Simposio Medline International Italy

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GAVePed
Gruppo Accessi Venosi Pediatrici

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2023

GAVeCeLT
Gli Accessi Venosi Centrali a Lungo Termine

MEDLINE

SIN
Società Italiana di Neonatologia

GdS Accessi Vascolari Neonatali

ESPERIENZA CON IL SORBAVIEW SHIELD NANO NEL PAZIENTE NEONATALE IN EMERGENZA

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ACCESSO VENOSO IN SITUAZIONE DI EMERGENZA

- Accesso venoso **immediato** in situazione clinica di **arresto cardiorespiratorio** o di **rischio vitale imminente**, per somministrare **farmaci e soluzioni** in maniera veloce ed efficace.

- **Processo tempo-dipendente**.

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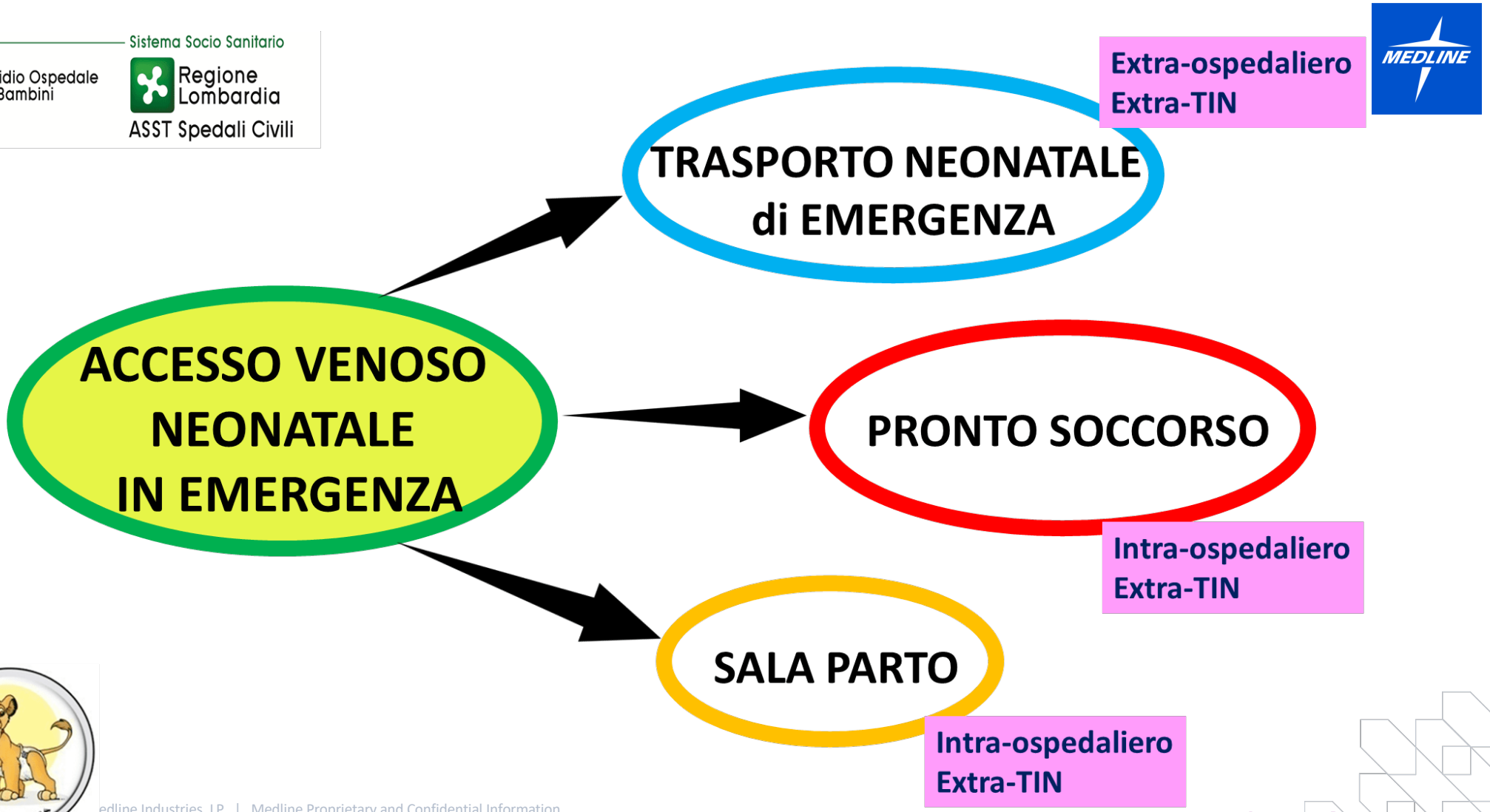
Sistema Socio Sanitario
Presidio Ospedale dei Bambini
Regione Lombardia
ASST Spedali Civili



SETTING

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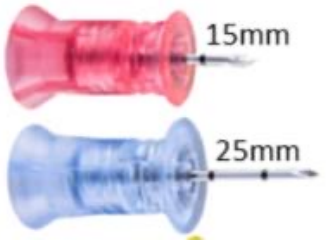
DISPOSITIVI PER ACCESSO VENOSO IN EMERGENZA

CATETERE VENOSO OMBELICALE (Pur)

CANNULA PERIFERICA CORTA (24G, 22G)

ACCESSO INTRAOSSEO



CICC/FICC NON TUNNELLIZZATO

Sistema Socio Sanitario

Presidio Ospedale dei Bambini

Regione Lombardia

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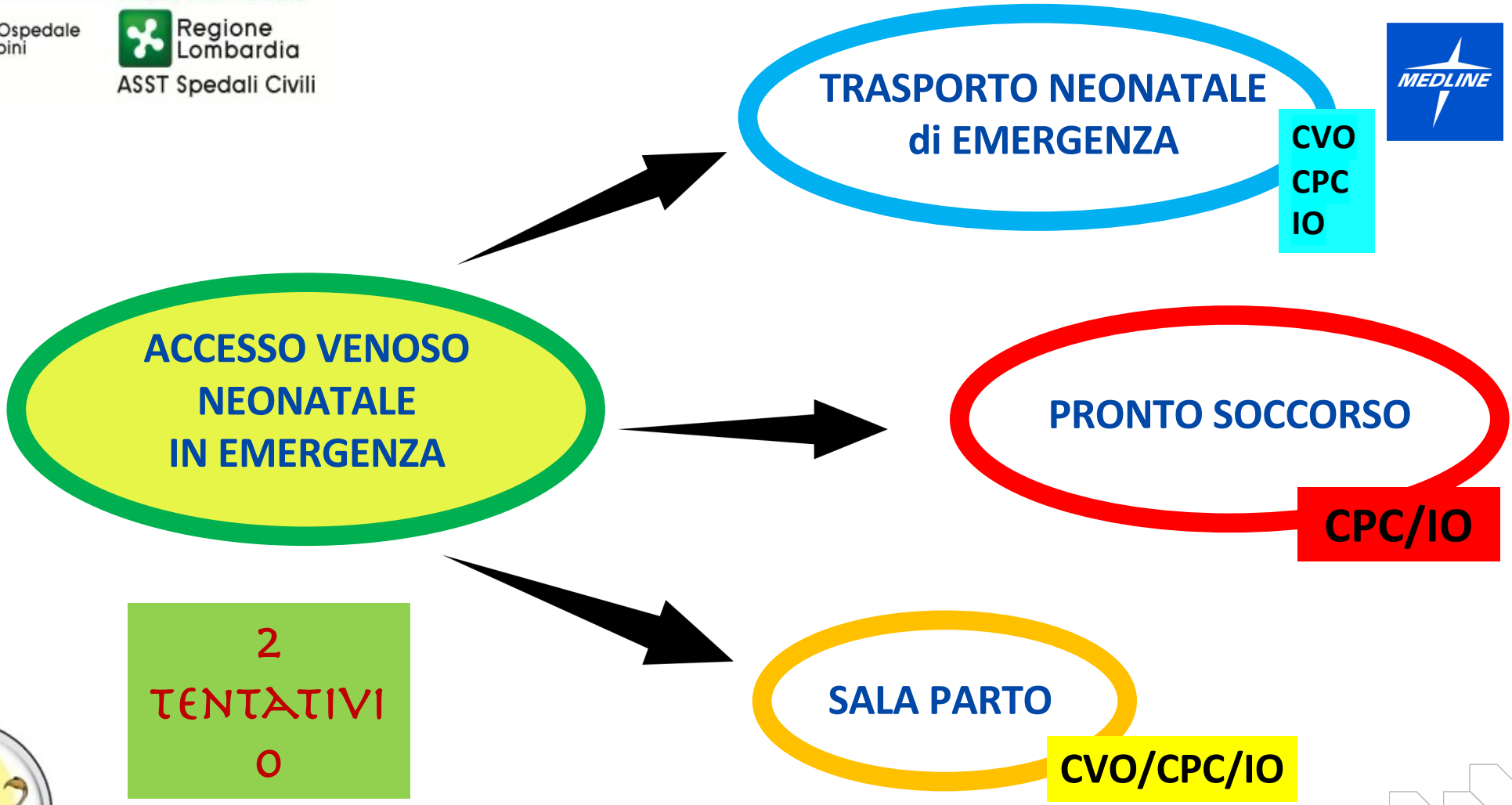


ACCESSO VENOSO PERIFERICO IN EMERGENZA

Molte complicanze:

- Inadeguata/assente antisepsi cutanea
- Infusione ad elevata velocità e flussi elevati
- Infusione di soluzioni e farmaci non indicati in vena periferica
- Elevato rischio di flebite, infiltrazione e stravaso
- Elevato rischio di dislocazione del device
- Elevato rischio di perdita del catetere
- Elevato rischio di discontinuare terapie vitali e ulteriore compromissione in paziente critico

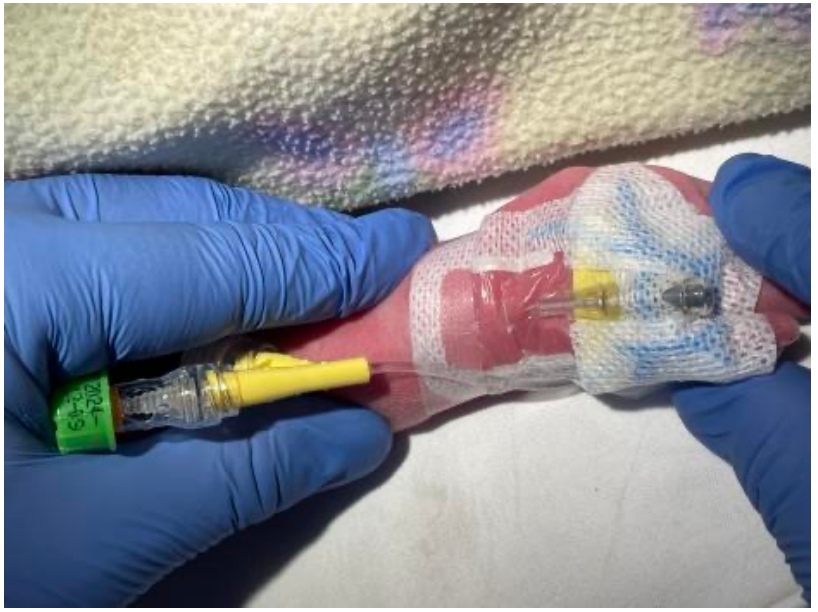

STABILIZZAZIONE

COLLA IN CIANOACRILATO E ACCESSI VENOSI PERIFERICI

38. VASCULAR ACCESS DEVICE SECUREMENT

3. Cyanoacrylate TA for securement has been studied in vitro, in animals, in pilot PIVC and arterial RCTs, and in 1 large superiority PIVC RCT.

Conflicting results have been reported. Reduced failure and increased dwell time have been reported when TA is applied in addition to a transparent dressing with or without a border in PIVC pilot RCTs and observational studies in various patient populations; however, 1 superiority PIVC secure-

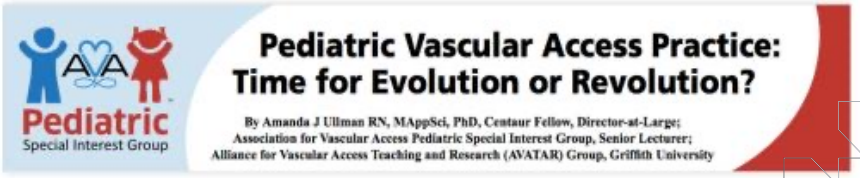


Infusion Therapy Standards of Practice

VANTAGGI DELLE MEMBRANE CON SISTEMA DI STABILIZZAZIONE INTEGRATO

- Barriera che **protegge ed isola exit site** (<rischio infettivo)
- Permette **visualizzazione exit site**
- **Migliora la Stabilizzazione del VAD** (< infezione,<trombosi):
  - minimizza movimenti del VAD a livello dell'exit site,
  - previene dislocazione del device,
  - previene perdita del dispositivo,
  - previene discontinuità di terapie.

- **Riduce le complicanze**:
  - Riduce rischio di contaminazione extraluminale (exit site)
  - Riduce rischi legati a mancata stabilizzazione del VAD:
    - Flebiti, stravaso e infiltrazione
    - Movimenti in and out (**rischio infettivo**)
    - Pistoning (**rischio trombosi**)
    - Dislocazione/perdita device.



STABILIZZAZIONE CPC

TRASPORTO EMERGENZA
NEONATO CRITICO

Nano SorbaView SHIELD Dressings

Adesivo: cianoacrilato
Membrana: poliuretano
Tessuto non tessuto

SHIELD Technology: membrana con dispositivo di stabilizzazione integrato che aumenta la **stabilità** del VAD anche in presenza di **forte trazione**

Nano SorbaView SHIELD Dressings

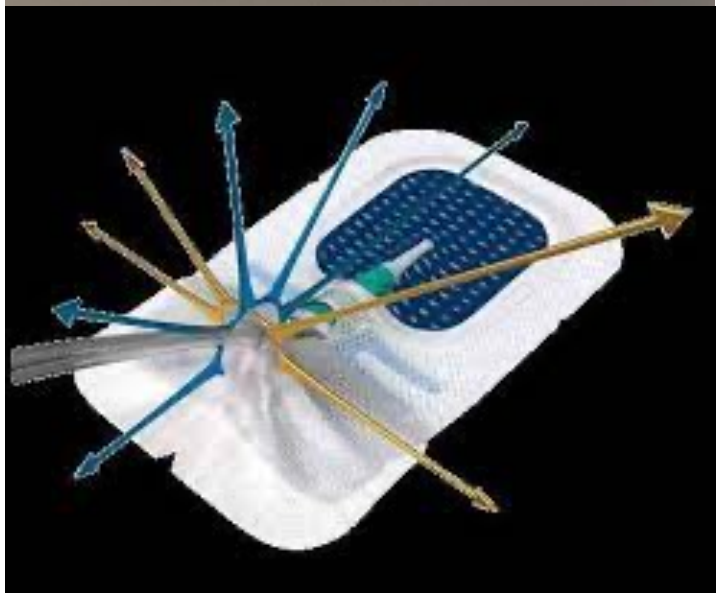
Progettato per piccoli pazienti, **dimensione ridotta**.

