

Foot Moisture Control and Orthotic Support

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Proper control of foot moisture is necessary to avoid several foot problems. The nearly quarter of a million sweat glands in a pair of feet excrete as much as a half pint of moisture each day. If a patient has hyperhidrosis (excessive foot moisture), the feet will produce much more than a half pint of fluid, and several problems can develop. The skin becomes susceptible to breakdown and damage, infections may develop, and bad odors can indicate the unhealthy state of the feet.

Causes of Hyperhidrosis

An infection or an overactive thyroid can raise the metabolic rate and cause a general increase in sweating. Since the sympathetic nervous system controls the perspiration rate in the feet and hands, autonomic imbalances and anxiety disorders often will result in more foot moisture. Most people have "idiopathic hyperhidrosis," indicating a lack of any identifiable causative condition. In fact, work stress, competitive effort, and our modern, busy lifestyles can be important sources of the sympathetic stimulation that causes excessive moisture at the feet.

The sweat glands in the feet secrete constantly, not just in response to heat or exercises, as do sweat glands elsewhere in the body. In fact, research has shown that foot sweating is not due to body overheating or elevated environmental temperatures. While sweating on the rest of the body surface is necessary for proper thermoregulation, the palms and soles of the feet do not participate in this function. One study found that in high temperatures, palmar and plantar sweating in relaxed subjects was negligible, while excited subjects produced considerable moisture at their hands and feet.¹

Foot Moisture Problems

When the feet are exposed to excessive moisture on a regular basis, several problems develop. First, there is a local effect on the skin; then various microbes take advantage of the altered environment to multiply. This process can result in a number of health problems and foot complaints.

Effects on the skin: Moisture that stays on the skin will eventually have a negative effect. This is usually manifested initially as a rash. Blisters often develop, due to an increase in friction between a soggy sock and damp skin.² When the blister breaks down, it can become infected and painful. If it is not immediately treated, an infected blister can cause a life-threatening systemic blood infection, especially in diabetics and others with compromised immune systems. Long-term biomechanical irritation in combination with excessive moisture is a frequent cause of or contributor to persistent, painful calluses and plantar warts.

Smells: A consistently warm and moist environment is an ideal breeding ground for bacteria. In the feet, bacterial breakdown of surface proteins and fats results in a distinctive foul smell. This condition (bromhidrosis) can be very difficult to live with.

Nail fungus and athlete's foot: A fungal infection (dermatophytosis) of the feet and/or toenails is a rather common condition. The fungus can be picked up in any moist environment where an infected person has walked. If the feet then dry out, the fungus dies. It is only when the feet stay moist that the fungus can grow and spread. Once established, a foot fungal infection (*tinea pedis*) can be very difficult to eradicate and will eventually cause permanent deformity of the toenails. Foot dryness and moisture control is imperative in order to prevent these infections, and also to deal with current fungal problems.

Solutions for Excessive Moisture

People no longer need to suffer from the effects of foot sweating. Most recurring problems are due to inattention and ignorance of several important factors that interfere with normal evaporation of foot perspiration. When a bit of time is spent caring for the feet, and proper choices of socks and shoes are made, most patients can easily control their foot moisture.

Foot care and footwear: Foot hygiene includes daily vigorous washing followed by thorough drying (including between the toes). Soaking in an astringent solution, such as strong tea (tannic acid) or vinegar water (acetic acid), aids the control of foot perspiration. For those with very sweaty feet, antibacterial soaps will add in the drying effect.³ Over-the-counter and alternative fungal controls, such as tea tree oil, may help some people. In more severe cases, topical prescriptions or even systemic fungicides (with many side-effects) or anticholinergic medications may be necessary to control a long-standing problem.

Socks that are made of natural materials, such as cotton and wool, help the feet breathe, while polyester and nylon socks and hose should be avoided. Some of the newer materials, such as olefins and acrylics, have even better wicking capabilities than the natural fibers and make better sport socks. Shoes should be made from breathable materials, such as leather, or have a mesh upper. Wearing sandals and going barefoot are even better, but may not always be practical. Insoles that contain charcoal are often only partially helpful, since they only control odor but do nothing to control moisture. Socks should be changed at least daily, and shoes should be allowed to dry thoroughly (at least 24 hours) before they are worn again.

Orthotics: When a patient needs biomechanical support, yet has a problem with excessive moisture, orthotic selection is more limited and has to be carefully considered. Custom-fitted sandals with biomechanical corrections built in are very useful. For patients with sweaty feet who need orthotics, leather tops often are better than the newer viscoelastic materials, which aren't very breathable. However, leather doesn't absorb shock as well as the viscoelastics. When a shock-absorbing benefit is needed, one possibility is a man-made material which is porous (has holes in the upper layer). This improves air flow and is very light.

The best solution for controlling foot moisture, while still providing the necessary support of an orthotic, is a new generation of materials which use "wicking" to pull sweat away from the foot surface. When an orthotic contains one of these materials, it is able to control most cases of hyperhidrosis, and even normal foot moisture is handled efficiently.

References

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FEBRUARY 2006