the squeal of the train's emergency brake. He walked into the path of the train as a result of environmental inattention in a situation with multimodal cues (physical barrier, visual markers, and audible deterrents). This was a completely preventable death.

On a less dramatic scale, in our role as alpine ski patrolers we have responded to numerous skier collisions and near misses in which at least one individual was wearing headphones. We have observed that difficulty in getting the attention of a skier or snowboarder to warn them of a hazard has often been associated with headphone use. The music is sometimes so loud that it can be heard clearly an arm's length away. Similar awareness and safety problems have been noted at the ski lift loading areas.

Objective data on effects of distraction in sports and wilderness settings are lacking. Nonetheless, the potential risks of distraction in dynamic environments are easy to imagine, and this is reflected in the policies of some sports organizations. For example, the Road Runners Club of America guidelines recommend against the use of headphones in running events and group training. USA Triathlon's rules specifically disallow personal audio devices in articles 3.4i, 5.8, and 6.3. USA Track & Field rule 144.3 also banned headphone use, though this was amended in 2008. The amendment gives race directors the discretion to allow headphones; however, the USA Track & Field emphasis remains "rooted in a concern for athlete and volunteer safety."⁹ The National Ski Patrol and National Ski Areas Association have no official rules on the matter. The Skier Responsibility Code states "ski in control," but this is a general directive open to interpretation. Many people believe that wearing headphones is a personal choice that has no impact on the safety of others or themselves.

Accidental trauma is the leading cause of death in children and young adults of both sexes. In the first 3 decades of life, death from accidental injury is 1.5 to 4 times more common than the second leading causes.¹⁰ Morbidity is reduced by use of protective gear such as helmets and by prompt transport to regionalized trauma centers. However, the greatest gains in minimizing traumatic injury derive from primary prevention: avoidance of the incident altogether. Headphones and handheld electronic devices distract users from their environments. This puts users at increased risk of accidental harm, particularly in dynamic settings with inherent risk such as near moving vehicles, while playing sports, or while engaged in wilderness activities.

We hope that sharing our observations and concern may generate interest in directing further attention to this matter. Formal study is warranted to determine the prevalence of headphone and handheld electronic device use in these settings, as well as the relative risk of injury associated with use of the devices. In the meanwhile, we

recommend counseling participants in active and wilderness events to maintain focus on the task at hand, and either forgo earphones or at least wear them on just 1 ear. If it is quantitatively substantiated that risk of injury is increased with headphone use, the question will arise of whether restrictive policies are required, or whether heightened awareness alone would effect voluntary changes in behavior.

Ramin Jamshidi, MD
Melissa A. Jamshidi, MSN, ANP-BC
Pediatric General & Thoracic Surgery
Phoenix Children's Hospital
Phoenix, AZ

References

1. Lee PC, Senders CW, Gantz BJ, Otto SR. Transient sensorineural hearing loss after overuse of portable headphone cassette radios. *Otolaryngol Head Neck Surg.* 1985;93:622–625.
2. Fligor BJ, Cox LC. Output levels of commercially available portable compact disc players and the potential risk to hearing. *Ear Hear.* 2004;25:513–527.
3. Hodgetts W, Szarko R, Rieger J. What is the influence of background noise and exercise on the listening levels of iPod users? *Int J Audiol.* 2009;48:825–832.
4. Bungum TJ, Day C, Henry LJ. The association of distraction and caution displayed by pedestrians at a lighted crosswalk. *J Community Health.* 2005;30:269–279.
5. Ibrahim JK, Anderson ED, Burris SC, Wagenaar AC. State laws restricting driver use of mobile communications devices distracted-driving provisions, 1992–2010. *Am J Prev Med.* 2011;40:659–665.
6. McCartt AT, Hellinga LA, Bratiman KA. Cell phones and driving: review of research. *Traffic Inj Prev.* 2006;7:89–106.
7. Lichenstein R, Smith DC, Ambrose JL, Moody LA. Headphone use and pedestrian injury and death in the United States: 2004–2011. *Inj Prev.* 2012;18:287–290.
8. Stavrinou D, Byington KW, Schwebel DC. Effect of cell phone distraction on pediatric pedestrian injury risk. *Pediatrics.* 2009;123:e179–e185.
9. USA Track & Field. Press release: USATF amends headphone rule. Available at: http://www.usatf.org/news/view.aspx?duid=USATF_2008_12_22_10_22_16. Accessed August 22, 2012.
10. Heron M. Deaths: leading causes for 2009. *National Vital Statistics Reports.* Hyattsville, MD: National Center for Health Statistics; 2012;61(7):1–95.

