

A woman is lying in a hospital bed, wearing a white hospital gown with a small floral pattern. She has a white headband on her head. On her right shoulder, a central venous catheter (CRBSI) is inserted and secured with a 3M adhesive dressing. The dressing is white and rectangular, with a clear circular window in the center showing the catheter hub. A clear plastic tube runs from the catheter, across her shoulder, and down towards the bottom of the frame. The background is a blurred hospital room with a wooden bedside table holding a tissue box and a bottle of hand sanitizer. A green geometric shape is overlaid on the bottom left corner of the image.

**Clinical evidence summary:  
focus on CRBSI prevention  
in oncology patients.**

# Burden of infectious complications.



“Oncology patients frequently require some form of vascular access for cancer treatment, blood transfusion and parenteral nutrition. However, due to disease- and treatment-related immunosuppression they are at particular risk of infections including catheter-related infections (CRIs). Moreover, CRIs prolong hospitalisation, cause an excess in resource utilisation and treatment cost, often delay anti-cancer treatment, and are associated with a significant increase in mortality in cancer patients.”

Böll B, Schalk E, Buchheidt D, *et al.* Central venous catheter-related infections in hematology and oncology: 2020 updated guidelines on diagnosis, management, and prevention by the Infectious Diseases Working Party (Agiho) of the German Society of Hematology and Medical Oncology (Dgho). *Ann Hematol.* 2021;100(1):239–259.



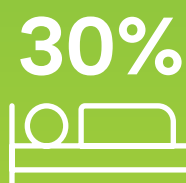
Patients diagnosed with aggressive haematological malignancies are associated with the highest risk of BSI. Different types of CVCs are associated with different levels of infection risk: Implantable ports had the lowest incidence of CABSIs, followed by PICC and the highest incidence being found in non-tunnelled followed by tunnelled central venous catheters.

Mollee P, Jones M, Stackelroth J, van Kuilenburg R, Joubert W, Faoagali J, Looke D, Harper J, Clements A. Catheter-associated bloodstream infection incidence and risk factors in adults with cancer: a prospective cohort study. *J Hosp Infect.* 2011 May;78(1):26–30. doi: 10.1016/j.jhin.2011.01.018.



“High risk of ICU admission (9.3% to 13.9% of neutropenic hematology patients who developed BSI required ICU admission vs 4.0% without BSI).”

Widmer A F, Kern W V, Roth J A, Dettenkofer M, Goetting T, Bertz H, Theilacker C, and Hospital Infection Surveillance System for Patients with Hematologic/Oncologic Malignancies Study Group (ONKO-KISS). Early versus late onset bloodstream infection during neutropenia after high-dose chemotherapy for hematologic malignancy. *Infection.* 2019; 47(5), 837–845. <https://doi.org/10.1007/s15010-019-01327-0>.



## 30%

Nationwide survey in the Netherlands including over 5000 patients. Overall, 30% of patients reported consequences for their oncological treatment or follow-up. Treatment changes included adjustment, delay and discontinuation of treatment.

De Joode K, Dumoulin DW, Engelen V, *et al.* Impact of the coronavirus disease 2019 pandemic on cancer treatment: the patients' perspective. *European Journal of Cancer.* 2020;136:132–139.



“Catheter-related bloodstream infections (CRBSIs) contribute to treatment delays, reduced doses of chemotherapeutics and consequently suboptimal treatment, prolonged hospitalisations, higher mortality rate and increased costs of care.”

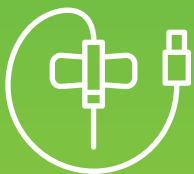
Sousa B, Furlanetto J, Hutka M, *et al.* Central venous access in oncology: esmo clinical practice guidelines. *Annals of Oncology*. 2015;26:v152-v168.



“This trial found that in delivering cancer chemotherapy, centrally inserted totally implantable venous access devices had lower complication rates than centrally inserted tunnelled catheters, and lower rates than peripherally inserted central catheters.”

