strategies to decrease cutaneous bacterial colonization. Prior studies have shown benefit from chlorhexidine-gluconate (CHG) skin application on CLABSI and MRSA infection rates in intensive care units (ICUs); however, the use of CHG in the non-ICU population has not been well studied. **Methods:** We performed a quasi-experimental before-and-after study to evaluate the use of daily 2% CHG wipes in non-ICU patients at a 1,000 bed acute-care teaching hospital beginning in November 2017. The study population included adult and pediatric patients with central venous catheters on non-ICU units, excluding patients on the following units: stem cell transplant and hematologic malignancy (these units had already established use of CHG skin application as a standard prior to the intervention), labor and delivery, and psychiatry. CHG was applied according to the manufacturer's instruction by nurses or nurse aides and random monthly auditing of compliance was performed. NHSN CLABSI, hospital-onset MRSA bacteremia, and hospital-onset MRSA LabID rates were compared for the period 24 months before the intervention (November 1, 2015, through October 31, 2017) to the 24-month period after the intervention (November 1, 2017, through October 31, 2019) using a paired *t* test. Notably, the health system also discontinued the use of contact precautions for patients with MRSA (excluding MRSA from open, draining wounds) 11 months prior to onset of this intervention. **Results:** The CLABSI rate decreased by 26% from 0.594 events per 1,000 central-line days (n = 50) before the intervention to 0.438 events per 1,000 central-line days (n = 38) after the intervention ($P = 0.19$). The number of CLABSIs with gram-positive organisms also decreased by 29%. MRSA LabID rates decreased by 37% from 0.301 events per 1,000 patient days (n = 119) to 0.189 events per 1,000 patient days (n = 75) ($P = 0.01$). MRSA bacteremia rates decreased by 79% from 0.058 events per 1,000 patient days (n = 23) to 0.012 events per 1,000 patient days (n = 5) ($P < 0.01$). Compliance with the intervention was 83% (n = 225). **Conclusions:** Daily CHG skin application in non-ICU patients with central venous catheters is an effective strategy to prevent CLABSIs and MRSA infections. We observed a decrease in MRSA LabID and bacteremia rates despite discontinuation of contact precautions. These findings suggest that a horizontal prevention approach of daily CHG skin application may be an effective alternative to contact isolation to interrupt transmission of MRSA in hospitalized patients outside the ICU setting.

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Poster Presentation

Chlorhexidine Dressings to Prevent Catheter-Related Bloodstream Infections: A Systematic Literature Review and Meta-analysis

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Background: Catheter-related bloodstream infections (CRBSIs) are associated with significant morbidity and mortality. We aimed to determine the effectiveness of chlorhexidine (CHG) dressings in preventing incident CRBSI in different settings and types of catheters. **Methods:** We searched PubMed, Cochrane Library, CINAHL, Embase, and ClinicalTrials.gov through March 2019 for studies with the following inclusion criteria: (1) population consisted of patients requiring short or long-term catheters; (2) CHG dressing was used in the intervention group and a nonantimicrobial impregnated dressing was used in the control group; (3) CRBSI was reported as an outcome. Randomized controlled trials (RCTs) and quasi-experimental studies were included. We used a random-effect models to obtain pooled OR estimates. Heterogeneity was evaluated with I 2 test and the Cochran Q statistic. **Results:** The review included 21 studies (17 RCTs). The use of CHG dressings was associated with a lower incidence of CRBSI (pooled RR, 0.63; 95% CI, 0.53–0.76). There was no evidence of publication bias. In stratified analyses, CHG dressing reduced CRBSI in ICU adult patients (9 studies, pRR, 0.52; 95% CI, 0.38–0.72) and adults with oncohematological disease (3 studies, pRR, 0.53; 95% CI, 0.35–0.81) but not in neonates and pediatric populations (6 studies, pRR, 0.90; 95% CI, 0.57–1.40). When stratified by type of catheter, CHG dressing remained protective against CRBSI in short-term venous catheters (11 studies, pRR, 0.65; 95% CI, 0.48–0.88) but not in long-term catheters (3 studies, pRR, 0.76:; 95% CI, 0.19–3.06). Other subgroup analyses are shown in Table 1. **Conclusions:** CHG dressings reduce the incidence of CRBSI, particularly in adult ICU patients and adults with an onco-

Table 1. Subgroup Analyses

Subgroups	No. of Studies	No. of CHG Catheters/ Control Groups	Pooled RR (95% CI)	I^2 Test (%)
All studies	21	7,806/7,761	0.63 (0.53–0.76)	0
Transparent CHG dressing (Tegaderm®)	8	2,654/5,506	0.58 (0.40–0.84)	0
CHG-impregnated disc (Biopatch®)	10	5,009/5,113	0.67 (0.49–0.92)	22
RCTs	17	6,393/6,235	0.58 (0.45–0.76)	1
Non-RCT or unclear design	4	1,413/1,523	0.69 (0.53–0.89)	1
Femoral insertion (≥44% study population)	3	389/368	0.65 (0.23–1.85)	7
Antimicrobial-impregnated catheters	2	607/607	0.55 (0.36–0.84)	0
Same frequency of dressing change in both groups	12	5,137/4,910	0.55 (0.40–0.75)	0
Different frequency of dressing change between intervention and control groups (7 vs ≤ 3 d)	5	1,010/1,058	0.62 (0.38–1.00)	14

