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Reduction of Methicillin-resistant *Staphylococcus aureus* (MRSA) on towels utilizing targeted directional microwave technology

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**Purpose:** The objective of this experiment was to assess the ability of targeted directional microwave (TDM) to reduce *MRSA* on damp, inoculated towels during machine drying in residential clothes dryer.

**Methods:** Sterilized cotton, towel swatches (100 cm<sup>2</sup>) were inoculated with a three strain *MRSA* inoculum at 10<sup>7</sup> CFU/cm<sup>2</sup> and allowed to dry for 3 hours to slight dampness. Control swatches were inoculated but not further treated. In duplicates, inoculated swatches were subjected to the following treatments: a) tumble heat dried for 20 min; b) TDM (40, 60, 80, or 120 sec) and air tumbled the remaining 20 min; or c) TDM (40, 60, 80, or 120 sec) and heat tumbled the remaining 20 min. After treatment, serial dilutions were made and plated onto plate count agar followed by incubation at 24 h at 37°C. The experiment was replicated three times.

**Results:** There were no significant reductions in *MRSA* population on inoculated towels that were subjected to heat drying for 20 minutes. Towels treated for 60 sec and air or heat tumbled had 2.77 or 3.85 log CFU/100cm<sup>2</sup> reductions, respectively, towels treated for 80 or 120 sec and heat tumbled had 5.48 or 4.96 log CFU/100cm<sup>2</sup> reductions, respectively, and towels treated for 120 sec and air tumbled had a 4.79 log CFU/100cm<sup>2</sup> reduction, when compared to the control towels. Although not statistically significant from samples subjected to heat drying for 20 minutes, *MRSA* was reduced by 1.91 or 1.67 log CFU/100cm<sup>2</sup> when treated for 40 sec and air or heat tumbled, respectively, and by 2.01 log CFU/100cm<sup>2</sup> when treated for 80 sec and air tumbled.

**Significance:** The high-heat drying cycle of residential clothes driers is not a sufficient method to kill *MRSA* unless TDM are utilized. By treating contaminated towels with TDM for more than 40 seconds in combination with heat and air drying, a significant reduction (up to 5 log

cycles of *MRSA*) was achieved. Use of this technology in institutional settings to help prevent the spread of *MRSA* is needed.