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1668. The SAFER Lines Project: A Mobile-App Strategy for Prevention of Outpatient Central Line Associated Bloodstream Infection (CLABSI)

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Background. Outpatient peripherally inserted central catheters (PICC) use has grown without standardized protocols for their management. We assessed the impact of a mobile app strategy for outpatient CLABSI prevention using photo-monitoring, assessment, and response to lines with local inflammation/infection in a cohort of cancer clinic patients.

Methods. This prospective cohort study evaluated adults with PICCs at an academic cancer clinic at baseline (7/2015–12/2016) and after implementing the SAFER (Standardizing Assessment For Effective Response) Lines program (intervention 5/2017–11/2018). This included a mobile app enabling (1) clinic assessment of localized inflammation or infection defined as Central Line Insertion Site Assessment (CLISA) score 2 or 3, respectively (Table 1), (2) photo-documentation, and (3) score-based automated physician alerts for remote response. We assessed demographics, malignancy type, and line characteristics. Generalized linear mixed effects model assessed program impact on frequency of CLISA 2 or 3 lines, clustered by patient. Cox proportional hazards and Kaplan Meier models assessed days to line removal after CLISA 2 or 3 were identified.

Table 1. Central Line Insertion Site Assessment Score (CLISA)

Score	Category	Description	Action
0	Normal Appearance	- Skin is flesh-colored - No erythema, localized swelling, or drainage	Continue serial assessments
1	Minimal Erythema	- **Skin at insertion site with erythema < 3mm radius** - Drainage/crusting scant and non-cloudy, if present* - No localized swelling at insertion site	**RN:** Verbal communication with next shift RN. **MD:** Acknowledge RN assessment in progress note
2	Advancing Erythema	- **Skin at insertion site with erythema 3-6mm radius** (or increase in erythema over 24 hours) - Localized swelling at insertion site may be present - Drainage/crusting is non-cloudy, if present*	**RN:** Verbal notification to MD **MD:** Strongly consider line removal. If not removed, document reason and plan.
3	Severe Erythema *OR* Purulence	- **Purulent (cloudy) drainage/crusting AND/OR** - **Erythema >6mm or rapid worsening in size/brightness** - Focal swelling at insertion (common, not required)** - Erythema not required if purulence present	**RN: Page MD** **MD: Order immediate line removal. If removal not possible, document plan for removal.**
NV	Insertion site not visible	Assessment not possible due to obscured line insertion site. Skin that is visible appears normal.	Document 'site not visible'.

*Bleeding without erythema excluded
**Specifically related to insertion site. Not intended to refer to anasarca or limb swelling.
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Results. Among 4,894 assessments of 528 PICCs in 380 outpatients, there were 272 lines (199 patients) at baseline and 256 lines (181 patients) after SAFER program implementation. Mean age, gender, PICC dwell time, and history of prior PICC were similar at baseline and intervention. The proportion of inflamed (CLISA 2) and infected (CLISA 3) lines decreased 40% (from 26% to 16%, and 19% to 11%, respectively) during intervention compared to baseline. Lines with peeling dressings decreased 80% (from 46% to 9%). Mean days to removal of inflamed lines decreased 59% (from 19 to 8 days); removal of infected lines decreased 85% (from 11 to < 2 days). Intervention was associated with 46% lower risk of local inflammation/infection (OR 0.46, CI=0.26–0.83, p< 0.01, Table 2) and faster line removal when such lines were identified (HR 0.18, CI=0.12–0.27, p< 0.01).

Table 2. Likelihood of Central Line Localized Inflammation or Infection (CLISA 2 or 3) – Multivariable Regression Model[1]

Characteristic	Odds Ratio (CI)	P-Value
Age (years)		
18-45	--	0.26
46-55	1.63 (0.71-3.77)	
56-65	1.35 (0.61-2.96)	
66-75	2.20 (1.02-4.73)	
>75	0.91 (0.35-2.39)	
Male	0.75 (0.44-1.30)	0.30
Hematologic vs other malignancy	1.89 (1.01-3.56)	0.05
History of prior central line	1.87 (1.04-3.37)	0.04
Line placed on right arm[2]	1.26 (0.67-2.39)	0.47
Peeling Dressing[3]	3.71 (0.10-10.87)	0.79
Line dwell time, days (SD)		
0-60	3.3 (1.4-7.8)	0.03
61-120	2.4 (1.0-6.0)	
121-180	1.6 (0.6-4.2)	
>180	--	
SAFER Lines Intervention	0.46 (0.26-0.83)	<0.01

[1]Generalized linear mixed effects model, clustered by patient
[2]Included to address any potential contribution of arm dominance that could influence ability for patients to keep the line/dressing clean
[3]Peeling dressing only included assessments prior to development of CLISA 2 or 3

Conclusion. The SAFER Lines mobile app and program decreased the frequency of locally inflamed or infected PICC insertion sites and increased the speed of removal when local inflammation/infection was found in cancer clinic patients.

Disclosures. **Raheeb Saavedra, AS**, Medline: Conducted studies in which hospitals and nursing homes received contributed antiseptic and/or environmental cleaning products|Stryker: Conducted clinical studies in which hospitals and nursing homes received contributed antiseptic products|Xttrium Laboratories: Conducted clinical studies in which hospitals and nursing homes received contributed antiseptic products **Raveena D. Singh, MA**, Medline: Conducted studies in which hospitals and nursing homes received contributed antiseptic and/or environmental cleaning products|Stryker: Conducted clinical studies in which hospitals and nursing homes received contributed antiseptic products|Xttrium Laboratories: Conducted clinical studies in which hospitals and nursing homes received contributed antiseptic products **Susan S. Huang, MD, MPH**, Medline: Conducted studies in which hospitals and nursing homes received contributed antiseptic and/or environmental cleaning products|Molnlyke: Conducted clinical studies in which hospitals received contributed antiseptic product|Stryker: Conducted clinical studies in which hospitals and nursing homes received contributed antiseptic products|Xttrium Laboratories: Conducted clinical studies in which hospitals and nursing homes received contributed antiseptic product.