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

Josep Oriol Martínez-Ferrer, Myriam Guerra Balic, Jordi Segura Bernal

Facultat de Psicologia. Ciències de l'Educació i de l'Esport Blanquerna. Universitat Ramon Llull. Barcelona.

Received: 22.09.2017
Accepted: 14.12.2017

Summary

The inclusion of people with disabilities is a priority axis in social development policies, both in Spain and in the rest of the world. Also, in practice of physical and sports activities, where they are already an example that can be extrapolate to other areas of the society. Currently the International Sports Federations (one-sport) are developing their inclusive processes to accommodate athletes with disabilities of their sport; this process has already become a widespread and irreversible worldwide sport movement. This situation is being conducted by the "Consejo Superior de Deportes" (Spanish Sport Council) and the Spanish Paralympic Committee, a process that must culminate with the incorporation, to these national federations by sport, of all people disabled or not, who want to practice their modalities, in a single sport organizational model.

In its first part, "Recommendations to the Medical Services in Spanish federations by sport, for the inclusion of athletes with disabilities", it already pointed out that the structure and organization of Federative Medical Services (SMF) must not be alien to the inclusive process and adaptation in all the federative structures. Therefore, now, the rest of the necessary and significant actions and adaptations are complete, as in physiotherapy, orthopedics and technical aids, health care, psychology and structural adaptations of the SMF also. This review, as a whole, has as main objective to guarantee, through its recommendations, quality services, which can be offer in the same measure to athlete with or without disability in equal treatment. Providing recommendations and more knowledge to the process of inclusion in the federated Spanish sport, so that it reaches success, and can guarantee a good service to all its athletes, following the most current criteria of good inclusive practices.

Key words:
Inclusion. Sport integration. Adapted sport. Disabled athlete. Adapted sport federations (multi-sport). Federations by sport (conventional). Medical sport services. Adapted sport psychology.

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

Resumen

La inclusión de las personas con discapacidad es un eje prioritario en las políticas de desarrollo social, tanto en España como en el resto del mundo, también en la práctica de las actividades físicas y deportivas, donde ya son un ejemplo extrapolable a otros ámbitos de la sociedad. Actualmente las Federaciones Deportivas Internacionales (unideportivas) están desarrollando sus procesos inclusivos para acoger a los deportistas con discapacidad de sus modalidades deportivas, este proceso ya se ha convertido en un hecho generalizado e irreversible a nivel deportivo mundial. También las federaciones deportivas españolas, tanto de deporte como las plurideportivas de personas con discapacidad han iniciado, a distintos niveles, este proceso inclusivo. Esta situación está siendo conducida por el Consejo Superior de Deporte y el Comité Paralímpico Español, proceso que ha de culminar con la incorporación, a estas federaciones nacionales por deporte, de todas las personas discapacitadas o no, que quieren practicar sus modalidades, en un sólo modelo organizativo.

En su primera parte, "Recomendaciones a los Servicios Médicos de federaciones españolas unideportivas, para la inclusión de deportistas con discapacidad", ya se remarca que la estructura y organización Servicios Médicos Federativos (SMF) no debe ser ajena al proceso inclusivo y de adecuación en las estructuras federativas. Por lo cual, ahora, se completan el resto de acciones y adaptaciones necesarias y significativas, como en la fisioterapia, ortopedia y de ayudas técnicas, atención sanitaria, psicológica y también de adaptaciones estructurales de los SMF. Esta revisión, en conjunto, tiene como objetivo principal garantizar, a través de sus recomendaciones, unos servicios de calidad, que puedan ser ofrecidos en la misma medida a deportista con o sin discapacidad en igualdad de trato. Aportando recomendaciones y más conocimiento al proceso de inclusión en el deporte federado español, para que éste alcance el éxito, y pueda garantizar un buen servicio a todos sus deportistas, siguiendo los criterios más actuales de buenas prácticas inclusivas.

Palabras clave:
Inclusión. Integración en el deporte. Deporte adaptado. Deportista con discapacidad. Federaciones de deporte adaptado (plurideportivas). Federaciones unideportivas (convencionales). Servicios médicos federativos. Psicología del deporte adaptado.

Correspondence: Josep Oriol Martínez-Ferrer
E-mail: JoseOriolMF@blanquerna.url.edu

Introduction

The inclusion of people with disabilities is a priority focal point of social development policies in Spain, Europe and around the world[1], with competition sport being an important way of achieving social inclusion goals (Martínez-Ferrer, 2004)[2]. We feel that world adapted sport is currently experiencing a historical time in terms of favouring the inclusion of these athletes in their sporting modality; whatever the physical, mental or sensorial characteristics of the people that perform them.

In 2004 in Cairo (Egypt), the Extraordinary Assembly of the International Paralympic Committee (IPC) approved favouring the inclusion of different sports and Paralympic athletes in the International Sporting Federations (single-sport). This new strategy is being applied in Spain by the Superior Board of Sport (SBS), with the gradual and progressive inclusion of people with disabilities and their sporting modalities, towards their incorporation into national federations for sport (single-sport). As the first part of this review explains, Federated Medical Services (FMS) should not be an exception in this fascinating inclusive and adaptation process; and this second part covers the other adjustments and adaptations that we consider to be the most essential and significant, including the latest new changes and the main services provided, as well as structural changes, which are also important in ensuring a good federated service to all athletes under the current criteria of good inclusive practices (Segura J, *et al.*)[3].

