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“Drying Your Hands in a Public Restroom: What You Need to Know”

Whether at a restaurant, a movie theatre, or enjoying a day at the beach, an individual is left with limited options when nature calls to make the unavoidable trip to the public restroom. To best navigate the public restroom experience, in the most hygienic of ways, here is what you need to know:

Public Perception

In a 2008 study, titled “Study of the Consumers’ Attitudes to Different Handdrying Systems”, 2000 participants were surveyed about hand drying in public restrooms; the survey generated some interesting facts. The study found that 71% of the participants regularly dry their hands after washing when in a public restroom (Intermetra 2008). Of these participants, 63% prefer using paper towels as their main drying method. In contrast, 28% of participants preferred using a warm air dryer to dry their hands.

When selecting which method to use to dry their hands, 71% of participants consider hygiene as the top priority whereas only 22% of participants prioritize quickness of drying. An interesting fact is that 68% of participants said that paper towels dry their hands the fastest versus the 19% of participants who felt warm air dryer was the fastest method. As such, the study concludes that the general public’s perception towards hand drying in a public restroom favours a hygienic and speedy method of hand drying, and prefers to use paper towels (Intermetra 2008).

Restrooms and Bacteria

Research conducted on the spread of infections and harmful bacteria living in public restrooms have been available to the public (but not necessary emphasized) since the 1950s (Mendes and Lynch 1975). Bacteria, including fecal matter, are said to be present on all surfaces in a public restroom including all surfaces necessary to touch in order to wash and dry hands (ibid). Thus, human hands play a major role in transmitting infectious bacteria, which we come into contact with on a daily basis (Jumma 2005). Keeping our hands clean with soap and water and selecting the proper hand drying method is the best defense against the spread of diseases (Gustafson 2000). This is especially true when using a public restroom. However, as will be further discussed below, not all hand-drying methods available in public restrooms are effective in keeping hands clean after they have been washed with soap and water (Redway and Fawder 2008).

Antibacterial soap and water is the best method to wash your hands and suppress the transmission of bacteria (www.healthcanada.ca). When soap and water are not available, the best substitute is hand sanitizer (ibid). Once hands are clean, three different hand-drying methods are typically available in public restrooms: paper towel, warm air dryers, and jet air dryers. Researchers at the University of Westminster, UK, examined these three methods of hand drying to determine which method is the most hygienic (Redway and Fawder 2008). They calculated which method keeps hands the cleanest once they have been washed. The results are as follows:

- Warm Air Dryers 194% bacteria *increase* on fingertips
 254% bacteria *increase* on palms



- Jet Air Dryers 42% bacteria *increase* on fingertips
 15% bacteria *increase* on palms
- Paper Towel 76% bacteria *decrease* on fingertips
 77% bacteria *decrease* on palms

Based on these results, there are three reasons why the warm air dryers and jet air dryers do not represent hygienic methods for drying hands. The first is that warm air dryers and jet air dryers do not fully dry hands with one use. This leaves hands damp, which allows for bacteria to thrive and breed (Redway and Fawder 2008).

Secondly, when hands are rubbed together under the stream of air, friction is created that pulls bacteria out of skin pores, but this bacteria is not blown away by the air-stream; it remains on the hands. Lastly, the stream of air coming from the warm air dryers and jet air dryers blows bacteria-rich air from within the bathroom onto hands and anything else within two meters distance from the air dryer (ibid). Therefore, using paper towels can be considered as the most hygienic choice when drying your hands in a public restroom.

Here are few more hygienic tips to consider:

- 1) Use paper towels to turn off the water facet and to open the bathroom door when you leave (www.healthcanada.ca). This will help ensure that your hands remain as clean as possible while you exit the restroom.
- 2) If available, bathrooms that offer touch-less (sensor) toilet flush, water facet, air dryer and paper towel dispensers are superior in preventing the spread of bacteria. The less contact with bathroom surfaces, the better.

Noise-Level Exposure

Consideration should also be given to noise level exposure of warm air dryers and jet air dryers. In general, warm air dryers operate at a lower decibel (dBA) range than jet air dryers. Jet air dryers have become louder at the cost of greater efficiency and greater air speed production. Normal conversation ranges between 40 – 60dBA.¹ Warm air dryer decibel range is from 70 -85db, and jet air dryers can range from 65 – 100 dBA.² To compare, 100dBA is comparable to a jet take-off at 300 metres, jet flyover at 1000 feet, and Bell J-2A helicopter at 100 feet.³

The National Institute of Health warns that prolonged exposure to 85dBA or greater can cause gradual hearing loss. Only 15 minutes of exposure to a noise level of 100dBA can cause damage to the eardrum causing permanent hearing loss.⁴ It can be noted that warm air dryers operate at a lower dBA level than jet air dryers, but warm air dryers have a prolonged dry-time of 30-50 seconds. Often more than one use is required to dry hands thoroughly. Jet air dryers operate at a higher dBA level with a faster 10-15 seconds dry-time. However, multiple uses may also be required.



	Dyson Airblade™ hand dryer AB02 (120v)	Warm Air Dryer (World dryer - Air Max DXM5 (120v))	Paper towels
Average Drying Time:	12 seconds	28.14 seconds	-
Operational Power Consumption:	1400 watts	2300 watts	-
Power Consumption Per Use:	0.0047 watts	0.0180 watts	-
Operating Cost Per Use:	\$0.0004	\$0.0016	\$0.0200
Annual Power Consumption:	349.18 kWh	1315.69 kWh	
Annual Operating Carbon Footprint:	69.84 kg/CO2e	263.14 kg/CO2e	657.00 kg/CO2e
Annual Operating Cost:	\$32	\$123	\$1460.00

Table 1: Comparison of Jet Air Dryers (JAD), Warm Air Dryers (WAR), and Paper Towels (PT) Based on 200 Uses Per Day, Per Drying Method and 1 Unit in Use.

Source: <http://www.english.dysonairblade.ca/specification/calculator.asp>

Hand Dryer	Model #	Dry Time (sec)	Cost (\$)	Decibels
Dyson Airblade	AB 02	10	1399	90
Xlerator	XL-W	12	418	95-100
World Dryer Airforce	J-974	14	260	85
World Dryer AirMax	XM5-974	15	395	83
World Dryer Model A	XA5-974	27	360	82
Electric-Aire	LE1-974	40	150	70
Fast Dry	HK-1800PA	45	91	58

Table 2: Decibel Levels for assorted Jet Air Dryers and Warm Air Dryers

Source: <http://www.restroomdirect.com/hand-dryer-noise-levels.aspx>

Implications for Decision-Making

Patrons, restroom owners and operators need to incorporate public health, and environmental and economic considerations when selecting a specific hand-drying method. Overall, warm air dryers and jet air dryers have a lower lifecycle impact on the environment as compared to paper towels. Additionally, the yearly operating costs of warm air dryers and jet air dryers are considerably lower than paper towels (see Table 1). The question remains: When selecting hand-drying methods, are marginal economic savings more important than impact on personal hygiene?

Works Cited



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¹ See <http://www.nidcd.nih.gov/health/hearing/ruler.html>

² See <http://www.restroomdirect.com/hand-dryer-noise-levels.aspx>

³ See <http://www.chem.purdue.edu/chemsafety/Training/PPETrain/dblevels.htm>

⁴ See <http://www.nidcd.nih.gov/health/hearing/ruler.html>