Healthcare Innovations
How practice has changed

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Risk factors for central venous access device failure: an analysis of 1893 catheters

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Purpose

Central venous access devices (CVAD) are a vital medical device but develop complications necessitating removal.

We examined risk factors for CVAD failure in hospitalised patients ≥16 years.

Methods

In this secondary analysis of data from a 10-site RCT assessing IV administration set change frequency, central line-associated blood stream infection (CLABSI), occlusion and dislodgement were examined.

Cox proportional hazards regression models were informed by Bayesian information criteria.

Results

1893 CVADs were included: 814 non-tunnelled CVADs, 757 peripherally-inserted central catheters (PICCs) and 322 tunnelled CVADs.

Factors associated with increased CLABSI:

- Mechanical ventilation (HR 1.70, p=0.047)
- Administration of blood products (HR 1.70, p=0.045)

Factors protective of CLABSI:

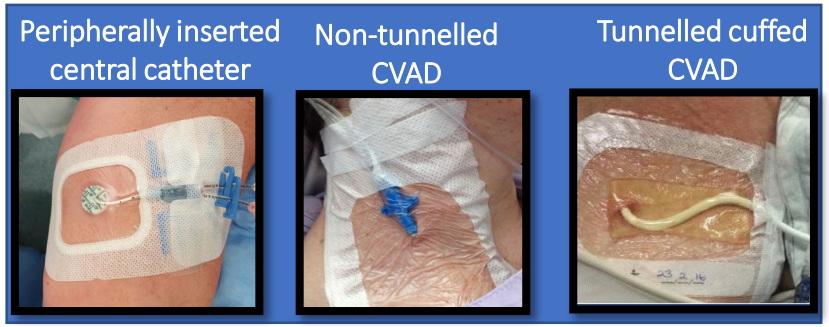
- PICC insertion compared to jugular or subclavian CVAD (HR 0.46, p=0.01)

Factors associated with higher risk of occlusion:

- Administration of propofol (HR 2.49, p=0.01) and insulin (HR 2.82, p<0.01)

Factors associated with increased dislodgement:

- Insertion in other hospital (HR 10.59, p=0.003)



Conclusions

Modifiable risk factors for CVAD complications have been identified.

- Enhanced infection prevention vigilance is required during CVAD care in mechanically ventilated patients and those receiving blood products.
- Increased CVAD securement is needed in patients requiring inter-hospital transfer.

These findings inform practice change to reduce preventable CVAD complications and improve patient outcomes.