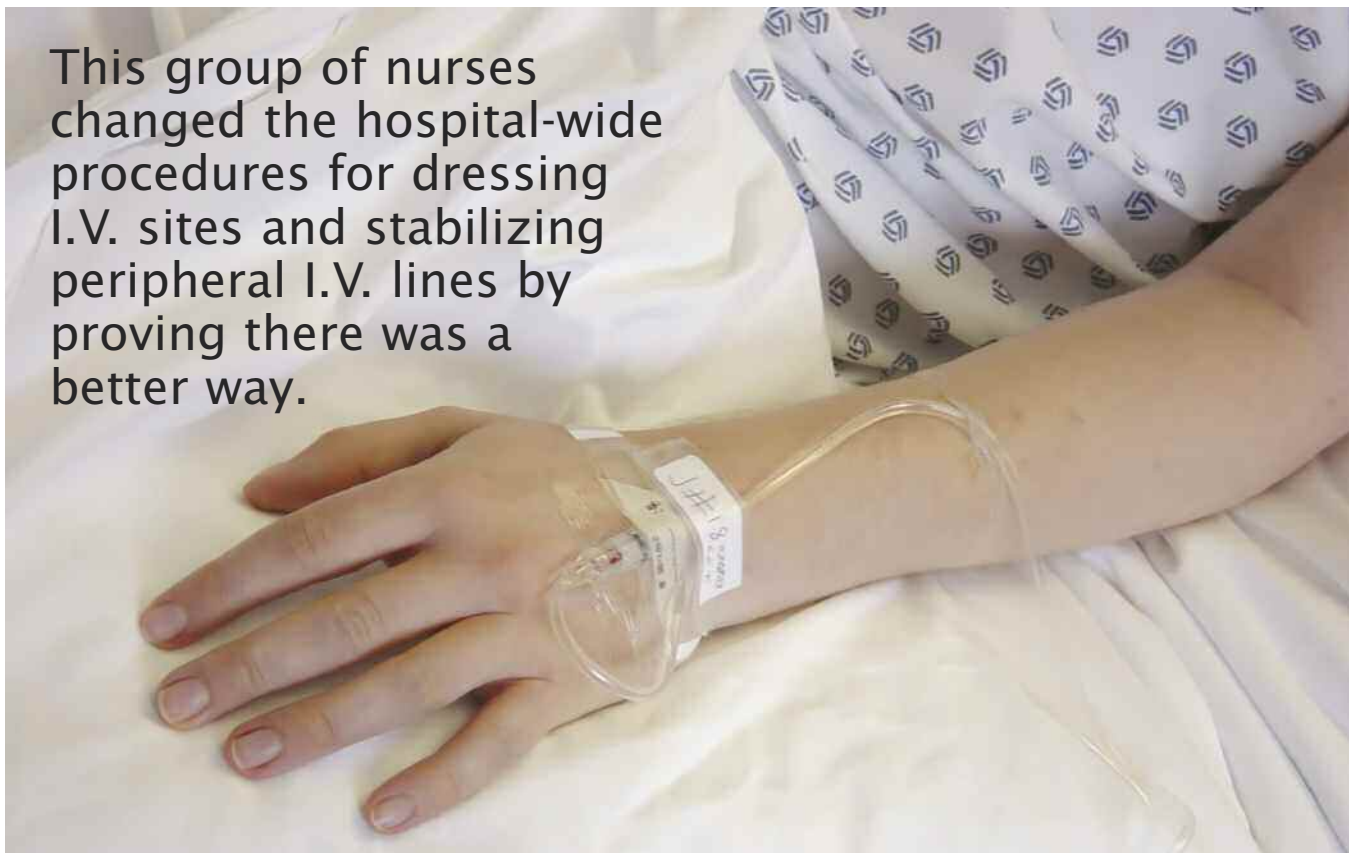


BEST PRACTICES FOR... IV DRESSINGS

What you need to know.



This group of nurses changed the hospital-wide procedures for dressing I.V. sites and stabilizing peripheral I.V. lines by proving there was a better way.



Evidence: The first word in safe I.V. practice

By Clara Winfield, RN, Susan Davis, BSN, RN, Sandy Schwaner, MSN, RN, ACNP, Mark Conaway, PhD, and Suzanne M. Burns, MSN, RN, RRT, ACNP, CCRN, FAAN, FCCM, FAANP

WHEN YOU BELIEVE that a practice at your facility is outmoded or unsafe, there's only one thing to do: Prove it! Conduct a well-structured study, and the truth will emerge.

