Parenteral and Enteral Access: A Coordinated Approach for Improving Patient Care and Reducing Costs

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Disclosure:
I have no commercial relationships relevant to the topic being presented.

Learning Objectives
1. List three benefits to a coordinated approach for parenteral and enteral access
2. List two ways a coordinated approach to parenteral and enteral access can improve patient outcomes
3. List two ways a coordinated approach to parenteral and enteral access can reduce costs

Self Assessment Questions
1. A coordinated approach for parenteral and enteral access is beneficial by:
   a. Achieving access in a timely manner
   b. Assuring selection of the optimal route for nutrition support
   c. Inserting the access device in the most cost-effective and safe location
   d. All of the above
   e. None of the above
2. Tying PICC approvals to PN approvals is beneficial because:
   a. It slows down the process for both, allowing the team more time to fully develop the nutrition plan
   b. It minimizes inappropriate PICC insertions
   c. It promotes a good working relationship between the house officers and the nutrition support team

Self Assessment Questions
3. The NST can promote the use of enteral nutrition by
   a. Offering a streamlined approach to enteral access consults
   b. Developing protocols to promote the use of enteral nutrition for patients at high nutritional risk
   c. Providing staff education when parenteral nutrition requests are denied
   d. All of the above
   e. None of the above
4. Which of the following is a way a nutrition support team can save costs?
   a. Immediately approving all requests to start PN
   b. Clustering all cases to be done in the operating room on one day of the week
   c. Limiting PICC insertions to one day per week to save staffing costs
   d. Inserting most PICCs at the bedside to limit use of the interventional radiology suite

Patient Care Challenges facing Nutrition Support Specialists
- Developing a nutrition care plan for individual complex patients needing our expertise.
- Developing a systems plan for delivery of complex nutrition care within a variety of settings (e.g., hospital, rehab, home).
Dealing with individual patient nutrition support challenges is very different from developing a systems plan for delivery of specialized nutrition support.

Delivering Nutrition Care in the Hospital Setting: Some Challenges

• Disparate patient populations (e.g., med, surg, OB/GYN, Cards) each with unique requirements for nutritional care.
• Multiple disciplines (MD, RN, PA) who may have different expectations.
• Limited nutrition training for healthcare professionals.

Delivering Nutrition Care: Results of an Inadequate Plan to Address the Challenges

- Inappropriate Nutrition Care
- Ineffective Nutrition Care
- Disjointed Nutrition Care
- Increased Patients Costs
- Poor Patient Care and Outcome
Appropriateness of PN Utilization by Clinical Service

Per Cent of Time TPN Appropriately Utilized, with and without MSS Consultation

MSS Parenteral and Enteral Access Procedures FY 96

Number of RN, PA, and IR PICC Placements FY 00

Per Cent of PICCs Placed by Discipline FY 00

Mean Time to PICC Placement at Inception of PICC Service
Comprehensive MSS

Decreased Patient Care Costs

Improved Patient Care

Delivering Nutrition Care: One Plan to Address the Challenges

Inpatient Consultation

QA Program

Comprehensive Metabolic Support Service (MSS)

Short-term Parenteral Access

Outpatient Care

Long-term Parenteral and Enteral Access

MSS PICC Service

• Review and approve/disapprove all PICC requests.
• Triage order of PICC placements.
• Assess and treat PICC issues/complications.
• Review all chest x-rays of PICC patients and approve PICC for use.
• Place outpatient PICCs.

Inpatient Nutrition Consultation Service

• Make recommendations regarding care of patients with complex nutrition problems (e.g., TPN, TFs).
• Mandatory approval/disapproval of TPN use for all inpatients.
• Metabolic Cart Studies.
• Mandatory approval/disapproval anabolic agent use (e.g., growth hormone, oxandrolone) for all inpatients.

MSS Surgeon

Coordinating Nutrition Care with Parenteral/Enteral Access

Request for PICC

Yes/No By MSS PA

Yes/No By RD

Yes/No MSS Attending

PICC + TPN

No PICC + Enteral Feeding
MSS Parenteral and Enteral Access Service

- Perform phone screen for outpatients receiving lines or tubes, obviating need for PATC visit.
- Schedule and assist MSS surgeons with OR line and tube surgeries.
- Provide follow-up care for line/tube outpatients.
- Provide mandatory CVL education and training of all BWH house staff.

