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Department of Emergency Medicine

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# Impact of an Interprofessional Central Venous Catheter Insertion Training Program

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## Background:

Evidence suggests that central venous Catheter (CVC) insertion training,<sup>1,2</sup> the use of ultrasound guidance,<sup>3,4</sup> and compliance with the Institute for Healthcare (IHI) central line bundle<sup>5</sup> improve patient outcomes.

## Objectives:

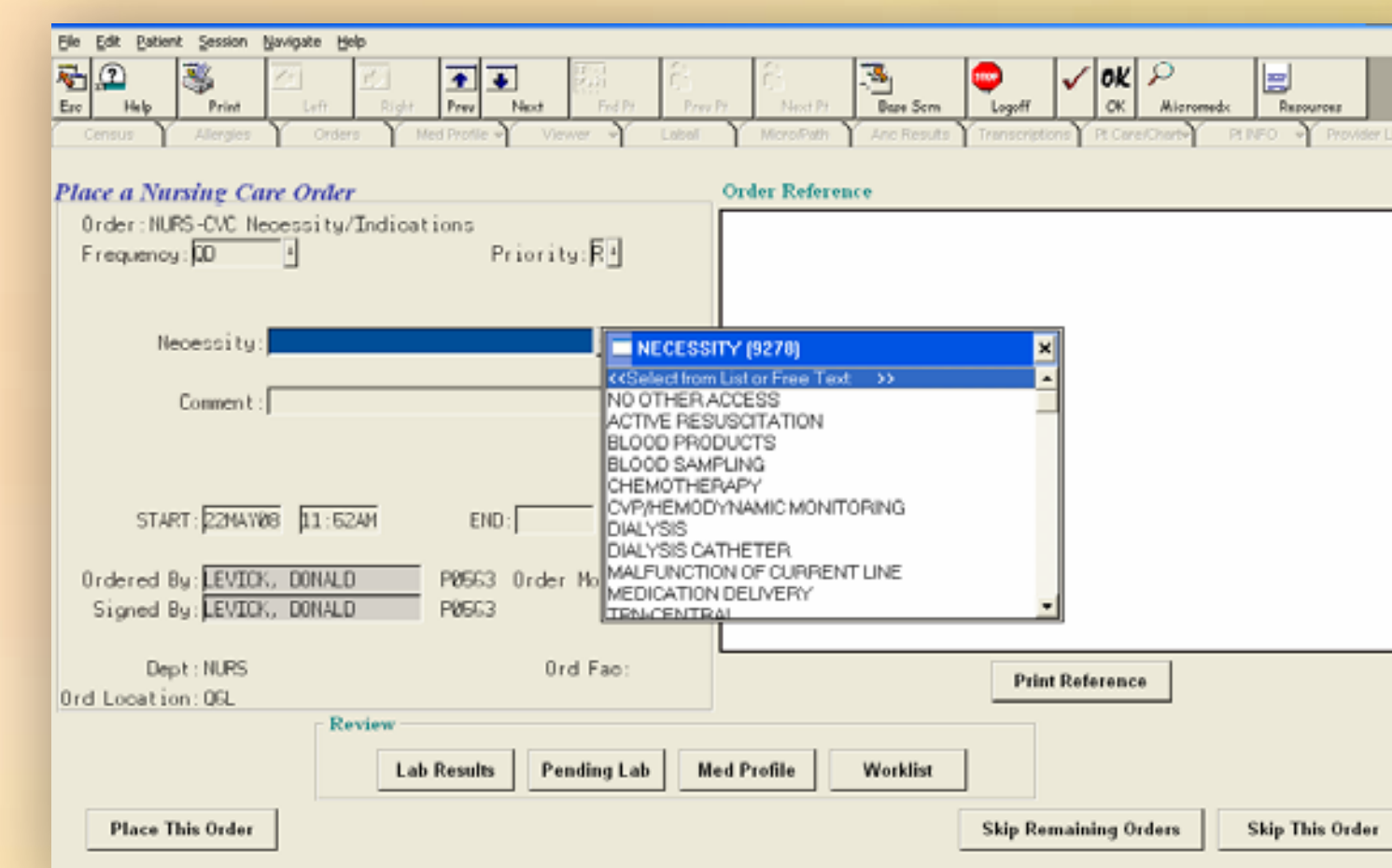
Reduce CVC complications including central line associated bloodstream infections (CLAB).

## Methods:

The CVC course is required of all residents who place central lines at LVHN upon entry into residency. A pre-course elearning module with video vignettes sets behavioral and collaborative expectations among all providers surrounding the procedure. The course includes: a half-day practical portion with manikin practice, ultrasound for target vessel verification, and a checklist based competency evaluation. Nurses participate in the course and ensure that the bedside checklist, which includes the IHI bundle, is used as it would be at the bedside. Assessments included post course surveys, focus groups, pre/post/delayed knowledge tests, and registry data that tracks compliance with the IHI bundle and CLAB.



## Checklist



## Title

## Results:

Focus groups confirmed the need for a check off run and that nurses are helping ensure sterile conditions and challenging residents on the number of needle stick attempts. Statistical quality control measures were used to track the effect of the training process on the CLAB rate for CVCs (peripherally inserted central catheters, PICC lines, excluded) which improved from 3.4 to 0.8 per 1000 line days (P=0.001). Reduced variability in the downward trending rate was reflected by the standard deviation decreasing from 1.45 pre-training to 0.40 post-training.