Membrana e sistema di fissaggio del catetere **integrati**
in un unico dispositivo:

- membrana traspirante con **MVTR >1500**
- sistema di fissaggio incorporato, **resiste forze di trazione multidirezionali.**

L'adesivo delicato non è sensibilizzante,
adeguato per la pelle del neonato e ha una buona tenuta.

E’ una membrana semipermeabile trasparente
ad alta traspirabilità con sistema di fissaggio.



SISTEMA di FISSAGGIO E MEDICAZIONE SORBAVIEW SHIELD NANO

Vantaggi:

- Visualizzazione diretta e sorveglianza exit site
- Isolamento dell'exit site
- Stabilizzazione del catetere
- Riduzione dei movimenti *in and out*
- Riduzione del *pistoning*
- Riduce rischio macerazione cute del neonato

↓ PERDITA DISPOSITIVO

↓ FALLIMENTO TERAPIA

↓ CONTAMINAZIONE VIA EXTRA-LUMINALE

TRASPORTO NEONATALE DI EMERGENZA

PACK PROCEDURALE

INSERZIONE AVP NEONATALE in EMERGENZA: *vantaggi*

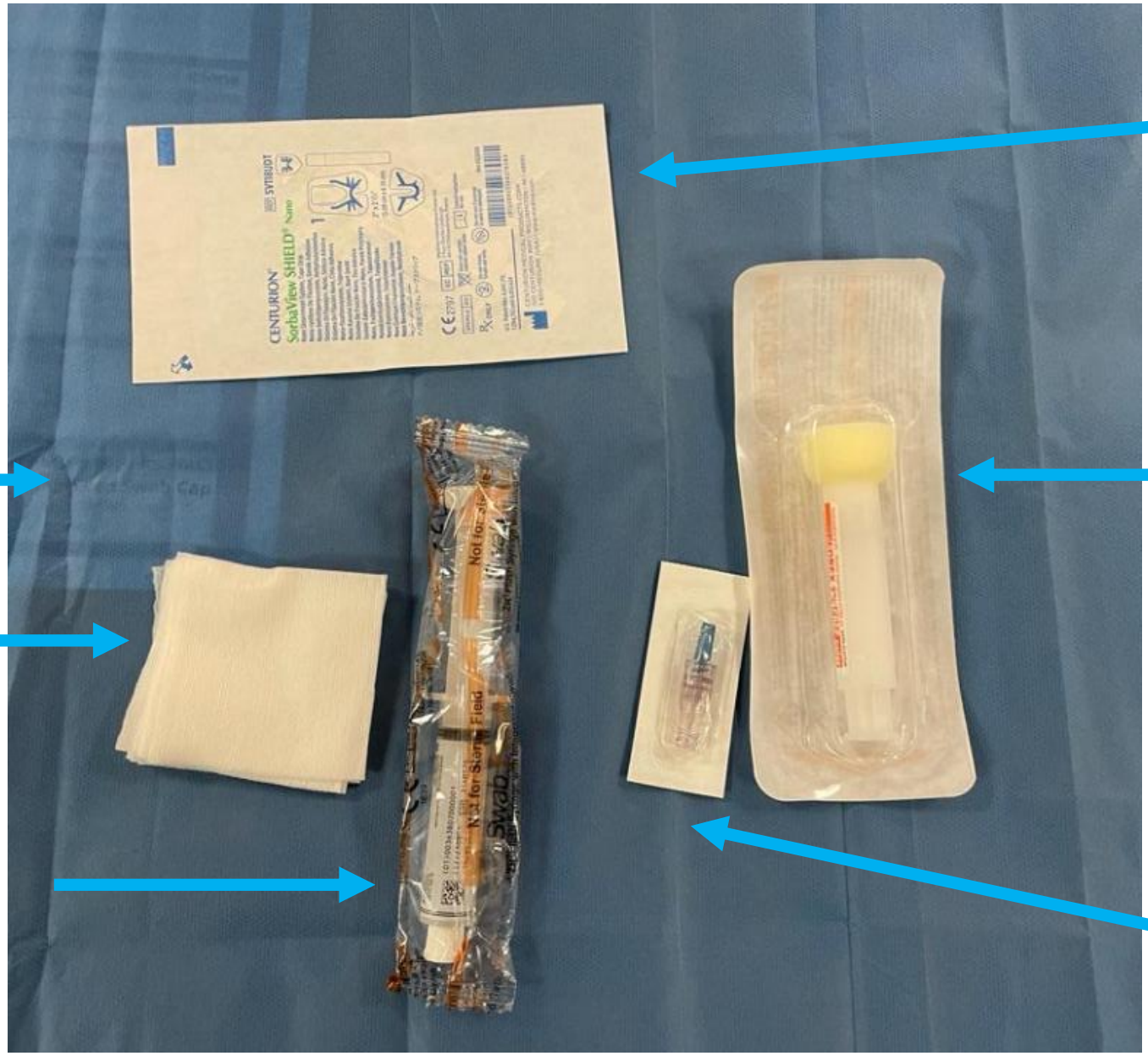
- ✓ **Specificamente allestito** per l'impianto AVP
- ✓ Emergenza, urgenza e Trasporto extra-TIN ed extra-ospedaliero
- ✓ **Materiale necessario** (non inclusa CPC, guanti)
- ✓ **Semplifica** l'impianto
- ✓ Strategia ideale per **riduce i tempi e il rischio di complicanze** legate all'inserimento in ambienti estranei all'equipe di trasporto.

RACCOMANDAZIONI GAVeCeLT 2021
PER LA INDICAZIONE, L'IMPIANTO E LA GESTIONE
DEI DISPOSITIVI PER ACCESSO VENOSO

GAVeCeLT
Gli Accessi Venosi Centrali a Lungo Termine

PACK
AVP STEN

Idealmente….



Membrana semipermeabile trasparente sterile bordata (NANO)

Telo sterile

Applicatore monodose monouso sterile CHG 2% IPA 70%

Garze sterili TNT

Siringa preriempita SF 0,9% Port Protector integrato

NFC neutro

STABILIZZAZIONE AVP NEONATALE IN EMERGENZA: strategie

- **Colla in cianoacrilato.**
- **Stabilizzare prolunga.**
- **Sistemi di stabilizzazione**: medicazioni semipermeabili trasparenti con sutureless device integrato **che reggano la trazione.**
- Auspicabile: Ottimizzazione **design dispositivo per accesso venoso periferico** in ambito neonatale (alette stabilizzazione).

Messaggi fondamentali

- Accesso vascolare in situazione di emergenza/urgenza è imprescindibile per l'assistenza del neonato critico.
- Ridurre rischio perdita accesso venoso massimizzando la stabilizzazione.
- L'uso di pack procedurali in situazione di urgenza/emergenza riducono i tempi di intervento e il rischio di complicanze.

Dott. Alessandro Crocoli

ESPERIENZA CON SORBAVIEW SHIELD NELL'UTILIZZO IN ROUTINE NEL PAZIENTE PEDIATRICO.

Dott. Alessandro Crocoli
U.O.S. Chirurgia Oncologica
Ospedale Pediatrico Bambino Gesù
Roma

Definition

Medical adhesive-related skin injury (MARSI)

*MARSI has been defined as "**an occurrence in which erythema and/or other manifestation of cutaneous abnormality** (including, but not limited to vesicle, bulla, erosion, or tear) **persists 30 minutes or more after removal of the adhesive"***

(McNichol et al, 2013).

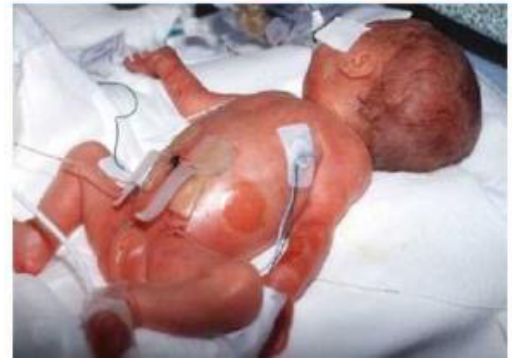
Epidemiology in Pediatric Patients

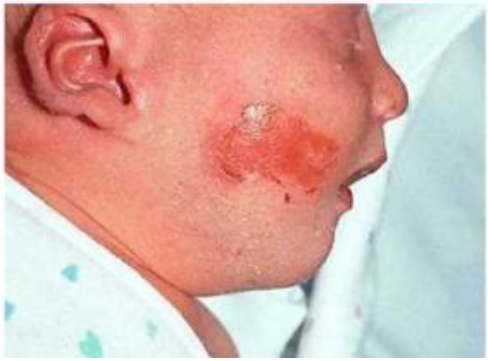
Medical adhesive-related skin injury (MARSI)

McNichol L, Lund C, Rosen T, Gray M. Medical adhesives and patient safety: state of the science. Consensus statements for the assessment, prevention and treatment of adhesive- related skin injuries. J WOCN. 2013;40(4):365-380.

Classification

Medical adhesive-related skin injury (MARSI)

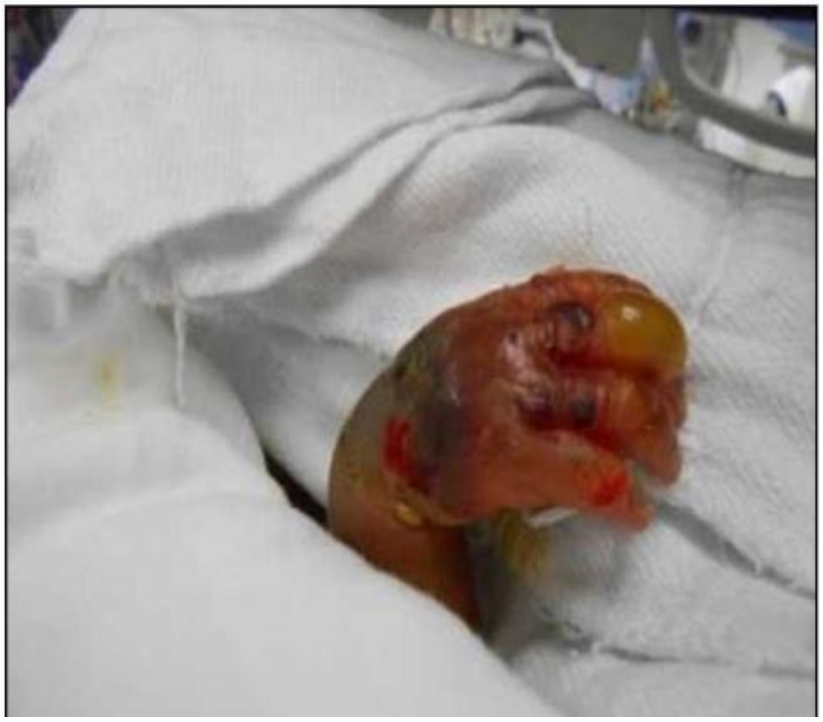




Mechanical
Skin (Epidermal) stripping—Removal of one or more layers of the stratum corneum occurring following removal of adhesive tape or dressing; lesions are frequently shallow and irregular in shape and the skin may appear shiny; open lesions may be accompanied by erythema and blister formation[1,16,17]
Tension injury or blister—Injury (separation of the epidermis from the dermis) caused by shear force as a result of distension of skin under an unyielding adhesive tape or dressing, inappropriate strapping of tape or dressing during application, or when a joint or other area of movement is covered with an unyielding tape[16,18,19]
Skin tear—Wound caused by shear, friction and/or blunt force resulting in separation of skin layers; can be partial- or full-thickness[20]

Classification

Medical adhesive-related skin injury (MARSI)



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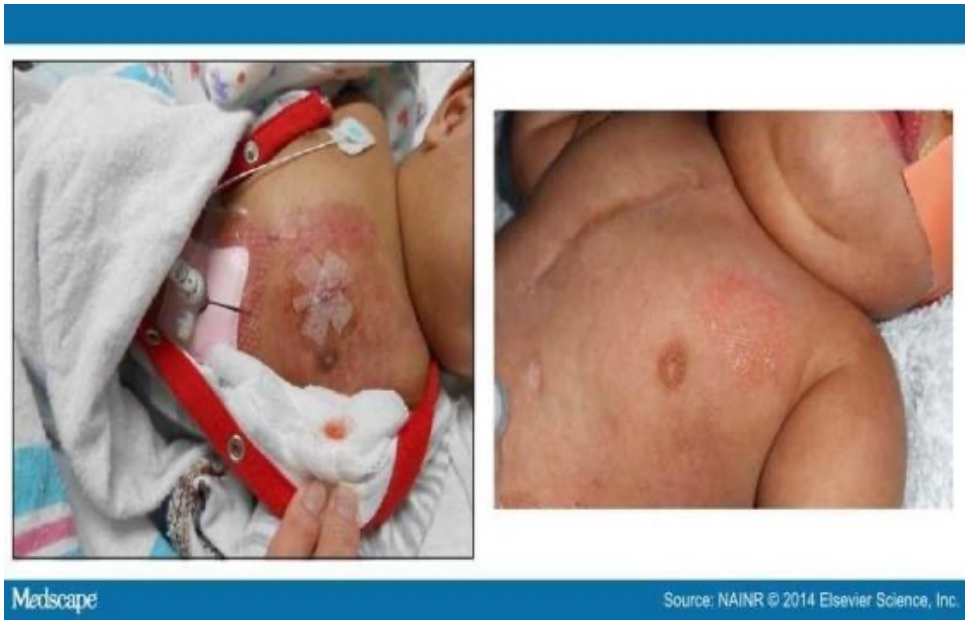
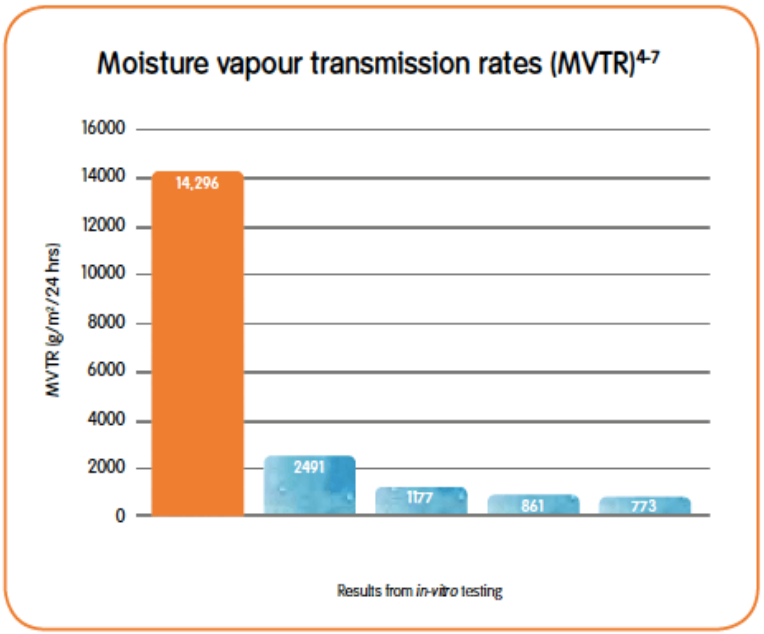
Medical adhesive-related skin injury (MARSI)