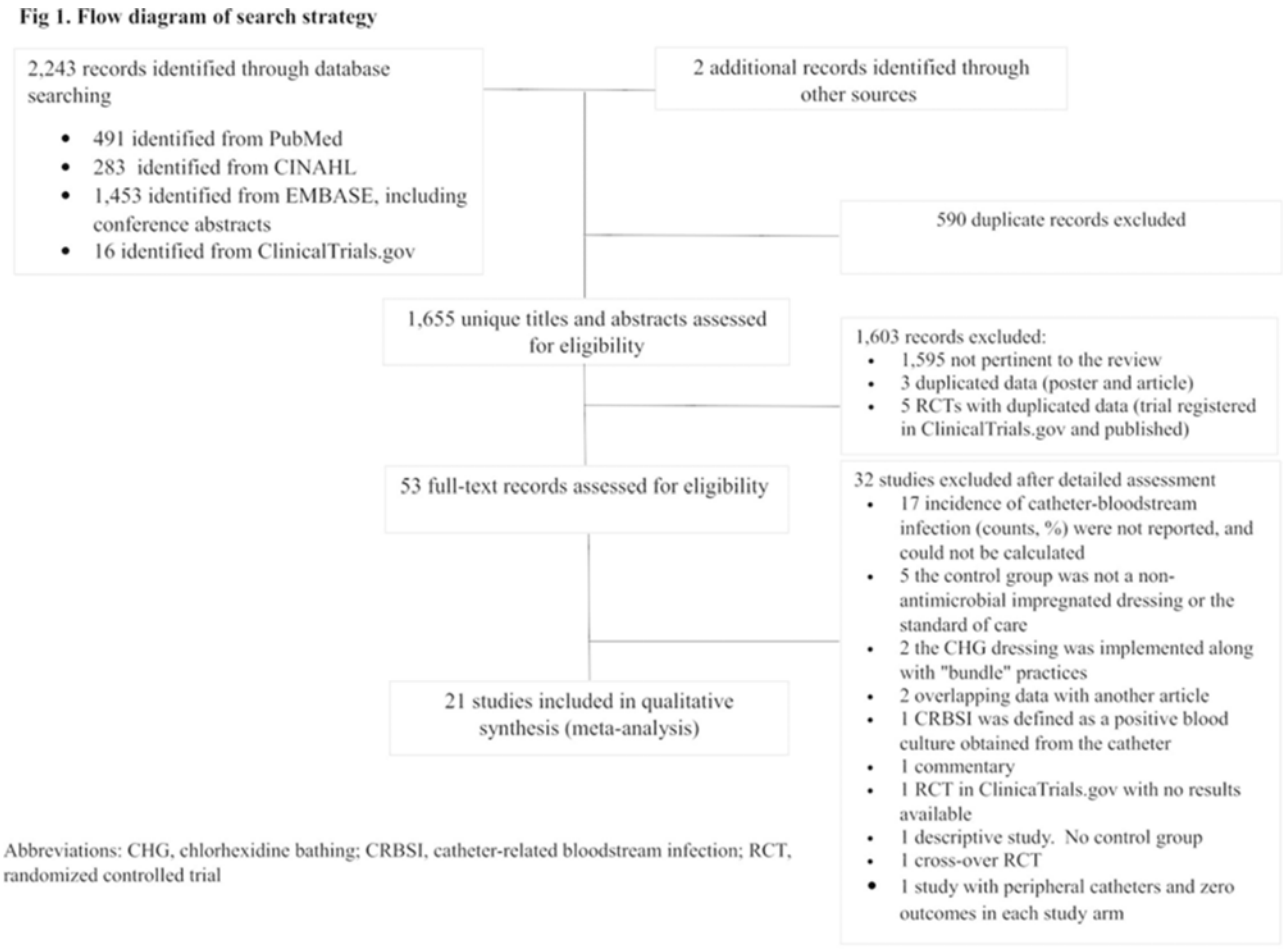

Fig. 1.

hematological disease. Future studies need to evaluate the benefit of CHG in non-ICU settings, in neonates and pediatric populations, and in long-term catheters.

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Chlorhexidine Gluconate Application as A Strategy to Reduce Cardiac Implantable Electronic Device Surgical Site Infection

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Background: The electrophysiology laboratory within the cardiac procedures unit (CPU) at Michigan Medicine specializes in implanting, exchanging, and extracting cardiac implantable electronic devices (CIED). During routine surveillance of surgical site infections (SSI), an increase in CIED infections (specifically endocarditis) was noted starting in 2016. The predominant organisms involved with infection were skin organisms such as *Staphylococcus aureus* and coagulase-negative *Staphylococcus*. **Methods:** Cases of SSI following CIED implantation were identified using positive microbiology results collected within 90 days of a procedure. Cases were classified using the NHSN SSI definitions. Upon identifying an increase in infections, a work group of key stakeholders was formed to determine root causes. Factors discussed included standardized surgical skin preparation techniques, patient education regarding bathing before and after procedures, types of surgical drapes in use, traffic in and out of procedure rooms during cases, environmental cleanliness of the procedure area, and adherence to the institutional surgical attire policy. In addition to the workgroup, several cases were observed by the IP team. **Results:** The investigation revealed several areas for improvement. As a first step, a practice of using 2% chlorhexidine gluconate (CHG)–impregnated bathing clothes on patients prior to surgery was implemented for the chest, neck, axilla, and arm. No other changes were implemented during this time period. In the year following implementation, there were zero cases of endocarditis and only 2 superficial SSIs (Figs. 1 and 2). **Conclusions:** Employing application of CHG to reduce the microbial burden on the skin significantly aided in preventing infections related to CIEDs.

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