple leadership roles including President of the Rhode Island Dental Association (RIDA) and President of the Kent County Dental Society. He is the long-term delegate for the RIDA and currently serves as the ADA’s district 1 deputy whip. He is also the delegate for the Rhode Island Society of Oral and Maxillofacial Surgeons and currently serves as the AAOMS district 1 caucus chair.

Prior to joining Rhode Island Hospital, Brown spent four years as a staff oral and maxillofacial surgeon at Winn Army Community Hospital in Fort Stewart, Georgia. After earning his B.S. in biology at Providence College, Brown attended Tufts University School of Dental Medicine in Boston, earning his D.M.D. prior to embarking on his Army career. He was selected by the Army for advanced training in oral and maxillofacial surgery training at the University of Texas in Houston.

Brown is currently researching antibiotic resistance in deep neck infections caused by dental sources.

The Milton W. Hamolsky Outstanding Physician Award is presented each January to a doctor who has made exceptional contributions to patient care and leadership. The late Milton Hamolsky, MD, was an endocrinologist who came to Rhode Island Hospital in 1963 and served as the first full-time physician-in-chief from that time until 1987. Hamolsky served as the chief administrative officer of the Rhode Island Board of Medical Licensure and Discipline and was a noted pioneer of medical education in Rhode Island.

Lisa Frappier, DO; James Ingraham, MD, named APA Distinguished Fellows

The American Psychiatric Association (APA) recently approved LISA FRAPPIER, DO, and JAMES INGRAHAM, MD, to become APA Distinguished Fellows, the highest membership honor the APA bestows upon members.

They will be recognized at the Convocation of Distinguished Fellows during the 2019 APA Annual Meeting in San Francisco on May 20, 2019.

The Fellowship is awarded to outstanding psychiatrists who have made significant contributions to the psychiatric profession in at least five of the following areas: administration, teaching, scientific and scholarly publications, volunteering in mental health and medical activities of social significance, community involvement, as well as for clinical excellence.
Brown Dermatologists honored during American Cancer Society Event

PROVIDENCE – Members of the R.I. General Assembly, and physicians from Brown Dermatology were honored during the annual Cancer Research Breakfast at Roger Williams Park Casino in December for their leadership in helping pass legislation that makes it illegal for minors to use tanning beds in Rhode Island.

Dr. Helena Kuhn, Dr. Mary Teeple, and Dr. Martin Weinstock were each presented with a Certificate of Appreciation from ACS CAN for providing testimonies in support of the tanning bill sponsored by Senate Majority Whip Maryellen Goodwin and Deputy Majority Leader Mia Ackerman. All three doctors are faculty members of the Warren Alpert Medical School of Brown University.

“We are proud to have contributed to the successful effort to protect minors from indoor tanning, an important, potentially addictive carcinogen targeted at teenagers and young adults. We would also like to congratulate ACS-CAN and our state legislators for advocating this important skin cancer prevention effort,” Brown Dermatology physicians said in a joint statement.

If you are under 18, you cannot go to a tanning booth,” said BERNARD JACKVONY, a national board member of the American Cancer Society Cancer Action Network (ACS CAN), which hosted the event. Jackvony praised the efforts of General Assembly members, and Brown Dermatology physicians who have helped make Rhode Island a national leader in cancer prevention.

Breast Health Center at Kent Hospital earns national accreditation

The Breast Health Center at Kent Hospital has been granted a three-year, full accreditation designation by the National Accreditation Program for Breast Centers (NAPBC), a program administered by the American College of Surgeons.

The Breast Health Center at Kent Hospital opened in January 2010, and has received full NAPBC accreditation three times since its inception. The program is a collaboration with Women & Infants Hospital.

During the survey process, the Breast Health Center demonstrated compliance with standards established by the NAPBC for treating women who are diagnosed with the full spectrum of breast disease. The standards include proficiency in the areas of: patient navigation, breast cancer surveillance, pathology, support and rehabilitation, and educational resources.

