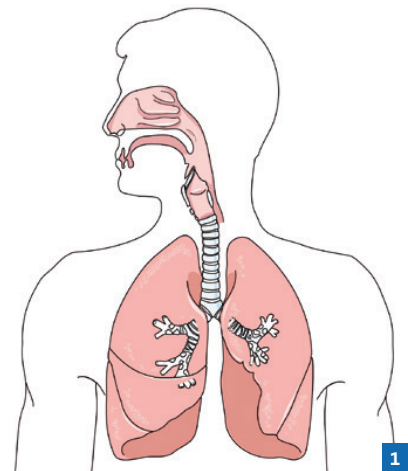


# HEALTH BENEFITS

## MEDICAL ASPECTS OF AIR HUMIDITY

### Humidity and well-being

More people probably know about the link between a dog's wet nose and health than they do about humidity and human well-being.



We are surrounded by pathogenic microorganisms all the time. Among the reasons they can do us no harm are the protective mechanisms of the mucous membranes. We are protected by a continuous self-cleaning function in the respiratory tract. Our bronchial tubes, trachea, larynx, nose, and wide sections of the pharynx contain ciliated cells, on the surface of which are found hair-like structures, the cilia. Between the cilia are goblet cells that continuously produce a viscous gel. This accumulates like a sticky film on the cilia, to which foreign particles and microorganisms adhere. The cilia perform coordinated, whip-like movements in the direction of the throat, conveying the thick mucus layer and its cargo towards the mouth.

#### Weakened self-cleaning effect

Prof. Dr. J. Peter Guggenbichler of the

Universitätsklinikum Erlangen demonstrated that this cleaning process is crucially dependent on indoor air humidity. If the mucous layer dries up from the outside due to insufficient humidity, the viscosity of the gel layer increases, weakening the flexibility and hence the beat rate of the cilia. Guggenbichler sees a humidity level of at least 30% as the minimum requirement. The fastest transport speed is achieved at a relative humidity of 45%. At a relative humidity below 20%, the cilia are fully inhibited, leaving the body defenceless against pathogenic microorganisms.

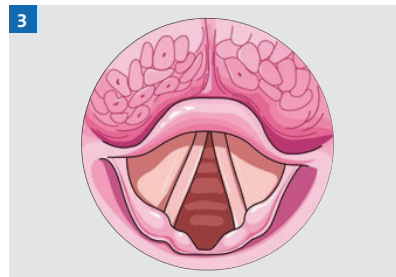
#### Transmission of influenza viruses

American scientists at the Mount Sinai School of Medicine in New York have investigated the influence of humidity on the transmission of influenza viruses. At a relative humidity between 20 and

35%, they assess the risk of becoming infected with an influenza A virus as about three times as high as at 50%. The humidity level influences not only the self-cleaning function of the mucous membranes, but also the size of the droplets that carry the viruses through the air. The exhaled droplets are most stable at a humidity between 20 and 40%. At this low humidity level, the aerosols evaporate faster. Since smaller droplets remain longer in the air, the probability of transmission rises. As the humidity level increases, the exhaled droplets absorb more water, causing them to fall to the ground faster.

#### Hoarseness and laryngitis

For people whose work involves a lot of talking (for example in call centres, service departments or customer support), humidity also plays a serious role. A humidity level that is too low



# HEALTH BENEFITS

can lead to problems with the voice. Common symptoms of this are dryness of the throat and larynx, increased clearing of the throat, and hoarseness. Other consequences include coughing, the need to swallow frequently and, in the worst case, voice loss. This occurs if the vocal cords become too dry. If the humidity level is too low, the mucous membranes of the vocal cords lose their elasticity. If the glottis can no longer be completely enclosed by the vocal cords after breathing in, additional air finds its way into the vocal tract, producing the strain indications described above. For professions that involve much speaking, experts therefore recommend a minimum humidity level of 40%.

## The dry eye effect

The function of the tear film in the eye is to protect the surface of the eye from the impact of the surrounding environment. Excessively dry air leads to increased evaporation. In extreme cases, the tear film can tear. This danger is amplified by long hours of staring at the screen, with a reduced rate of blinking. Ophthalmologists warn against underestimating what they term “dry eye” as a harmless sense of feeling unwell, seeing it instead as a complex disease pattern. The symptoms include swollen eyelids, redness, foreign body



sensation, burning, and excessive sensitivity to light, resulting in increased irritation, burning eyes and, in severe cases, inflammation and serious damage to the eyes.

## Weakened skin protection

Even the protective function of the skin can suffer from excessively dry air in the office. At a humidity level below 20%, the skin becomes chapped and cracked, exhibiting symptoms such as itching, especially between the fingers. Chronic skin conditions such as neurodermatitis or psoriasis may be aggravated by dry room air.

## Harmful particulate matter

The presence of fine particles in room air is a frequently underestimated health risk. Particulate matter, or respiratory dust, is made up of minute, invisible particles that penetrate deep into the human respiratory tract, where they can cause serious lung irritation and diseases. An inadequate humidity level facilitates the development of dust and the intensity of swirl in indoor spaces. A humidity level between 40 and 60% causes the dust particles to fall more quickly to the ground.



## Dry air and health

Intensive work with computer screens, jobs that require much speaking and overheated offices combined with an inadequate humidity level can lead to significant health risks. Common symptoms, especially in the winter months, include respiratory infections, difficulty in swallowing, sore throat and burning eyes. An optimum humidity level throughout the year helps to reduce the rate of absence through sickness, which means that direct humidification systems pay for themselves very quickly.

## Effects of humidity:

- 1 Protection of the respiratory tract
- 2 Reduction of the risk of infection
- 3 Protection of the vocal tract
- 4 Prevention of dry eyes
- 5 Vitalising and healthy
- 6 Ideal in call centres