

UNIQUE ANTI-DOPING AND THERAPEUTIC USE EXEMPTION CONSIDERATIONS FOR THE PARALYMPIC ATHLETE

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While athlete medical care is often top-of-mind for the sports medicine professional, they are also often relied upon as a source of information regarding the anti-doping process. As a primary source of up-to-date information and advice to ensure athletes are not prescribed or inadvertently provided substances or methods prohibited in competitive sport, this includes constantly keeping abreast of changes to a relatively complex milieu of anti-doping rules, standards and processes. Indeed, no one wants to be the source of incorrect guidance or information, which then leads

to potentially negative consequences – such as a positive anti-doping test or an adverse health event. Health professionals that knowingly or unknowingly fail to comply with anti-doping rules run the risk of an anti-doping violation. This has the potential to lead to devastating penalties, such as a publicly disclosed period of ineligibility up to a lifetime ban from sport, for both the athlete and/or the health professional.

For athletes with a disability, there may be special considerations because of unique medical conditions requiring acute or chronic use of prohibited medications or

methods which necessitate a therapeutic use exemption (TUE) or the need for personal equipment, such as catheters, to aid the sample provision process. In addition, there may also be the need for a representative to assist during the doping control process, when an athlete is selected for urine and/or blood testing in- or out-of-competition.

There is a plethora of resources to inform and educate athletes and health professionals alike regarding anti-doping best practices¹. Although the complexity can be somewhat overwhelming, it is the responsibility of all those that participate in

TABLE 1

MEDICAL DIAGNOSIS	SUBSTANCE & METHOD EXAMPLES
Arterial Hypertension	Diuretics (S5), Beta-blockers (P1)
Pain	Narcotics (S7), Cannabinoids (S8)
Musculoskeletal Injuries	Glucocorticoids (S9), Narcotics (S7)
Diabetes Mellitus	Hormone and Metabolic Modulators (S4)
Attention Deficit Disorder (ADD)	Stimulants (S6)
Asthma	Beta-2 Agonists (S3)
Dehydration or GI distress	Intravenous Infusions and Injections (M2)

Table 1: Examples of substances and methods on the WADA Prohibited List for that may be used for common medical diagnoses in the para athlete.

sport to understand and comply with anti-doping policies and rules to ensure a safe and level playing field. While most athletes inspire, others may seek to cheat to gain an unfair competitive advantage. At times, this unfortunately includes para athletes. This article will provide key highlights of anti-doping rules and processes with a specific focus on para athletes.

A GLOBAL ANTI-DOPING FRAMEWORK

Prior to 1999 and the inception of the World Anti-Doping Agency (WADA), absent a global anti-doping system and regulator, individual countries and events managed matters related to doping in sport. This led to inconsistent enforcement and, overall, an ineffective system.

The World Anti-Doping Code (WADC) and accompanying WADC International Standards – inclusive of the WADA Prohibited List, International Standard of Testing and Investigations (ISTI), International Standard for TUEs (ISTUE), International Standard for Laboratories (ISL) and International Standard for Protection of Privacy and Personal Information (ISPPPI) – were all created to harmonise global anti-doping policies and procedures. This includes sample collection and analysis, a TUE process, adjudication, investigations and education systems. The goal of these processes is to provide mandatory best practices that hold all athletes in Olympic and Paralympic Sport accountable to the rules of fair play in competitive sport through anti-doping rights and responsibilities.

Health professionals in sport are equally responsible to anti-doping rules under the WADC and by sport-specific anti-doping rules, such as the International Paralympic Committee (IPC) Anti-Doping Code. Other specific anti-doping rules modelled from the WADC may be used for major games, such as the Olympic and Paralympic Games.

THE WADA PROHIBITED LIST

The List (<http://list.wada-ama.org>) is mandatory and divides substances into different categories. It also identifies which classes of substances are prohibited at all times (in- and out-of-competition), in-competition only and only in specific sports².

A substance or method is considered for inclusion on the WADA Prohibited List (“the List”) if it meets any two of the following three criteria:

- It enhances or has the potential to enhance sport performance.
- It represents an actual or potential health risk to the athlete.
- It violates the spirit of sport.

The independent WADA Prohibited List Expert Group reviews the List on an annual basis after an extensive WADA stakeholder consultation process. After approval, the List revisions are published by October 1 of every year and the annual updated List comes into effect on January 1.

Search engines such as the Global Drug Reference Online (www.globaldro.com) and other country-specific resources are also useful for a quick check to see if an ingredient or brand medication is on the List. Common

medical diagnoses seen in the para athlete population and that may be associated with use of prohibited substances and methods are listed in Table 1.