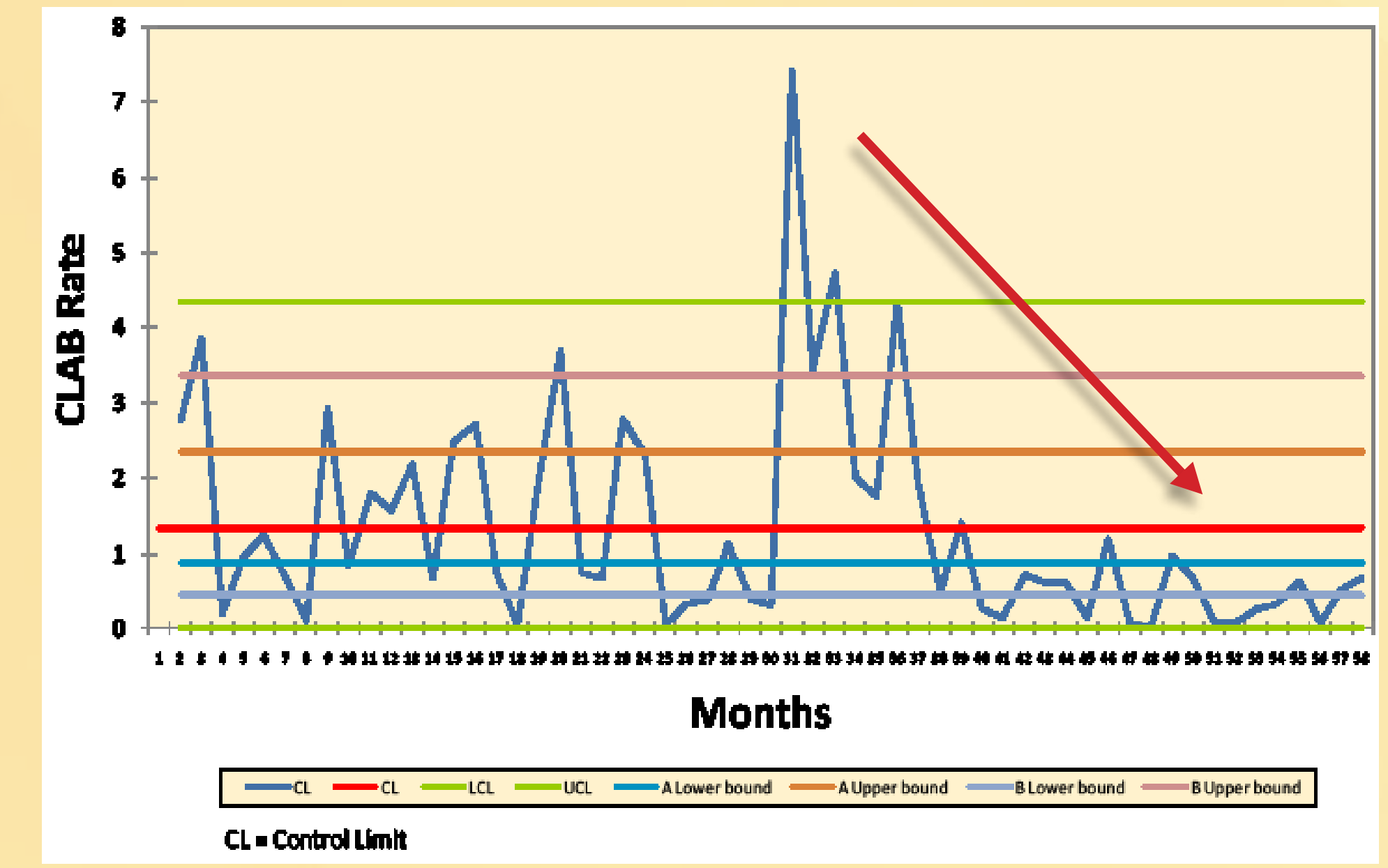
Fiscal Year	Non-PICC Line Days	Infection Rate / 1000 Line Days	Training Cohort (begins with FY)
2006	15,004	3.4	
2007	15,138	2	A
2008	14,136	2.5	B
2009	19,463	1.4	C
2010*	15,781	0.8	D

\* = year to date

## SQC Control Chart for CLAB Rate



## SQC Range Chart for CLAB Rate (Variability)



## Conclusion:

The CLAB rate was successfully reduced. Check off competency runs and nurse collaboration in the checklist are plausible contributing factors to success.

## Next Steps:

Central line training paradigms, including bedside checklists, interprofessional training protocols, and registry methods for performance tracking require refinement and broader application.

## References:

1. Barsuk, J. H., et al. Crit Care Med, 2009, 37(10):2697-2701.
2. Evans, L. V., et al. (abstract) Acad Emerg Med, 2009, 16(s1):s6.
3. Leung, J., et al. Ann of Emerg Med, 2006, 48(5):540-547.
4. Milling, T. J., et al. Crit Care Med, 2005, 33(8):1764-1769.
5. Pronovost, P., et al. N Engl J Med, 2006, 355(26):2725-2732.
6. TeamSTEPPS™: Strategies and Tools to Enhance Performance and Patient Safety. Agency for Healthcare Research and Quality, Rockville, MD.

Behavior and Communication Around the Procedure

Technical Aspects of Maintaining Sterile Field

Practice in Seldinger Technique

Understanding the Process Surrounding and post Insertion

## The CVC Course

Technical Aspects of Insertion, Complications, Indications, Contraindications