# Simple and Efficient: Standardizing Ultrasound-Guided Peripheral Insertions with Sterile Barrier Dressing Cuts Waste, Saves Time, Costs Less, Improves Patient Safety

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## Purpose

The goal of this continuous improvement study was to evaluate improving the efficiency of procedural practices with ultrasound guided peripheral catheter insertions to eliminate waste, improve aseptic practices, provide probe protection, and establish a standardized process.

## Background

Our medium-sized regional hospital has 245 beds, with a dedicated ICU of 24 beds and an emergency department that sees ~160 patients/day. Our 5-member vascular access team manages ~90 ultrasound guided insertions per month.

As the use of ultrasound guided peripheral access has increased with our difficult access patients, we have recognized the need to evaluate the procedural and supply variations from department to department. The facility used a Central Line Dressing Kit for every ultrasound-guided peripheral catheter insertion (kit includes an antimicrobial sponge, sterile gloves, sterile probe cover, sterile gel, drape, gauze, skin antiseptic, and a securement device). During insertion observations, it was noted that inserters were wasting some of the more expensive components in the Central Line Dressing Tray, leading to unnecessary cost. Further, while all inserters were trained on the procedure using this tray, there was significant variation among which products were used and which steps of the aseptic procedure were followed. More importantly, patients were asking for "certified nurses" to do these insertions, reflecting patient dissatisfaction with certain inserter techniques. As a quality improvement initiative, we evaluated the impact of switching to an intravenous Start Kit with a sterile barrier ultrasound dressing (UltraDrape®; Parker Laboratories, Inc., Fairfield, NJ) on standardization and efficiency in performing aseptic non touch (ANTT) ultrasound-guided 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.[1] 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)

## Results

Observation of ultrasound-guided insertions, prior to the change, 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. In 2021 we standardized the process using an intravenous Start Kit and a sterile 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 shown in the table, cost analysis compared supply items used and quantified the before ($25.32) and after the sterile barrier dressing standardization ($6.88). The results demonstrated an overall savings of $18.44 per insertion. Incorporating the sterile barrier dressing resulted in a 73% supply cost reduction post-intervention.

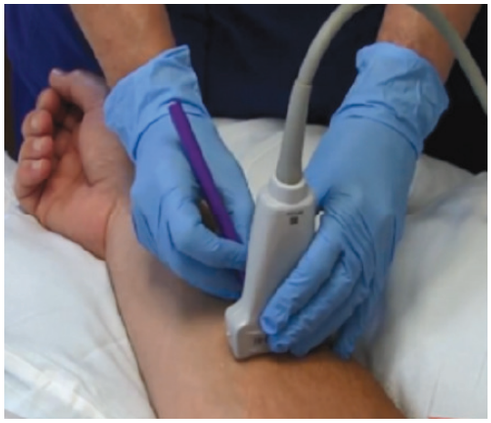
**Calculations in Supply Costs and Time for UGPIV Insertion**

| … 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 |
| **Total** | **$25.32** | **Total** | **$6.88** |
| **Cost savings of $18.44 per UGPIV insertion reflecting a cost savings of 73%** | | | |
| **Median Time Required (minutes)** | | | |
| **Time required** | **9.3** | **Time required** | **3.7** |
| **Time savings of 5.6 minutes per UGPIV insertion reflecting a 50% reduction in nurse time.** | | | |

*** Exam glove cost incorporated into room charges**

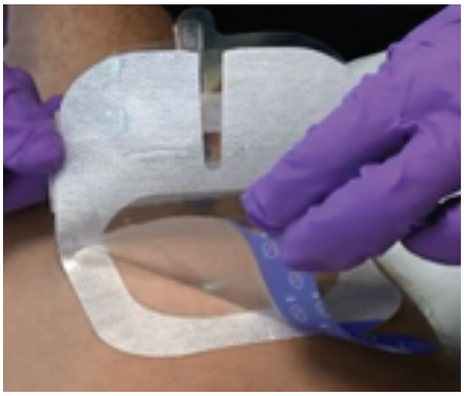
Time savings of the 1-2-3 method for the sterile barrier dressing application with ultrasound-guided insertions demonstrated 50% reduced time with ranges of 3.2 – 4.25 minutes compared to 6.51 – 12.14 minutes for the full probe cover and Central Line Dressing Kit. Team time efficiency achieved with the sterile barrier dressing allows more ultrasound-guided patient insertions resulting in fewer attempts and happier patients and nursing staff.

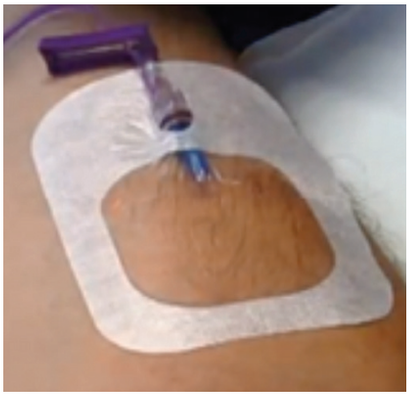
## 1-2-3 Method for Sterile Barrier Dressing



**1.** Mark the 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!

## Conclusions

Our change to hospital-wide best practice for ultrasound-guided peripheral insertions with a Start Kit and sterile barrier dressing achieved our goals of standardizing the procedure, reducing waste, providing efficient probe protection, and improving aseptic technique. By standardizing the supplies and the procedure, the positive results were a substantial 73% cost-savings and a 50% reduction in nursing time. With 90+ catheters placed per month, savings equated to greater than $20,000 per year with ultrasound-guided insertions and nurse time efficiency gained 8.4 hours/month. These findings support the integration of a standardized ultrasound-guided protocol using a sterile barrier dressing to improve efficiency of application and to reduce overall procedure costs.

### References


1. Drafz M, Goeller K, Dizon B, Buc D, Moureau N. Efforts toward standardization of UGPIV insertion through quantitative clinical product evaluation. Scientific Abstract Poster presented at Association for Vascular Access Annual Scientific Conference; October 5, 2019; Las Vegas, NV.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