3M Science. Applied to Life.™

Reducing infection risk at all access points with antimicrobial protection.

A critical issue for every health care facility.

The bad news: Catheter-related bloodstream infections are a critical issue around the world. In Western Europe, it ranges from 1.1 to 4.2 CRBSI per 1,000 catheter days.[1]

The good news: There are ways to prevent these complications and associated costs.

Understanding the terminology.

CRBSI – Catheter-Related Bloodstream Infection (CRBSI requires laboratory confirmation that identifies the catheter as the source of the infection.)

CLABSI – Central Line-Associated Bloodstream Infection (Surveillance methods track the possibility of a central venous catheter infection and record it as a CLABSI. Whilst CLABSI may also include secondary bloodstream infection, almost all of these patients will be recognised as having an infection specifically due to the presence of the catheter.)

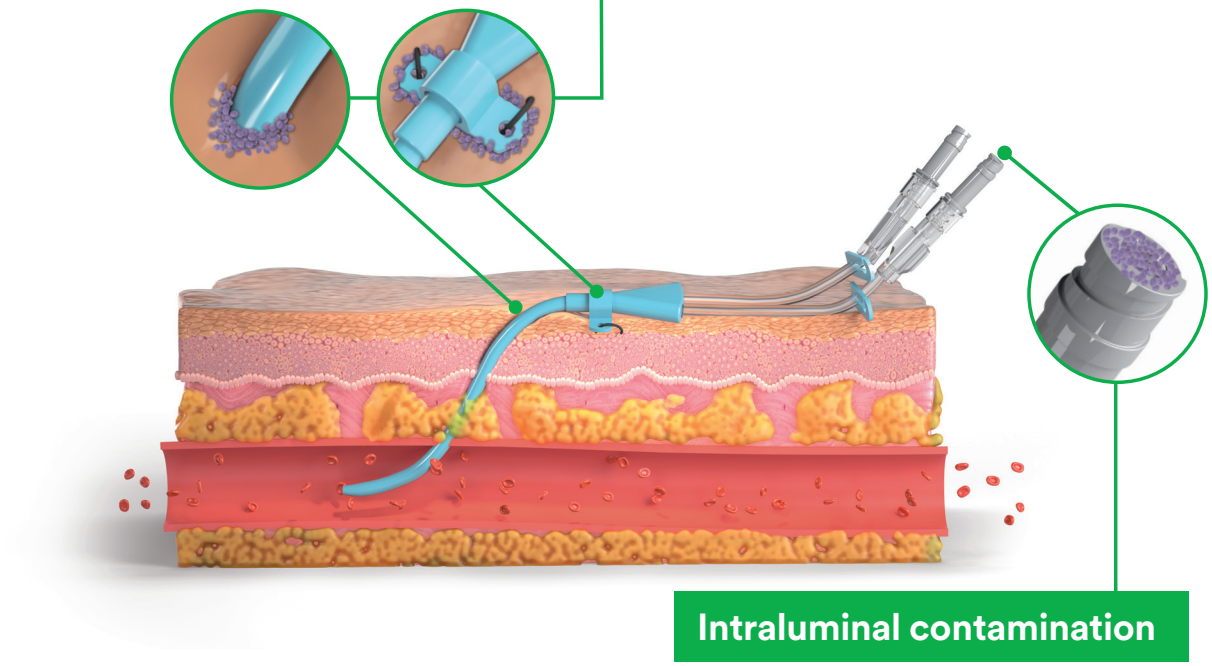
Reduction in vascular-associated infections of central lines will be reflected in reduced rates of CLABSI, CRBSI or both.
Please note: For purposes of this brochure, the term bloodstream infections (BSI) includes, but is not limited to, CRBSI and CLABSI.

Sources of infection.

While vascular catheters provide the advantage of prolonged venous access, they present a risk of infectious complications. In fact, 60% of hospital-acquired bloodstream infections originate from some form of vascular access[2]. These infections can be acquired at the time of the initial insertion or anytime throughout the duration of the venous access. Microbes can enter the bloodstream through multiple access points including:

Extraluminal contamination

Results when bacteria originating on the surface of the skin diffuses along the outside of the catheter and enters through the insertion point.



Intraluminal contamination

Results when bacteria diffuses through the catheter post insertion, typically via contamination of the lumen through the catheter port.

1 Tacconelli E, Smith G, Hieke K, Lafuma A, Bastide P. Epidemiology, medical outcomes and costs of catheter-related bloodstream infections in intensive care units of four European countries: literature- and registry-based estimates. J Hosp Infect. 2009 Jun;72(2):97-103. doi: 10.1016/j.jhin.2008.12.012. Epub 2009 Feb 25.

