

Opinion

Ready, set, go: Medical preparations for the Paris 2024 Paralympic Games

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1. Introduction

In August 2024, over 4400 Paralympic athletes will gather in Paris for the Paralympic Summer Games—the pinnacle of every Paralympian's (Para athletes competing at the Paralympic Games) career to showcase their ability and skills. Their training, preparation, and effort in the years leading up to the Games are unparalleled. To achieve success, Paralympians specifically rely on a medical support team to achieve their goals. So, what is required of the medical support team to prepare Paralympians to get *ready, set, and go* to Paris 2024?

2. Paralympians are unique athletes

The International Paralympic Committee categorized Para athletes (athletes with disabilities who play sport)¹ in 3 major impairment categories: vision impairment (i.e., low vision or blind), physical impairment, and intellectual impairment. Physical impairment is subdivided into neurological impairment (brain disorders, spinal cord-related disorders, and neuromuscular disorders) and musculoskeletal disorders (limb deficiency, short stature, leg length difference, and impaired passive range of motion).²

Paralympians are unique, not only in their sporting prowess, level of resilience, comradery, and sportsmanship but also from a medical perspective. Each athlete has a distinctive impairment that can pose challenges within the realm of sport, but also in activities of daily living. Impairments add medical complexity to the Paralympian athlete's health. Impairments can be static or change or worsen over time (progressive impairments).² Paralympians are often older, can have co-morbidities, and may have multiple impairments, such as a brain disorder with vision impairment. Understanding

these physical impairments, and their implications on health, mental status, and sports performance, is key to optimal medical preparation.

Besides individual athlete health and mental challenges, the medical support team should also plan for possible external elements that may pose health and performance risks, for example, environmental factors, such as heat, and risk of illness and infections. Risk mitigation strategies should be planned, and athletes should be educated appropriately.

3. Ready: Medical preparation

Paralympians are more prone to illness and injuries than their Olympic counterparts.^{3–5} This higher predisposition to illnesses and injuries emphasizes the importance of medical planning, screening, and preparedness. Medical support staff (physicians, physical therapists, and other members of the multi-disciplinary team) should evaluate Paralympians by means of a standardized periodic health evaluation (PHE) well before the Games to allow sufficient time for prevention or intervention strategies. Follow-up at regular intervals is important as annual/once-off medical evaluations might not detect conditions that change over time, such as progressive muscle weakness in athletes with neuromuscular disorders.

Currently there is no international standardized PHE for Paralympians. However, physicians can utilize the standard PHE currently recommended by the International Olympic Committee.⁶ This PHE form contains sections on medical history (per anatomical region), family history, medications, allergies, immunizations, gender-related questions, injury history, and equipment use and nutrition, followed by a physical examination and selected special investigations. We suggest that the attending physicians apply knowledge of medical concerns by adding impairment-specific medical history, physical examination, and special investigations for each impairment category to the current PHE to screen for

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common illnesses and injuries appropriately. For example, an athlete with a spinal cord injury is more prone to urinary tract infection due to neurogenic bladder and self-catheterization. A baseline urinary analysis (e.g., urine dipsticks) and assessing sterile catheterization techniques are recommended during the PHE. An athlete with vision impairment and no light perception may have disturbed circadian rhythms, resulting in poor sleep and daytime dysfunction,⁷ therefore monitoring of sleep quantity and quality is important to assess. Paralympians commonly suffer from pain and pain-related disorders, such as phantom pain in an amputated limb, muscle spasticity provoking pain in athletes with cerebral palsy, and neurogenic pain in athletes with spinal cord injuries. In these athletes, pain control should be assessed and managed.

At the time of the PHE, it is also important to inquire about adaptive equipment use, recreational drug use (e.g., for pain management), supplement use, and chronic medication use. If applicable, applications for therapeutic use exemptions should be done. The PHE is also an opportunity to educate athletes on doping regulations and illness prevention strategies during travel.

Preparation for environmental conditions at the time of the Games is important because of the concern about heat in Paris. Paralympians should be educated on symptoms and signs of heat-related illness. Heat acclimation protocols (i.e., exposure to artificial conditions to elicit favorable physiological adaptations to heat stress)⁸ should be implemented during training to prepare for expected competition conditions.

4. Set: Support team

A medical support team with knowledge and expertise to deal with unique medical issues in Paralympians should be selected. Members should be good team players, as interdisciplinary teamwork is essential. Psychological support, nutritional advice, and having orthotists and prosthetists to assist with mechanical advice are important. Safeguarding officers are also essential because individuals with impairment are more vulnerable to non-accidental harm (abuse).⁹

5. Go: Games time

Planning of arrival times prior to competition should allow ample time for appropriate rest, adjusting to different time zones (if applicable), and heat acclimatization (i.e., physiological adaptation to improve heat dissipation in natural weather conditions),⁸ especially in athletes with spinal cord injuries (altered thermoregulation) and limb deficiencies (less body surface to dissipate the heat). Heat illness risk mitigation includes appropriate clothing, proper hydration, decreasing exercise intensity and duration in the heat, and cooling techniques, such as water spray bottles and ingestion of ice slurries.^{8,10}

Physical surroundings will be unfamiliar and challenging to athletes with visual impairments, and decreased mobility. Therefore, implementing an appropriate “buddy” system, by pairing each of these athletes with another athlete who will be

able to assist in case of emergency at the accommodation, is advised. Emergency plans should be in place, including local emergency and medical referral facilities’ contact details. Local evacuation plans should also be shared with all team members.

6. Summary

Paralympians are unique athletes and medical preparation for the Paralympic Games starts with the principle “knowing your athlete”. Medical support team selection and logistical planning and preparations should focus on the needs of individual team members. This will result in healthy, well-prepared, and confident Paralympians to get *ready, set, and go*.

Authors’ contributions

CS drafted the manuscript; WD and MS reviewed and edited the final manuscript. All authors have read and approved the final version of the manuscript, and agree with the order of presentation of the authors.

Competing interests

WD is the Medical Director for the International Paralympic Committee for the Paris 2024 Paralympic Games. The authors declare that they have no other competing interests.

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