Recommendations to the Medical Services in Spanish federations by sport, for the inclusion of athletes with disabilities (first part)

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Summary

The inclusion process in adapted sport, affects at several levels on the Medical Services in Spanish Sport Federations (SMF), due to the presence of disabled athletes. This is a first part of the article titled *Recommendations to the Medical Services in Spanish federations by sport, for the inclusion of athletes with disabilities.* New significant aspects related with specific and differential adaptations on physiological control and sports control, are presented: medical and functional recognition, sports performance tests, sports-medical examination, functional classifications and assessments. Subsequently, nutrition, hydration and ergogenic supplements specific aids are explained. Finally, specific aspects of anti-doping control in disabled athletes are discussed: therapeutic uses exemption and specific adaptations to the sample collection techniques.
The second part, in a second article, will deal with other specific actions in the SMF and with other actions and adaptations that guarantee equality of conditions among athletes.

Recomendaciones a los Servicios Médicos de federaciones españolas unideportivas, para la inclusión de deportistas con discapacidad (primera parte)

Palabras clave:
Inclusión. Integración deportiva. Deporte adaptado. Deportista con discapacidad. Persona con discapacidad. Federaciones unideportivas (convencionales). Servicios médicos federativos.

Resumen

El proceso de inclusión del deporte adaptado repercute a diversos niveles de los Servicios Médicos Federativos (SMF), que deben de adaptarse a la presencia de los deportistas con discapacidad en las federaciones unideportivas españolas. En esta primera parte de las "Recomendaciones a los Servicios Médicos de federaciones españolas unideportivas, para la inclusión de deportistas con discapacidad" se presentan las bases en que fundamentar las necesarias adaptaciones, desde un modelo general de inclusión – integración, desde la dimensión del deportista, con diversos tipos de discapacidad, y de la modalidad deportiva. Se presentan los aspectos más significativos a tener en cuenta por los SMF en el proceso de inclusión de los deportistas con discapacidad, referidos a las adaptaciones específicas y diferenciales sobre el control fisiológico y el rendimiento deportivo: reconocimiento médico y funcional, pruebas de rendimiento deportivo, reconocimiento médico-deportivo, valoraciones y clasificaciones funcionales, y nutrición, hidratación y ayudas ergogénicas. Finalmente, se comentan aspectos específicos del control antidopaje en deportistas con discapacidad: autorizaciones de usos terapéuticos y adaptaciones específicas en las técnicas de recogida de muestras.
La segunda parte, en un segundo artículo, tratará de otras acciones específicas en los SMF y otras acciones y adaptaciones que garanticen la igualdad de condiciones entre los deportistas.

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Introduction

The inclusion of people with disabilities is a priority focus in social development policies in Spain, Europe, and the rest of the world, with physical and sporting activities, as well as competition sport, constituting an important means of achieving social inclusion targets[1]. Adapted sport is undergoing a historical moment around the world in terms of favouring the inclusion of its athletes, with the key objective being the promotion of performing sporting modalities, whatever the physical, psychic, mental or sensorial characteristics of the individuals undertaking them. This process represents a challenge that will mark the future of sporting modalities and competition sport in the 21st century.

Suggestions for driving forward inclusion/integration processes of adapted sport in Spain propose situations that require responses, for example:

- Structural and organisational adaptations,
- Aspects related to the promotion and initiation of sport, not just for people with disabilities but also for the wider population
- Aspects related to the guidance and training of sports managers and technicians, support for athletes, competition personnel, judges or referees
- The development of interdisciplinary teams that include adapted sport as an objective
- The development of adapted sport projects and programmes included in general sports programmes
- Sporting legislation applicable to the development of the process, agreed upon by single-sport federations.

Consequently, Federated Medical Services (FMS) should not be exceptional within this context of federative inclusive adaptation, and adaptation to these new needs emerging from the presence of athletes with different disabilities and their sporting modalities should be carried out. In this first part of the review, along with the FMS inclusion process of single-sport federations of athletes with disabilities, we will present the need to adapt the basic services offered, focusing on a level of physiological control and sporting performance, nutrition, ergogenic support, and as a result of this, anti-doping control.