2 Crnich CJ, Maki DG.The Role of Intravascular Devices in Sepsis. Curr Infect Dis Rep. 2001 Dec;3(6):496-506.

Mortality 1.57 times

CRBSIs are associated with 1.57 times higher risk of mortality in critically ill adults.[3]

1 out of 5

who contract a CLABSI will die.[4]

Hospitalisation

1.9 –14 more days in hospital.[1]

Evidence has demonstrated an increase in hospital resources, and associated costs, required to treat morbidities due to CRBSIs.[5-6]

The consequences of just one bloodstream infections are still considerable, costing up to:

UNITED KINGDOM:

£9,990

per patient[7]

ITALY:

€13,030

per patient[1]

GERMANY:

€29,909

per patient[5]

FRANCE:

€20,200

per episode[8]

The broad range of cost estimation relates to variations on the cost parameters included in calculations.

3 Siempos II, Kopterides P, Tsangaris I, Dimopoulou I, Armaganidis AE. Impact of catheter-related bloodstream infections on the mortality of critically ill patients: A meta-analysis. Critical care medicine. 2009 Jul 1;37(7):2283-9.

4 Cassini A *et al.* Burden of Six Healthcare-Associated Infections on European Population Health: Estimating Incidence-Based Disability-Adjusted Life Years through a Population Prevalence-Based Modelling Study. PLoS Med. 2016 Oct 18;13(10):e1002150.

5 Leistner R, Hirsemann E, Bloch A, Gastmeier P, Geffers C. Costs and prolonged length of stay of central venous catheter-associated bloodstream infections (CVC BSI): a matched prospective cohort study. Infection 2014 42:31-36, doi 10.1007/s15010-013-0494-z.

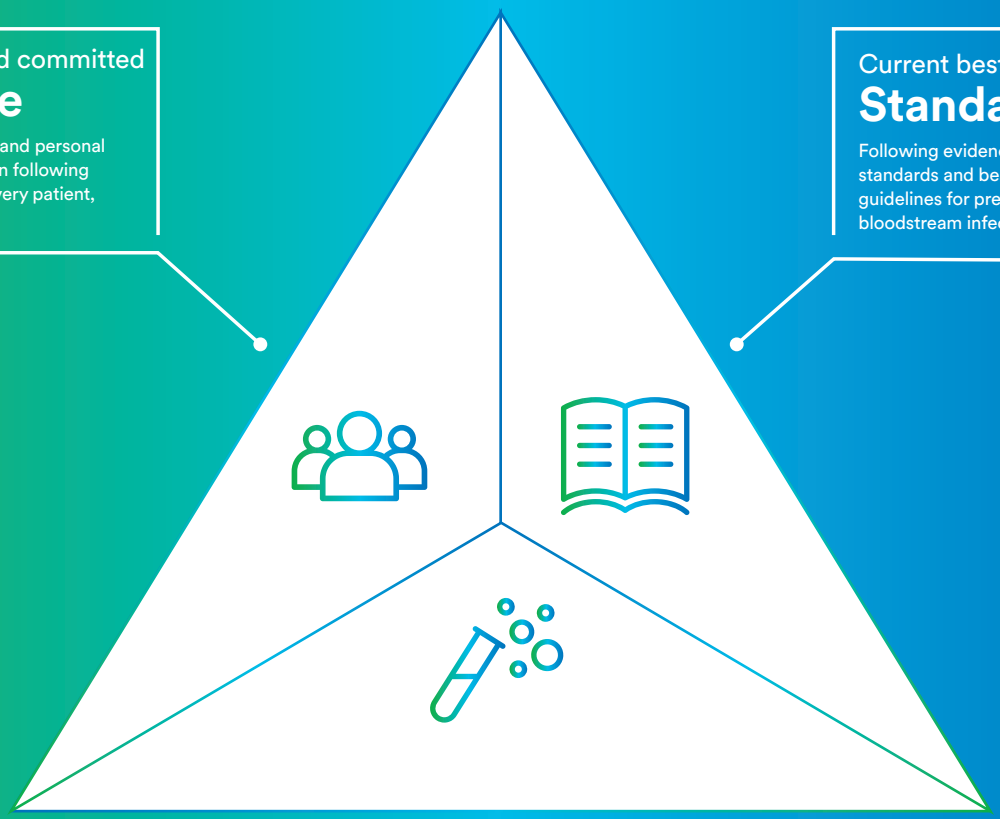
6 Blot SI *et al.* Clinical and economic outcomes in critically ill patients with nosocomial catheter-related bloodstream infections. Clinical Infectious Diseases. 2005 Dec 1;41(11):1591-8.