Wu O, McCartney E, Heggie R, Germení E, Paul J, Soulis E, Dillon S, Ryan C, Sim M, Dixon-Hughes J, Agarwal R, Bodenham A, Menne T, Jones B, Moss J. Venous access devices for the delivery of long-term chemotherapy: the CAVA three-arm RCT. *Health Technol Assess*. 2021 Jul;25(47):1-126. doi: 10.3310/hta25470.

<https://www.journalslibrary.nihr.ac.uk/hta/hta25470#/abstract>. Last accessed 1.Feb.2023



A significant number of adult oncology patients require at least one PIVC to fulfill their therapeutic plan.

Significant divergent practices were observed and identified by the nurses, especially concerning nurses' adherence to the ANTT, catheter stabilisation and dressing and catheter flushing and locking. Such practices may partially explain the high complication rate found (26%) and substantiate the need for future intervention in this field.

Santos-Costa P, Paiva-Santos F, Sousa LB, *et al.* Nurses' practices in the peripheral intravenous catheterisation of adult oncology patients: a mix-method study. *JPM*. 2022;12(2):151.



The predominant source of intravascular (IV) catheter-related bloodstream infections (CRBSI) are both skin at the insertion site and the catheter hub. Extraluminal and intraluminal sources of contamination are important and effective prevention programs must address both sources.

Rates of Intravascular Device-Related Bloodstream Infection Caused by Various Types of Devices Used for Vascular Access Mermel LA. What is the predominant source of intravascular catheter infections? *Clin Infect Dis*. 2011 Jan 15;52(2):211–2. doi: 10.1093/cid/ciq108.

## 3M™ Tegaderm™ CHG Dressing demonstrated an antimicrobial benefit during the complete long-term catheter therapy.

Biehl LM, Huth A, Panse J, et al. A randomised trial on chlorhexidine dressings for the prevention of catheter-related bloodstream infections in neutropenic patients. *Ann Oncol.* 2016;27(10):1916–1922.

### Topic(s)



Infection reduction



Ease of use

### Background

In neutropenic patients, mortality due to catheter-related bloodstream infections (CRBSI) has been reported to be as high as 36%.

Luft D, Schmoor C, Wilson C, et al. Central venous catheter-associated bloodstream infection and colonisation of insertion site and catheter tip. What are the rates and risk factors in haematology patients? *Ann Hematol.* 2010;89:1265–1275.

### Design

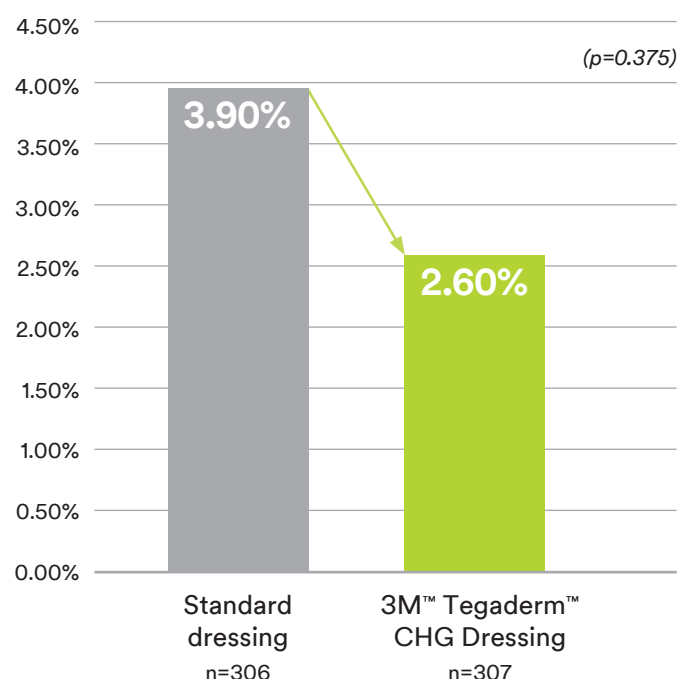
Open-label randomised, multi-centre trial in 10 German hematological departments measuring definite catheter-related bloodstream infections (CRBSI) within the first 14 days of central venous catheter (CVC) placement.