That's what we did when we believed that the methods for dressing I.V. sites and stabilizing peripheral I.V. catheters for the patients in our surgical admission suite

(SAS) weren't best practices. We knew that the Infusion Nurses Society (INS) standards and the Centers for Disease Control and Prevention (CDC) guidelines suggested specific superior methods.

According to the 2000 Infusion Nursing Standards of Practice, "a sterile dressing shall be applied and maintained on vascular and nonvascular access devices." And according to the CDC guidelines, we should have been using "either sterile gauze or sterile transparent semi-permeable dressings" to cover the catheter site.

But based on a procedure established years earlier, nonsterile, clear plastic tape was placed directly over the I.V. site without sterile gauze. The I.V. line was then directly connected to the hub of the

catheter and the connection secured with more tape. Before a patient's transfer from the post-anesthesia care unit (PACU) to the hospital floor, the PACU nurse removed the dressing, added extension tubing per hospital protocol, secured the catheter with nonsterile tape, and placed a sterile tape and gauze dressing or transparent dressing, also per hospital protocol.

Dressing I.V. sites and securing I.V. catheters: Four methods

The photographs show the four methods evaluated in the study.

We believed this method consumed too much time, created a risk of blood exposure and infection, and could result in catheter dislodgement and unnecessary patient discomfort. But believing is not proving. So we set out to show that this method was unsafe and ineffective—and to identify a safe, effective method that would meet the needs of the anesthesia team and nursing staff *and* that was consistent with the recommendations of regulatory agencies and experts in the field.

Reviewing the evidence

Our review of studies on I.V. dressings and stabilization methods revealed some interesting findings. First, using nonsterile tape to stabilize I.V. catheters exposes patients to infectious material from 50% to 100% of the time. And infections increase the length of stay and treatment time and, of course, require restarting I.V. therapy.

The one stabilization device manufactured specifically to stabilize I.V. catheters is superior to nonsterile tape. This device, however, hasn't been compared to other sterile stabilization devices.

The results of studies evaluating the use of tape and gauze versus the use of transparent dressings are mixed. But the common theme of all the studies is that a sterile dressing over a well-stabilized catheter results in lower complication rates, reduced hospital time, increased healthcare worker safety, and lower overall costs to patients and institutions.

Our study

We designed a study to compare the existing method of dressing pre-operative I.V. sites and stabilizing peripheral I.V. catheters with three other methods. We hypothesized that, compared with the current method, one of the three other methods would produce better adherence and stability, take less nursing time, and cause less blood exposure.

We conducted the study in a surgical admission suite and PACU of a large academic medical center. We included first-case adult elective surgical patients who ar-

rived at the hospital on the day of their scheduled procedure. The study group included 105 patients undergoing orthopedic, gynecologic, neurosurgery spinal, or bariatric surgeries. Patients needing paper tape because of allergies or skin friability weren't included.

Four methods

Each morning, we reviewed the surgical schedule and identified patients who met our entry criteria. Then, the unit clerk randomly assigned one of the four methods to each patient by drawing a colored paper square from a box. The four methods were the existing method, the U-method, the Tegaderm method, and the Versaderm method. (See *Dressing I.V. sites and securing I.V. catheters: Four methods*.)



Existing method. We placed nonsterile tape directly over the I.V. insertion site and connected the I.V. tubing directly into the catheter hub.




U-method. We tore a 4- to 5-inch piece of one-inch tape into two half-inch strips. Then, we placed one half-inch strip beneath the catheter hub, sticky side up and chevroned the ends parallel to the catheter. We placed the other half-inch strip directly over the hub of catheter. We also added a small-bore extension set at the catheter hub for the I.V. tubing connection. Finally, we placed a sterile 2 x 2 gauze dressing directly over the insertion site and secured it with one-inch tape.



Tegaderm method. After the I.V. catheter was inserted, we added the small-bore extension set. We placed a sterile Tegaderm dressing directly over the I.V. site, covering the hub and luer-lock.



Versaderm method. After the I.V. catheter was inserted, we added the small-bore extension set. We placed a sterile Versaderm dressing directly over the I.V. site, covering the hub and luer-lock.



We learned that the existing method resulted in significantly more blood exposure.

Collecting data

We collected the following data:

- time and date of I.V. insertion
- type of surgery
- dressing method
- method of stabilization
- length of time (in seconds) to place the dressing
- adhesiveness and stabilization of the dressing on return to the PACU
- blood exposure during dressing change and the time (in seconds) to change the set-up.

