

**3M**

**Tegaderm™**

CHG Chlorhexidine Gluconate  
I.V. Securement Dressings

CLINICAL EVIDENCE SUMMARY

**The  
evidence  
is clear.**





# Table of Contents

## Topics Key



### Infection Reduction

Measurable decrease in catheter-related bloodstream infection (CRBSI) rate.



### Antimicrobial Protection

Microbial colonization and *in vitro* zone of inhibition.\*



### Ease of Use

Product usability and clinician preference.



### Health Economics

Cost savings and overall economic impact.

## META-ANALYSIS

### Chlorhexidine-impregnated dressing for the prophylaxis of central venous catheter-related complications: a systematic review and meta-analysis.



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Wei L, Li Y, Li X, Bian L, Wen Z, Li M. *BMC Infect Dis.* 2019;19:(1).  
<https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-019-4029-9>.

### Chlorhexidine-impregnated dressing for prevention of catheter-related bloodstream infection: a meta-analysis.



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Safdar N, O'Horo JC, Ghufran A, et al. *Crit Care Med.* 2014;42(7):1703-1713.

## RANDOMIZED CONTROLLED TRIAL

### Effectiveness of a chlorhexidine dressing on silver-coated external ventricular drain-associated colonization and infection: a prospective single-blinded randomized controlled clinical trial.



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Roethlisberger M, Moffa G, Fisch U, et al. *Clin Infect Dis.* 2018;67(12):1868-1877.

### A randomized trial on chlorhexidine dressings for the prevention of catheter-related bloodstream infections in neutropenic patients.



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Biehl LM, Huth A, Panse J, et al. *Ann Oncol.* 2016;27(10):1916-1922.

### Tegaderm™ CHG Dressing significantly improves catheter-related infection rate in hemodialysis patients.



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Righetti M, Palmieri N, Bracchi O, et al. *J Vasc Access.* 2016;17(5):417-422.

### Randomized controlled trial of chlorhexidine dressing and highly adhesive dressing for preventing catheter-related infections in critically ill adults.



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Timsit JF, Mimoz O, Mourvillier B, et al. *Am J Respir Crit Care Med.* 2012;186(12):1272-1278.

\*No clinical correlations intended.

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## RANDOMIZED CONTROLLED TRIAL (CONT.)

### Suppression of regrowth of normal skin flora under chlorhexidine gluconate dressings applied to chlorhexidine gluconate-prepped skin.



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Bashir MH, Olson LK, Walters SA. *Am J Infect Control*. 2012;40:344-348.

## PEER REVIEWED

### Sustained reduction of catheter-associated bloodstream infections with enhancement of catheter bundle by chlorhexidine dressings over 11 years.



pg. 14

Eggimann P, Pagani JL, Dupuis-Lozeron E, et al. *Intensive Care Med*. (2019) 45:823-833. <https://doi.org/10.1007/s00134-019-05617-x>.

### Chlorhexidine-impregnated transparent dressings decrease catheter-related infections in hemodialysis patients: a quality improvement project.



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Apata IW, Hanfelt J, Bailey JL, Niyyar VD. *J Vasc Access*. 2017;18(2):103-108.

### Significant reduction of external ventricular drainage-associated meningoventriculitis by chlorhexidine-containing dressings: a before-after trial.



pg. 16

Scheithauer S, Schulze-Steinen H, Höllig A, et al. *Clin Infect Dis*. 2016;62(3):404-405.

### Clinical evaluation of a chlorhexidine intravascular catheter gel dressing on short-term central venous catheters.



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Karpanen TJ, Casey AL, Whitehouse T, Nightingale P, Das I, Elliott TS. *Am J Infect Control*. 2016;44(1):54-60.

\*No clinical correlations intended.

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## PEER REVIEWED (CONT.)

### Transparent film intravenous line dressing incorporating a chlorhexidine gluconate gel pad: a clinical staff evaluation.



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Karpanen TJ, Casey AL, Das I, Whitehouse T, Nightingale P, Elliott TSJ. *J Assoc for Vasc Access*. 2016;September:21(3):133-138.

### Economic impact of Tegaderm chlorhexidine gluconate (CHG) dressing in critically ill patients.



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Thokala P, Arrowsmith M, Poku E, Martyn-St. James M, Anderson J, Foster S, Elliott T, Whitehouse T. *J Infect Prev*. 2016;17(5):216-223.

### Cost-effectiveness analysis of a transparent antimicrobial dressing for managing central venous and arterial catheters in intensive care units.



pg. 20

Maunoury F, Motrunich A, Palka-Santini M, Bernatchez SF, Ruckly S, Timsit JF. *PLoS One*. 2015;10(6):e0130439.

### Chlorhexidine gluconate dressings reduce bacterial colonization rates in epidural and peripheral regional catheters.



pg. 21

Kerwat K, Eberhart L, Kerwat M, et al. *Biomed Res Int*. 2015;2015:149785. doi: 10.1155/2015/149785.

### Reduction of central venous line-associated bloodstream infection rates by using a chlorhexidine-containing dressing.



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Scheithauer S, Lewalter K, Schröder J, et al. *Infection*. 2014;42(1):155-159.

### Use of a 1-piece chlorhexidine gluconate transparent dressing on critically ill patients.



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Pfaff B, Heithaus T, Emanuelson M. *Crit Care Nurse*. 2012;32(4):35-40.

## Topics Key



### Infection Reduction

Measurable decrease in catheter-related bloodstream infection (CRBSI) rate.



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Cost savings and overall economic impact.

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## POSTER

### Fitness of use of Biopatch® and Tegaderm™ CHG for protecting central venous catheters and arterial lines in critically ill patients.



pg. 24

Eggimann P, Joseph C, Thévenin MJ. Oral presentation at: 3rd International Conference on Prevention and Infection Control; June, 2015; Geneva, Switzerland.

### A different experience with two different chlorhexidine gluconate dressings for use on central venous devices.



pg. 25

Kohan CA, Boyce JM. Poster presented at Association for Professionals in Infection Control and Epidemiology (APIC) and published in *Am J Infect Control*. 2013;41(6):S142–S143.

### Growth inhibition of microorganisms involved in CRBSIs by an antimicrobial transparent I.V. dressing containing chlorhexidine gluconate (CHG).



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Hensler JP, Schwab DL, Olson LK, Palka-Santini M. Poster session presented at: 19th Annual Conference of the European Society of Clinical Microbiology and Infectious Diseases 2009; May 16-19, 2009.

### Antimicrobial activity of a CHG-impregnated gel pad for I.V. site protection.



pg. 27

Schwab D, et al. Poster presented at: the conference of Infusion Nursing Society; May, 2008.

### A novel integrated chlorhexidine-impregnated transparent dressing for prevention of vascular catheter-related bloodstream infection: a prospective comparative study in healthy volunteers.



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Maki D, Stahl J, Jacobson C, et al. 2008. Poster presentation at The Society for Healthcare Epidemiology of America annual conference.

## ADDITIONAL INFORMATION

### Instructions for Use

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\*No clinical correlations intended.

# “Chlorhexidine-impregnated dressing is beneficial to prevent CVC-related complications.”

Wei L, Li Y, Li X, Bian L, Wen Z, Li M. Chlorhexidine-impregnated dressing for the prophylaxis of central venous catheter-related complications: a systematic review and meta-analysis. *BMC Infect Dis.* 2019;19(1). <https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-019-4029-9>.

## TOPIC(S)



Infection  
Reduction

## DESIGN

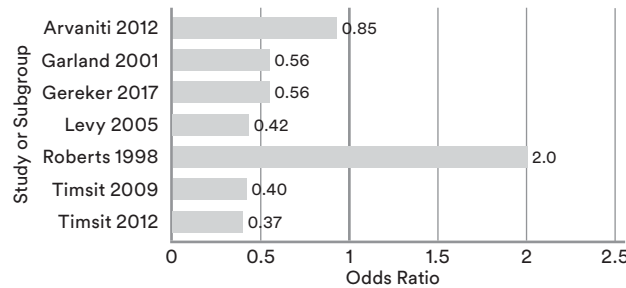
Meta-analysis of 12 randomized controlled trials with 6,028 patients that met inclusion criteria.

