

PRACTICUM DOCUMENTATION

Student' Name:

Course:

Date Due:

Professor

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1a2 Summary of Audits

	Clinic 1	Clinic 2	Clinic 3	Clinic 4	Clinic 5	Clinic 6
Number of patients	60	52	30	44	120	60
Number of catheters used in 2013	20	10	4	17	27	20
Number of catheters removed in 2013	10	5	2	9	4	10
Number of catheter replaced	9	2	1	4	17	9
Number of CR-BSI's	14	3	1	4	20	14
Number of RN's providing catheter care	3	3	2	2	4	3
Number of PCT's providing catheter care	0	0	0	3	6	4
Number of hospital days for CR-BSI's	96	13	10.	32	214	96
SUMMARY OF AUDIT RESULTS						
	Clinic 1	Kentucky	Clinic 2	Kentucky	Clinic 3	Ohio
	Audit 1	Audit 2	Audit 1	Audit 2	Audit 1	Audit 2
Removing gloves and sanitizing hands after remomval of dressing	64%	70%	89%	94%	100%	100%
Sanitizing hands before contact with catheter	60%	65%	90%	95%	100%	100%
Observing 5 minuets soak time on catheter caps before treatment	20%	24%	90%	98%	93%	93%
Waiting 3-5 minuets for providone iodine to dry before applying dressing	49%	60%	98%	98%	100%	100%
Waiting 3-5 minuetes for providone iodine to dry on caps before removing	20%	15%	73%	90%	70%	90%
Observing 5 minuets soak time prior to termination of treatment	10%	15%	73%	90%	80%	95%
Observing 3-5 minuets wait time before disconnecting bloodlines	10%	10%	50%	90%	70%	90%
SUMMARY OF AUDIT RESULTS						
	Clinic 4	Ohio	Clinic 5	West VA	Clinic 6	West VA
	Audit 1	Audit 2	Audit 1	Audit 2	Audit 1	Audit 2
Removing gloves and sanitizing hands after remomval of dressing	91%	95%	5%	5%	64%	70%
Sanitizing hands before contact with catheter	98%	98%	45%	50%	60%	65%
Observing 5 minuets soak time on catheter caps before treatment	75%	85%	0%	5%	20%	25%
Waiting 3-5 minuets for providone iodine to dry before applying dressing	100%	100%	0%	0%	49%	60%
Waiting 3-5 minuetes for providone iodine to dry on caps before removing	75%	85%	0%	0%	20%	15%
Observing 5 minuets soak time prior to termination of treatment	50%	70%	0%	0%	10%	15%
Observing 3-5 minuets wait time before disconnecting bloodlines	25%	25%	0%	0%	10%	10%

Documented data was provided after audit 1 that included; the review of catheter exit site care, initiation and termination of treatment and hand hygiene at each clinic.

Documented data was also provided after audit 2 which included the review of catheter exit site care, initiation and termination of treatment and hand hygiene with exceptions of clinics 1, 5, 6.

1b Assessment Tool

Needs Assessment

Are you a: Nurse _____ LPN _____ PCT _____ Clinic # _____

How long have you been a dialysis PCT?

How long have you been a dialysis nurse? _____

1. Can you touch the dialysis machine while a patient is running without gloves? Yes or No
2. Can you touch the dialysis machine while a patient is running with one finger in the glove or by using the glove as a barrier? Yes or No
3. What PPE is required when initiating and terminating treatment?

4. What PPE is required when initiating and terminating treatment of a CVC?

5. When must you use soap and water to wash your hands?

6. What is the procedure to clean the exit site of a CVC?

7. How long do you let the cap soak in providone-iodine? _____

8. How long does it take for providone-iodine to dry?

9. How long does it take for alcohol to dry? _____

10. Do you always soak the CVC's cap for the recommended period of time? Yes or No

If not, state why?

11. Do you always wait for the providone-iodine to dry before initiating or terminating treatment?

Yes or No If no, state why? _____

12. What types of organisms can be found in a dialysis clinic?

13. Is it necessary for patients who have CVC's to wear masks? Yes or No

14. What are the best ways to prevent infections in the dialysis clinic? _____

15. How long should you clean the exit site of a CVC? _____

16. How long should you wash your hands? _____

17. For how long should one take sanitizing hands with alcohol gel? _____

18. Do you know what dialysis precautions are? Yes or No

19. Do you skip steps in the policy for CVC care? Yes or No

If yes state why?