7 Jenks M, Craig J, Green W, Hewitt N, Arber M, Sims A. Appl Health Econ Health Policy. Tegaderm CHG IV Securement Dressing for Central Venous and Arterial Catheter Insertion Sites: A NICE Medical Technology Guidance. 2016 Apr; 14(2):135-49. doi: 10.1007/s40258-015-0202-5.

8 Schwebel C *et al.* Economic evaluation of chlorhexidine-impregnated sponges for preventing catheter-related infections in critically ill adults in the Dressing Study. Crit Care Med. 2012 Jan; 40(1):11-7. doi: 10.1097/CCM.0b013e31822f0604.

The three keys to reducing infection risk.

Eliminating bloodstream infections cannot be achieved with a single initiative, process or technology. All avenues of infection protection must be explored and implemented. Whether it is the antimicrobial technology found in 3M products or the strict adherence by everyone involved in patient care to consensus recommendations, there are many facets to reducing vascular access infections.

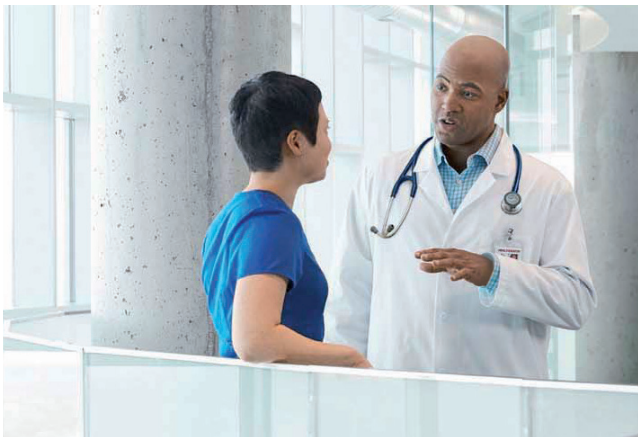


Trained and committed
People
Proper training and personal accountability in following protocols for every patient, every time.

Current best practice
Standards
Following evidence-based standards and best practice guidelines for preventing bloodstream infections.

Effective and proven
Technology
Using the right technology can be associated with decreased risk of bloodstream infections.

3M solutions align with current best practice standards.



Many well-regarded organisations have studied how to best prevent BSI. While each group comes at the problem from a different perspective, there is a consensus around the best practices as they relate to technology. **Specifically, there is agreement on the efficacy of disinfecting port protectors and chlorhexidine gluconate (CHG) dressings.**

INS Infusion Therapy Standards of Practice (2016)

Standard 41: Vascular Access Device (VAD) Care & Dressing Change

Practice Criteria C

- Assess the vascular access device/skin junction site and surrounding area for redness, tenderness, swelling and drainage by visual inspection and palpation through the intact dressing.

Practice Criteria J

- Use CHG impregnated dressings over CVADs to reduce infection risk when extraluminal route is primary source of infection.

Standard 34: Needleless Connectors

Practice Criteria G

- Use of passive disinfecting caps containing disinfecting agent (IPA) shown to reduce intraluminal microbial contamination and reduce rates of CLABSIs. Use of disinfection caps on peripheral catheters has limited evidence but should be considered.

Practice Criterion I

- Ensure that disinfecting supplies are readily available at the bedside to facilitate staff compliance with needleless connector disinfection.

Gorski L, Hadaway L, Hagle ME, McGoldrick M, Orr M, Doellman D. Infusion Therapy Standards of Practice. J Infus Nurs. 2016; 39 (suppl 1): S1-S59.

Royal College of Nursing (RCN) Standards for infusion therapy (2016)

- Use of passive disinfection caps containing disinfecting agents (such as isopropyl alcohol) should be in line with local policies.
- Consider the use of chlorhexidine gluconate impregnated dressings in adult patients with a central venous access device unless the patient has a chlorhexidine allergy.

Royal College of Nursing (2016) Standards for infusion therapy Fourth edition, London, UK.

NICE Accreditation, Medical technologies guidance (2015)

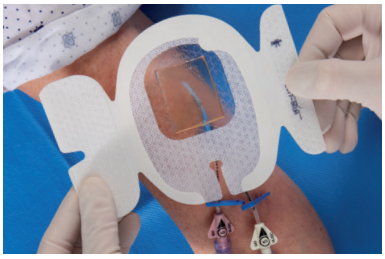
- The 3M Tegaderm CHG IV securement dressing should be considered for use in critically ill adults who need a central venous or arterial catheter in intensive care or high dependency units.

