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Central venous catheter insertion guidelines

Central Venous Catheters

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Item assessed, answer	No. (%) of healthcare professionals (n = 39)
Hand hygiene performed before insertion	
Yes	39 (100)
No	0 (0)
Hand antiseptis used	
Yes	38 (97.4)
No	1 (2.6)
Maximal sterile barrier precautions used	
Yes	34 (87.2)
No	5 (12.8)
Type of skin antiseptis used	
2% chlorhexidine gluconate	9 (23.1)
Povidone-iodine	30 (76.9)
Appropriate sterile sheet used	
Yes	25 (64.1)
No	14 (35.9)
Contamination during insertion	
Yes	5 (12.8)
No	34 (87.2)
>1 attempt at insertion	
Yes	17 (43.6)
No	22 (56.4)
Complication during insertion	
Yes	0 (0)
No	39 (100)
Hand hygiene performed after insertion	
Yes	33 (84.6)
No	6 (15.4)

Saskatoon Health Region

Authorization

Pharmacy Nursing Committee

MMC Motion #:

SHR Nursing Practice Committee

Policies & Procedures

Title:

CENTRAL VENOUS CATHETERS INSERTION - ASSISTING

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Royal University Hospital
Saskatoon City Hospital
St. Paul's Hospital

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Deliberations:

The policy applies to insertion of all central venous catheters (CVC's).

CVC:

A venous access device whose tip dwells in the superior or inferior vena cava

CLABSI:

A central line associated blood stream infection (CLABSI) is a primary blood stream infection (BSI) in a patient that had a central line within the 48-hour period before the development of a BSI and a not bloodstream related to an infection at another site.

1. PURPOSE

1.1 To minimize the risks of central line-associated bloodstream infections and other complications associated with the insertion of central venous catheters.

2. POLICY

2.1 All licensed staff assisting with the insertion of CVC's will be educated in CVC care and prevention of CLABSI.

Note:

Central line-associated bloodstream infection (CLABSI) continues to be one of the most deadly and costly hospital-associated infections. <http://www.shr.ca/saskatoon/CentralLineInfection/Pages/default.aspx>

2.2 An evidence-based catheter insertion bundle should be utilized for all CVC insertions. See Appendix A.

2.3 Insertion is performed using maximal sterile barrier technique.

2.3.1 A sterile gown and gloves, a mask & cap are to be worn by all personnel directly involved in the insertion procedure. Circulating staff need to wear a cap and mask within 1 meter of the sterile field.

