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**Title:** *Health Economics: The New Language of Athletic Training Impact*

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1 It is with great excitement that we open the discussion of the achievements within the athletic  
2 training (AT) profession and their promising impact on the horizon in the field of health  
3 economics. We intend to offer a storied connection between past, current and future athletic  
4 training initiatives and the potential impact on the greater health care system when viewed  
5 through the lenses of health economics. The evolution of athletic training practice tells a story  
6 that when reviewed using terminology and paradigms found in greater healthcare system, new  
7 opportunities are identified. Health economics offers the possibility for the redefining of athletic  
8 training in ways that drive value demonstration, future initiatives and even possibly offer insight  
9 into the challenges of practice evolution.

### 11 **Redefining of Athletic Training Services**

12 Athletic Training is a unique health care profession with foundations established in athletics.  
13 Using traditional descriptors, athletic training is defined by athletic settings not normally  
14 recognized by the Centers for Medicare and Medicaid as Medicare providers <sup>1</sup>. In these  
15 situations, the AT was simply part of the team and bridged the gap between athletics and health  
16 care providing services as needed under the guidance of a supervising physician. If these  
17 foundational settings are reviewed using terminology and descriptors common to health care  
18 systems today and those found in the discussion of health economics, we find new insight. For  
19 example, traditional athletic settings offer service delivery models strong in preventative health  
20 care and population health management where the AT is most often the first point of contact and  
21 embedded in the population they serve. They are responsible for the coordination of care  
22 management for those needing additional services and the efficient use of medical networks to  
23 achieve an efficient and effective patient outcome. Traditional service delivery models also

include comprehensive services from prevention through recovery. Review of athletic training practice using terminology consistent with health care and economics exposes new insights in the delivery characterization of athletic training services and find a unique parallel to those in primary care <sup>2</sup>. The parallel of AT services to primary care services provides insight into opportunities for value demonstration and business models primary care providers have found effective.

It is without doubt that the athletic training profession has expanded in clinical skill set and employment opportunities. Members of the Athletic Training Strategic Alliance have provided resources documenting the expansion in both certification and educational requirements. The Board of Certification for the Athletic Trainer has established a comparative guide showing the differences between the 8<sup>th</sup> Practice Analysis to the 7<sup>th</sup> edition <sup>3</sup>. The guide demonstrates the evolution of AT competency. The Commission on Accreditation of Athletic Training Education has also published comparative resources from the current program standards and their evolution <sup>4</sup>. The National Athletic Trainer's Association (NATA) has also demonstrated the expansion and placed significant emphasis on support needed to identify and grow professional opportunities <sup>5</sup>.

Growth and value demonstration has been a focus for many years within the profession and a driving factor behind the multitude of practice settings and delivery models found today.

Creation of NATA committees focused on public health and practice settings and taskforces focused on labor demands, compensation advocacy and data informed practice are proof of the intention to demonstrate values and capitalize on ATs strengths. Coupled with the ongoing labor impact in the wake of the COVID-19 response and the rapidly expanding opportunities for ATs, the importance of understanding return on investment for therapeutic interventions, resource allocation of ATs labor force and for targeted advocacy of supportive policies become clear.

These same needs are impacting the greater healthcare system and open the door for clear communication of the impact ATs have on patients and systems, which creates an amazing opportunity to respond with an understanding of the intersection of AT profession and health economics. The NATA has recently updated its membership practice questions to support greater understanding of not only the expanded practice settings, but also the delivery and financing models <sup>6</sup>. With expanded membership data, successful models that promote professional vitality and improved delivery of AT services will be sought. This expanded delivery model insight along the review through primary care lenses are examples of the intersection of athletic training and health economics.

Hallmark efforts such as the 1990 recognition as an American Medical Association allied health care provider have solidified athletic trainers' legitimacy in the healthcare system, placing them in the spotlight highlighting important impact on concussion management, sudden cardiac arrest, heat illnesses, public health, and partnerships in primary care science. Traditionally, the values of ATs services are proven through keeping athletes on the field, workers in the factory, and soldiers ready for deployment—successes that remain ATs' victory song. In an evolving model of healthcare, outcomes referenced against the cost of services define the new language of value, driven by data. This is where the application of economic principles and modeling against the practice of athletic training becomes particularly exciting. In 2019, the Athletic Training Research Agenda provided focused recommendations from the athletic training community on critical topics related to the profession's advancement and prioritized health economics <sup>7</sup>.