UK National Institute for Health and Care Excellence (NICE), Medical technologies guidance (MTG25), July 2015.

epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England (2016) revised recommendation IVAD20

- Consider the use of a 2% chlorhexidine-impregnated sponge or gel dressing in adult patients with a central venous catheter as a strategy to reduce catheter-related bloodstream infection.

Loveday H.P. *et al.* epic3: revised recommendation for intravenous catheter and catheter site care. Journal of Hospital Infection (Guideline addendum) 92 (2016) 346-348.



Centers for Disease Control and Prevention Checklist for prevention of CLABSI

- Handle and maintain central lines appropriately: For patients 18 years of age or older, use a chlorhexidine impregnated dressing with an FDA cleared label that specifies a clinical indication for reducing CLABSI for short-term non-tunneled catheters unless the facility is demonstrating success at preventing CLABSI with baseline prevention practices.
- Supplemental strategies for consideration: Antiseptic impregnated caps for access ports.

Centers for Disease Control and Prevention. Checklist for prevention of central line-associated bloodstream infections. Available at: https://www.cdc.gov/hai/bsi/bsi.html (accessed August 11, 2017).

Using 3M antimicrobial technology can help prevent bloodstream infections.

The right technology plays an integral role as part of an overall infection protection plan. Even when strictly following best practices for hygiene, aseptic technique and insertion practices, there still remains a risk of infection. Properly deployed antimicrobial solutions offer another line of defense against bloodstream infections (BSI). 3M offers products that protect against both extraluminal and intraluminal contamination.

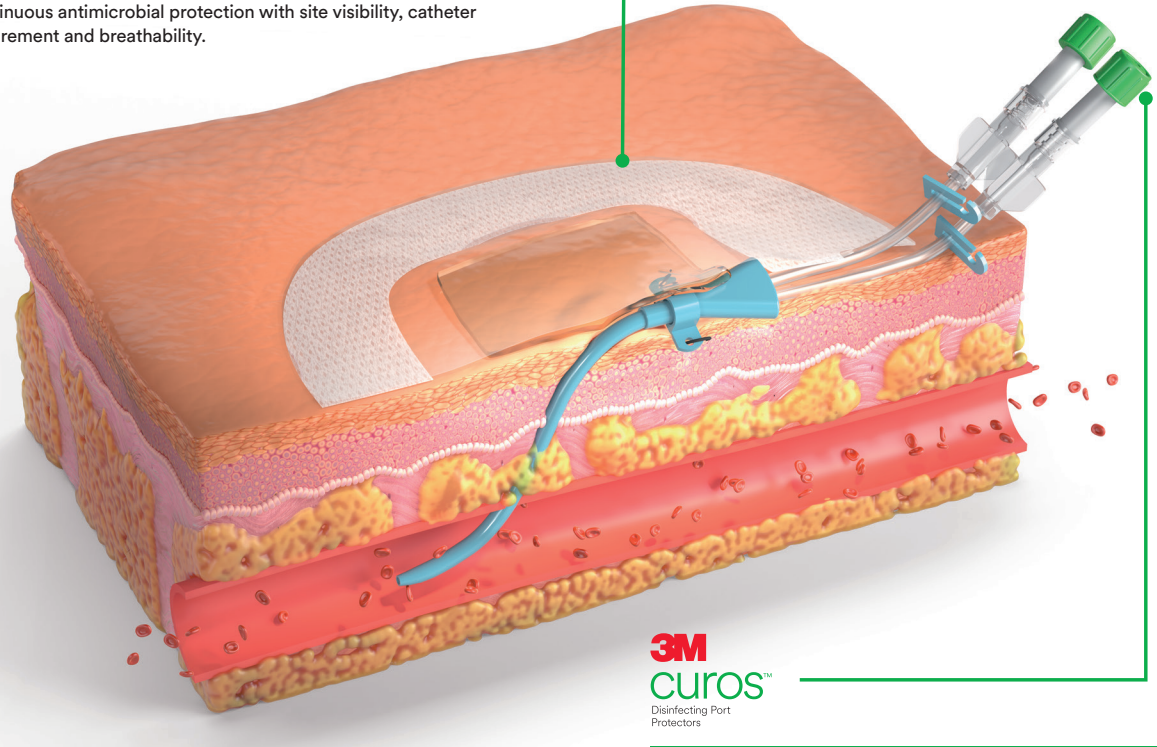
Reducing infection risk at all access points with antimicrobial protection

3M Tegaderm™
Chlorhexidine Gluconate (CHG) I.V. Securement Dressing

Extraluminal contamination

3M™ Tegaderm™ CHG I.V. Securement Dressing

Proven to reduce CRBSI, integrated IV dressing combines continuous antimicrobial protection with site visibility, catheter securement and breathability.



