Using "MAGIC" to Facilitate Appropriate PICC Use: Implementation of a PICC Appropriateness Assessment Tool

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Background

- Peripherally inserted central catheters (PICC) are increasingly used for vascular access in hospitalized patients due to convenience of placement and long term viability.
- PICCs also associated with multiple complications including upper extremity thromboses (2–5%) and central line blood stream infections (CLABSIs) (1–5%), which increase as the size and number of PICC lumens increase.
- Michigan Hospital Medicine and Safety Consortium (HMS) is a state wide quality collaborative focused on improving PICC utilization and decreasing PICC related complications in hospitalized patients.
- Recent study across ten HMS hospitals showed significant variation in PICC insertion indications and patterns of use not explained by patient acuity or hospital size.
- Review of our hospital's HMS data showed that over 25% PICCs were removed within 5 days of insertion pointing towards potentially inappropriate use.
- The recently released "Michigan Appropriateness Guide for Intravascular Catheters" (MAGIC) provides clinicians a framework to consider appropriateness of PICC use in various clinical scenarios.

Aim

• Our goal was to decrease inappropriate PICC utilization by implementation of a "PICC assessment tool" developed using the MAGIC criteria.

Intervention



Appropriate PICC Indications & Assessment Tool

Table 1. Appropriate Indications for PICC Use (MAGIC)

Delivery of peripherally compatible infusates when the prop such use is \geq 6 days.

Delivery of non-peripherally compatible infusates (e.g., irrita vesicants), regardless of proposed duration of use.

Delivery of cyclical or episodic chemotherapy that can be ad through a peripheral vein in patients with active cancer, pro proposed duration of such treatment is \geq 3 months.

Invasive hemodynamic monitoring or requirement to obtain access in a critically ill patient, provided the proposed durati \geq 15 days.

Frequent phlebotomy (every 8 h) in a hospitalized patient, proposed duration of such use is \geq 6 days.

Intermittent infusions or infrequent phlebotomy in patients difficult peripheral venous access, provided that the propose such use is \geq 6 days.

For infusions or palliative treatment during end-of-life care.

Delivery of peripherally compatible infusates for patients res nursing facilities or transition from hospital to home, provid proposed duration of such use is \geq 15 days.

Results

 Table 2. PICC and Midline Utilization, Pre and Post Implementation

Average Monthly Utilization	March 2015 - July 2015	Aug 2015 - Jan 2016
Overall PICCs/Month	112 (±7)	73 (±5)
Triple Lumen PICCs/ Month	37 (±8)	13 (±4)
Single Lumen PICCs/ Month	20 (±7)	33 (±4)
Midlines/Month	4 (±3)	14 (±3)
Patient-Days/Month	13,228±582	12,750 ± 611

sed duration of	RN NAME:	
	Date Consult Received:Time: Insertion Date/Time:	
	REASON FOR INSERTION:	
tants or	NUTRITION: TPN TYPE/DOSE*FINAL DOSE FOR PICC MUST HAVE OSMOLARITY=>90	00
	ABX/MED : NAME OF MED: HOW LONG WILL PT RECEIVE	
ninistered ded that the	THE APPROPRIATE ROUTE FOR ADMINSTRATION OF THIS MEDICATION PER IV GUIDELINES: PERIPHERAL/MIDLINEPICC *PICC not appropriate for therapy<14days when it can be administered through peripheral/midline. *Midline appropriate for therapy 1-4weeks	/CENTRAL duration
	***IF YES THEN MIDLINE IS PREFERRED NEXT STEP	
central venous	BLOOD DRAW FREQUENCY: HAVE 2 PHLEB ATTEMPTED LAB DRAW: Y / N OTHER REASON FOR PICC ORDER	
on of such use is	ALLERGIES:	
	LARSY GER CREAT WBC INR PLATELETS POS BLOOD CUITURES Y / N **POS STAPH AUREUS OR CANDIDA CONSULT ID	
	IF GER < 30 HAS NEPHROLOGY APPROVAL BEEN OBTAINED: X / N NEPHROLOGIST	
ovided that the		
ovided that the	ADMITTING DIAGNOSIS :	
	PMHx :	
• . 1	APPROPRIATE ACCESS: MIDLINE (PREFERRED) PICC REASON NOT CANDIDATE:	
with poor/	INSERTION INFORMATION: FEWESTS # OF LUMENS SHOULD BE SELECTED TO MANAGE THE PRESCRIBED THERAPY	
l duration of	VEIN USED: R I BASILIC BRACHIAL CEPHALIC MEDIAN CUBITAL	
	LINE TYPE: SINGLE MIDLINE DUAL MIDLINE SINGLE PICC DUAL PICC TRIPLE PICC	
	RATIONALE FOR DUAL OR TRIPLE LUMEN PICC	
	EXACT TIP LOCATION: DISTAL SVC/CAJ MID SVC PROX SVC OTHER	
	PROBLEMS DURING INSERTION	
aing in skilled	PICC REFERRED TO SPECIALS: YES NO	
d that the	COMMENTS:	

Figure 1. PICC Assessment Form



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Discussion

- Decision to order PICC line was often made without thoughtful consideration to other vascular access devices. The screening process empowered vascular access providers to insert a device based on appropriate clinical indication.
- Decrease in PICC placements placed for provider/ patient convenience.
- PICCs requested for difficult vascular access re-directed towards midlines (usage increased by 50%).
- Decrease in triple lumen PICC lines which were often requested for having "back-up" lumens.
- Review of HMS data shows significant decrease in PICC utilization < 5 days. Impact on UE VTE and CLABSI rates pending.
- Patients requiring frequent phlebotomies and those with difficult blood draws still pose a challenge as alternative devices have not been well studied and have varying success rates.

Conclusions

- Choosing wisely campaigns have identified PICC utilization as an opportunity to improve practice especially to decrease PICCs placed for patient or provider convenience.
- A simple PICC assessment tool to assess PICC appropriateness prior to insertion can reduce inappropriate PICC utilization, decrease # of lumens and can be replicated at other institutions.
- Further studies are needed to assess the impact of decrease in utilization on PICC related complications.

References

- Chopra, V., Flanders, S. A., Saint, S., Woller, S. C., O'grady, N. P., Safdar, N., ... Bernstein, S. J. (2015). The Michigan Appropriateness Guide for Intravenous Catheters (MAGIC): Results From a Multispecialty Panel Using the RAND/UCLA Appropriateness Method. Annals of Internal Medicine Ann Intern Med, 163(6_Supplement).
- Chopra, V., Anand, S., Krein, S. L., Chenoweth, C., & Saint, S. (2012). Bloodstream Infection, Venous Thrombosis, and Peripherally Inserted Central Catheters: Reappraising the Evidence. The American Journal of Medicine, 125(8), 733-741.
- Chopra, V., Smith, S., Swaminathan, L., Boldenow, T., Kaatz, S., Bernstein, S. J., & Flanders, S. A. (2016). Variations in Peripherally Inserted Central Catheter Use and Outcomes in Michigan Hospitals. JAMA Internal Medicine JAMA Intern Med.
- SGIM Peripherally inserted central catheters | Choosing Wisely. (n.d.). Retrieved February 19, 2016, from http://www.choosingwisely.org/clinician-lists/society-general-internalmedicine-peripherally-inserted-central-catheters-for-patient-provider-convenience/