MSS Parenteral and Enteral Access Procedures FY 96 – FY 97

Outpatient Nutrition Care

- Multidisciplinary team (ideally MD, RD, RN/PA) to see patients in office and provide phone support.
- Outpatient team helps coordinate transition from inpatient setting to rehab or home.
- Team member coordinates delivery of nutrition prescription with homecare company, VNA, and patient.
- Team monitors patient progress (e.g. labs) and transitions patient parenteral to enteral feeding when possible.

Nutrition Education

- Provide fundamentals of nutrition education for students, residents, and fellows.
- Educational forums to include didactic lectures, clinical rotations, weekly conferences.
- Issues regarding parenteral and enteral access to be addressed.

MSS in Action: A Case Study

Enterocutaneous fistula and small bowel evisceration of twenty-five years’ duration: successful surgical and nutritional management

V Patel, KM Mogensen, SO Rogers and MK Robinson

Case Study

- 1981: 43 y.o. male admitted to outside hospital with pelvic abscess due to either a ruptured appendix or perforated bowel.
- Abscess treated with percutaneously placed pelvic drain.
- Patient declined further treatment, left hospital with drain in place, and was lost to follow-up for 24 years.
Case Study

• Patient managed persistent drainage and progressively enlarging drain site with ostomy bag obtained without medical supervision when loops of bowel and stool appeared.
• 1993: Stool output had ceased per rectum and emanated from drain site alone.

Case Study

• 2005: Admitted to BWH with c/o profound fatigue.
• Reported rapid transit of undigested matter from mouth the ECF with 3L output per day.
• PE: Cachetic with temporal muscle wasting
  • Height 175cm, estimated dry weight 49.7 kg
  • BMI 15.6; 68% IBW; NRI 79

Case Study

• Labs: Na 118; BUN/Cr 95/3.3
• Radiology: enterocutaneous and colovesicle fistulae.
**Case Study: Treatments**
- Rehydration, correction of electrolytes, and TPN via PICC for pre-operative feeding.
- After six weeks went to OR for extensive resection of small and large bowel distal to ECF with jejuno-colonic anastomosis, repair or colovesicle fistula, omental patch of bladder, sigmoid colectomy with rectal pouch and end sigmoid colostomy.

**Case Study**
- Post-op complicated by anastomotic leak requiring conversion to end jejunostomy (160 cm).
- 2/06: resection of defunctionalized colon with jejuno-rectal anastomosis to return bowel continuity.
- 10/06: Wt: 63.4 kg (100% IBW). Two nights per week TPN.

**Components of Metabolic Care for this Patient**
- TPN
- Refeeding Management
- Pre-Op feeding
- PICC
- Manage SBS
- Transition to PO
- Wean TPN
- Convert to Port
- Outpatient Care
- Comprehensive Metabolic Support Service (MSS)

**Components of Metabolic Care**
- Long-term Parenteral and Enteral Access
- Short-term Parenteral Access
- Inpatient Consultation
**Keys to Success**

- Multidisciplinary team (MD, RD, RPh, PA) with expertise in nutrition support, and parenteral and enteral access.
- Coordinated approach to care between multiple services.
- Mandatory requirement for approval of use of certain resources.
- MSS policies are approved by MSEC and ICU committees so that they are hospital-wide policies which can not circumvented.

**Comprehensive MSS**

**QA Program**

- Collect data to identify issues and determine MSS effect on patient care.
- Collect cost data and determine MSS effect.
- Determine if MSS modifications needed or existence justified based on data.

**Decreased Patient Care Costs**

**Improved Patient Care**
Improvements in Patient Care as a Result of the Multidisciplinary Nutrition Support Team

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February 1, 2009

Disclosures
I have no commercial relationships relevant to the topic being presented.