3M curos™
Disinfecting Port Protectors

Intraluminal contamination

3M™ Curos™ Disinfecting Port Protectors

Consistent use of Curos Disinfecting Caps on IV needleless connectors is associated with decreased CLABSI. Disinfect and protect needleless connectors, open female and male luer devices to help reduce the risk of contaminants from entering the catheter post-insertion.

Trained and committed
People

Preventing bloodstream infections takes training and commitment.

Technology alone cannot improve the quality of care. Achieving the intended benefits of 3M products relies on the informed and consistent use of new innovations as well as adherence to consensus best practices – all of which requires on-going training and support.

3M℠ Health Care Academy:

3M Health Care Academy offers online continuing education for healthcare professionals and contains over 50 free courses. This professional training and education resource is dedicated to helping you focus on deepening your expertise and improving patient care.

For more information visit: www.3M.co.uk/elearning

3M Clinical Specialists

The 3M Clinical Specialists can help facilities implement the use of 3M products to achieve and sustain high compliance. Our team consists of nurses dedicated to supporting your efforts. Areas we can assist with include:

- Planning resources and guidance
- Sharing proprietary processes and tools to accelerate adoption and measure your success
- Implementation and large trial support
- Compliance tools for training, motivating and auditing
- On-going training and support
- Point prevalence reviews to help you reduce risk at all access points
- Clinical expertise regarding standards, guidelines and how 3M products can help you achieve successful outcomes

Is your dressing choice improving your patient's outcome?

3M Clinical Specialists and 3M Sales Representatives collaborate with hospital leadership to review and develop site-specific implementation plans that set the stage for long-term success.

We offer highly effective, in-depth training plans and work to develop champions to lead ongoing education efforts that maximise knowledge retention.

We offer customisable tools and metrics for you to monitor, analyze and improve progress, because if you can measure it, you can improve it.

Working with you to achieve positive outcomes – providing access to compliance tools, reference materials and continuing education opportunities.

Right dressing – Right patient – Right line – Right time

3M™ Tegaderm™ CHG Dressings reduce risk of extraluminal contaminants.

In use for over 50 years, CHG has proven to be an effective antimicrobial. CHG skin preps are often used to minimise contamination of the insertion site, but microbes can reside below the surface layers of the skin and regrowth can occur within 24 hours.[9] 3M™ Tegaderm™ CHG I.V. Securement Dressings are clinically proven to reduce CRBSIs in patients with central and arterial catheters by 60% and to reduce skin and catheter colonisation by 61%.[10] The use of CHG-impregnated dressings are a recommended clinical best practice by NICE and supported by INS, RCN, epic3 and CDC guidance.

Only Tegaderm CHG I.V. Securement Dressings go beyond chlorhexidine gluconate by also offering transparency for site visibility, catheter securement and a design that supports standardised application.

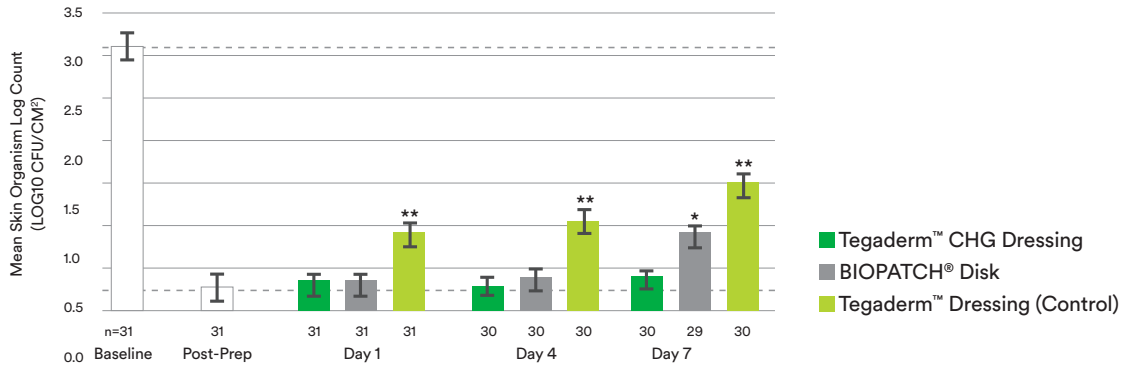
Proven efficacy against 37 strains of microorganisms.

