Povidone-Iodine vs. Chlorhexidine for Preoperative Decontamination: Systematic Literature Analysis

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Introduction

Postoperative infections in oral surgery remain a concern, with preoperative decontamination playing a critical role in outcomes. While chlorhexidine is widely used, emerging evidence suggests povidone-iodine may offer superior antimicrobial effectiveness. No standardized protocol for preoperative decontamination of oral and perioral tissues currently exists.

Research Aims

- Compare the effectiveness of chlorhexidine (CHX) and povidone-iodine (PVI) in preoperative oral decontamination
- Assess bacterial load reduction and postoperative infection outcomes
- Support a more effective and reliable standard for preventing postoperative infections

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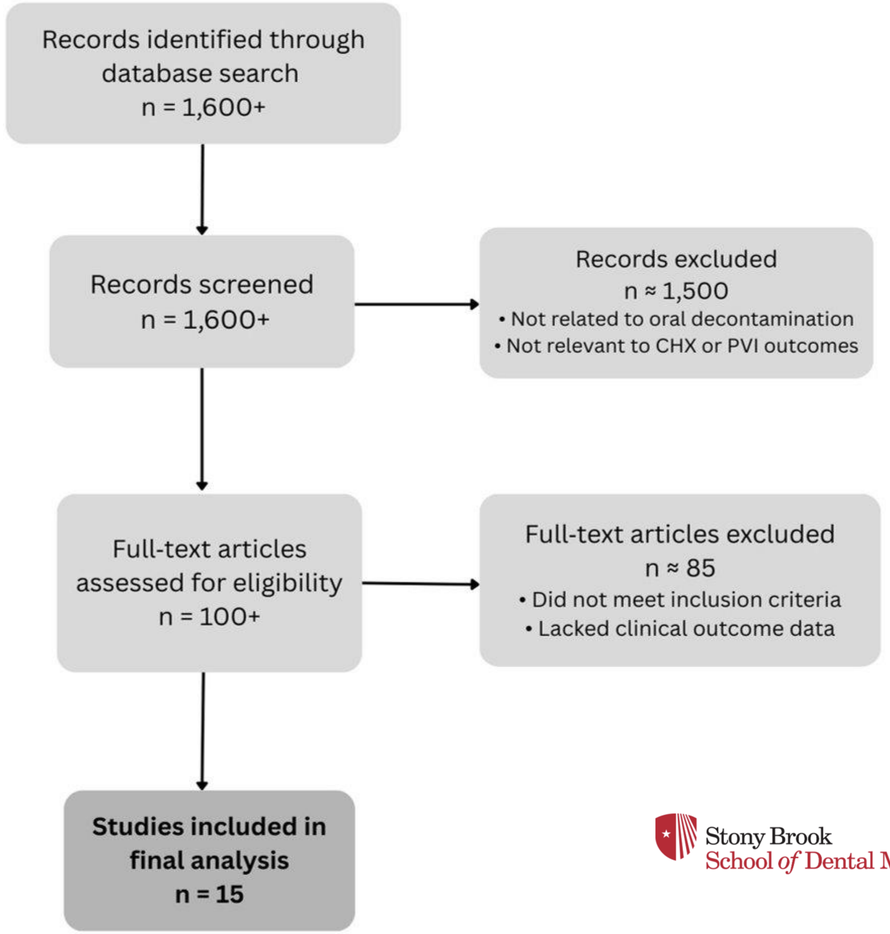
Materials/Methods

- Systematic Literature Review
- Databases: PubMed, Google Scholar, Stony Brook University Library, Web of Science, Scopus
- 1,600+ articles screened
- 100+ full-text reviewed
- 15 studies included
- Inclusion/exclusion criteria applied
- Outcomes assessed:
  - Bacterial load
  - Infection rates
  - Clinical complications



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Results

Study (et al.)	Clinical Setting	Intervention	Key Outcome
Kanagalingam et al., 2017	Cancer therapy patients	PVP-I oral rinse	Mucositis duration reduced **(2.75 vs. 9.25 weeks)** and severity significantly lower **(P < 0.001)**
Managutti et al., 2015	Third molar surgery	PVP-I vs CHX vs control	Post-operative bacteremia: **20% PVP-I, 40% CHX, 60% control**
Funahara et al., 2024	Oral care patients	PVP-I brushing	Bacterial load reduced by **19% (P = 0.003)**; water increased bacteria by **13%**
Imakkiare et al., 2024	Intubated oral cancer patients	PVP-I oral application	Significant bacterial reduction **(P < 0.01)** and decreased pneumonia risk **(P < 0.05)**
Monstrey et al., 2022	Surgical patients	PVP-I vs CHX irrigation	SSI rates: **0.6% with PVP-I vs 3.1% with CHX (P < 0.001)**
Adamietz et al., 1998	Radio chemotherapy patients	PVP-I prophylaxis	Lower mucositis incidence and fewer opportunistic infections **(P = 0.019–0.048)**
Ealla et al., 2024	Oral & maxillofacial surgery review	PVP-I protocols	Meta-analysis showed **27–33%** reduction in SSI rates

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Results

Study (et al.)	Clinical Setting	Intervention	Key Outcome
Aftab et al., 2023	Meta-analysis of microbial sensitivity	CHX vs. PVP-I	CHX effectiveness varied widely by bacteria; PVP-I resistance rarely reported
Donatsky et al., 2013	Endoscopy patients	CHX rinse	CFU reduced **88% (P = 0.001)**, but abscess-forming bacteria persisted
Scannapieco et al., 2009	ICU ventilated patients	CHX oral rinse	Reduced S. aureus only; **no significant effect** on major respiratory pathogens
Parreco et al., 2020	ICU patients	CHX oral decontamination	Increased mortality **(OR 1.25)** and no pneumonia benefit
Dorestan et al., 2021	Perioral skin disinfection	Betadine vs. CHX	Both reduced bacterial colonies; CHX slightly greater short-term reduction
Spreadborough et al., 2016	Oral surgery	CHX rinse	Immediate bacterial reduction followed by postoperative recolonization
Collins et al., 2020	Periodontal surgery	Seawater vs. CHX irrigation	**No significant difference** between CHX and seawater irrigation

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Conclusions

- Povidone-iodine (PVP-I) showed broad, consistent antimicrobial effectiveness
- PVP-I significantly reduced bacterial load, infections, and clinical complications
- Current preoperative decontamination lacks a universally adopted standards
- Evidence supports PVP-I as a reliable approach to improving infection prevention
- **PVP-I may represent a new standard of care for preoperative oral and perioral decontamination**