Dermatitis
Irritant contact dermatitis—Non-allergic contact dermatitis occurring as a result of a chemical irritant; a well-defined affected area correlates with the area of exposure; may appear reddened and swollen and vesicles may be present; typically of shorter duration[10,21]
Allergic dermatitis—Cell-mediated immunologic response to a component of tape adhesive or backing; typically appears as an area of erythematous, vesicular, pruritic dermatitis corresponding to the area of exposure and/or beyond; persists for up to a week[10,21,22]

Classification

Medical adhesive-related skin injury (MARSI)



Other

Maceration—Changes in the skin resulting from moisture being trapped against the skin for a prolonged period; skin appears wrinkled and white/gray in color; softening of the skin results in increased permeability and susceptibility to damage from friction and irritants

Folliculitis—Inflammatory reaction in hair follicle caused by shaving or entrapment of bacteria; appears as small inflamed elevations of skin surrounding the hair follicle; may be nonsuppurative (papules) or contain pus (pustules)

Costs

Medical adhesive-related skin injury (MARSI)

Clinical impact

Choosing a high-adhesion tape for use on fragile skin may result in MARSI, which may cause pain, increase the risk of infection and delay healing.[1]

55 treatments

For every 100 patients who receive a medical tape application, 55 treatments for MARSI will be needed.[12]

Cost impact

MARSI doesn't just affect clinical outcomes and patient well-being. It may also contribute to higher care costs, which can burden the healthcare system as a whole.

125x greater cost

The average tape-induced skin injury costs $88.50 to treat, which is 125x greater than the average cost of one roll of plastic tape.[12]

Patient impact

Not choosing the right medical adhesive may negatively impact the patient, affecting everything from their care experience to your facility's satisfaction scores.

62% of clinicians

In one survey, 62% of clinicians indicated their current medical tapes do not meet the needs of fragile skin patients.[13]

What We know

Medical adhesive-related skin injury (MARSI)

Medical adhesive-related skin injury (MARSI)

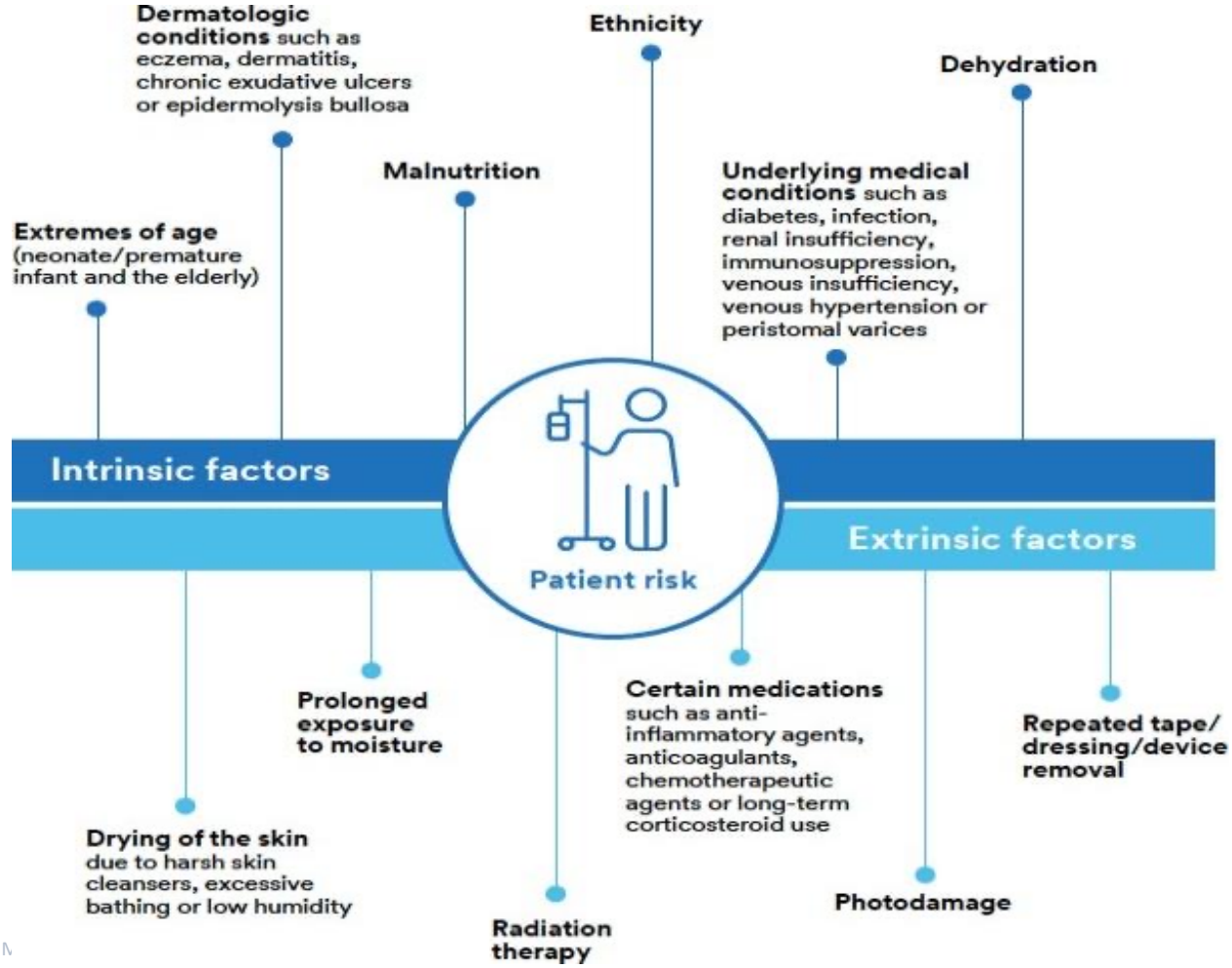
The US Food and Drug Administration (FDA) defines a medical adhesive tape or adhesive bandage as "**a device intended for medical purposes that consists of a strip of fabric material or plastic, coated on one side with an adhesive**, and may include a pad of surgical dressing without a disinfectant. The device is used to cover and protect wounds, to hold together the skin edges of a wound, to support an injured part of the body, or to secure objects to the skin".

United States Department of Health and Human Services. Medical adhesive tape and adhesive bandage. 21CFR880.5240,

Medical adhesive-related skin injury (MARSI)

Types of medical adhesives.		
Adhesive Type	Backing	Uses
Acrylates 	Cloth Silk Polyester (woven, non-woven) Paper, Plastic Foam, Polyurethane (film)	Secure medical devices (ETT, IV, NG tube, oxygen cannula)
Hydrocolloid	Film	Ostomy care Platform underneath tape Integrated into adhesive products (ETT holder, umbilical catheter securement)
Hydrogel	Plastic Reflective cover	EKG electrodes Temperature probes
Silicone 	Woven polyester Plastic	Secure EEG electrodes "Platform" between skin and tape Border of wound dressings
Zinc Oxide	Plastic	Use only on top of hydrocolloid platform

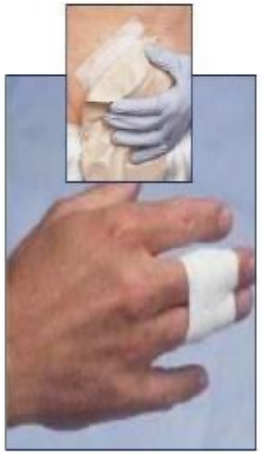
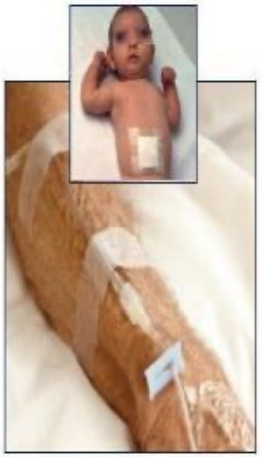
Medical adhesive-related skin injury (MARSI)



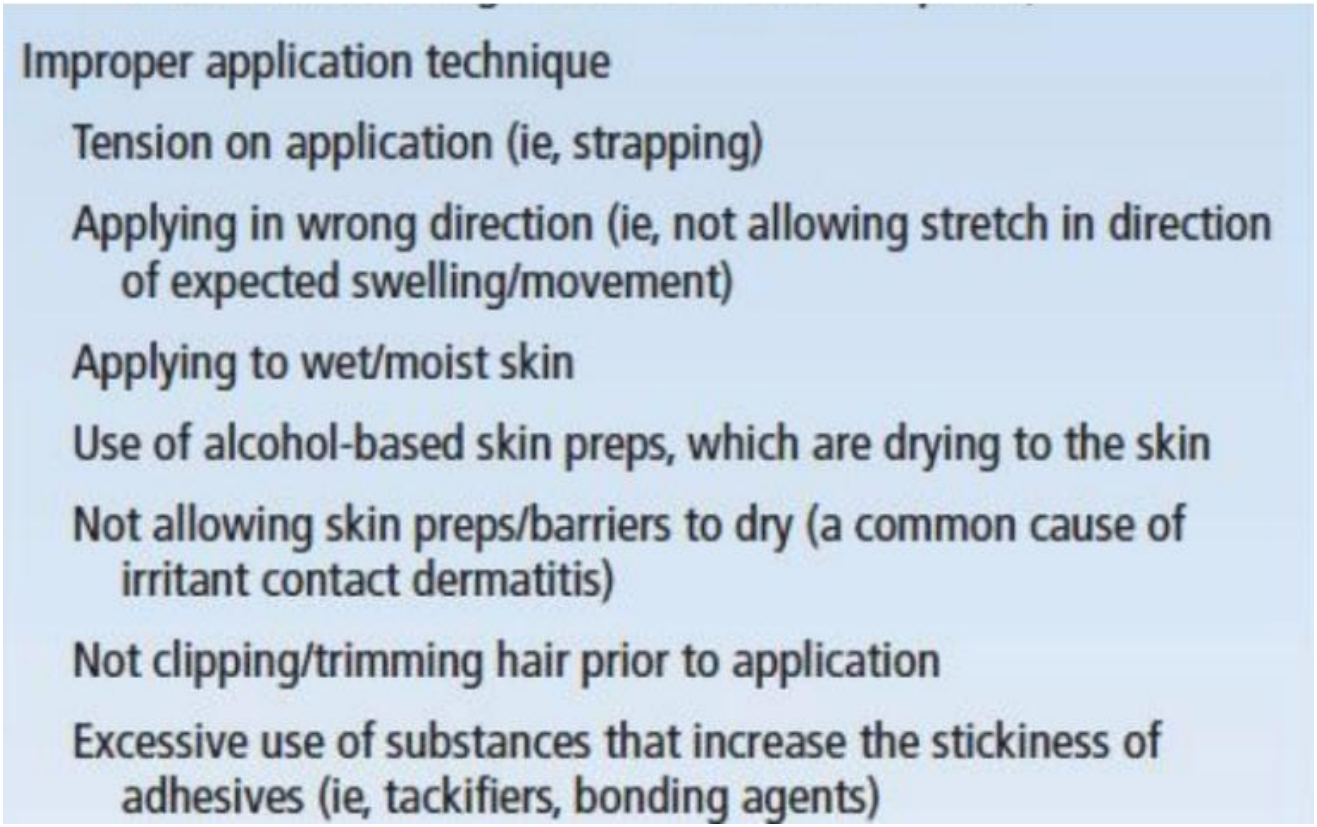
Medical adhesive-related skin injury (MARSI)

- Improper choice of tape
  - Using tape with excessive adhesion for the purpose
  - Wrong choice of tape (ie, not using a tape with stretch for an area where swelling or movement is anticipated)
- Improper application technique
  - Tension on application (ie, strapping)
  - Applying in wrong direction (ie, not allowing stretch in direction of expected swelling/movement)
  - Applying to wet/moist skin

Table 1: Level of adhesion consideration

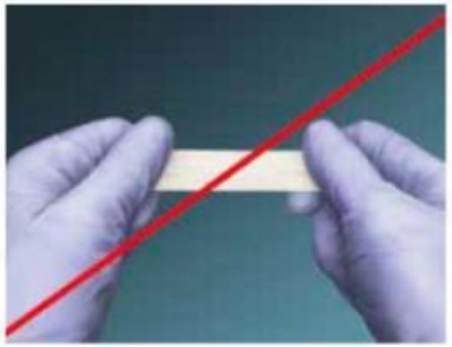
Critical securement	Multipurpose	Gentle to skin
Securing medical devices Heavy tubing (e.g. endotracheal tube, chest tube nasogastric tube)	Securing medical devices (e.g. ostomy bag) Immobilising body parts	Anchoring dressings Lightweight tubes/devices (e.g. IV)
		
← Higher level of adhesion	Moderate level of adhesion	Lower level of adhesion →

Medical adhesive-related skin injury (MARSI)



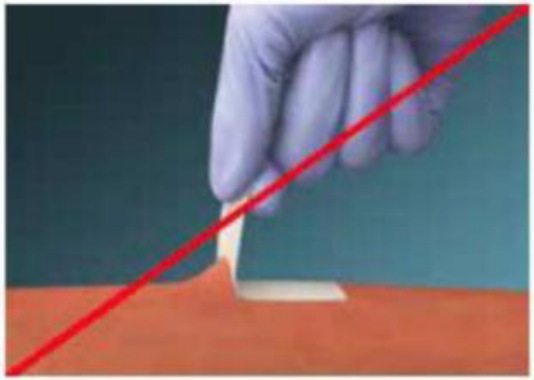
Preventing MARSI

Medical adhesive-related skin injury (MARSI)



Application tips

- Tape should not be pulled or stretched when applied.
- Minimize touching adhesive surface to retain adhesive levels.
- Avoid gaps and wrinkles that can allow moisture to get between the tape and the skin, tubing or dressing.
- Do not encircle a limb completely with tape.
- If swelling occurs, loosen and replace tape. 3M™ Kind Removal Silicone Tape can be repositioned without compromising adhesion.
- When securing dressings, tape should extend a minimum of one-half inch (one inch is preferred) beyond the edge of the dressing to hold the dressing in place.