Tegaderm CHG I.V. Securement Dressings have demonstrated *in vitro* antimicrobial efficacy against a broad range of microorganisms. Many of the 37 strains tested were resistant organisms, including MRSA, MRSE, VRE and MDR. Tegaderm CHG I.V. Securement Dressings maintain their antimicrobial properties throughout the shelf-life of the product.[11]

Enterococcus spp. (5 strains) | *Pseudomonas aeruginosa (5 strains)* | *Candida spp. (2 strains)* | *Staphylococcus aureus (8 strains)* | *Escherichia coli (1 strain)* | *Coagulase-negative staphylococci (7 strains)* | *Klebsiella spp. (2 strains)* | *Enterobacter spp. (1 strain)* | *Other (6 strains)*

3M™ Tegaderm™ CHG Dressings suppress skin flora regrowth on prepped skin better than BIOPATCH® Disks with CHG

Mean skin organism log count over time[9]



All pairwise testing done against Tegaderm CHG Dressing using a paired t-test with Holm stopwise adjustment for multiple comparisons.
* p-values <0.01 ** represents p-value <0.001

All you need, all in one.

Tegaderm CHG I.V. Securement Dressings provide four essential elements you need to protect your patients' IV sites in one, easy-to-use product.

Infection reduction

Built-in CHG gel pad provides reliable antimicrobial protection for patients.

Site visibility

Transparent film and gel pad allow continuous visualisation of the insertion site.

Consistent application

Integrated CHG gel pad design ensures dressings are applied correctly and consistently.

Catheter securement

Stabilisation border, keyhole notch and reinforcing tape strips designed to work together to minimise catheter movement or dislodgement.

9 Bashir MH, Olson LK, Walters SA. Suppression of regrowth of normal skin flora under chlorhexidine gluconate dressings applied to chlorhexidine gluconate-prepped skin. Am J Infect Control. 2012; 40(4): 344-8.

10 Timist JF *et al.* Randomized controlled trial of chlorhexidine dressing and highly adhesive dressing for preventing catheter-related infections in critically ill adults. American journal of respiratory and critical care medicine. 2012 Dec 15;186(12):1272-8.

11 Schwab DL, Olson LK, Palka-Santini ME. Growth inhibition of micro-organisms involved in catheter-related infections by an antimicrobial transparent IV dressing containing chlorhexidine gluconate [abstract]. In: the 19th European Congress of Clinical Microbiology and Infectious Diseases, Helsinki, Finland, 16 - 19 May 2009. Clinical Microbiology and Infection, Volume 15, Supplement 4, May 2009, S325-326. Abstract P1194. Poster available at http://multimedia.3m.com/mws/media/587470O/tegaderm-chg-dressing-growth-inhibitions-of-microorganisms.pdf?fn=70-2010-7286-8.pdf

Clinically proven to reduce CRBSI in different patient groups.

Tegaderm CHG I.V. Securement Dressing is the only transparent dressing indicated and proven to reduce CRBSI and vascular catheter colonisation that aligns with evidence-based guidelines and practice standards.

Total parenteral nutrition (TPN)

Proven for TPN patients

- decrease in CRBSI from eight cases to zero (P=0.057)
- useful addition in the goal of zero avoidable CRBSIs within this high-risk group of patients

Madeo M, Lowry L; Journal of Hospital Infection 2011; 79(4):373-374.

Haemodialysis

Proven benefits for patients with tunneled cuffed central venous catheters:

- 86% reduction of CRBSI
- positive impact on savings for regular dialysis use

Righetti M *et al.* J Vasc Access 2016: Sep 21:17(5):417-422.

Critical care

Proven in RCT for patients with central venous and arterial catheters:

- 60% reduction of CRBSI
- 61% reduction of skin and catheter colonization
- cost-effective for regular use in ICU patients requiring vascular access

Timsit JF *et al.* American Journal of Respiratory and Critical Care Medicine 2012:186(12):1272-1278.
Maunoury F, Motrunich A, Palka-Santini M, Bernatchez S. Ruckly S, Timsit JF, PLoS One. 2015 Jun 18;10(6):e0130439. doi: 10.1371/journal.pone.0130439. eCollection 2015.