THERAPEUTIC USE EXEMPTIONS

TUEs are a vital part of sport, allowing an athlete to train and compete while using a prohibited substance or method for a legitimate medical reason. Under the WADA ISTUE, an athlete has the responsibility to show that they can satisfy four criteria for TUE approval before they are granted permission to use a prohibited substance or method. Based on the criteria, the athlete must show that the prohibited substance or method is needed to treat an acute or chronic condition and that the treatment will only return the athlete to their normal level of health, without offering any performance-enhancing benefits.

NEUROPATHIC PAIN IN THE PARA ATHLETE

Para athletes may experience neuropathic pain arising from disease or injury to the central or peripheral nervous system (e.g. spinal cord injury, traumatic brain injury, amputation, complex regional pain syndrome). When non-prohibited alternatives such as gabapentin, duloxetine, tramadol and capsaicin have failed, **cannabis** and **narcotic analgesics** (both of which are banned only in-competition) may be considered to manage pain³.

As a side issue, all sports medicine practitioners should be aware that in certain countries, possession of these substances is considered illegal without proper regulatory documentation.

Moreover, the athlete must be able to show that the prohibited substance or method is necessary because there are no other reasonable treatment alternatives and that any previously used treatments were ineffective. All TUE applications are

TABLE 2

WADA Prohibited List Category	Percentage of total
S9. Glucocorticosteroids	23%
S5. Diuretics and other masking agents	17%
S7. Narcotics	16%
S6. Stimulants	12%
S4. Hormone and metabolic modulators	11%
M2. Chemical and physical manipulation	8%
S1. Anabolic agents	4%
S3. Beta-2 agonists	3%
S8. Cannabinoids	3%
M1. Manipulation of blood and blood components	1%
P2. Beta-blockers	1%
S2. Peptide hormones, growth factors and related substances	1%
So. Non-approved substances	0%
	100.00%

Table 2: TUEs approved for para athletes in 2016.

reviewed by a TUE Committee. As a matter of principle, from the documentation provided, the Committee needs to be able to arrive at the same diagnosis and treatment plan as the athlete’s physician without seeing the athlete. In the absence of a differential diagnosis, betterment of generalised symptoms alone is not sufficient to grant a TUE. WADA provides specific *Medical Information to Support the Decisions of the TUE Committees* as guidance for TUE Committees and athletes alike on medical best practices to ensure a successful TUE application.

From a para athlete perspective, five List categories accounted for 79% of all approved TUEs globally in 2016 – Glucocorticoids (23%), Diuretics and Masking Agents (17%), Narcotics (16%), Stimulants (12%) and Hormone and Metabolic Modulators (11%) (Table 2). This appears to be consistent with common diagnoses frequently seen in the para athlete population (Table 1). For additional information, several diagnoses are highlighted here.

TRAUMATIC BRAIN INJURY, HYPOPITUITARISM AND ANDROGEN DEFICIENCY

Traumatic brain injury sustained in falls, sports-related trauma or road traffic accidents may result in transient or chronic dysfunction of the hypothalamic-pituitary axis. The postulated mechanism is an initial mechanical shear followed by potential secondary insults of hypoxia, hypotension and increased intracranial pressure. The production of endogenous hormones may be affected, particularly **growth hormone** and **testosterone**. For consideration of a TUE, all diagnoses must meet strict criteria of an organic aetiology. TUEs for treatment of functional disorders, which may be transient or potentially reversible or for the betterment of generalised symptoms without an unequivocal diagnosis will not be accepted. In all cases, multiple blood tests showing a clear pattern of deficiency, combined with a thorough clinical history, physical exam and imaging studies are essential.

In general, a TUE is required in advance of using a prohibited medication, however specific rules may vary based on the competitive level of the athlete, the specific medication and the circumstances of use. For example, to protect the health of the athlete, emergency treatment should never be withheld. Thus, an emergency or ‘retroactive’ TUE may be granted in

exceptional or emergency circumstances, even after the medication has been administered.

Depending on the competitive level of the athlete, application for a TUE must be made directly to either a national anti-doping organisation (NADO), an international sport federation (IF) or a major event medical organiser. Additionally, WADA may review

NEUROPATHIC PAIN IN THE PARA ATHLETE

Insulin-dependent diabetes mellitus is more prevalent in the para athlete population compared to the able-bodied athlete population. Athletes with mobility impairment are at higher risk for metabolic syndrome due to loss of lean muscle mass. Additionally, some amputee athletes may have a long-standing history of diabetes, resulting in dysvascular complications and resultant amputation. Injectable insulin is sometimes necessary to control blood sugar levels and diagnosis should be thoroughly documented through standard clinical and laboratory measurements. Any adjustment of insulin dosage or frequency after a TUE is granted, should be reviewed and authorised by the relevant anti-doping organisation.