## METHODS

Studies were randomized controlled trials comparing chlorhexidine-impregnated dressing versus other dressing or no dressing for prophylaxis of central venous catheter (CVC)-related complications.

## RESULTS

### Risk of Catheter Colonization



### Incidence of CRBSI



Ratios <1 favor chlorhexidine-impregnated dressing.  
Ratios >1 favor other dressing or no dressing.

## KEY FINDINGS

Chlorhexidine-impregnated dressing is beneficial to **reduce the risk of catheter colonization** for catheter-related bloodstream infections (CRBSI) for patients with CVC.

Chlorhexidine-impregnated dressings were conducive to **reduce the incidence of CRBSI.**

Chlorhexidine transparent dressing could effectively **reduce the frequency of dressing changes** to ease workload of nursing staff.

# A chlorhexidine-impregnated dressing is beneficial in preventing catheter colonization and, more importantly, CRBSI.

Safdar N, O'Horo JC, Ghufuran A, et al. Chlorhexidine-impregnated dressing for prevention of catheter-related bloodstream infection: a meta-analysis. *Crit Care Med.* 2014;42(7):1703-1713.

## TOPIC(S)



Infection Reduction

## DESIGN

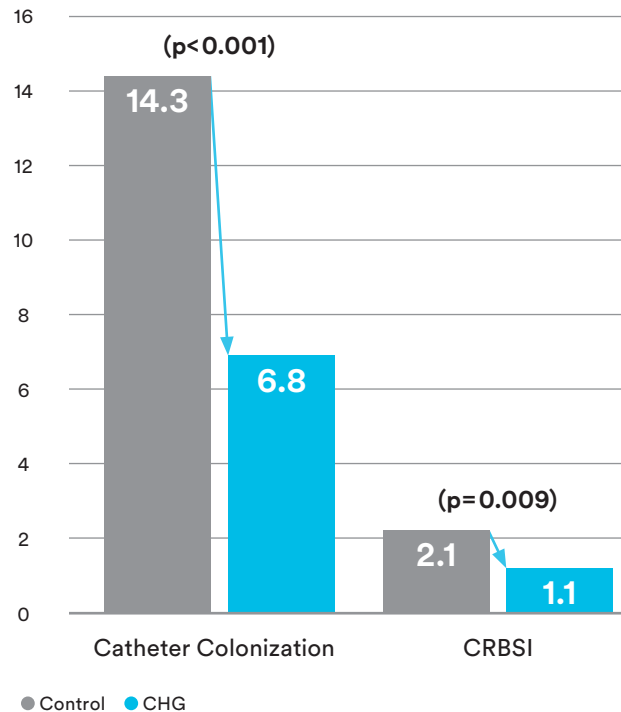
Meta-analysis of nine randomized controlled trials that met inclusion criteria.

## METHODS

Studies were randomized controlled trials comparing a chlorhexidine-impregnated dressing with conventional site care to assess the efficacy of a chlorhexidine-impregnated dressing for prevention of central venous (CVC) and arterial catheter-related colonization and catheter-related bloodstream infection (CRBSI).

## RESULTS

### Catheter Colonization (% of catheters) & CRBSI (% of patients)



## KEY FINDINGS

There was **significant benefit** to using a chlorhexidine-impregnated dressing for **CVC and arterial catheters.**

There was a **low incidence rate** of contact dermatitis using a chlorhexidine-impregnated dressing in adults.



# Tegaderm™ CHG Dressing helps reduce the risk of EVD exit site contamination and EVDAs.

Roethlisberger M, Moffa G, Fisch U, et al. Effectiveness of a chlorhexidine dressing on silver-coated external ventricular drain-associated colonization and infection: a prospective single-blinded randomized controlled clinical trial. *Clin Infect Dis.* 2018;67(12):1868-1877.

## TOPIC(S)



Antimicrobial Protection

## DESIGN

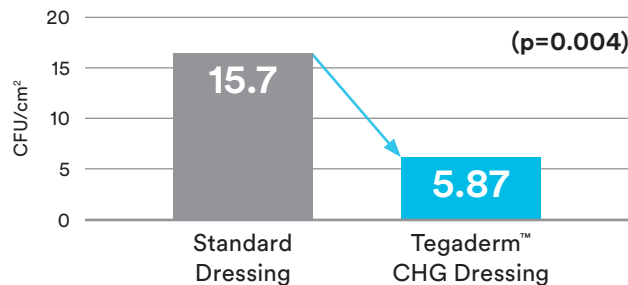
Randomized controlled trial comparing bacterial regrowth at external ventricular drain (EVD) site five days post-op between control (standard dressing) and chlorhexidine gluconate dressings (Tegaderm™ CHG Dressing).

## METHODS

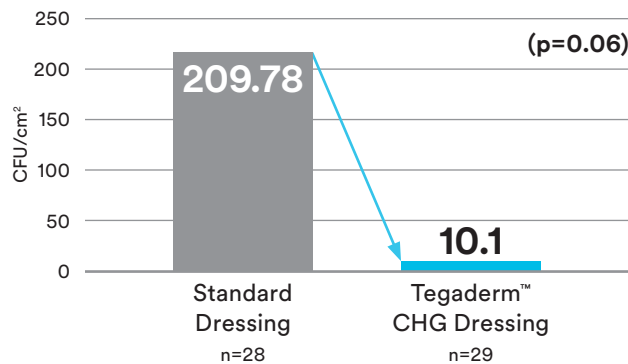
Study assessed 57 subjects (29 in the Tegaderm™ CHG Dressing group and 28 in the standard dressing group). Secondary endpoints included sonicated EVDs, EVD-associated infections and surgical treatment of hydrocephalus.

## RESULTS

### Cutaneous Bacterial Regrowth at EVD Entry Site Five Days Post-op



### Subcutaneous EVD Segment Sonification



## KEY FINDINGS

Cutaneous bacterial regrowth at the EVD site was **lower** for Tegaderm™ CHG Dressing versus standard dressing.

Bacterial colonization of the subcutaneous EVD segment and tip was **95% less** for Tegaderm™ CHG Dressing versus standard dressing.

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

Biehl LM, Huth A, Panse J, et al. A randomized 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

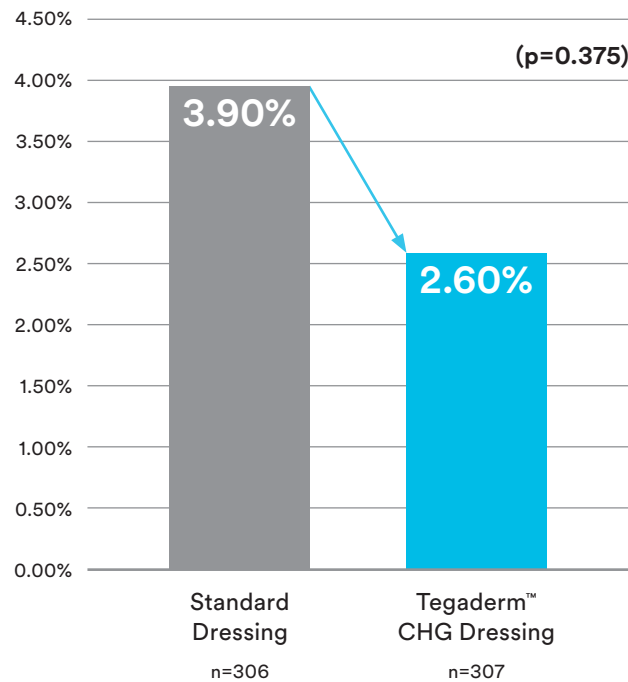
Open-label randomized, multi-center trial in 10 German hematological departments measuring definite catheter-related bloodstream infections (CRBSI) with the first 14 days of central venous catheter (CVC) placement.

