

Adopting a Public Health Lens: One Program's Story

Mark Hoffman, PhD, ATC, FNATA*; Cathleen Crowell, PhD, ATC†; Kim Hannigan, PhD, ATC†; Marc F. Norcross, PhD, ATC†; Sam Johnson, PhD, ATC†

*College of Public Health and Human Sciences, Oregon State University, Corvallis; †School of Biological and Population Health Sciences, Oregon State University, Corvallis

Context: The clinical practice of athletic training involves the daily application of public health (PH) principles and practices. In recent years, there has been an increased interest in understanding and promoting the intersections of athletic training and PH.

Objective: The primary objective of this article is to share the path taken by the Oregon State University athletic training faculty to integrate PH perspectives into our work and provide examples of how this has affected our program, scholarly work, and service activities.

Background: Our college pursued and obtained accreditation from the Council for Education for Public Health. During the pursuit of accreditation, the college's leadership encouraged each academic program to integrate direct connections to PH.

Description: Our athletic training program embraced the administration's encouragement to adopt a PH lens and took definitive steps developing relationships and establishing collaborations with PH experts. Additionally, we started to establish approaches for infusing PH content and perspectives into our curriculum.

Clinical Advantage: Athletic training programs can position themselves and their students to forge partnerships and find resources, solutions, or skill sets that are currently underutilized in athletic training.

Conclusions: The adoption of a PH lens by the athletic training program at Oregon State University has benefitted students and faculty. We recommend all athletic training programs explore opportunities to integrate PH into activities inside and outside of the classroom.

Key Words: Curricular development, program philosophy, athletic training advancement

Dr Hoffman is currently Associate Professor in the College of Public Health and Human Sciences at Oregon State University. Please address correspondence to Mark Hoffman, PhD, ATC, FNATA, School of Biological and Population Health Sciences, Oregon State University, 2450 Jefferson Way, Corvallis, OR 97330. mark.hoffman@oregonstate.edu.

Full Citation:

Hoffman M, Crowell C, Hannigan K, Norcross MF, Johnson S. Adopting a public health lens: one program's story. *Athl Train Educ J*. 2020;15(4):331–336.

Adopting a Public Health Lens: One Program's Story

Mark Hoffman, PhD, ATC, FNATA; Cathleen Crowell, PhD, ATC; Kim Hannigan, PhD, ATC; Marc F. Norcross, PhD, ATC; Sam Johnson, PhD, ATC

KEY POINTS

- Integration of Public Health concepts into an AT curriculum requires intentionality.
- Adoption of a Public Health perspective should be program wide.
- There is extensive overlap between the practices of AT and PH.

INTRODUCTION

Athletic training traditionally has been viewed as a health care profession that provides care to individuals by preventing, treating, managing, and rehabilitating injuries or conditions. However, as all patients are members of a larger group, an athletic trainer (AT) is also frequently concerned about addressing health issues of populations of patients such as teams, groups, and communities. This approach of addressing health beyond the individual is a foundational tenet of public health (PH).

The World Health Organization defines *health* as a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity.¹ This holistic perspective, taking into account an individual's physical, mental, and social wellbeing, allows for the extrapolation beyond the individual to a group or population. When these concepts are extended to a group or population, it becomes PH. Public health is an interdisciplinary field focusing largely on the promotion of health and wellness in a group or population through illness and injury prevention. This includes tracking illnesses and injuries through surveillance systems and working with a broad range of disciplines to promote health by developing interventions and policy. In short, the PH approach prioritizes "prevention over treatment, populations over individuals, and engagement at multiple levels."^{2(p576)}

Athletic training and PH have intersected for decades. Injury and illness prevention have long been a domain of the athletic training profession. There is a long history of ATs conducting or assisting with injury surveillance. Additionally, given the practice settings of many ATs, there is a responsibility for the health of a group or population, such as a team, a school, or a business. Athletic trainers often participate in developing, disseminating, and implementing interventions and policies related to health and safety of the populations they serve. Each of these are related to key functions of PH.

More recently, awareness of the intersection between athletic training and PH has increased in a variety of ways. In 2015, the Athletic Training and Public Health Summit² was held at Oregon State University (OSU). In 2019, the *Journal of Athletic Training* published a special issue devoted to PH and athletic training. In 2020, the Commission on Accreditation of Athletic Training Education (CAATE) curricular standards will require "foundational knowledge" in PH. Additionally,

there has been a notable increase in presentations at local and national meetings on this topic.