## **Why is Economic Analysis Used**

Health economics is a study of allocation of limited resources aiming to improve health care quality, accessibility, and affordability. Decision and policy makers often face alternative strategies that can achieve varying levels of success and require different amounts of investment, but they cannot fund all interventions due to budget constraints and resources scarcity. In these cases, health economists can implement economic analyses to inform evidence-based decision makings of the best use of limited resources. Economic evaluation is an analytical technique that compares the costs and the outcomes of alternative strategies. It has been used in a variety of areas and settings of clinical and population health to assess the values of health care technologies, services, and interventions. Researchers and providers have evaluated a wide range of topics, such as colorectal cancer screening in elderly persons<sup>8</sup>, health promotion program to improve blood pressure control<sup>9</sup>, early childhood interventions to improve self-regulation<sup>10</sup>, intervention program to prevent alcohol misconduct in military setting<sup>11</sup>, and so on. Federal agencies also compared cost and benefits in rulemaking process, and “most agencies are to design regulations in a cost-effective manner and ensure that the benefits of their regulations justify the cost”<sup>12</sup>.

It is valuable to note the utilization of health economics as a common pathway for practice improvement and vitality is not unique to athletic training. Our partners in primary care and physical therapy are also focused on the study of and communication of value using health economic principles. Primary care providers continue to research financing and service delivery models that have positive economic impacts<sup>13</sup>. Likewise, the physical therapy profession has developed a report to discover how physical therapy can improve cost-effectiveness of care<sup>14</sup>. AT efforts in the same space are paramount to the vitality of the profession and the identification of new ways to communicate value.

### 93   **How Is Economic Analysis Conducted**

94   Because economic analysis aims to identify the optimal strategy that can improve the outcome at  
95   a lower cost, outcomes and costs are key components when evaluating and comparing  
96   interventions. Intervention outcomes or effectiveness can be short-term or long-term, and can be  
97   intermediate or ultimate. Since ATs work to prevent injuries and promote healthy behaviors, they  
98   have great potential for improving clinical and community outcomes, such as preventing  
99   emergency department visits, and reducing missing school and working days, which can all be  
100   analyzed as effectiveness measures. These outcomes can also be converted into monetary values,  
101   for example, savings in medical payments by reducing preventable visits associated with AT  
102   services <sup>15</sup>. Evaluation of the monetary values of outcomes, or the return from investments, can  
103   make the findings easier to understand and more straightforward to inform investment decisions.  
104   This can be particularly helpful to facilitate comparisons among alternative interventions across  
105   disciplines and of which the desired outcomes are different.

106   On the other hand, cost is to measure the resources people spend in a particular use or the  
107   investment in an intervention. Examples are investment in hiring ATs such as salaries and  
108   benefits <sup>16</sup> or cost of implementing injury prevention programs <sup>17</sup>. It warrants attention that other  
109   costs may also be incurred to people if, for instance, they need to pay for transportation or take a  
110   day off to receive care. This sheds light on the importance of explicitly describing the  
111   perspective of an economic study, because the perspective determines whose interest and  
112   viewpoint the study focuses, and in turn identifies what effectiveness and costs measures should  
113   be counted <sup>18,19</sup>.

Cost-effectiveness analysis (CEA) and benefit-cost analysis (BCA) are two basic types of economic analysis where the results summarize differences in uses of resources and different success in achieving non-monetary or monetary outcomes. In CEA, the outcome is measured in its nature unit (not converted into monetary value). The result can be expressed as the incremental cost-effectiveness ratio (ICER) with difference in uses of resources (cost) in the numerator and different success in achieving outcomes (effectiveness) in the denominator. ICER can then be interpreted as the additional cost of investment in a strategy over another to gain one additional unit of desired outcome. If, as above mentioned, the outcome is measured as monetary values in BCA study, then return-on-investment (ROI) can be calculated as the amount of benefits or savings associated with per-dollar investment in an intervention.