## METHODS

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

## RESULTS

### Definite CRBSI within First 14 Days of CVC Placement



## KEY FINDINGS

Tegaderm™ CHG Dressing was well tolerated and **significantly reduced** definite and probable CRBSI.

# First evidence-based study to show that Tegaderm™ CHG Dressing significantly reduces CRBSI rates in hemodialysis patients.

Righetti M, Palmieri N, Bracchi O, et al. Tegaderm™ CHG Dressing significantly improves catheter-related infection rate in hemodialysis patients. *J Vasc Access*. 2016;17(5):417-422.

## TOPIC(S)



Infection Reduction



Health Economics

## DESIGN

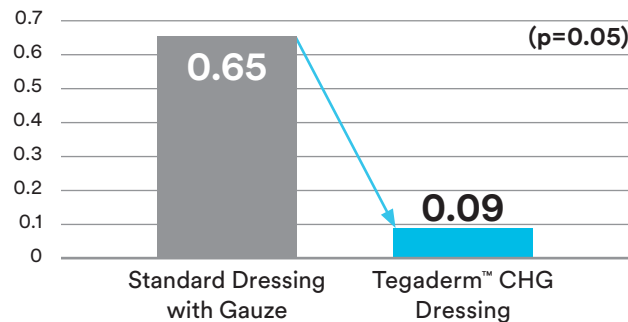
Prospective randomized cross-over trial measuring catheter-related infections (CRI) and catheter-related bloodstream infections (CRBSIs) in prevalent hemodialysis patients in inpatient and outpatient settings.

## METHODS

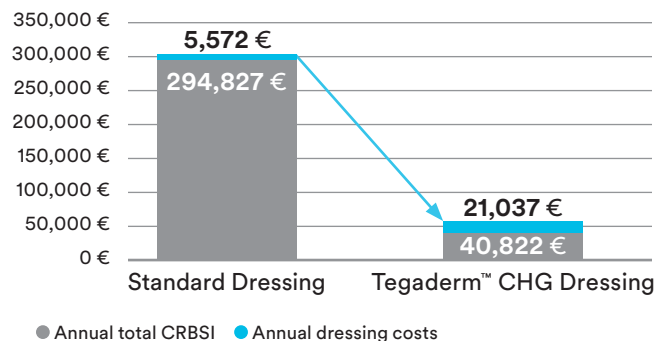
Study compared two treatments – Tegaderm™ CHG Dressing (n=29) changed weekly versus a standard dry gauze dressing (n=30) changed three times/week at every dialysis session (n=59).

## RESULTS

### CRBSI Incidence Rate (per 1,000 Catheter Days)



### Annual Healthcare Cost Savings



## KEY FINDINGS

**86% reduction** in CRBSI incidence rate with Tegaderm™ CHG Dressing.

**€237,940** annual healthcare cost savings on CRBSIs when using Tegaderm™ CHG Dressing versus standard dressings.

# Tegaderm™ CHG Dressing decreased the CRBSI rate in ICU patients with intravascular catheters.

Timsit JF, Mimoz O, Mourvillier B, et al. Randomized controlled trial of chlorhexidine dressing and highly adhesive dressing for preventing catheter-related infections in critically ill adults. *Am J Respir Crit Care Med.* 2012;186(12):1272-1278.

## TOPIC(S)



Infection Reduction



Antimicrobial Protection

## DESIGN

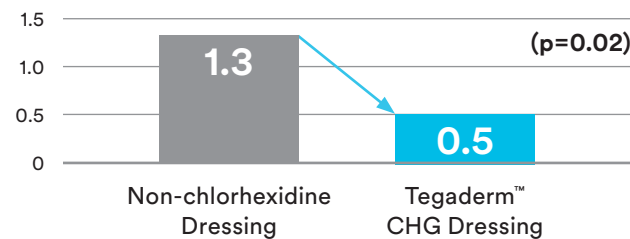
Multi-center randomized controlled trial comparing major catheter-related infections (CRI) with or without catheter-related bloodstream infections (CRBSI) and catheter colonization rates within central venous (CVC) and arterial catheters.

## METHODS

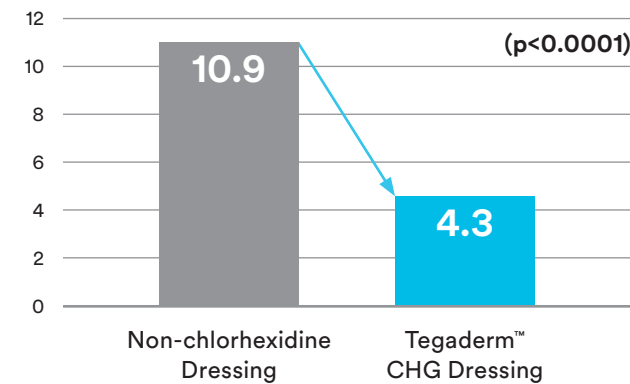
Trial compared chlorhexidine to non-chlorhexidine dressings to determine if Tegaderm™ CHG Dressing decreases catheter colonization and CRBSI rates in CVC and arterial catheters. Studies were conducted in 12 French ICUs with a total of 1,879 patients evaluated.

## RESULTS

### CRBSI Rate (per 1,000 Catheter Days)



### Catheter Colonization Incidence (per 1,000 Catheter Days)



## KEY FINDINGS

CRBSI rate was **60% lower** with Tegaderm™ CHG Dressing versus non-chlorhexidine dressing.

**61% reduction** in catheter colonization incidence with Tegaderm™ CHG Dressing.

# Tegaderm™ CHG Dressings suppress regrowth better than BIOPATCH® Disks on prepped skin after 7-day wear time.

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;40:344-348.

## TOPIC(S)



Antimicrobial Protection

## DESIGN

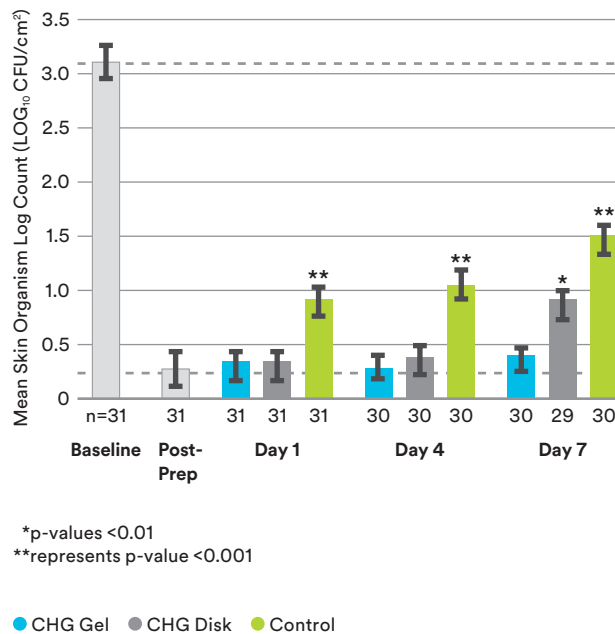
Randomized controlled trial comparing suppression of microbe regrowth on CHG-prepped skin between control, CHG gel dressings and CHG disks.

## METHODS

Trial compared the skin organism suppression performance of CHG gel dressings and CHG disks on the backs of 30 healthy subjects.

## RESULTS

### Mean Skin Organism Log Count Over Time



## KEY FINDINGS

CHG gel had significantly **lower skin organism regrowth** than a standard transparent adhesive dressing.

At 7 days, CHG gel had **significantly lower skin organism regrowth** than CHG disks.