Moving towards completing the inclusive process

It is important to highlight that the ultimate goal of the process is to achieve the inclusion of athletes with disabilities in single-sport federations. Yet it is also obvious to observe that not all athletes with disabilities - and their corresponding sporting modalities - will have the same possibilities of achieving this objective of maximum inclusion. Some will probably only be able to achieve – now and in the near future – levels that could fit within integration; thus the phrase "inclusion/integration" (Martínez-Ferrer, 2016)[2], which is often used as a premeditated fact for better understanding. Possessing sufficient normalisation criteria is a fixed requirement, which should show respect towards the diversity of all athletes in the single-sport federation at all times. In each case, the level or levels of normalisation and socialisation that these athletes and their modalities can achieve must be identified[2].

We are going to define these levels of the inclusive dimension through the characteristics of the athletes' disabilities and of the sporting modality, with this differentiation proving very useful for single-sport federation, which must later implement the participation and representation of the adapted sport within the federation itself, particularly in its sporting competitions. The dimensions are:

a) *Dimension of the athlete with disability*: in this case the athletes with disabilities can achieve the following levels:

– Included individual athlete: when his/her functional and competing capacities do not differ from those shown by other athletes at his/her sporting level within this sporting modality. An example could be an athlete with the ramifications of a forearm amputation, in a middle-distance athletics race.

Integrated individual athlete: when his/her functional and competing capacities are not comparable to those of other athletes at his/her sporting level within this modality. In this situation he/she must compete with athletes with a similar disability, applying the functional classification criteria of the sporting modality in question. An example could be a swimmer with the ramifications of complete paraplegia from the twelfth dorsal level, in a free-style swimming competition.

Adapted individual athlete: when his/her competitive capacity cannot be compared to those of other athletes at his/her sporting level because this modality or competitive characteristic does not exist in the single-sport federation. In this situation he/she must also compete with athletes with a similar disability, applying the functional classification criteria of the sporting modality in question. An example could be a visually impaired cyclist in tandem cycling mode, with a sighted guide.

Inclusive team athlete: when his/her functional and competitive capacities do not differ from those of the rest of the athletes in the team in that sporting modality, or are counterbalanced by small regulatory changes. An example could be a basketball player with a hearing impairment, with combined refereeing using a whistle and green and red lights.

Adapted team athlete: when his/her competitive capacity cannot be compared to that of other athletes at his/her sporting level because this modality or competitive characteristic does not exist within the single-sport federation. In this situation he/she must also compete in teams comprising athletes with similar disabilities, applying the functional classification criteria of the sporting modality in question. In this case, an example could be a football player with the ramifications of infantile cerebral palsy with hemiparesis with manifest spasticity, on a seven-a-side football team.

b) *Dimension of the sporting modality*: in this case the modality could achieve the following levels:

Inclusive modality: when the athletes have a similar functional and competitive level, for example, archery.

Integrated modality: when the modality is the usual one and within the same competitive setting, but not all the athletes have a similar or standard functional level and in the competition they must be classified in specific classes. An example would be table tennis for people with intellectual disabilities.

- Adapted modality: when the modality in question must have technical variations to allow it to be practiced by some athletes with disabilities. An example would be adapted curling.
- Assimilated modality: when the modality is not a true reflection of the standard modality and similar modalities have been developed to be performed by some athletes with disabilities, such as wheelchair rugby modality.

c) *Special dimension*: We should not forget that some sports carried out by people with disabilities do not have real inclusive capacity. There is a simple explanation, as there is not an established single-sport federation. An example of this is *Boccia* for athletes with physical disabilities, or *Goalball* for blind and visually impaired athletes. These sports should be established as single-sport federations on a national level with the support of the Spanish Superior Sports Board (SSB), as they already are on an international level.

The inclusion/integration of this special group within the federated Spanish sport will not be on a federative level, rather on a level of its equal interrelation in supra-federative organisations such as the Spanish Olympic Committee (SOC) or the Spanish Paralympic Committee (SPC), where it should occupy a newly created and represented space, in this case as "Paralympic Specific Sport Federations".

We must also consider the inverse possibility – integrated – in which people without disabilities perform any speciality of the adapted sport within the integrated modality, such as the incorporation of seated volleyball players without disabilities.

This historical time of including adapted sport into the sporting world is the latest challenge faced by sporting federations and competitive sport in the first quarter of the 21st century.