Improving Patient Care
- PN Utilization
- PICC Service
- Parenteral & Enteral Access Service
- Complex Cases
- Options for Non-Academic Medical Centers

2008 PN Utilization Update
- Review of all inpatient PN starts between 8/1/08 and 10/31/08 for:
  - Ordering service
  - Indication for PN
    - Indicated—following A.S.P.E.N. guidelines
    - Preventable—could have gotten enteral access
    - Not Indicated—able to take oral nutrition
  - MSS vs. Non-MSS

Effect on PN Utilization
Parenteral Nutrition (PN) Use for Adult Hospitalized Patients: A Study of Usage in a Tertiary Medical Center  

What works?

- Mandatory NST approval for all PN starts—requires “buy in” from hospital administration
- Intensive education & support for staff RDs
- Promotion of enteral access & feeding when appropriate

Central Venous Access:  
The MSS PICC Service

Request for PICC

IV RN

Interventional Radiology

PICC placement successful  
PICC placement unsuccessful  
PICC placement successful  
PICC placement unsuccessful

PICC placement process prior to April 2000  
Alternative plan developed
Quality Assurance Issues Related to PICCs

- Inappropriate requests by physicians not familiar with clinical indication for PICC insertion
- Inefficient placement process leading to delays in patient care and discharge from hospital
- High volume may lead to significant cost containment issues

BWH PICC Placement Team

- Formed in April 2000
- Multidisciplinary Team Includes:
  - Physician Assistants (PAs) working with Metabolic Support Service (MSS) surgeons
  - Certified intravenous (IV) nurses from the IV Team
  - Interventional Radiologists

Bedside Ultrasound

- We thought that the use of ultrasound could improve success rate of bedside PICC insertion
- PAs were trained to use ultrasound at the bedside starting in November 2000
- A new flow for PICC consults was developed


Alternative plan developed
Bedside attempt by IV RN
PICC placed in IR
Bedside attempt by PA with US guidance
PICC placement successful

Screening Process

- Each PICC consult is first screened for appropriateness of indication and then triaged to IV RN, MSS PA or IR insertion attempt
- PICC may be disapproved by CDC, JCAHO or K/DOQI guidelines
  - No need for central venous access (e.g., tied to PN approval)
  - Patient already has central venous access
  - Patient has fever or suspected/confirmed bloodstream infection
  - Patient has stage IV or V chronic kidney disease
  - More durable central venous access is indicated

Total PICC Requests by Fiscal Year

- Increased by 93%

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of Requests</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 00</td>
<td>1652</td>
</tr>
<tr>
<td>FY 02</td>
<td>2265</td>
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<tr>
<td>FY 04</td>
<td>2493</td>
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<td>FY 06</td>
<td>3024</td>
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<tr>
<td>FY 07</td>
<td>3123</td>
</tr>
<tr>
<td>FY 08</td>
<td>3195</td>
</tr>
</tbody>
</table>
### Percent of PICC Requests Denied by Fiscal Year

<table>
<thead>
<tr>
<th>% Disapproved</th>
<th>FY 00</th>
<th>FY 01</th>
<th>FY 02</th>
<th>FY 03</th>
<th>FY 04</th>
<th>FY 05</th>
<th>FY 06</th>
<th>FY 07</th>
<th>FY 08</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32.6</td>
<td>30.7</td>
<td>26.3</td>
<td>26.1</td>
<td>26.6</td>
<td>26.3</td>
<td>26.9</td>
<td>31.2</td>
<td>38.5</td>
</tr>
</tbody>
</table>

### Improved Care & Reduced Costs for Patients Requiring Peripherally Inserted Central Catheters: the Role of Bedside Ultrasound & a Dedicated Team


- Quarterly data from three time periods were assessed:
  - "Service Inception" (Apr-Jun 2000)
  - "Ultrasound Initiation" (Oct-Dec 2000)
  - "Current Service" (Oct-Dec 2002)
- The following parameters were assessed:
  - Total PICC requests
  - Total PICC placements
  - Location of placement
  - Days to placement
  - Average cost of PICC placement

### Improved Care & Reduced Costs for Patients Requiring Peripherally Inserted Central Catheters: the Role of Bedside Ultrasound & a Dedicated Team


There was a significant decrease in the number of patients sent to interventional radiology from inception of the service to initiation of ultrasound, from initiation of ultrasound to the current service, and from service inception to the current service.

