

# Perspiration and body odor – keeping the ‘emotional smell’ under control

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(Excessive) Perspiration together with the possibly developing body odor may be part of sporting activities, in company however it can be embarrassing. The cosmetic industry offers a wide range of products with antiperspirant and highly effective deodorant properties.

**A**ntiperspirant products are not only expected to inhibit perspiration but also should have anti-bacterial effects. Antiseptic properties are important as the humid environment as e.g. in the armpits supports the growing of bacteria. The metabolites of microorganisms develop quite an unpleasant scent. As these odorous substances generally are clearly noticed by others, deodorant products frequently contain fragrances to blanket the smells. Astringent additives offer further advantages here.

The activity of the sweat glands as well as the skin in general reflect the mental state of the individual person: moist palms during the interview for a new job, cold sweat on the front or increased perspiration during physical work are a quite normal bodily function as well as the body odor signals which develop in case of stress, sympathy or antipathy (The German language even literally uses the expression “I cannot stand your smell”).

Quite a few individuals however suffer from excessive sweating which is also called hyperhidrosis and triggered by emotional response. These spontaneous fits of profuse sweating are quite a nuisance for those affected, especially in company of others. It is frequently accompanied by anxiety which still aggravates the hyperhidrotic condition. Deliberate stress management through relaxation exercises may be of help here. Also hormone disorders or menopause symptoms may lead to increased and spontaneous perspiration. Beverages containing caffeine as well as spicy and sumptuous food generally aggravate the problem. Alcohol also is a rather negative factor in this case.

Sweat glands are high performance glandular systems and altogether able to secrete more than 2 liters of sweat per hour, a fact which illustrates the potential in case of hyperhidrosis. Sweating due to emotional response may be preventively treated with home remedies like sage tea, valerian or St. John's wort. In cases of excessive hyper-

hidrosis prescription drugs like anticholinergics (substances which suppress the acetylcholine effects) are helpful as the sweat glands are controlled by the autonomic nervous system (sympathetic). On the other hand also physical therapy as e.g. iontophoresis shows positive results. Studies have shown that besides surgical measures like the removal of sweat glands also local injections of botulinum toxin as a perspiration inhibitor may show long-term effects.

## Moisture loss

Sweat mainly consists of water, actually 99 percent and the remaining 1 percent are sodium chloride (table salt) and small amounts of short-chained and mostly volatile fatty acids as well as some other substances like e.g. urea, uric acid and ammonia. Due to the fatty acid contained sweat shows a sub-acid reaction. Besides the moisture loss via sweat glands the human body also loses moisture via the barrier layers of the stratum corneum, a process which is called transepidermal water loss (TEWL).

Individuals with barrier layer disorders who generally show symptoms of dehydrated skin and atopic dermatitis therefore particularly suffer from an increased water loss. In this connection the personal hygiene behavior has to be analyzed: taking two showers a day while using shower gel or shampoo has a harmful effect on the skin barrier. The TEWL increases and the skin swelling leads subsequently to an additional susceptibility for microbial infections, among others also mycoses. In case of barrier disorders, dried sweat increasingly may lead to irritations of the skin. Applying perfumes with high alcohol content additionally causes a decrease of the lipid content of the skin and further augments the skin irritation.

## The source of “smells”

There are apocrine glands located in the hairy

areas of the body like the pubic area, navel, breast and armpits which lead to the hair follicle craters and there are eccrine glands which can be found on the whole body and directly lead to the skin surface. The main task of eccrine glands consists in temperature regulation while the apocrine glands in cooperation with the bacterial flora of the skin and their additional organic components determine the characteristic smell of the individual person.

Apocrine sweat formation is controlled by the sex hormones and starts with reaching puberty.

### **Antiperspirants**

The sweat inhibiting effect of acidic salts basically consists in their combining with the mucopolysaccharides of the skin and these compounds then will plug up the orifices of the eccrine glands. Additionally there is a precipitation of proteins which is the stronger the lower the pH of the saline solution is. Salts like aluminium chloride are most frequently used for this purpose. The best results will of course be reached if the product is applied as a preventive measure and not just after the sweat formation already is in full progress. It may hence be useful to let the products become effective over night in order to enable the agent to penetrate into the glandular ducts. Aluminium salts have bactericidal properties and by chemical bonding also are able to neutralize body odor. Their antitranspirant properties still are improved by adding the salts to emulsions, by the use of additives to control the consistency and agents concealing the body odor like perfume oils. In case of sensitive skin however it should be kept in mind that depending on the composition barrier disorders may develop when using emulsifiers or sensitization of the skin when applying perfume oils on a long-term base.

The additional use of preservatives which are generally used to microbiologically stabilize the organic components of emulsions may also cause the skin to sensitize. On the other hand, also the low pH-level of solutions of aluminium salts in combination with the emulsifiers may lead to temporary irritations of the skin. Diluted alum solutions consisting of potassium aluminium sulfate are an alternative here. Alum is a tried and tested astringent substance which closes lesions occurring with wet shavings.

In deodorizing products more emphasis is laid on odor-neutralizing and bactericidal effects than on sweat inhibiting properties. Therefore their composition differs from antiperspirants.

Besides perfume oils they contain specific germ-killing substances like farnesol, glycerol ester like glycerolmonolaurate und diglycerin monocaprinat, partly also alcohol in high concentrations. Besides aluminium salts also perspiration inhibiting additives of quaternary ammonium salts are used. Deodorants may be free of water and sprayable while roll-on deodorants mostly contain emulsions or gels. Because of rheological reasons deodorant sticks frequently contain alkali stearates which may lead to skin barrier disorders in case of a long-term and concentrated use just like synthetic emulsifiers.

Particularly in case of sweaty feet baths containing astringent agents still are prescribed. The selection of appropriate socks (made of cotton) and shoes made of material which is pervious to air is a prerequisite here for the long-term improvement of this problem. Above all it is important to avoid a humid microclimate as this supports the growth of microorganisms which develop intense odorous substances especially around the foot area.

Although there is a multitude of different products with the appropriate convenience on the market one principle should not be ignored: the natural bacteria colony as well as the natural balance should be disturbed as little as possible. In other words: warm water still is one of the most important basic elements for the personal hygiene.

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