# “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

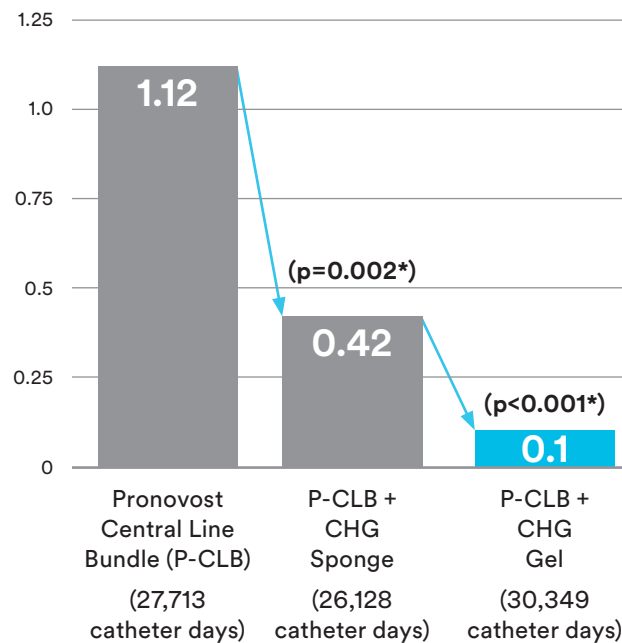
Real-world data study from 2006 to 2014 at a 35-bed mixed adult ICU in the Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland, a primary and referral hospital for a population of 250,000 and 1,500,000, respectively.

## METHODS

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

## KEY FINDINGS

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

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

# Tegaderm™ CHG Dressing helps reduce the risk of CRI rates for hemodialysis patients with tunneled CVC.

Apata IW, Hanfelt J, Bailey JL, Niyyar VD. Chlorhexidine-impregnated transparent dressings decrease catheter-related infections in hemodialysis patients: a quality improvement project. *J Vasc Access.* 2017;18(2):103-108.

## TOPIC(S)



Infection Reduction

## DESIGN

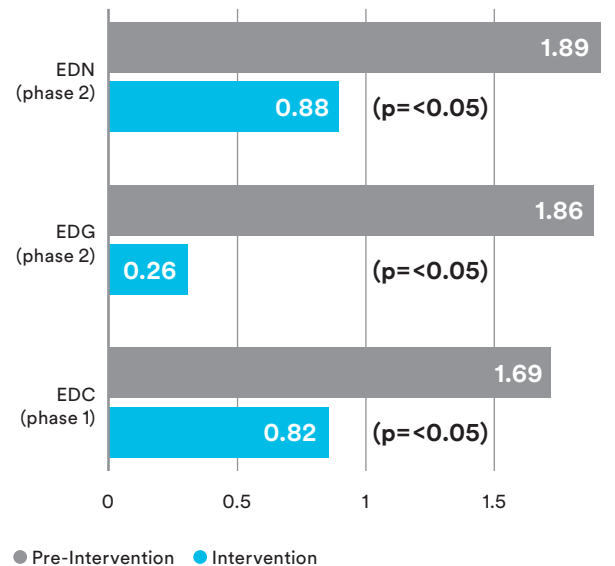
Prospective before and after intervention study measuring catheter-related infection (CRI) rates in patients with dialysis catheters.

## METHODS

Comparison of CRI rates in two dressing regimens – Tegaderm™ CHG Dressing and adhesive dry gauze dressings with an antibiotic ointment in hemodialysis patients having tunneled central venous catheters (CVC). The study was conducted in two phases: Phase 1 assessed the impact of Tegaderm™ CHG Dressing on one dialysis unit (EDC) versus two control dialysis units (EDG and EDN); Phase 2 introduced Tegaderm™ CHG Dressing to the two control dialysis units.

## RESULTS

### CRI Rates (per 1,000 Catheter Days) per Respective Outpatient Units During Intervention Change



## KEY FINDINGS

Tegaderm™ CHG Dressing was associated with a **substantial reduction in CRIs** across 3 hemodialysis units.

In one unit, there was an **86% reduction** in infection rate.

# Use of Tegaderm™ CHG Dressing helps reduce the risk of EVD-associated MV rates without increasing costs or workloads.

Scheithauer S, Schulze-Steinen H, Höllig A, et al. Significant reduction of external ventricular drainage-associated meningoventriculitis by chlorhexidine-containing dressings: a before-after trial. *Clin Infect Dis.* 2016;62(3):404-405.

## TOPIC(S)



Infection Reduction



Health Economics

## BACKGROUND

Additional studies assessing the safety and application of CHG for neurovascular devices include:

Ho KM, Litton E. Use of chlorhexidine-impregnated dressing to prevent vascular and epidural catheter colonization and infection: a meta-analysis. *J Antimicrob Chemother.* 2006;58(2):281-287.

Scheithauer S, Möller M, Höllig A, Marx G, Thoroe S, Lopez-Gonzalez L, Reinges MHT, Lemmen SW. Are chlorhexidine-containing dressings safe for use with ventricular drainages? *Infection.* 2014;42:545-548.

Sviggum HP, Jacob AK, Arendt KW, Mauermann ML, Horlocker TT, Hebl JR. Neurologic complications after chlorhexidine antiseptics for spinal anesthesia. *Reg Anesth Pain Med.* 2012;37(2):139-144.

## DESIGN

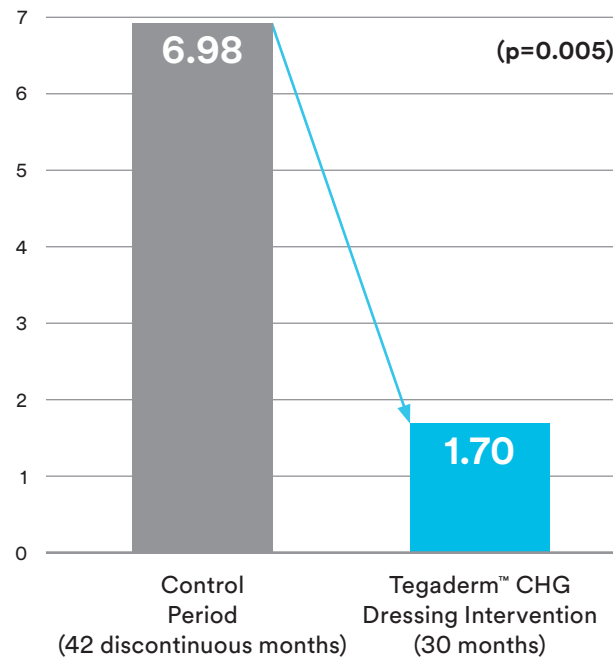
Before and after intervention study comparing external ventricular drainage (EVD)-associated meningoventriculitis (MV).

## METHODS

Study replaced standard gauze dressings with Tegaderm™ CHG Dressing. Evaluation and calculation of the EVD-associated MV rates were performed by an interdisciplinary and interprofessional health team twice weekly during infectious disease rounds.

## RESULTS

### EVD-Associated MV Rate (per 1,000 EVD Days)



## KEY FINDINGS

**No adverse events** (e.g., skin reactions) occurred.

There was a **68% reduction** in MV rates.

The intervention **significantly reduced rates** without increasing costs or workloads.



# Tegaderm™ CHG Dressing group saw a significant reduction in the number of microorganisms recovered from the CVC insertion site compared to non-antimicrobial dressings.

Karpanen TJ, Casey AL, Whitehouse T, Nightingale P, Das I, Elliott TS. Clinical evaluation of a chlorhexidine intravascular catheter gel dressing on short-term central venous catheters. *Am J Infect Control.* 2016;44(1):54-60.

## TOPIC(S)



Antimicrobial Protection

## DESIGN

Prospective, cross-over, comparative, non-blinded, single-center clinical study.