The surveyors recognized the leadership of CANDACE L. DYER, MD, the medical and radiation oncology staff, imaging and pathology services, and the plastic surgery services.

L. Anthony Cirillo, MD, elected to the ACEP Board of Directors; receives ACEP Health Policy Award

L. ANTHONY CIRILLO, MD, FACEP, has been elected to the Board of Directors for the American College of Emergency Physicians during the annual meeting of the ACEP Council on September 30, 2018 for an initial three-year term of office.

Dr. Cirillo is an ABEM board-certified emergency physician who has been active in the healthcare policy and advocacy arena for many years. He received his medical degree from the University of Vermont College of Medicine and completed his residency at the UMass Medical Center in Worcester, MA.

During the ACEP 18 meeting held in San Diego, Dr. Cirillo was awarded the Colin C. Rorrie, Jr, PhD Award for Excellence in Health Policy, which is presented to an individual who has made a significant contribution to achieving the health policy objectives of the College and/or who has demonstrated outstanding skills, talent, and commitment as an administrative or political leader.

Dr. Cirillo has previously served as President of the RI Chapter of ACEP and served for seven years as Chair of the Rhode Island Medical Political Action Committee (RIMPAC). Dr. Cirillo is employed by US Acute Care Solutions, a national emergency medicine group, where he serves as the Director of Health Policy & Legislative Advocacy. Dr. Cirillo lives in North Kingstown and works clinically in New London, CT and at Westerly Hospital.

From left to right: Dr. Mary Teeple, Dr. Martin Weinstock, and Dr. Helena Kuhn.

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Recognition
Recognition

Rhode Island Hospital earns Blue Distinction® Centers+ designation for cardiac care

Blue Cross & Blue Shield of Rhode Island has recognized Rhode Island Hospital with a “Blue Distinction Centers+ for Cardiac Care” designation, as part of the Blue Distinction Specialty Care program. Blue Distinction Centers are nationally designated providers that show expertise in delivering improved patient safety and better health outcomes, based on objective measures that were developed with input from the medical community and leading accreditation and quality organizations. Rhode Island Hospital is the only hospital in the state to be awarded the designation.

Only those hospitals that first meet nationally established quality measures for Blue Distinction Centers are considered for designation as a Blue Distinction Centers+.

Hospitals recognized with this designation are assessed using a combination of quality information supplied by hospitals and third party data registries, and cost measures derived from Blue Cross and Blue Shield companies’ medical claims.

South County Health Cancer Center re-accredited by Commission on Cancer

The Commission on Cancer (CoC), under the auspices of the American College of Surgeons, has re-accredited the South County Health Cancer Center through 2021.

The CoC is an organization that monitors comprehensive quality of care to improve survival and quality of life for cancer patients. As a result of the survey, conducted on October 9, 2018, the CoC awarded the Cancer Center a three-year accreditation for complying with the organization’s strict standards, noting seven areas earning commendation.

Areas of Commendation:

- Standard 1.9 Clinical Research Accrual
- Standard 1.11 Cancer Registration Education
- Standard 1.12 Public Reporting of Outcomes
- Standard 2.1 College of American Pathologists Protocols and Synoptic reporting
- Standard 2.2 Oncology Nursing Care
- Standard 5.2 Rapid Quality Reporting System (RQRS) Participation
- Standard 5.6 Data Submission; Accuracy of Data

Megan L. Ranney, MD, receives Selya Award for Excellence in Research

MEGAN L. RANNEY, MD, MPH, an emergency medicine physician and injury prevention researcher, was honored with the 2018 Bruce M. Selya Award for Excellence in Research at the Lifespan Annual Meeting. She was nominated by Brian Clyne, MD, in his capacity as Lifespan’s interim physician-in-chief for emergency medicine and interim chair of emergency medicine at the Warren Alpert Medical School of Brown University.

Dr. Ranney founded and directs the Emergency Digital Health Innovation Program at Brown. She is an associate professor of emergency medicine in the medical school, and of health services, policy and practice in the School of Public Health. She has published widely, with well over 100 scientific publications and 70 presentations at scientific meetings.