Other findings noted by the PACU nurse, such as infiltration or phlebitis, were also recorded. Infection wasn't used as an endpoint because patient stays in our department are short.

Our analysis and results

We determined descriptive statistics for all variables of interest. The relationship between the taping method and outcome variables (adhesiveness, stabilization, and blood exposure) were determined with the chi-square test. Nursing time was evaluated using the Kruskal-Wallis test. Significance was set at $P=0.05$. We estimated cost savings based on the nursing time needed to redo the taping method.

Regarding adhesiveness and stabilization, we found no statistically significant difference among the methods. However, the current method did result in significantly more exposure to blood ($P=0.001$) and

took more time than the other three methods.

Given these findings, our next question was this: Which of the three other methods would best meet the needs of the nurses in the SAS and PACU, the anesthesiologists, and the hospital? Other studies haven't established a clear benefit for using tape and gauze as opposed to using clear dressings. The CDC suggests one benefit of transparent dressings: They need to be changed only every 72 to 96 hours.

Since we completed our study, the INS has issued new guidelines recommending catheter stabilization to preserve the integrity of the access device. The U-method we studied used non-sterile tape for stabilization, which isn't optimal practice. The Versaderm method, however, involved using the Versaderm dressing, which comes with sterile foam stabilization tape and a transparent center. Thus, we selected the Versaderm method. Compared with the current method, the Versaderm

method also has the advantage of saving thousands of dollars a year in nursing time.

And because our selection is evidence-based, our institution has adopted it in all units. ★

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Central venous catheter dressings put to the test

By Barbara S. Trotter, BSN, RN, CMSRN; Janet L. Brock, RN; Sandy S. Schwaner, MSN, RN, ACNP; Mark Conaway, PhD; and Suzanne M. Burns, MSN, RN, RRT, ACNP, CCRN, FAAN, FCCM, FAANP

WHAT'S THE BEST dressing for a central venous catheter (CVC) site? That's the question we asked. At our facility, we were using several different dressings and methods, and we wondered if we could determine the best option. To find out, we performed a study, comparing three common methods.

Our review of the literature showed that many studies have examined dressing materials and skin-cleaning preparations. The evidence indicates that chlorhexidine is an effective cleaner. When used with either transparent or gauze dressings, it decreases skin colonization.

However, the studies didn't discover a superior dressing material. They do show that adherence of the dressing and visibility of the insertion site are important considerations. And the Centers for Disease Control and Prevention says that when used with chlorhexidine, transparent dressings can be changed weekly, if they remain intact. Gauze dressings must be changed more frequently because they prevent observation of the site.

Our purpose and population

The purpose of our study was to compare the method we most commonly used—the tape and gauze method—with two other methods. We had three outcome criteria:

- dressing condition. Was the dressing soiled in any way; was it wet, moist, bloody, dry, dirty?
- adherence. Did the dressing stay intact?
- nursing time. How much time was needed for dressing changes?

We received Institutional Review Board approval and an expedited status for our study. We weren't required to obtain written consent, but we did obtain the patients' verbal consent.

Our study population was a convenience sample of adult patients with CVCs, hospitalized on two general-medicine, acute-care units between June and August 2005. We excluded patients with implanted chest and arm ports.

Three dressing methods

We compared three randomly assigned dressing methods:

An acute-care nursing team compares central venous catheter dressing methods and discovers the best—and least expensive—option.

- tape and gauze. These dressing materials were part of our hospital's central-line kit, and we routinely used this method.
- transparent dressing (Tegaderm) and gauze. This dressing was commonly used with

sterile gauze underneath because users believed the gauze prevented sticking and made removing the dressing easier.

- transparent dressing (SorbaView) alone. This dressing has cloth tape borders and a reinforcing panel to secure a CVC. We also tested a type of SorbaView designed for internal jugular lines. For the purposes of our study, we considered these two types to be one method. (See *Three dressing methods up close.*)

The study nurses were trained in the three methods, and descriptions of the methods were on the study data collection sheet. For all three methods, the nurses cleaned the catheter sites with 2% chlorhexidine gluconate (Chloraprep), using sterile technique.

Three dressing methods up close

These photos show the three study dressings.



Tape and gauze



Tegaderm transparent dressing and gauze



SorbaView transparent dressing

The discharge coordinators on each unit identified patients with CVCs, updated the list of CVCs daily, and placed it at the nurses' station for easy access. The unit clerks randomly assigned the methods to the patients by blindly picking slips of paper from a jar. Then, the unit clerks placed a colored paper indicating the assigned dressing method at the head of the patient's bed.