Repercussions of the federative inclusive process in Spain

Diverse sporting modalities have already been pushed into the sphere of competitions, with International Federations of Sports for People with Disabilities, to Sporting Federations for Sport (single-sport), having already developed inclusive/integrated competitions for athletes with different disabilities. Even the Paralympic Games in Rio 2016 moved 10 sporting modalities to these federations[2] (displayed in Table 1).

Since 2008 and following the international model, the Spanish Paralympic Committee (SPC) has been promoting agreements with Spanish Olympic federations to join forces to ensure that Paralympic sport improves day after day in social interest and respect for diversity. Currently contacts are being made for the inclusive development of the Paralympic modalities of Cycling, Horse Riding, Canoeing, Triathlon, Tennis, Table Tennis, Archery, Olympic Shooting and Windsailing, among others.

In this second part of the review, more adjustment and general adaptation proposals will be presented, from Spanish single-sport federations, arising from the "Inclusion protocol of competition sport of people with disabilities in conventional sporting federations – single-sports, in Spain"[4].

In this second part of the review, more proposals are presented for adjustment and general adaptations of the Spanish single-sport federations, taken from the "Inclusion protocol in competition sport for people with disabilities in conventional – single-sport sporting federations in the Spanish State"[4].

Table 1. Relationship between sports and international single-sport federations in the inclusion/integration process in the world Paralympic Movement.

• **Canoeing**	*International Canoe Federation* (ICF)
• **Cycling**	*Union Cycliste Internationale* (UCI)
• **Curling**	*World Curling Federation* (WCF)
• **Horse riding**	*International Equestrian Federation* (FEI)
• **Rowing**	*International Rowing Federation* (FISA)
• **Tenis**	*International Tennis Federation* (ITF)
• **Table tennis**	*International Table Tennis Federation* (ITTF)
• **Archery**	*Fedération Internacional de Tir á l'Arc* (FITA)
• ***Triathlon***	*International Triathlon Union* (ITU)
• **Sailing**	*International Federation for Disabled Sailing* (IFDS) Dependent on the International Sailing Federation (ISAF)

Source: International Paralympic Committee webpage (consulted 2012/2016).

Other proposed adaptations of the federated medical services

This section defines the specific, healthcare-related, structural and technical adjustments and adaptations of the FMS, to provide services and to monitor all athletes, including those with some kind or degree of disability.

Physiotherapy and orthopaedic technical supports

Athletes that have some kind of disability require the services and care of physiotherapy professionals to maintain their physical and biomechanical faculties, particularly their muscles and joints[5,6]. In some cases, this is due to the excessive demand of over-loaded areas, for example, the shoulders and shoulder girdle in athletes that use wheelchairs and that may also use them in their everyday life. In other cases this can be anatomical areas, that due to limited usage or paralysis, require movement and passive manipulation to prevent unwanted effects, such as contractures and ankylosis in restricting positions, which can occur in swimmers with paralysis or paresis in their lower extremities. Under these conditions, physiotherapists establish functional re-adaptation exercise programmes, so that these people can recover and once again perform functions effectively, thanks to regular physiotherapy support programmes that are applied to specific sports and the modalities they perform[5,6].

From a technical point of view, the objectives of sports physiotherapy for people with or without disabilities depend on both the perspective of the trainer and the athlete[5], and depend on the discipline and anatomical-physiological characteristics of the athlete. However, in the case of athletes with disabilities these targets will also directly depend on their disability and the degree of the effects of this, and in

many cases on their movement system; walkers with great tendency to asymmetry on the longitudinal axis, or wheelchair users with an overload of the shoulders and arms as a basic element for movement. All of these aspects should be taken into account in personalised physiotherapy treatments.

We can establish the main objectives for these athletes:

- *Establishing preventive measures:* through a synergetic relationship between the trainer and the sports physician or team sports physician, to develop a working programme that minimises the risks of injuries and overloading, considering adequate preparation, the correct nutritional provisions and ideal physiotherapy care depending on the physical and mental capacities of each athlete. This objective is fundamental for them, as there are large anatomical areas (as mentioned above), with muscle-joint overload resulting from or as a consequence of the effect of these disabilities. As such, constant work is required from physiotherapy specialists, particularly for the shoulder and arms area for wheelchair users, and for the dorsal spine and lumbar region for all disabilities that may affect the longitudinal axis, among others.
- *Continuing treatment upon returning to competition:* the main aim of physiotherapy is to provide therapy without putting conventional medical treatments to one side; therefore, the athlete is supervised by a multi-disciplinary sports and medical team. Recovery from injuries will be quicker if this stage is monitored by an efficient and cohesive multi-disciplinary team, with the very latest medical knowledge, helping the athlete return as soon as possible to the sporting activities, regardless of his/her condition as an athlete without a disability, but especially for those with disabilities, it is important to ensure a return to everyday activities, which should be compromised as little as possible.
- *Sporting activation:* an athlete should follow a progressive sequence in the event of acquiring an injury. If the physiotherapist has done his/her job to prevent muscular atrophy, circulatory deficit and postural imbalances, particularly in athletes with disabilities in the areas where the effects have caused these aspects through lack of use, then the athlete with or without an injury can already return to activity, always under regular medical and physiotherapeutic surveillance.

  Within these final two physiotherapeutic objectives, once implemented and consolidated, we should assess the possible variations that these actions could represent for adaptability to the athlete's orthesis, prosthesis or wheelchair, which should always be re-assessed after these processes for returning to competition.

