Position Paper

Dry your hands hygienically: But how?

satino wepa

Easy. Clean. Professional.

Science decides

Why hand drying with paper towels is the hygienic method of choice in public washrooms: a summary of the scientific data.

Drying hands in public washrooms

Outside the clinical setting, washing hands with soap and water is the method of choice for breaking chains of infection. It can be used to effectively reduce all types of germs and thus minimize the risk of germ transmission.

In addition to factors such as soap and the correct method of washing hands, drying your hands also plays a very important role as residual moisture on the skin can damage the skin and cause skin diseases. Additionally, the residual moisture on the skin promotes the growth and transmission of germs[1,2].

The numbers of occupational skin diseases in Germany are high for years. According to the German statutory accident insurance those are mainly hand eczema which are also caused by incorrect hand hygiene practices. These numbers were also at a high level during the COVID-19 pandemic. Therefore, this summary of the scientific data on hand drying is intended to reduce these numbers.

Washrooms usually provide different ways to dry hands, including air dryers, cotton towels or paper towels. But which method is safest and most hygienic, and above all, why?

Numerous scientific studies have been carried out on this, the results of which we summarise here to answer this question for you.

What does hygiene in hand drying include?

Essentially, hygiene with hand drying is based on four pillars.

1.
RESIDUAL MOISTURE
Too much residual moisture on the skin

2.
SURFACE HYGIENE
Transmission of germs through contact with frequently touched surfaces

3.
AIR HYGIENE
Transmission of germs through germ-containing water droplets (aerosol)

4.
NOISE AND ACCESSIBILITY
Poor accessibility of the hand drying devices

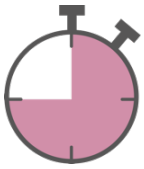
1. Residual moisture – a risk close to the skin

- **Residual moisture on the skin can lead to skin damage or promote the growth and transmission of germs**
- **Studies show that the average time a washroom visitor spends drying their hands is only around 10 seconds[3]**

The first and most important pillar of hand drying is the removal of residual moisture on the skin, because such moisture can lead to skin damage and promote the growth and transmission of germs.

Studies show that the average time a washroom visitor spends drying their hands is only about 10 seconds[3]. It is therefore crucial that as much moisture as possible is removed from the skin within this short time.

Paper towels can absorb 96% of water from the hand within 10 seconds, as shown by another study[4].



The **airflow dryer** used for this comparison had almost 60% of the water remaining on the hand in the 10-second period; he was only able to remove a comparable amount of water after a drying time of 45 seconds.

2. Surface hygiene – why the surroundings matter

The second pillar of hand drying is surface hygiene. All washrooms have numerous surfaces that are often heavily contaminated with germs – however, these are not only the handle of the washroom door or the area of the door leaf around the handle. According to studies, this also includes the floor, soap dispensers, taps and the housing of airflow dryers[5,6].

Touching surfaces contaminated with germs after washing hands impairs the effect of washing. Therefore, when visiting a washroom, touch as few surfaces as possible: this reduces the risk of further spreading existing germs. This also includes unintentional touching. Especially with jet hand dryers into which the hands are inserted, it occurs up to 13 times per use, as shown by a study from the USA[7].

This is particularly problematic, because over 1,000 times more germs have been detected on jet hand dryers than on paper towel dispensers[8].

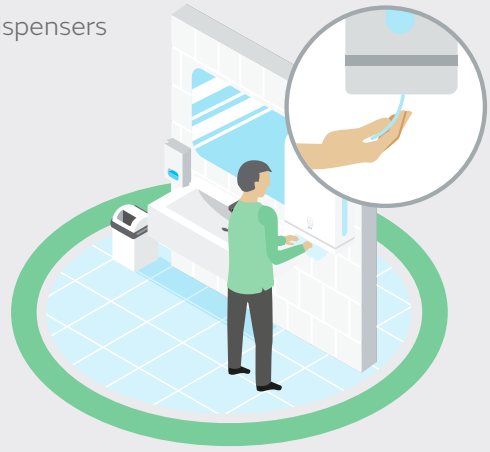
Paper towels, on the other hand, help to minimise risk – even with manual dispensers the paper is only removed from the bottom of the dispenser housing, which significantly reduces the risk of accidental contact.

