

Development of Information Regarding Susceptibility to Heat Illness Using the Cooperative Extension Agency Model in Kentucky

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Context: Dissemination of information regarding the latest research findings in rehabilitative health care is often limited to professional journals. **Objective:** The purpose of the paper is to describe opportunities to better distribute scientific information to wider swaths than normally contained within a readership of a journal, to describe a process to deliver important information via the Cooperative Extension Service, and provide an example of such an informational brochure.

Design: An interdisciplinary approach was developed to provide access to a larger cohort of individuals the latest research findings regarding heat and hydration.

Data Extraction: CINAHL, Medline, and Sport Discus were reviewed from 1966 to 2006 using the terms Heat, Hydration, Rhabdomyolysis, Rehabilitation, Heat Exhaustion, Heat Stroke, and Dehydration. **Data Synthesis:** We found substantial information describing recommendations for preventing, recognizing, and treating illness due to variance in heat and hydration. The information was succinctly summarized, converted to a 7th grade reading level, and shared with a larger audience via a unique model available through Cooperative Extension Agencies. **Conclusion:** Providing scientific information via a Cooperative Extension Model enables sharing of information from experts to communities. This methodology increases the distribution of the latest scientific knowledge to broader audiences.

The purpose of the paper is to describe opportunities to better distribute scientific information to wider swaths than normally contained within a readership of a journal, to describe a process to deliver important information via the Cooperative Extension Service, and provide an example of such an informational brochure (see Appendix, p. 280-281 herein).

Dissemination of information via scientific journals is the means by which experts share knowledge with one another. The information undergoes peer review critical analysis. Sharing of information is often limited to individuals in that or similar professions; however, the ability to disseminate expert knowledge to professionals in other areas or groups of individuals that work in similar conditions but in different settings is limited.

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This issue on heat and hydration issues contains valuable information for individuals that participate in outdoor activities often in high temperatures, under rigorous physical conditions, with very little organized breaks and often for a greater amount of time than any athletic event. It is important when sharing the information to make it accessible and understandable to different constituents. Further, once that information is in a form that is understandable, it is important that it be disseminated to individuals in local communities who would benefit from it the most.

The state of Kentucky and others holds a valuable resource in its Cooperative Extension Service. The University of Kentucky Cooperative Extension Service, with its land grant partner Kentucky State University, is an outreach and engagement system with a mission to improve the lives of Kentuckians by providing research-based education. This educational information addresses important issues in the areas of agriculture, youth development, family health and well-being, and community economic development. The Cooperative Extension Service facilitates taking the university to the people in local communities.

There are 120 Cooperative Extension offices throughout the state of Kentucky, one in each county. Within these offices reside some of the most valuable resources available in the dissemination of information at the local level. Cooperative Extension agents are the connection between the local citizens of their counties and the specialists, faculty, and others on the university campus as well as the agricultural research centers in the state. Likewise, in rural communities, members seek information, guidance, and socialization at these offices. It is a place that provides the feeling of community and a place where information is shared. The information available through Cooperative Extension offices is reliable and research-based, stemming from the work at the University of Kentucky and its partners. It is a place to find the most reliable and valid information for community members.

Extension agents provide research-based educational programming and events in their counties for Kentucky citizens that address the needs of the community. In addition, educational materials are developed and distributed including fact sheets, newsletters, media releases, and videos.

Family and Consumer Sciences (FCS) agents become knowledgeable in many content areas and serve as the resource for information with topics such as family resource management, foods and nutrition, health, safety and wellness, clothing and textiles, and family relations. For many FCS agents, a large part of their health and wellness programming focuses on physical activity and the goal to improve lives through behavior change with increases in daily physical activity among community participants. FCS agents target populations throughout each stage of the life cycle from infants to older adults.

4H/Youth Development agents work to improve the lives and futures of Kentucky's youth. This is probably one of the most recognized and well-known areas of Extension. The 4-Hs stand for Head, Heart, Hands, and Health. With health as an area of focus, physical activity and safety have become a part of the programming.

Agriculture and natural resources agents work with our agriculture and farm communities throughout the state. With physical work and the safety issues involved in the daily routine of this population, programming for these individuals can often be provided through collaboration with FCS agents to reach an even broader audience with health education information.

When provided with research information which has been translated to a simple and usable format, such as fact sheets and other programming materials, extension agents can deliver this information to the people. The Cooperative Extension Service, therefore, provides a valuable resource to extend the reach and impact of research conducted at the university to those who can benefit from it most: the people of the Commonwealth of Kentucky. For example, the newsletter that was developed in this project has the potential to reach over 90,000 Kentuckians through the Cooperative Extension physical activity program, Get Moving Kentucky!

The development of the informational newsletter titled *Heat Illness: Stay Safe During Warm Weather Activities* was a joint effort between the University of Kentucky College of Agriculture and College of Health Sciences. After development of the text information based on the latest scientific evidence, the handout was created and reviewed by three content experts. After review and revision, the brochure was disseminated via the UK Cooperative Extension Health Education Through Extension Leadership HEEL program to the Commonwealth through cooperative extension agents.