She serves as chief research officer for the American Foundation for Firearm Injury Reduction in Medicine (AFFIRM) and has held roles on numerous national and local task forces related to efforts to stem gun violence, including co-chairing Rhode Island Governor Gina Raimondo’s Task Force on Gun Violence.
East Greenwich Pediatrics named Cancer Prevention Champion by CDC for HPV vaccine prevention efforts

East Greenwich Pediatrics has been awarded the 2018 HPV Vaccine Cancer Prevention Champion Award, given jointly by CDC, The American Cancer Society and the Association of American Cancer Institutes.

The award recognizes clinicians, clinics, practices, groups, and health systems who are going above and beyond to foster HPV vaccination in their communities.

CDC issues the award to clinicians, clinics, practices, groups, or health systems nominated by their immunization program.

East Greenwich Pediatrics features a patient-centered medical home model of care, where the patient is the most important person in the healthcare system. Serving nearly 8,000 patients in the community, the practice fosters a culture of immunization, where the entire staff actively conveys the message that “vaccines work.”

Clinicians at East Greenwich Pediatrics promote the HPV vaccine as routine right from the start. At an 11-year old well visit, clinicians introduce the HPV vaccine with the other recommended adolescent vaccines, which helps parents understand that the vaccine is routine. The clinic describes the HPV vaccine as cancer prevention, and makes a strong recommendation for the HPV vaccination, knowing these are major factors influencing vaccine uptake. They also provide Vaccine Information Statement (VIS) handouts and FAQs, and take time to address parents’ questions and concerns and dispel myths about the HPV vaccine.

Conveying the importance of the HPV vaccine as cancer prevention has resulted in an HPV vaccine series completion rate of 87% for adolescent patients, which makes East Greenwich Pediatrics Rhode Island’s 2018 HPV Vaccine is Cancer Prevention Champion!
ROBERT “BOB” EARLE NADEAU, MD, passed peacefully on December 26, 2018 in Providence, surrounded by family.

The son of Alfred F. and Inez Nadeau, Bob was born in Lewiston, ME on September 13, 1938. He graduated in 1960 from Brown University, where he met his wife, Elizabeth Tillinghast, and was a member of the varsity golf team and Delta Upsilon. In 1964 Bob graduated from Tufts Medical School and completed his medical residency at Dartmouth. He then served as a Captain and general internist in the United States Air Force from 1966 to 1969, stationed in Spangdahlem, Germany. Bob further trained in psychiatry at the University of Rochester in Rochester, NY where he continued on as Associate Clinical Professor of Psychiatry. A member of the American Psychiatric Society, Bob continued in private practice and teaching until retiring in 2009.

He enjoyed summers and retirement in Little Compton, RI where he was passionately engaged in playing golf with his friends, driving his tractor and working in his woodshop. He was especially fond of the many visits from his ever growing and loving family.

Bob is survived by Elizabeth Tillinghast Nadeau, his loving wife of 58 years, and his four children Elizabeth J. Nadeau (Robert Legge) of Lyons, NY, Dana T. Nadeau (Joel Richnak) of Nevada City, CA, Robert E. Nadeau (Arielle Basch) of New York City and Jennifer J. Nadeau, MD (Jay Guthin) of Barrington, RI. He is also survived by his brother David Nadeau, eight grandchildren and numerous nieces and nephews.

A celebration of Bob’s life will be held in Little Compton, RI in the summer of 2019. In lieu of flowers, the family respectfully requests donations be made to Butler Hospital’s Memory and Aging Program: https://foundation.butter.org/.

 DR. SONIA SPRUNG was born December 12, 1921 and passed away peacefully on January 25, 2019 at the age of 97. Her life was remarkable in many ways. She was born in the Ukraine to Clara and Victor Mendelson. She had one sibling, Sara, who encouraged her to enroll in medical school. Her studies were interrupted by WWII. As the Nazis started bombing her town she and her parents escaped and travelled 1500 miles to Kazakhstan where she was able to resume her studies and become a doctor.