### Improved Care & Reduced Costs for Patients Requiring Peripherally Inserted Central Catheters: the Role of Bedside Ultrasound & a Dedicated Team


We demonstrated a significant decrease (80% ↓) in time to PICC insertion.

### Improved Care & Reduced Costs for Patients Requiring Peripherally Inserted Central Catheters: the Role of Bedside Ultrasound & a Dedicated Team


We demonstrated a significant decrease (80% ↓) in time to PICC insertion.
PICC-Associated Bacteremia

Obtained catheter-related blood stream infection data from infection control for April-September 2008

<table>
<thead>
<tr>
<th>PICC type</th>
<th># of infections</th>
<th>Total inserted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single lumen</td>
<td>1 (0.2%)</td>
<td>405</td>
</tr>
<tr>
<td>Double lumen</td>
<td>15 (3.5%)</td>
<td>423</td>
</tr>
<tr>
<td>Triple lumen</td>
<td>4 (5.1%)</td>
<td>79</td>
</tr>
</tbody>
</table>

PICC indications

Antibiotics 7 (1.2%) 605
Chemotherapy 3 (7.3%) 41
PN 9 (4.1%) 219
Other 2 (3.3%) 60

PICC-Associated Bacteremia

Long-Term Access Service

• Three MSS surgeons
• OR time available 5 days/week
• Procedures:
  – Tunneled catheters
  – Ports
  – Percutaneous endoscopic gastrostomy (PEG)
  – PEG with jejunal extension
  – Open gastrostomy tubes
  – Jejunostomy tubes
  – Naso-jejunal tubes

Why have a dedicated Access Service?

• BWH is aligned with the Dana Farber Cancer Institute
• They have a high volume of patients with central venous and enteral access needs
• Close relationships with:
  – Breast cancer center
  – Gynecological cancer center
  – Bone marrow transplant service
  – Head & neck cancer center

MSS Parenteral and Enteral Access Procedures FY 96 – FY 08
The Access Consult Process

- Consults come in to the MSS Parenteral and Enteral Access Coordinator
- Preop paperwork organized for the MSS PAs
- PAs conduct preoperative phone screening
  - Save patients a visit to the Center for Preoperative Evaluation

Central Venous Access Phone Screen

Enteral Access Phone Screen

Streamlined forms facilitate phone screening and standardize the process

Day of Surgery

- MSS PAs assist in all aspects of the procedure
  - Obtain consent & complete other preoperative paperwork
  - First assist in the case
  - Complete postoperative paperwork
- Standardized patient educational materials written by MSS clinicians are provided to the patient upon discharge

Postop Care

- The MSS Access Coordinator schedules patient follow up as needed
  - PEG patients have automatic follow up scheduled within 4-7 days of the procedure
  - Other patients are on a PRN basis
- MSS PAs have clinic time available daily for follow up appointments
- MSS surgeons readily available for complex issues

Complex Access Cases
Complex Cases: Enteral Access

- MW is a 41M with viral myocarditis 10/18/2008 requiring BiVAD
  - Repeated attempts at bedside enteral access were unsuccessful
  - TPN considered risky due to tenuous venous access and concern for bacteremia seeding BiVAD
- He was not fed x 21 days
- TPN was initiated on hospital day 21
- He needed enteral access

Use of a Continuous-Flow Device in Patients Awaiting Heart Transplantation

Complex Access: Enteral Access (continued)

- One of our MSS surgeons, Dr. Edward Kelly, also rounds in the Cardiothoracic Intensive Care Unit
  - this partnership facilitated a smooth consult
- A nasojejunal tube was inserted in the OR under endoscopic and fluoroscopic guidance

Insertion of NJT

NJT In Place & Response to Nutritional Therapy

Complex Cases: Parenteral Access

- RC is a 58M with SBS since 1988
  - 40 cm small bowel in continuity with colon
  - Antithrombin III deficiency, significant clotting issues
  - All upper extremity and neck access options to the right atrium exhausted due to clot
- Did well on an oral diet from 1997-2007
- June 2007: acute cholangitis & long ICU stay
- Weight dropped from 137# to 102#
  - 74% UBW
  - 64% IBW (IBW is 160#)
- Needed to resume PN
Complex Cases: Parenteral Access (continued)

