



Addressing the Dressing: Improving Dressing Disruption in Vascular Access

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Disclosures

- Michelle DeVries is a member of the speaker's bureau with the following organizations:
 - Access Scientific
 - Becton Dickinson
 - Ethicon
 - Eloquest Healthcare
 - Teleflex
- Adjunct Research Fellow – Alliance for Vascular Access Teaching and Research

Objectives

- Review the current guidelines and standards regarding vascular access dressing integrity
- Discuss the evidence indicating the association between dressing disruption and bloodstream infection
- Describe a successful intervention designed to improve dressing integrity on vascular access devices

Where do we go from here?



THE INTERNAL AND EXTERNAL PRESSURE TO REPORT ZERO HAS LITERALLY CHANGED HOW SURVEILLANCE NUMBERS ARE COLLECTED AND USED



WE NEED TO ENSURE THAT EMPHASIS SHIFTS BACK TO TRULY GETTING TO ZERO...RATHER THAN SIMPLY REPORTING ZERO



PARTNERING WITH VASCULAR ACCESS FOR THEIR EXPERTISE IS CRUCIAL FOR UNDERSTANDING THE FULL SPECTRUM OF CONSIDERATIONS BEYOND THE MORE TRADITIONAL INFECTION CONTROL STRATEGIES.

DO YOU Know...

- ECRI has included PIV bloodstream infections as one of the Top 10 Patient Safety Risks for 2019?

2019 Top 10 Patient Safety Concerns

1. Diagnostic Stewardship and Test Result Management Using EHRs
2. Antimicrobial Stewardship in Physician Practices and Aging Services
3. Burnout and Its Impact on Patient Safety
4. Patient Safety Concerns Involving Mobile Health
5. Reducing Discomfort with Behavioral Health
6. Detecting Changes in a Patient's Condition
7. Developing and Maintaining Skills
8. Early Recognition of Sepsis across the Continuum
9. Infections from Peripherally Inserted IV Lines
10. Standardizing Safety Efforts across Large Health Systems

Do you
know...



CDC is considering
expanding surveillance to
include ALL hospital onset
bacteremias?

CLABSI would be a
subset of this
protocol



Creating a framework where every bloodstream
infection is evaluated can help raise awareness
about current under evaluated risks



Public comment closed April 15

Vascular Access specialists submitted
significant feedback to help identify current
concerns with CLABSI-centric focus

Infusion Therapy Standards of Practice, 2016

- Site care, including skin antisepsis and dressing changes are performed ... **immediately** if the dressing becomes damp, loosened, or visibly soiled, or if moisture, drainage or blood are present under the dressing.

Infusion Therapy Standards of Practice, 2016

- Change the dressing **immediately** to closely assess, cleanse and disinfect the site in the event of drainage, site tenderness, other signs of infection **or if the dressing becomes loose/dislodges**

Infusion Therapy Standards of Practice

- Avoid the use of tape... rolls of nonsterile tape can become contaminated with pathogenic bacteria
 - Admittedly this is in the section regarding engineered stabilization devices but...

CDC
Guidelines for
the Prevention
of
Intravascular
Catheter
Related
Infections,
2011

- Replace catheter site dressing if the dressing becomes damp, loosened or visibly soiled

epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England

IVAD18:

Transparent...dressings should be changed... If they are no longer intact or if moisture collects under the dressing

IVAD19: Gauze dressing should be changed when the dressing becomes damp, loosened or soiled

How are we doing here?



Why do intact dressings matter?

- Dressing disruption is a major risk factor for catheter related bloodstream infections.
 - "The risk of major catheter-related infection and catheter-related bloodstream infection increased by more than three-fold after the second dressing disruption and by more than ten-fold if the final dressing was disrupted"

CASCADE trial...