In conclusion, providing scientific information via a cooperative extension model enables sharing of information from experts to communities. This methodology increases the distribution of the latest scientific knowledge to broader audiences.

Appendix

UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

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Heat Illness: Stay Safe During Warm Weather Activities

Cooperative Extension Service

This publication was compiled and edited as a joint effort by the University of Kentucky College of Agriculture H.E.E.L. Program and the College of Health Sciences.

Your body is made up of greater than 65% water, therefore, it is important to drink fluids and remain hydrated when outdoors.¹ This can increase safety and performance during physical activity. There are guidelines to decrease risk of injury when engaging in physical activity, especially in warm and hot environments.² There are several risks when mixing hot weather and low fluid intake. Dehydration, heat cramps, exertional heat stroke (EHS), and heat exhaustion are often the result of physical exertion in hot, humid weather without appropriately replacing fluid loss.³

Dehydration

Dehydration is the loss of fluid from the body, and is an illness you can prevent. When you perform intense exercise in a hot environment your cardiovascular (CV) system simply cannot meet the demands of the skin and the muscles to decrease internal heat.¹ As dehydration worsens, the amount you sweat can decrease. Once you feel thirsty, your body is already dehydrated. If dehydration persists, you may become uncomfortable with feelings of sluggishness or nervousness, as well as irritability, fatigue or a loss of appetite.

Heat Cramps

Heat cramps are a mild heat illness that can be easily treated. These intense muscle spasms usually develop after exercising for long periods of time and when large amounts of fluid and salt are lost from sweating. Heat cramps can result from being dehydrated and from sweating. They can leave you feeling thirsty and fatigued. Heat cramps can be avoided by being in good physical condition; getting used to the heat and humidity slowly, and eating and drinking properly.



Heat Exhaustion:

Exercise (heat) exhaustion is the inability to continue exercise due to any combination of heavy sweating, dehydration, sodium loss, or energy depletion. It occurs most often in hot, humid conditions. Other signs and symptoms include paleness, persistent muscle cramps, weakness, fainting, dizziness, headache, hyperventilation, nausea, decreased urine output, and a body-core temperature that generally ranges between 36.8°C (97.8°F) and 40.8°C (104.8°F).²

Exertional Heat Stroke (EHS)

EHS is an elevated core body temperature (usually 40.8°C [104.8°F]) related to signs of organ system failure due to high body temperature. Heat stroke is life threatening and can be fatal unless treated properly. Signs and symptoms include increased heart rate, sweating (although skin may be wet or dry at the time of collapse), hyperventilation, altered mental status, vomiting, diarrhea, seizures, and coma.² The risk of death is greater if a body temperature remains above 41.8°C (106.8°F) and is reduced if body temperature is lowered rapidly.²



Educational programs of the Kentucky Cooperative Extension Service serve all people regardless of race, color, age, sex, religion, disability, or national origin.
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Prevention

Adapting to Heat

It is important to slowly and gradually adapt to exercise. This is sometimes called becoming acclimated, or acclimatization. Slowly and gradually get used to working outdoors in a hot environment. Like athletes, you must adapt to exercise in the heat gradually over 10 to 14 days. Progressively increase the intensity and duration of work in the heat with a combination of strenuous interval training and continuous exercise. If you are overweight you may be more prone to heat disorders. Remaining physically fit will allow you to acclimate to heat more efficiently.³

Fluids, Fluids, Fluids

You should try to match fluid intake with sweat and urine losses to stay hydrated. It is important to replace fluids during outdoor activities that involve high intensity exercise such as bailing hay or harvesting crops. It is as important or more important to replace fluids in the evening and after the activity. These strategies will lessen the risk of short and long term dehydration and decrease the risk of heat-related events. While caffeine is a substance that increases urine production it can be consumed as part of a normal diet without affecting the balance of fluid in your body.⁶ However, caffeinated drinks should not be the primary choice for fluid replacement. The primary choice for fluid replacement should be water and sports drinks. Salt replacement can be made in the form of salty snacks (i.e. pretzels, canned soup) or the dilution of salt in a sports drink in a way that still tastes good. For example, depending on an individual's needs, ¼ tea-spoon of salt (590 mg of sodium) could be added to a 32 oz sports drink to replace lost sodium.^{4, 7}

In conclusion take these steps to prevent heat illness:

- Drink plenty of fluids; water and sports drinks are recommended.
- Limit drinks with caffeine.
- Become acclimatized to heat slowly and gradually.
- Stay physically active to improve your physical fitness.
- You can replace salt by adding a "pinch" to a sports drink in a way that still tastes good.



If you perform intense exercise in the heat, take plenty of breaks to drink fluids, find a cool place to rest, and consider salt replacement especially if you are prone to heat cramps.

For more information on health issues in Kentucky, please visit: www.ca.uky.edu/HEEL

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