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Influence of insertion site on central venous catheter colonization and bloodstream infection rates. Do not advance the line until you have hold of the end of the wire Once the central line is in place, remove the wire Aspirate and flush all lumens and re clamp and apply lumen caps Suture the line to allow 4 points of fixation Dress with a clear dressing so the insertion point can be clearly seen Attach central line to pressure bag to allow CVP monitoring Nursing staff can show you how to do this or you can Run a blood gas to ensure a venous sample Chest x-ray to confirm placement and to check for pneumothorax Clear documentation of date of insertion and monitor for infection Stop procedure Seek senior help Central lines can have multiple lumens. 1996;82:125-8.CAS PubMed PubMed Central Google Scholar 39.Bodenham AR, Simcock L. 2003;58:388.Article CAS Google Scholar 45.Ryu HG, Bahk JH, Kim JT, Lee JH. 2011;39:S1-34.Article Google Scholar 79.Gowardman JR, Robertson IK, Parkes S, Rickard CM. 2009;28:365-77.Article Google Scholar 16.Troiano CA, Hartman GS, Glas KE, Skubas NJ, Eberhardt RT, Walker JD, Reeves ST, Councils on Intraoperative Echocardiography and Vascular Ultrasound of the American Society of Echocardiography. 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Ultrasound-guided central venous catheterization in cancer patients improves the success rate of cannulation and reduces mechanical complications: a prospective observational study of 1,978 consecutive catheterizations. 1991;100:1090-5.Article CAS Google Scholar 87.Casey AL, Burnell S, Whinn H, Worthington T, Farouqi MH, Elliott TS. The risk of catheter-related bloodstream infection with femoral venous catheters as compared to subclavian and internal jugular venous catheters: a systematic review of the literature and meta-analysis. 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In: AHRQ making health care safer II. 2009;18:73-83.Article Google Scholar Page 2 From: Practical guide for safe central venous catheterization and management 2017Target veinAdvantagesDisadvantagesInternal jugular veinVein is easy to identifyStrong catheter discomfortLow risk of mechanical complicationsInfrequent thrombus formationPuncturing easy with ultrasound-guided techniquesSubclavian veinLittle catheter discomfortVein is difficult to identifyLow risk of thrombus formationEasy to mistakenly enter the cranial side on right sideHigh risk of pneumothorax and/or hemopneumothoraxRisk of pinch-off syndromeUltrasound-guided puncture techniques are difficult for inexperienced practitionersFemoral veinVein is easy to identifyStrong catheter discomfortPuncturing easy with ultrasound-guided techniquesHigh risk of thrombus formationPICCLethal complications unlikelyHigh risk of thrombus formationLow risk of infectionPinch-off syndrome occurs when the catheter is inserted through the ligament between the first rib and the clavicle, which causes the catheter to be pinched when the arm is moved, leading to poor infusion and eventually even cutting off the catheter. 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The internal jugular is usually preferred to subclavian approach where possible as it is less likely to lead to pneumothorax Indications for central line (central venous catheter) insertion Administration of medications that require central access e.g. amiodarone, inotropes, high concentration electrolytes Fluid balance monitoring with CVP Intravenous access (long term or difficult peripherally) Complications of central line (central venous catheter) insertion Haemothorax Pneumothorax Haematoma Inadvertent arterial puncture Ultrasound and sterile ultrasound sheath Sterile trolley Sterile field, gloves, gown and mask Seldinger central line kit Saline flush Chlorhexidine Lignocaine (4ml (2 vials) of 2% is reasonable) Suture Scalpel Sterile dressing Pressure bag to attach to monitoring Coagulopathy Local infection Avoid in raised intracranial pressure- aim for a femoral approach if required Patient non-compliance Consent patient if conscious otherwise document why the procedure is in the patients best interests Consent should include: Infection, bleeding (arterial puncture, haematoma, haemothorax), pain, failure, damage to surrounding structures (including pneumothorax), thrombosis. Apply sterile sheath to the ultrasound probe Confirm anatomy Under ultrasound guidance insert lignocaine cutaneously and around internal jugular. Ultrasound-guided internal jugular venipuncture by short-axis approach in 203 cases at the University of the Ryukyus Hospital (in Japanese with English abstract). 2004;100:1411-8.Article Google Scholar 51.Pikwer A, Acosta S, Kolbel T, Malina M, Sonesson B, Akeson J. Central venous catheters: legal issues. 3 (in Japanese). Central venous catheter use. 2008;28:439-46.Article Google Scholar 12.Tokumine J. 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Use of real-time ultrasound guidance during central line insertion: brief update review. Intravascular complications of central venous catheterization by insertion site. Confirm what the line will be used for and how many infusions a patient has to aid your selection of the line with the correct amount of lumens Always ensure you are happy with your anatomy before commencing the procedure Ensure your sterile trolley is well set up with the kit lined up in the order you will use things and a clear area for sharps. ♦PubMed PubMed Central Google Scholar 57.Peris A, Zagli G, Bonizzoli M, Cianchi G, Ciapetti M, Spina R, Anichini V, Lapi F, Batacchi S. Anaphylactic shock induced by an antiseptic-coated central venous [correction of nervous] catheter. 1990;73:772-4.Article CAS Google Scholar 41.da Silva PS, Waisberg J. doi: 10.1111/jth.12071. 2014;42:321-4.Article CAS Google Scholar 74.Bonne S, Mazuski JE, Sona C, Schallom M, Boyle W, Buchman TG, Bochicchio GV, Coopersmith CM, Schuerer DJ. 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This will make your life easier: Whilst lignocaine has time to work flush all lumens of the line and then clamp all lumens except the Seldinger- port Ensure caps are available for the lumens Under ultrasound guidance take Seldinger needle attached to syringe and insert into the internal jugular vein When blood is freely aspirated remove syringe and immediately inset Seldinger wire. Guidewire catheter change in central venous catheter biofilm formation in a burn population. International evidence-based recommendations on ultrasound-guided vascular access. J Am Coll Surg. 1.Pikwer A, Hammarskjöld F, Larsson AT, Lindgren S, Lindwall R, Taxbro K, Oberg F, Acosta S, Akeson J. 1994;15:231-8.Article CAS Google Scholar 68.Miller MR, Griswold M, Harris JM 2nd, Yenokyan G, Huskins WC, Moss M, Rice TB, Ridling D, Campbell D, Margolis P, Muething S, Brilll RJ. Injuries and liability related to central vascular catheters: a closed claims analysis. 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