



THE ROLE OF PHYSIOTHERAPIST IN PARALYMPICS

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BACKGROUND

The term paralympic was considered as a pun combining paraplegic and olympic. Although its origin is unclear, the term “Paralympic” is used to describe the Stoke Mandeville Games. The paralympic sport has grown and developed for the following three main reasons

- Sports are an effective means of augmenting rehabilitation outcomes for people with disabilities.
- People with disabilities have a right to participate in sports and should have the same opportunities as others.
- Paralympic sport is ELITE, EXCITING AND INSPIRING.

History

- 1948 - First Stoke Mandeville Games
- 1949 - Second Stoke Mandeville Games
- 1956 - Third Stoke Mandeville Games
- 1957- The term “Paralympic” is to describe Stoke Mandeville Games
- 1960 - First Paralympic Games held in Rome
- 1964 - Second Paralympic Games held in Tokyo
- 1968 - Third Paralympic Games held in Israel
- 1972 - Fourth Paralympic Games held in Germany
- 1976 - Fifth Paralympic Games held in Canada
- 1980 - Sixth Paralympic Games held in Netherlands
- 1984 - Seventh Paralympic Games held in New York
- 1988 - Eighth Paralympic Games held in Seoul Korea
- 1992 - Ninth Paralympic Games held in Spain
- 1994 - Tenth Paralympic Games held in Norway
- 1996 - Eleventh Paralympic Games held in Atlanta
- 1998 – Twelfth Paralympic Games held in Japan
- 2000 - Thirteenth Paralympic Games held in Australia
- 2002- Fourteenth Paralympic Games held in Australia
- 2004 - Fifteenth Paralympic Games held in Greece
- 2006 - Sixteenth Paralympic Games held in Italy
- 2008 - Seventeenth Paralympic Games held in China
- 2010 - Eighteenth Paralympic Games held in Canada
- 2012 - Nineteenth Paralympic Games held in UK

- 2014 - Twentieth Paralympic Games held in Russia
- 2016 - Twenty first Paralympic Games held in Brazil
- 2018 - Twenty second Paralympic Games held in Russia
- 2020 - Twenty third Paralympic Games held in Korea
- 2022 - Twenty fourth Paralympic Games held in Japan
- 2024 - Twenty fifth paralympic Games are going to be held in France

Advent of Paralympics

- It is commonly accepted that the Paralympic movement began in England in 1940's. However, the concept of providing sports opportunities specifically for people with disabilities was pioneered by Sir Ludwig Guttman.
- Sir Ludwig Guttman - Founding Father of the Paralympic Games.
- Sir Ludwig Guttman (1899-1980) was born into a Jewish family in Germany. He qualified as a medical doctor in 1924(MD) and began his lifelong specialization neurology and neurosurgery.
- At Stoke Mandeville, Guttman began a number of highly innovative methods of rehabilitation for people with spinal cord injury (SCI).
- Chief among these was the inclusion of sport as an integral part of physical rehabilitation, as an initiative. It ultimately lead to the establishment of the paralympic games.

Sport as Rehabilitation

- A hallmark of rehabilitation at Stoke Mandeville was that, patients were always encouraged to extend themselves physically - whether sitting up in bed during early rehabilitation from the unit, patients were expected to have high levels of physical independence.
- As attractive as this game was for the patient, the use of the stick at the same time as propelling the wheelchair made the game unacceptably dangerous, and it was soon replaced by a variety of other sports, including archery, netball, javelin throw and snooker.
- Guttman promoted sports as the most natural form of remedial exercise, restoring physical fitness, strength, coordination, speed, endurance and overcoming fatigue.
- Guttman believed that sport was a vital means of achieving what he regarded as the ultimate aims of rehabilitation to make the spinally injured person as independent as possible and to restore him to his rightful place in social life.

Logo

Official logo for the IPC (International Paralympic Committee) adopted in 2003. It comprises three agitos symbolising "spirit in motion" and "mind and body spirit".

Paralympic categories

The five areas of resolution are that all paralympic systems of classification must be

- Be consistent with the International Classification of Functioning Disability and Health (ICF)
- Based on scientific evidence
- Define eligible types of impairments
- Define minimum impairment criteria
- Classify impairments according to the extent of activity limitation caused

Defining eligible types of Impairments

To date only ten types of Impairment have been eligible for Paralympic sports.

- Visual impairment
- Impaired strength
- Impaired range of movement
- Limb deficiency

- Leg length discrepancy
- Hypertonia
- Ataxia
- Athetosis
- Short stature
- Intellectual impairment

The above mentioned ten impairment types are eligible for various Paralympic sports; In order to compete in Paralympic sports, a person must be affected by at least one of the impairments listed above.