4. Pulling tape at a vertical angle (perpendicular) to the skin will pull at the epidermis, increasing the risk of MARSI.
5. As tape is removed, continue to support the skin at the peel line.

Tip: For tape that is strongly adhered to skin or hair, consider using a medical grade adhesive remover or moisturizer to soften the adhesive along the peel line (peel edge).

VAD stabilization

Medical adhesive-related skin injury (MARSI)

Peripheral or central venous accesses must be stabilized and fixed using stabilization devices engineered for this purpose (engineered stabilization device, ESD).

- Skin-adhesive devices
- Dressing-integrated systems
- Subdermal fixation devices

Inadequate stabilization can result in inadvertent dislocation of the catheter, which frequently necessitates early loss of venous access due to complications.

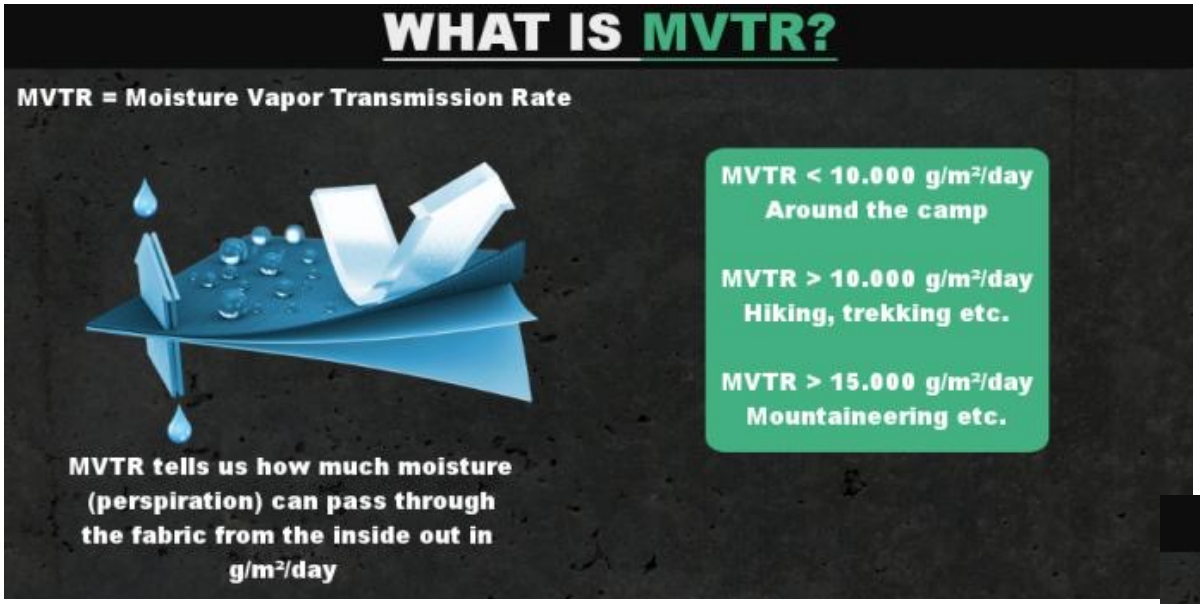
INS 2016

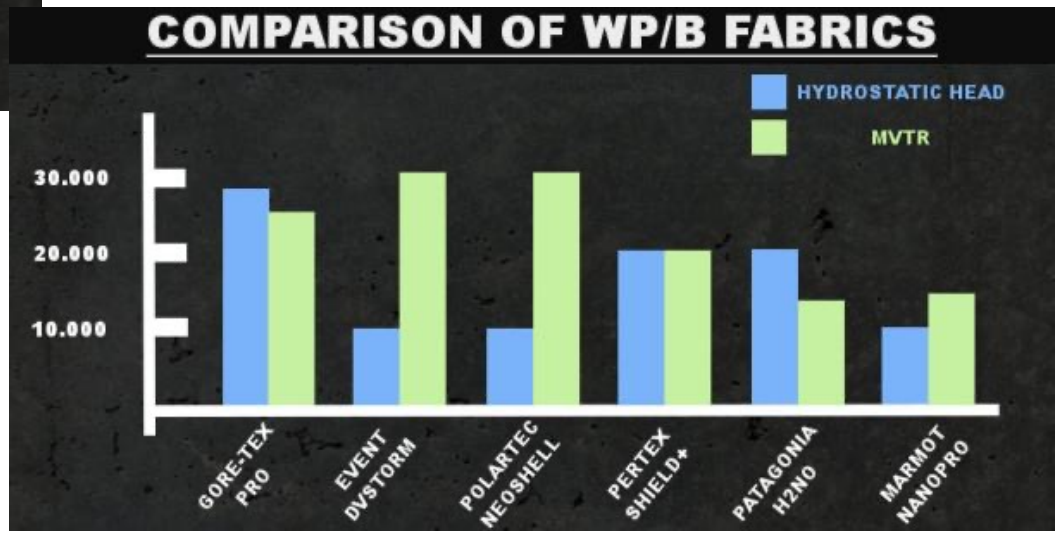
Integrated Medication system

Medical adhesive-related skin injury (MARSI)

- Easy to apply
- Stays securely in place for long wear times that meet hospital protocols (up to 7 days for central lines, and up to 96 hours for peripheral catheters)
- Easy to remove
- Exceptionally high moisture vapour transmission rate (MVTR)
- Adhesive is non-irritating, non-sensitising and non-cytotoxic
- Transparent window allows continuous site visibility

Medical adhesive-related skin injury (MARSI)





Integrated Medication system

Medical adhesive-related skin injury (MARSI)

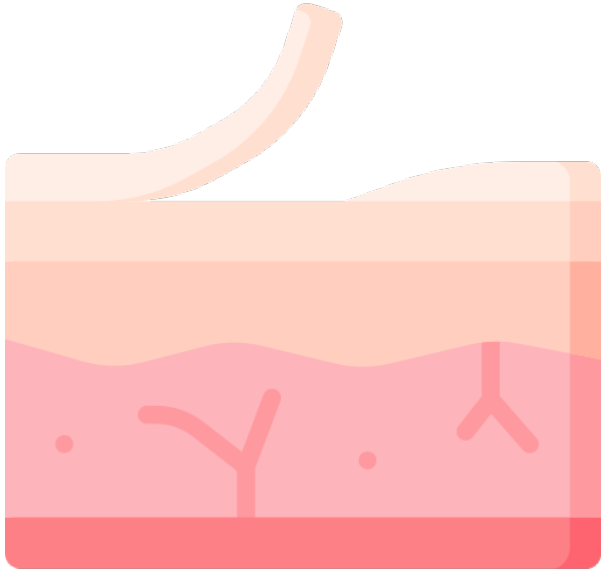
Dressing type	Trade name	Manufacturer	Thickness (mm)	WVTR (g m $^{-2}$ d $^{-1}$) (at 24 h)	
				0.4 m s $^{-1}$	Static
Hydrocolloid	Biofilm®	CliniMed Ltd	1.79 ± 0.09	6512 ± 445	2892 ± 337
	Comfeel®	Coloplast A/S	1.27 ± 0.11	285 ± 8	308 ± 16
	Dermiflex®	Johnson & Johnson	2.41 ± 0.05	76 ± 5	90 + 10
	Duoderm®	ConvaTec Ltd	1.93 ± 0.10	889 ± 49	886 ± 60
	Duoderm CGF®	ConvaTec Ltd	2.27 ± 0.08	120 ± 19	*
	Granuflex E® Extra Thin	ConvaTec Ltd	0.50 ± 0.05	216 ± 6	205 ± 10
	IntraSite®	Smith & Nephew	1.29 ± 0.08	357 ± 29	354 ± 42
	Metoderm®	ConvaTec Ltd	2.92 ± 0.20	809 ± 19	823 ± 45
	Restore Cx®	Hollister Inc.	1.19 ± 0.08	476 ± 18	482 ± 69
	Tegasorb®	ConvaTec Ltd	2.10 ± 0.15	136 ± 15	*
	Ultec®	Sherwood Med	1.10 ± 0.02	534 ± 63	*
Hydrogel	Geliperm®	Geistlich Ltd	1.13 ± 0.19	9009 ± 319	*
	Vigilon® (no films)	Bard	1.13 ± 0.17	9360 ± 34	*
	Vigilon® (+1 film)	Bard	1.16 ± 0.17	50 ± 19	*
Film	Bioclusive®	Johnson & Johnson	0.077 ± 0.01	394 ± 12	*

*Not selected for test under static condition.

Integrated Medication system

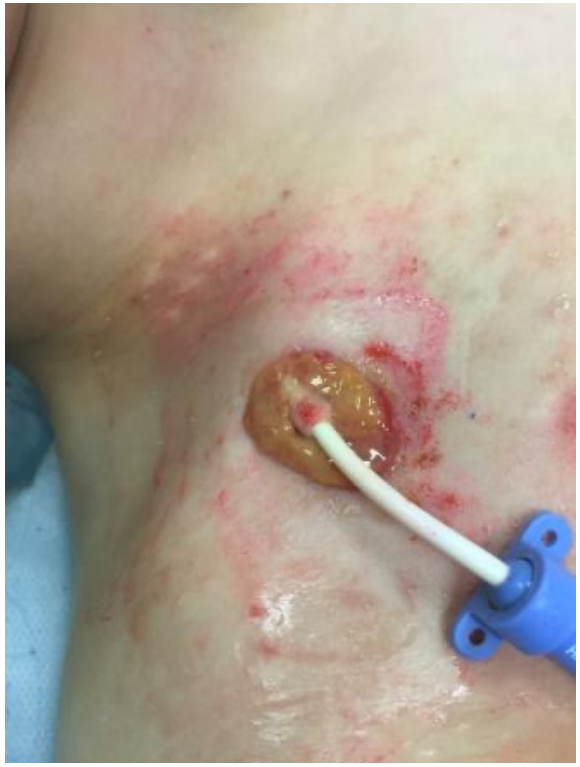
Medical adhesive-related skin injury (MARSI)

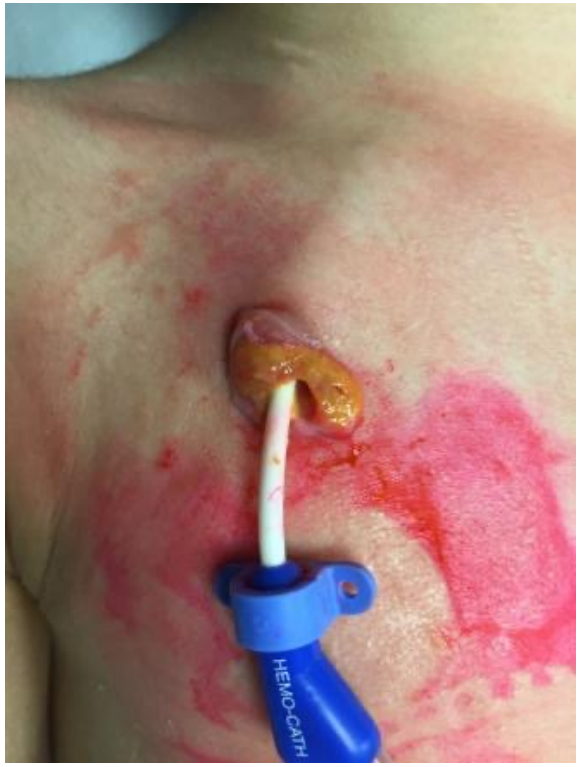
- **Multipurpose use**
- Well tolerated by the patients
- Easy dressing procedure

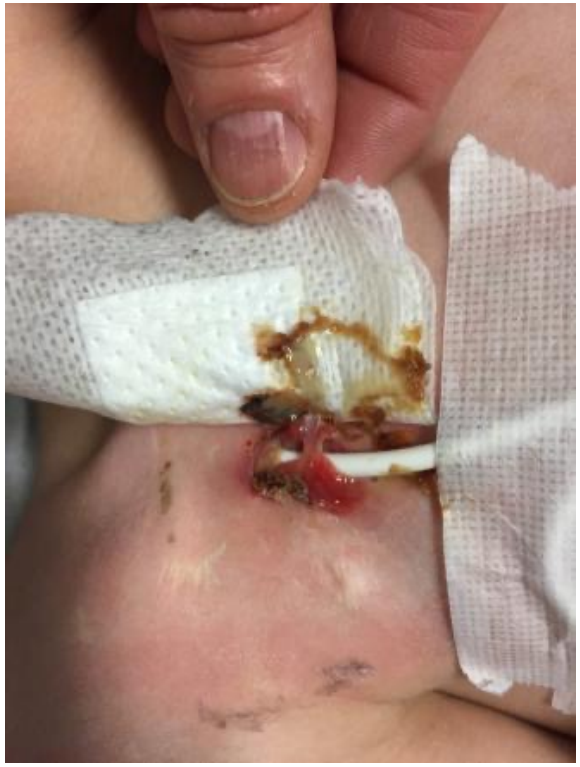


In Children

Medical adhesive-related skin injury (MARSI)