A knowledge and use of orthopaedic materials and technical supports, especially for athletes with motor disabilities, will be very important in the good bio-mechanical development of the sporting practice and movement. Currently, sporting prostheses and wheelchairs designed for the diverse Paralympic sports are already highly specific and unique[6]. We define Orthopaedic Sports Material as any instrument or apparatus that facilitates sporting movements and gestures for athletes with disabilities, in particular those with physical disabilities. Among the most representative are specific sports wheelchairs and prostheses for sporting application with an exoskeleton or functional design; also

Figure 1. Diverse sports prostheses and their servicing. Diverse competition wheelchairs with sport-specific adaptations (authors' private photo archive).

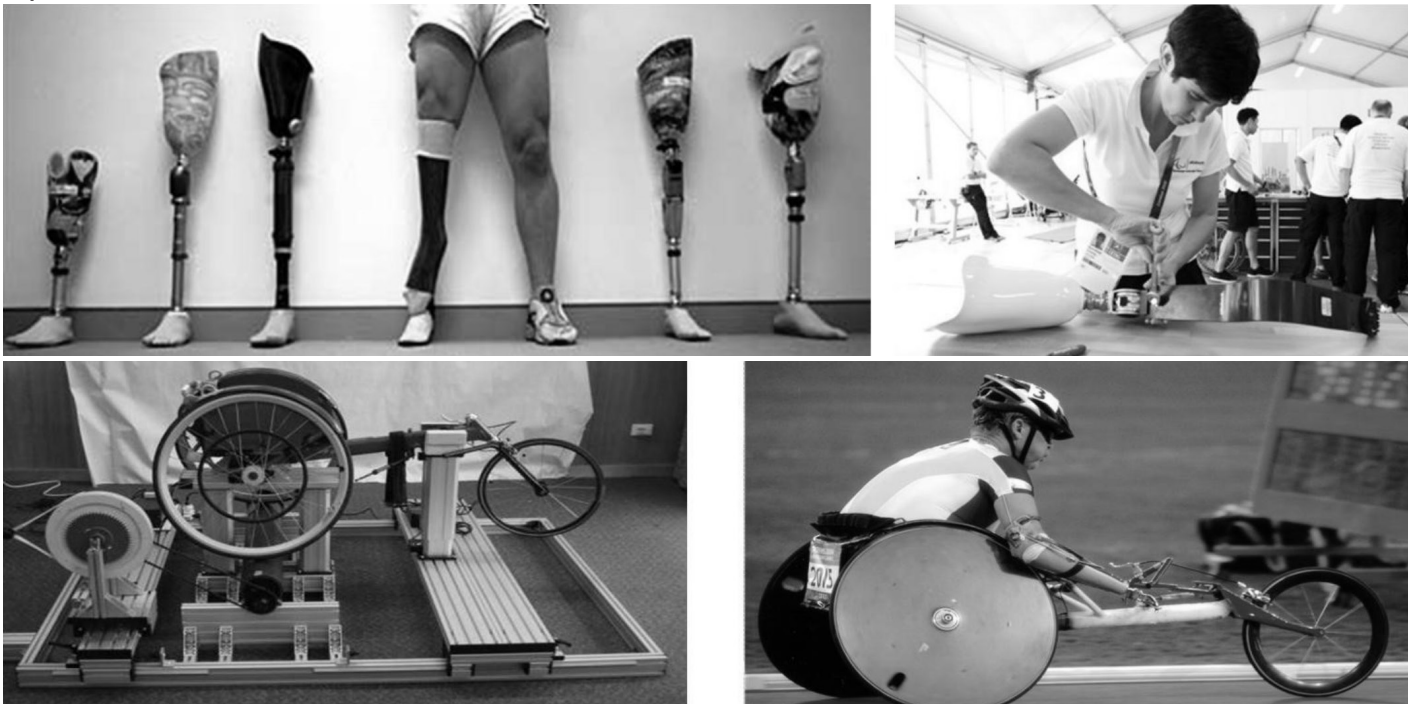


Figure 2. Wheelchair fixing devices for fencing in the wheelchair modality (authors' private photo archive).

included are sticks, crutches (safer in sporting practice), specific ortheses to facilitate mobility in sport, such as the so-called "stabilos", a mixture of a crutch, a ski pole and a ski tip for skiers with motor disabilities (Figure 1).

On the other hand, we define Technical Sporting Aids as the adaptations made to habitual sporting instruments or implements so they can be used in sporting practice for better performance and safety. In this case we could highlight the sticks attached to electrically-controlled wheelchairs for electric wheelchair Hockey players; the opaque masks for Goalball players with visual deficiencies; or the supports and special fixing devices used to secure wheelchairs during adapted fencing (Figure 2).

There are currently numerous specific sporting wheelchairs and functional sporting prostheses (Figure 1), in a range of different varieties and possibilities. For this reason, it is often necessary to count upon the support of specialised orthopaedic personnel, technical assistance, and enough maintenance and repair material to keep the support device suitable during sporting practice and to adapt it to the disability of the user

Healthcare assistance: in follow up and in competitions

Follow up healthcare assistance is usually organised into three types of basic functions: medical-sporting attention for athletes, regular anti-doping checks, and the establishment of ergogenic and/or nutritional support systems, with the latter two aspects favouring an improvement in specific sports performance, as mentioned in the first part of the review. Each sport has specific regulations regarding healthcare needs, which is why the curricular characteristics of the personnel in this field will depend on these. However, in cases of inclusion processes for athletes with disabilities, it will be very important for the medical specialist in physical education and sport to have support and active consultancy with specialised adapted sports physicians, in the previously mentioned aspects: doping, assessments, classifications, etc. As well as experts in the effects of the disability that these athletes may have, such as rehabilitation specialists, medullar injury specialists, amputation specialists, in the repercussions of cerebral palsy or head injury, and of course ophthalmologists, ENT specialists, and if necessary psychiatrists. Consultation with GPs could also be a good supporting platform for adequate federated sporting medical healthcare.

