

## COMMENTARY

# Reconsidering Sports Pharmacists and Anti-Doping Education as the World Celebrates the Olympic and Paralympic Games

Marina Kawaguchi-Suzuki, PharmD, PhD,<sup>a,b,c</sup> Ashley Anderson, BS Pharm, MBA,<sup>a,c</sup> Satomi Suzuki, PhD<sup>d</sup>

<sup>a</sup> United States Anti-Doping Agency (USADA), Colorado Springs, Colorado

<sup>b</sup> Pacific University, School of Pharmacy, Hillsboro, Oregon

<sup>c</sup> SportsOracle Limited, Aberdeen, United Kingdom

<sup>d</sup> Japan Anti-Doping Agency (JADA), Tokyo, Japan

<sup>e</sup> Editorial Board Member, American Journal of Pharmaceutical Education, Arlington, Virginia

Submitted April 19, 2021; accepted April 21, 2021; published August 2021.

The 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 the importance of anti-doping education among patient-athletes. Patient-athletes make up a distinct patient population, and pharmacists are well positioned to support athletes' therapeutic decisions. Pharmacists need to be able to search for and interpret drug information to take care of this special population appropriately. The purpose of 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 have become more widely available, pharmacists' awareness of 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 the importance of "clean" sport for their patient-athletes.

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

## INTRODUCTION

The Tokyo Olympic and Paralympic Games took place in 2021, after being moved from the summer 2020 because of the COVID-19 pandemic. Just as preventive measures were taken to avoid the spread of COVID-19 cases so that the Games could be safely hosted in Japan, pharmacists should recognize the equal importance of anti-doping efforts made to ensure "the spirit of sport" among Olympians and Paralympians. The World Anti-Doping Code harmonizes anti-doping policies in all signatory sports and participating countries, and it is set by the World Anti-Doping Agency (WADA).<sup>1</sup> Anti-doping rules consistent with the Code were enforced by the International Olympic Committee and the International Paralympic Committee along with Japan Anti-Doping Agency (JADA) during the Tokyo Olympic and Paralympic Games.<sup>2,3</sup>

---

**Corresponding Author:** Marina Suzuki, Pacific University, School of Pharmacy, 222 SE 8th Ave., Ste. 451, Hillsboro, OR 97123. Tel: 503-352-2676. Email: msuzuki@usada.org

**Disclaimer:** This article reflects the views of the authors and should not be construed to represent affiliated organizations' views or policies.

The anti-doping efforts at major sporting events include the in- and out-of-competition testing of athletes and a significant amount of education, ranging from creating a guidebook for health care providers to preparing resources for nearby health care institutions. These efforts were necessary to disseminate information on prohibited substances and Therapeutic Use Exemption (TUE), a special process that allows athletes to use a prohibited substance and/or method, if approved. 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 Olympic and Paralympic Games bring an opportunity to reevaluate the importance of anti-doping education for future pharmacists in the United States. While Team USA had nearly one thousand elite athletes for the Tokyo 2020 Games, there are thousands of more athletes who are members of national sport governing bodies in the US subject to these anti-doping rules.<sup>4</sup> This highlights a large number of elite athletes in the US, along with countless junior and recreational athletes.<sup>5</sup>

When athletes "dope," they may gain an unfair advantage that undermines the hard work of their competitors,

which is unethical, but doping also poses health concerns for athletes. Some performance-enhancing drugs can be dangerous when used improperly for doping. Pharmacists should accept it as their professional duty to prevent intentional and unintentional doping by athletes competing at all levels, just 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 of programs already in place might help train and equip pharmacists with the adequate knowledge and skills to support safe use of drugs among patient-athletes.