Paper towels can also be used for turning off the tap or operating the door handle, so that the risk of germ transmission is reduced here as well.

Frequently touched surfaces lead to the spread of germs

Jet air dryers

Paper dispensers



Airblade dryer

13 touches

per uses[8]

Jet hand dryer

1.000 x more germs

than on a paper towel dispenser[8]

Paper dispensers work

contactless

3. Air hygiene – the fight against aerosols

The third pillar is air hygiene. Two well-researched germ-spreaders are found in washrooms that release large quantities of germs into the indoor air. One is the toilet flush – when flushing, the toilet lid should always be closed to minimise the risk of infection via aerosols. The other germ-spreaders are electric airflow dryers: when actuated, these powerfully distribute germ containing air via aerosol in the room[5,9,10].

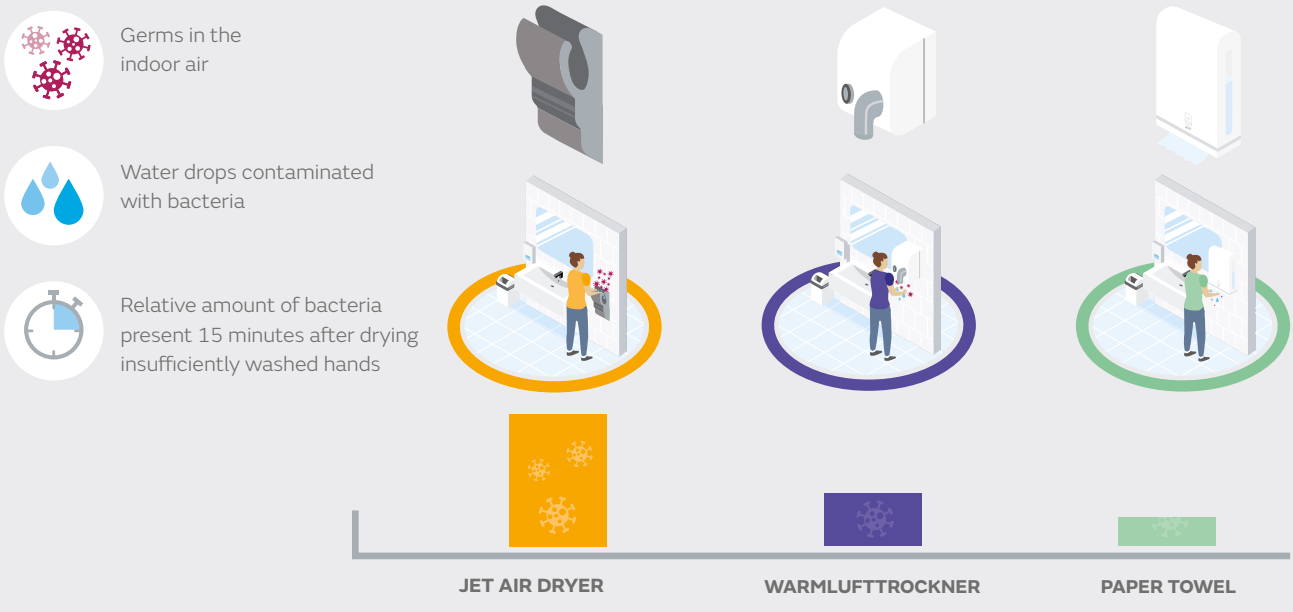
Even directly after washing your hands, these are not completely free of germs. In addition to the bacteria in our skin flora, lingering viruses can, if hands are not washed properly, also enter the indoor air via airflow dryers. Since even just a few germs are sufficient for infection with many viral cold- or diarrhoea pathogens, and because viruses remain in the indoor air in an aerosol for several hours, a risk of infection can also arise in this way[11].

Many germs could be detected after deposition on horizontal surfaces in the immediate vicinity of airflow dryers (e.g. on the floor). The highest proportion of germs was found in the immediate vicinity (in approx. 1 m radius) of the airflow dryer[11].

