

# Action of povidone-iodine against methicillin-sensitive and -resistant cultures of *Staphylococcus aureus*.

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## Abstract

Forty clinical isolates of methicillin-resistant and methicillin-sensitive *Staphylococcus aureus* were studied for their susceptibility to povidone-iodine (available iodine 11%) under a variety of conditions. The cultures varied in properties, notably in their sensitivity to other therapeutic agents. No differences were observed between the resistant and sensitive cultures in destruction by povidone-iodine. When bactericidal activity occurred, > 99% of the bacterial cells were lethally damaged within 10 seconds of exposure to povidone-iodine. The bacterial cells that had been washed and resuspended thrice in distilled water were most susceptible, with as little as  $1 \times 10^{-16}$  G ( $2.36 \times 10^5$  atoms) of iodine being required to destroy one bacterial cell. Attempts were made to select variants resistant to iodine from the surviving minority population in such experiments. These experiments failed to select resistance, and it is concluded that any apparent variation in vulnerability to povidone-iodine results from aggregation of the bacteria and differences in penetration of povidone-iodine. Substances were studied for their ability to inactivate povidone-iodine. The most potent agents were the free sulphur-containing amino acids, cysteine and methionine. These are present in high concentrations in nutrient broth and most other culture media. This explains the reports of 'pseudo-resistance' to povidone-iodine in certain laboratory experiments. Suggestions are made for the optimum use and formulation of povidone-iodine.

PMID: 8290463 PMID: [PMC2400017](#)

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