Decreasing Blood Culture Contamination Rates Through Nurse Education and Sterile Glove Use in an Adult Emergency Department

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Introduction & Background

- Sepsis is a leading cause of death in the US and globally accounts for 6 million deaths per year
- Sepsis is the leading cause of hospital mortality, and costs up ~$27 billion annually
- Blood cultures are the gold standard and the first line in detecting blood stream infections
- National guidelines support a contamination rate of 2 - 3%
- Current contamination rate is 6.8% in the adult ED
- Currently a clean technique and aseptic gloves are used during the blood culture collection process

Purpose & Aims

- The purpose of this quality improvement project is to decrease contamination rates by implementing and evaluating the introduction of sterile gloves in the blood culture collection process and educating staff on this evidence-based change

Aim 1: Evaluate and increase baseline knowledge and awareness of registered nurses (RNs) and patient care technicians (PCTs) after providing in-service education about blood culture contamination collection practices and standards through an in-service educational presentation

Aim 2: Compare the blood culture contamination rate after educating staff and QI implementation to baseline blood culture contamination rate and determine if there is any relationship between the type of gloves used and presence of contamination

Methods

Design: pre- and post-test with pre- and post -intervention study design using retrospective chart review
Setting: 45-bed adult ED at a large academic teaching hospital in an urban area of the east coast
Sample: 60 clinical staff members, 208 blood culture bottles
Inclusion Criteria: Any RN or PCT employed by the ED, not on orientation. Blood culture results of ED patients $\geq$ 22 yrs old.

Sample Characteristics

RN	52
PCT	8
Day-shift	33
Night-shift	27
Microbial Growth Present	15
No Microbial Growth Present	89
Sterile Gloves Used	45
Aseptic Gloves Used	59

Intervention & Measures

Evidence Based Interventions:
An in-service education session adapted from Johns Hopkins Hospital Blood Culture Collection Policy and national guidelines was given on day and night shift for 5 days
- The use of sterile gloves when obtaining blood cultures

Measures:
- Pre-/post-test of RNs' and PCTs' practice regarding blood culture collection practice for adult patients
- Data collection via chart audit of blood culture results drawn in the adult ED for adult patients, pre-implementation phase
- Data collection via chart audit of blood culture results drawn in the adult ED for adult patients, post-implementation phase
- Data collection of pre- and post-implementation phase data collection of blood culture contamination rates

Results

Aim 1:
- There was a **60.5% mean improvement** and a **33.3% raw improvement** between pre-test and post-test scores
- There is a significant difference (p <0.001) in knowledge and awareness of blood culture collection and contamination standards after attending the in-service education

Results

Aim 2:
- Contamination rates were at **6.8 % at the beginning** of the QI project & **5.3% at the end** of the 10 week implementation period
- There is a significant (p=.005) correlation between the type of glove used and presence of contamination

Gloves Used and Contamination Presence
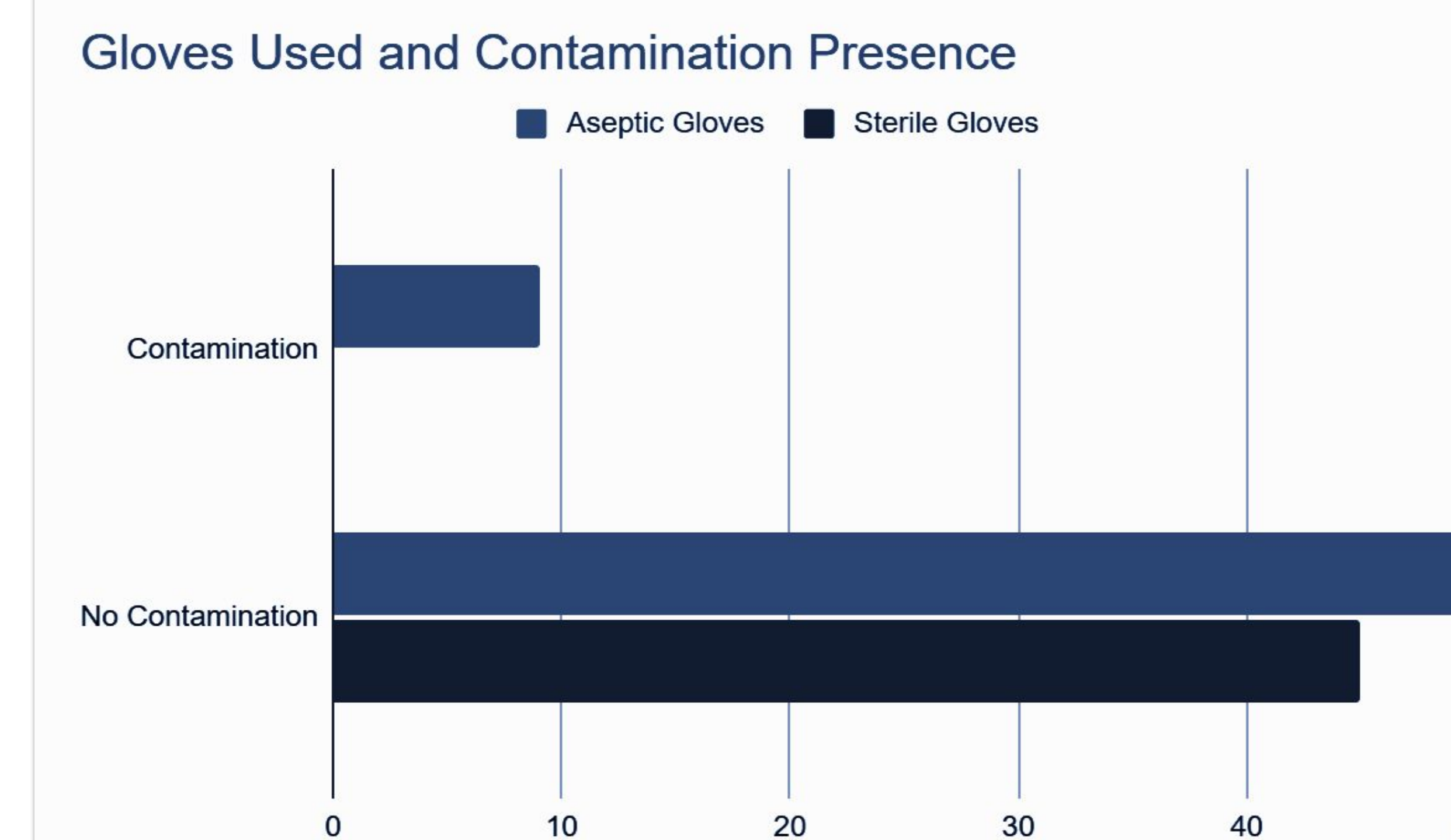
Conclusion & Dissemination

- Sterile gloves versus aseptic gloves, can improve contamination rates
- There is a significant relationship between types of glove used & contaminants presence
- Staff education significantly improves awareness & understanding of blood culture collection
- Project results presented to ED leadership & the adult ED sepsis committee
- A clinical practice change update for hospital dissemination is being voted upon by the continuing practice and professional development council

Scan QR code for references & supplemental documents