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# Prevention of Central Venous Catheter-Associated Blood Stream Infections in Pediatric Patients: A Review of the Literature

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# Prevention of Central Venous Catheter-Associated Blood Stream Infections in Pediatric Patients: A Review of the Literature



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# Conflicts of Interest

- ▶ None
- ▶ Products mentioned in this presentation were used in the studies cited.

# Objectives

- ▶ To examine a problem encountered in the clinical setting.
- ▶ To explore the evidence through published literature.
- ▶ To develop a literature review of current peer reviewed manuscripts.



# Purpose

- ▶ The purpose of this literature review was to determine if there was a relationship between the insertion site of a central venous catheter, the type of dressing used, and the rate of blood stream infections among the pediatric population.



# Background/significance

- ▶ Central venous catheter-related blood stream infections (CVC-BSI)
  - ▶ Increased hospital stay
  - ▶ Increased health care costs
  - ▶ Increased risks in pediatrics



# Methods

- ▶ Database search: MEDLINE and CINAHL.
- ▶ Search terms: central venous catheter, intensive care, pediatric, bloodstream infection.
- ▶ Inclusion criteria
  - ▶ Nurse authored
  - ▶ Pediatric population
  - ▶ Published 2008-2014



# Results

- ▶ Five research articles met the criteria
  - ▶ Insertion sites - 2 articles
  - ▶ Dressing types and cost effectiveness - 3 articles



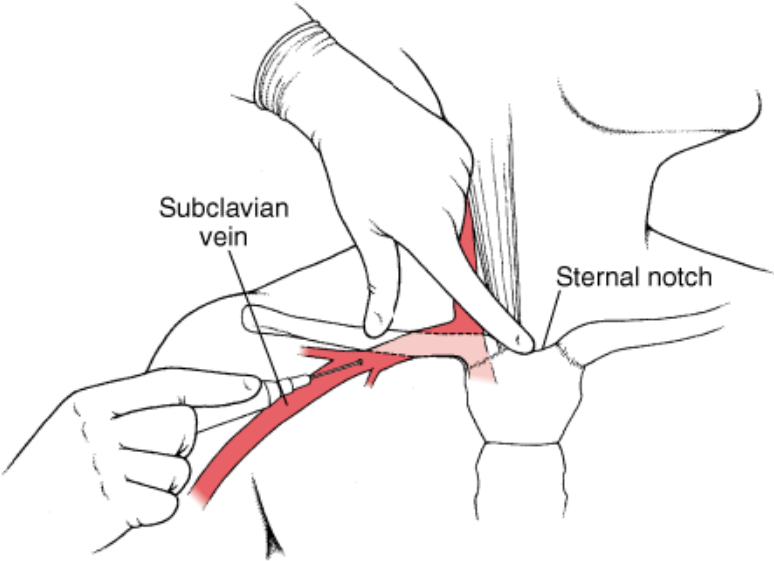


# Results

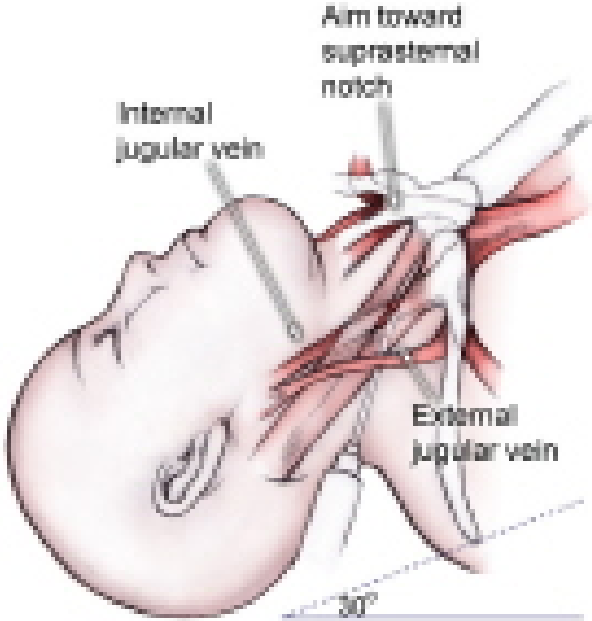
## ▶ Insertion sites

- ▶ Statistically no difference between the subclavian, internal jugular, and femoral vein sites and infection rates.
- ▶ Increased risk of BSI in femoral site versus non-femoral (greater and lesser saphenous veins, basilica veins, and cephalic veins)

