Appendix: Table 7

Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections (2017)

AT A GLANCE

Appendix: Table 7 from the Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections (2017) guideline.

Summary of Evidence for Using Chlorhexidine-Impregnated (C-I) Dressings among Patients Aged < 18 Years with Short-term, Non-tunneled Central Venous Catheters (data are directly extracted from studies unless otherwise noted)

Study Features	Population and Setting	Study Groups	Outcome Definitions	Results
Duzkaya, 2017[7] (Extracted by Dasti) **Risk of bias score:** Moderate [M] **Study objective:** To compare the efficacy of a chlorhexidine-impregnated dressing with that of a standard dressing in preventing CRBSI in children	**N = 100 patients Inclusion criteria:** Patients aged 1 month to 18 years old admitted to PICU; had no CRBSI at the time of hospital admission; had a CVC in place for more than 72 hours; were not receiving neuromuscular blockers; and obtained written consent to be part of the study. **Exclusion criteria:** NR **Setting:** PICU of university hospital **Location:** Istanbul, Turkey **Dates:** December 2012–January 2014 **Anticipated study power:** A minimal sample size of 61 patients would have an 80% power to detect a difference of 19% between development and absence of CRBSI at α=.05	**Intervention:** n=50 patients (number of catheters per patient NR)2% C-I gel pad dressing **Control:** n=50 patients (number of catheters per patient NR) Sterile (gauze) pad **Standard care for both groups:** Insertion site: femoral, jugular, or subclavian vein Catheters: non-tunneled CVCs Skin prep: 10% PI was used for dermal antisepsis, and cleansing was maintained for 3 minutes. Dressing change: In the intervention group, 2% C-I dressings remained in situ for 7 days unless they became wet. In the control	**CRBSI:** Growth of 15 CFUs or more in the catheter end. Culture and microorganisms in the two blood samples with the same antibiotic resistance patterns as the microbes in the catheter end.**Local catheter infection:** growth of 15 CFUs or more in the culture of the catheter end and findings of inflammation at the catheter insertion site in the absence of blood-borne infection	**CRBSI incidence (events/patients):** 1/50 (2%) vs. 5/50 (10%); p>0.05**Local catheter infection: (events/patients):** 1/50 (2%) vs. 2/50 (4%); p>0.05

Study Features	Population and Setting	Study Groups	Outcome Definitions	Results
	Follow up: NR	group, gauze dressings were changed daily because children's skin is more sensitive than adults' skin and frequent exposure of the catheter insertion site allowed earlier recognition of redness or changes. Chlorhexidine bathing: None		
Levy, 2005[8](Extracted by Overholt) **Risk of bias score:** Moderate [M] **Study objective:** To determine the efficacy and safety of the chlorhexidine gluconate-impregnated sponge for the prevention of CVC colonization and CABSI in infants and children undergoing cardiac surgery	**N = 145 patients Inclusion criteria:** Infants and children 0–18 years old admitted to the PCICU during the study period and required a non-tunneled CVC for >48 hrs **Exclusion criteria:** NR **Setting:** 1 children's medical center PCICU **Location:** Israel **Dates:** January 2002–March 2003 **Follow up:** NR **Anticipated study power:** 80% power to detect a 20% reduction in colonization and adverse event rates based on 70 patients in each group. CABSI was secondary study outcome.	**Intervention:** n=74 patientsC-I sponge dressing under transparent polyurethane dressing **Control:** n=71 patients Transparent polyurethane dressing **Standard care for both groups:** Insertion site: Internal jugular vein Catheters: short-term, non-tunneled catheters Skin preparation: Disinfection with CHG solution for 30 seconds and allowed to dry Dressing change: Only if mechanical complications, bleeding, oozing or signs of exit site infection (redness or pus discharge) occurred. Insertion site was cleansed with CHG and covered with the same type of dressing. Daily chlorhexidine bathing: NR	**Catheter-associated bloodstream infections (CABSI):** Bacteremia without isolation of the same organism from the tip of the CVC and blood. Blood and exit site cultures were performed when clinical systemic and local signs of infection occurred **Product related adverse events:** Not defined **Local redness:** Not defined	**CABSI incidence (events/patients):** 4/74 (5.4%) vs. 3/71 (4.2%); p=1.00**Product related adverse events:** Significant adverse events were not associated with the use of this device in this patient population. **Local redness incidence: (events/patients):** 4/74 (5.4%) vs. 1/71 (1.4%) • All intervention events occurred in neonates.
Garland, 2001[6](Extracted by Stone) **Risk of bias score:** Moderate [M]	**N = 705 neonates;** 620 percutaneous (non-tunneled) CVCs85 Broviac (tunneled) CVCs	**Intervention:** n=335 patientsSkin was cleansed for at least 30 seconds with 70% isopropyl alcohol. After alcohol was	**CRBSI**: clinically relevant BSI without an identifiable primary source other than a CVC colonized by the same strain grown from blood cultures. Hub	**CRBSI incidence (events/percutaneous catheters):** 11/297 (3.7%) vs. 10/323 (3.1%); RR: 1.2 (CI: 0.5–2.7); p=0.68**BSI**