- Our partnership with interventional radiology facilitated a smooth consult
- The inferior vena cava was the only central access available
- A tunneled catheter was inserted in the IVC (with tip in the RA)
  - Transhepatic approach
  - Translumber approach
- PN was started—weight 135# on three days/week of PN

Complex Cases: Parenteral Access (continued)

- 2006 Transhepatic approach to right atrium
- 2007 Translumbar approach to right atrium

Options for Non-Academic Medical Centers

- BWH’s partnership with the DFCI has allowed us to expand our Parenteral and Enteral Access Service
- Options for non-AMCs
  - Providing PICC insertion service for rehab/nursing homes
  - Providing an enteral access service for a local rehab or nursing home

Improving Patient Care Summary

- PN Utilization
- PICC Service
- Parenteral & Enteral Access Service
- Complex Cases
- Options for Non-Academic Medical Centers

Approach for Non-Academic Medical Centers

- Providing PICC insertion service for rehab/nursing homes
- Providing an enteral access service for a local rehab or nursing home
Decreased Costs as a Result of the Multidisciplinary Nutrition Support Team

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Disclosure:
I have no commercial relationships relevant to the topic being presented.

Outline

- Cost of running the service
- Cost savings associated with the service
- Developing the quality improvement program
- Innovations to add value to your service

Cost of Running the Service

- Staff
- Training
- Capital investments (equipment)
Staffing Patterns

• Physician assistants
• Medical assistants
• Registered dietitians
• Administrative staff

Where are the IV RNs? They are part of our PICC Service, but are staffed by the Department of Nursing’s IV Team.

Determining PA Staffing Levels

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>2000</th>
<th>2003</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS PA FTE</td>
<td>1.5</td>
<td>2</td>
<td>3.25</td>
</tr>
<tr>
<td>PICC Consult Volume</td>
<td>1652</td>
<td>2291</td>
<td>3195</td>
</tr>
<tr>
<td>PA:PICC ratio</td>
<td>1:1100</td>
<td>1:1146</td>
<td>1:983</td>
</tr>
<tr>
<td>OR Volume</td>
<td>607</td>
<td>845</td>
<td>1065</td>
</tr>
<tr>
<td>PA:OR ratio</td>
<td>1:405</td>
<td>1:423</td>
<td>1:355*</td>
</tr>
</tbody>
</table>

*3 FTE cover OR

MSS Medical Assistant

• PICC volume was increasing dramatically
• The PAs were doing an excellent job, but needed assistance for efficiency
• Hired one MA in 2004
  – Set up for PICC insertion
  – Assist during the procedure
  – Clean up while PA enters orders, documents in medical record
  – Data entry in our PICC database
  – Order PICC supplies
  – Assist with metabolic cart studies
• In 2008, added a per diem MA to work Sundays

RD Staffing

• Inpatient RDs: staffed by the Department of Nutrition
  – “Team Leader” RDs are the inpatient nutrition support dietitians
• The MSS has 1 FTE of RD time, plus a per diem RD
  – The full time RD is the clinical manager
    • Management, QI, education, research, & pt care
  – The per diem RD has a flexible schedule, depending on the home PN census

Administrative Staffing

• MSS RN transitioned to the DFCI in 2005
  – Responsibilities: taking calls for inpatient/outpatient access consults, preop phone screening, booking OR, entering/managing data into the Access Service database, home PN management
  – We split the position into an administrative role and a clinical role
  – Developed the position of Parenteral and Enteral Access Coordinator
  – PAs assumed preop phone screening responsibilities & RD took on other tasks of MSS RN

Training—PAs

• PICC training:
  – Takes ~ 6 weeks of PICC insertion to be independent with basic screening/approval and insertion techniques
  – Formalized ultrasound course added to enhance proficiency
• OR training takes ~ 4-6 weeks
• Additional PA tasks ~ 4-6 weeks
• For a PA to be fully independent, a minimum of four months training
• A structured training schedule, standardized forms, frequent check ins help smooth the process
Training—Other Staff