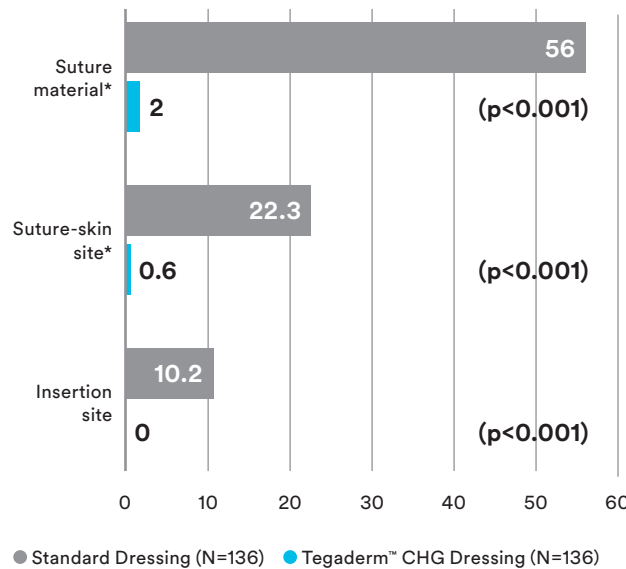
## METHODS

Study assessed the antimicrobial efficacy of Tegaderm™ CHG Dressing in patients with an antimicrobial central venous catheter (CVC). Comparator was a standard dressing with an antimicrobial CVC. All patients except two had an antimicrobial CVC inserted. CVCs were secured with braided silk sutures.\*

\*Tegaderm™ CHG Dressing is not indicated to reduce bacterial colonization of sutures and suture sites.

## RESULTS

### CVC Microbes Median CFU/cm<sup>2</sup>



## KEY FINDINGS

Tegaderm™ CHG Dressing significantly reduced the number of microorganisms on the catheter insertion site and catheter device insertion site.

Microbes collected from underneath Tegaderm™ CHG Dressing did not exhibit resistance or susceptibility to CHG.

# 99% of clinical staff surveyed recommended continuing the use of Tegaderm™ CHG Dressing.

Karpanen TJ, Casey AL, Das I, Whitehouse T, Nightingale P, Elliott TSJ. Transparent film intravenous line dressing incorporating a chlorhexidine gluconate gel pad: A clinical staff evaluation. *J Assoc Vasc Access.* 2016;September:21(3):133-138.

## TOPIC(S)



Ease of Use

## DESIGN

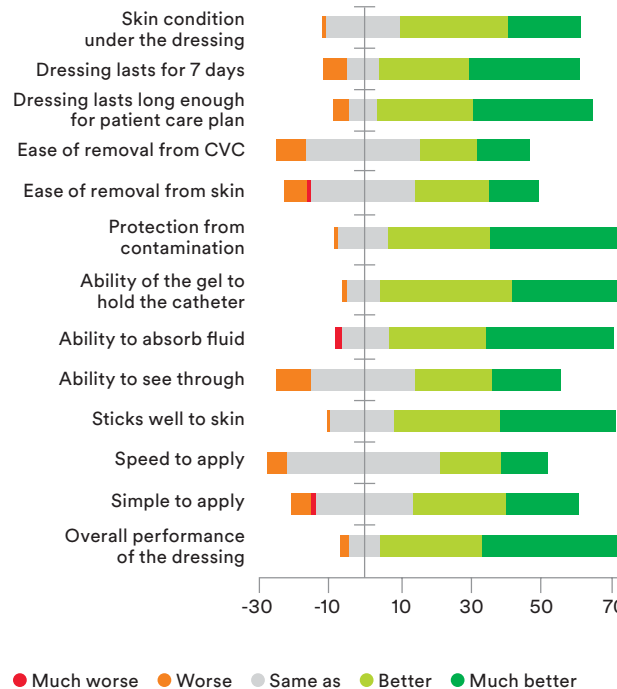
Clinical staff evaluation of a Tegaderm™ CHG Dressing compared to a standard dressing (n=81).

## METHODS

The study group was from the Critical Care unit and followed patients (>14,200) with short-term central venous catheter (CVC) or vascular access catheter (VAC) for dialysis. Study was divided into two phases: 9 months of Tegaderm™ CHG Dressing use was compared to 12 months of standard dressing use. Staff completed evaluation following implementation of Tegaderm™ CHG Dressing.

## RESULTS

### Tegaderm™ CHG Dressing Ratings Relative to a Standard Dressing



## KEY FINDINGS

**86%** of the clinical staff surveyed rated the performance of the Tegaderm™ CHG Dressing as **better or much better** than the standard dressing.

The Tegaderm™ CHG Dressing **performed well** in a **diverse group** of critical care patients.

**98.7%** of clinicians **recommended continued use** of Tegaderm™ CHG Dressing.

# The use of Tegaderm™ CHG Dressing results in an overall cost savings of £77,427 per 1,000 adult patients compared to standard care.

Thokala P, Arrowsmith M, Poku E, Martyn-St. James M, Anderson J, Foster S, Elliott T, Whitehouse T. Economic impact of Tegaderm chlorhexidine gluconate (CHG) dressing in critically ill patients. *J Infect Prev.* 2016;17(5):216-223.

## TOPIC(S)



Health Economics

## DESIGN

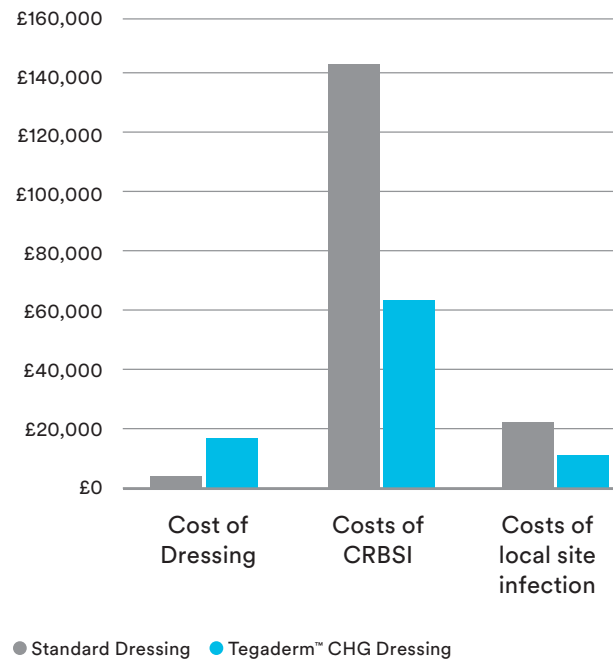
Analytical cost-consequence model populated with data from published sources.

## METHODS

Estimation of the economic impact of a Tegaderm™ CHG Dressing compared with a standard dressing.

## RESULTS

### Breakdown of Different Costs for Standard and Tegaderm™ CHG Dressing (for a Cohort of 10,000 Patients)



## KEY FINDINGS

Tegaderm™ CHG Dressing has a **98.5% probability** of saving **£77,000** per year per 1,000 patients.

CRBSI risk with Tegaderm™ CHG Dressing was **0.6 per 1,000** catheter days, versus **1.48 per 1,000** catheter days with a standard dressing.

# The Tegaderm™ CHG Dressing is more cost-effective than a non-chlorhexidine dressing in this base case scenario.

Maunoury F, Motrunich A, Palka-Santini M, Bernatchez SF, Ruckly S, Timsit JF. Cost-effectiveness analysis of a transparent antimicrobial dressing for managing central venous and arterial catheters in intensive care units. *PLoS One*. 2015;10(6):e0130439.

## TOPIC(S)



Health  
Economics

## DESIGN

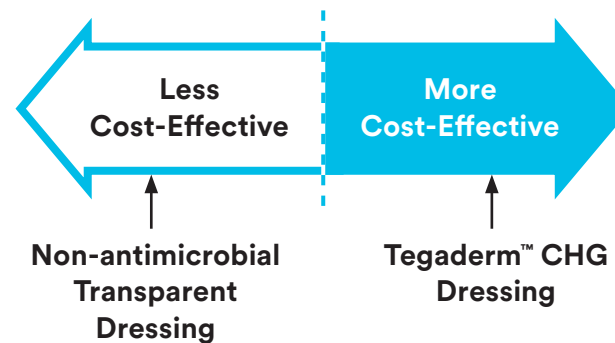
A novel health economic model (30-day time non-homogenous Markov model).