20. If you are a PCT did you receive specialized training in the care of CVC? Yes or No

21. Have you had prior training in CVC care in the last year? Yes or No

22. How did you learn CVC care? _____

23. If you are a PCT did you attend a 10 week training course? Yes or No

24. Do you feel that you need more training in CVC care? Yes or No?

25. Do you know what your clinic's Catheter Related-Bloodstream infection rate is? Yes or No

How do you learn best? Video _____ PowerPoint _____ Hands On _____ Lecture _____

Demonstrations _____ Group Learning _____ Computer Based Programs _____

1c. Education Coordinator, Mentor Review and Feedback

Needs assessment were reviewed by the education coordinator. Valid point brought up by the needs assessment proved that there were a broad range of questions which assessed base knowledge and addressed the reason why employees were not following policy and procedure. The Education Coordinator directed me to my mentor for further feedback.

Needs assessment was sent via e-mail to mentor, via phone conversation we discussed learning tools to help facilitate the administering of the needs assessment tool. I was instructed to contact her and we would review the results when needs analysis was completed.

1e. Analysis of Need Assessment

The results of the needs assessment was complicated especially from the clinics that were in the acquisition process. In the acquisition clinics there was clearly a need for improvement in the care of a central venous catheter. The needs assessment was given to six clinics randomly chosen; three were company owned clinics and three were acquisition clinics. The needs assessment was given to 17 nurses, and 13 PCT's. The mean years as a dialysis nurse were 5.4 years; the mean years as a PCT were 3.6 years. The ironic part of the needs assessment revealed that the three lowest scoring clinics from the audit were also the clinics that had the most experienced nurses and PCT's. The first part of the needs assessment focused on the knowledge base of the employees. The second part of the needs assessment focused on the employees training. And finally the third part focused on the preferred method of learning.

Many of the PCT's were "grand-fathered" in as PCT's when the State Boards of Nursing enacted the law requiring PCT's to obtain certification. Many of the long-term PCT's were given on the job training without theory. The newer PCT's did attend a 10 week training course based on didactic and clinical experience. The nurses with the most experience were also trained on the job, without a structured class containing didactic and theory.

For the newer nurses and PCT's that did attend the 10 week course reported that lecturer, power point, videos, and hands on training were used in their class. They did express concerns with their preceptors during orientation, that they were taught one way in the classroom but the preceptor taught them different techniques.

The three higher scoring clinics were aware of policy and procedure and for the most part did follow policy and procedure but also listed time constraints as the number one reason for not following policy and procedure. The three lower scoring clinics were far more sarcastic in their

answers and openly admitted to not following policy and procedure citing “too busy”, “no time”, “we have never done it that way why start now”.

The needs assessment does indicate there are serious education needs for the clinics that scored the lowest in the audit. It also indicate that many of the employees did not receive the appropriate training that is now required for nurses and PCT's in the dialysis setting. Educational needs identified from the needs assessment include review of policy and procedure, exit site care, initiation and termination of treatment, hand hygiene, and competency skills checklist.

1f. Summary of Feedback from Mentor

The needs assessment summary was sent to the mentor via email. The results were then discussed via phone. We came to a conclusion that time was the main reason given by PCT's and nurses for failing to follow the outlined protocols. Lack of know how in catheter care was also found as one of the draw backs. This was attributed by the fact that nurses and PCT's failed to read or go through the policies and procedures related to catheter care. My mentor advised me to include the policy and procedure in the educational program to at least make sure all staff had read the policy and procedures related to catheter care. She felt like the three higher scoring clinics which are company owned were fine but the attention should be focused on the three low scoring clinics, which were acquisition clinics. She felt like they may have got lost in the transition to a new company and would benefit from and educational program designed for them. We also discussed the negative comments that were written on the assessments, advising me that this may lead to a problem in the classroom. Overall she said I was doing a good job with collecting and analyzing the data.

2a2. Summary of State Board of Nursing rules and regulation

The Ohio Board of Nursing laws for a dialysis technician fall under the scope of practice for nursing. The dialysis technician is able to initiate, terminate treatment using a catheter, fistula or graft, monitor the patient, respond to complications during dialysis and draw blood. The dialysis technician can administer the following medications: Intravenous Normal Saline, Intravenous Heparin, Dialysate, Intradermal Lidocaine and Oxygen. All of these tasks must be under the direct on site supervision of the registered nurse. The care of the central venous catheter is a delegation duties assigned by the registered nurse or physician. The prerequisite for a dialysis technician to perform this activity includes; 6 months working in a dialysis unit, completion of the Central Venous Catheter class and passing score of 80%, demonstration in the classroom setting and two observations in the clinic setting by the registered nurse. The dialysis technician cannot trouble shoot problems with the CVC, they must report the problem to the registered nurse, and this includes reversing the lines.