These methods have been used to analyze economic impacts and aid in investment decisions relevant to AT services. In a recent study, Peterson et al<sup>17</sup> estimated an ROI of over \$7 saved in anterior cruciate ligament treatment cost prevented for every dollar investment in the implementation of injury prevention programs compared with standard warm-up. Earlier research also suggested economic impacts of high school AT services may vary by insurance status<sup>16</sup>. These studies demonstrate the critical role of economic evaluation in identifying opportunities to improve the economic analysis of AT services. Despite its importance, Peterson and Li<sup>18</sup> reviewed the economic evaluation studies of AT services and found the literature remained limited, suggesting this is still a new area with great potential.

#### **Promote Economic Analysis for ATs**

Above we provide a brief overview and summarize a few key elements of economic analysis as a starting point to provide the foundation for exploration and discussion of opportunities for practice based research for ATs. Peterson and Li <sup>18</sup> recently reviewed literature and provided thorough discussion on how to implement and improve economic evaluations for AT research. We also suggest a few references to readers who are interested in more discussion.<sup>19–21</sup>

Collaboration between clinicians and researchers will be pivotal in advancing understanding and application of health economics in athletic training. Opportunities such as the Athletic Training Practice Based Research Network and the supporting electronic medical record is a prime example of the collaboration that leverages the expertise of the practicing clinician and the researcher<sup>22</sup>. The results are publications and informed clinical decisions that drive improved outcomes and efficiencies. Such efforts support association plans. The NATA Strategic Plan 2023-2025 has also identified the vitality of the profession and the values of the athletic training skill set as significant priorities for professional advocacy<sup>5</sup>. So it is with a strong direction that all practicing ATs need data to validate their professional endeavors and enhance their value message. They are also in an ideal situation to record and share information and practices that support ATs economic values. Recording treatment encounters, tracking downstream revenue, preventing lost work time and its costly impact and triaging for more efficient referral patterns are but a few examples of the ways ATs track economic impact.

## **Conclusion**

In order to facilitate decision and policy makings on investment in ATs services, it is imperative to develop more economic research in this area. Important to the success of athletic training,



economic research is a more common understanding of economic principles and the methods and ways in which the principles can be leveraged by the professional body of athletic trainers. We hope this current thematic issue of health economics can inspire and foster more interdisciplinary collaborations to advance economic research of AT services and to promote the athletic training profession.

## References:

1. National Athletic Trainer's Association. Billing 101. NATA. August 10, 2015. Accessed March 28, 2025. <https://www.nata.org/practice-patient-care/revenue-reimbursement/general-revenue-reimbursement/billing-101>
2. Foo CD, Surendran S, Jimenez G, Ansah JP, Matchar DB, Koh GCH. Primary Care Networks and Starfield's 4Cs: A Case for Enhanced Chronic Disease Management. *International Journal of Environmental Research and Public Health*. 2021;18(6):2926. doi:10.3390/ijerph18062926
3. Board of Certification for the Athletic Trainer. BOC Practice Analysis, 8th Edition May Impact Your Education Program. Board of Certification for The Athletic Trainer. February 15, 2023. Accessed March 28, 2025. <https://bocatc.org/newsroom/boc-practice-analysis-8th-edition-may-impact-your-education-program/>
4. Commission on Accreditation of Athletic Training Education. Professional Program Standards. Accessed March 28, 2025. <https://caate.net/Programs/Professional/Professional-Program-Standards>
5. National Athletic Trainers' Association. *Strategic Plan 2023-2025*. [https://www.nata.org/sites/default/files/nata\\_strategicplan2023\\_full-web-reduced.pdf](https://www.nata.org/sites/default/files/nata_strategicplan2023_full-web-reduced.pdf)
6. National Athletic Trainer's Association. Update Your Workplace Settings. NATA. August 12, 2024. Accessed March 31, 2025. <https://www.nata.org/nata-now/articles/2024/08/update-your-workplace-settings>
7. Eberman LE, Walker SE, Floyd RT, et al. The Prioritized Research Agenda for the Athletic Training Profession: A Report From the Strategic Alliance Research Agenda Task Force. *J Athl Train*. 2019;54(3):237-244. doi:10.4085/1062-6050-374-18
8. van Hees F, Habbema JDF, Meester RG, Lansdorp-Vogelaar I, van Ballegooijen M, Zauber AG. Should colorectal cancer screening be considered in elderly persons without previous