Given the connection and common goals of athletic training and PH combined with the pressing needs to improve the health of the population, some athletic training programs have embraced the intersections of the 2 disciplines and have taken specific actions to adopt a PH lens for their curriculum. At OSU, one of the prime drivers of adopting a PH lens was when the College of Public Health and Human Sciences pursued accreditation from the Council on Education of Public Health. With the college's move toward accreditation, faculty in all non-PH programs (athletic training, human development and family sciences, kinesiology, and nutrition) were encouraged to explore ways to infuse PH practices and perspectives into their work. The athletic training faculty at OSU fully embraced this charge and actively started identifying ways our interests and activities fit under the PH umbrella. The primary objective of this article is to share the path we, the OSU athletic training faculty, have taken to integrate PH perspectives into our work and provide examples of how this has affected our program, scholarly work, and service activities. In some respects, the college's pursuit of PH accreditation was a watershed moment for our athletic training faculty. We quickly realized the natural overlap of many of our interests with the interests of faculty from the traditional PH disciplines. Ultimately, this has resulted in new collaborations, scholarly projects, and infusion of PH principles into our curriculum. We are excited about the collaborations we have formed and the work we are doing and perhaps more importantly the impact on the development of our athletic training students. Due to these benefits, we encourage other ATs to seek opportunities to connect athletic training and PH.

Teaching from a PH Perspective

The athletic training program at OSU has a long history of educating future ATs. The professional undergraduate program has been accredited by the CAATE or one of its predecessors for over 40 years. In the summer of 2016, we welcomed our first cohort of professional master's students, and the program was accredited at the master's level in 2017.

The transition from an undergraduate program to a graduate program afforded us several advantages in infusing PH content in the program. Unlike with the undergraduate program, the master's students complete primarily athletic training specific courses. This allowed us to either offer new athletic training specific courses or expand existing courses to cover additional content. With the additional course credits, we are able to incorporate PH content throughout the program.

One of the Council on Education of Public Health accreditation requirements was that all students in the college enrolled in degree programs outside of the traditional PH

Table. Examples of Where in the Curriculum the 4-Step Sequence to Sports Injury Prevention is Applied Using an Example of Primary, Secondary, and Tertiary Prevention

	Step 1: Establishing the Extent of the Problem	Step 2: Establishing the Risk Factors and Mechanism of Injury	Step 3: Introducing Prevention Measures	Step 4: Assessing the Preventative Measure
Lateral ankle sprains (standards 70, 71, 78)	<ul style="list-style-type: none"> • Orthopedic Assessment of Lower Extremity Injuries (Year 1, Fall) • Physiology and Management of Musculoskeletal Injuries (Year 1, Fall) • Evidence-Based Medicine (Year 1, Spring) 	<ul style="list-style-type: none"> • Orthopedic Assessment of Lower Extremity Injuries (Year 1, Fall) 	<ul style="list-style-type: none"> • Introduction to Athletic Training (Year 1, Summer) • Clinical education experiences 	<ul style="list-style-type: none"> • Evidence-Based Medicine (Year 1, Spring) • Lower Extremity Therapeutic Exercise (Year 2, Fall)
Behavioral health (standard 77)	<ul style="list-style-type: none"> • Psychosocial Factors in Physical Activity (Year 1, Winter) 	<ul style="list-style-type: none"> • Psychosocial Factors in Physical Activity (Year 1, Winter) 	<ul style="list-style-type: none"> • Athletic Training Management (Year 2, Winter) • Clinical education experiences 	<ul style="list-style-type: none"> • Evidence-Based Medicine (Year 1, Spring)
Asthma (standards 70, 71, 74, 75)	<ul style="list-style-type: none"> • General Medical Assessment (Year 1, Winter) • Emergency Management of Sports Trauma (Year 1, Spring) 	<ul style="list-style-type: none"> • General Medical Assessment (Year 1, Winter) • Emergency Management of Sports Trauma (Year 1, Spring) 	<ul style="list-style-type: none"> • Athletic Training Management (Year 2, Winter) 	<ul style="list-style-type: none"> • Evidence-Based Medicine (Year 1, Spring)

disciplines needed to complete coursework covering foundational PH knowledge. This requirement aligns nicely with the CAATE’s 2020 curricular standards related to PH. To meet these requirements, students complete a Foundations of Public Health course during their first summer in the program. The course focuses on the fundamental principles, concepts, and tools used in PH to promote population health and incorporates a combination of case study methods, lecture, and discussion. The goal of the course is that students will develop a broad understanding of PH and recognition of how discipline specializations address the social, behavioral, and environmental determinants of PH.

