



# Impact of a Peripherally Inserted Central Catheter Team on Catheter-Related Blood Stream Infections

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# Problem

High Incidence of Catheter Related  
Blood Stream Infections

# Demographics

Total Bed Capacity: 327

Average Daily Census: 213

Average Length of Stay: 4.2 days

# Incidence

January	0	July	0
February	0	August	0
March	2	September	0
April	3	October	0
May	4	November	0
June	2	December	0

# Effect on Care

## Catheter Related Blood Stream Infections (CRSBI)

Increase length of Stay

Result in non-Reimbursed hospital  
costs

Approximate 80,000 CRSBI in US  
intensive care units cost  
approximately \$296 to  
\$2.3 Billion

## Bottom Line

Incidence of Catheter Related Blood Stream Infections are associated with 2,400 to 20,000 deaths per year

# Data

Data was collected through chart reviews, microbiology reports, Nurses notes and Physician documentation to try to determine a causative factor in the incidence of CRSBI

No seasonal preponderance

No practitioner preponderance

No hospital departmental preponderance



# Data

There was a relationship between catheter insertion site infections and the femoral sites were found to have the highest infection rate.

Policy was formulated to have all femoral artery or venous catheters removed within 24 hours of insertion

# Previous Practice

Central Lines were inserted by Physicians in either ED, OR, or Critical Care Settings

Central Line care and management was inconsistent

PICC lines were inserted in Radiology by Radiologists or Radiology Technologists

There was a lack of follow-up and continued monitoring on these lines

Cost without considering length of stay or equipment was approximately \$1,000 per PICC line (this cost is for personnel alone)

Number of PICCS per year was approximately 250

Insertion time was 60 minutes

Personnel required for  
Radiology PICC:

1. Radiologist
2. Radiographer
3. Transporter

Personnel required for RN  
PICC insertion:

1. PICC trained RN

# What we tried

1. Education
2. Competency checklists
3. Return Demonstration on techniques

# Results

Infections remained at high levels

# Evidence Based Practice

Intravascular catheter-related bloodstream infections are an important cause of illness and excess medical cost. In prospective studies, the relative risk (RR) for a catheter-related bloodstream infection is 2 to 855 times higher with central venous catheters than peripheral venous catheters (1-3). Approximately 80,000 catheter-related bloodstream infections occur in U.S. intensive-care units each year, at a cost of \$296 million to \$2.3 billion (4,5). These infections are associated with 2,400 to 20,000 deaths per year.

# Benefits of an RN driven PICC team

Reduction of hospital length of stay by allowing patients to continue intravenous therapy in alternate care environments.

Provision of a reliable infusion device with minimal complications for patients who have a compromised venous access.

Since this catheter is inserted peripherally, there is no possibility of a pneumothorax associated with catheter insertion.

Insertion is guided by the Sherlock Guidance system on the Site Rite technology. Successful venipuncture is visualized with the ultrasound site rite technology.

Placement is verified by the Radiologist prior to the initiation of IV fluids to avoid the administration of medications in a small vessel.

The catheter is placed in the upper arm to allow for ease of patient movement and ease of maintaining catheter placement and patency.

Reduce the risk of catheter related infections. Acute care catheters have an infection risk of 2.4-5.8%/1000 catheter days whereas a PICC line has an infection risk of 0.6%/1000 catheter days.



# Implementation

Critical Care Educator was given the directive to make the connection with the Bard representative and select some dates for training.

A team of 5 nurses completed an on-line study program and started training with an RN trainer from Bard.

PICC team started training the week of 6 July. The training period lasted for 1 week. Bard provided a PICC RN resource to provide the education for the team, and at the end of the week, two RN's from the PICC team completed the training and achieved the required number of successful insertions to become certified.

# Implementation

All five nurses were given the opportunity to observe but two nurses were initially certified and the remaining 3 nurses were certified over the next week.

Initially, two nurses went for each of the PICC insertions for experience, support, and help with troubleshooting

Since the initiation of the PICC team, catheter related blood stream infections have diminished to 0. To date, the PICC team has had 600 successful PICC line insertions. Radiology continues to serve as a resource for difficult insertions, or for insertions that had successful venipunctures but there was difficulty with advancing the catheter to the appropriate location.

The radiologist was able to do an over-wire technique and advance the catheter to the appropriate position.

# Results

PICC inserted by RN yields an approximate savings of \$850 per insertion. That resulted in a savings to the hospital of \$510,000 to date.

# Results

PICC nurses interview the patient prior to insertion, and discuss any pre-existing conditions (mastectomy, PVD, etc)

Assure that H & P are on chart prior to procedure

Time-out is done with PICC RN, Primary Care RN, Patient, and family

# Results

There are several factors associated with the decreased infection but of most significance are the differences in insertion and follow-up procedures.

The RN PICC team uses maximal barrier processes 100% of the time.

The RN PICC team does follow up care at 24 hours and 7 days post catheter insertion. All patients are monitored and the catheters are assessed both by the team and the RN providing care for the patient.

Patient and family education is done at the time of insertion and the patient is provided with instructional material regarding the care of the PICC line after discharge.

## Further Study

In view of the fact that the PICC team has had such a great level of success with their catheter insertions (zero infections) a new process is being piloted that will provide for the a PICC team member to assess, change dressings, and document on every central line in the hospital with the exceptions being dialysis catheters and neonates.



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