Table 2 Study outcomes (*n* = 121)

	Group 1 SPU + SSD + CHG (<i>n</i> = 39)	Group 2 PAL + CHG + Tape (<i>n</i> = 5)	Group 3 CSD + CHG (<i>n</i> = 42)	Group 4 TA + SPU (<i>n</i> = 35)
Number of dressing changes:	72	8	52	60
- Incidence rate ^b	163	139	163	191
Dressing/secdev life:				
- days to first change ^c	1.71 (0.66, 3.38)	0.94 (0.41, 2.60)	1.83 (0.53, 5.45)	1.49 (0.56, 3.44)
- days ^d	3.68 (1.77)	5.21 (2.86)	3.53 (1.98)	3.41 (1.52)
Reason for change (<i>n</i> = 189) ⁱ :				
- routine	45 (62%)	3 (38%)	27 (53%)	19 (33%)
- dressing lifting	19 (26%)	4 (50%)	11 (22%)	27 (47%)
- sweating	4 (6%)	0 (0%)	0 (0%)	2 (3%)
- leakage	2 (3%)	2 (25%)	1 (2%)	0 (0%)
- bleeding	12 (17%)	5 (62%)	11 (21%)	10 (17%)
- unknown	0 (0%)	0 (0%)	0 (0%)	1 (2%)
- other	18 (25%)	2 (25%)	20 (39%)	28 (48%)

Number (percentage) shown unless otherwise noted

Table 3. CVC dressing duration in the 4 dressing types.

Dressing Type	Dressings removed for any reason, n=1229			Dressings removed for non-adherence, clammy skin, or bleeding under dressing n=630		
	Number of dressings observed	Dressing duration (hrs) median [IQR]	z value*	Number of dressings observed	Dressing duration (hrs) median [IQR]	z value**
Opsite IV 3000	310	43.5 [21–78]	–1.79	160	36.0 [15-67.5]	–1.21
Tegaderm	237	46.0 [22–85]	–0.33	122	45.5 [22-73.8]	1.17
IV Advanced	262	40.5 [20–85]	–1.12	143	32.0 [14-69.5]	–1.98
Sorbaview	116	68.5 [32–105]	4.51	42	53.0 [30-95]	3.39
Unrecorded	304			163		

IQR, inter quartile range; *P < 0.001 and ** P = 0.002 for at least one difference between dressings.

Finding the right dressing

Finding the right dressing, cont.

Table 1. Phases of the continuous evaluation of CVC dressing durability.

Phase	Months	CVC dressing evaluated	Other securement techniques
One	1–4	Standard dressings: sterile, transparent, semi-permeable polyurethane dressings (Opsite IV 3000 and 3M Tegaderm®)	None
Two	5–8	3M Tegaderm® IV Advanced: sterile, transparent, semi-permeable polyurethane dressings	Dressing with an integrated border around the dressing. Separate Hyperfix® border applied to create a further secure 'window' around the edge of the dressing
Three	9–12	Sorbaview®: sterile, transparent, semi-permeable polyurethane dressings	Integrated two piece dressing, one part for the site with a wide border and second part with a wide supporting bridge

Lack of
consistency

How do you define
intact?

When is it OK to
reinforce?

Is is OK for edges to be
lifted or rolling up?

How can we make it better?

- Do you start with clean skin?
- Do you use skin prep?
- Do you let everything dry?
- Is your securement helping or hindering maintenance?
- Is additional securement or adhesive necessary?
- Is adhesive remover necessary?

It can be done!



This is not just
about
inpatients

- Outpatient infusion and home health
 - What are patients taught?
 - How many dressings are disrupted when the patient is seen/visited?
 - Are extra visits necessary to address these dressings?
 - How does this impact reimbursement?

How do you measure the impact?

Partner with infection prevention

- How many CLABSIs/BSIs/CRBSIs had premature dressing changes?
Documentation of reinforcement?

Use your Electronic Medical Record

- How many dressings are changed before Day 5? Day 7?
- How many are reinforced at the time of removal?

Prevalence rounds

- Review dressings on all units
 - Stratify by anatomical location, line type
 - How many
 - Fully intact?
 - Lifted?
 - Reinforced?
 - Insertion site exposed?

Medical Adhesives and Patient Safety, 2013

- Consider the potential adverse consequences of insufficient adhesion and/or adhesive failure, when selecting medical adhesive products for use in securing a critical device.
 - “Critical devices include those for which there is a risk of significant clinical impact to a patient if the device is dislodged or does not perform as expected. Examples include vascular access devices, endotracheal tubes, nasogastric feeding tubes, and indwelling urinary catheters. Proper securement of critical devices is paramount to patient safety.”

