

# Case Study - Cork University Hospital

Over €160,000 savings in water and energy along with legionella risk reduction benefits from new showers



## Background

Hospitals are a unique environment, especially when it comes to water-related services – from showers, toilets and taps providing basic services to reverse osmosis providing sterilisation and dialysis services. A crucial element of water management in hospitals is infection control, in particular managing potential bacterial growths (e.g. legionella, pseudomonas). While these issues are typically managed by flushing water through low use fittings and the removal of dead legs, showers are a challenge as their surfaces usually remain humid after water has been used and may serve as a damp micro-niche for permitting bacteria to grow and multiply.



## What was done

CUH is one of the largest hospitals in Ireland with over 800 beds. In 2017, a plan was put in place to replace all shower heads with Medi-Showers. These healthcare specific shower heads are designed to inhibit the growth of potentially harmful bacteria and, at the same time, reduce the volume of hot water used. The Medi-Shower™ system was designed to solve these hygiene problems by completely replacing the spray plate with an innovative anti-microbial, detachable and colour coded micro-sized shower head. The showers come with a hose assembly, a shower handle featuring a smooth bore inner water tract and micro-sized colour coded shower heads. The colour coded shower heads are replaced/recycled quarterly as part of the service contract.

In addition to their anti-bacterial function, these showers typically have flow rates of around 8 litres per minute which is much less than the 12 – 22 litres per minute of the older shower heads in CUH. Since 2017, the showers throughout the hospital have been changed. This has happened in stages, with 60 replaced during 2022 and the last 10 – 15 showers due to be changed in 2023.



Medi shower set



## The Results

From an infection control perspective, the new shower heads and associated service contract have been hugely successful. In addition, with the recent changes in water charges, and the significant increases in the cost of hot water provision, the accrued savings highlight a very worthwhile investment.

Currently there are around 460 showers in the hospital. Some of these are used multiple times a day (e.g. theatres and multi-bed wards) while others are used less frequently. Assuming an average of 2 uses per day, the following table estimates the savings associated with the shower changes.

	Original Showers	Medi-showers	Savings
Flow rates	22 – 12 litres/min (average 17 l/min)	6 – 8 litres/min (average 7 l/min)	~ 10 litres/min per shower
Number of showers in CUH	460	460	
Average shower time (estimated)	8 minutes twice a day	8 minutes twice a day	
Total water use	17 x 460 x 8 x 2 x 365 = 45,700 m <sup>3</sup> /year	7 x 460 x 8 x 2 x 365 = 18,800 m <sup>3</sup> /year	26,900 m <sup>3</sup> /year

	Costs		Cost Savings
Cost of incoming water for showers per year <sup>1</sup>	€138,000	€57,000	€81,000
<b>COST OF HEATING SHOWER HOT WATER PER YEAR<sup>2</sup></b>	<b>€141,000</b>	<b>€58,000</b>	<b>€83,000</b>
<b>ANNUAL COST SAVINGS</b>			<b>€164,000</b>

	Carbon Emissions		Carbon Savings
Carbon emissions for water supply & waste water management <sup>3</sup> (tonnes of CO <sub>2</sub> e per year)	19	8	11
Carbon emissions from the provision of hot water <sup>4</sup> (tonnes of CO <sub>2</sub> e per year)	359	148	211
<b>ANNUAL CARBON SAVINGS (TONNES CO<sub>2</sub>E)</b>			<b>222</b>

## Cost Benefit

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<sup>1</sup>Current IW charge is €3.02 per m<sup>3</sup>

<sup>2</sup>Based on an assumed value of €0.08 per kWh incl VAT for natural gas, an assumed shower temperature of 40°C, an assumed average incoming water temperature of 10°C, and a boiler efficiency of 90%.

<sup>3</sup>Estimated carbon emission for water supply (0.151) and wastewater management (0.272) = 0.423 kg CO<sub>2</sub>e/m<sup>3</sup>

<sup>4</sup>Based on a delta T of 30°C (an assumed shower temperature of 40°C and an assumed average incoming water temperature of 10°C), natural gas NCV of 203g CO<sub>2</sub>/kWh, and a boiler efficiency of 90%.