Haematology

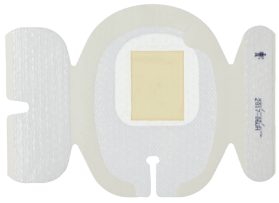
Proven benefits for neutropenic high-risk patients who receive a long-term catheter for administration of intensive chemotherapy:

- 40% reduction in probable/definite central venous CRBSI
- safe for application on oncology patients
- investment on product for regular use outweighed by a lower infection- associated costs

Biehl LM *et al.* Ann Oncol 2016 Oct:27(10):1916-22.
Heimann SM, Biehl LM, Vehreschild JJ, Franke B, Cornely OA, Vehreschild MJGT. American Journal of Infection Control 2018 April, pii: S0196-6553(18)30157-3. doi: 10.1016/j.ajic.2018.03.006 [epub ahead of

3M™ Tegaderm™ Chlorhexidine Gluconate (CHG) I.V. Securement Dressings

The only transparent dressing proven to reduce CRBSI and vascular catheter colonisation. The gel pad provides 2% CHG to the skin surface immediately, without requiring moisture to activate. The integrated design ensures consistent application, aligning with evidence-based guidelines and practice standards.



3M™ PICC/CVC Securement Device + Tegaderm™ CHG I.V. Securement Dressing

An engineered stabilisation device (ESD) plus antimicrobial (CHG) dressing designed to provide continuous antimicrobial protection for up to 7 days.

Antimicrobial I.V. securement dressing

Sutureless securement device

3M™ Tegaderm™ CHG Chlorhexidine Gluconate I.V. Port Dressing

Antimicrobial (CHG) gel pad plus I.V. port dressing specifically designed to protect single or double implanted venous ports and non-coring 'Huber' needles from pathogens most commonly found in CRBSIs.*

I.V. securement dressing

CHG gel pad

* *in vitro* studies show the CHG gel pad is a microbial barrier and protects the insertion site against a variety of gram-positive and gram-negative bacteria and yeast, including organisms most commonly associated with catheter-related bloodstream infections (CRBSI). 3M data on file (010659).

3M™ Curos™ Disinfecting Port Protectors reduce risk across all intraluminal access points.

3M Curos Disinfecting Port Protectors are alcohol-containing caps that twist onto IV access points for disinfection and protection. Consistent use of Curos disinfecting caps on IV needleless connectors is associated with decreased CLABSIs.[12]

Each Curos disinfecting port protector contains 70% isopropyl alcohol (IPA). The IPA bathes the surfaces of the port and disinfects it in one minute and protects it for up to 7 days if not removed.

3M Curos disinfecting port protectors is the only brand on the market that has offerings to help reduce risks across all intraluminal access points – it provides protection for all patients, all access points, all the time.

Curos disinfecting port protectors achieved a >99.99% reduction in 6 microbes commonly associated with CLABSI.[13, 14]

The effectiveness of Curos disinfecting port protectors was tested *in vitro* against:[14]


Staphylococcus aureus

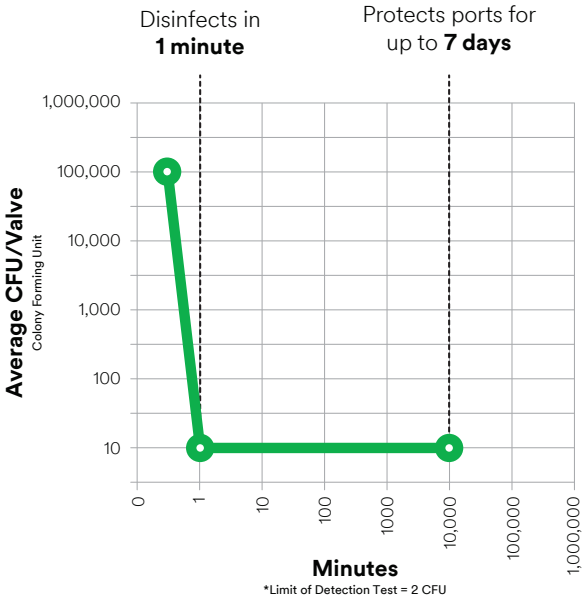

Staphylococcus epidermidis


Escherichia coli


Candida albicans


Pseudomonas aeruginosa


Candida glabrata



The entire family of Curos disinfecting port protectors

- Disinfects in one minute
- Protects ports for up to seven days if not removed
- Twists on, stays on
- Brightly colored for visual verification and auditing
- Single use only

12 See various studies listed in 3M™ Curos™ Clinical Evidence Summary, available at 3m.com/Curos

13 For more information regarding organisms associated with central line–associated bloodstream infections, refer to: Weiner *et al.* (2016). Antimicrobial-Resistant Pathogens Associated With Healthcare-Associated Infections: Summary of Data Reported to the National Healthcare Safety Network at the Centers for Disease Control and Prevention, 2011–2014. Infection Control & Hospital Epidemiology, 1-14. doi: 10.1017/ ice.2016.174

14 Data reflects *in vitro* findings on Curos™ Disinfecting Port Protectors (Data on file)

Protect ports and ensure peace of mind.