- MA: close work with PAs, Clinical Manager, IV RN manager
- Administrative staff
  - Detailed training manuals
  - Hospital training for OR and billing procedures, various software programs
- Success for all: organized training schedule, good written documentation & training materials, support, & time

General Staffing Issues

- A clinical manager is important to organize the program
  - Ideal staffing: a nutrition support certified RD, PA, RN, or BCNSP
- Control of turnover is essential
- Need to protect your FTEs
- HR support to recruit & hire qualified staff
Justifying More Staff

- Staff must track productivity!
  - Simple spreadsheets to track hours spent
  - Internal databases
- Monitor hospital trends
- Remain innovative—can you add a needed service?

MSS Intervention:
Prevention of Complications
Decreases Costs

Cost Savings with Our Team

- Decrease catheter-related bloodstream infections (CR-BSIs)
- Decrease inappropriate PN use
- Streamlined approach to enteral & parenteral access procedures
- Dedicated PICC service

Delivering Nutrition Care:
One Plan to Address the Challenges

- Inpatient Consultation
- Short-term Parenteral Access
- Nutrition Education
- Outpatient Care
- Long-term Parenteral and Enteral Access

Reducing CR-BSIs

- Wide range reported for cost related to CR-BSI
  - Recent review: $3,700-$29,000/episode*
  - Others have quoted $34,508 to $56,167 per infection survivor.**

*Infect Control Hosp Epidemiol 2006;27:522-530
Medicare Will Not Pay for Medical Errors and Preventable Conditions

Published September 30, 2008

Reducing CR-BSIs

- PN-Related
  - PN increases risk of CR-BSIs
  - Strict controls on PN utilization can help reduce incidence
- Catheter-Related
  - Each lumen on a central catheter can be a source of infection
  - The PICC Service bases the type of catheter on the indication
  - For long-term central venous access, we may suggest alternate catheters based on the indication

Cost Savings

- By working to reduce CR-BSI, the cost saved could offset a significant portion of the funds needed to run the NST

Cost Associated with PN

- Approximate cost of BWH PN solutions
- Labor not included—drives up cost further
  - Pharmacist time + RD time

<table>
<thead>
<tr>
<th>Volume</th>
<th>Cost 1 liter</th>
<th>Cost 1.5 liters</th>
<th>Cost 2 liters</th>
<th>Cost 2.5 liters</th>
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<tr>
<td>1 liter</td>
<td>$19.00</td>
<td>$25.00</td>
<td>$33.00</td>
<td>$40.00</td>
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MSS PICC Service

- Quality improvement issues:
  - Inappropriate requests by physicians not familiar with clinical indication for PICC insertion
  - Inefficient placement process leading to delays in patient care and discharge from hospital
  - High volume may lead to significant cost containment issues

Improved Care & Reduced Costs for Patients Requiring Peripherally Inserted Central Catheters: the Role of Bedside Ultrasound & a Dedicated Team


We decreased waiting time by 80%
Improved Care & Reduced Costs for Patients Requiring Peripherally Inserted Central Catheters: the Role of Bedside Ultrasound & a Dedicated Team


We decreased costs by 25%

### TABLE IV
Cost of PICC placement by discipline

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Cost of PICC placement (dollars)</th>
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<tbody>
<tr>
<td>FV RN</td>
<td>$62.20</td>
</tr>
<tr>
<td>PA</td>
<td>$70.14</td>
</tr>
<tr>
<td>ER</td>
<td>$65.02</td>
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</table>

PICC, peripherally inserted central catheter; IV RN, certified intravenous registered nurse; PA, physician assistant; IR, interventional radiology.

### TABLE V
Average cost of PICC placement

<table>
<thead>
<tr>
<th>Time period</th>
<th>Average cost/PICC (dollars)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service inception</td>
<td>$267.81 ± 12.04</td>
</tr>
<tr>
<td>US initiation</td>
<td>$246.72 ± 10.35</td>
</tr>
<tr>
<td>Current service</td>
<td>$203.36 ± 5.63‡</td>
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</table>

*Mean ± SEM. ‡p < .05 vs service initiation. 