In terms of healthcare cover for sporting competitions, this review does not aim to provide a detailed identification of the elements and guidelines to develop within the competition healthcare organisation. Authors such as Moreno E, *et al* (2001)[7] on a general level, and Van de Vliet and Wilkinson (2015)[8], specifically for Paralympic competitions, already describe this issue in enough detail. We are merely going to highlight the probable presence in competitions of people with different disabilities, whether athletes, officials and managers, the public, family members and even media personnel, which could be major in competitions with the participation of adapted sport. This fact should be taken into account in the specific previsions of healthcare organisations. Sometimes this just requires making simple previsions such as providing wheelchair spaces for attendees; offering beds to help transfer athletes; or the participation of diverse healthcare specialists in the different effects depending on the type of competition and competitors. It is important to count on the collaboration of a reference hospital with specific healthcare units to provide specialised assistance depending on the disability, for example, the Medullar Injuries Unit, the Acute Brain Injury Unit, or the Ophthalmology Emergency Service, among others.

Journeys and travel

With the growth of the Paralympic Movement, athletes with different disabilities and degrees of affectation travel frequently to compete, often covering large distances. The needs required to prepare these journeys should be considered, with the aim of ensuring that these

athletes reach the competition in an optimum state of activation to guarantee their sporting success. We present various recommendations organised by the "tempus" and characteristics of the journey, applicable to all athletes in general, and specifically for the types of disabilities and their main effects.

Depending on the "tempus" and characteristics of the journey

- *Prior to the journey:* individual assessment of any restriction that could prevent the athlete from travelling so as to plan optimum sporting performance, medication requirements and possible administration during the journey. It is particularly important to review the use of any medication or ergogenic supplies that may require special conditions, such as refrigeration, or insulin syringes, among others. These actions also favour the review of possible medications or methods that require a Therapeutic Use Exemption (TUE), according to the World Anti-Doping Agency's (WADA) annually published list of banned substances and methods. Obtaining all the immunisations needed for the destination location should also be guaranteed. General reviews of the level of accessibility and the mode of transport, as well as the estimated length of the journey will also be necessary.

  Ensure beforehand that the athletes have all their necessary travel documents; including passports, a visa for the country they are travelling to (if required), medical insurance and vaccination history. Provide extra space for enough equipment and healthcare apparatus, technical support supplies and orthopaedic material to last the entire journey and stay. Take into account the time difference at the destination to calculate the need to take possible action beforehand to adapt to sleeping times and for possible medication administration times.

  Finally, make sure small amounts of medication and supplies are available during the journey, taking into account the current strict regulations on medication and the transportation of liquids, especially for air travel.
- *During the journey:* keep hydrated at all times and in all situations. The air used to ventilate aeroplanes is extremely dry and can cause dehydration. It is important to consider your personal preferences to find the right balance between suitable hydration and an excessive use of the bathroom facilities. Also, avoid alcoholic drinks that can be highly diuretic and dehydrating. For lengthy journeys, frequent hand washing is recommended to prevent infections. Whenever possible, athletes should keep mobile and perform quick stretching sessions and walk about. For athletes that cannot walk, upper body stretches are recommended, as well as short self-massages on the legs and arms to help the blood flow and the lymphatic system throughout the journey.

  Keep the distribution of medication and/or treatments to previously established intervals, ensuring the correct dosage at all times.
- *Once at the destination:* Monitor the amount of pollution and/or the air quality in the place of competition. This is important if the athlete is asthmatic or prone to respiratory diseases; this may require an adaptation of the bronchodilator dose. Help adjust the sleep/circadian cycle by applying the various guidelines previously established to these effects, and avoid light stimulation before sleeping (TV, tablet, computer screens), as this can make it harder to fall asleep.

  Fluid balance should be controlled. If the athlete's urine is darker or more concentrated upon arrival, the athlete should recover hydration as quickly as possible, until the urine is a clear, yellow colour.

Specifics regarding the type of disability and the degree of affectation

- *Athletes with effects from medullar injury, spinal bifida, poliomyelitis and other central or peripheral neurological effects:* use the pillow that is normally used whilst sitting. This can be particularly important for lengthy journeys to avoid pressure sores and ulcers. It is also recommendable to make small posture changes on the sitting supports every 30 minutes of the journey.

  For athletes that use them, check the state of the catheter and catheter equipment, and plan a time to control diuresis with catheterisation or catheters. This can be important on lengthy flights in which an aisle chair must be used for getting to the lavatory. For males the use of a condom catheter with a leg diuresis bag is considered appropriate to reduce the need to use the lavatory. If the athlete is prone to UTIs, the prescription of an antibiotic prophylaxis is considered acceptable before and during the travel period.