### Methods

Study assessed 613 neutropenic patients (307 in the 3M™ Tegaderm™ CHG Group and 306 in the standard dressing group).

### Results

#### Definite CRBSI within first 14 days of CVC placement.



Tegaderm CHG Dressing was well tolerated and **significantly reduced** definite and probable CRBSI within 14 days of CVC placement.



## “This large real-world data study further supports the current recommendations for the systematic use of CHG dressings on all catheters of ICU patients.”

Eggimann P, Pagani JL, Dupuis-Lozeron E, *et al.* Sustained reduction of catheter-associated bloodstream infections with enhancement of catheter bundle by chlorhexidine dressings over 11 years. *Intensive Care Med.* (2019) 45:823–833. <https://doi.org/10.1007/s00134-019-05617-x>.

### Topic(s)



Infection  
reduction

### Design

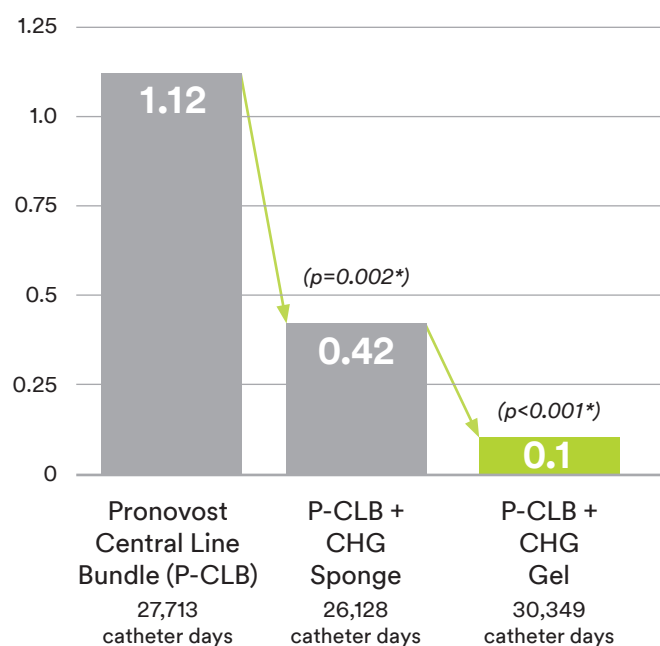
Real-world data study from 2006 to 2014 at a 35-bed mixed adult ICU in the Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland, a primary and referral hospital for a population of 250,000 and 1,500,000, respectively.

### Methods

This 11-year study evaluated the impact of incrementally introducing CHG dressings (sponge or gel) to an ongoing catheter bundle on the rates of catheter related bloodstream infections (CRBSI). This was measured as part of a surveillance program and expressed as incidence density rates per 1,000 catheter-days for every central venous catheter (CVC), including dialysis catheters and introducer sheaths for pulmonary artery (PA) catheters, and arterial catheters.

### Results

**CRBSI rates (per 1,000 CVC and arterial catheter days) – 18,286 patients.**



\*p-values represent comparisons to standalone P-CLB

Chlorhexidine dressings were associated with a **sustained 11-year reduction** of CRBSIs.

**Study involved 2356 metastatic cancer patients or 12.9% of total number of included patients.**  
No subgroup analysis by patient comorbidities has been performed.

Data indicates the skin reaction rates for **CHG gel and CHG sponge were equivalent** at 0.3 /1,000 device days.

## Implementation of port protectors and needleless neutral pressure connectors was associated with a significant reduction in the rate of central line-associated bloodstream infections (CLABSI) and contaminated blood cultures (CBCs).

Sweet MA, Cumpston A, Briggs F, Craig M, Hamadani M. Impact of alcohol-impregnated port protectors and needleless connectors on central line-associated bloodstream infections and contamination of blood cultures in an inpatient oncology unit. *Am J Infect Control*. 2012; 40(10): 931–934.

### Design

Before and after intervention study comparing CLABSI and CBC rates in adult haematology and oncology patients with CVCs.