Basic adaptations of the federated medical services

The aim of this review is to present a proposal of general adjustments and adaptations of Spanish FMS, derived from the inclusion proposal within the Spanish Sporting Federation: *"Inclusion protocol of competitive sport for people with disabilities in conventional sporting federations – single-sports – in Spain"*. This study corresponds to a qualitative and far-reaching doctoral thesis[2], which proposes following a methodical research-action methodology that brings us closer to existing knowledge about the inclusion of adapted sport within sporting federations via their managers, technicians and athletes, comparing knowledge from different adapted sport federations and single-sport federations. The participative discussion Focus Group methodology was applied[3] in order to put forward the foundations of an intervention model that may be useful for transforming the setting into inclusive, framed within the criteria agreed upon in *"Good Inclusive Practices"*[4]. This review includes the main actions needed to transform FMS, especially those used generally by all federations, which will evolve towards specific actions depending on the sporting modality, as well as the type of disability and the degrees of disability in each single-sport federation.

Adaptations of medical and functional examinations

Medical and functional examinations must adapt to the needs and characteristics of the specific sport and of the athletes with disabilities that perform them, whether physical, sensorial or intellectual disabilities. These adaptations stem from the criteria established by the International Paralympic Committee Medical Code *(IPC Medical Code,* 2011)[5], which establishes all general criteria of medical assistance, the preservation of athletes' health and the ethics and confidentiality of the services provided.

Sporting performance tests

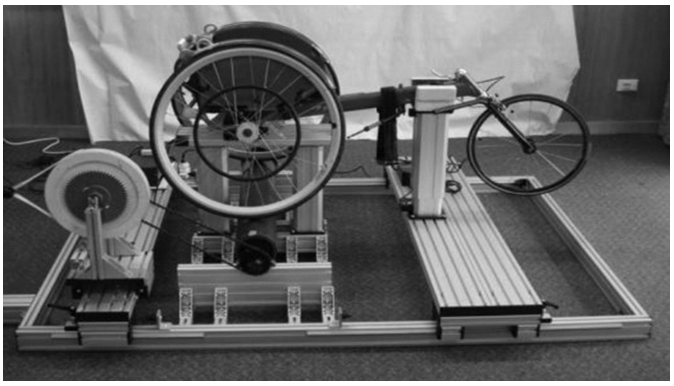
In order to perform a good follow-up of the training of athletes with disabilities, they must overcome some tests for physical condition, just like other athletes. These tests will assess different capacities and physical conditions, the most important of which are aerobic capacity, muscle strength and body composition. Also, depending on the type of sport and the disability, agility, speed, balance, flexibility and coordination can also be assessed.

Often, before carrying out the tests, one or more familiarisation sessions are required, in particular with athletes that have intellectual-type disabilities. It should be considered that, for some of them, the material and the equipment, as well as the execution techniques, are new, and we must ensure a minimum level of learning and confidence for the test to be valid.

With regards to the material and equipment, we must make some adaptive considerations. Some may be common for athletes with and without disabilities, but their assessment via the applied formulas may vary depending on the disability. This occurs, for example, when we want to obtain body composition via skin fold tests, or dynamometric indices via isometric dynamometers. Other pieces of equipment and machinery are specific to some of the disabilities. For example, in the case of wheelchair users, the use of a handbike is necessary. A sufficiently wide treadmill would also be useful, upon which a wheelchair could be placed, with fixtures to keep it on the belt. A third option would be to use mechanical rollers, requiring good fixture to the wheelchair to prevent possible accidents, particularly at moments of fatigue or claudication of the athlete (Figure 1). Another recommendable aspect, in the case of very reduced mobility, would be to have a belt with unloading harnesses for athletes with major walking limitations.

It is important to apply a specific protocol with loads and intensities that are customised to each athlete and his/her disability and sport so as to carry out an appropriate follow-up of his/her training, as there can be different physiological responses that can appear when exercise is performed with some kinds of disability. For example, in the case of Down syndrome, it is important to be aware of the chronotropic incompetence presented, with maximum heart rates being lower than those of the population in general for the same age (Guerra M. *et al,* 2003)[6]. Or, in the case of cerebral palsy, the thermo-regulation alteration due to an alteration of sweating, also significant in athletes with the symptoms of spinal cord injury[7,8]. Furthermore, in the case of field tests, it will be

Figure 1. Athletics wheelchair mounted on a treadmill for a study. A fixing device has been fitted to avoid possible accidents during the tests (authors' private photographic archive).



necessary to perform the corresponding adaptations, or simply create new tests that assess the elements we wish to control. In any case, it will be necessary to previously validate these tests for the corresponding demographic group.

