

Evidence Assessment: Summary of a Systematic Review

Who is this summary for?

Policy makers or clinicians who have to make decisions about the treatment and care of patients with central venous catheters.

Gauze and tape and transparent polyurethane dressings for central venous catheters

Key findings

- We found a four-fold increase in the rate of catheter related blood stream infection when a polyurethane dressing was used to secure the central venous catheter compared to gauze and tape.
- Rates of catheter-related blood stream infections (between 0% and 6%) were similar to those reported in prior research irrespective of the type of product used.
- There was no difference between the different types of polyurethane dressings for the prevention of catheter-related blood stream infection.

Background

Central venous catheters (CVCs) facilitate venous access, allowing the intravenous administration of complex drug treatments, blood products and nutritional support, without the trauma associated with repeated venipuncture. However, CVCs are associated with a risk of infection. Some studies have indicated that the type of dressing used with them may affect the risk of infection. Gauze and tape, transparent polyurethane film dressings such as Tegaderm® and Opsite®, and highly vapour-permeable transparent polyurethane film dressings such as Opsite IV3000®, are the most common types of dressing used to secure CVCs. Currently, it is not clear which type of dressing is the most appropriate.

Question

What is the effectiveness of gauze and tape with transparent polyurethane dressings for central venous catheters, in dressing material and dressing condition in hospitalised adults and children?

The use of gauze and tape and transparent polyurethane dressings for central venous catheters in Cameroon: Nosocomial infections are a major public health problem in health facilities in Cameroon. Statistics on the magnitude of the problem are not known. Nosocomial infection can be caused by germs from the patient, caregiver or hospital environment. Gauze and tape and transparent polyurethane dressings for central venous catheters are not systematically used in Cameroon. This intervention can reduce the incidence of nosocomial infections in hospitals.

Table 1: Summary of the systematic review		
	What the review authors searched for	What the review authors found
Studies	Randomized controlled trials (RCT)	Six RCTs met the inclusion criteria.
Participants	Patients, of any age, in the hospital setting, with Central venous catheters in situ.	Participants were either oncology patient's renal patients; or general surgical patients.
Interventions and controls	Studies which compared gauze and tape central venous catheters dressings with transparent polyurethane Central venous catheters dressings, or compare different transparent polyurethane Central venous catheters dressings.	Of six trials, four compared gauze and tape with transparent polyurethane dressings (total participants = 337) and two compared different transparent polyurethane dressings (total participants = 126)
Outcomes	<p>Primary outcomes</p> <ul style="list-style-type: none"> • Incidence of catheter-related bloodstream infection: isolate of the same organism from a semi-quantitative or quantitative culture of a catheter segment and from separate percutaneous blood cultures, with no other identifiable source of infection. • Incidence of positive catheter cultures: any positive semi quantitative or quantitative culture from a proximal or distal catheter segment. • Incidence of skin/site colonisation (mean number of colony-forming units): any positive semi-quantitative or quantitative culture from the skin around the catheter site. <p>Secondary outcomes</p> <ul style="list-style-type: none"> • Incidence of exit-site infection. • Incidence of tunnel infection. • Incidence of catheter security. • Incidence of skin irritation. • Dressing condition/durability (incidence or mean score). 	<p>Three trials provided data for exit site infection.</p> <p>One study assessed skin/site colonisation.</p> <p>One study reported rates of catheter related bloodstream infection.</p>
Date of the most recent search: 10 May 2011		
Limitations: This is a moderate quality systematic review with limitations related to the included studies, AMSTAR =7/11.		
Citation: Webster J, Gillies D, O'Riordan E, Sherriff KL, Rickard CM. Gauze and tape and transparent polyurethane dressings for central venous catheters. Cochrane Database of Systematic Reviews 2011, Issue 11. Art. No.: CD003827. DOI:10.1002/14651858.CD003827.pub2		

Table 2: Summary of findings

Outcomes	Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)
Catheter-related blood stream infection (CRBI) Same organism recovered from catheter tip and blood culture	4.19 [1.02-17.23]	337 (4)	Low
Exit-site infection Laboratory testing	1.78 [0.62-1.17]	665 (3)	Low
Positive catheter culture Laboratory testing	0.74 [0.27-2.09]	138 (2)	Low

Applicability

In this review, two of the studies were conducted in the USA and one and 1 each in Spain, Turkey, Canada, and Netherlands. Even though none of these studies was conducted in Africa, some of these interventions can be applied in low resource settings.

Conclusions

We found a four-fold increase in the rate of catheter related blood stream infection when a polyurethane dressing was used to secure the central venous catheter. True effect could be as small as 2% or as high as 17-fold.

Prepared by

M. Vouking, C.D. Evina, L. Mbuagbaw, P. Ongolo-Zogo: Centre for the Development of Best Practices in Health, Yaoundé, Cameroon. Available at www.cdbph.org

April 2014