In contrast to various electric fan dryers, which generate a germ-containing aerosol with high air speeds, this danger does not exist when drying hands with paper towels. Therefore, paper towels are also the better choice from the point of view of air hygiene.

Paper towels produce almost no aerosol containing germs, even when drying poorly washed hands[12,13].

Spreading of germs after drying insufficiently washed hands



Source: Microbiological comparison of hand-drying methods: the potential for contamination of the environment, user, and bystander, E.L. Best, P.Parnell, M.H. Wilcox (2014)

Paper towels produce almost no germ-containing aerosols even when drying poorly washed hands[12,13]

4. Noise and Accessibility

The fourth pillar is user-friendliness. The high air velocity of air flow dryers is achieved by very high engine speeds, which lead to very high noise levels. According to studies, these devices can reach a volume of 94 dB. In addition to the spread of germs from such devices, this volume is also a reason why, according to the Robert Koch Institute, jet air dryers should not be used in medical facilities[12]. Due to their smaller size, children or people in wheelchairs have their heads closer to the jet air dryer, resulting in even higher noise levels of up to 115 dB[13]. The Federal Environment Agency also comes to the conclusion that these dryers pose a medium hearing hazard for children[14]. In addition to the low volume during use, paper towels also offer very good accessibility. They do not require constant overhead handling, as with airflow dryers or cotton roll dispensers, and dangerous leaning out of the wheelchair, e.g. to operate an air flow dryer, in which the hands have to be put in from above, is eliminated.

115 dB

is the noise level that jet air dryers can reach[13]

Accessibility – handicapped people and children must also be able to dry their hands safely in washrooms

Germs in the indoor air

Water drops contaminated with bacteria

Relative amount of bacteria present 15 minutes after drying insufficiently washed hands

The reach **distance** is insufficient for using a jet air dryer

JET AIR DRYER

Warm air dryers require inconvenient **overhead use**

WARMLUFTTROCKNER

Paper towel dispensers can be **easily accessed** even at standard mounting height

PAPER TOWEL

Paper towels are an accessible option and they are suitable for all ages.

Many heavily contaminated surfaces lurk in washrooms

Paper towels are very popular with washroom visitors. In a survey conducted by the Federal Center for Health Education, 61% of those surveyed indicated paper towels as the preferred method for drying hands[15]. One reason for their popularity is their versatility. Paper towels are suitable for avoiding having to touch heavily contaminated surfaces in washrooms such as doorknobs or faucets directly. Otherwise, a strong recontamination of the hands takes place, especially after hand washing.

61%

of respondents cited paper towels as the preferred method for drying hands

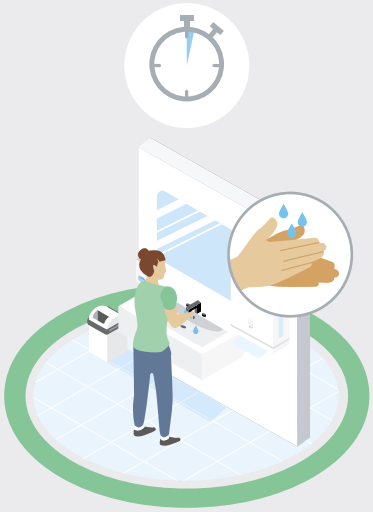
Paper towels help avoid having to touch heavily contaminated surfaces directly

Jet air dryers and cotton roll dispensers are often a bottleneck in the washroom

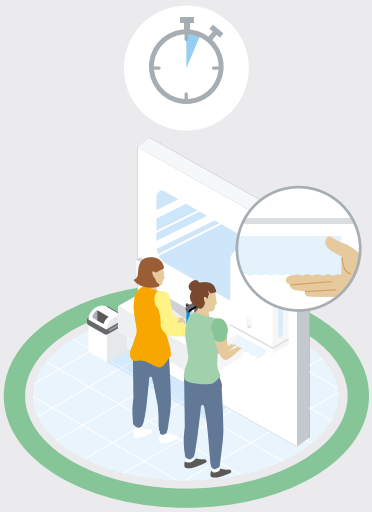
Especially at peak times there are queues in front of jet air dryers or cotton roll dispensers. Our data shows that a paper towel dispenser is blocked for just 3 seconds on average. As a result, it is quickly accessible again for subsequent washroom visitors. The crowds of people in washrooms that are avoided in this way also reduce the risk of infection in washrooms, since e.g. by toilet flushing a lot of germ-containing aerosol is generated.