We told non-study nurses to notify the study nurses when a patient needed a CVC dressing change. We provided a list of study nurses on the daily assignment sheets, so everyone knew who was available to change the CVC dressings. The CVC sites were dressed and assessed for skin integrity and adherence three times a week by one of the study nurses. This process continued until a patient was discharged, transferred to a non-study unit, or had the CVC removed.

Analysis and answers

We determined descriptive statistics for all variables of interest. And we used a chi-square test to test the relationship between the dressing method and adherence. Significance was set at $p=0.05$. We estimated cost savings.

We evaluated 224 dressing applications for these CVCs: percutaneously inserted central venous catheters (59%), traditional direct, nontunneled catheters (26%), and sutured Hohn catheters (15%). For all methods, 65% of the dressings adhered; 34% lost adherence; and 1% were pulled off by the patient. The SorbaView method performed the best. (See *How well did the dressings stick?*)

Because the SorbaView dressing, unlike the two nontransparent dressings, can be left in place for a week, we estimated a hospital-wide change would save more than \$35,000 a year on materials alone. To accu-

rately determine the weekly cost of our hospital's central-line kits, we added the cost of other products commonly used to supplement them. Also, because the SorbaView dressing can be left in place longer, it saved considerable nursing time.

Positive change in practice

Our study findings led to the hospital-wide adoption of SorbaView as our standard CVC dressing. Because we were concerned that a change in practice might affect infection rates, we collaborated with the Epidemiology Department to monitor bloodstream infection rates. And because the change affects all practice areas, we will continue monitoring reports related to adherence. During the first year after the hospital-wide change, nurses reported being highly satisfied with the SorbaView adoption, and the rate of in-line infections remained the same.

With our study, we demonstrated that in an acute-care patient population, a transparent dressing (SorbaView) was more adherent than the two other methods commonly used in our facility. The change to this method resulted in cost and nursing-time savings. Nurses' anecdotal reports continue to be extremely positive, and we are proud that we effected a positive change in practice. ★

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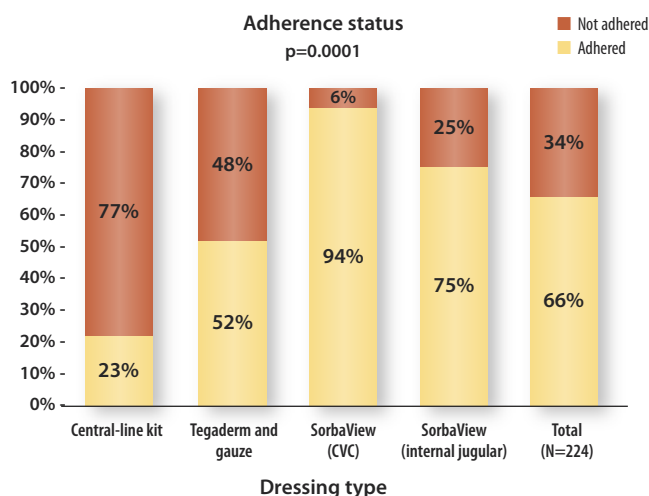
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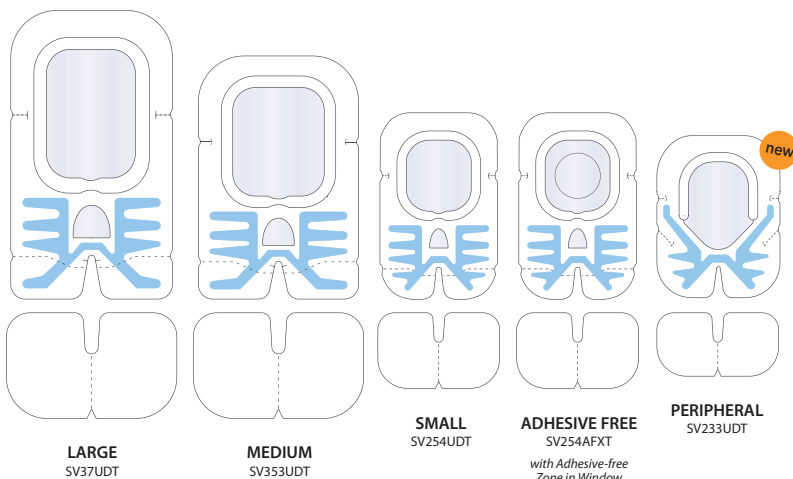
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How well did the dressings stick?

As the graph shows, SorbaView stayed in place much more often than the central line kit and the Tegaderm and gauze dressings.





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