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Guest Editorial: Physical Therapy Reviews

Stepping forward following lower limb amputation

Prasath Jayakaran[a] , Natalie Vanicek[b]

[a] School of Physiotherapy, University of Otago, Dunedin, New Zealand,

[b] Department of Sport, Health & Exercise Science, University of Hull, Hull, UK

Corresponding author. Email: prasath.jayakaran@otago.ac.nz

ORCID

Jayakaran Prasath http://orcid.org/0000-0001-8126-5526

Natalie Vanicek http://orcid.org/0000-0002-9602-3172

Amputation of limbs is one of the oldest surgical procedures. Hippocrates (460–370 BC) recommended amputation for trauma or gangrene of the limbs. While trauma is still a significant cause of amputation in developing countries, the number of amputations due to dysvascular limb condition (diabetes and peripheral vascular disease) has increased exponentially in recent decades, in both developed and developing countries. A current estimate suggests that, by the year 2020, there will be around 1.6 million people living with an amputation in the United States alone, with almost 50% of them secondary to a dysvascular limb condition. [1] A similar trend of limb loss due to dysvascular conditions has been observed and reported globally [2].

The physical asymmetry induced by a lower limb amputation significantly impacts on the functional well-being of the individual [3]. Trauma amputations originally focussed on life-saving procedures, without emphasis on preparing the residual stump for the application of a prosthesis. Nowadays, a patient's post-operative management and return to normal life are equally important considerations in the rehabilitation process. Significant advances in biomedical sciences and prosthetics technology have contributed to highly sophisticated prosthetic limbs, evolving from wooden peg legs to bionic limbs, to state of the art carbon fibre prostheses used by sporting athletes. Numerous studies on different prosthetic parts have refined their structural and functional components, [4] which have been optimised with the goal of providing prosthetic function similar to a normal limb.

Individuals undergoing a lower limb amputation are confronted with a number of psychosocial, physical and physiological challenges. These may include alterations in body image, forced changes in occupation and lifestyle, pain, impaired physical functioning and reduced participation in activities. While the short-term rehabilitation goals are to learn the task of walking with a prosthetic limb, manage physical impairments and address psychosocial issues, the ultimate long-term rehabilitation goal for individuals with a lower limb amputation is to attain optimum levels of functioning in their daily lives. Achieving an adequate level of functioning facilitates participation in physical and social activities, which in turn help negate the development of lifestyle-related diseases.

In this special issue we have compiled five expert reviews to inform individuals who are involved in the rehabilitation process following limb loss. One review explores how prosthetic prescription is an integral component of the rehabilitation phase and for user outcomes. Phantom limb pain is a common impairment, often debilitating for many individuals and impacts their physical function and quality of life. Therefore, one review explores the non-pharmacological management of this condition. Patient education about the prevention of limb loss through modifiable lifestyle risk factors is critical, especially in individuals with diabetes and/or peripheral vascular disease, and one review explores how physical therapy plays an important role for individuals at high risk of amputation. While regular physical activity is recommended for the prevention of other health comorbidities, individuals with a lower limb amputation may encounter a number of barriers preventing them from regular participation. One review discusses the importance of physical fitness, and factors that impact physical activity in those with a lower limb amputation. Finally, the

last review summarises some of the available physical therapy interventions to improve balance and walking ability.

References

[1] Ziegler-Graham K, MacKenzie EJ, Ephraim PL, Travison TG, Brookmeyer R. Estimating the Prevalence of Limb Loss in the United States: 2005 to 2050. Arch Phys Med Rehabil. 2008;89(3):422–429.

[2] Godlwana L, Nadasan T, Puckree T. Global trends in incidence of lower limb amputation: A review of the literature. South Afr J Physiother. 2008;64(1):8–12.

[3] Shields C, Thorp H, Hendry G, Jayakaran P. Health-related quality of life in persons with dysvascular and traumatic lower limb amputation: a systematic review. Physiotherapy. 2015;101:e673.

[4] Zahedi S Lower limb prosthetic research in the 21st century. Endolite;2010.