Quality Improvement – Baseline data

- Review of 2016 infection control surveillance data revealed that 25% of bloodstream infections had documentation that dressing had been reinforced or prematurely changed
- Repeated point prevalence (direct observation) studies showed 45% of PIV dressing were reinforced, lifted or completely disrupted
 - 15% had an exposed insertion site

Project

- Quality improvement effort approved through Infection Control Committee and Shared Governance
- Multi-disciplinary team including vascular access, infection prevention, nursing education/clinical nurse specialists with input from wound nurses and materials management
- The goal was to achieve 80% of dressings remaining full intact (all four corners) without reinforcement until device removal or 7 day dressing change

Results (pilot study)



	Fully intact	Insertion site exposed
Baseline	55%	15%
Current kit plus education	57% (76/134)	15% (20/134)
Updated dressing (dressing 2) alone *	9% (1/11)	27% (3/11)
Dressing 1 plus gum mastic	93% (26/28)	0%
Dressing 2 plus gum mastic	83% (19/23)	0%

* Evaluation halted based on initial findings

Continued results

Month (2017)	Fully Intact	Total Observed	Dressing Integrity
August	543	695	78.13%
September	1,325	1,422	93.18%
October	1,905	1,967	96.85%
November	2,439	2,504	97.40%
December	2,270	2,330	97.42%
Total	8,482	8,918	95.11%

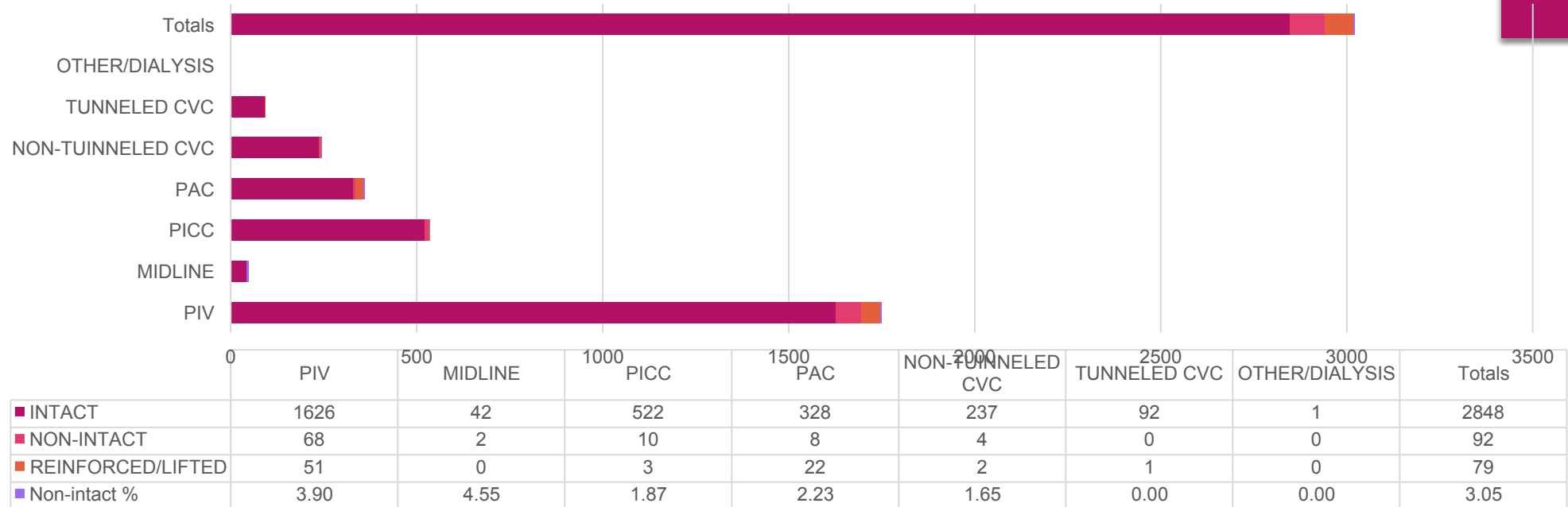
Month (2018)	Fully Intact	Reinforced/ Lifted	Non-Intact
January	2,479	23	13
February	2,064	25	28
March	3,396	18	16
April	1,682	39	32
May	1,634	27	3
June	1,566	9	6
Total	12,821	141	98
Percent:	98.17%	1.08%	0.75%

