Physiotherapy for Athletes with Spina Bifida

Introduction:

Spina bifida (SB) is the term used to describe a group of congenital conditions in which there is abnormal development of part of the spinal cord. Spina bifida, which literally means "cleft spine," is characterised by the incomplete development of the brain, spinal cord, and/or meninges (the protective covering around the brain and spinal cord). The higher the malformation occurs on the spine, the greater the amount of nerve damage and loss of muscle function and sensation.

Types of Spina Bifida:

Occulta: The mildest and most common form in which one or more vertebrae are malformed. This form of SB, present in 10-20% of the wider population, rarely causes disability or symptoms.

Closed neural tube defects: A diverse group of defects in which the spinal cord is marked by malformations of fat, bone, or meninges. In most instances there are few or no symptoms; in others the malformation causes incomplete paralysis with urinary and bowel dysfunction.

Tethered spinal cord: Typically, the bottom of the spinal cord floats freely in the spinal canal, but for many people with SB, the spinal cord is attached to the spinal canal. Thus, the spinal cord stretches as a person grows, and this stretching can cause spinal nerve damage. The person might have back pain, scoliosis (crooked spine), weakness in the legs and feet, bladder or bowel control problems, and other issues.

Meningocele: Spinal fluid and meninges protrude through an abnormal vertebral opening; the malformation contains no neural elements and may or may not be covered by a layer of skin. Some individuals with meningocele may have few or no symptoms while others may experience such symptoms as complete paralysis with bladder and bowel dysfunction.

Myelomeningocele: The most severe and occurs when the spinal cord/neural elements are exposed through the opening in the spine, resulting in partial or complete paralysis of the parts of the body below the spinal opening. The impairment may be so severe that the affected individual is unable to walk and may have bladder and bowel dysfunction.

This document was prepared in collaboration with
Paralympics Australia and the Queensland Academy of Sport.

Physiotherapy Considerations:

- Postural asymmetry (e.g. scoliosis): Adapt equipment to compensate for postural asymmetries. Work with Sports Seating and Engineering to develop customised equipment interfaces. Will often need to accommodate to the posture rather than correct to an "anatomical norm". Aim for symmetry as much as possible for ideal joint and body loading, recognising that this isn't always possible.
- An athlete with Spina Bifida will often perform best in a functional asymmetry and have a specific sense of stability in this position. When making any changes to trial performance gain opportunities ensure the functional asymmetrical posture can still be return to if required. May need to consider new equipment rather than making large modifications to current equipment so the previous set up is always available to return to during the process.
- Consider what other areas and structures are getting loaded as a result of how the athlete moves, or the asymmetries that exist.
- Be aware of what the athlete's function and range of movement is and adapt activities to maximise function.
- Be aware of any movement restriction, balance and coordination challenges, and take these into consideration with any relevant drills or exercises. It's good to help athletes practice their balance in a safe way, as well as lay down the foundation for optimal basic movement patterns.
- For those athletes who are wheelchair users, ensure there is appropriate time out of the wheelchair as well so that the athlete can change position and lengthen out through legs, hips and spine where possible. Lying prone can be particularly helpful with lengthening out through the hips and providing a sustained stretch.
- For athletes that are wheelchair users encourage regular maintenance and review of their chair to ensure optimal function and promote injury prevention.

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Medical risk factors:

Hydrocephalus: Hydrocephalus is very common in individuals with myelomeningocele, and is treated with the insertion of a shunt. A shunt is a device that is surgically implanted and designed to drain the excess CSF from the brain. Although a shunt generally works well, it may malfunction if it disconnects or becomes blocked. If this happens the CSF may begin to accumulate again and a number of physical symptoms develop. It is important to get medical attention if any of the symptoms of a malfunctioning shunt appear.

Symptoms of a malfunctioning shunt:

- Headache
- Vomiting
- Vision problems
- Irritability/tiredness
- Deterioration of performance – including gait, balance, and concentration
- Personality changes
- Dizziness
- Seizures

Pressure Injuries:

- Sensation of touch, pain, temperature and pressure can all be affected, and the higher up the lesion is, the greater the surface area of lost sensation.
- Loss of skin sensation means that there is an increased risk of developing injuries in the areas that the athlete cannot feel.
- Some of the common sites for skin and pressure injuries include the buttock and sacrum (from prolonged sitting) and the back of heels and ankles (from shoes or AFOs rubbing).
- For those athletes who are wheelchair users, ensure regular review of equipment (wheelchair: both sport and day chair) are conducted to ensure appropriate seating and pressure management is in place.
- Need to monitor training load and adjust load/repetition as required.
- If an athlete is using a new wheelchair, cushion or other adaptive device, close monitoring of the fit and how the athlete interfaces with this is required.

- Ensure there is appropriate time out of the wheelchair as well so that the athlete can change position and lengthen out through legs, hips and spine where possible.
- Ensure appropriate hygiene strategies are in place to minimise issues.

Incontinence: Some require catheterisation and bowel management. The athlete should have an established routine to manage this.

Bladder Infections: Due to frequent catheterisation the risk is increased. Allow regular bag emptying or regular toilet breaks.

Latex Allergies: Allergies to latex are more prevalent with people with SB. Check allergen status with the athlete. Be mindful of this with the use of theraband and tape. It is possible get latex free products if required.

Resources, Links and References

Children and Adults with Spina Bifida http://www.waisman.wisc.edu/~rowley/sb-kids/index.html

Spina Bifida foundation Victoria: http://www.sbfv.org.au/

https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Spina-Bifida-Fact-Sheet

Spina Bifida Hydrocephalus Queensland

https://static1.squarespace.com/static/5926168ef7e0ab55ef3dc982/t/5c36a6486d2a738eeb56cf88/1547085424373/Health+Professional+Information+%E2%80%93+Spina+Bifida+Hydrocephalus%2BOrange.pdf

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