Taking into account the heterogeneity of athletes with disabilities, and the large amount of sports that they can perform, it is difficult to establish specific protocols for assessing this demographic, which is why individualisation is so paramount.

It is therefore necessary to consider that before performing any test, general reference values should not be used to establish their current level of physical condition. We must always compare each individual with him/herself, and analyse improvements or changes for the worse that may occur in order to adapt training in the quest for satisfactory performance.

Medical-sporting examinations

In this section the characteristics and functionalities of the disability presented will be taken into account, in relation to the risk of practicing competitive sport. To do so, the official certifications held by the athlete with a disability should be considered, and the international criteria established in the International Paralympic Committee Classification Code (*IPC-Classification Code*)[9] - also approved in 2011 - in which eligibility criteria are established depending on the degree of disability and functionality for performing the specific sport. These criteria also establish which athletes may be eligible to partake in competitive sports, from levels that vary from maximal handicap[9] – an athlete that cannot be chosen given the risk that participating in the sport may have on his/her health and safety – to minimal handicap[9] – an athlete than is not eligible to participate in the adapted sport and may only compete in the inclusive modality, as his/her degree of disability and functioning are very similar to those for standard athletes in this specific sport.

Functional assessments and classifications of the disability

Classifying the degree of disability is a necessary assessment to ensure fair competition. Similar to wrestling, boxing and weight lifting, in which the athletes compete in accordance with established weight categories, athletes with disabilities are grouped into classes defined by the degree of functionality presented by the disability in a specific sport, which is often different despite the degree of disability being similar.

In 2003, the Paralympic Movement re-launched the study and analysis of the classification systems – initiated in 1990 by the Barcelona'92 Organising Committee of the 9th Paralympic Games (COOB'92)[10] –, recognising the need to coordinate some classifications under a theoretical and universal model. The outcome of this process is the International Paralympic Committee Classification Code, which is crucial for the future of Paralympic athletes as this classification ensures that the disability of an athlete is always relevant in his/her sporting performance (*IPC Classification Code*, 2011, Article 2.1.1)[9]. The code is complemented with international regulations establishing the technical and operative requisites for classification. There are three fundamental international control regulations for functionality:

- *Assessment of the athlete:* the procedures for athlete assessment and the adjudication of the sporting class and sporting class status.
- *Protests and appeals:* procedures for handling protests and appeals related to classifications when the disability of the athlete varies or if recommended.
- *Capacitation as classifier and certification*: management for uniform and universal training, and certification as specialised classifiers with authority to undertake classifying actions, whether nationally or internationally. The code is applied to all sports within the Paralympic Movement. The application of and compliance with the International Paralympic Committee Classification Code used by international sporting federations is supervised by the International Paralympic Committee (IPC).

The International Paralympic Committee Classification Code requires all assessment and subsequent classification systems applied to a specific sport to establish: a) the identification of the eligible impediments for this particular sport in athletes with disabilities; b) a detailed description of the assessment methods applied to the athletes so that the impact of the deficiency can be demonstrated.

These methods must be based on objective, standardised and certified objectives.

The IPC has adopted the research study *"International Paralympic Committee position stand—background and scientific principles of classification in Paralympic sport"*, by Tweedy and Vanlandewijck[11] as its benchmark, based on the evidence of an assessment and classification in a specific sport, specific classification systems that must coincide with the principles established in this section.

To guarantee that the competition is fair and equal, all Paralympic athletes have a categorisation system that ensures that winning is always based on the ability, aptitude, strength, resistance, tactical capacity and mental concentration of the athlete, and not by the level of his/her disability, taking into account the same factors that are considered for the successful sporting performance of an athlete without a disability. The aim is to minimise the impact of impairments in the sporting activity, discipline or sport. Therefore, having an impairment is not enough to be able to participate in the Paralympic games.

Currently, two classification models are applied in the International Paralympic Movement:

- *Sport-specific models*: in this classification system, athletes are evaluated and assessed taking into account the specific requirements needed in each sport and/or their basic sporting movements, for example, wheelchair sports/capacity to propel the wheelchair. This system is also known as functional classification.
- *General model*: in this classification system athletes are evaluated taking into account the type and degree of deficiency presented; for example, the degree of visual impairment and its repercussion on practicing the sport.