Improved Care & Reduced Costs for Patients Requiring Peripherally Inserted Central Catheters: the Role of Bedside Ultrasound & a Dedicated Team


We decreased costs by 25%

### Overall Cost Savings Related to the PICC Service FY 01 to FY 03

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Savings</th>
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<tbody>
<tr>
<td>FY 01</td>
<td>$509,519</td>
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<tr>
<td>FY 02</td>
<td>$774,940</td>
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<tr>
<td>FY 03</td>
<td>$962,260</td>
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### Delivering Nutrition Care: One Plan to Address the Challenges

- Inpatient Consultation
- QA Program
- Comprehensive Metabolic Support Service (MSS)
- Nutrition Education
- Short-term Parenteral Access
- Long-term Parenteral and Enteral Access
- Outpatient Education

### Outpatient Preop Evaluation Savings Related to MSS Phone Screening

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Savings</th>
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<td>$54,000</td>
</tr>
<tr>
<td>FY 01</td>
<td>$62,300</td>
</tr>
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<td>$67,300</td>
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<tr>
<td>FY 03</td>
<td>$66,900</td>
</tr>
<tr>
<td>FY 04</td>
<td>$99,800</td>
</tr>
</tbody>
</table>

Savings = cost/preop visit X # outpatient access procedures/yr
Cost/preop visit: $200 Source: Angela Bader, MD

Preop phone screening:
- Efficient
  - Allows the Center for Preoperative Evaluation to focus on more complex patients
  - Saves our patients a trip to the hospital
Manager Training

- Does your institution offer employee training for spreadsheet software and database software?
- If not, seek it out elsewhere
- These are powerful tools that allow you to generate tremendous amounts of data
Developing Data Collection Tools

- What are your high-volume procedures?
- What are your high-cost procedures?
- What is important to your service?
- What is important to administration?

MSS Innovations

- Expanded our PICC service to include Sunday to facilitate Monday discharges
- PICC education reference cards
- Work with Infection Control
  - Monitoring of CR-BSI rates
  - Develop & implement guidelines for use of antimicrobial catheters
  - Track outcomes jointly
- MSS Rotation for ICU and GI fellows
- Medical student education

What have you done for me lately?

- NSTs are great at saving money, but that’s often not enough
- It’s important to find ways to become self-sufficient and generate revenue for program development

Billing for PA Services

- Initially, PAs did all tasks without billing
- Now generate revenue for:
  - Bedside tunneled catheter removals
  - Inpatient PEG consults
  - Inpatient PICC insertions
Opportunities with Increased Revenue

- The MSS becomes more self-sufficient with our physician extenders billing for their services
- Opportunity for programmatic development
  - Home PN services
  - Increased education for health-care professionals and trainees
  - Funding for research

Self Assessment Questions

1. A coordinated approach for parenteral and enteral access is beneficial by:
   a. Achieving access in a timely manner
   b. Assuring selection of the optimal route for nutrition support
   c. Inserting the access device in the most cost-effective and safe location
   d. All of the above
   e. None of the above

2. Tying PICC approvals to PN approvals is beneficial because:
   a. It slows down the process for both, allowing the team more time to fully develop the nutrition plan
   b. It minimizes inappropriate PICC insertions
   c. It promotes a good working relationship between the house officers and the nutrition support team
   d. Inserting most PICCs at the bedside to limit use of the interventional radiology suite

Self Assessment Questions

3. The NST can promote the use of enteral nutrition by
   a. Offering a streamlined approach to enteral access consults
   b. Developing protocols to promote the use of enteral nutrition for patients at high nutritional risk
   c. Providing staff education when parenteral nutrition requests are denied
   d. All of the above
   e. None of the above

4. Which of the following is a way a nutrition support team can save costs?
   a. Immediately approving all requests to start PN
   b. Clustering all cases to be done in the operating room on one day of the week
   c. Limiting PICC insertions to one day per week to save staffing costs
   d. Inserting most PICCs at the bedside to limit use of the interventional radiology suite
We thank you for your time!

Any questions?