After the war she and her family left the Soviet Union and went to a displaced persons camp in Munich, Germany where she worked for the JDC treating refugees who arrived from Eastern Europe after the war. Her only child, Edie Nadler, was born there. In 1951, the family received permission to immigrate to the USA. When she arrived to Brooklyn, NY, she had to renew all her credentials which involved becoming an intern and resident and passing exams in English to become certified again in the medical profession.

The family then moved to Providence where she was in private practice for 40 years as a pediatrician. She was an enthusiastic member of Temple Emanuel and attended services there regularly. She reluctantly retired at 75 and then started traveling the world, 36 cruises took her to all the places she ever dreamed of visiting.

She is survived by her daughter, Edie Nadler (Jonathan Nadler); granddaughters, Lisa (Masa) and Jessica (Ryan); great-grandchildren, Miles, Ruby and Frankie as well as Shara Mendelson, Mischa Mendelson, Gideon Mendelson, Tom Tomeo and Owen, Leo and Isabella Mendelson Tomeo.

She was a true original and will be remembered with love, admiration and respect.

EDGARD TURNIER, MD, 83, of Cumberland and formerly of Newport, passed away December 27, 2018. He was the beloved husband of Carol (Sherry) Turnier.

Dr. Turnier was a political exile from Haiti. He was the first foreign graduate accepted at Rhode Island Hospital internship program, where he became the chief surgical resident. He later accepted a position at Stanford University for two years conducting cardiovascular research. Dr. Turnier then served his residency at USC for two years, performing open-heart surgery. He practiced in both southern and northern California, the Midwest and Newport, Rhode Island.

Besides his wife of 47 years, he is survived by his children, Stephanie Mitchell, Christopher Turnier, Meghan Patterson, and Bradford Turnier, and his five grandchildren.

Donations to Hope Hospice & Palliative Care of RI, 1085 North Main Street, Providence, RI, 02904, in memory of Dr. Turnier, would be appreciated.
Obituaries

JOHN YASHAR, MD, 91, died on January 11, 2019 in Palm Beach Gardens, Florida.

He was born in Iran and as a young child was a talented violinist and played Persian classical music on a weekly radio program. An accomplished student, he received his medical degree at the University of Teheran, after which he traveled to the United States in 1950, landing at Ellis Island, NYC, with $50 in his pocket.

He pursued his internship and residency at Bellevue Hospital in New York, and upon completion continued his studies at Beth Israel in Boston, where he was chief resident. He then trained in cardiovascular surgery at Case Western in Cleveland.

Dr. Yashar pioneered open-heart surgery in Rhode Island, becoming the first physician to successfully complete open-heart surgery in the state; he also helped to found and develop the open-heart surgery program at The Miriam Hospital.

Dr. Yashar was in private practice with his brother, Dr. James Yashar, and simultaneously worked and assumed leadership roles at numerous hospitals in the state. He was a Clinical Associate Professor at Brown University Medical School, where he trained hundreds of physicians, and a member of the Society of Thoracic Surgery, the American College of Cardiology, the Rhode Island Medical Society, among other associations.

Dr. Yashar was widely known for his love of medicine and compassion for others. He developed deep connections with his patients and their families. He was known for his humor, ability to spin a wonderful tale, and his unwavering support for his colleagues. His success was based on hard work, dedication, and kindness.

Above all else, he held family most dear. He was a loving and committed husband, father, grandfather, great-grandfather, son, and brother. He was married to Audrey M. Yashar for 54 years and they lived with their five children in Pawtucket, Providence, and Jamestown, RI, before retiring to Florida. His family was continually by his side as he battled Parkinson’s during the final year of his life. He was predeceased by his wife, Audrey. He is survived by his brother, Dr. James Yashar, and his sister, Mahin Kayvanfar; his five children: Beverly, Susan, Gail, Deborah, and Stephen; his three in-law children: John Mesberg, Christopher Smith, and Heike Yashar; his eight grandchildren; and his two great-great grandchildren.

Donations in his memory may be made to the American Heart Association.