Study Features	Population and Setting	Study Groups	Outcome Definitions	Results
Study objective: To report the results of a multicenter prospective, RCT undertaken to ascertain the efficacy of a novel chlorhexidine gluconate impregnated dressing for the prevention of catheter colonization and CRBSI in critically ill neonates.	**Inclusion criteria:** Critically ill neonates admitted to units who would likely require a CVC for at least 48 hrs where the parents gave informed consent. Amended after 9/118 (7.6%) of neonates experienced adverse reactions to the C-I dressing during the first 15 months of the study. After this, infants <26 weeks were enrolled only if CVC was inserted after the first week of life. **Exclusion criteria:** NR **Setting:** NICUs in 4 university hospital and 2 community hospital **Location:** USA **Dates:** June 1994–August 1997 **Anticipated study power:** 80% (α=0.05) to detect a 50% reduction in CRBSI rates from baseline of 9% risk based on 490 neonates in each group. Study stopped early due to funding and low CRBSI rate. **Follow up:** NR	allowed to dry, CVC was inserted and site was dressed with C-I sponge under transparent polyurethane dressing. Dressings were changed every 7 days**Control:** n=370 patients Skin was cleansed for at least 30 seconds with 10% aqueous PI. After PI was allowed to dry, CVC was inserted then site was dressed with transparent polyurethane dressing. **Standard care for both groups :** Insertion sites: leg, arm, head/neck and other. Catheters: percutaneous and tunneled CVCs. 6% of catheters in each group were surgically placed. Skin preparation: different by groups. Dressing change: changed every 7 days Daily chlorhexidine bathing: none.	cultures, if obtained, were negative for the organism grown from the blood**BSI without a source:** A positive blood culture during the time a catheter was in situ or within 24 hrs of removal; clinical signs or symptoms of a BSI within 6 hrs of the positive culture; antibiotic therapy for ≥7 days and no other documented primary site of infection; and catheter tip and hub cultures were either not colonized or colonized with organisms different from those grown from the blood · BSI signs and symptoms: an increase or decrease in the white blood cell count by 3×10^3 per mm^2 or ≥0.15 immature neutrophils ratio on a complete blood count; new-onset apnea; glucose intolerance or hypoglycemia; metabolic acidosis; tachycardia or hypotension; mottled or ashen appearance with a normal hematocrit; and/or new onset of feeding intolerance, lethargy, or fever. **Adverse reactions**: Included severe or localized contact dermatitis, pressure necrosis and/or reactions leading to scar formation. **Severe localized contact dermatitis:** Not defined. **Pressure necrosis under C-I dressing:** Not defined.	**BSI without a source incidence (events/percutaneous catheters):** 46/316 (14.6%) vs. 44/346 (12.7%); RR: 1.1 (CI: 0.8–1.7); p=0.49. **Adverse reaction incidence (events/patients):** • All neonates: 19/335 (5.7%) vs. 0; p<0.01 • Neonates <1,000g: 15/98 (15%) • Neonates ≥1,000g: 4/237 (1.5%) • p<0.01 for comparison by weight **Severe localized contact dermatitis incidence (events/patients) during first 15 months of study:** 7/118 (5.9%) of neonates with C-I dressing developed severe localized contact dermatitis • After change in protocol, there were 12/217 (5.5%) more episodes of contact dermatitis **Other adverse events under C-I dressing incidence (events/patients) during first 15 months of study:** • Pressure necrosis: 2/19 (10.5%) • Scar formation: 2/19 (10.5%)

Summary of evidence for patients under 18.

Footnotes

M. Basis of score described in Table 9.

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Appendix: 3.0 Risk of Bias Assessments

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Appendix: 3.0 Risk of Bias Assessments

Appendix: 4.0 GRADE Approach