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Evidence-based Series 16-1

Managing Central Venous Access Devices in Cancer Patients

Members of the Central Venous Access Device Guideline Panel

A Quality Initiative of the
Program in Evidence-based Care (PEBC), Cancer Care Ontario (CCO)
Developed by the Central Venous Access Device Guideline Panel

Report Date: September 25, 2006

The full Evidence-based Series #16-1 is comprised of 3 sections and is available on the CCO website (http://www.cancercare.on.ca)
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Section 1: Clinical Practice Guideline
Section 2: Systematic Review
Section 3: Guideline Development and External Review - Methods and Results

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Evidence-based Series 16-1: Section 1

Managing Central Venous Access Devices in Cancer Patients: A Clinical Practice Guideline

Members of the Central Venous Access Device Guideline Panel

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Questions

1. In order to prevent catheter-related intraluminal thrombosis and local or systemic catheter-related infection, minimize the need to replace devices, and enhance quality of life among children and adults with cancer:
   - Should central venous access devices (CVAD) be locked with heparin or saline?
   - What volume and strength of solution should be used to lock CVADs?
   - How frequently should CVADs be locked?
   - What type of catheter should be used?

   Locking (also called capping or flushing) solutions used with positive pressure technique maintain catheter patency by preventing blood reflux and by reducing risk of blood clotting in the device lumen when blood reflux occurs.
2. In patients who require systemic therapy for cancer, what are the indicators (e.g., functional or quantitative neutropenia, age, diagnosis, therapy, immune status, or patient convenience) that have an impact on the decision to insert a central venous access device?

Recommendations and Key Evidence

ADULTS

There is insufficient evidence for or against the choice of a particular protocol in the adult cancer population. Recommendations by the panel regarding the schedule of solutions, volumes, concentrations, and frequencies are based on a consensus of the expert clinical opinion and the experience of the CVAD Panel in their practices and the best available evidence. These recommendations are framed as a consensus schedule and are presented in Table 1.

The purpose of the consensus schedule is to provide clinical institutions and other organizations with a framework on which to build their own institutional protocols, and to encourage standardization of protocols across institutions. While there is dearth of evidence to drive institutional change, standardization of protocols is of value in and of itself as it can

increase patient confidence in nursing care, improve the patient experience, and simplify nursing education. Other important considerations include:

- The impact on patients, families, and staff of inconsistent practice, at a time of transition of care between centres.
- The cost to patients and families in both quality of life and dollars of potentially unnecessary increase in frequency of hospital visits for CVAD management that are required by some hospitals.
- The cost to the health care system associated with more frequent flushing with more costly solutions that may not be justified.

Table 1. Consensus recommendations for locking central venous access devices in adult cancer patients.

CVAD	Lock Solution	Volume[A]	Concentration	Frequency
Implanted device (e.g. Port-A-Cath™)	Heparin	5 mL	100 units/mL	After each use or every four weeks if not in use
Closed ended Tunnelled catheter (e.g. Groshong™)	Sterile Saline	10 mL	0.9%	After each use or weekly if not in use
Open ended Tunnelled catheter (e.g. Hickman™)	Heparin	3 mL	100 units/mL	After each use or weekly if not in use
Closed ended PICC (e.g. Groshong™)	Sterile Saline	10 mL	0.9%	After each use or weekly if not in use
Open ended PICC (e.g. Cook™, Vaxcel™)	Heparin	3 mL	100 units/mL	After each use or weekly if not in use

CVAD, central venous access device; PICC, peripherally inserted central line

NOTES:

[A] Rationale for volumes was based on dead space volume of the catheter plus sufficient volume to ensure positive pressure. The volume of solution should be altered if the volume of the catheter being used is non-standard or unique. The weight of patient is not a consideration when determining the volume of solution; the volume of the catheter is the key parameter.

- Guidelines published by the Oncology Nursing Society (ONS) in 2004 were used as a framework for the consensus schedule.
- Heparin use would be contraindicated in patients with Heparin-Induced Thrombocytopenia (HIT)
- All lines should be flushed with a minimum of 10 mL of normal saline prior to locking to prevent solution incompatibilities.
- Positive pressure apparatuses are not included in the recommendations because this data is still emerging and was not fully reviewed by the guideline panel.

PEDIATRIC

There is insufficient evidence for or against the choice of a particular protocol in the pediatric population to justify a change in current institutional practices. Although the pediatric representatives on the panel recognized the value of standardized guidelines and practice, a pediatric consensus could not be achieved.

INDICATORS

There is insufficient evidence to determine specific indicators that may have an impact on the decision to insert a CVAD or for catheter-related intraluminal thrombosis among adults and pediatric cancer patients.

Future Research Recommendations

The Central Venous Access Device Guideline Panel recommends, based on the absence of randomized trials or well-designed epidemiologic studies on any of the questions addressed by this report, that research institutions develop trials that can supply evidence to inform decision-making on these issues. This is especially the case in the pediatric setting.

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