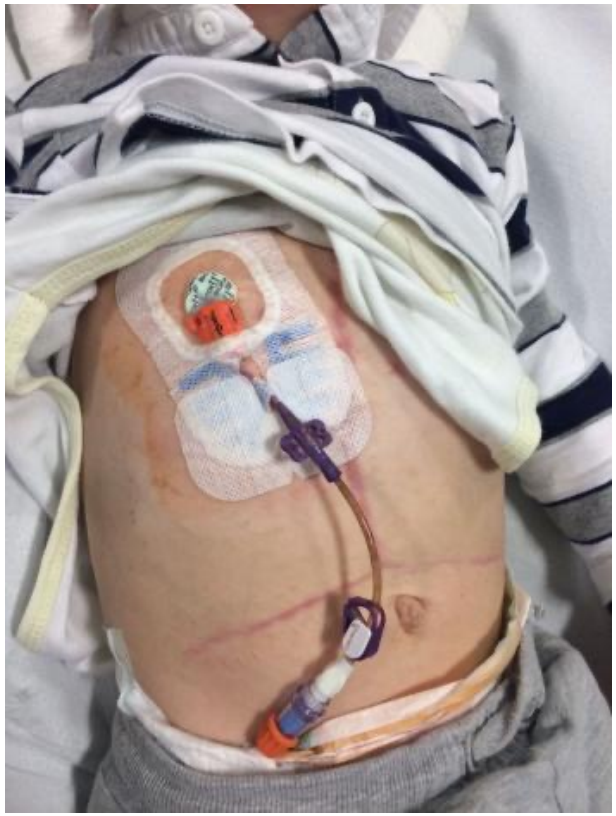


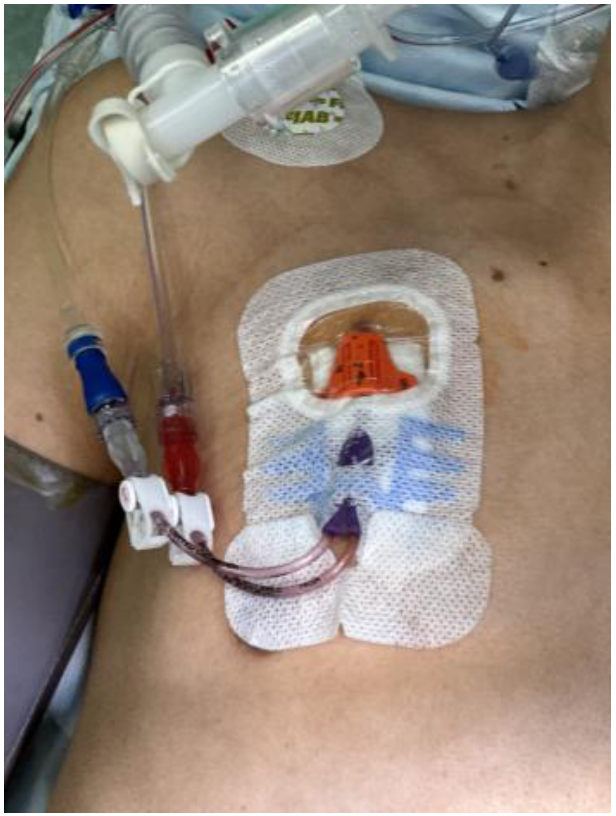


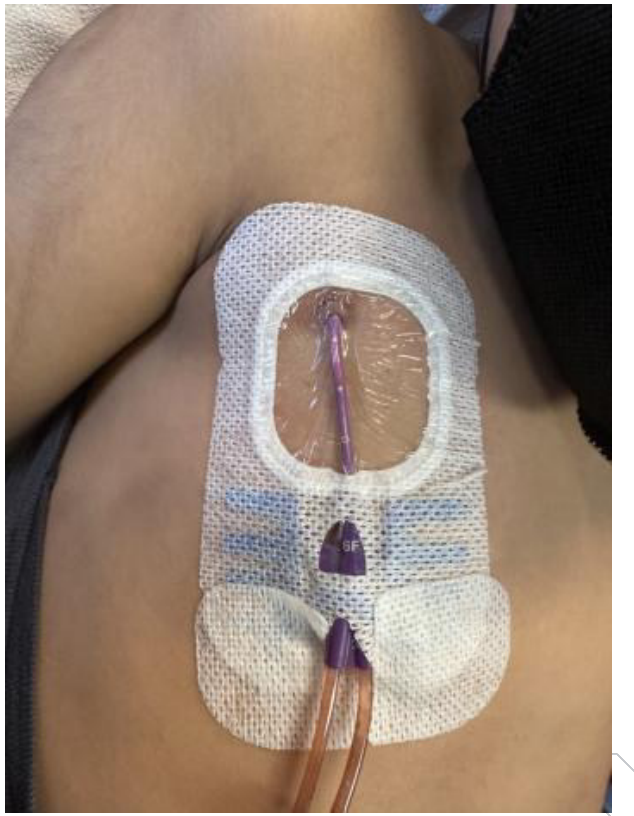


In Children

Medical adhesive-related skin injury (MARSI)

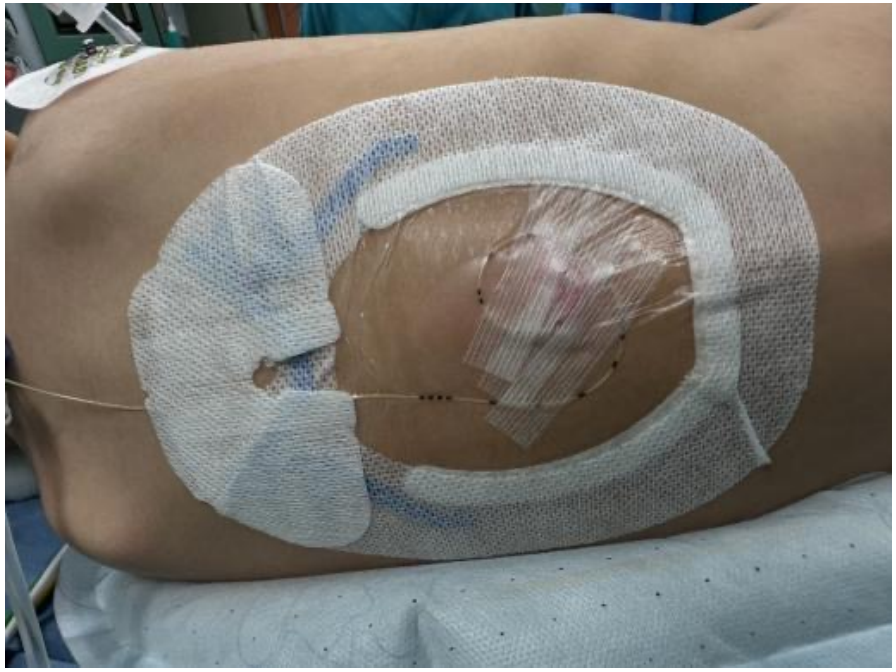


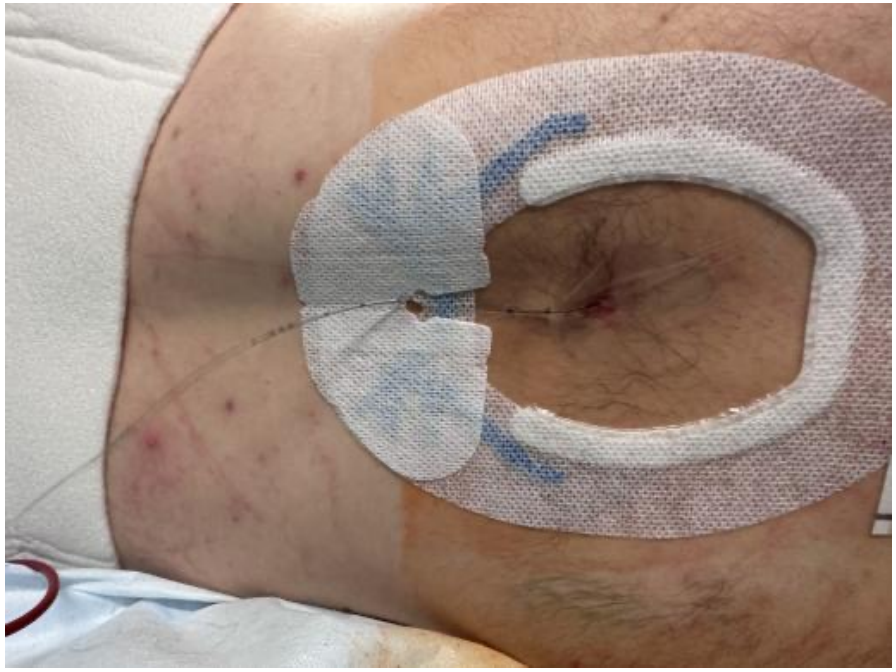




In Children

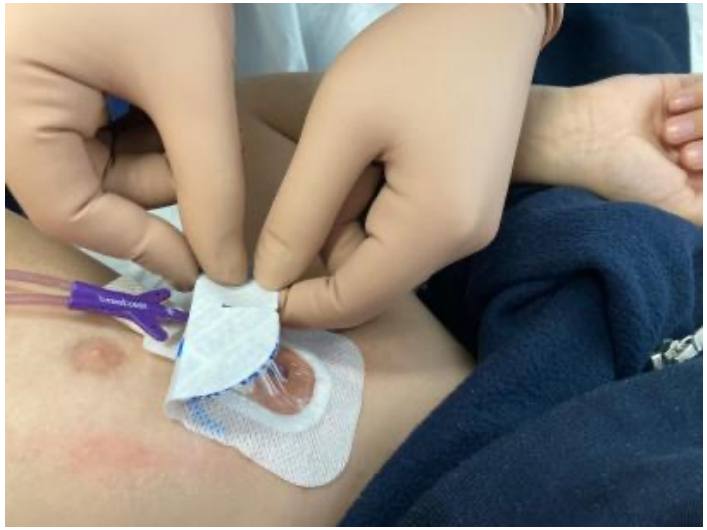
Medical adhesive-related skin injury (MARSI)

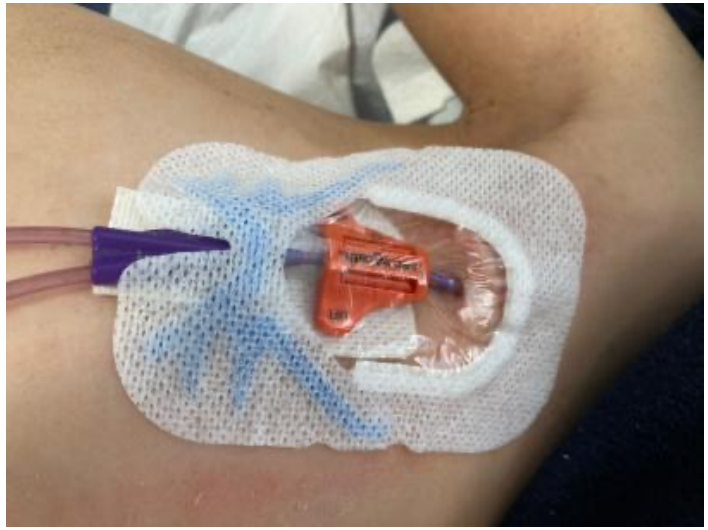




In Children

Medical adhesive-related skin injury (MARSI)





THANK YOU

GAVeCeLT
Gli Accessi Venosi Centrali a Lungo Termine

V Convegno Nazionale
GAVePed
2023 RIMINI
15-16 Maggio

Organizzazione e training

GAVePed
Gruppo Accessi Venosi Pediatrici

Stravaso negli accessi periferici neonatali medicazioni home made e medicazioni integrate

Vito D'Andrea

VAD failure rate

25% per i CVC; 30-40% per AVP

Ciò è legato a:

- Occlusione
- Dislocazione
- Rottura
- Stravaso
- Flebite
- Trombosi
- Leakege
- Infezione sistemica

McGee and Gould, 2003; Bolton, 2010; Rickard et al, 2010; Chopra et al, 2013; Ullman et al, 2015

VAD failure rate

AVP	%	CVC	%
Flebite	14,7-16,1	Infezione	0,4 -4,1 per 1000 GC
Infiltrazione	15,7-33,8	Migrazione	4,2
Infezione	0,18	Trombosi	1-5
Occlusione	2,5- 32,7	Occlusioni	2,4-7,4
Dislocazione	3,7-50	Complicanze al sito di inserzione	7-24

Cyanoacrylate tissue adhesive: a new tool for the vascular access toolbox. Jackie Nicholson. British Journal of Nursing, 2019

Il fissaggio ideale:

- Ridurre i movimenti dell'accesso vascolare all'interno del vaso (pistoning; "in and out")
- Ridurre i movimenti dell'accesso vascolare all'esterno (mantenendolo nella vena)
- Fornire una barriera alla contaminazione batterica
- Facilitare la traspirazione della cute (alto MVTR specie nel neonato pretermine)
- Prevenire il sanguinamento
- Garantire una chiara e semplice valutazione del sito di inserzione
- Minimizzare il trauma sulla cute
- Essere comfortevole
- Poco costoso
- Facile da applicare

Tissue adhesive for vascular access devices: who, what, where and when? Amanda Corley. British Journal of Nursing, 2017

TABLE 1 Guidelines for Vascular Access in Preterm Infants <33 Weeks' Gestation

Gestation	UVC	UAC	PIV
≤26 wk	Recommended	Recommended	
27–28 wk	Recommended	Recommended for selected cases[a]	
≥29 wk	Avoid except in selected cases[a,b]	Recommended for selected cases[a]	Recommended

Nurses were to inform the staff neonatologist if PIV could not be established after 4 attempts.

[a] Use only if the patient is intubated and ventilated, or FIO_2 > 40% on continuous positive airway pressure, or the patient is hemodynamically unstable, needing fluid bolus or inotropes.

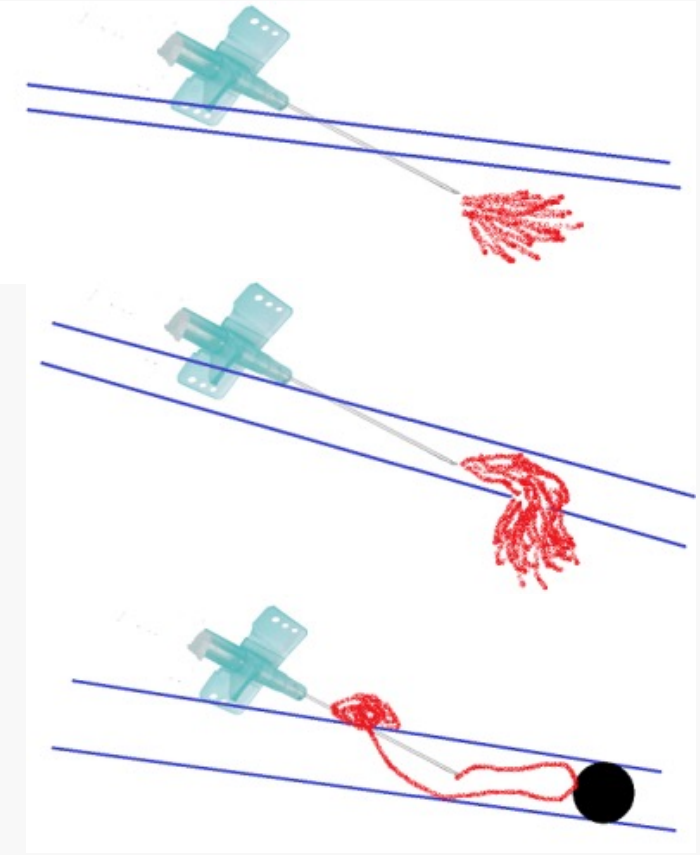
[b] Difficulty establishing PIV access.