### Methods

#### Pre-intervention

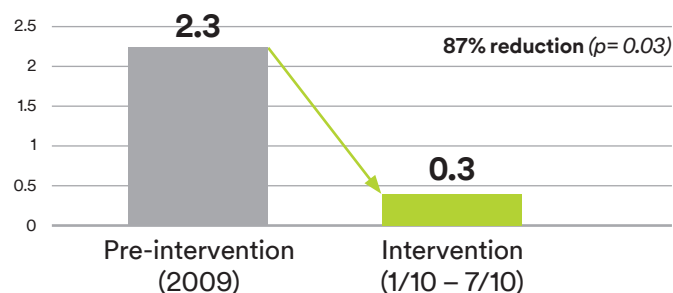
Scrub the hub protocol.

#### Intervention

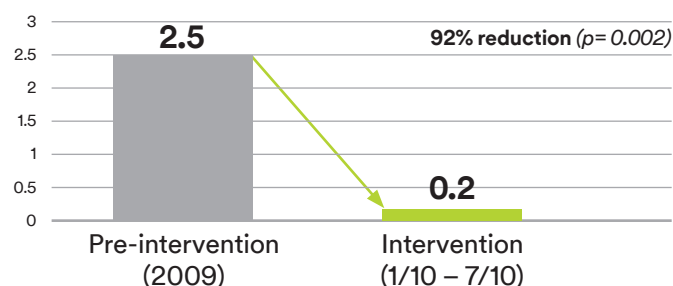
Needleless neutral pressure connectors and 3M™ Cuross™ Disinfecting Cap for Needleless Connectors placed on CVC hubs.

### Results

#### CLABSI rate (per 1000 catheter days)



#### CBC rate (%)



The number of central line days was 6,851 in the pre-intervention and 3,005 in the intervention period.

Compliance to the  
intervention =  
**85.2%**

The implementation of alcohol-impregnated port protectors and needleless neutral pressure connectors **significantly reduced the rates of CLABSI by 87%** in oncology patient population ( $p=0.03$ ).



# Curo<sup>TM</sup>

Disinfecting Port  
Protectors

Peer reviewed

## “...use of the antiseptic barrier cap can lower the occurrence of central line-associated bloodstream infection (CLABSI) and is cost saving.”

Voor in 't holt AF, Helder OK, Vos MC, *et al.* Antiseptic barrier cap effective in reducing central line-associated bloodstream infections: a systematic review and meta-analysis. *Int J Nurs Stud.* 2017; 69: 34–40.

Voor In 't Holt AF, Helder OK, Vos MC, *et al.* Corrigendum to 'Antiseptic barrier cap effective in reducing central line-associated bloodstream infections: A systematic review and meta-analysis'. *Int J Nurs Stud.* 2018 Aug; 84:79–80.

### Design

Systematic review and meta-analysis.

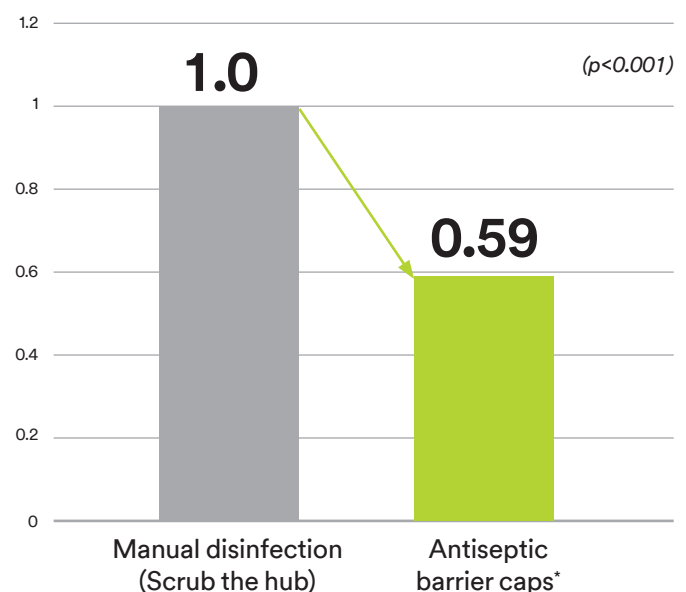
### Methods

Studies conducted in the hospital setting that compared 3M™ Curo<sup>TM</sup> Disinfecting Cap for Needleless Connectors and SwabCap® Disinfecting Caps to manual disinfection on the incidence of CLABSI per 1000 catheter days were included.