Quarterly trends

DEVICES	4th Quarter 2017	1st Quarter 2018	2nd Quarter 2018	3rd Quarter 2018	4th Quarter 2018	1st Quarter 2019	Total Oct 2017 through March 2019
INTACT	6,750	8,046	4882	2,572	4218	2613	29081
NON-INTACT	105	66	75	50	190	93	579
REINFORCED/LIFTED	82	59	41	25	88	94	389
TOTAL	6,937	8,171	4998	2,647	4496	2800	30049
% fully intact	97.30	98.47	97.68	97.17	93.82	93.32	96.78

* Beginning midyear 2018 “non-intact” dressings also include those in which end of catheter is exposed due to inappropriate placement of securement strip

First Quarter 2019 by Device Type



Still going strong..

The impact of observer

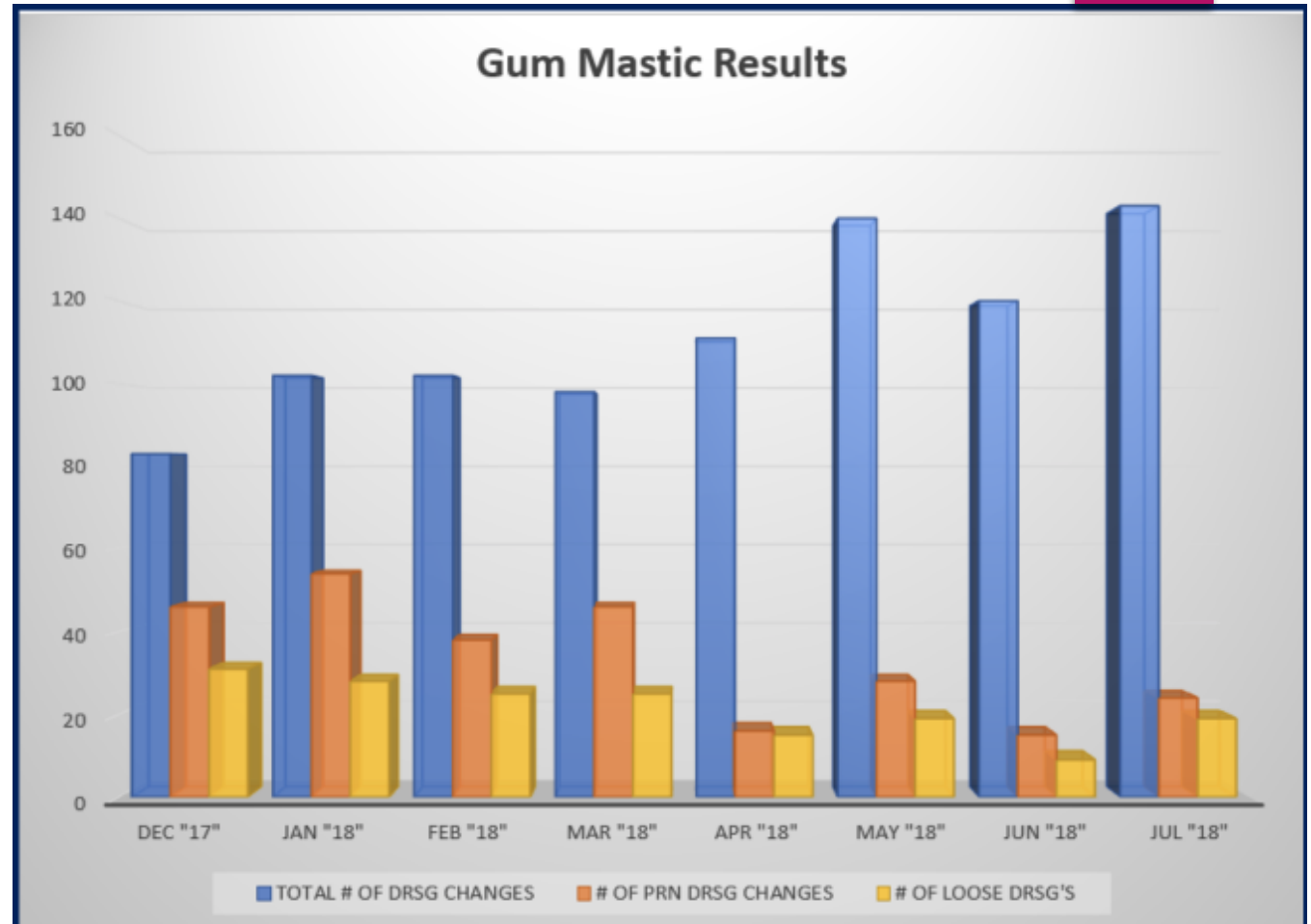
DRESSING STATUS BY DIRECT VISUALIZATION	UNIT RN	% OF TOTAL	PROFESSIONAL DEVELOPMENT TEAM	% OF TOTAL	INFECTION PREVENTION	% OF TOTAL	VASCULAR ACCESS TEAM	% OF TOTAL	MULTI-DISCIPLINARY TEAM	% OF TOTAL
INTACT	16658	97.63%	36	58.06%	137	70.98%	738	90.33%	478	68.78%
NONINTACT	216	1.27%	14	22.58%	33	17.10%	58	7.10%	129	18.56%
REINFORCED/LIFTED	188	1.10%	12	19.35%	23	11.92%	21	2.57%	88	12.66%
TOTAL	17062		62		193		817		695	