# Insertion Sites

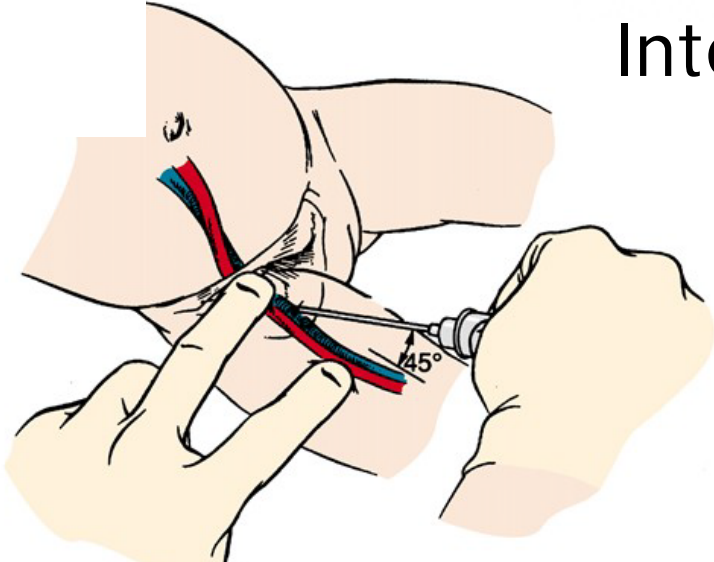


Subclavian Vein



Sternocleidomastoid muscle

Internal Jugular Vein



Femoral Vein



# Results

- ▶ Dressing Types
  - ▶ No statistical difference between dressing types and infection rate.
  - ▶ Increased satisfaction among nurses with use of Tegaderm dressings.

# Dressing Types



SorbaView



Biopatch



Tegaderm



# Results

## ► Cost Effective

Compared	Money Saved Hospital-wide
SorbaView in place of Tegaderm with gauze	\$35,000 per year
Tegaderm with Chlorhexidine in place of Biopatch	\$39,000 per year

- savings of \$3.42 per dressing change when using the Tegaderm dressing with chlorhexidine gluconate gel versus the Biopatch



# Limitations

- ▶ Articles:
  - ▶ Small sample sizes
  - ▶ Two articles were adult ICU patients only
  - ▶ Poor compliance with RN surveys regarding dressing types
- ▶ Research:
  - ▶ Lack of articles with pediatric sampling
  - ▶ Limited access to full text articles
  - ▶ Difficulty in locating nurse written articles

# Conclusions

- ▶ The findings of these five articles suggest that there was no strong relationship between insertion sites, dressing types, and BSI rates.
- ▶ Three of the articles discovered that there was a \$35,000 hospital wide savings with the use of a Tegaderm dressing versus a Biopatch dressing.



# Future Directions

- ▶ More pediatric-focused research
- ▶ Type of Research
  - ▶ Qualitative studies to incorporate past experiences with CVC and BSI's
  - ▶ Use of a valid patient acuity measurement
  - ▶ Gather a larger sample size
- ▶ Practice Implications:
  - ▶ Tegaderm suggested versus Biopatch for cost saving purposes
- ▶ At this time, no change in policy/procedure is needed





# Research Lessons Learned

- ▶ How to critique and understand a research article
- ▶ The specific components of a research article
- ▶ Use of key words for searching
- ▶ Use Boolean search method (and, or, not)
- ▶ How to access nursing journals

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