COMMENTARY

Sports Pharmacists and Antidoping Education – Reconsideration at the Time of Olympic and Paralympic Games

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Tokyo Olympic and Paralympic Games in 2021 presented an opportunity for pharmacists to recognize the uniqueness of sports pharmacy as a developing field and to understand importance of antidoping education among patient-athletes. Patient-athletes make up a distinct patient population, and pharmacists are well positioned to support athletes’ therapeutic decisions. It is desired for pharmacists to be able to search for and interpret drug information to take care of this special population appropriately. This commentary is to facilitate a discussion on what changes or reinforcement might help train pharmacists to become equipped with adequate knowledge and skills to support safe use of drugs among patient-athletes.

While effective resources and tools became more widely available, pharmacists’ awareness and training in the field of sports pharmacy continue to be needed. No matter where they practice, pharmacists should be ready to promote ‘the spirit of sport’ and defend clean sport for their patient-athletes.

Keywords: sport, pharmacy, pharmacist, athletes, education, antidoping

INTRODUCTION

Tokyo Olympic and Paralympic Games took place in 2021, moved from the summer 2020 due to the COVID-19 pandemic. While preventive measures were taken to avoid the spread of COVID-19 cases to host the Games safely in Japan, pharmacists should equally recognize anti-doping efforts made to ensure ‘the spirit of sport’ among Olympians and Paralympians. The World Anti-Doping Code, or the Code, harmonizes anti-doping policies in all sports and participating countries, and it is set by the World Anti-Doping Agency (WADA). The Code was enforced by the International Olympic Committee (IOC) and the International Paralympic Committee (IPC) along with Japan Anti-Doping Agency (JADA) during Tokyo Olympic and Paralympic Games.

The antidoping efforts at major sporting events were not only the testing of athletes and result managements but also included significant amount of education ranging from creating a guidebook for health care providers to preparing resources for surrounding health care institutions. These efforts were necessary to disseminate information on prohibited substances and Therapeutic Use Exemptions (TUE), a special permit for athletes to use a prohibited substance. In addition, coordination was essential between professional organizations supplying a large number of Medical Support Personnel, including physicians, pharmacists, nurses, and other allied health care professionals involved in the planning and execution of the Games.

The timing of Olympic and Paralympic Games brings an opportunity to reevaluate the importance of anti-doping education for our future pharmacists in the United States (US) with consideration to the field of sports pharmacy. Team USA had nearly one-thousand elite athletes across the nation just for Tokyo 2020 Games, and National Collegiate Athletic Association (NCAA) Championship Sports exceeded a half-million participants in 2019-2020, highlighting a large number of athletes in the US, along with countless junior and recreational athletes.

When athletes dope, they might gain an unfair advantage that undermines the hard work of their competitors which is unethical but also poses health concerns for athletes. Some performance-enhancing drugs are deemed dangerous when used for doping. Pharmacists should accept the professional duty to prevent intentional and unintentional doping for athletes competing at all levels, as they would to avoid adverse events for any patient in their care. This commentary is to facilitate a discussion on what changes or reinforcement might help train pharmacists to become equipped with adequate knowledge and skills to support safe use of drugs among athletes.
Antidoping Resources in the US

Sports represent a major part of our culture. With athlete celebrity status, high-profile substance abuse cases, and a few seeming cover-ups of performance-enhancing drug use, one may wonder how often athletes consult pharmacists to optimize their drug therapy and to avoid inadvertent doping. In the juncture of substance use and athletic performance, pharmacist’s expertise would seem the obvious bridge for appropriate use of medications. Instead, the gap sometimes appears to be filled by “the internet” or more informally by peers, marketing claims, and misinformation from social media. Once pharmacists develop and share their expertise in sports pharmacy, consultations by pharmacists should become one of the best personalized drug resources for our patient-athletes.

The National Anti-Doping Organization (NADO) in the US for Olympic, Paralympic, Pan American and Parapan American sport is the United States Anti-Doping Agency (USADA). USADA manages anti-doping program for both in-competition and out-of-competition testing and educates athletes on antidoping. Additionally, they provide useful resources for health care professionals, including pharmacists, who may work with athletes at all levels of competition.6 WADA publishes a document, the annual Prohibited List, classifying performance-enhancing substances and methods prohibited in sports: at all times, in-competition only, or for specific sports.7 USADA interprets this Prohibited List and offers a freely accessible search engine called Global Drug Reference Online (Global DRO).8 Global DRO can help pharmacists review a patient-athlete’s medication profile for any prohibited medication at the point of care. Global DRO is also considered a primary reference for athletes to check the prohibitory status of their own medications. Even when pharmacists are familiar with the Prohibited List, Global DRO can be a useful tool to determine the current status, prohibited or not prohibited, for prescription and non-prescription drugs. Global DRO is updated several times a year and offers details on the drug status to assist athletes’ and clinicians’ decisions.