Meccanismo dello stravaso/infiltrazione:

La punta del catetere perfora la parete del vaso con conseguente infusione della soluzione nel tessuto circostante

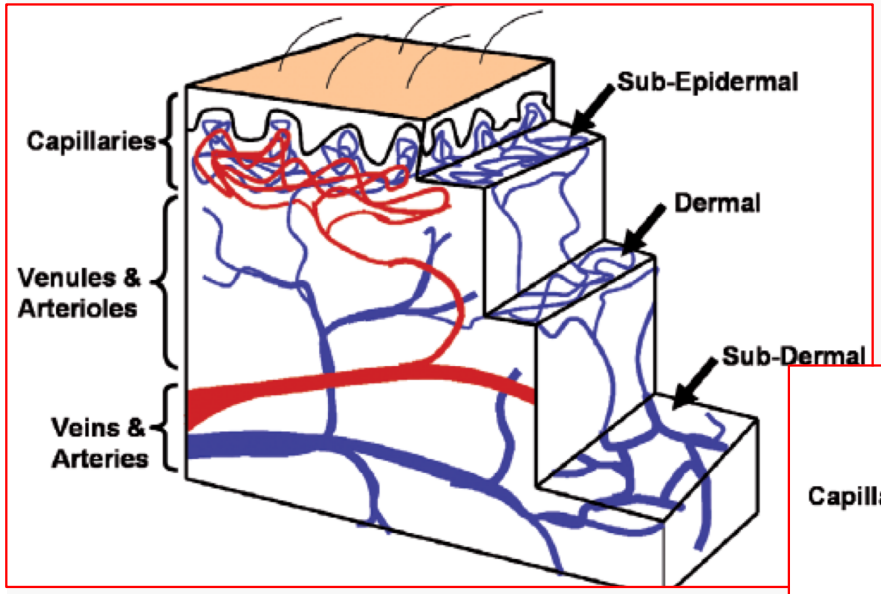
Caratteristiche chimiche intrinseche del farmaco come Osmolarità e pH irritano la parete del vaso portando ad una lesione dello stesso e quindi allo stravaso.

La punta del catetere rimane nel vaso, la vasocostrizione dovuta all'infusato o all'irritazione della parete del vaso, crea una pressione negativa e conseguente dispersione dell'infusato attraverso il foro di inserzione del catetere.

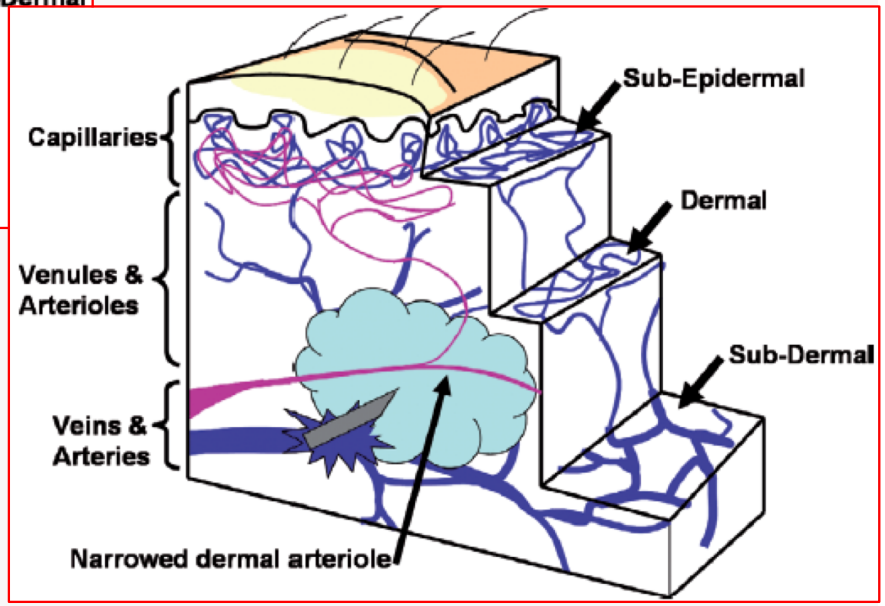


(Koeppel, 2006)(Beall et al., 2013)

FISIOPATOLOGIA DEL DANNO TISSUTALE



La componente arteriosa viene compressa dell'edema provocando ischemia.
Si crea inoltre danno tissutale dato dalle caratteristiche chimiche del farmaco.



BOX 1

Mechanisms of tissue damage from extravasation injuries as recognized by Khan and Holmes (22)

- direct cellular toxicity
- osmotic pressure gradient across the cell membrane
- ischaemic necrosis due to vasopressors and cationic solutions
- mechanical compression
- bacterial colonization and superinfection

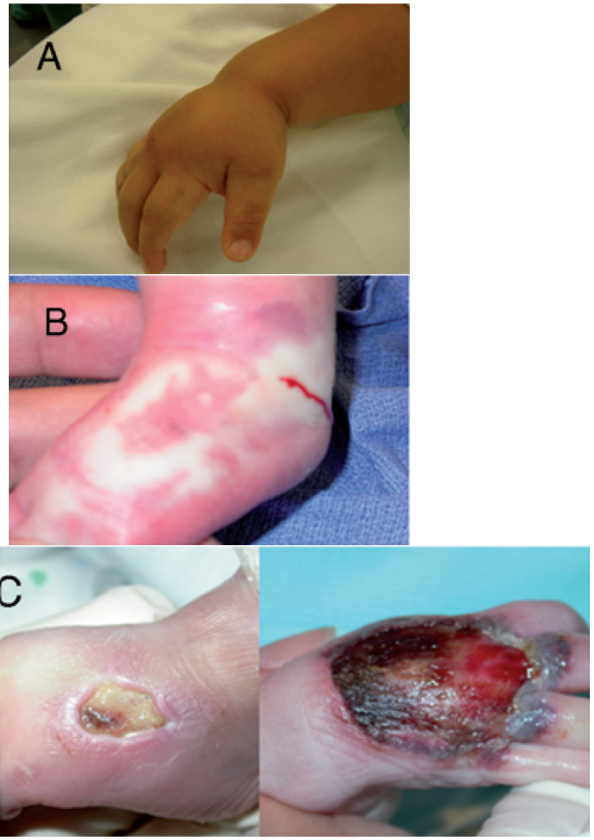
(INS, 2011)

SCALA VALUTAZIONE INFILTRAZIONE/STRAVASO

STADIO II

STADIO III

STADIO IV



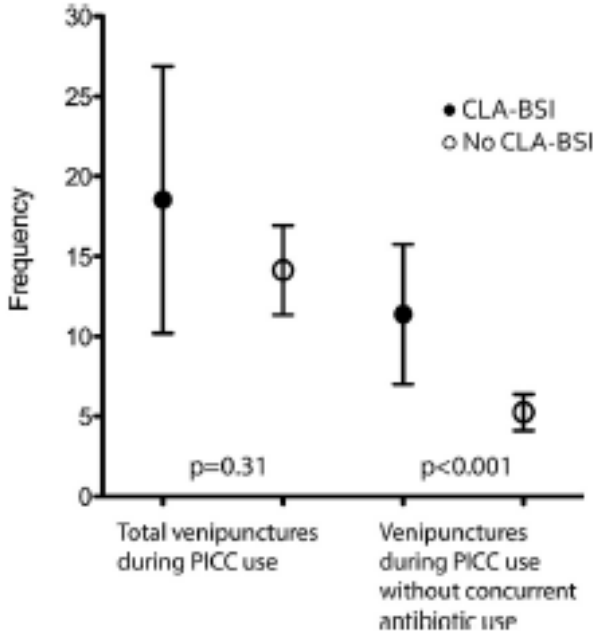
Stadio I	1. Dolore al sito di inserzione 2. No eritema 3. No gonfiore
Stadio II	1. Dolore al sito di inserzione 2. Leggero gonfiore(0-20 %) rispetto all'arto controlaterale 3. No sbiancamento 4. Buon polso arterioso nel sito dello stravaso/infiltrazione 5. Refill Capillare < 2 secondi
Stadio III	1. Dolore al sito di inserzione 2. Marcato gonfiore(30-50 %) rispetto all'arto controlaterale 3. Sbiancamento 4. Cute fredda al tocco 5. Buon polso arterioso nel sito dello stravaso/infiltrazione 6. Refill Capillare <2 secondi
Stadio IV	1. Dolore al sito di inserzione 2. Marcato gonfiore(>50 %) rispetto all'arto controlaterale 3. Sbiancamento 4. Cute fredda al tocco 5. Diminuito o polso arterioso assente nel sito dello stravaso/infiltrazione 6. Refill Capillare > 4s 7. Cute lesionata o necrosi

- Perdita accesso
- Sospensione infusionale
- **Dolore**
- Punture multiple

Increased frequency of peripheral venipunctures raises the risk of central-line associated bloodstream infection in neonates with peripherally inserted central venous catheters

Hao-Yuan Cheng [a], Chun-Yi Lu [a], Li-Min Huang [a], Ping-Ing Lee [a], Jong-Min Chen [b], Luan-Yin Chang [a,*]

	Total
Patient number	125
Gestational week[a]	28.7 ± 0.3
Birth bodyweight (g)[a]	1102.9 ± 49.0
Chronological age at PICC insertion (d)[a]	7.5 ± 0.9
ICU duration at PICC insertion (d)	7.6 ± 0.9
Cormobidities (*n*)	
Lung diseases[a]	79 (63)
GI diseases[b]	16 (13)
CHD[c]	66 (53)
CNS diseases[d]	24 (19)
Hydrops fetalis	4 (3)
Renal failure	8 (6)



↑ 16% ogni venipuntura

European Journal of Pediatrics
https://doi.org/10.1007/s00431-018-3234-7

ORIGINAL ARTICLE

Elective replacement of intravenous cannula in neonates—a randomised trial

Li Yen Chin[1] · Timothy A. Walsh[1] · Karen Van Haltren[1] · Laura Hayden[1] · Miranda Davies-Tuck[2] · Atul Malhotra[1,2,3]

	Standard ($n=55$)	Elective ($n=58$)
Infant characteristics		
Gestation (weeks) (median, IQR)	35 (33–39)	36 (33–39)
Male (n, %)	34 (62)	30 (52)
Birth weight (g) (mean, SD)	2571 (947)	2708 (919)

	Standard	Elective	Crude ratio (95% confidence interval)	p value
Intention to treat analysis, participant numbers	55	58		
Any extravasation, per patient (n, %)	33 (60)	28 (48.3)	RR 0.80 (0.57 to 1.13) RD − 0.12 (− 0.30 to 0.07)	0.21
Extravasation event, per 1000 IV hours	7.8	6.1	HR 0.91 (0.55 to 1.5)	0.70
Per protocol analysis, participant numbers	55	45		
Any extravasation, per patient (n, %)	32 (58.2)	24 (53.3)	RR 0.92 (0.65 to 1.30) RD − 0.05 (− 0.24 to 0.15)	0.63
Extravasation event, per 1000 IV hours	7.3	6.5	HR 1.14 (0.66 to 1.96)	0.63

Peripheral intravenous cannula (PIVC) insertion is one of the most common invasive procedures performed in neonates and is frequently associated with adverse events. There are no studies in the neonatal population looking at the possibility of reducing the risk of PIVC-related complications by elective replacement of PIVC. A randomised, non-blinded, control trial was conducted in a tertiary level neonatal unit in Melbourne, Australia, to examine rates of extravasation in neonates with elective replacement of PIVC as compared to standard practice. Neonates born at 32 weeks of gestation or more were randomly assigned to have their PIVC replaced electively (every 72–96 h) or when clinically indicated in a 1:1 allocation ratio after parental consent. Primary outcome studied was rate of extravasation. Secondary outcomes included rates of phlebitis, leakage or spontaneous dislodgement of PIVC. One hundred thirteen infants were enrolled. Extravasation was noted in 33 (60%) of standard practice group vs. 28 (48.3%) of elective replacement (RR 0.80, CI 0.57–1.13, $p=0.21$) infants. Time to first extravasation was similar between the groups (hazard ratio 0.69, CI 0.42–1.15). Extravasation events per 1000 IV hours were also similar between groups. Similar results were seen by both intention to treat and per protocol analyses. There was an increase in leaking rates (HR1.98, CI 1.03–3.81, $p=0.04$) in the elective group, while phlebitis and spontaneous dislodgement rates were similar to standard group.

Conclusion: Elective replacement of PIVC in neonates is not associated with reduction in extravasation rates.

DOI: 10.1097/JPN.0000000000000385

CE Continuing Education

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Efficacy of Vein Visualization Devices for Peripheral Intravenous Catheter Placement in Preterm Infants

A Randomized Clinical Trial

Seda Çağlar, PhD, RN; Funda Büyükyılmaz, PhD, RN; İlkay Bakoğlu, RN; Sevil İnal, PhD, RN; Özgül Salihoğlu, MD

Figure 2. AccuVein AV400.

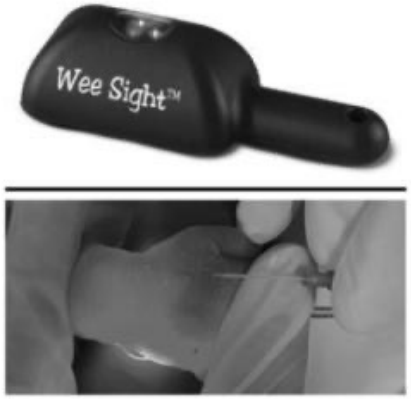


Figure 3. Wee-Sight Transilluminator.