Disability

Those who are confirmed to a wheelchair, deaf, blind or missing a limb, those who have only one of a paired set of organs or those with behavioural, emotions and psychological disorders that substantially limit a major life activity are said to be disabled persons.

Types

- Amputee
- Cerebral palsy
- Spinal cord injury
- Spina bifida
- Polio

Biomechanics

- The study of biomechanics of wheelchair propulsion played an important role in designing the equipment and improved athletic performance impact on wheelchair racing, basketball, rugby and handcycling.
- Risks of mechanical over use are higher, due to overuse injuries, mobility can decrease. Nevertheless high level sports performance is possible with the subsequent increases in physical fitness, health and mobility.
- A properly fitted manual wheelchair should offer freedom and efficiency during propulsion.
- The wheelchair users have been encouraged to use a more forward long smooth strokes during the propulsive phase.
- Higher stroke frequencies have been shown to correlate to median nerve injury and lead to increased heart rate and cardio respiratory stress.
- A racing chair used in combination with correct propulsion biomechanics can result in an extremely efficient means of movement above and beyond all other hand rim sport.
- A racing chair's primary steering is however is controlled by the upper body's interaction with the front wheel, where pressure can be applied to handle the bars, which turn the front wheel from left to right.
- The racing stroke as a technique where the extensive shoulder extension and abduction during the backswing lead to increased hand speed at the impact energy transfer phase.
- There are a total of five phases
 1. Drive forward and downward
 2. Push rim contact
 3. Pushing through to the bottom of the push rims
 4. Push off or fallow through

5. Elbow drive to the top

In paraplegic:-

During the push phase:- triceps brachii, antero medial deltoid, pectoralis major are more active

During the recovery phase:- subscapularis, supraspinatus, middle trapezius are more active

In Quadriplegic:- Activation of pectoralis major seems to be more prolonged when compared to paraplegic

Role of Physiotherapist in Paralympics

It is interesting to find out how the physiotherapist involved in the Paralympics. The Olympic ambition will lead to an increase in the number of active sports participants, which will have both positive and negative consequences in the sense of more sports injuries, increase in costs as a result of sports injuries. This is where the role of the physiotherapist comes into play, which will become increasingly prominent in guiding sports participants.

Muscles to be strengthened:-

- 1 Shoulder elevators, depressors, flexors, adductors
- 2 Scapula elevators
- 3 Elbow flexors, extensors and Forearm supinators, pronators
- 4 Trunk mobilization
- 5 Pelvic rotators and elevators
- 6 Hip extensors, flexors and adductors
- 7 Knee flexors and extensors

Strength training benefits

- Increase bone mineral density
- Improve glucose metabolism
- Avoid muscle loss
- Reduce low back pain
- Reduce resting blood pressure

Trainings so vital

- Range Of Movement (ROM) of all joints to prevent thrombosis, improve mobility and to gain strength
- Mobility training for trunk, shoulder and pelvis
- Resistive exercises practiced on the sound limb
- Training for weight transfers, crutch walking, wheelchairs etc
- Chest exercises
- Assessing the athlete's ROM and strength
- Training for single limb standing and balancing
- Flexibility and strengthening programme

Last but not least, lots of talking, boosting of the morale of the patient plenty of sympathy and psychological reassurance

Physiotherapeutic modalities

- Ultrasound

- TENS
- Electric stimulation
- LASER therapy
- Soft tissue manipulation
- Cryotherapy
- Hot packs
- Therapeutic exercises

Conclusion

Physical benefits:- General fitness, CVS conditioning, postural control, flexibility, muscle strength, balance

Psychological benefits:- Impaired motivation, self confidence, self esteem, competitive spirit

Physical Medicine & Rehabilitation (PM&R) in Christian Medical College (CMC) Vellore, Tamil Nadu, India

The history of PM&R in India is intertwined with the personal story of Dr.Mary Verghese. The tragedy of a road traffic accident that rendered her paraplegic inspired her to establish a department of PM&R in Vellore and a Rehabilitation institute, the first of its kind in the country. The field of the physical medicine and rehabilitation which deals with the comprehensive care ,for persons with disability, to make them physically independent.

Elite Paralympic Athlete's:

Aiming at success from wheelchairs. Spinal cord injury might have changed their lives competitively, but for young men who were treated and rehabilitated at PM&R, CMC Vellore, overcame the challenges to make a difference. Spinal cord injuries posed numerous challenges for patients as they would lose sensation in the legs and would not be able to move. The department introduced wheelchair sports into the rehabilitation programme not on a competitive basis, but to expose the patients to sports and make them fit.

Mr .Venkatachalam who underwent rehabilitation at PM&R Vellore had won the athletic events of discus throw, shotput race in the Paralympics 2015 .He was devastated following the SCI and did not know what he was getting to do for the rest of his life on a wheelchair. But being part of sports has energised him, made him fit and has won the recognition of being a Paralympic player.

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