

Direct Cost Analysis of an Aerosolized Hydrogen Peroxide Dry Fogging Disinfection System Integrated within a Smart Hospital Ecosystem

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Background: Effective environmental disinfection is a core component of a comprehensive infection prevention strategy. However, incomplete disinfection, safety of personnel, cost and labor requirements have limited adoption of newer technologies. An automated dry hydrogen peroxide fogging technology designed to overcome these limitations has recently entered the market, potentially offering a more clinically and economically effective solution. This novel technology, available in an affordable subscription model, provides micron-sized hydrogen peroxide to the entire room, ensuring optimal disinfection of all surfaces. The system also allows integration within data platforms to provide historical data on equipment usage, aerosolized hydrogen peroxide dosages, room coverage, disinfection times and locations to improve processes and provide auditable records. We aimed to perform a direct cost analysis of this new system.

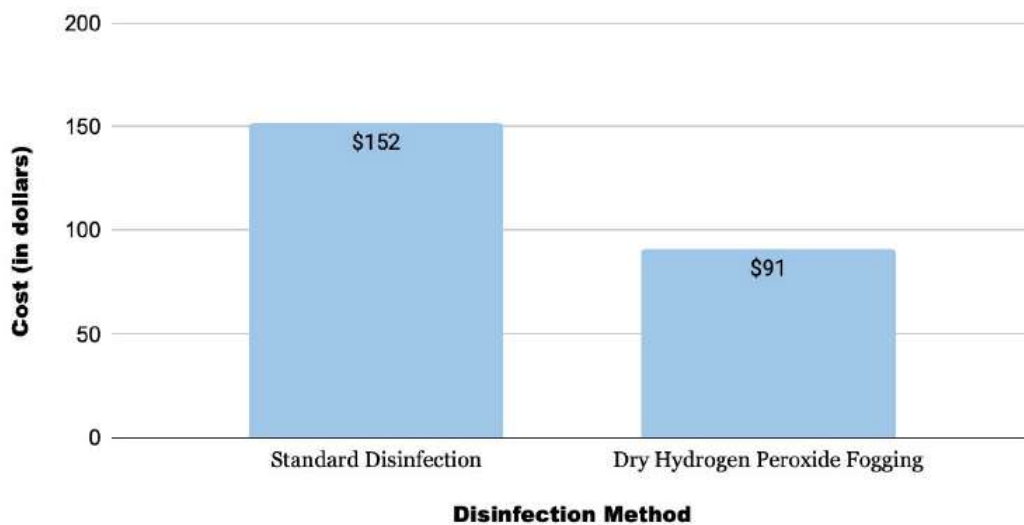
Methods: To estimate costs, we assumed a US hospital with an average of 129 staffed beds and an occupancy of 0.73 patients per bed per day. We modeled a daily hospital discharge rate of 17%, an hourly rate for environmental services staff of \$22.81, and a mean time reduction from the use of dry hydrogen peroxide fogging (Breezy Med, Albuquerque, NM) of 10 minutes.

Results: With a time reduction for disinfection turnover of 10 minutes using automated dry hydrogen peroxide fogging compared to standard manual disinfection, a cost savings of \$3.80 per bed turned over was realized. At a rate of 16 daily bed turnovers, a daily cost savings of \$61, and an annual cost savings of \$22,165 results.

Conclusions: A new dry aerosolized hydrogen peroxide disinfecting fogger system offers a substantial cost savings in a typical hospital scenario.

Daily Cost

Assuming 16 daily turnovers



Annual Cost

Assuming 16 daily turnovers



Notes: To estimate the savings for a US hospital, we assumed a US hospital has 129 staffed beds, on average (<https://www.definitivehc.com>). We assume an occupancy of 0.73 patients per bed per day (<https://www.researchgate.net/about>). We assume a daily hospital discharge rate of 17%. The daily hospital discharge rate was estimated using 2023 data of the total number of US daily hospital discharges divided by the total US average daily census. Total US daily hospital discharges was derived from AHA annual survey data of total discharges ([aha.org](https://www.aha.org)). Total US average daily census was derived from 2023 total discharges and 2023 average LOS (<https://www.kff.org>).