Controlling Legionella in hospital water systems: experience with the superheat-and-flush method and copper-silver ionization.

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OBJECTIVE: To evaluate the effect of copper-silver ionization on Legionella colonization and nosocomial legionnaires' disease and to compare the efficacy of metal ions versus the superheat-and-flush method of disinfection.

DESIGN: Prospective determination over a 36-month period of copper and silver ion concentrations in the recirculating hot-water system, Legionella colonization of the hospital water distribution system, and cases of nosocomial legionnaires' disease. Retrospective comparison of results with the previous 13 years, during which the superheat-and-flush method was used.

SETTING: The Pittsburgh Veterans' Affairs Health Care System (University Drive Division) acute-care hospital.

INTERVENTION: Three copper-silver ionization systems were installed on the hot-water distribution system in November 1994.

RESULTS: The average number of cases of legionnaires' disease per year and the percentage of distal sites positive for Legionella pneumophila for the superheat-and-flush method versus the copper-silver ionization method was six cases with 15% positivity versus two cases with 4% positivity, respectively. The reduction in Legionella colonization after copper-silver ionization was significant ($P<.05$) compared to the superheat and flush. Mean copper and silver ion concentrations (mg/L) were 0.29 and 0.054 from hot-water tanks, and 0.17 and 0.04 from distal outlets, respectively.

CONCLUSIONS: We conclude that a properly maintained and monitored copper-silver ionization system was more effective than the superheat-and-flush method for reducing the recovery of Legionella from the hospital water distribution system.