The impact of the sport must be proven; the sporting classes, in each Paralympic sport, establish grouping criteria of the athletes given their degree of limitation in the activity, resulting from their impairment. Classification is sport-specific, as impairment affects the capacity to perform different sports to different extents. As a result of this, an athlete may fulfil the criteria for one sport, but may not meet requirements for another sport, or may fulfil them with less functional significance.

Nutrition, hydration and ergogenic supports

The fundamental aspects of nutrition for athletes with disabilities will now be described. Two main aspects should be considered:

- On the one hand, the specific characteristics of the ramifications presented by the athlete with a disability, particularly persistent effects, whether physical, functional or mental, that may affect his/her capacity for nutrition. In the case of a tetraparesic or tetraplegic athlete, and even in cases of double-disarticulation of the shoulders, the fact that the athlete does not have easy access to drinks presents a complication when maintaining on-going hydration and even correct nutrition.
- On the other hand, it is also important to consider possible interaction with habitual and sporadic pharmacological treatments that many of these athletes receive to control their conditions, as well as the possible interaction between this base medication and the quantitative and qualitative effects they have on their nutrition, such as in the case of therapies that consider the use of diuretics, beta-blockers, muscle relaxers, anti-epileptic and/or anti-spasmodic drugs, among others.

It is important to know the practical aspects of correct hydration and nutrition in athletes with different disabilities: a) why it may be useful to drink or eat during exercise; b) the amount of liquid to drink; c) the best kind of drinks to consume; d) the amount and quality of nutrients to ingest and how to do it; e) the modifications that should be made in cold or hot environments; and f) the functional characteristics of athletes with disabilities.

Severe dehydration affects performance and increases the risk of illness through overheating, but drinking too much can also be harmful or uncomfortable, particularly for athletes with sphincter control difficulties.

Each athlete is different because each has different losses through sweat, different ramifications, treatments, etc., as well as different opportunities to drink liquids during training sessions and competitions. We must remember that humans do not adapt to dehydration, but we can learn to complain about it less.

Simple steps can help map out "good practices" for correct hydration (IOC: Nutrition for Paralympic athletes 2012)[12]:

- Start the session well hydrated.
- If the colour of the athlete's urine is darker than normal, more liquids may be required. This can be very objective for athletes that use diuresis bags for habitual incontinence for their disability[8].
- Drawing up a capacitation plan and drinking during competition is always necessary.
- If the athlete regularly has - in the terms of Casa *et al*. (2005) - a "salty shirt" [13], it is possible that he/she needs drinks with more salt, or to get more salt from foods, when sweat losses are considerable.

It is important to minimise the risk of gastro-intestinal problems, deriving from a condition that causes constipation, or from treatment with this side effect, occasionally also heightened on hot days, which favour constipation and dehydration. It may be best to avoid solid foods 2 to 3 hours before competing, as a combination of physical exercise and nervousness can lead to some gastric troubles.

Trainers of athletes with disabilities must have training resources available regarding specific nutrition and hydration, so they can guide their athletes towards good habits.

Thermoregulation mechanisms are generally less efficient in athletes with disabilities, and particular attention should be paid to the environment, activity patterns, clothing and hydration to avoid overheating and hypothermia.

Athletes with disabilities who consume a wide range of foods should not require dietary supplements, including the consumption of energy drinks containing large amounts of caffeine and that are not appropriate.

It is also very important for athletes with disabilities to always inform and update their trainers of any changes to medications that may have been prescribed, so that the FMS can assess new energy and hydration requirements, assessing whether or not specific ergogenic support mechanisms are needed. This information will always be regularly passed on to their trainers.

With regards to ergogenic supports, firstly it is necessary to have a correct knowledge of the energy system that is being used during the sport, as well as the characteristics of the ramifications and possible treatments used by the athletes with disabilities, as we have previously highlighted. This way, the right nutritional ergogenic support mechanisms can be used for each situation. These mechanisms are recommended for athletes with disabilities when the supplementation protocols proven to be effective are known, and upon assessing their possible interactions with the symptoms and treatments prescribed for these kinds of athletes. There is currently scarce regulation in the industry regarding specific nutritional supplementing for athletes with disabilities.