Out of 9 studies included in the systematic analysis 2 studies were conducted at hematology oncology units (22.2%), 1 at the ICU (11.1%), and 6 at multiple departments (66.7%) involving a number of oncology patients.

### Results

#### Relative pooled CLABSI (per 1000 catheter days)



Nine studies were included in the systematic review and seven within the meta-analysis.

\*Curo<sup>TM</sup> Disinfecting Cap for Needleless Connectors and SwabCap<sup>®</sup> Disinfecting Caps.

There were  
**41% fewer**  
CLABSIs associated  
with use of the  
antiseptic barrier cap.

(IRR = 0.59, 95% CI = 0.45–0.77  
 $p < 0.001$ )

Overall median rate  
of compliance with  
barrier cap =  
**82.5%**

Net cost savings  
ranged from  
**\$39,050 to**  
**\$3,268,990**

# International recommendations.



## DGHO

German Society for  
Hematology and  
Medical Oncology

### Central venous catheter-related infections in hematology and oncology: 2020 updated guidelines on diagnosis, management, and prevention.<sup>1</sup>

Chlorhexidine-containing dressings, preferably transparent chlorhexidine-impregnated gel dressings, may be used alternatively as they might reduce the risk of CRIs (BI). As CRIs are often preceded by hub colonization, disinfectant caps might be a promising approach to reduce the incidence of CRIs in cancer patients.



## NICE

National Institute  
for Health and Care  
Excellence

### Tegaderm CHG securement dressing for vascular access sites.<sup>2</sup>

The intended place in therapy would be to secure vascular access devices for haemodialysis in people with tunnelled central venous catheters, intravenous (IV) chemotherapy in people with cancer, people who need total parenteral nutrition and children's intensive care.



## AIOM

Italian Association  
of Medical Oncology

### Nursing management of the medium and long term central vascular access in the oncology patient.<sup>3</sup>

The use of slow-release 2% chlorhexidine based transparent polyurethane IV dressing is recommended in the adult patient.

Use port protectors with 70% isopropyl alcohol (IPA) which can be applied to all IV access points (needle-free connector, male luer, female luer).



## SEEO

Spanish Society of  
Oncology Nursing

### ECO-SEOM-SEEO safety recommendations guideline for cancer patients receiving intravenous therapy.<sup>4</sup>

For short-term peripheral catheters, chlorhexidine dressings are recommended to reduce infection rates.

1 Böll B, Schalk E, Buchheidt D, et al. Central venous catheter-related infections in hematology and oncology: 2020 updated guidelines on diagnosis, management, and prevention by the Infectious Diseases Working Party (Agiho) of the German Society of Hematology and Medical Oncology (Dgho). *Ann Hematol.* 2021;100(1):239–259.

2 Tegaderm CHG securement dressing for vascular access sites. Medtech innovation briefing NICE. Published: 27 October 2020. Available online [www.nice.org.uk/guidance/mib231](http://www.nice.org.uk/guidance/mib231). Last accessed 1 Feb 2023.

3 Gestione infermieristica degli accessi vascolari centrali a medio e lungo termine nel paziente oncologico. Available at [https://www.aiom.it/wp-content/uploads/2021/09/2021\\_Gestione\\_infermieristica\\_AV\\_WGNAIOM.pdf](https://www.aiom.it/wp-content/uploads/2021/09/2021_Gestione_infermieristica_AV_WGNAIOM.pdf) Versione giugno 2021. Last accessed 1 Feb 2023.

4 Magallón-Pedra I, Pérez-Altozano J, Virizuela Echaburu JA, Beato-Zambrano C, Borrega-García P, de la Torre-Montero JC. ECO-SEOM-SEEO safety recommendations guideline for cancer patients receiving intravenous therapy. *Clin Transl Oncol.* 2020;22(11):2049-2060.