



## COLLABORATING FOR BEST PRACTICE

*This article is taken from a presentation at the AVA 2022 Annual Scientific Meeting in Minneapolis, MN and a following poster abstract presented at the CVAA-WoCoVA Conference 2023 in Toronto, ON, April 25<sup>th</sup>–28<sup>th</sup>*

# Simple and efficient: Standardizing ultrasound-guided peripheral insertions with barrier dressing cuts waste, saves time, costs less, and improves patient safety

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**O**ur medium-sized regional hospital has 245 beds, with 24 beds in the intensive care unit, an emergency department that sees approximately 160 patients per day, and a five-member vascular access team that manages about 90 ultrasound-guided (UG) insertions per month. Like everywhere else, we have witnessed an increase in the use of UG peripheral access due to changing demographics. During routine observations, we recognized the need to evaluate UG procedural and to supply relevant variations to the departments involved.

At the time of the study, we used a Central Line Dressing Kit for UG peripheral catheter insertions. The kit includes an antimicrobial sponge, sterile gloves, sterile probe cover, sterile gel, drape, gauze, skin antiseptic, and a securement device. Despite all inserters being trained on the procedure for using this kit, observers saw inserters were wasting some of the more expensive components in the Central Line Tray, leading to unnecessary cost. Further, there was significant variation among which products were used and which steps of the aseptic procedure were followed. Observations revealed practice variability for supply usage with sterile and non-sterile gloves, non-sterile gel, needles inserted through non-sterile gel, and frequent procedural contamination. More importantly, patients were asking for “certified nurses” to do these insertions, reflecting patient dissatisfaction with certain inserter techniques.

Our goal was to evaluate procedural practices and supplies used with UG peripheral insertions to improve aseptic practices, provide probe protection, eliminate waste, and establish a standardized process.

In 2021, we standardized the process using an intravenous Start Kit with a transparent barrier dressing, instead of a probe cover. The barrier dressing performs three functions: 1) sterile probe protection; 2) gel separation from insertion site; and 3) transparent dressing cover. As a quality improvement initiative, we evaluated the impact of switching to the new kit on procedure standardization and efficiency in performing aseptic non-touch (ANTT) UG insertions.

In a previously published prospective in-vivo quantitative performance survey of 210 procedures, 97% of respondents strongly agreed that the sterile barrier dressing provided gel and probe separation from the skin; 98% preferred using the sterile barrier dressing versus a sterile transducer cover; and 87% agreed that the sterile barrier dressing improved patient care by facilitating aseptic technique.<sup>1</sup> Respondents also found that the product’s window was large enough and allowed for a good ultrasound image through the dressing, and that the product provided sufficient barrier, securement, and adherence. In addition, 99% strongly agreed that it is easy to apply (see 1-2-3 Method for Sterile Barrier Dressing below).

A cost analysis compared supply items used and quantified the before (\$25.32) and after the sterile barrier dressing standardization (\$6.88; Table 1). The results demonstrated an overall savings of \$18.44 per UG insertion. Incorporating the sterile barrier dressing resulted in a 73% supply cost reduction post-intervention and fewer wasted products.

With 90+ catheters placed per month, savings equated to more than \$20,000 per year (\$18.44 x 90 x 12 = \$19,914.20).

Time savings of the 1-2-3 method for the sterile barrier dressing application with UG insertions demonstrated 50% reduced time with ranges of 3.2–4.25 minutes compared to 6.51–12.14 minutes for the full probe cover and Central Line Dressing Kit. This translates to a nurse time efficiency gain of 8.4 hours/month.

**Table 1**

*Cost Analysis Before and After Sterile Barrier Dressing Standardization*

Calculations in Supply Costs and Time for UGPIV Insertion			
... with a Sterile Probe Cover		... with Sterile Barrier Dressing	
Supplies Required			
Saline Syringe	\$0.20	Saline Syringe	\$0.20
IV Catheter	\$1.24	IV Catheter	\$1.24
J-Loop	\$2.34	J-Loop	\$2.34
Dressing Tray w/CHG & TSMP Dressing	\$9.58	IV Start Kit	\$0.74
		UltraDrape	\$1.89
Sterile Gloves	\$1.41	Exam Gloves	\$0.00*
Statlock Ultra	\$3.06	Marking Pen	\$0.30
Sterile Probe cover with Sterile Gel	\$7.49	Multi-use Gel	\$0.17
<b>Total</b>	<b>\$25.32</b>	<b>Total</b>	<b>\$6.88</b>
<b>Cost savings of \$18.44 per UGPIV insertion reflecting a cost savings of 73%</b>			
Median Time Required (minutes)			
<b>Time required</b>	<b>9.3</b>	<b>Time required</b>	<b>3.7</b>
<b>Time savings of 5.6 minutes per UGPIV insertion reflecting a 50% reduction in nurse time.</b>			

Note. \*Exam glove cost incorporated into room charges  
 IV = intravenous; CHG = chlorhexidine gluconate; TSMP = transparent semipermeable membrane dressing; UGPIV = ultrasound-guided peripheral intravenous.

## Limitations

Our hospital is located in a wealthy, nearly 90% white city on Florida's Atlantic coast.

This quality improvement initiative was limited to our facility and its purchasing contracts.

## Conclusion

Our change to best practice for UG peripheral insertions using a Start Kit with transparent barrier dressing achieved our goals of standardizing procedure, reducing waste, providing efficient probe protection, and improving aseptic technique. Team time efficiency achieved with the barrier dressing allows more and safer UG insertions resulting in fewer attempts and happier patients and nursing staff. These findings support the integration of a standardized UG protocol using a sterile barrier dressing to improve efficiency of application and to reduce overall procedure costs.

## 1–2–3 Method for Sterile Barrier Dressing



1–Mark selected site and adjust the gain brighter. Peel and fold off flap #1.



2–Position fold edge of UltraDrape on mark and stick to skin. Apply gel to #2 back area.



3–Insert, peel gel layer off and pull down dressing #3. FINISHED!



## References

- Drafz, M., Goeller, K., Dizon, B., Cobbs, A., & Moureau, N. (2023). Multi-center qualitative observational evaluation of ultrasound probe protection using a sterile transparent barrier and securement dressing to standardize UGPIV catheter insertions. *International Journal of Nursing and Health Care Research*, 6, 1418. <https://doi.org/10.29011/2688-9501.101418>