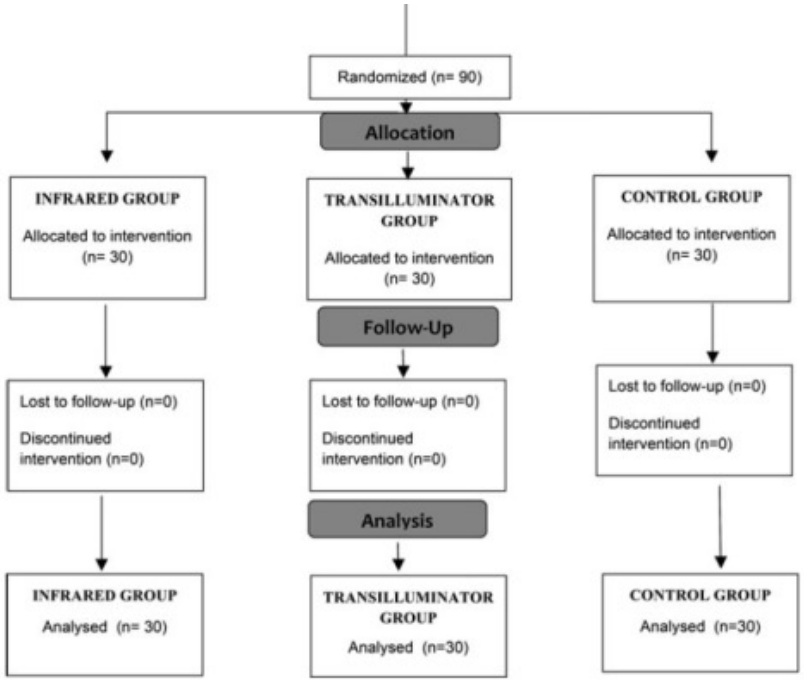


Table 2. **Comparison of the physical parameters and cannulation success of preterm infants (*N* = 90)**

Variables	Transilluminator group (*n* = 30)	Infrared group (*n* = 30)	Control group (*n* = 30)	Statistical test; *P* value
Body temperature, °C				
Preintervention	36.37 ± 0.17	36.46 ± 0.11	36.14 ± 1.78	$F = 0.773$; $P = .465$
Postintervention	36.39 ± 0.17	36.46 ± 0.11	36.44 ± 0.14	$F = 1.605$; $P = .207$
Pulse rate				
Preintervention	142.20 ± 12.75	136.70 ± 14.34	138.93 ± 17.90	$F = 0.999$; $P = .372$
Postintervention	148.00 ± 13.33	139.43 ± 13.57	143.63 ± 16.41	$F = 2.615$; $P = .079$
Respiratory rate				
Preintervention	53.73 ± 8.45	50.13 ± 5.08	50.37 ± 5.80	$F = 2.789$; $P = .067$
Postintervention	58.03 ± 10.56	51.93 ± 5.12	55.27 ± 8.50	$F = 3.991$; $P = .022$
Time to successful cannulation mean ± SD, s	45.27 ± 30.83	8.70 ± 2.56	17.30 ± 8.40	$F = 32.01$; $P = .000$
Success of the first attempt, *n* (%)				
Yes	18 (60)	24 (80)	26 (86.7)	$\chi^2 = 6.26$; $P = .04$
No	12 (40)	6 (20)	4 (13.3)	

Table 3. **Comparison of dwell time and pain scores of preterm infants (*N* = 90)**

Variables	Transilluminator group (*n* = 30)	Infrared group (*n* = 30)	Control group (*n* = 30)	Statistical test; *P* value
Dwell time of PIVC, mean ± SD, d [Min-Max]	1.27 ± 0.45 (1-2)	1.57 ± 0.50 (1-2)	1.27 ± 0.45 (1-2)	$F = 4.10$; $P = .02$
NIPS scores, mean ± SD				
Preintervention	0.17 ± 0.38	0.23 ± 0.43	0.20 ± 0.41	$F = 0.202$; $P = .817$
During seeking appropriate vein	0.60 ± 0.85	0.33 ± 0.18	0.33 ± 0.18	$F = 12.076$; $P = .000$
During cannulating the vein	1.66 ± 0.84	1.33 ± 0.96	1.26 ± 0.64	$F = 2.025$; $P = .138$

J Perinat Neonat Nurs • Volume 33 Number 1, 61–67

Journal of Perinatology (2016), 1–4

www.nature.com/jp

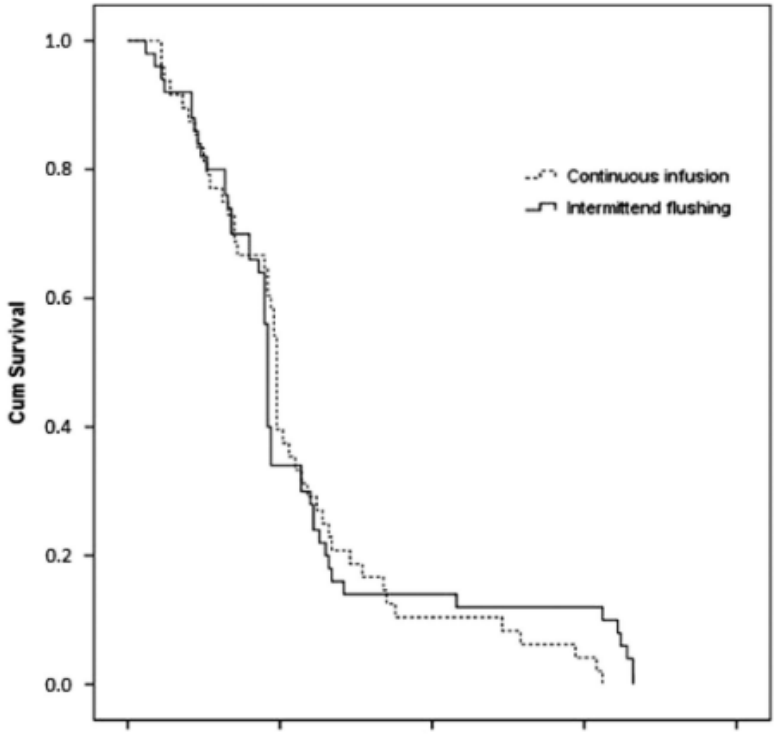
ORIGINAL ARTICLE

Continuous infusion versus intermittent flushing: maintaining peripheral intravenous access in newborn infants

Table 1. Demographic characteristics of cohort 1 (continuous infusion) and cohort 2 (intermittent flushing)

	Cohort 1 (n=48)		*Cohort 2 (n=50)*	
	%	*n*	*%*	*n*
Gender				
Male	58.3	28	56	28
Female	41.7	20	44	22
Gestational age				
Mean (±s.d.)		40+3 (±9 days)		
42–40 weeks	70.8	34	50	25
40–37 weeks	29.2	14	50	25

Complication	*Cohort 1: continuous infusion (n=48)*	*Cohort 2: intermittent flushing (n=50)*
	n (%)	*n (%)*
No complication	27 (56)	39 (78)
Infiltration	13 (27)	4 (8)
Phlebitis	4 (8)	0 (0)
Occlusion	3 (6)	3 (6)
Loss of function due to manipulation	1 (2)	4 (8)



Original research article

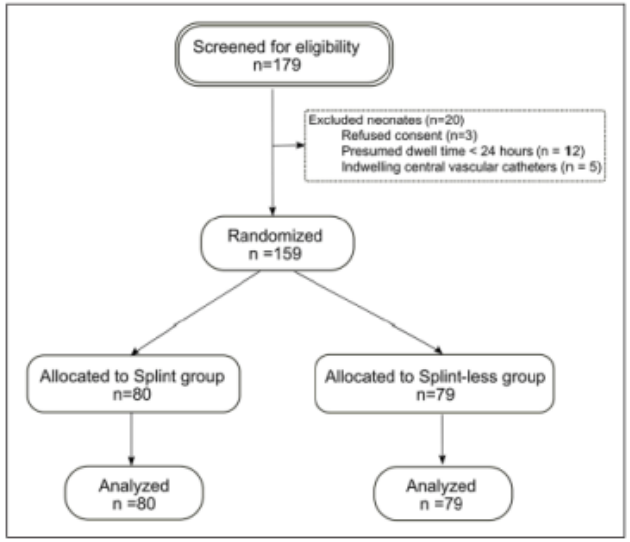
JVA | The Journal of Vascular Access

Peripheral intravenous cannulae in neonates: To splint or not?

The Journal of Vascular Access
1–5

DOI: 10.1177/1129729821996926
journals.sagepub.com/home/jva
SAGE

Tiroumourougane Serane V[1], Rathnapratheep Rajasekaran[2], Vijayasankar Vijayadevagaran[1] and Bhuvaneswari Kothendaraman[3]



Parameter	Range	Splint (%)	No splint (%)
Study population		80 (50.3)	79 (49.7)
Sex	Boys	51 (32.1)	30 (18.9)
Gestational age (weeks)	≤34	30 (18.9)	49 (30.8)
	35–36	18 (11.3)	12 (7.5)
	≥37	32 (20.1)	18 (11.3)
Weight (grams)	<1500	10 (6.3)	28 (17.6)
	1500–2500	38 (23.9)	25 (15.7)
	>2500	32 (20.1)	26 (16.3)
Place of delivery	Outborn	45 (28.3)	34 (21.4)
Site of insertion	Hand	55 (34.6)	50 (31.4)
	Forearm	4 (2.5)	10 (6.3)
	Foot	14 (8.8)	10 (6.3)
	Leg	7 (4.4)	9 (5.7)
Inserting person	Doctor	17 (10.7)	39 (24.5)
	Senior staff nurse	57 (35.8)	31 (19.5)
	Staff nurse	6 (3.8)	9 (5.7)
Crossing a joint	Yes	27 (17.0)	31 (19.5)
	No	53 (33.3)	48 (30.2)
Purpose of vascular access	Intermittent	3 (1.9)	2 (1.3)
	Continuous	77 (48.4)	70 (44.0)
	Parenteral nutrition	0 (0)	7 (4.4)

Reasons for removal	Splint group (%)	Splintless group (%)	p Value
Extravasation	70 (44)	66 (42)	0.704
Erythema	11 (7)	7 (4)	
Palpable cord	3 (2)	2 (1)	

Results: Out of 159 neonates, 80 were allotted to splint group and the rest to splint-less group. Mean dwell time of intravenous line in splint group was 27.68 ± 13.03 h which was significantly less than in splint-less group (32.87 ± 15.79 h, mean difference: 5.11 h, *p* value: 0.03). Subgroup analysis in preterms showed mean dwell time of 28.54 ± 14.86 h in splint group which was less than that of splint-less group (35.10 ± 16.24 h) (*p* value: 0.03). No such difference was noted in the term neonates. Subgroup analysis for catheters put across joints does not show difference in mean dwell times between splint and splint-less groups. Multivariate regression analysis did not identify any variable which independently affected the outcome.

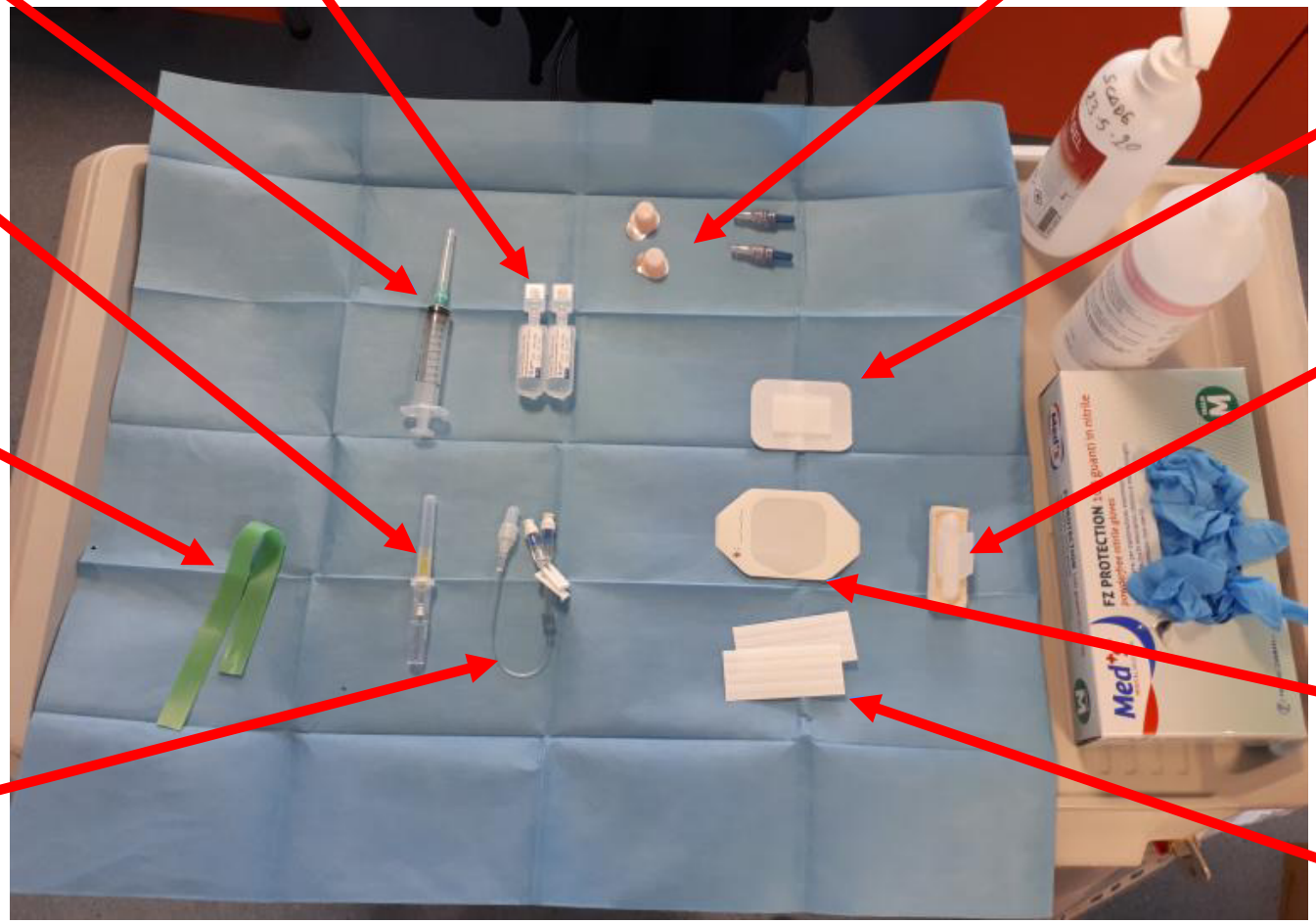
Conclusion: Use of splint does not prolong the dwell time of the catheter and is probably harmful in some neonates.