In Response to WMS Practice Guidelines for Eye Injuries and Illnesses

To the Editor:

As a member of the Wilderness Medical Society (WMS) for many years and a supporter of evidence-based med-

icine, I appreciate the effort that the WMS has made to develop practice guidelines regarding different aspects of wilderness medicine. Recently, I was reading the guideline for eye injuries and illnesses.¹ Although the attempt at making this guideline conform to the American College of Chest Physicians (ACCP) Grading Recommendations is admirable, I believe the authors may have gone too far with their recommendations in most cases when many of the recommendations may be expert opinions that hold little evidence to support them.

The authors state the “data . . . are sparse . . . therefore we evaluated the data regarding eye injuries and illness . . . and adapted these to the wilderness setting” and “evidence . . . is limited to case reports and extrapolation of clinical and hospital care.” Because of the scarce evidence for many of these illnesses or injuries in wilderness settings, I argue that several of these recommendations should be downgraded. Further, evaluating evidence from the nonwilderness setting and adapting them to the wilderness decreases the certainty of the treatment within this setting. I, however, do not know whether the existing ACCP recommendations can sufficiently handle the complexity of the wilderness medicine guidelines with the paucity of evidence for these conditions in this setting.

Should wilderness practitioners abide by any grade I recommendation in these guidelines? There is not enough room to express the appropriate uncertainty with these recommendations; they do not offer an “insufficient evidence” or even an “expert opinion” for any grade or description. The strength of recommendation taxonomy (SORT) might be considered as an alternative grading system² in the future as it can further differentiate the strength of the evidence and the recommendations and it has more flexibility within its system to work within the wilderness medicine field.

There are several other concerns with this guideline I would like to bring to the attention of the authors. The first issue regarding this guideline is the inclusion of treatments that cannot be done in the wilderness setting. Two specific examples follow. Under central retinal artery occlusion (CRAO), the authors discuss counterpulsation, which is unavailable in the field. Why would it be discussed? Pentoxifylline is an option if available, but counterpulsation is not. The second example is the recommendation of surgical management of acute angle-closure glaucoma as grade 1A. Again, this is not an available field option, so why would it be mentioned? I would think the authors could make a stronger recommendation for emergent evacuation for definitive treatment (ie, surgery) rather than have a treatment option that cannot be done in the wilderness setting.

In the central retinal vein occlusion section, the article states “although the treatments . . . are complicated . . . it is nevertheless reasonable to start . . . with topical steroids.” The authors did not reference any studies to support this. Without even referencing a case report, I would think this is likely expert opinion, and without any studies I would propose this would be very weak evidence on the ACCP system (2C). Although topical steroid drops are unlikely to harm anyone, the risk-benefit analysis cannot be judged in this instance without any studies as there is surely some possible harm from topical steroids such as allergies, irritation, or pain.

In their discussion of conjunctivitis, I would disagree with the 1A recommendation for systemic antibiotics. I would argue that the recommendation should be “do not give systemic antibiotics unless Trachoma present: 1A.” Single dose azithromycin has been shown to be effective for trachoma.³ As the WMS guideline states, conjunctivitis is self-limited, and systemic antibiotics would be a waste of a potentially valuable wilderness resource, and could potentially cause significant harm through *Clostridium difficile* colitis, antibiotic-induced diarrhea, rash, or anaphylaxis, not to mention future long-term concerns for resistance. Further, there is some evidence suggesting that some antibiotics may increase the mortality rate.⁴ I believe the harms do outweigh the benefits on this recommendation and hence my choice for 1A recommendation against systemic antibiotics for conjunctivitis unless trachoma is present.

Regarding orbital fractures, the bulleted recommendation should read “Avoid nose blowing”; the word *avoid* is missing and if someone just read the recommendations, they would recommend nose blowing, which is recommended against in the guidelines.

Under corneal abrasion, the review of cycloplegics, the review cited used combination nonsteroidal anti-inflammatory drugs and cycloplegics; however, the review did not look at cycloplegics alone. There is some evidence that suggests cycloplegics alone do not help for pain control.⁵ From this citation, cycloplegics have no role in the treatment of corneal abrasions, although the Cochrane group will undoubtedly be looking at this issue in the future.