## **DISCUSSION**

### **Anti-Doping Resources in the United States**

Sport and competitions represent a major part of US culture. With all the competing priorities of elite athletes and varied access to health professionals well-educated in anti-doping rules, many pharmacists may wonder how often athletes consult them to optimize their medical treatment, including selection of drugs that are non-prohibited to avoid inadvertent doping. In the juncture of substance use and athletic performance, pharmacists' expertise would seem the obvious resource to ensure appropriate use of medications. Instead, the knowledge gap sometimes appears to be filled by questionable health information websites on the internet or, even 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 patient-athletes.

The Congressionally-recognized official National Anti-Doping Organization (NADO) in the United States for Olympic, Paralympic, Pan American, and Parapan American sport is the United States Anti-Doping Agency (USADA). The agency manages anti-doping programs for both in-competition and out-of-competition testing and educates athletes on their anti-doping roles and responsibilities. Additionally, they provide useful resources for health care professionals, including pharmacists, who may work with athletes at all levels of competition.<sup>6</sup> The WADA publishes an annual document, "Prohibited List," which classifies performance-enhancing substances and methods prohibited in sports, whether prohibited at all times, in-competition only, or in particular sports.<sup>7</sup> The USADA and partnering NADOs interprets the Prohibited List and offers a freely accessible search engine called Global Drug Reference Online (Global DRO) in multiple languages.<sup>8</sup> 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 continuously and offers details on the drug status to assist athletes' and clinicians' decisions.

### **Need for Anti-Doping Education**

Although effective resources, such as Global DRO, are available to prevent doping, they do not replace pharmacist's clinical judgements; a certain degree of training in anti-doping is still desirable for all practicing pharmacists. Unfortunately, it is still possible for athletes and even health care providers to misinterpret information about prohibited substances or methods without the appropriate training. While most pharmacists would correctly suspect that anabolic steroids, stimulants, and erythropoietin stimulating agents are prohibited for use in sports, many may not realize that diuretics are prohibited as they may be used as masking agents, or that selegiline is prohibited due to its stimulant metabolites, such as levomethamphetamine.

As an example, some substances are permitted in sport, but when delivered intravenously in volumes larger than those accepted by the WADA, a TUE is required. Astute athletes will know this based on the education they receive when they are added to the USADA Registered Testing Pool. However, there are other athletes that may come under USADA's jurisdiction that do not receive formal education. When health care providers order intravenous infusions over 100 mL per 12-hour period to deliver a permitted substance, such as a saline or iron infusion, this is a prohibited method, causing an anti-doping rule violation for the athlete. The awareness of health care providers, including pharmacists, of the prohibited status of intravenous infusions (regardless of the status of the substance being infused) is essential in protecting athletes from accidentally committing anti-doping rule violations.

Another scenario which may occur is when a patient-athlete with chest congestion or shortness of breath is prescribed an albuterol nebulizer treatment in the office by his or her physician. Albuterol nebulizer exceeds the WADA maximum dose allowed for athletes. A cautious, educated athlete would consult Global DRO while at the physician's office to confirm the status of albuterol. Physicians may feel surprised or frustrated by anti-doping rules that seem to conflict with best practices. However, a pharmacist trained in anti-doping rules can assist the athlete and the physician in 1) identifying a permitted alternative (in this case an albuterol metered dose inhaler used within the WADA permitted dosage range) or 2) gathering the required documentation to apply for a TUE. Having health

care providers educated in anti-doping guiding the treatment of drug-tested athletes will make it much safer and less stressful for athletes to receive healthcare. Currently, the onus is on the athlete to evaluate any medical treatment plan against the WADA anti-doping rules. In addition to USADA, the National Collegiate Athletic Association provides training and Drug Free Sport AXIS for athletes in their jurisdiction. These student-athletes may be subject to additional anti-doping rules.

As these examples illustrate, patient-athlete education in collaboration with pharmacists' awareness, is essential to further prevent doping in sports. 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 in certain inhalers with maximum daily dose limits. Pharmacists could readily calculate a prescribed dose to ensure total puffs are below the WADA limit and counsel the patient-athlete on appropriate use.

