

## What is the most hygienic way to dry your hands?

Our territory is the bathroom. We have colonised all aspects – the toilet bowl is a firm favourite among my kind, followed closely by the luxury floor tiles just out of the mop's reach, and not forgetting the hand dryer – the best adrenaline-pumping rollercoaster ride. Let me introduce myself as Gerry. I believe you call us germs. You see great importance in trying to eradicate us after your washroom visit. Not surprising really, as some of us can make you very ill, and the likelihood of us leaving the bathroom with you is higher than you would like it to be (1). The risk is even higher if you leave with wet hands, hence the importance of effective hand drying in breaking the cycle of our transmission (2). This is expressed in the WHO's statement 'clean hands are safer hands (3).' Hand drying and hand washing are starting to be viewed as equally important steps in achieving clean hands and a safer environment. However, you seem indecisive on the best way to dry your hands; I have seen many towels and hand dryers come and go, each with varying abilities to fling us bacteria all over the walls and unsuspecting bystanders.

My favourite visitors pick up hundreds of us on their hands, rinse us gently with water (we are tougher than they think) then simply wipe their hands down their sides, or touch the toilet door lock and handle, where we remain, multiplying, only to be deposited onto the next target. Our least favourite visitors seem only too aware of our invisible presence. They wash their hands seven different ways, focussing on where we like to hide – the nail beds and in comfy crevasses between the fingers. Unlike the hand washing techniques, there are no firm recommendations on how to dry hands in the most hygienic way. Both hand hygiene and washroom hygiene need to be considered when deciding which technique is best. Taylor *et al.* found little difference in germ spread via droplets between paper towels and a hand dryer (1). A further randomised, prospective study comparing dispensed cloth towels, paper towels from a pile next to the sink, warm forced air from a mechanical hand-activated dryer, and spontaneous room air evaporation found no significant difference in their efficiency of removing bacteria from hands (4). You lot are very indecisive. Researchers have used different techniques ranging from contact plates to rinse methods to assess how many of my comrades are present. It is also difficult to standardise hand drying across investigations, which may explain some of the differences in results.

Many other scientific studies have found more decisive results. In terms of hand hygiene, some studies have demonstrated that the numbers of us microbes actually increases on fingertips after electronic hand drying by up to five times (5) (6). Some say that drying hands with warm air increases our spread in water droplets around the room, especially if hand washing is suboptimal (7; 8). One recent study found that a jet hand dryer dispersed water droplets, along with bacteria, over a greater distance and height compared with paper

towels, roller towel and a warm air dryer (8). It is a fun ride for us though; no one seems to acknowledge that. Another research paper found that numbers of bacteria were 27-fold higher in the vicinity of a jet air dryer compared with paper towels. When using hands covered in paint as an indirect measure of bacteria, the jet air dryer caused paint droplets to be spread over the user of the hand dryer and a bystander. However, this was not seen when paper towels were used. This contamination of others in the washroom and the surrounding area is bad news for healthcare settings, which rely on sterile environments for healthy patient recovery (9). In further support of the use of paper towels, after taking into account speed of drying, degree of dryness, effective removal of bacteria and prevention of cross-contamination, a systematic review found paper towels to be the most hygienic way to dry hands (2). Although not all the articles that were reviewed agreed on all aspects, the authors concluded that paper towels were hygienically superior to electric dryers and should be made available to healthcare workers. This view is echoed by the European Tissue Symposium, who firmly believes that single-use paper towels are the most hygienic way to dry hands, owing to their absorbent properties. We can settle comfortably in water droplets, so these need to be thoroughly removed before leaving the bathroom and the friction created when rubbing the towels over your skin helps to achieve this. Paper towels can absorb nine-times their weight in moisture, making them prime candidates for water droplet removal (10). Paper towels are not just effective, they are also popular – in a survey, two-thirds of those questioned preferred this method of hand drying over hand dryers or textile rolls (11).

I should not be revealing these secrets, as our germs may need to find other ways to get around! I have seen the extent of the problem we pose for those who do not dry their hands properly so I can appreciate its importance. Although not all studies agree, the overall consensus appears to be that paper towels are the most hygienic method of hand drying owing to their ability to absorb water efficiently and unseat our microbes from your hands.

## References

1. Taylor JH *et al.* A microbiological evaluation of warm air hand driers with respect to hand hygiene and the washroom environment. *J. Appl. Microbiol.* 89 (2000): 910–919.
2. Huang C *et al.* The Hygienic Efficacy of Different Hand-Drying Methods: A Review of the Evidence. *Mayo Clinic Proceedings* 87(8) (2012): 791–797.
3. WHO. Clean Care is Safer Care. [Online] 2015. <http://www.who.int/gpsc/en/> (accessed 28/12/2015).
4. Gustafson DR *et al.* Effects of 4 Hand-Drying Methods for Removing Bacteria From Washed Hands: A Randomized Trial. *Mayo Clinic Proceedings* 75(7) (2000): 705–708.
5. Blackmore MA. A comparison of hand drying methods. *Cathering & Health* 1 (1989): 189-198.

6. Knights B *et al.* Hand drying: an assessment of efficiency and hygiene of different methods. A survey by the Applied Ecology Research Group, University of Westminster for the Association of Makers of Soft Tissue Papers. 1993.
7. Meers PD *et al.* Hot-air hand driers. *Journal of Hospital Infection* 14 (1989): 169–171.
8. Best EL *et al.* Comparison of different hand-drying methods: the potential for airborne microbe dispersal and contamination. *Journal of Hospital Infection* 89(3) (2015): 215–217.
9. Best EL *et al.* Microbiological comparison of hand-drying methods: the potential for contamination of the environment, user, and bystander. *Journal of Hospital Infection* 88(4) (2014): 199-206.
10. European Tissue Symposium. Position on the use of electric air dryers versus paper hand towels. <http://europeantissue.com/wp-content/uploads/2015/04/ETS-PP-Hygiene-WAD-JAD-November20152.pdf> : (2015) (accessed 28/12/2015).
11. INTERMETRA Business & Market Research Group. Study of the Consumers' Attitudes to Different Handdrying Systems for European Tissue Symposium. June 2008.

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