3 seconds

are sufficient until a paper towel dispenser is accessible again



Step 1
After washing hands with soap and water ...



Step 2
... a paper towel is removed from the dispenser ...

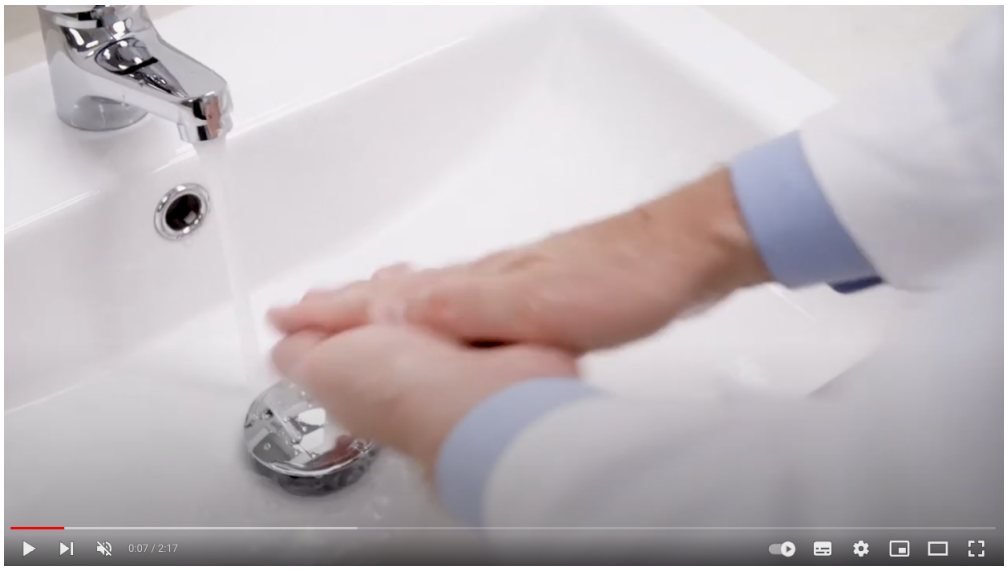
Step 3
... while drying hands, the dispenser is accessible again within 3 seconds.

Paper towels help avoid queuing in the washroom at busy times

The bottom line:

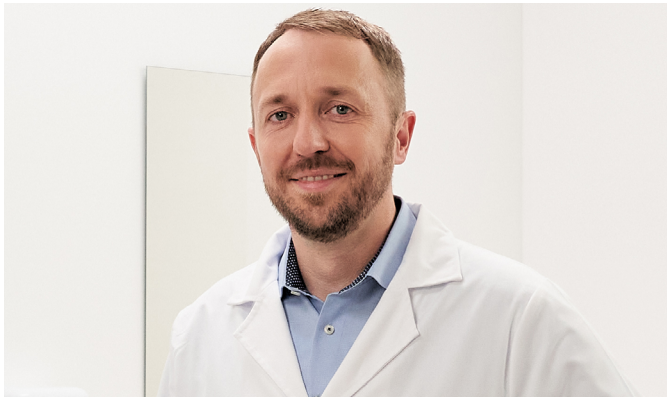
Everything speaks in favour of paper towels

In summary, it can therefore be stated: Not only the good user-friendliness for the general public speaks in favour of the paper towel, but also the scientific knowledge. The paper towel should be the method of choice for hand drying due to its better hygienic properties. Based on the very good quality of data on hygiene with hand drying, the World Health Organization, the Robert Koch Institute, the German Society for Hospital Hygiene, the Federal Environment Agency and the Federal Center for Health Education have come to the conclusion that disposable paper towels should be used to dry hands[14, 16-18].



Video:
Advantages of disposable towels

AUTHORS:



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