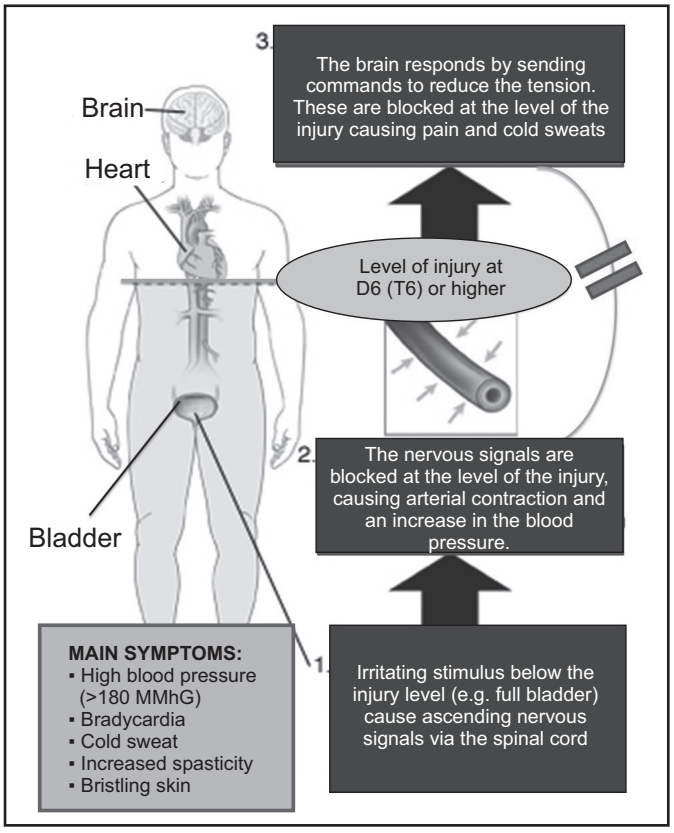
  An intestinal control programme should be planned around the time of travel and during the journey. If possible, defecating before starting the journey is recommendable, as this is more practical and easier when using public transport. Once the athlete reaches the destination, the intestinal programme times may require adjustment to work around the competitions.

  If there are athletes that suffer from spasms, these may occur more frequently due to tension and fatigue on a long journey. Check to see if this could be due to a neuro-sympathetic irritation below the level of the injury[9], which is common in athletes with medullar injury, due to possible folds in clothes under the area where the athlete is sitting, a trapped catheter or a full bladder. By alleviating the source of irritation, spasms may improve. If the spasms continue to worsen and are not alleviated using these methods, an anti-spasmodic pharmaceutical solution should be taken, particularly if the journey is very long.

  Due to the design of aeroplane seats, it is possible that the athlete will be sitting in a very upright position for hours on lengthy flights. This is frequently due to their reduced mobility, causing circulatory oedemas in the legs. In this case, the athlete should keep his/her legs raised during the journey. Special ascending compression stockings can also be used.

  Many athletes with medullar injury, particularly those with upper chest or cervical spine injuries, may present skin thermoregulation

Figure 3. Schematic representation of Autonomous Dysreflexia.



Adapted from Mazzeo F, Santamaria S, Iavarone A. "Boosting" in Paralympic athletes with spinal cord injury: doping without drugs." Funct. Neurol. 2015;30 (2):91.

disorders[9]. Aqueous mist spray bottles should be used to improve the body temperature. This can also be useful upon arrival and during the competition in hot regions. If the body feels cold, keep warm clothes or blankets to hand for a quick solution.

Athletes with medullar injury above vertebra D6 could be at risk of presenting Autonomic Dysreflexia (Krassioukov, 2012)[9], an uncontrolled reaction of the sympathetic nervous system due to harmful stimulus below the level of the injury, which cannot be controlled by the medullar injured athlete. Prevention will be the main tool for controlling it, avoiding possible irritating elements that can trigger it, such as tight, wrinkled clothing, late emptying of the bladder, among others. If dysreflexia symptoms appear, such as a headache, cold sweat, a possible increase in spasticity, nausea and/or vomiting, bristling skin and a significant increase in the systolic arterial tension, above 180 mm of Hg, with marked bradycardia, emergency action should be taken (Figure 3).

The first step is to locate and remove the stimulus, then place the athlete in the *"trendelembrug"* position and relax him/her; if this does not improve the haemodynamic situation, treat *"in situ"* with quick action vasodilators (Nifedipine 60 mgr. or Nitro-glycerine sublingually), remembering that the most serious cases can cause serious crises with epileptic contractions, visual impairment, stroke, collapse and death.

– *Athletes with amputation/s:* at a skin level and particularly in the area of the stump/s, take good care of the skin and check that there are no open wounds or areas of sores through contact. If the athlete wears a prosthetic limb, this could be removed for the majority of the journey if it is lengthy. If the athlete removes the prosthesis, correct distal irrigation should be guaranteed, raising the extremity and performing a gentle tissue massage to avoid problems with oedema when re-positioning it upon arrival.

As previously mentioned and due to the design of the seats, particularly in aeroplanes, swelling or oedema can develop in the limbs. This may be uncomfortable, and it can create problems when re-positioning the prosthesis/prostheses. Firm compression stockings can be used, which are extremely useful, preventing excess fluid from accumulating in the legs.

Structural adaptations

It is important, following the recommendations of the architect and accessibility expert Enrique Rovira-Belta Cuyas, to analyse the structural adaptations of the FMS, using their guide as a reference *"L'esport Inclou: Guia d'accessibilitat de material i ajudes tècniques per a centres esportius"* (2012)[10] to avoid accessibility barriers.

In the area around the FMS there should be parking spaces reserved for ambulances, medical vehicles and also, in particular, for users with reduced mobility[6]. These spaces should measure 5.00 m x 2.20 m for the vehicle in question, positioned in a row and with back clearance of 1.50 m to enable lateral transfer into and out of the vehicle, particularly for wheelchair users.

The FMS should have hydraulic beds with a minimum elevation height of 0.45 m to facilitate the transfer of all possible users, in particular for those with reduced mobility.

The floor surface should be hard, smooth and non-slip throughout, made of material that can be easily disinfected without damaging the surface features.

There should be two-way accessible itineraries in both directions, a minimum of 1.80 m wide to allow two competition wheelchairs to pass simultaneously. It is recommended that the different elements of an itinerary should be different colours so they can be easily distinguished: ground, ceiling, vertical furnishings, doors, etc.

