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Development and Implementation of an Advanced Vascular Access Team

Suman Kaushal RN, BSN, Holly Hamm, RN, CRNI, Lorinda Chang, RN, BSN,
Deborah K. Dix, RN, MSN Director, Sophie Harnage RN, BSN Clinical Manager & SRMC PICC Team

Background

Since the mid 1980'S Peripherally Inserted Central Catheters (PICCs) have been accepted as an appropriate vascular access device in patients requiring midterm access. Over the past decade, PICCs have proven to be an appropriate central vascular access device for the acute care setting. With the addition of ultrasound insertion, bedside placement has become safe and successful. PICCs are supported by the AHRQ (2001), CDC (2002), INS, and AVA. The IHI initiative however did not include PICCs or catheter care and maintenance in their 100,000 Lives Campaign. Catheter contamination with insertion, care and maintanence have been identified as major causes of CRBSI. In December of 2005, we were a small team focused on peripheral intravenous (IV) starts and few peripherally inserted central catheter (PICC) insertions. It was determined that to improve patient outcomes, become more cost effective, and improve continuity of central venous catheter care, we redirected our service towards an advanced vascular access team. This team would take ownership of PICC insertion and maintenance of vascular access devices.

Purpose

- To develop and implement an advanced vascular access team that would take complete ownership of PICC insertion and maintenance of:
- This would improve patient safety and satisfaction and become the cornerstone of a CRBSI reduction bundle.

Description of Project

- In January 2006, our primary peripheral IV team was redirected towards an advanced vascular access team which included:
  - Early patient assessment program by selecting appropriate VAD upon admission . This improves patient safety, satisfaction, and outcomes while decreasing complications and eliminating infection.
  - 100% ultrasound guided PICC insertion.
  - Radiographic interpretation.
  - Daily maintenance of PICC lines including daily site checks and dressing changes.
  - Discontinuation of the line.
  - Ownership of team education/competency/policies & procedures
  - Nurse/patient/physician education.
  - Staff Orientation:
    - Online PICC course
    - One to One training with
    - Experienced PICC RN
    - Review INS and CDC standards
    - Follow and review SRMC policy and procedure
    - Competency Checklist
    - Vein Assessment
    - Ultrasound placement
    - Chest X-ray confirmation class with competency
    - Maintenance
    - Troubleshooting

Outcomes

- 2006 thru June 2008, 4-5 team members covering Monday- Friday from 7a-7p
- 3 team members on weekends from 7a-7p
- Average Monthly PICC Volume:
  - 2006-131 Insertions
  - 2007-189 Insertions
  - 2008-193 Insertions (1st &2nd Qtr.)
- Success Rate- 98%
- IR referral rate- 2%
- CRBSI's- ZERO

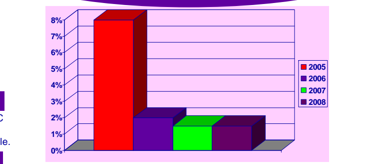
Conclusion

The development of SRMC's advanced vascular access team set the standard of practice for choosing the right line for the right patient, based on patient's diagnosis and therapy. Taking full ownership of the PICC process from assessment, to insertion, to maintenance, and to catheter discontinuation, has promoted a high level of consistency in care delivery, increased insertion success rates, improved patient outcomes, decreased catheter-related complications, and improved continuity of care for our patients. Having a specialized high tech PICC team at SRMC achieved over 5000 PICC lines inserted with a Zero CRBSI rate.

Nursing Implications

1. PICCs are a viable option for central venous access.
2. Specialized trained PICC team provides a high level of consistency in care delivery with an improved continuity of patient care.
3. Specialized trained PICC team ensures high quality insertion success rates.
4. Specialized trained PICC team brings care to the bedside, decreasing transportation risks, when compared to transporting patients from bedside to IR.
5. Incorporating a specialized PICC team combined with products designed for extraluminal and intraluminal protection can eliminate CRBSI.

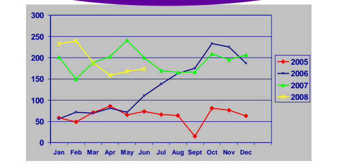
PICCs placed in Interventional Radiology



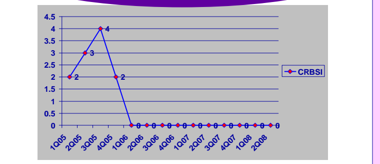
Overview of Results

Central Line Descriptors	2005	2006	2007	1st& 2ndQtr.2008
Average Monthly PICC Volume	60	131	189	193
PICC Volume	767	1570	2266	1158
Insertion Success Rate	92%	98%	98%	98%
Interventional Radiology Rate	8%	2%	2%	2%
Insertion Location	Antecubital	Upper Arm, Basilic Vein (preferred)	Upper Arm, Basilic Vein (preferred)	Upper Arm, Basilic Vein (preferred)
Insertion Technique SonoSite® (iLook® 25)	Traditional/Modified Seldinger	100% Ultrasound Guided	100% Ultrasound Guided	100% Ultrasound Guided
Maximum Barrier	PICC team only	All central lines	All central lines	All central lines
Skin Preparation Chloroprep ®	Inconsistent	Consistent	Consistent	Consistent
Insertion Site Antimicrobial Biopatch ®	Inconsistent	Consistent	Consistent	Consistent
Line Stabilization Statlock ®	Inconsistent	Consistent	Consistent	Consistent
Connector InVision Plus ® Neutral ®	Positive Pressure Device	Neutral Device	Neutral Device	Neutral Device
RN Training	Annual In-Service Day	One-on-One Training at the bedside	One-on-One Training at the bedside	One-on-One Training at the bedside
Flushing Protocol	Normal Saline followed by Heparin (positive pressure flush)	Flush 10ml NS every 8 hours and PRN use (push/pause technique)	Flush 10ml NS every 8 hours and PRN use (push/pause technique)	Flush 10ml NS every 8 hours and PRN use (push/pause technique)
Dressing	24 hour pressure gauze dressing then weekly	No pressure dressing (exception excessive bleeding) Weekly dressing change	No pressure dressing (exception excessive bleeding) Weekly dressing change	No pressure dressing (exception excessive bleeding) Weekly dressing change
Line Monitoring	Completed q week with dressing change	Completed daily during site checks.	Completed daily during site checks.	Completed daily during site checks.

PICC Line Insertions January 2005- June 2008



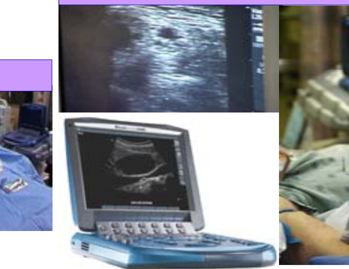
Incidence of CRBSI in PICC Lines January 2005- June 2008



Patient Education

Maximum Barrier Precautions

Ultrasound Guided PICC Placement



Needleless Connector

Septum Disinfection

Staff Education

Radiographic Interpretation training for PICC Team RNs.

Antimicrobial Interventions

Catheter Flushing

Catheter Care / Daily Maintenance

Contact Information: Sutter Roseville Medical Center 1 Medical Plaza, Roseville, CA 95661 Phone: (916) 781-1611 Fax: (916)781-1479 Email: HammH@Sutterhealth.org

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