## METHODS

Study used to estimate cost-effectiveness of using Tegaderm™ CHG Dressing compared to non-chlorhexidine dressings in a multi-center French ICU scenario (12) based on the number of catheter-related bloodstream infections (CRBSI) avoided.

## RESULTS

Using a Tegaderm™ CHG Dressing is more cost effective than using a non-antimicrobial transparent dressing.



## KEY FINDINGS

Tegaderm™ CHG Dressing was associated with  
**11.8 fewer infections**  
per 1,000 patients.

The incremental cost-effectiveness ratio is  
**€12,046 per CRBSI**  
reduction.

The incremental net monetary benefit per patient is  
**€344.88.**

# Tegaderm™ CHG Dressing helps reduce the risk of bacterial colonization of the tip and the insertion site of epidural and local regional catheters used in anesthesia.

Kerwat K, Eberhart L, Kerwat M, et al. Chlorhexidine gluconate dressings reduce bacterial colonization rates in epidural and peripheral regional catheters. *Biomed Res Int.* 2015;2015:149785. doi: 10.1155/2015/149785.

## TOPIC(S)



Antimicrobial Protection

## DESIGN

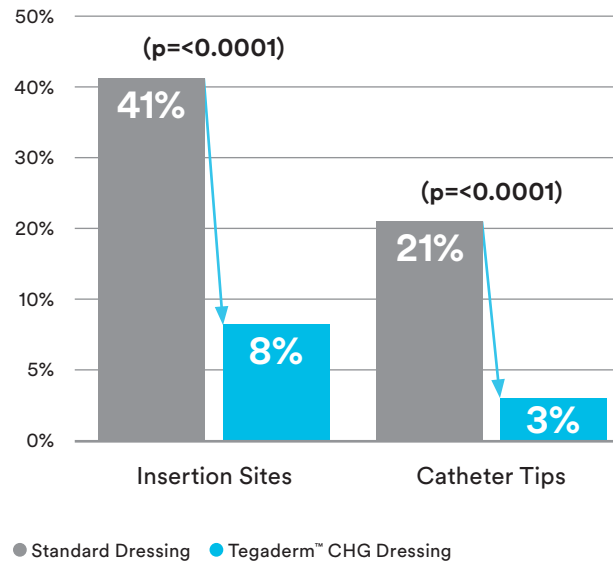
Prospective study that included a total of 337 anesthesia catheters from 308 patients in a routine clinical setting.

## METHODS

Examination of the effect of Tegaderm™ CHG Dressing applied to two separate patient groups requiring local regional or epidural anesthesia. Catheter tips and insertion sites were assessed for colonization after treatment was discontinued.

## RESULTS

### Positive Culture Results



## KEY FINDINGS

**80% reduction** in insertion site colonization with use of Tegaderm™ CHG Dressing.

**86% reduction** in catheter tip colonization with use of Tegaderm™ CHG Dressing.

# Tegaderm™ CHG Dressing helps reduce the risk of CLABSI.

Scheithauer S, Lewalter K, Schröder J, et al. Reduction of central venous line-associated bloodstream infection rates by using a chlorhexidine-containing dressing. *Infection*. 2014;42(1):155-159.

## TOPIC(S)



Infection  
Reduction

## DESIGN

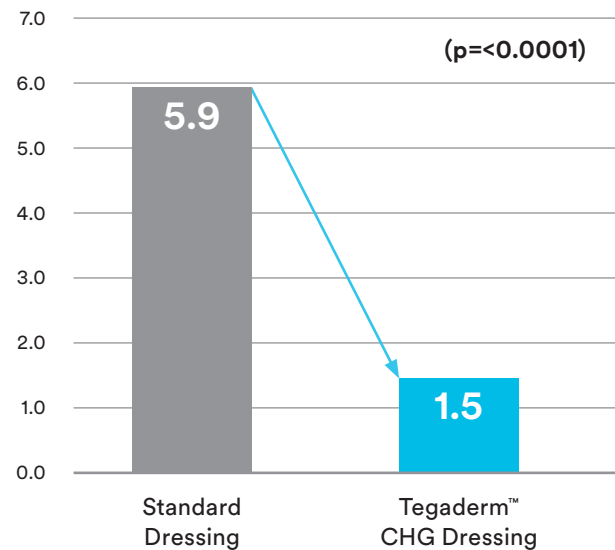
Before and after historical central line-associated bloodstream infection (CLABSI) study of 1,298 patients at two intensive care units (ICUs) from November 2010 to May 2012.

## METHODS

Studies compared the number of CLABSIs and infection rates between patients with standard dressings and Tegaderm™ CHG Dressing. The results were also compared to historical data.

## RESULTS

### CLABSI Rate (per 1,000 Catheter Days)



## KEY FINDINGS

**74% reduction**  
in CLABSIs using  
Tegaderm™ CHG Dressing  
compared to standard dressings  
in the observation phase.

The  
**low rate of  
adverse events**  
associated with Tegaderm™ CHG  
Dressing was a positive result.

The durability of  
Tegaderm™ CHG Dressing  
was confirmed to be  
**7 days.**

# “A low rate of catheter-related bloodstream infections can be maintained, nurses’ satisfaction achieved, and cost savings realized with the dressing.”

Pfaff B, Heithaus T, Emanuelson M. Use of a 1-piece chlorhexidine gluconate transparent dressing on critically ill patients. *Crit Care Nurse* 2012;32(4):35-40.

## TOPIC(S)



Ease of Use



Health Economics

## DESIGN

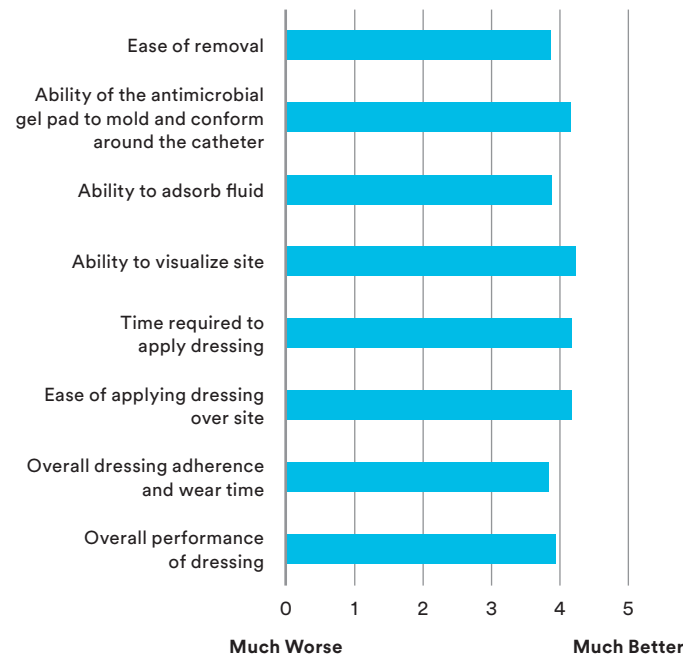
Quality improvement observation study completed in an adult medical-surgical intensive care unit (ICU) in a 714-bed tertiary care facility during a period of 1,881 device days.

## METHODS

Comparison of the effectiveness of a one-piece Tegaderm™ CHG Dressing versus a dressing plus a BIOPATCH® Disk on patients with a central venous catheter in the ICU. Patients were monitored for catheter-related bloodstream infections. Evaluation of cost and nurses’ satisfaction (n=30) with the new dressing.

## RESULTS

### Performance Ratings for a One-piece Tegaderm™ Dressing with Chlorhexidine Gluconate



## KEY FINDINGS

Estimated savings in the ICU for a similar 6-month period would be **\$1,463.76** and estimated savings **hospital-wide** would be **\$19,511.91.**

Nurses **prefer Tegaderm™ CHG Dressing** over BIOPATCH® Disks.

# BIOPATCH® was replaced with Tegaderm™ CHG for all central venous catheters and arterial lines for all ICU patients because healthcare workers reported significant improvement in fitness of use.