Doors should be at least 2.10 m high and 0.90 m wide, and 1 m for competition wheelchairs. If there are two doors, one should measure at least 1 m wide.

Toilet facilities and possible nearby areas such as changing rooms should be equipped to perform anti-doping checks. Recommendations: there should be enough space to allow a turning circle measuring 1.50 m in diameter free from any obstacles, between the ground and 0.70 m height inside the accessible hygiene room. There should also be enough space to allow a turning circle measuring 1.50 m in diameter free from obstacles inside the booth, before the access door.

In order that these 2 spaces can be equipped to perform anti-doping checks, it is recommended:

- That the floor surface is non-slip.
- That the top part of the hand washing facilities are a maximum height of 0.85 m, free height below of 0.70 m minimum, and free depth below 0.50 minimum. Front access should be possible, without a step.
- Large mirrors, from 0.90 at the base (or moveable to a 10º vertical angle).
- Toilet positioned at a height of 0.45 – 0.50 m, with handrails as described previously. Lateral transfer space of at least 0.80 m, free from obstacles and 0.75 deep. In publicly used areas, a space to transfer on both sides, an accessible WC room. Steps are not permitted for toilets, apart from if they are part of the construction to achieve an accessible height.
- Urinals: if there are more than 5 units, at least one must be positioned at a height of 0.30 – 0.40 m from the base.
- Lighting: Lighting with timers is not permitted in accessible hygiene facilities.

Changing rooms should have the same features analysed as for hygiene facilities. The changing room should have enough internal space to permit a turning circle of 1.50 m in diameter free from obstacles, between the floor and 0.70 m of height. There should be individual accessible changing rooms, at least one for each sex, to allow the user and an assistant to enter, despite being of a different sex. Also, the external space of the booth should allow for turning circle measuring 1.50 m in diameter, free from obstacles, in the area before the door.

Technical adaptations

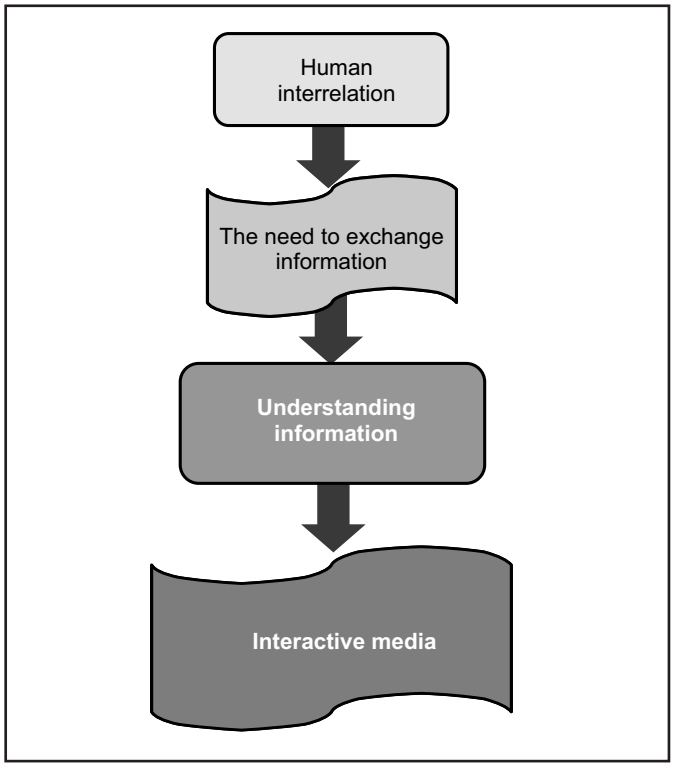
Represented by apparatus or equipment used for mobilisation, communication and information that favours the stay and access to all FMS: orthosis and prosthesis, anti-sore cushions, anti-decubitus mattresses, sticks, crutches, standing frames, walking frames, wheel chairs, cranes, seat and bed for bathing. Also, optical supports and electro opticals, Braille writing machines, sound recorders, peripheral devices, hearing supports, headphones, voice synthesisers and any other element that is duly justified.

Adapting communication and disclosure

For this kind of basic adaptation, the following elements are necessary:

- Information given via megaphone will be transcribed by sign-language interpreters in any events that require this service.
- Technical and human resources will be strengthened to make ordinary information and communication systems accessible.
- Sound amplification systems in: e-mail, fax, digital screens, information panels or similar, text telephones, information screens displaying the information given aurally via megaphone, among others.
- Sign language interpreters, headphones and magnetic circuits.
- Written signposting.
- Subtitling.
- Simultaneous interpretation.
- Picture codes.

Figure 4. Diagram of the elements of human communication.



Adapted from "Elementos para el Intercambio Comunicativo", in Otero, M.O. (2011). Support for institutions in receiving and welcoming dependent people.

According to Otero (2011) [11], in order for communication exchange to take place, the process should be linked to different elements, such as: mutual interaction, exchange of information, mutual understanding, and effective communication means and techniques (Figure 4). However, in specific cases of users with significant auditory impairments, serious communication disorders, multi-disabilities associated to brain damage, etc., adaptations are needed in diverse elements of the process to enable these individuals to participate in this circuit.

For example, sign language is a non-vocal communication method, so that deaf people can receive and exchange information with their surroundings using the sensorial visual channel and a gestural code, instead of the auditory channel and the use of spoken words. Other people with disabilities, such as those with visual impairments, need a different language code to the alphabet and its grammar, such as the "Braille" system.