Consistent use of Curos disinfecting caps on IV needleless connectors is associated with decreased CLABSIs.[12]

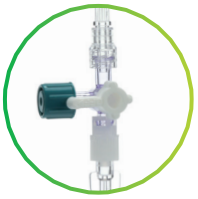
3M™ Curos™ Disinfecting Cap for Needleless Connectors

Provides quick and verifiable disinfection of needleless connectors. Fits commonly used needleless connectors.

3M™ Curos Tips™ Disinfecting Cap for Male Luers*

Disinfects and protects the distal end of IV tubing and other male luer devices.

CIRCLE OF DISINFECTION AND PROTECTION



3M™ Curos™ Stopper Disinfecting Cap for Open Female Luers

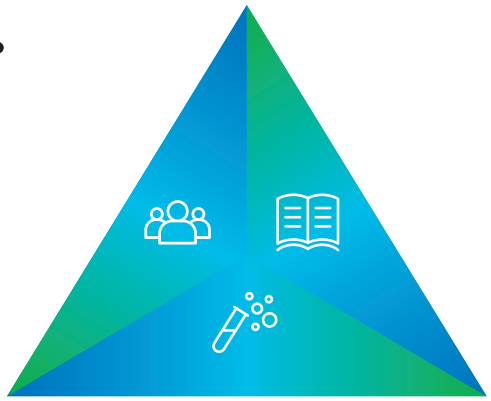
Designed to fit on a wide range of stopcocks and catheter hubs. Their unique design maintains pressure and disinfects the critical areas with 70% (v/v) isopropyl alcohol.

3M™ Curos™ Disinfecting Cap for Tego® Hemodialysis Connectors

This specially designed Curos disinfecting cap is compatible** with Tego® Needlefree Hemodialysis Connector.

*Available in selected geographies.
** ICU Medical. "Tego Swab Recommendations and Compatibility with Disinfecting Caps," October, 2012. http://www.icumed.com/media/610752/tego-swab-recommendation-and-use-with-disinfecting-caps-vab.pdf

Standards. People. Technology. The protection trifecta.



Reducing the risk of bloodstream infection is not a one-time event. It is an ongoing effort that requires exacting standards of care, a commitment from the care team to methodically adhere to those standards, and technology that adds an additional layer of antimicrobial protection. Together, we can help defeat bloodstream infections.

Product	3M product order number	Suggested devices	CHG gel pad size	Overall dressing size	Units per box	Boxes per case
3M™ Tegaderm™ (CHG) Chlorhexidine Gluconate I.V. Securement Dressing	1657R	All CVCs, Arterial, Dialysis, Midline and other percutaneous devices	3 cm x 4 cm	8,5 cm x 11,5 cm	25	4
	1658R	Universal, other percutaneous devices	3 cm x 4 cm	10 cm x 12 cm	25	4
	1659R	All CVCs and PICCs	3 cm x 7 cm	10 cm x 15,5 cm	25	4
	1660R	PIVs, Midline, Arterial, CVCs and other percutaneous devices	2 cm x 2 cm	7 cm x 8,5 cm	25	4
3M™ Tegaderm™ (CHG) Chlorhexidine Gluconate I.V. Port Dressing	1665R	Implanted Venous Ports	6,2 cm x 4,9 cm	12 cm x 12 cm	25	4
PICC/CVC Securement Device + Tegaderm™ CHG I.V. Securement Dressing	1877R-2100	PICCs, CVCs and other vascular access devices	3 cm x 4 cm	8,5 cm x 11,5 cm	20	4
	1879R-2100	PICCs, CVCs and other vascular access devices	3 cm x 7 cm	10 cm x 15,5 cm	20	4

Product	Dispenser	3M product order number	Boxes per case	Units per box	Total caps or tips per case
3M™ Curos™ Disinfecting Caps for Needleless Connectors	Individuals	CFF1-270R	10	270	2,700
	Strips (10 count)	CFF10-250R	10	25 Strips	2,500
3M™ Curos™ Disinfecting Caps for Tego® Hemodialysis Connectors	Individuals	CTG1-270R	8	270	2,160
3M™ Curos™ Stopper Disinfecting Caps for Open Female Luers – Teal	Individuals	CSV1-270R	8	270	2,160
	Strips (5 count)	CSV5-250R	8	50 Strips	2,000

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