Need for Antidoping Education

Although effective resources, such as Global DRO, are available to prevent doping, it does not replace our clinical judgement, and a certain degree of training in antidoping is still desirable for practicing pharmacists. Unfortunately, it is still possible for athletes, and even health care providers, to misinterpret information about banned substances or methods. While most pharmacists would correctly suspect that anabolic steroids, stimulants, and erythropoietin stimulating agents are prohibited for use in sports, many do not recognize that diuretics are prohibited as masking agents or that selegiline is prohibited due to the levomethamphetamine metabolite. The complex WADA definitions of prohibited and permitted use of glucocorticoids may have pharmacists mistaking corticosteroid inhalers as prohibited when these have no restrictions.

In one instance, a former drug reference pharmacist at USADA recalls a conversation with an athlete who called after searching Global DRO and finding infliximab was not prohibited. The athlete knew the prescription was administered intravenously at an outpatient infusion center. The doctor and the infusion center pharmacist assured the athlete that infliximab is not a performance-enhancing substance based on their review of the Prohibited List. In fact, the large volume of the intravenous infusion is prohibited at-all-times and requires a TUE to receive this drug, even though the substance itself is not prohibited.

As another real-case example, a patient-athlete with chest congestion and complaints of shortness of breath called USADA from a physician’s office. The patient-athlete told the physician levalbuterol nebulizer treatment is prohibited. After confirming the status, the patient-athlete handed the phone to the physician who sounded frustrated, stating this is patient’s drug of choice. After learning the patient-athlete did not need an urgent breathing treatment, the pharmacist explained the prohibited status, asked about therapies this physician might be considering as an alternative, then noted the permitted dose of inhaled albuterol.

Patient education is essential to prevent doping in sports. The NCAA provides training, Drug Free Sport AXIS. However, it is not ensured that all student-athletes are fully informed about appropriate use of prescriptions, non-prescriptions, and dietary supplements. Especially during open sporting events, athletes may not be in the Registered Testing Pool and may lack education on antidoping rules. Even when they are educated, athletes often seek reassurance about the restrictions for their medications, such as inhalers. All beta-2 agonists are prohibited, except certain inhalers with maximum dose limits. Resources provide these maximum inhaled doses in micrograms, but the patient-athletes would benefit more by knowing the limit for the number of puffs. Pharmacists could readily calculate a prescribed dose to ensure total puffs are below the limit and counsel on appropriate use.

It is critical for pharmacists to be able to screen for potentially prohibited substances when patients identify themselves as athletes. Special medical needs may exist for elite athletes, competitive exercise-enthusiasts, or retired elite athletes, who may also struggle with mental health or substance abuse. With pharmacists being the most accessible health
care providers and often the final check before patients receive medications, we are presented with an opportunity to prevent doping and educate patients and health care teams.

**Sports Pharmacists**

Sports pharmacy is an emerging subspecialty within the field of pharmacy that requires additional education to meet the needs of patient-athletes and highly drug- and supplement-conscious consumers.\(^9\) Pharmacists and pharmaceutical scientists have been working diligently for decades to support athletes at major sporting events. Recognizing that athletes have unique medication needs as a distinct special patient population is an initial step for pharmacists. Athletes make a career out of peak performance and tend to take many medications and supplements for an otherwise-healthy group.\(^10,11\) At the same time, competitive athletes have restrictions on substances allowed for use, regardless of their medical diagnosis and prescription, which is difficult for athletes to navigate alone. Pharmacists remain under-represented and under-utilized as part of the athlete entourage, due to lack of awareness, limited formalized education in pharmacy schools, and/or lack of confidence.\(^12,13\)

One of JADA’s noteworthy achievements was certifying Sports Pharmacists by establishing a system that integrates the expertise and strengths of ‘sport,’ ‘anti-doping,’ and ‘pharmacists’ for the first time in the world.\(^14,15\) JADA’s certification program is summarized in Table 1. Training on antidoping was valued for staffing pharmacists at the Polyclinic in the Olympic Village during the 2020 Tokyo Games. Sports Pharmacists in Japan receive a decal to display at their pharmacy to let athletes and support staff know that they have expertise in checking for prohibited substances, supporting a preparation of athlete’s application for TUE, and educating athletes on antidoping. Japanese Sports Pharmacists are also searchable by an online database. Prior to the Olympic and Paralympic Games, JADA’s Sports Pharmacists played an active role in National Sports Festival, where athletes aged 15 years and above compete at National Level. Antidoping education especially among the young athletes was emphasized as many were not familiar with the antidoping rules.

