



Central venous access device complications and device failure is a prevalent and significant problem in the adult ICU, leading to substantial patient harm and increased healthcare costs”

Takashima et al (2018).

Abstract:

**OBJECTIVES:** To examine the proportion and rate of central venous access device failure and complications across central venous access device types in adult intensive care.

**DATA SOURCES:** A systematic search was undertaken in the electronic databases Cochrane Central Register of Controlled Trials (CENTRAL), Embase, U.S. National Library of Medicine National Institutes of Health (MEDLINE), and Cumulative Index to Nursing and Allied Health (CINAHL) in September 2017.

**STUDY SELECTION:** Included studies were of observational (prospective and retrospective) or interventional design and reported central venous access device failure and complications in adult ICU settings. Studies were excluded if they were published prior to November 2006 or not reported in English. Two reviewers independently screened articles, assessed eligibility, extracted data, and assessed risk of bias.

**DATA EXTRACTION:** Data were extracted on the primary outcome, central venous access device failure, and secondary outcomes: central venous access device complications (central

line-associated bloodstream infection, catheter-related bloodstream infection, catheter-related thrombosis, occlusion, catheter removal due to suspected infection, dislodgement, breakage, and local infection). Patient and device data and study details to assess the study quality were also extracted.

**DATA SYNTHESIS:** A total of 63 studies involving 50,000 central venous access devices (396,951 catheter days) were included. Central venous access device failure was 5% (95% CI, 3-6%), with the highest rates and proportion of failure in hemodialysis catheters. Overall central line-associated bloodstream infection rate was 4.59 per 1,000 catheter days (95% CI, 2.31-6.86), with the highest rate in nontunneled central venous access devices. Removal of central venous access device due to suspected infection was high (17%; 20.4 per 1,000 catheter days; 95% CI, 15.7-25.2).

**CONCLUSIONS:** Central venous access device complications and device failure is a prevalent and significant problem in the adult ICU, leading to substantial patient harm and increased healthcare costs. The high proportion of central venous access devices removed due to suspicion of infection, despite low overall central line-associated bloodstream infection and catheter-related bloodstream infection rates, indicates a need for robust practice guidelines to inform decision-making surrounding removal of central venous access devices suspected of infection.

Reference:

Takashima, M., Schults, J., Mihala, G., Corley, A. and Ullman, A. (2018) Complication and Failures of Central Vascular Access Device in Adult Critical Care Settings. *Critical Care Medicine*. August 7th. .

doi: 10.1097/CCM.0000000000003370.