CARDIOVASCULAR CONDITIONS IN THE PARA ATHLETE

There is a higher prevalence of cardiac-related diseases in para athletes compared to able-bodied athletes. This is likely due to several factors, including the older average age of para athletes as well as the fact that in some cases, the athlete's primary impairment may lead to cardiac dysfunction, e.g. muscular dystrophy⁴. Beta-blockers, banned in-competition in precision sports such as shooting and archery, have been a source of controversy and challenge in recent years. There is lack of clarity regarding what constitutes a valid TUE, with athletes often suffering the consequences. A comprehensive review is long overdue to establish the true impact of **beta-blockers** on sports performance, perhaps in the hopes that some beta-blockers could be removed from the List and allowed without a prior TUE approval. When applying for a TUE for beta-blockers in precision sports, the athlete and their physician need to duly consider the implications of two decisions of the Court of Arbitration for Sport (CAS), both in the sport of shooting (CAS 2009/A/1948; CAS 2013/A/3437). In these cases, despite undisputed medical indications for the therapeutic use of beta-blockers, the TUE applications were rejected because the athletes could not show the absence of an enhancing effect on their individual performance⁵. CAS has confirmed that there are very limited circumstances where TUEs for beta-blockers in precision sports should be granted⁶.

any TUE decision to both reduce the burden on an athlete and offer an avenue of appeal. NADOs and IFs can be consulted to provide additional guidance to health professionals by walking them through the steps of the TUE application process.

What can sports medicine staff do to ensure a successful TUE application?

From time to time, sports medicine staff may be approached to help athletes with their TUE applications. The number one reason why TUEs are returned or denied

is because of the lack of complete medical records.

In all cases, the TUE application must have adequate medical information to substantiate the diagnosis. This should include a comprehensive medical history and examination with relevant laboratory investigations and imaging studies. An appropriately qualified physician must also justify use of the otherwise prohibited substance or method and explain why an alternative, permitted medication cannot be used. Sometimes, sports medicine staff may need to assist the athlete to obtain the above information from the treating physician(s) who may be unfamiliar with the TUE process.

Lastly, applications need to be submitted to the appropriate TUE Committee in a timely manner to facilitate decision-making and an expeditious response to the athlete. Depending on the level of the athlete and competition, TUEs are submitted to the TUE Committee of a NADO, IF or major event organiser. While mutual recognition of TUEs is encouraged between organisations, it cannot be assumed, so it is also best to check where necessary.

TABLE 3

IMPAIRMENT	CONSIDERATIONS & HELPFUL GUIDANCE
Visually impaired	<i>Athletes may require assistance from the person accompanying the athlete (or the Doping Control Officer) in communication and/or sample collection. Special attention should be placed on ensuring the integrity of the sample and that the doping control form is completed accurately.</i>
Hearing impaired	
Limb deficiencies/amputees/ abnormal limb movement/ paralysis	
Athletes with neurogenic bladder or dysraphisms	<i>Athletes with indwelling catheter</i> <i>While there is no need to change to urinary catheter or bag, pre-existing urine in the bag must be emptied first and sample is taken from fresh urine collected.</i>
	<i>Athletes who perform intermittent catheterization</i> <i>Glycerol is widely used as a lubricant for urinary catheterization and as an antiseptic in their storage. While the quantities used for these purposes are small and not expected to exceed the threshold for reporting an adverse analytical finding, it is advised that athletes consult their doctors for glycerol-free alternatives^{7,8,9}.</i>

Table 3: Doping control considerations for the para athlete.

DOPING CONTROL PROCESS

Under WADA Code-compliant anti-doping rules, an athlete may be selected for testing in- or out-of-competition and to avoid intentional tampering or manipulation of the urine or blood sample, the process is guided and observed by a Doping Control Officer. Witnessed urine collections can be understandably uncomfortable for the athlete and this can be complicated further in athletes with a disability. It is the role of the sports medicine professional to offer representation to athletes during the sample collection process. It is important to understand the entire doping control process, as a team doctor may accompany the athlete through the sample collection process and/or be asked to assist in the sample collection.

Para athletes may also have a range of medical conditions that may require the doping control process to be adapted, especially with regards to notification and sample collection. Unique considerations for the para athlete in the doping control process and helpful guidance are given in Table 3.