The fields for Sports Pharmacy are diverse in Japan and provides a model for other countries. Sports Pharmacists provide antidoping education for athletes and their support staff, such as coaches. In institutional settings, they provide care when athletes are admitted to their hospital for acute conditions or for perioperative needs. In community settings, they are an approachable resource for athletes especially for self-treatment and supplements advice. Some pharmacists also give lectures in pharmacy schools as antidoping is a potential topic tested on their national pharmacist licensure exam. Similarly, they can provide antidoping classes at middle and high schools and teach the dangers of illicit drug use. The expertise of Sports Pharmacists has been appreciated beyond the traditional pharmacy practice settings in Japan.

**US Pharmacy Curriculum and Post-Graduate Education**

The accreditation “Standards 2016” requires pharmacy programs to prepare our graduates for patient-centered care (Standard 2.1), and providing proper antidoping education will help meet multiple CAPE 2013 Outcomes, such as 2.1. Patient-Centered Care and 3.3. Patient Advocacy.\(^16,17\) Antidoping education is also applicable under multiple domains of core Entrustable Professional Activities (eg. Patient Care Provider Domain and Information Master Domain).\(^18\) It is highly desirable for pharmacists to be aware of unique needs of patient-athletes, research and interpret antidoping information and prohibited classes of medications.

While pharmacy schools may not offer an antidoping course in the curriculum, drugs for human performance and misuse/abuse information can be integrated within existing areas of curriculum, such as Therapeutics and Pharmacology as related to substance abuse. While extensive antidoping knowledge may not be required for entry-level pharmacists, raising awareness among pharmacy graduates will serve our patient-athletes better, as pharmacists may encounter patient-athletes in any practice settings. An elective course or rotation can be also set up for students highly motivated or interested in sports pharmacy.

For practicing pharmacists interested in developing and maintaining expertise in the area of sports pharmacy, online courses offered by the WADA, USADA or the IOC will be a great starting point. A certification program like the one provided by the JADA would be ideal to ensure expertise among a broader range of pharmacists supporting patient-athletes, but such program is currently unavailable for US pharmacists.

**CONCLUSION**

Sport pharmacy is not yet a fully established field, and very limited specialized training or certification programs are available in the US. In any practice setting, pharmacists working with patients who are athletes should identify and meet their therapeutic needs both as patients and as athletes. As patient-athletes are recognized as a special population, pharmacists can better serve them to prevent health risks associated with doping, inappropriate use of substances, or potential ending of athletic careers due to misinterpretation or substance misuse or abuse. In the juncture of substance use
and athletic performance, pharmacists’ expertise can promote appropriate use of medications. With expertise in sports pharmacy, pharmacists should become one of the best personalized drug resources for patient-athletes, and we as a drug expert should be ready to fight for clean sport with patient-athletes.

ACKNOWLEDGEMENTS

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REFERENCES

Table 1. Certification Requirements of Sports Pharmacists by Japan Anti-Doping Agency (JADA).15,19

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<thead>
<tr>
<th>Eligibility Requirements</th>
<th>Covered training contents</th>
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<tr>
<td>Licensed pharmacists in Japan</td>
<td>Basic Seminar (in-person seminar in July)</td>
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<td>To complete one-year program consisting of two seminars and to prove competency by achieving a passing score on a test covering four domains: the Code, the Prohibited List, Therapeutic Use Exemptions (TUE), and ethics</td>
<td>• Antidoping rules based on the Code and the Prohibited List</td>
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<td>• TUE process and requirements</td>
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<td></td>
<td>• Differences from standard patient care – The “standard” is different for athletes. Athletes are responsible for detection of any prohibited substances in their system. Even with medical necessity, if it is against the antidoping rules, the use will be considered as violation.</td>
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<td>• Case studies and discussion of ethical dilemmas with pharmacists from Sports Pharmacist Committee at the JADA Exert Group</td>
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<td>• Athletes’ perspectives on antidoping in their training environment and with their daily lives</td>
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<tr>
<td>Certification period</td>
<td>Advanced Seminar (e-learning in January)</td>
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<td>4 years; however, participation in the Advanced Seminar is required annually to maintain the certification. The certification decal (which can be displayed at pharmacy) is good only for one year, and a renewal is required annually as the international anti-doping rules change every year.</td>
<td>• Updates in the Code and the Prohibited List – Updates are published annually on January 1st by the World Anti-Doping Agency.</td>
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