



AMPUTATIONS AND WHEELCHAIR SEATING AND MOBILITY

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MEDICAL FOCUS

DEFINITION

Amputation may be acquired or congenital. An acquired amputation results in the complete or partial loss of a limb from injury/trauma, disease or surgery. Congenital amputations are referred to as limb deficiencies when a baby is born missing part or all of a limb.

AMPUTATION PREVALENCE

In the United States, 2 million people live with limb loss and more than 185,000 amputations are performed annually (National Limb Loss Information Center). “In the U.S., 82% of amputations are due to vascular disease. Nearly 70% of amputations due to trauma involve the upper limbs” (John Hopkins).

AMPUTATIONS AND ASSISTIVE TECHNOLOGY

Amputations are often accommodated with prosthetics. A wide variety of prosthetics are available to address specific amputation locations and levels, as well as functional needs. Some people with a unilateral upper extremity amputation may choose to use their other arm for functional tasks and the residual limb as an assist.

AMPUTATIONS REQUIRING A WHEELCHAIR DUE TO MOBILITY LIMITATIONS

A person with bilateral upper extremity limb loss or deficiency is less able to protect themselves in a fall, though strategies to fall safely and regain an upright position can be learned. Ambulation is still possible and functional. A person with lower extremity amputations will often use prosthetics that may allow functional ambulation. However, wheeled mobility may be used for long distances or more challenging terrain such as uneven surfaces and long and/or steep slopes. Wheeled mobility in these scenarios is typically used to compensate for fatigue, to prevent skin breakdown over the stump from overuse within a prosthetic, and to reduce pain which can occur in these conditions.

A person who requires a wheelchair and also has upper extremity amputation or limb deficiency will generally require a power wheelchair (i.e. quadrilateral amputee). If the person has a unilateral upper extremity amputation, a joystick can be used. If the client has a bilateral amputation, a residual limb may have adequate range of motion to provide joystick control with appropriate mounting. If a joystick cannot be used, other driving methods, such as head array, may be indicated.

For a quadrilateral amputee, independent transfers in and out of a wheelchair base may be possible by using a seat that can lower close to floor height.

When a person has lower limb amputations or limb deficiencies, the center of gravity of a manual wheelchair is impacted. Frame adjustments will need to be made to prevent the chair from being tippy posteriorly.

AMPUTATIONS IMPACT ON WHEELCHAIR SEATING

A person with a below the knee amputation or limb deficiency will have full contact over the buttocks and posterior thighs, however, will not have weight

bearing on one or both feet. It is important to ensure that overall pressure distribution is adequate to minimize pressure injury risk. Sometimes a residual limb support is used below the knee to provide posterior support to increase pressure distribution, comfort and reduce edema.

A person with an above knee amputation may not have adequate pressure distribution along the posterior thighs and so experience increased pressure under the ischial tuberosities. The seating surface materials and contours must mitigate this risk. The client will also be less stable and require more postural support at the pelvis, as a result.

Rarely, a portion of the pelvis is missing. To provide adequate postural support, stability and pressure distribution, a custom orthotic is often required which is worn while the client is seated in the wheelchair seating system.

CONTACT

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Michelle Lange is s an occupational therapist with more than 30 years of experience and has been in private practice, Access to Independence, for over 10 years. Lange is a well-respected lecturer, both nationally and internationally and has authored numerous texts, chapters and articles. She is the co-editor of Seating and Wheeled Mobility: a clinical resource guide, editor of Fundamentals in Assistive Technology, Fourth Edition, NRRTS Continuing Education Curriculum Coordinator and clinical editor of NRRTS DIRECTIONS magazine. Lange is a RESNA Fellow and member of the Clinician Task Force. She is a certified ATP, certified SMS and senior disability analyst of the ABDA.