Adapting sport psychology services

Psychological intervention in sport aims to contribute towards improving the mental conditions of everyone participating in this field: athletes, technicians, referees and judges, managers, parents or tutors, etc. This works in two senses: first, improved sporting performance linked to learning and the development of motor skills and mental abilities

to face the competition; and second, promoted health and well being, including psychological risk prevention that the activity could cause: competitive stress, interpersonal conflicts, burnout, etc.

The main mission of a sporting organisation is to meet the shared needs of everyone involved, which in inclusive sport are even richer and more varied. In terms of intervening to improve performance, psychology provides resources to train mental abilities, to plan training, to face events, to lead teams and to guide parents or tutors. In federations undergoing inclusive processes, even in the short term, functional diversity makes the day-to-day more complex, but in the mid term it strengthens results and the organisation's development. This added complexity calls for more specific knowledge, and psychology provides contents on the type and profile of the athletes and their particular adapted activity, as well as the transformation processes and the change of attitude across the entire organisation.

In the sports initiation phase, psychology helps develop attitudes and basic competencies for all children: effort, consistency, commitment with the activity, cooperation, etc. Functional diversity helps recognise both their own and external limitations. Therefore, experiences in inclusive education at school can be useful in the sporting sphere (Carbó and Giné, 2016)[12]. In the technification stage, psychology helps improve learning, especially of mental abilities, which in turn are transferred to fields such as study, work or life in general: attention and concentration, facing situations, tolerating frustration, developing a positive identity, etc. Functional diversity increases challenges, but in exchange, this situation can bring out psychological strengths, both in individuals and in groups. The psychologist can also analyse and help integrate competition systems and training methods, addressing the diversity of the group, facilitating cooperation-competitiveness processes in group work and team sports, and supporting the interdisciplinary aspects between sports techniques and those for adapted sports, as well as between other professionals (leaders, managers, etc.).

Inclusive sport requires the application of innovative knowledge and enhances excellence. For example, an athlete with a disability is a model for other companions to learn from. There are no major differences between the basic competencies of an athlete with or without a disability, but functional diversity offers all participants a greater chance of success, because it emphasises aspects that are often overlooked, such as: complementing each other and improving human impairments as a group, or transforming apparent impairments into a multiplying motivational factor. In this sport, the psychologist optimises the learning process of the whole group, whether by working directly with the athlete, or indirectly by training and collaborating with the technician. This task focuses on boosting specific processes, such as effort, motivation or self-confidence, which whilst shared among all people, require more effort when functional diversity multiplies. The technician should discover all the possibilities of each athlete, and the psychologist should complement this work and offer support[12]. In inclusive sport, cooperative work is even more necessary, which is returned in the general improvement of the organisation.

The psychologist contributes knowledge to assess and analyse interactions through methods of observation, records or interviews. In a psychology service, the psychologist also assists and guides the federative behaviour and complements the duties of other services. The FMS is one of these; as well as that of competition personnel (referees and coaches), for the design and application of regulations and competition rules. Their collaboration in functional classification processes is also interesting. By training technicians, psychology contributes knowledge about the evolution of the people involved, the disabilities – in particular mental or intellectual – and the diverse profiles of the athletes. The psychologist performs personalised follow-up, and adjusts mental resources, depending on the disability and experience of each of them. Finally, the psychologist provides guidance on how to treat the athlete, how to communicate with him/her and how to lead the group. The personalised work is an essential part of any kind of training and for any kind of athlete, in the search for their autonomy and ability to control themselves (Segura *et al*., 2016)[14].

The inclusive process, a one-way journey

Sporting practice has always been considered as an essential element for achieving good health, particularly among people with disabilities. If we want this demographic to have an integral development, we must include sport, outdoor games and physical exercise as essential aspects of achieving a good quality of life and full social normalisation.

The good development of competition sport for people with disabilities in an inclusive environment is based on two founding concepts: national and international legislation; and social awareness among both the demographic of people with disabilities and the rest of the population, particularly those that practice physical activity and sport regularly. Collectively acting upon the adaptation of pre-established social regulations and on social, general and specific attitudes in the sporting practice.

The first responsibility, within the legislative sphere, is of the State. The UNESCO International Charter of Physical Education and Sport, 21st November 1978[15], indicates sport as a fundamental human right and as essential for the development of peoples' personalities. Heading I of the Spanish constitution[16] states that sport is a fundamental factor in the formation and integral development of the personality, and constitutes a cultural manifestation that will be supported and promoted by public Spanish authorities. In Spain, the legislation regarding people with disabilities indicates their rights and liberties; these principles coincide with the *"International Classification of Impairments, Disabilities and Handicaps"* (WHO)[17], differentiating each one of the elements and understanding invalidity as "the disadvantaged situation of a specific individual as a consequence of an impairment or a disability that restricts or prevents the performance of a role that is considered normal based on age, sex and social and cultural factors".

Looking beyond legislative capacity, there are actions under the responsibility of other social organisations spanning from those of a

general nature to more specific ones, of sporting federations and sports clubs (Martínez-Ferrer, 2016)[4], with general federative actions being the most far-reaching for this review:

- Federative legal actions: that favour the development of single-sport federations and their sport.
- Federative management actions: targeting the organisation, management and driving of the federations, developing a new inclusive organisational culture.
- Actions in the inclusive dimension: favouring the inclusion or integration of athletes with disabilities, with normalisation criteria, and always respectful of diversity.
- Actions in the technical-federative sphere: with specific training for federated personnel, in our case for healthcare professionals who facilitate and guarantee the process.