Eggimann P, Joseph C, Thévenin MJ. Fitness of use of Biopatch® and Tegaderm™ CHG for protecting central venous catheters and arterial lines in critically ill patients. Oral presentation at: 3rd International Conference on Prevention and Infection Control; June, 2015; Geneva, Switzerland.

## TOPIC(S)



Ease of Use

## DESIGN

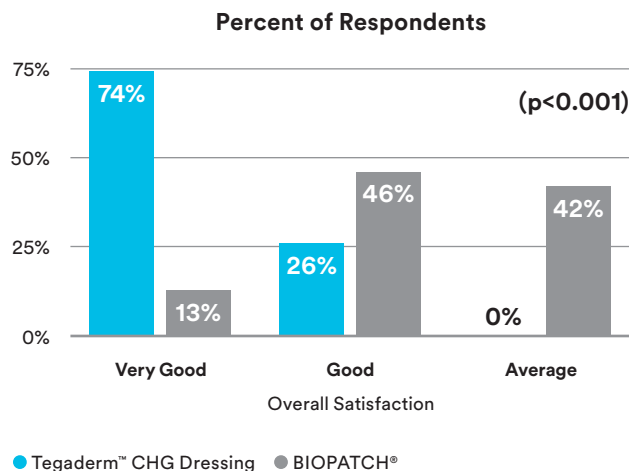
Clinical staff evaluation at 5 ICUs (2,000 admissions and 11,000 patient-days annually).

## METHODS

Study compared the fitness of use of BIOPATCH® Disks (n=24) and Tegaderm™ CHG Dressings (n=42) in a mixed ICU based on a questionnaire given to healthcare workers.

## RESULTS

### Comparison of Staff Satisfaction Evaluation



## KEY FINDINGS

There was significant improvement of the **ease of installation** reported for Tegaderm™ CHG Dressing compared to BIOPATCH® Disks.

In most cases, staff reported that Tegaderm™ CHG Dressing **improved coverage** of the insertion and suture sites.



# Tegaderm™ CHG Dressing is designed to ensure consistently correct placement with the CHG gel pad completely covering the catheter insertion site in 100% of tested applications.

Kohan CA, Boyce JM. A different experience with two different chlorhexidine gluconate dressings for use on central venous devices. Poster presented at Association for Professionals in Infection Control and Epidemiology (APIC) and published in *Am J Infect Control*. 2013;41(6):S142–S143.

## TOPIC(S)



Ease of Use

## DESIGN

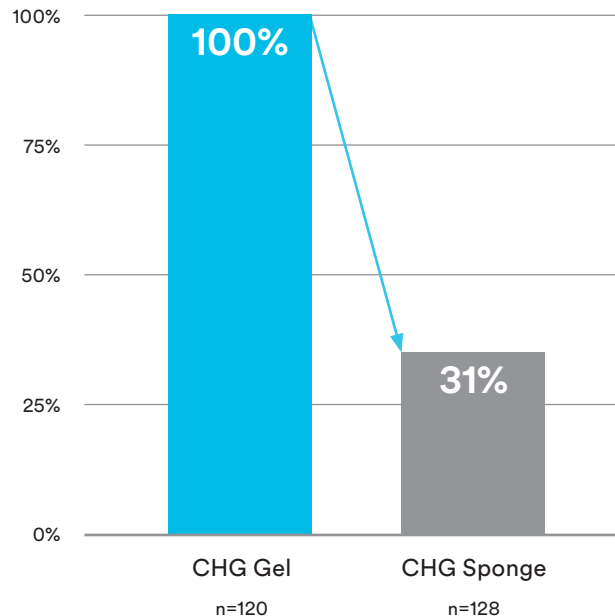
Clinical audits of dressing application and occlusiveness conducted in 2009 while using a BIOPATCH® Disk and in 2012 while using a Tegaderm™ CHG Dressing.

## METHODS

Audit evaluated the frequency of correct application for BIOPATCH® Disks and Tegaderm™ CHG Dressing in 248 dressing applications.

## RESULTS

### Percentage of Dressings Correctly Placed at the Insertion Site



## KEY FINDINGS

BIOPATCH® Disks were placed incorrectly at the insertion site **69% of the time** despite repeated educational sessions.

**Inappropriate placement** of the BIOPATCH® Disks included the disk placed on top of the catheter, disk upside down, radial slit not approximated, or disk too small for catheter size.

# The Tegaderm™ CHG Dressing demonstrated broad-spectrum antimicrobial activity against all 37 strains of microorganisms tested.

Hensler JP, Schwab DL, Olson LK, Palka-Santini M. Growth inhibition of microorganisms involved in CRBSIs by an antimicrobial transparent I.V. dressing containing chlorhexidine gluconate (CHG). Poster session presented at: 19<sup>th</sup> Annual Conference of the European Society of Clinical Microbiology and Infectious Diseases 2009; May 16-19, 2009.

## TOPIC(S)



Antimicrobial Protection

## DESIGN

*In vitro* study to assess zone of inhibition and aged zone of inhibition (22 months aged dressings).\*

## METHODS

The antimicrobial activity of the Tegaderm™ CHG Dressing gel pad was tested against a panel of 37 microorganism strains, comprised of 21 gram-positive and 14 gram-negative bacteria and two yeasts. The antimicrobial activity of Tegaderm™ CHG Dressing was evaluated against these microorganisms commonly associated with catheter-related bloodstream infections using *in vitro* zone of inhibition.\*

\*No clinical correlations intended.

## RESULTS

**Tegaderm™ CHG Dressing demonstrates *in vitro* efficacy against 37 strains of microorganisms including gram-positive and gram-negative bacteria and yeasts.**



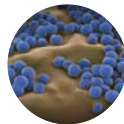
*Enterococcus*  
(5 strains)



*Pseudomonas aeruginosa*  
(5 strains)



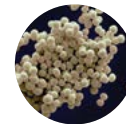
*Candida*  
(2 strains)



*Staphylococcus aureus*  
(8 strains)



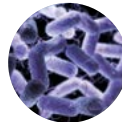
*Escherichia coli*  
(1 strain)



Coag Neg Staph  
(7 strains)



*Klebsiella*  
(2 strains)



*Enterobacter*  
(1 strain)



Other  
(6 strains)

## KEY FINDINGS

Many of the 37 strains tested were resistant organisms, including **MRSA, MRSE, VRE, and MDR** strains.

Tegaderm™ CHG Dressing **retains its antimicrobial properties** as demonstrated by the aged dressing's ability to produce similar zones of inhibition\* compared to unaged dressings.

# Tegaderm™ CHG Dressing provides antimicrobial protection under the catheter.

Schwab D, et al. Antimicrobial activity of a CHG-impregnated gel pad for I.V. site protection. Poster presented at: the conference of Infusion Nursing Society; May, 2008.

## TOPIC(S)



Antimicrobial Protection

## DESIGN

*In vitro* study to assess the zones of inhibition generated from surface CHG and diffused CHG.\*

## METHODS

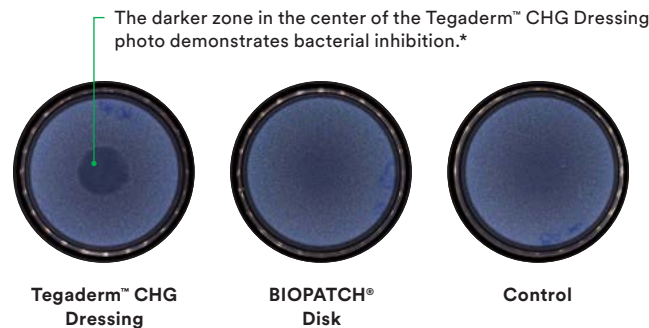
Multiple *in vitro* methodologies were used in this study:

- 1. Surface availability:** Evaluated the presence of CHG on the surface of Tegaderm™ CHG Dressing and BIOPATCH® in the absence of additional moisture.
- 2. CHG diffusion:** Evaluated the diffusion of CHG from Tegaderm™ CHG Dressing through an agar plate to areas not in direct contact.