Furthermore, studies relating these supplements to the characteristics of disabling conditions or their interactions with medication that may control them - therefore truly guaranteeing the specific effectiveness of these supports in adapted sport - are practically non-existent.

Anti-doping control

The desire to achieve the personal and economic prizes available in modern-day sport may cause some athletes to want to win at any cost. The Paralympic Movement has also been tarred with these unfair and unacceptable practices[14].

To guarantee clean and fair sport, the IPC and its international federations, and the multi-sport and single-sport organisations with inclusive modalities are signatories and active members of the World Anti-Doping Agency (WADA) and the World Anti-Doping Code (2015)[15]. As a stakeholder of the WADA, the IPC has developed and implemented its own International Paralympic Committee Anti-Doping Code *(IPC Anti-doping Code)*[16], which includes the anti-doping regulations applicable to the Paralympic Movement, as well as the annual Banned Substances List, which are the same as those applied to Olympic sports, established annually by the WADA. As such, national single-sport federations and their FMS must follow these guidelines, in the event that they are not specifically defined in the Organic Act 3/2013, 20th June, governing the protection of the health of athletes and the fight against doping in sporting activity (Official Spanish Gazette No. 148, 21st June 2013)[17], they should consult the Spanish Agency for Health Protection in Sports (AEPSAD) to apply them and to find out their usage regulations.

With regards to aspects that may be different in the doping control of athletes with disabilities, they are more technical aspects rather than regulatory ones, as the mentioned Act for protecting the health of athletes and the fights against doping in sporting activity (2013)[17] does not make significant distinctions, which is why we always highlight those applied in the IPC Anti-Doping Code[16].

In reality it is very difficult to determine and analyse the exact effects that a substance, a method or a combination of the two can have on athletes, and whether this is damaging to their health. In particular, if an athlete with a disability must use substances to treat or stabilise any of the effects of his/her condition, or as a result of the combination of his/her base therapies, false positives may be given.

For athletes with disabilities, the initial review of a treatment to establish whether or not a Therapeutic Use Exemption (TUE) can be applied for and accepted is very complex and on many occasions it is essential for fair play, yet at the same time it is paramount for the health of the athletes in question, which should not be compromised under any circumstances. Therefore, it is vitally important for the athlete to give all possible information to his/her federation doctors and to the panel of TUE experts regarding all treatments and palliative methods, in complete confidentiality and applying the ethic of professional secrecy. Within this relationship, the doctor will take on various roles, including: educator, doctor, detective, sporting judge and advisor.

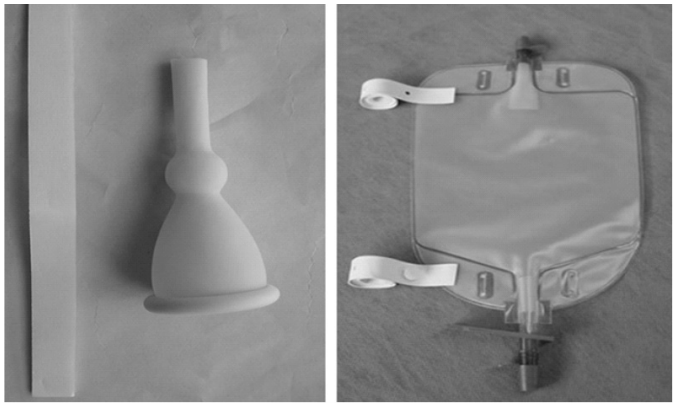
Some differentiating aspects of Anti-Doping Control in adapted sport.

- Therapeutic Use Exemptions (TUE): athletes with disabilities need to familiarise themselves with the TUE process. They should obtain an TUE, where applicable, from their national federations, and from the IPC if they are international athletes (Official Spanish Gazette No. 148, 21st June 2013; Article 17)[17]. Athletes must be aware that they may be likely to receive an adverse (positive) laboratory result, and the possible violation of anti-doping regulations until their TUE has been officially granted. Therefore, medical treatment should not start before the issuing date of the TUE authorisation certification, except for emergency medical conditions. The demands of the TUE will not be considered for back-dated approval, except for cases stipulated in the WADA World Code[15] such as: a) emergency; for example, urgent medical treatment or acute medical condition treatment; b) exceptional circumstance in which the athlete does not have enough time to request his/her TUE, or if there is insufficient time for the TUE Committee to consider it before a competition and before applying an anti-doping control plan.
- Adaptations of sample collecting techniques in adapted sport: the WADA World Code[15] provides the opportunity to modify sample-collecting processes for anti-doping controls. The Anti-Doping Official[17] enabled to perform anti-doping controls, following these recommendations, is authorised to modify standard procedures to take samples from athletes with disabilities, with the aim that these modifications do not violate the integrity, safety or identity of the sample, and with authorisation from the athlete and/or his/her representative.