With pharmacists being the most accessible health care providers and often the final gatekeeper before patients receive their medications, we as a profession are presented with an opportunity to prevent doping and educate patients and health care teams. 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, and retired elite athletes, who may also struggle with mental health issues or substance abuse.

### 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.<sup>9</sup> 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 a lot of medications and supplements for an otherwise healthy group.<sup>10,11</sup> At the same time, there are restrictions on the substances that competitive athletes are allowed to use, regardless of their medical diagnosis and legitimate prescription use, making this area difficult for athletes to navigate alone. Pharmacists remain underrepresented and underutilized among the athlete's entourage largely because of a lack of awareness about pharmacy clinical care capabilities, limited formalized education in pharmacy schools, and/or lack of confidence among pharmacists in their ability to care for this population.<sup>12,13</sup>

One of JADA's noteworthy achievements was certifying sports pharmacists by establishing a system that integrates the expertise of pharmacists to the field of sports and anti-doping for the first time in the world.<sup>14,15</sup> The Association's certification program is summarized in Table 1. Pharmacists having training in anti-doping were valued for staffing at the Polyclinic in the Olympic Village

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

Eligibility	Licensed pharmacists in Japan
Requirements	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
Covered training contents	Basic Seminar (in-person seminar in July) Anti-doping rules based on the Code and the Prohibited List TUE process and requirements 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 anti-doping rules, the use will be considered as violation. Case studies and discussion of ethical dilemmas with pharmacists from Sports Pharmacist Committee at the JADA Exert Group Athletes' perspectives on anti-doping in their training environment and with their daily lives Advanced Seminar (e-learning in January) Updates in the Code and the Prohibited List – Updates are published annually on January 1st by the World Anti-Doping Agency.
Certification period	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.

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 preparation of an athlete's application for TUE, and educating athletes on anti-doping. Japanese certified 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 the country's National Sports Festival, where athletes aged 15 years and above compete at the national level. Anti-doping education, especially among young athletes, was emphasized as many were not familiar with the anti-doping rules.

The fields for sports pharmacy are diverse in Japan and provides a model for other countries. Sports pharmacists provide anti-doping 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 care. In community settings, they are an approachable resource for athletes, especially those interested in self-treatment and supplement advice. Some pharmacists also give lectures in pharmacy schools as anti-doping is a potential topic on their national pharmacist licensure examination. Similarly, sports pharmacists can provide anti-doping classes at middle and high schools and teach students about the dangers of illicit drug use. Thus, the expertise of sports pharmacists is appreciated beyond traditional pharmacy practice settings in Japan.

### **Pharmacy Curriculum and Postgraduate Education in the United States**

The Accreditation Council for Pharmacy Education Standards 2016 requires pharmacy programs to prepare graduates for patient-centered care (Standard 2.1). Providing proper anti-doping education would help meet multiple CAPE 2013 Outcomes, such as 2.1. Patient-Centered Care and 3.3. Patient Advocacy.<sup>16,17</sup> Anti-doping education is also applicable under multiple domains of the core Entrustable Professional Activities for New Pharmacy Graduates (e.g., the Patient Care Provider Domain and the Information Master Domain).<sup>18</sup> It is highly desirable for pharmacists to be aware of the unique needs of patient-athletes and to research and interpret anti-doping information and prohibited classes of medications for them.

While pharmacy schools may not include an anti-doping course in their curriculum, drugs for human performance and misuse/abuse information can be integrated into existing areas of the curriculum, such as within therapeutics and pharmacology courses, as information related to substance abuse. While extensive anti-doping knowledge may not be required for entry-level pharmacists, raising

awareness of doping among pharmacy graduates will serve our patient-athletes better as pharmacists may encounter athletes in any practice settings. An elective course or practice experience could also be set up for students highly 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 International Olympic Committee (International Paralympic Committee) will be a great starting point. A national certification program like the one provided by the JADA would be ideal to ensure expertise among a broader range of pharmacists supporting patient-athletes.

