

## Investigation at a Veterans Affairs Medical Center of Spurious Legionella Environmental Testing Results and High Laboratory-to-Laboratory Variability Among Four Commercial Laboratories

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**Background.** The Department of Veterans Affairs (VA) requires quarterly water Legionella environmental testing (LET). The Minneapolis Veterans Affairs Medical Center (MVAMC) began LET in 2008. All results were negative until November 2015, when a new (CDC ELITE-certified) LET laboratory (lab1) reported Legionella spp (Lsp) in 12 of 40 (30%) MVAMC samples. Healthcare-associated legionellosis (HAL) and LET reliability were investigated.

**Methods.** Records of all 2015 MVAMC Lsp cases and potentially exposed patients were reviewed. In January 2016, test and control water samples were sent to 4 contract LET laboratories. MVAMC water samples were collected from 5 purportedly Lsp-positive sites. A sterilized-water negative control and 3 positive controls (10× dilutions of *L. pneumophila* type 1 [Lp1] stock culture) were created. Each LET laboratory received 18 masked samples: 1 negative control, 3 positive controls, and 5 test samples, all in duplicate. Purported Lsp isolates underwent matrix-assisted laser desorption/ionization time of flight (MALDI).

**Results.** During intensified LET (6 November 2015 to 11 January 2016), Lab1 ostensibly found Lsp in 77 (26%) of 296 MVAMC water samples. Mitigation and remediation was performed. No HAL was identified. The 4 LET laboratories' blinded test results (cfu/mL) were as shown:

(Definitions: Lp2-15, Lp serotypes 2-15; Lnp = Lsp, not pneumophila.)

In February 2016 Lab3 tested all sites Lab1 had reported as Lsp positive including areas not remediated; all were negative for Lsp. By MALDI, 18 purported MVAMC Lsp isolates from Lab1 were all diverse non-Lsp environmental organisms. After learning of these results, Lab1 withdrew from its LET contract. The CDC and VA experts were notified.

**Conclusion.** A CDC-ELITE certified LET laboratory provided spurious results, with enormous consequent costs to MVAMC. Laboratory-to-laboratory differences were found between the

remaining 3 laboratories, raising concern about accuracy for both positive and negative LET results. Healthcare systems must be cautious in deciding when to perform LET and how to interpret the results.

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