Since the students complete the foundational PH course during their first term in the program, we build on this knowledge in other courses in the curriculum. One way we have done this is by using the 4-step sequence to sports injury prevention developed by van Mechelen et al³ that includes:

- (1) Establishing the extent of the problem,
- (2) Establishing the risk factors and mechanism of injury,
- (3) Introducing prevention measures, and
- (4) Assessing the preventative measure by repeating step (1).

While we recognize others have proposed additional steps to the van Mechelen et al model,^{4,5} the original 4-step sequence works well for us, as it provides a straightforward introduction to the PH approach for athletic training students. Additionally, we augment the content with ideas of the other models in our courses. In this section, we describe our approach to integrating PH concepts throughout the curriculum using the 4-step sequence of prevention as a guide. The

Table provides examples of the courses where each of the 4 steps in the sequence is applied using athletic training specific examples that encompass primary, secondary, and tertiary prevention.

Establishing the Extent of the Problem. *Epidemiology* is a core PH discipline that studies the distribution and determinants of health-related states or events and applies these studies to control health problems.⁶ We believe it is essential for ATs to understand the prevalence, incidence, or both as well as the severity of injuries and conditions they may encounter. For example, in our musculoskeletal assessment course series and general medical assessment course, students are exposed to these principles for the different conditions covered in the courses. In the evidence-based practice course, students are encouraged to seek out data to inform their practice. Furthermore, the appreciation of epidemiological data helps in the understanding of the impact a certain type of injury or condition (eg, anterior cruciate ligament rupture) has on the greater population and the downstream consequences for predisposition to other conditions (eg, osteoarthritis). We also address these concepts in the athletic training program management course while discussing resource allocation. Additionally, in our therapeutic exercise courses, both short- and long-term consequences of the injury are covered. In these courses, we highlight the importance of seeking resources on different populations from a variety of sources. We believe all these principles are important for the future AT when he or she either collects these data or interprets them.

Establishing the Risk Factors and Mechanism of Injury. Understanding the risk factors and the mechanisms for different injuries is critical to the success of AT practice. In

many of our courses, we cover ideas such as the difference between modifiable and nonmodifiable risk factors. We also address differences between populations, genders, and health disparities. In our administration course, the students develop policies and procedures based on specific risk factors and etiologies.

Introducing Prevention Measures. Athletic trainers commonly implement preventative measures for the population in which they are working. Historically, much of the attention related to the prevention of injuries and illnesses by ATs has focused on preventative taping and bracing. However, ATs perform a great deal of preventative work that often goes undocumented. This work ranges from assessing environmental conditions to developing educational programming for a population, such as a team, on the dangers of substance abuse including vaping or chewing tobacco. This type of prevention is highlighted throughout our program. Additionally, we go beyond just developing the preventive measure and cover the importance of how to implement the intervention. For example, after writing policies and procedures in the athletic training program management course, students discuss how to disseminate and implement the policies to ensure effectiveness.

Assessing the Preventative Measures. After the implementation of the prevention measure, it is important to determine whether the program works. We stress the importance of incorporating assessments whenever prevention programs are implemented. Students learn about different outcome measures, including both patient- and practitioner-centered outcomes, in their assessment and evidence-based practice courses. Students also learn methods to assess quality and impact of the prevention programs they implement through a quality improvement process and concepts of numbers needed to treat. We address that certain outcomes can be challenging to measure due to some injuries occurring infrequently and emphasize there may be proxy variables, such as the number of coaches adopting a prevention program, that provide valuable information.

While the injury prevention model is sequential, due to the nature of our curriculum and differing rotations for clinical education experiences, not all aspects of the model are introduced chronologically. However, all students complete a required culminating capstone project geared toward their current or future clinical setting. In many cases, the students select a capstone project that follows the model in sequential order and offers a real-life application of the process to a clinically relevant problem. Some of the work products have been critically appraised topic papers, policy and procedures documents, and implementation guides.

We believe our program successfully introduces a population level approach to our coursework. Content is continually being added and updated each term. For example, students document patient encounters in electric health records, and there is increasing interest in using this data for quality improvement projects as well as to address population level health issues. We have received feedback from some students that their interest and eventual satisfaction with our program was positively impacted by our emphasis on integrating PH principles into our curriculum.