ANATOMICAL LOCATION	TOTAL NUMBER OF IV SITES	INTACT	% OF TOTAL	NON-INTACT	% OF TOTAL	REINFORCED	% OF TOTAL
PIV HAND	2285	2109	92.30	91	3.98	35	1.53
PIV WRIST	828	779	94.08	32	3.86	17	2.05
PIV FOREARM	3172	3073	96.88	54	1.70	57	1.80
PIV ANTECUBITAL	2918	2816	96.50	59	2.02	43	1.47
PIV UPPER ARM	266	261	98.12	3	1.13	2	0.75
PIV EXTERNAL JUGULAR	91	82	90.11	4	4.40	5	5.49
PIV NOT SPECIFIED	813	804	98.89	5	0.62	4	0.49
TOTAL PIVS	10373	9924	95.67	248	2.39	163	1.57
CVC - NON-TUNNELED JUGULAR	221	208	94.12	13	5.88	0	0.00
CVC NON-TUNNELED SUBCLAVIAN	98	94	95.92	4	4.08	0	0.00
CVC NON-TUNNELED FEMORAL	97	94	96.91	3	3.09	0	0.00
CVC NON-TUNNELED NOT SPECIFIED OR OTHER	91	90	98.90	1	1.10	0	0.00
TOTAL NON-TUNNELED CVCS	507	486	95.86	21	4.14	0	0.00
CVC TUNNELED JUGULAR	27	25	92.59	0	0.00	2	7.41
CVC TUNNELED SUBCLAVIAN	32	31	96.88	0	0.00	1	3.13
CVC TUNNELED FEMORAL	6	5	83.33	1	16.67	0	0.00
OTHER	53	53	100.00	0	0.00	0	0.00
TOTAL TUNNELED CVCS	118	114	96.61	1	0.85	3	2.54
DIALYSIS CATHETER INTERNAL JUGULAR	68	64	94.12	4	5.88	0	0.00
DIALYSIS CATHETER SUBCLAVIAN	145	137	94.48	5	3.45	3	2.07
DIALYSIS CATHETER FEMORAL	26	24	92.31	2	7.69	0	0.00
DIALYSIS CATHETER OTHER	228	226	99.12	2	0.88	0	0.00
TOTAL DIALYSIS CATHETERS	467	451	96.57	13	2.78	3	0.64
SWAN GANZ/CORDIS INTERNAL JUGULAR	5	5	100.00	0	0.00	0	0.00
SWAN GANZ/CORDIS SUBCLAVIAN	1	1	100.00	0	0.00	0	0.00
SWAN GANZ/CORDIS FEMORAL	3	3	100.00	0	0.00	0	0.00
SWAN GANZ/CORDIS OTHER	12	12	100.00	0	0.00	0	0.00
TOTAL SWAN GANZ/CORDIS	21	21	100.00	0	0.00	0	0.00
PAC CHEST	1235	1172	94.90	40	3.24	23	1.86
PICC LINE UPPER ARM (Cephalic or Basilic)	1868	1817	97.27	34	1.82	17	0.91
MIDLINE	428	399	93.22	19	4.44	10	2.34

