Heat and Hydration Curriculum Issues: Part 1 of 4—Hydration and Exercise

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AS ATHLETIC training (AT) educators, we have a responsibility to provide students with the most accurate information and recommended practices related to the prevention, recognition, and treatment of athletic injuries; exertional heat illnesses (EHIs) are no exception. Athletic trainers will encounter numerous EHIs during their careers and must be prepared to respond in an expedient manner to prevent morbidity and mortality.\textsuperscript{1} Currently, there is an overwhelming amount of literature, including two position stands,\textsuperscript{1-4} pertaining to EHIs, fluid replacement, and exercise. There is a need, therefore, for synthesis of the most critical knowledge and skills, particularly for AT educators who are developing lesson plans to cover the material in a manner that fulfills the NATA Educational Competencies.\textsuperscript{5} Currently, the NATA Educational Competencies require an entry-level student to acquire the knowledge and skills pertaining to recognition and treatment of environmental conditions, but the most critical information necessary to achieve this competency has not been specified. As the AT profession moves toward a more evidence-based approach to clinical practice, AT educators must provide students with specific knowledge beyond that which is outlined in the NATA Educational Competencies.\textsuperscript{5} EHI and hydration are interrelated topics, but each requires thorough discussion in the classroom. Knowledge and skill development related to several key concepts can help future athletic trainers prevent the potentially fatal consequences associated with exertional heat stroke (EHS) and hyponatremia (HY).

Athletic trainers are often apprehensive about the hydration status of their athletes. This is a critical concern when athletes exercise intensely in the heat, especially when multiple bouts of exercise must be performed on consecutive days. The process of keeping a group of athletes properly hydrated is not simple; it requires extensive consideration of the various elements that comprise a successful hydration strategy. We hope that a formal presentation of these key considerations will provide a valuable framework for athletic training students to formulate strategies to address these issues related to heat and hydration.

This report is the first of a 4-report series that will present AT educators with suggested teaching strategies and lesson plan objectives related to heat and hydration issues. This report addresses fundamental hydration issues. The second report will address essential issues related to EHI. Attention will be given to the need for rectal thermometry in the third report, and cold water immersion will be addressed in the fourth report.

\textbf{Key Points}

Multiple strategies for information retention and synthesis should be used when developing lessons for heat and hydration.

Lecture, discourse, and experiential learning, are several ways to improve student learning.
Discussion

Athletic training students (ATSs) utilize a variety of learning methods. Learning preference often depends upon the learning environment or the concept being covered. Incorporation of various teaching methods during instruction can enhance a student’s independent thinking, which is essential to the ability of the ATS to implement knowledge in the field. Teaching methods that may enhance student learning that is specific to EHI and hydration status include (a) making a connection to students’ backgrounds, (b) providing lectures (univocal discourse), (c) supplying dialogic discussions, and (d) presenting experiential learning.

The teaching methods recommended in the following section have been provided to address differing levels of learning objectives, as well as a variety of means to address different learning styles. Our suggestions for classroom activities are drawn from a social constructivist learning perspective, which proposes that students construct knowledge within a social context. A social constructivist approach to teaching involves collaborative student work to solve real-life problems, with dialogue serving as the mediator for shared sense-making. Students initially need a foundation from which to construct their knowledge of heat and hydration issues. Consequently, we have identified background connection activities to encourage students to connect their experiences with the given topic and/or to have them apply current understanding to the topic during the initiation of a lesson. We also have outlined lectures to be delivered using univocal discourse, which involves the transmission of knowledge from the instructor to students. The topics covered in these lectures are those considered to be significant to the instructor and acceptable conventions. Lower-level objectives can be effectively addressed with this method, but these can also be attained in a manner that highly engages students cognitively to support their construction of knowledge. The background connection activities and lectures serve as the basis for dialogic discussions, which are central to social constructivist teaching practices. This approach involves having students construct their own meanings of higher-level objectives, such as analyzing and synthesizing concepts (see Casa and Casa for more information about univocal and dialogic discussions). Finally, to further students’ construction of their knowledge of heat and hydration issues, experiential learning activities have been designed to present realistic problems encountered in professional practice. These activities allow students to process concepts in a setting similar to the field (e.g., lab activities), which can allow them to learn at a variety of levels.

The lesson plans outlining key hydration issues are presented in Table 1. The content objectives are listed in the first column and corresponding teaching strategies are presented in the second column. The authors recommend presenting this information in three to four 60- to 75-minute classroom/laboratory sessions. Although heat and hydration issues should be discussed multiple times throughout the curriculum, the initial introduction to the material and objectives discussed below should be conducted with 2nd or 3rd semester students (within an undergraduate AT education program).

Table 2 outlines a starting point for discussions and activities (possibly useful for a research class for senior students). AT educators are encouraged to reference the NATA Fluid Replacement for Athletes Position Statement and the ASCM Fluid Position Statement for further information. See also Table 3 for a self-testing program for optimal hydration.

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<thead>
<tr>
<th>Table 1. Key Hydration Curriculum Issues and Recommended Teaching Strategies</th>
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<tbody>
<tr>
<td><strong>Content Objectives</strong></td>
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<tr>
<td>Physiological and health ramifications of dehydration</td>
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<td>Students will recognize the importance of maintaining adequate hydration levels as a consequence of dehydration.</td>
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