## RESULTS

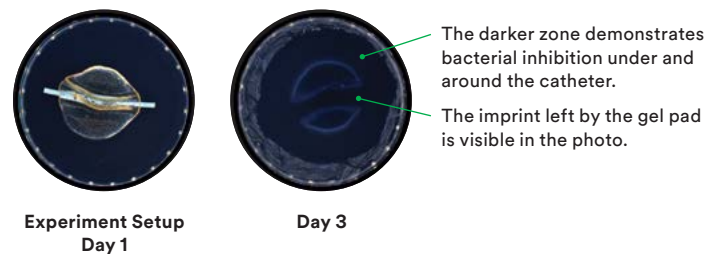
### Method 1: Provides Antimicrobial Protection without Moisture

Images of agar plates inoculated with *S. epidermidis* at 24 hours



### Method 2: Provides Antimicrobial Protection under the Catheter

Images of agar plates inoculated with *S. epidermidis*



\*No clinical correlations intended.

## KEY FINDINGS

Tegaderm™ CHG Dressing provides antimicrobial protection **without any additional moisture.**

CHG from the Tegaderm™ CHG Dressing is **diffused** under the catheter.

# Tegaderm™ CHG Dressing provides continuous antimicrobial activity.

Maki D, Stahl J, Jacobson C, et al. 2008. A novel integrated chlorhexidine-impregnated transparent dressing for prevention of vascular catheter-related bloodstream infection: a prospective comparative study in healthy volunteers. Poster presentation at The Society for Healthcare Epidemiology of America annual conference.

## TOPIC(S)



Antimicrobial Protection

## DESIGN

*In vivo* trials in healthy volunteers of immediate and long-term cutaneous antimicrobial activity to analyze prevention of skin floral regrowth on alcohol prepped subclavian sites and cumulative kill of skin flora on unprepped sites over 10 days of exposure.

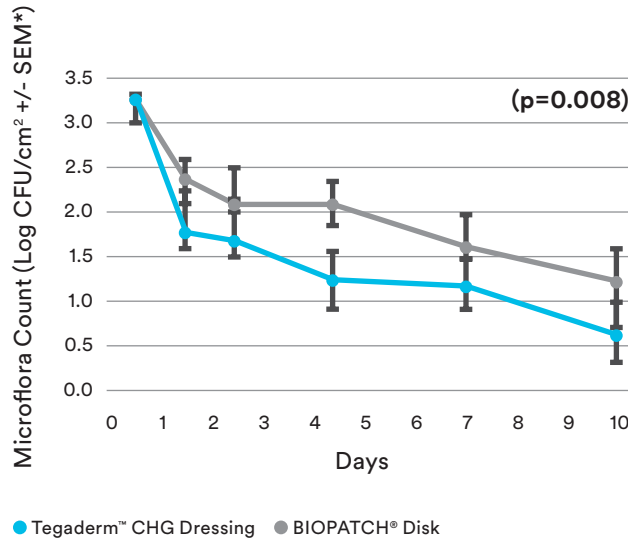
## METHODS

Study compared the antimicrobial effectiveness of Tegaderm™ CHG Dressing to BIOPATCH® Disks on healthy adult volunteers.

## RESULTS

### Provides Immediate and Persistent Reduction of Microbes

*In vivo* kill time of normal flora on unprepped skin on healthy adult volunteers



\*SEM: Scanned Electron Microscopy

## KEY FINDINGS

Tegaderm™ CHG Dressing is proven to be **as effective as or better than** BIOPATCH® Disks at persistently reducing microbes at each time point.

## Description

3M™ Tegaderm™ CHG Chlorhexidine Gluconate I.V. Securement Dressing is used to cover and protect catheter sites and to secure devices to the skin. It is available in a variety of shapes and sizes. Tegaderm™ CHG I.V. Securement Dressing consists of a transparent adhesive dressing and an integrated gel pad containing 2% w/w Chlorhexidine Gluconate (CHG), a well known antiseptic agent with broad spectrum antimicrobial and antifungal activity.

The transparent film provides an effective barrier against external contamination including fluids (waterproof), bacteria, viruses\* and yeast, and protects the I.V. site.

*In vitro* testing (log reduction and barrier testing) demonstrates that the Tegaderm™ CHG gel pad in the Tegaderm™ CHG I.V. Securement Dressing has an antimicrobial effect against, and is a barrier to, a variety of gram-positive and gram-negative bacteria, and yeast in the dressing. The gel pad absorbs fluid.

\**In vitro* testing shows that the transparent film of the Tegaderm™ CHG dressing provides a viral barrier from viruses 27 nm in diameter or larger while the dressing remains intact without leakage.

Tegaderm™ CHG I.V. Securement Dressing is transparent, allowing continual site observation, and is breathable, allowing good moisture vapor exchange.

## Indications

3M™ Tegaderm™ CHG Chlorhexidine Gluconate I.V. Securement Dressing can be used to cover and protect catheter sites and to secure devices to skin. Common applications include securing and covering IV catheters, other intravascular catheters and percutaneous devices.

Tegaderm™ CHG I.V. Securement Dressing is intended to reduce vascular catheter colonization and catheter-related bloodstream infections (CRBSI) in patients with central venous or arterial catheters.

## Warnings

- DO NOT USE TEGADERM™ CHG I.V. SECUREMENT DRESSING ON PREMATURE INFANTS OR INFANTS YOUNGER THAN 2 MONTHS OF AGE. USE OF THIS PRODUCT ON PREMATURE INFANTS MAY RESULT IN HYPERSENSITIVITY REACTIONS OR NECROSIS OF THE SKIN.
- FOR EXTERNAL USE ONLY. DO NOT ALLOW THIS PRODUCT TO CONTACT EARS, EYES, MOUTH OR MUCOUS MEMBRANES.
- THE SAFETY AND EFFECTIVENESS OF TEGADERM™ CHG I.V. SECUREMENT DRESSING HAS NOT BEEN ESTABLISHED IN CHILDREN UNDER 18 YEARS OF AGE.
- DO NOT USE TEGADERM™ CHG I.V. SECUREMENT DRESSING DIRECTLY OVER BURN INJURY.
- DO NOT USE THIS PRODUCT ON PATIENTS WITH KNOWN HYPERSENSITIVITY TO CHLORHEXIDINE GLUCONATE. THE USE OF CHLORHEXIDINE GLUCONATE CONTAINING PRODUCTS HAS BEEN REPORTED TO CAUSE IRRITATIONS, SENSITIZATION, AND GENERALIZED ALLERGIC REACTIONS.  

Hypersensitivity reactions associated with topical use of Chlorhexidine Gluconate have been reported in several countries. The most serious reactions (including anaphylaxis) have occurred in patients treated with lubricants containing Chlorhexidine Gluconate, which were used during urinary tract procedures. Preparations of this type are not approved for sale in the U.S. under any circumstances. Caution should be taken when using Chlorhexidine Gluconate containing preparations, and the patient should be observed for the possibility of hypersensitivity reactions.
- IF ALLERGIC REACTIONS OCCUR, DISCONTINUE USE IMMEDIATELY, AND IF SEVERE, CONTACT A PHYSICIAN.

**Caution:** Federal Law restricts the device to sale by or on the order of a licensed health care professional.

## Precautions

3M™ Tegaderm™ CHG I.V. Securement Dressing should not be placed over infected wounds. This device is not intended to treat catheter-related bloodstream infections (CRBSI) or other percutaneous device-related infection.

Any active bleeding at the insertion site should be stabilized before applying the dressing. Do not stretch the dressing during application. Mechanical skin trauma may result if dressing is applied with tension.

The skin should be clean, dry and free of detergent residue. Allow all preps and protectants to dry completely before applying the dressing to prevent skin irritation and to ensure good adhesion.

# Notes

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To learn more about 3M™ Tegaderm™ CHG Dressing or to schedule a product evaluation, visit us at [3M.com/TegadermCHG](https://www.3M.com/TegadermCHG)



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