DIETARY SUPPLEMENTS

In the pursuit of sporting excellence, it is common for athletes to use dietary supplements to ensure that every possible strategy is harnessed to give them an ‘edge’ over their competitors. Careful thought and consideration should be given prior to taking any supplement.

On the one hand, a dietary supplement such as iron may be specifically prescribed by a medical professional because the athlete suffers from iron deficiency from an iron-poor diet. On the other hand, a battery of supplements may be self-prescribed by the athlete ordered online, bought over the counter or even supplied by a well-meaning friend. This lack of regulation frequently places athletes at risk. In many countries,

dietary supplements do not undergo pre-market review for safety and effectiveness before they are sold. This dramatically increases the risks the supplement containing a prohibited substance, even if it is not written on the label or list of ingredients.

Although there is no uniform message or position of all sports organisations, many have taken the approach of highly discouraging dietary supplement use. As an example, the US Anti-Doping Agency (USADA) has created a comprehensive supplement resource called Supplement 411 (www.supplement411.org) where athletes and other stakeholders are encouraged to become informed consumers by accessing extensive resources. The key messages are:

- REALISE there are safety issues with dietary supplements.
- RECOGNISE risk when you see it.
- REDUCE your risk of testing positive and experiencing health problems by taking concrete steps.

Anti-doping rules, including the IPC Anti-Doping Code, state clearly that athletes are responsible for any prohibited substance or its metabolites and markers found to be present in their samples. Yet there continues to be athletes (and officials advising them) who place themselves at undue risk of inadvertently taking contaminated or adulterated supplements containing prohibited substances, commonly stimulants and anabolic steroids and sometimes prescription medications such as glucocorticoids and diuretics. Athletes should be highly sceptical and take caution of weight loss, muscle mass and testosterone boosters, pre-workout energisers and sexual enhancement products.

In a recent illustrative case, two athletes, both of whom had been tested regularly in their sport, took health supplements with the intention of losing weight in a weight class sports. On the ingredient bottles, there was no mention of any prohibited substance. Hydrochlorothiazide was found in one and methylhexanamine in the other. Both received sanctions that included disqualification of their results and a period of ineligibility for competition.

What should every sports medicine clinician know?

Sports medicine clinicians should educate themselves in anti-doping matters as it is not only a duty, but because athletes under their care have implicit trust in their advice, counsel and judgement. Not infrequently do athletes state that they had checked with their doctor prior to consuming a medication or supplement, only to have a subsequent positive test. Ignorance on the part of the doctor may result in the athlete being notified of an adverse analytical finding, a sanction being imposed and/or a period of ineligibility; potentially ruining his or her athletic career. If a member of an athlete’s support team, such as a physician, is found to be administering or attempting to administer a prohibited substance or method to any athlete in-competition or



KEY TAKE HOME MESSAGES FOR THE SPORTS MEDICINE PROFESSIONAL

out-of-competition, he or she may also receive a sanction. The same may result with complicity, for example assisting, encouraging, aiding, abetting, conspiring or covering up information involving an anti-doping rule violation. Uniquely for clinicians, in addition to anti-doping consequences, there could be medico-legal implications and even criminal prosecution depending on the country and jurisdiction.

In addition, sport medicine doctors may be invited to educate the sporting community in anti-doping-related issues and may even be involved in the organisation of anti-doping activities. Many resources can be found on websites of NADOs and IFs and others specific to the sports medicine professional can be found online at:

- WADA Sport Medicine Toolkit (<https://www.wada-ama.org/en/resources/education-and-awareness/sport-physicians-tool-kit-online-version>)
- USADA/Stanford University Continuing Medical Education Health Pro Advantage – CME credit for physicians and open otherwise to any sports medicine professional (<https://med.stanford.edu/cme/courses/online/USADA.html>)

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Sports Medicine professionals should:

- Become educated and aware of country-, sport- and event-specific anti-doping rules to be an accurate resource to athletes and to avoid errors.
- Know the WADA Prohibited List and use country-specific resources to confirm the prohibited status of a substance or product.
- Assist athletes in applying for a TUE when appropriate by providing complete medical notes which clearly document a diagnosis and treatment plan consistent with best medical practice.
- Be aware that para sport athletes may request modifications to the doping control process due to factors related to their disability.
- Act as a representative to assist athletes through the doping control process.
- Educate athletes and the sports community regarding dietary supplements, noting that athletes may be at risk of an anti-doping rule violation or an adverse health event.

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