  This may be the case when:

a) Athletes present limited mobility or coordination during the standard sample collection procedure; e.g. If the athlete is unable to handle the collection cup correctly, other, larger containers may be used that are adapted to his/her coordination and/or mobility deficit. The Anti-Doping Official can help carry out these tasks under the supervision and authorisation of the athlete and/or his/her representative.
b) In the case of visual impairment, the athlete's representative can sign the corresponding forms and records.
c) When the athlete cannot inspect the sample collection equipment, his/her representative will be authorised to carry out the inspection.
d) If he/she has neurological or neuromotor development conditions (e.g. Athletes with a neurological or development disability), the athlete's representative may accompany him/her at all times during the sample collection session.
e) When an athlete uses a catheter or a condom device for the production and diverting of urine (diuresis bags). Athletes that use urine-collecting bags can choose one of the following methods for the collection of their samples (Figure 2).
   - If the catheter or condom device can be separated from the diuresis bag and a new bag can be attached for subsequent sample collection.

Figure 2. To the left, a standard urine-collection device and adhesive strip for attachment to the penis (condom-type device), for leaking incontinence. To the right, a urine-collection bag with straps for attaching to the leg for wheelchair users (authors' private photographic archive).



- If the used catheter or condom must be replaced, the completely empty bag and a new sample of fresh urine must be collected. The sample can also be collected directly via the catheter in a collection cup.

In this latter case (section e), the IPC Statement on the Use of Catheters (2008) should be considered, with textual quotation: *"The IPC considers the use of a urinary catheter by an athlete with a need for self-catheterization as 'personal equipment'. There are potential hazards to using different catheters, such as infection and/or allergic reactions. Athletes use their own catheters, therefore, due to the variety of brands, models and sizes, it cannot be expected that Organising Committees or doping control authorities will supply catheters that meet the individual requirements of each athlete. Along these lines, and giving absolute priority to the health of the athlete, the catheter used is the athlete's responsibility. Though it is not compulsory, athletes are recommended to use sterile catheters for hygiene reasons and to prevent illnesses".*

f) When it is impossible to collect a blood sample though venepuncture on the arms (e.g. amputations of the upper limbs), the Spanish Anti-Doping Agency (AEPSAD) official will extract the blood sample from the vein on the foot or ankle, depending on the disability.

g) It should be noted that any of these specific adaptations in collecting samples from an athlete with a disability should be specified and listed in the Supplementation Form of the sample collection taken by the Anti-Doping Official.

Conclusions

In this first part of the review, the most significant aspects have been presented for FMS to consider in the inclusion process of athletes with disabilities in state single-sport federations. The different levels of standardisation that each athlete with a disability can attain in single-sport federations in general have been displayed, as well as inclusion/integration processes, which in any case will be related to the level and type of disability presented by the athlete, as well as his/her sporting modality.

The specific adaptations that single-sport federations must implement have also been presented. In this first part, focusing on the specific assessments that have to be carried out on athletes with disabilities, with a particular emphasis on the different characteristics and those that overlap with other athletes, both in physiological control and sporting performance, nutrition, the use of ergogenic supports, and as a result of them, the anti-doping control of these athletes.

In the second part of this review, to be prepared shortly, other actions and activities of FMS will be described, as well as a brief description of architectonic adaptations and the suppression of different types of barriers, with the overall objective of providing a service under equal conditions for athletes with disabilities.

The intention of this review as a whole is not to provide a standard list of adaptations and inclusive applications, rather to pool the main adaptations and inclusive adaptations that should be present in state single-sport federations, which, individually and specifically, should be assessed and redesigned, specifically considering the sporting modalities of the athlete, applicable to all athletes regardless of their conditions.

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