Scholarship from a PH Perspective

Similar to teaching, the adoption of a PH lens has influenced the scholarship activities of our faculty in ways that positively impact not only patient care but the athletic training profession. Although the research expertise of athletic training faculty in our program is generally in the areas of motor control and lower extremity biomechanics, we quickly discovered the importance of developing collaborations with colleagues from traditional PH disciplines. Some of the connections we have successfully made are with individuals in health promotion and health behavior, epidemiology, and health management and policy. By working collaboratively, we combine their expertise and research methodologies with our knowledge of athletic training practice to answer fundamental, population-level questions of great importance to athletic training that have been generally unexplored.

Our first foray into PH scholarship focused on policy evaluation. While various professional organizations, including the National Athletic Trainers' Association and National Athletic Trainers' Association Research and Education Foundation, focus on developing and publishing best-practice recommendations, it is relatively uncommon for ATs to engage in evaluations determining the extent of best practice implemented in the real world. Accordingly, one of the calls emanating from the 2015 Athletic Training and Public Health Summit was to evaluate the extent to which best practice and best-practice policies are being used in the community.² Facilitated by the curiosity of one of our athletic training students, we evaluated the level of preparedness of Oregon high schools to respond to a catastrophic sports-related emergency.⁷ We also reached out to international experts in health promotion and health behavior to assist in the development of a questionnaire that we have used to assess the knowledge, attitudes, and behaviors of high school⁸ and club⁹ soccer coaches with respect to their use of lower extremity injury prevention programs.

A second research area that our faculty has been active in since adopting a PH lens is sports epidemiology—or more precisely in the development of software that will allow detailed athletic exposure reporting to be used across all institutions in a major athletic conference. An athletic conference-wide injury surveillance system was being developed by others when we recognized some significant limitations of the system that would effectively limit the types of questions the conference and its member schools could answer from the data. Using our past experience working as ATs in the conference and the discipline-specific expertise of colleagues in epidemiology and computer science, we developed an athletic exposure reporting system that will allow the conference's injury surveillance system to be one of—if not the—most powerful surveillance systems in terms of the number of athletes and the level of athletic exposure detail captured.

Most recently, we partnered with a colleague trained in health policy and management with specific expertise in analyzing insurance claims information. Through this collaboration and the assistance of another OSU PH faculty member with expertise in geographic information system mapping, we were able to investigate the influence that having athletic training services at a high school has on medical payments and

utilizations.^{10,11} In addition to being the first investigation to evaluate the influence that ATs have on medical claims, our ability to use a population-level approach allowed us to demonstrate that the effect that ATs in the high school setting have on medical costs and utilization is dependent upon the type of insurance that their patients have (ie, public versus private insurance) and possibly their employment model (ie, employed directly by the district versus via a clinic-outreach model). The results of this work are also being used to inform State of Oregon legislators in an effort to garner support for PH funding to provide all Oregon high schools with access to athletic training services.

In each of these examples, it is important to note that none of the AT faculty involved in this scholarly work had specific expertise performing survey-based psychosocial research, sports epidemiology, or insurance claims analyses. Rather, we simply made a conscious decision that we wanted to go beyond the confines of our laboratories to conduct research that might have a more immediate impact on health and wellness in our community. The only requirements for accomplishing this was for us to recognize that (1) we did in fact have the appropriate expertise to know what types of questions to ask, (2) our limitations were most often associated with the specific methodology or analysis technique that was needed to answer those questions, and (3) once we had the results, we were best positioned to interpret the implications of those results on athletic training practice. Ultimately, as long as a topic falls within the knowledge base of an AT, potential areas of research are really only limited by a failure to identify the right types of collaborators. As a result, we continue to identify new areas that lend themselves to a population-level approach, including asthma management and injury and illness prevention in wildland firefighters.

Service from a PH Perspective

The adoption of a PH lens by our program has influenced choices faculty make regarding participation in service activities outside the university. We have become more aware of local, regional, and national opportunities to engage with individuals and groups involved with and leading initiatives focused on PH issues.

In terms of policy development and evaluation, several of us have been invited to join the Oregon School Activities Association's Sports Medicine Advisory Committee with the intention that we would bring a PH perspective to the committee. Faculty have also testified in front of the Oregon Legislature about the important role that ATs play in ensuring the health and safety of high school students in Oregon. Additionally, we have been invited to join a state-level assessment of the state's youth concussion law that the State of Oregon conducted with the goal of determining what resources the state could provide to schools.

We have also been involved in state-level educational campaigns related to suicide prevention, antibullying, and emergency preparedness. The suicide prevention campaign was a partnership with the Oregon Health Authority, which houses the state's PH division. Our faculty have also been invited to participate in the development of an educational campaign on preventing opioid abuse by using an upstream approach to pain management.