Regarding corneal frostbite, as there are case reports (not even case series), I again would not say 1C would be appropriate. 1C is a strong recommendation; however, I cannot see how this could be a strong recommendation as there is not sufficient strength in the methodology of the studies. I agree there may be little harm, but I cannot agree that there are benefits as there is not enough evidence to support a recommendation as there have been too few cases treated. Again the ACCP grading system fails the WMS practice guidelines.

I do encourage the authors of this and other wilderness guidelines to make them available in the National Guideline Clearinghouse (<http://www.guideline.gov/>) so they can be more available to providers unaware of the Wilderness Medical Society and those who do not have access to *Wilderness & Environmental Medicine*, including students.

Jay Zimmermann, MD
Department of Family and Community Medicine
Penn State Hershey Medical Center
Hershey, PA

References

1. Drake B, Paterson R, Tabin G, Butler FK Jr, Cushing T; Wilderness Medical Society. Wilderness Medical Society practice guidelines for treatment of eye injuries and illnesses in the wilderness. *Wilderness Environ Med.* 2012;23:325–326.
2. Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *Am Fam Physician.* 2004;69:548–556.
3. Evans JR, Solomon AW. Antibiotics for trachoma. *Cochrane Database Syst Rev.* 2011;(3):CD001860.
4. Ray WA, Murray KT, Hall K, Arbogast PG, Stein CM. Azithromycin and the risk of cardiovascular death. *N Engl J Med.* 2012;366:1881–1890.
5. Brahma AK, Shah S, Hillier VF, et al. Topical analgesia for superficial corneal injuries. *J Accid Emerg Med.* 1996;13:186–188.

Reply to Dr Jay Zimmermann's Letter

To the Editor:

We thank Dr Zimmerman for his response to the Wilderness Medical Society Practice Guidelines for Treatment of Eye Injuries and Illnesses in the Wilderness. We appreciate the thoughtful critique regarding both the American College of Chest Physicians (ACCP) classification system and the specific treatments of various eye conditions.

All grading systems have potential limitations. Wilderness medicine topics, in general, have limited and anecdotal evidence. Many of the recommendations given in this practice guideline are graded 1C, which indicates a “strong recommendation” with “low/very low quality evidence.” This recommendation encompasses case series, observational studies, and the like, which is appropriate for the level of evidence that we reviewed.

Some definitive treatments in this guideline are graded 1A, and although it may not be possible to perform all of these in the wilderness setting, they are included to educate all responders to the standard, evidenced-based treatment for the given condition, and to stress, particu-

larly, that if not available in the wilderness, then emergent evacuation must ensue.

Central Retinal Vein Occlusion

It is true that the data to support any particular treatment for central retinal vein occlusion (CRVO) are lacking. To quote Yanoff and Duker's ophthalmology text: “No known treatment reverses the pathology seen in CRVO. Aspirin; systemic anticoagulation with coumadin, heparin, and alteplase; local anticoagulation with intravitreal alteplase; corticosteroids; anti-inflammatory agents; isovolemic hemodilution; plasmapheresis; and optic nerve sheath decompression all have been advocated but without definitive proof of efficacy.”¹ Topical steroids have been suggested for emergency treatment of CRVO.² Because there are minimal data supporting any particular treatment and because there are few downsides to topical steroids, it was determined to be a feasible option for wilderness treatment. We agree that this is in the realm of expert opinion and, therefore, may be better rated as a 2C recommendation.

Conjunctivitis

The 1A recommendation should have only been applied to the recommendation for topical antibiotics. The *Cochrane Review* that is referenced showed that “. . . the use of antibiotics is associated with significantly improved rates of clinical and microbiological remission.”³ The data supporting systemic antibiotics are not as strong and should not have been listed as a recommendation.

Although trachoma may be encountered among a local population abroad, it is rarely encountered during a wilderness excursion, and discussion of global eye diseases was beyond the scope of these guidelines.

Corneal Abrasion

It is correct that the review cited did not specifically address cycloplegics used without nonsteroidal antiinflammatory drugs, as the study evaluated patching versus other treatments and was not intended to specifically look at cycloplegics versus nonsteroidal antiinflammatory drugs. This was, however, the strongest available evidence for treatment of corneal abrasion and, therefore, is the treatment on which we based our recommendation. The study by Brahma et al⁴ does note that topical nonsteroidal antiinflammatory drugs alone were a superior treatment; however, this isolated randomized controlled trial has not yet been reproduced, and we look forward to further research into this question.