Essere neonato è un fattore di rischio indipendente

Siringa 10 ml

SF fiala

Tappini a Valvola + PortProtector



Cerotto Premedicato Sterile

AgoCannula 24 G

Applicatore Monouso Sterile di Clorexidina 2 % in IPA 70 % *(Chloraprep)*

Laccio Emostatico

Medicazione Trasparente Semipermeabile *(Tegaderm)*

Prolunga 2 Vie

SteriStrip Sterili

34. VASCULAR ACCESS DEVICE PLACEMENT

Practice Recommendations

I. PIVCs: Short PIVCs, Long PIVCs, and Midline Catheters

F. Adhere to principles of Standard-ANTT or Surgical-ANTT with PIVC insertion based upon the assessment of the complexity of insertion.
   1. Use Standard-ANTT for simple PIVC insertion.
      a. Don a new pair of disposable, nonsterile gloves in preparation for PIVC insertion; do not touch/palpate the insertion site after skin antisepsis.[26-31] (IV)
      b. If repalpation of the vein is required after skin antisepsis, use sterile gloves for palpation and insertion and adhere to the principles of Surgical-ANTT to prevent recontamination of the insertion site. Contamination of nonsterile gloves is well documented.[3,32-35] (I)

G. Restrict PIVC insertion attempts to no more than 2 attempts per clinician at PIVC insertion. Multiple unsuc-
   1. After 2 unsuccessful attempts, escalate to a clinician with a higher skill level and/or consider alternative routes of medication administration. (Committee Consensus)

Contents lists available at ScienceDirect

Journal of Pediatric Nursing

S.T.I.C.K.: A Quality Improvement Pediatric IV Infiltration Prevention Bundle

S. Securement

T. TLC (Touch, Look, Compare)

I. Irritants

C. Catheter selection (type, size, location)

K. Keep it? Daily review of necessity

(Watterson et al., 2018)

KEY DEFINITIONS

Adhesive securement device (ASD): an adhesive-backed device that adheres to the skin with a mechanism to hold the VAD in place; a separate dressing is placed over the ASD. Both the dressing and ASD must be removed and replaced at specific intervals during the VAD dwell time.

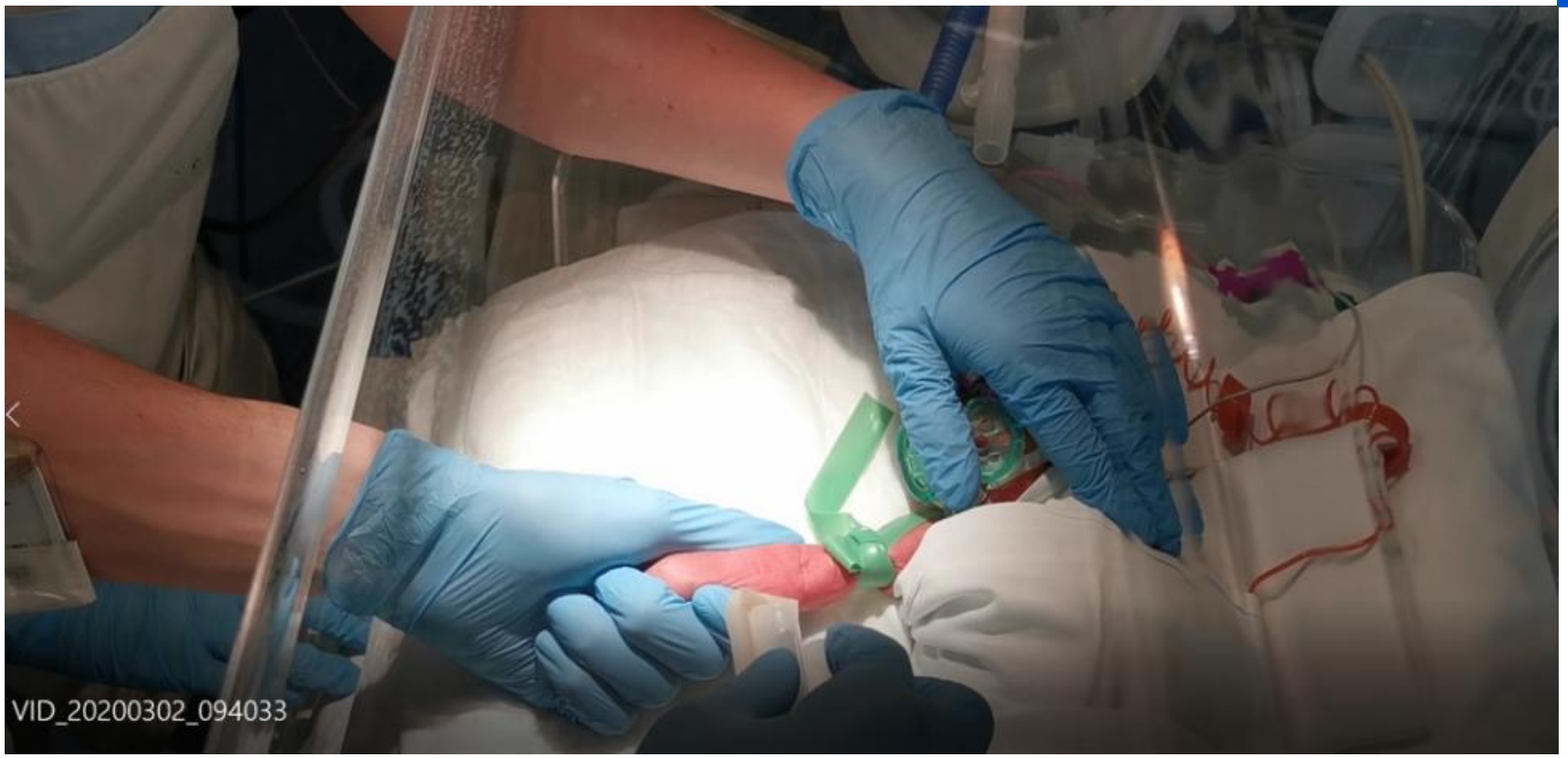
Integrated securement device (ISD): a device that combines a dressing with securement functions; includes transparent, semipermeable window and a bordered fabric collar with built-in securement technology.

Subcutaneous anchor securement system (SASS): a securement device that anchors the VAD in place via flexible feet/posts that are placed just beneath the skin; these act to stabilize the catheter right at the point of insertion. A separate dressing is placed over the SASS. The SASS does not need to be changed at regular intervals when the dressing is changed; it can remain in place if there are no associated complications.

Tissue adhesive (TA): a medical-grade cyanoacrylate glue that can seal the insertion site and temporarily bond the catheter to the skin at the point of insertion and under the catheter hub. TA should be reapplied at each dressing change.

Applicazione Laccio Emostatico

Antisepsi Cutanea con Clorexidina 2% in IPA 70 %

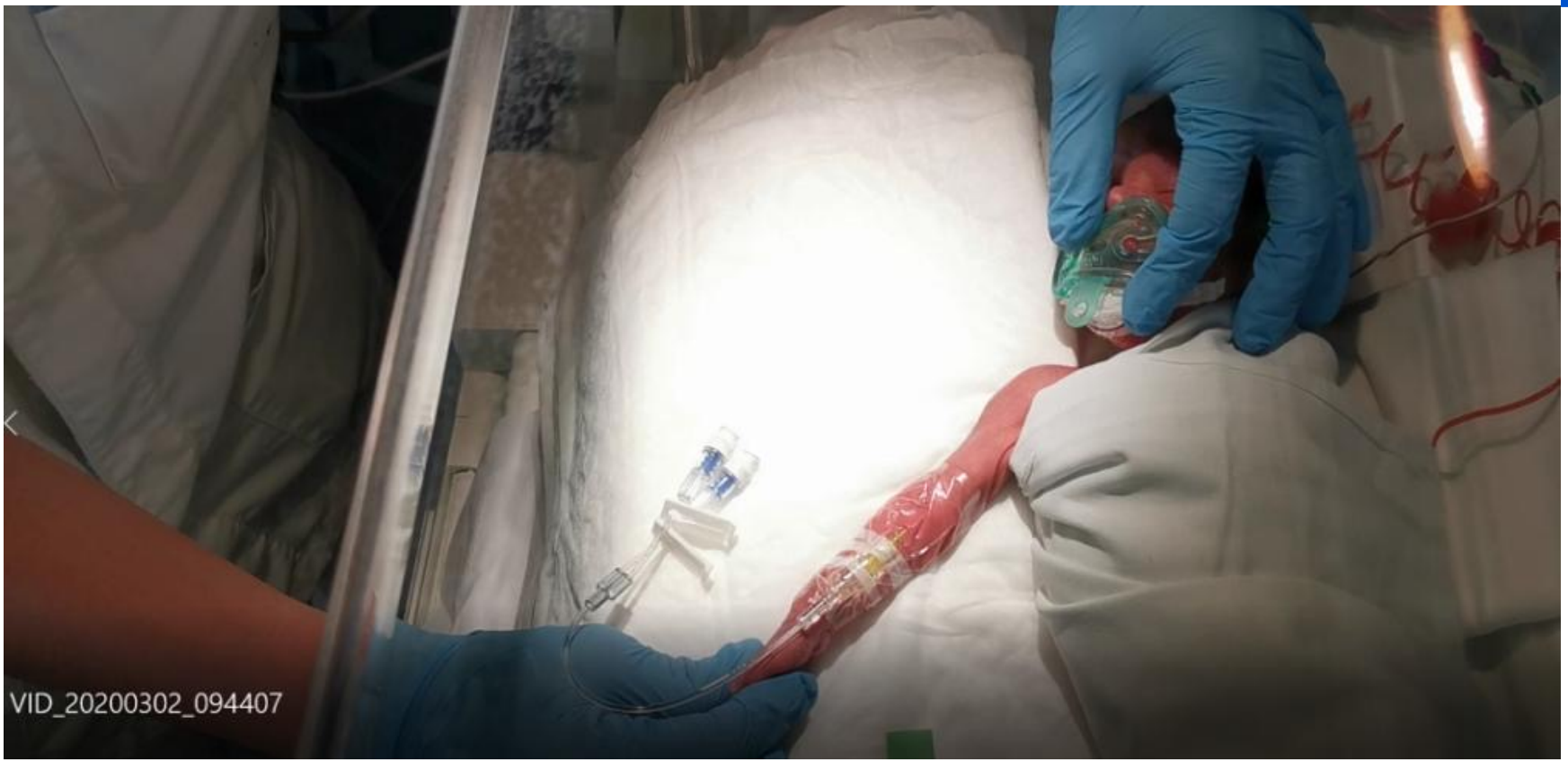


Puntura della Cute

Reflusso di Sangue nella Cannula

Posizionamento Prolunga a 2 vie Preriempita

Applicazione Membrana Trasparente Semipermeabile (Tegaderm)



Apporre Steri-strip di «ancoraggio» per creare un punto di scarico per eventuali trazioni

Allontanano il punto di LEVA per eventuali trazioni e sollecitazioni,
prevenendo precoci dislocazioni del catetere

Lavaggio e Lock del Catetere con SF

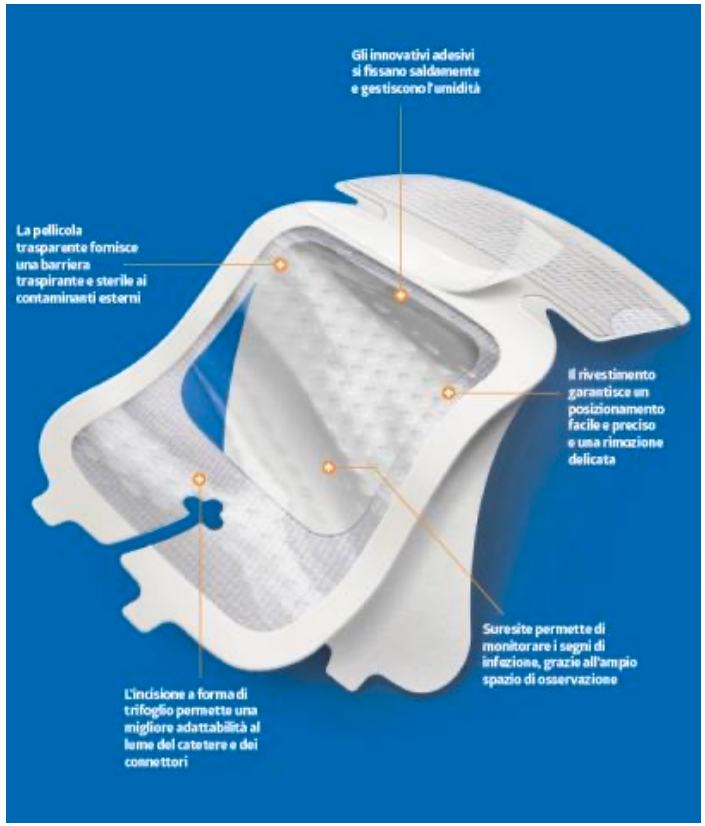
Applicazione Port Protector

- **Punti di Accesso al Catetere Disinfettati**

- **Accesso Venoso Stabile**

(*La TECNOLOGIA FA LA DIFFERENZA, meglio una MEDICAZIONE TRASPARENTE BORDATA del posizionamento di SteriStrip*)

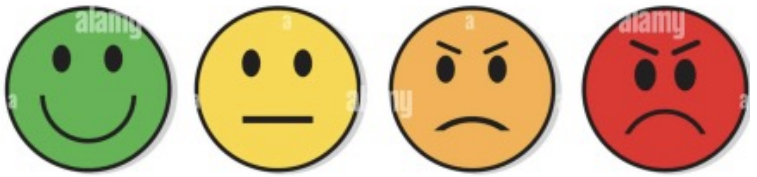
- **Punto di Inserzione Valutabile**



4,45 x 3,81 cm

	50 Home made	75 SureSite
Insertion site		
Dorsum of the hand n (%)	23 (46)	33(44)
Forearm n (%)	12 (24)	18(24)
Foot n (%)	13 (26)	21(28)
Ankle n (%)	2 (4)	3(4)
Monitoring time h	1318	2199
Monitoring time per SPC h	26.4	29.3
Infusate		
10% glucose	23 (46)	39(52)
Parenteral nutrition	27 (54)	36(48)
Infiltrations n (%)	40 (80)	56(74)
Milian score >2 n (%)	3 (7.5)	4(5.3)

Valutazione



- Facilità di applicazione
- Facilità di rimozione
- Capacità di adesione