For ATs, the number of PH issues and potential places for collaboration is extensive. For example, asthma continues to be a significant PH issue in the United States and around the world and one where ATs can make an impact. Specifically, one of the OSU AT faculty members is working closely with an asthma education group to explore opportunities for ATs to deliver asthma education to schools and communities. This is a natural fit for many ATs since they already possess most of the knowledge needed to educate patients and families on asthma management. Additionally, our faculty has experienced a lot of success working with state-level high school and PH organizations. Much of our work is occurring at the state level because that is where our relationships naturally occurred. Our experiences working at the state level has been highly collaborative and void of turf issues. The organizations we have connected with generally understand the importance of ATs working in the secondary schools and appreciate the access that ATs have in this population. We have not extensively explored working with the local health department, mainly because our activities thus far have connected us at a different level. However, we acknowledge that engaging local health departments holds great potential for collaborations and relationships at a level that could facilitate effective improvements in the health of our communities.

CONCLUSIONS

Our efforts to integrate PH concepts into our program have resulted in positive outcomes in the education of athletic training students and in the faculty's scholarship and service activities. The opportunities and direction of scholarship by our faculty and others have impacted local and state policy as well as created collaborations among a greater variety of stakeholders in PH. The graduates from the AT program have exposure to PH approaches to injury assessment, risk factor analysis, and prevention implementation to enhance their clinical practice. We acknowledge that additional ways to integrate PH approaches into our program exist and look forward to continuing to adapt our program to meet these challenges.

At OSU, we are fortunate to be housed in the same academic college as our PH collaborators but emphasize that this arrangement is not essential for athletic training programs to adopt a PH lens. As was clearly noted at the Athletic Training and Public Health Summit in 2015,² identifying and establishing a relationship with PH experts possessing the expertise needed to answer an athletic training related question is the most critical step. We encourage athletic training programs to recognize the potential benefits that an approach such as ours would provide to their students and faculty and seriously consider infusing PH content into all aspects of their programs.

REFERENCES

1. Constitution. World Health Organization Web site. <https://www.who.int/about/who-we-are/constitution>. Accessed October 8, 2020.
2. Hoffman M, Bovbjerg V, Hannigan K, et al. Athletic training and public health summit. *J Athl Train*. 2016;51(7):576–580. doi:10.4085/1062-6050-51.6.01.
3. van Mechelen W, Hlobil H, Kemper HC. Incidence, severity, aetiology and prevention of sports injuries. A review of concepts.

- Sports Med.* 1992;14(2):82–99. doi:10.2165/00007256-199214020-00002.
4. Finch C. A new framework for research leading to sports injury prevention. *J Sci Med Sport.* 2006;9(1–2):3–9; discussion 10. doi:10.1016/j.jsams.2006.02.009.
 5. Van Tiggelen D, Wickes S, Stevens V, Roosen P, Witvrouw E. Effective prevention of sports injuries: a model integrating efficacy, efficiency, compliance and risk-taking behaviour. *Br J Sports Med.* 2008;42(8):648–652. doi:10.1136/bjsm.2008.046441.
 6. Steadman, TL. *Stedman's Medical Dictionary.* 28th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2005.
 7. Johnson ST, Norcross MF, Bovbjerg VE, Hoffman MA, Chang E, Koester MC. Sports-related emergency preparedness in Oregon high schools. *Sports Health.* 2017;9(2):181–184. doi:10.1177/1941738116686782.
 8. Norcross MF, Johnson ST, Bovbjerg VE, Koester MC, Hoffman MA. Factors influencing high school coaches' adoption of injury prevention programs. *J Sci Med Sport.* 2016;19(4):299–304. doi:10.1016/j.jsams.2015.03.009.
 9. Morgan EA, Johnson ST, Bovbjerg VE, Norcross MF. Associations between player age and club soccer coaches' perceptions of injury risk and lower extremity injury prevention program use. *Int J Sports Sci Coach.* 2018;13(1):122–128. doi:10.1177/1747954117707480.
 10. Li T, Norcross MF, Johnson ST, Koester MC. Cost-benefit of hiring athletic trainers in Oregon high schools from 2011–2014. *J Athl Train.* 2019;54(2):165–169. doi:10.4085/1062-6050-390-17.
 11. Li T, Johnson ST, Koester MC, Hommel A, Norcross MF. The impact of high school athletic trainer services on medical payments and utilizations: a microsimulation analysis on medical claims. *Inj Epidemiol.* 2019;6:15. doi:10.1186/s40621-019-0194-y.