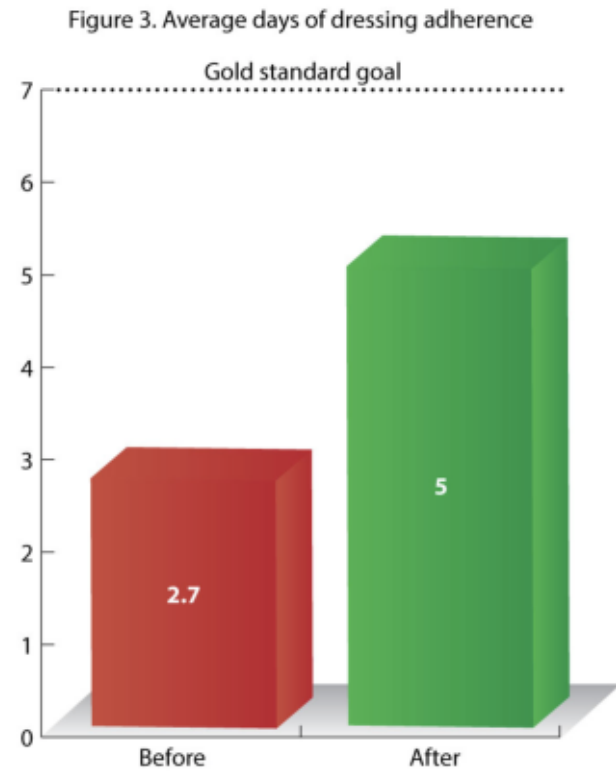
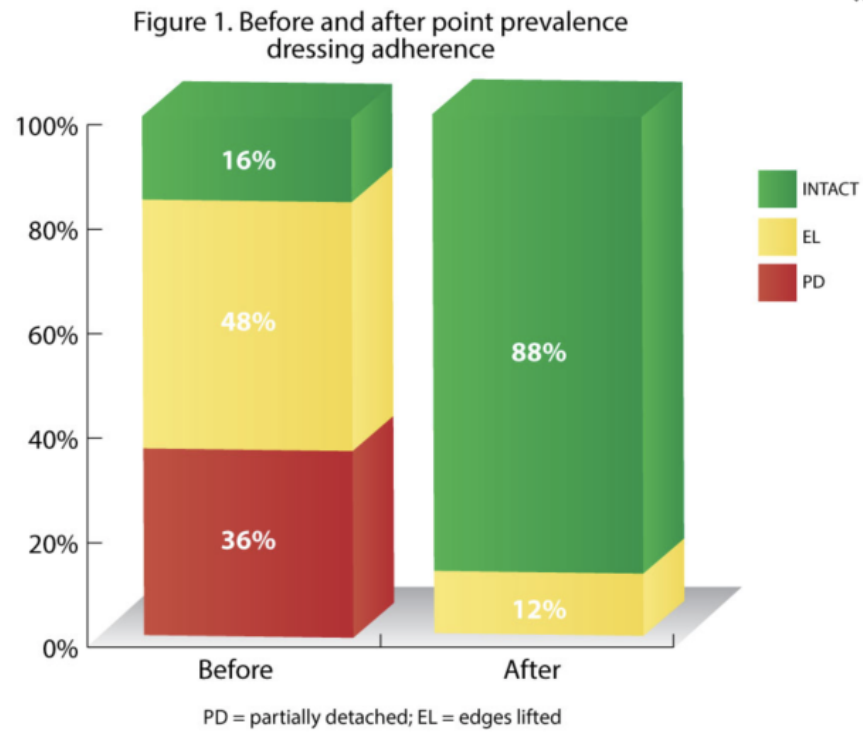
Dressing integrity by device and location

