FOOTWEAR REQUIREMENTS FOR PEOPLE WITH DIABETES

Feature	Requirements
Length	Inner length of the footwear should be 1 to 2 cm longer than the foot length as measured from heel to the longest toe when a person is standing. Adequate length needs to be confirmed when people are weight-bearing while wearing the footwear.
Depth	Depth should accommodate the toes to move freely without causing pressure at the medial, lateral, or the dorsal surfaces of the foot.
Width	Width should equal the width of all parts of the foot. Width is good when the upper can be slightly bunched. The relation between forefoot and rearfoot is important, as accommodating a wide forefoot may result in the heel being too wide.
Height	Footwear height can be low, ankle-high, or high. High footwear provides more firmness, stability, and reduces joint motion. The shaft of high footwear also contributes to forefoot pressure reduction. See Table 3 for specific height requirements for people with a foot deformity.
Insole	The removable molded insole can be pre-fabricated or custom-made. The primary function of the insole is pressure redistribution. This is achieved via the principle of increasing the contact area between the foot and the insole, and the addition of corrective elements in the insole. Shock-absorbing, soft, but sufficiently resilient and non-slippery materials should be used.
Outsole	Rubber, plastic, and leather can all be used in construction of footwear outsoles, but rubber outsoles are thought to be superior. Outsoles can be supple, toughened, or stiff. The shoe should not be more supple than the foot, or friction between foot and shoe will develop during push-off. See Table 3 for specific outsole requirements for people with a foot deformity and Table 4 for the offloading effects of specific modifications.
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Rocker Profile	Rocker profiles have proven effective in reducing plantar pressures, especially on the forefoot. The rocker profile chosen depends on the affected joints and is determined by the apex position (pivot point) and the angle from the pivot point to the tip of the toe. For plantar pressure reduction of the metatarsophalangeal joints, the pivot point needs to be proximal to these joints. The rocker profile also impacts balance; the more proximally placed, the greater the balance disturbance. A person's balance should therefore always be taken into account when deciding on the rocker profile.
Heel Enclosure	An adequately fitting and enclosed heel is recommended, as open-backed footwear or a heel enclosure that is too wide can result in injury and usually requires a person to claw their toes in order to keep them on. The heel counter needs to be free of edges protruding into the footwear.
Heel Lift	The heel lift (or heel-forefoot difference, or pitch) should be generally 1.5–2 cm, and should not exceed 3 cm.

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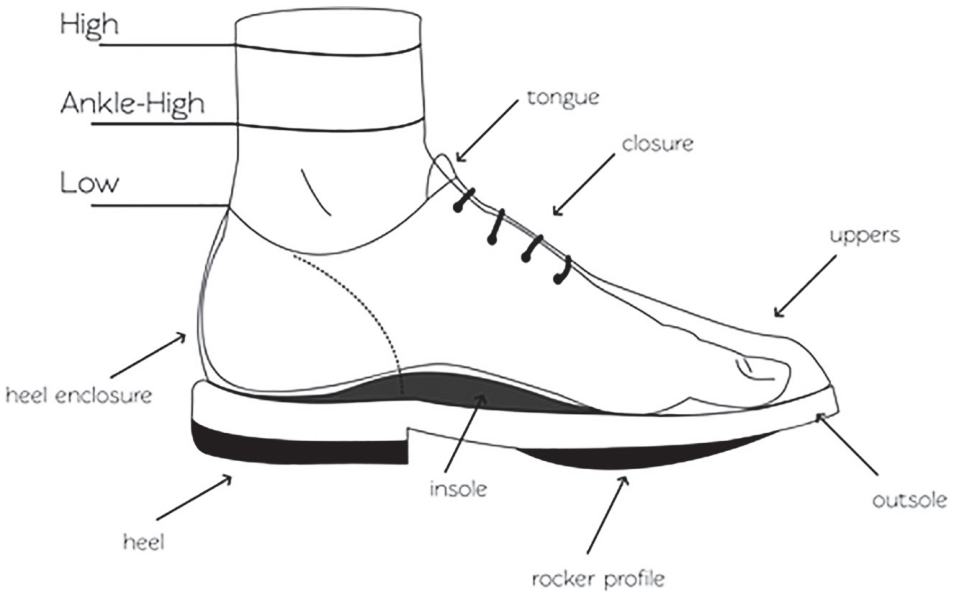
Closure	Adequate closure (or fixation) is needed to keep the foot from sliding forward. Closure should allow secure longer-term fastening and individual adjustment. Laces have long been considered the optimal choice; however, alternatives that are easier to use while still meeting these criteria are available as well, and innovative closures continue to be developed.
Uppers	The uppers consist of the "quarter" (hind- and midfoot) and "vamp" (forefoot and toes). Uppers should be made from leather or a combination of materials (similar to sports shoes), with smooth inner lining made from a material that does not harden over time, with limited seams and preferably no seams in the vamp area as they reduce the ability of the leather to give. Uppers should be breathable and durable and have the ability to mold to deformities of the foot without resulting in pressure areas. Uppers can be supple, toughened, or stiff. The vamp area should generally remain supple to accommodate the toes. See Table 3 for specific requirements for the uppers (quarter) for people with a foot deformity.
Toe Box	The part of the shoe that covers and protects the toes. This should be supple (unless specific requirements, e.g., for building professionals, require otherwise), and should accommodate the shape of the toes to avoid any rubbing on the toes.

The Anatomy of a Shoe



Specific Footwear Requirements for People with Diabetes and a Foot Deformity

	Height	Outsole	Uppers (quarter)[b]	Tongue
Limited joint mobility	Low[a]	Toughened	Supple	Supple
Pes cavus	Ankle-high	Toughened	Toughened	Toughened[c]
Flexible flat foot with hallux valgus	High	Toughened	Toughened	Toughened[c]
Rigid flat foot with hallux valgus	Ankle-high	Toughened	Strong medial support	Toughened[c]
Charcot foot	High	Stiff	Toughened	Toughened[c]
Hallux or toe amputation	High	Stiff	Toughened	Toughened[c]
Forefoot amputation	High	Stiff	Stiff	Stiff