### **CONCLUSION**

Sports pharmacy is not yet a fully established field, and very limited specialized training is available to pharmacists in the United States. 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 help prevent doping, inappropriate use of substances, or a potential athletic career ending due to misinterpretation of prohibited drug lists. At the juncture of substance use and athletic performance, pharmacists' expertise can promote appropriate use of medications. Pharmacists with expertise in sports pharmacy can be one of the best drug information resources for patient-athletes and a great advocate in the fight for clean sports.

### **ACKNOWLEDGMENTS**

We acknowledge Japan Anti-Doping Agency for their support in preparing this commentary.

### **REFERENCES**

1. World Anti-Doping Agency. The Code. <https://www.wada-ama.org/en/what-we-do/the-code>. Published 2021. Accessed March 23, 2021.
2. Japan Anti-Doping Agency. For Athletes and Sport Agencies. <https://www.playtruejapan.org/athlete/>. Accessed March 23, 2021.
3. Japan Anti-Doping Agency. Play True 2020. <https://playtrue2020-sp4t.jp/>. Published 2020. Accessed March 23, 2021.
4. United States Olympic & Paralympic Committee. Team USA: Olympic Games Tokyo 2020. <https://www.teamusa.org/tokyo-2020-olympic-games/meet-team-usa/athletes>. Published 2021. Accessed April 13, 2021.
5. National Collegiate Athletic Association. NCAA Sports Sponsorship and Participation Rates Database. <https://www.ncaa.org/about/resources/research/ncaa-sports-sponsorship-and-participation-rates-database>. Published 2020. Accessed April 13, 2021.
6. United States Anti-Doping Agency. About USADA. <https://www.usada.org/about/>. Published 2021. Accessed April 5, 2021.

7. World Anti-Doping Agency. What is Prohibited. <https://www.wada-ama.org/en/content/what-is-prohibited>. Published 2021. Accessed April 5, 2021.
8. The Global Drug Reference Online (Global DRO). 2021. <https://www.globaldro.com/home/index>. Accessed April 18, 2021.
9. International Pharmaceutical Federation. FIP Guidelines: the role of the pharmacist in the fight against doping in sport. 2014:1–4.
10. National Collegiate Athletic Association. NCAA National Study on Substance Use Habits of College Student-Athletes. <https://www.ncaa.org/about/resources/research>. Published 2018. Accessed April 12, 2021.
11. Ambrose PJ. Drug use in sports: a veritable arena for pharmacists. *J Am Pharm Assoc (2003)*. 2004;44(4):501–514; quiz 514–506.
12. Hooper AD, Cooper JM, Schneider J, Kairuz T. Current and potential roles in sports pharmacy: a systematic review. *Pharmacy (Basel)*. 2019;7(1).
13. Howard MS, DiDonato KL, Janovick DL, et al. Perspectives of athletes and pharmacists on pharmacist-provided sports supplement counseling: An exploratory study. *J Am Pharm Assoc (2003)*. 2018;58(4S):S30–S36 e32.
14. Japan Anti-Doping Agency. Play True 2020: Sports Pharmacist. <https://playtrue2020-sp4t.jp/static/sportspharmacist/>. Accessed March 23, 2021.
15. Sports Pharmacist. Know About Sports Pharmacist. <https://www.sp.playtruejapan.org/>. Published 2010. Accessed March 23, 2021.
16. Accreditation Council for Pharmacy Education. *Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree*. Chicago, IL 2015.
17. Medina MS, Plaza CM, Stowe CD, et al. Center for the Advancement of Pharmacy Education 2013 educational outcomes. *Am J Pharm Educ*. 2013;77(8):162.
18. Haines ST, Pittenger AL, Stolte SK, et al. Core entrustable professional activities for new pharmacy graduates. *Am J Pharm Educ*. 2017;81(1):S2.
19. Japan Anti-Doping Agency. Sports Pharmacist. <https://www.playtruejapan.org/activity/pharmacist.html>. Accessed March 23, 2021.