- 188 screening? A cost-effectiveness analysis. *Ann Intern Med.* 2014;160(11):750-759.  
189 doi:10.7326/M13-2263
- 190 9. Côté I, Grégoire JP, Moisan J, Chabot I, Lacroix G. A Pharmacy-Based Health Promotion  
191 Programme in Hypertension. *Pharmacoeconomics.* 2003;21(6):415-428.  
192 doi:10.2165/00019053-200321060-00005
- 193 10. Li T, McClelland MM, Tominey SL, Tracy A. Cost-Effectiveness Analyses on Various  
194 Models of The Red Light, Purple Light Self-Regulation Intervention for Young Children.  
195 *Front Psychol.* 2021;12. doi:10.3389/fpsyg.2021.711578
- 196 11. Li T, Waters TM, Kaplan EK, et al. Economic Analyses of an Alcohol Misconduct  
197 Prevention Program in a Military Setting. *Mil Med.* 2017;182(1):e1562-e1567.  
198 doi:10.7205/MILMED-D-16-00098
- 199 12. Carey MP. Cost-Benefit Analysis in Federal Agency Rulemaking.
- 200 13. CLARKE L, ANDERSON M, ANDERSON R, et al. Economic Aspects of Delivering  
201 Primary Care Services: An Evidence Synthesis to Inform Policy and Research Priorities.  
202 *Milbank Q.* 2021;99(4):974-1023. doi:10.1111/1468-0009.12536
- 203 14. American Physical Therapy Association. The Economic Value of Physical Therapy in the  
204 U.S. Value of Physical Therapy. Accessed March 28, 2025. <https://www.valueofpt.com/>
- 205 15. Li T, Johnson ST, Koester MC, Hommel A, Norcross MF. The impact of high school  
206 athletic trainer services on medical payments and utilizations: a microsimulation analysis on  
207 medical claims. *Inj Epidemiol.* 2019;6:15. doi:10.1186/s40621-019-0194-y
- 208 16. Li T, Norcross MF, Johnson ST, Koester MC. Cost-Benefit of Hiring Athletic Trainers in  
209 Oregon High Schools From 2011–2014. *Journal of Athletic Training.* 2019;54(2):165-169.  
210 doi:10.4085/1062-6050-390-17
- 211 17. Peterson C, Li T, Norcross MF. Return on investment of anterior cruciate ligament injury  
212 prevention programs in the United States. *Journal of Athletic Training.* 2025;Online ahead of  
213 print. doi:10.4085/1062-6050-0507.24.
- 214 18. Peterson C, Li T. Evidence for Economic Evaluations of Athletic Trainer Services.  
215 *Journal of Athletic Training.* 2022;57(7):632-639. doi:10.4085/1062-6050-0666.21
- 216 19. Russell LB, Gold MR, Siegel JE, Daniels N, Weinstein MC. The role of cost-  
217 effectiveness analysis in health and medicine. Panel on Cost-Effectiveness in Health and  
218 Medicine. *JAMA.* 1996;276(14):1172-1177.
- 219 20. Gold MR, Siegel JE, Russell LB, Weinstein MC. *Cost-Effectiveness in Health and*  
220 *Medicine.* Oxford University Press.
- 221 21. U.S. Department of Health and Human Services Centers for Disease Control and  
222 Prevention. Office of the Director, Office of Strategy and Innovation. *Introduction to*

223     *Program Evaluation for Public Health Programs: A Self-Study Guide*. Centers for Disease  
224     Control and Prevention; 2011.

225     22.     The Athletic Training Practice-Based Research Network - ATSU. AT-PBRN.org.  
226     Accessed March 28, 2025. <https://www.coreat.org/>

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