Reduction in PRN Dressing Changes

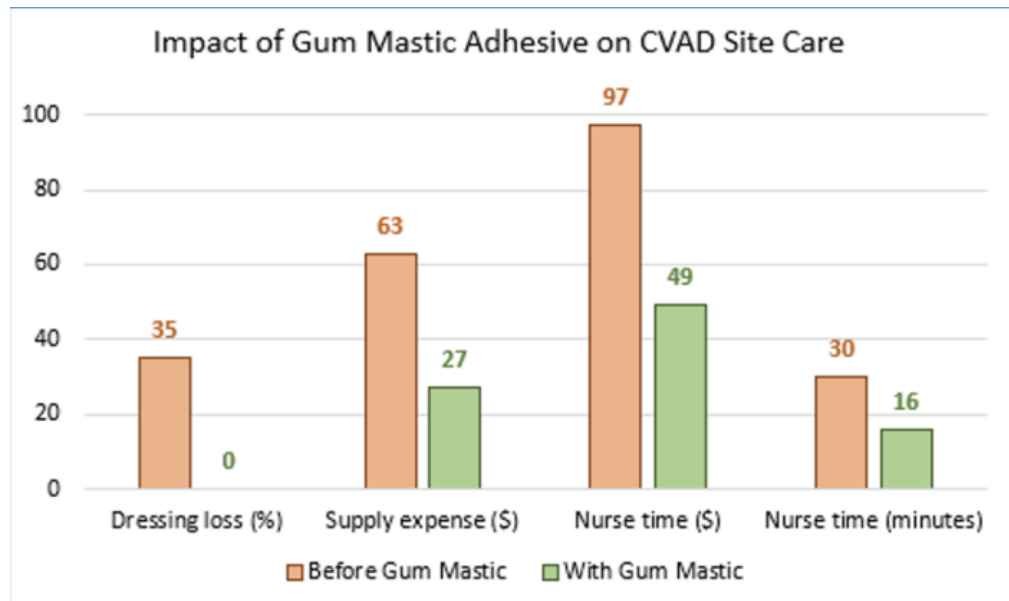
- Since introducing the gum mastic and the tissue adhesive products into our practice in late March 2018 we have experienced a decrease in:
 - PRN dressing changes by approximately 31%
 - Bloody dressings by 15%
 - Loose dressings by 16%.
- Based on the estimated cost of a central venous dressing change being \$32.70 this would result in a cost savings of approximately \$40,000 per year.



Increased Average Days of Dressing Adherence



Use of Gum Mastic Medical Adhesive to Maintain Central Venous Access Device Dressing Integrity



- Zero early dressing disruptions occurred among the 33 patients who received gum mastic adhesive application with CVAD site care, one of whom had his CVAD for over a month. This includes observation for both partial and complete lifting of the dressing.
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Bundling for success -- Peripheral lines

- Insertion:
 - CHG skin prep
 - Sterile gloves if repalpating the site
 - Alcohol caps for intraluminal protection
 - Chlorhexidine impregnated sponge dressing for extraluminal protection
 - Updated catheter – integrated extension set
 - Bordered (securement) dressing
 - Neutral connectors
 - ** New addition 2017 – liquid gum mastic adhesive with dressing placement
- Maintenance:
 - Careful assessment – check the patient, not the box
 - Remove when clinically indicated, with dressing change at 7 days (or sooner if dressing compromised)
 - Re-prep when redressing the site
- Ongoing surveillance of process and outcomes
- Review any infections with floor staff in “real time” to discuss missed opportunities for prevention

Hospitality

- “I’ve often marveled that the word “hospitality” is mostly made out of “hospital,” and yet the staff in so many hospitals seem to understand so little about hospitality.”
 - Thom Dick. Journal of Emergency Medical Services (2012)



Hospitality continued

- “On the day after surgery, the site had to be re-taped because the IV became unstable. To secure it, another nurse simply added more tape (circumferentially, I might add). The day after that, another nurse ripped all the tape off (but left the original OpSite, clinging only to my hair) and just replaced the tape. When I asked her to moisten the tape with alcohol before ripping it off, she said she was too busy to do that. Two days later, I mentioned to a fourth nurse that the IV was falling out (again). By that time, a lot of congealed blood was visible in the tubing.’
- “When they started ripping the tape off, I asked them if they would please moisten the tape with an alcohol prep. One of them kept on ripping, saying he didn’t have time for that, so this time I insisted. Sure enough, the alcohol soaked through the backing on the tape, and within seconds it had softened the adhesive. The tape came right off. But then they treated me like a smart ass for making the suggestion.”

Gentle reminder...

- Any line may be your patient's life line. How can we work to make it better?