In parallel to these, social actions should also be developed that favour synergies around federated sport, facilitating the inclusion/integration process, generating inclusive processes in spheres such as: a) inclusive school (and physical education classes in an inclusive environment); b) physical activities in their different modalities: health, leisure and free time, body expression, in a normalising environment and one that is respectful of diversity; c) raised awareness among the media regarding the values of sport, also represented by Paralympic athletes and the example they set.

Acknowledgements

The authors would like to acknowledge the collaboration and special support in drafting section "3.4. Structural adaptations" by the architect and great expert in accessibility, Mr Enrique Rovira-Beleta Cuyas.

Bibliography

1. UNESCO. Carta internacional revisada de la educación física, la actividad física y el deporte (versión en castellano). Actas de la 38ª reunión Conferencia General, Paris (Francia) noviembre 2015 (consultada 3001/2017). Disponible en: http://portal.unesco.org/es/ev.php-URL_ID=13150&URL_DO=DO_TOPIC&URL_SECTION=201.html
2. Martínez-Ferrer JO. Paper de l'activitat física i l'esport adaptat en la normalització de las persones discapacitades. *Aloma.* 2004;13:13-23.
3. Segura J, Martínez-Ferrer JO, Guerra M, Barnet S. Creencias sobre la inclusión social y el deporte adaptado de deportistas, técnicos y gestores de federaciones deportivas de deportes para personas con discapacidad. *Revista Iberoamericana de Psicología del ejercicio y el deporte.* 2013;8(1):127-52.
4. Martínez-Ferrer JO. Estudio y protocolización del proceso de inclusión del deporte de competición de las personas con discapacidad en la federaciones deportivas convencionales en el Estado Español. Tesis Doctoral 2016 (consultado 18/12/2016). Disponible en: http://www.tdx.cat/bitstream/handle/10803/351962/Tesi_Jose_Oriol_Martinez.pdf
5. Herrera Palacios JM, Ordóñez Pasaje DL, Posada Tellez A, Landinez-Parra NS. Fisioterapia y balance en deportistas de voleibol sentado en la Selección Colombia de Voleibol Sentado rama masculina. *Rev Cubana Invest Bioméd* 2014;33(4):356-66.
6. Jiménez-Galván E. Agentes y factores clave en la práctica del deporte adaptado en España: la visión actual sobre el cambio. Actas 1ª Conferencia Nacional de Deporte Adaptado, Toledo Mayo 2009, pp. 79-89 (consultado 1003/2017). Disponible en: http://www.munideporte.com/imagenes/documentacion/ficheros/20090616124222conferencia_nacional_deporte_adaptado.pdf
7. Moreno Millán E, Bonilla Quintero F, Escalante Ruiz MJ. Planificación y gestión de la cobertura sanitaria y de salud pública en acontecimientos deportivos. *Urg Emerg Catastr.* 2001;2:145-55.
8. Van de Vliet P, Wilkinson M. Emergency Medical Care in Paralympic Sports. En: McDonagh DO and Zideman DA. *The IOC manual of emergency sports medicine.* John Wiley & Sons 2015;212-9.
9. Krassioukov A. Autonomic dysreflexia: current evidence related to unstable arterial blood pressure control among athletes with spinal cord injury. *Clin J Sport Med.* 2012;22(1):39-45.
10. Rovira-Beleta E. L'esport Inclou: Guia d'accessibilitat de material i ajudes tècniques per a centres esportius. Institut Barcelona Esports. Ajuntament de Barcelona Ed. bcn.cat / esportinclou 2012 (consultado 0404/2017). Disponible en: http://ajuntament.barcelona.cat/esports/sites/default/files/Guia%20d%27accessibilitat%20Barcelona%20Esport%20Inclou.pdf
11. Otero MO. *Apoyo en la Recepción y Acogida en Instituciones de personas dependientes.* SSCS0208. Antequera (Málaga). IC Editorial (ediciones on-line), 2013.
12. Carbó M, Giné C. Calidad de vida, hábitos de salud y actividad física en personas con discapacidad intelectual. En: Segura J. (coord.). *Psicología aplicada al deporte adaptado.* Barcelona. Ed. UOC; 2016. p.179-90.
13. Sanagustín A. Parálisis cerebral y deporte adaptado. En: Segura J. (coord.). *Psicología aplicada al deporte adaptado.* Barcelona. Ed. UOC; 2016. p.91- 100.
14. Segura J, Sanagustín A, Manzano E, Molins M. Entrenamiento psicológico en deporte adaptado. En: Segura J. (coord.). *Psicología aplicada al deporte adaptado.* Barcelona. Ed. UOC; 2016. p.79-90.
15. UNESCO. Carta internacional de la educación física, la actividad física y el deporte. Actas de la 20ª reunión Conferencia General, Paris (Francia) noviembre 1978 (consultada 1802/2017). Disponible en: http://www.unesco.org/new/es/social-and-human-sciences/themes/physical-education-and-sport/sport-charter
16. de España R. Constitución Española (1978). Congreso de los diputados. Reino de España. En: *Boletín Oficial del Estado,* 29 de Diciembre de 1978, núm. 311. (Consultado 0801/2017). Disponible en: https://www.boe.es/boe/dias/1978/12/29/pdfs/A29313-29424.pdf
17. Organización Mundial de la Salud. Clasificación internacional de deficiencias, discapacidades y minusvalías: manual de clasificación de las consecuencias de la enfermedad: publicada de acuerdo con la resolución WHA29. 35 de la Vigesimonovena Asamblea Mundial de la Salud, Mayo 1976." (1994). (Consultada 0901/2017). Disponible en http://apps.who.int/iris/handle/10665/131983