The Kentucky board of Nursing is very specific for dialysis technicians. All care must be performed under the direct on site supervision of a registered nurse. The dialysis technician can prepare and cannulate fistulas or grafts and initiate and terminate treatments but they may not connect or disconnect patients with central venous catheters. Medications the dialysis technician may administer under the supervision of a registered nurse include Heparin 1:1000 units or less, to initiate treatment, prime the pump or administer throughout the treatment. Normal saline to correct hypotension and to prime the bloodlines, as set forth in the facilities medical protocol. Any amount above the protocol will not be administered without direct supervision of a registered nurse or physician. The dialysis technician may respond to complications that arise with dialysis.

The West Virginia Board of nursing allows dialysis technicians to initiate and terminate treatment, connect and disconnect patients with central venous catheters and care for exit sites. The dialysis technician must work 6 months in the dialysis setting, attend a CVC class and pass with a score of 85% and must be in good standing with the company. The dialysis technician must be checked off in class and be observed two separate times by a registered nurse then annual competency must be demonstrated. The dialysis technician may give Heparin to prime the pump throughout treatment or as a bolus intravenously. They may also administer normal saline via the extracorporeal circuit as needed during dialysis. Intradermal anesthetic may be given as prescribed by the physician. All care that a dialysis technician provides must be under direct supervision of a registered nurse or physician.

2b1. Summary of Company Policy and Procedure

The current policy and procedures as they relate to central venous care are as follows:

Exit Site Care – The catheter site dressing is removed and the site inspected for any signs or symptoms of infection. The dressing is discarded along with the gloves, the hands are sanitized and new gloves are put on. Using Providone-Iodine the exit site is cleansed from the exit site outward in a circular motion. The Providone-Iodine is allowed to dry 3-5 minutes before applying the new dressing.

Initiation of Treatment – A blue absorbent pad is placed under the catheter. Providone-Iodine is poured onto a 4x4 gauze pad; the gauze pad is placed around the lumen and cap and allowed to soak for 5 minutes. The gauze pad is then removed and the lumen and caps are allowed to air dry for 3-5 minutes before opening the caps and attaching syringe.

Termination of Treatment – A new blue absorbent pad is placed under the catheter and Providone-Iodine is poured onto a 4x4 gauze pad. The gauze pad is placed around the lumens and cap, and allowed to soak for 5 minutes. The gauze pad is then removed and the lumens and caps are allowed to air dry for 3-5 minutes before disconnecting the bloodlines and applying the syringes.

2c. Education Coordinator and Mentor Feedback

I met with the Education Coordinator to discuss the company policy and procedures related to central venous catheter care (CVC) and we were in agreement of the policy and procedures. We also discussed the State Board of Nursing scope of practice for patient care technicians (PCT's), she stated the scope of practice were correct for each state and expressed frustration with the Ohio and West Virginia dialysis scope of practice not specifically stating PCT's can care for CVC's. Our company policy states that all staff must show competency at least annually, but since these were acquisition clinics they may not have been checked off for competency. The Education Coordinator also provided me with a copy of the audit sheet that is used in order for me to understand what the audits consist of when an audit is performed. She also provided me with the annual skills check off list.

I e-mailed the summary of the company policy and procedures and the State Board of Nursing policies for patient care technicians (PCT's). My mentor suggested I call the Board of Nursing for Ohio and West Virginia to verbally verify the role of the PCT in caring for the central venous catheter since I was unable to find the law or policy in print. We also discussed the role of the PCT and the nurse. She had nothing to add to these, and stated to keep up the good work. As a follow up to this conversation I did contact the State Boards of Nursing for Ohio and West Virginia, they did verify that a PCT could care for a CVC, just not troubleshoot anything with the catheter, both board stated it falls under delegation of duty for the nurse.

3a. Annotated Bibliography

Lok, C. E. (2011). Prevention and management of catheter-related infection in hemodialysis.

Kidney International. 79 (6): pp. 587 -598

This article gives an overview of Central Venous Catheter (CVC), the morbidity and mortality associated with the use of CVC and the risk factors and pathogens related to the use of a CVC. It also discusses the prevention including appropriate care by the Hemodialysis Staff, the preferred cleaning solution and most effective topical antibiotics to use for prevention of infection. The article also discusses the removal of catheters as soon as possible to decrease infection rates and advises against catheter salvage. The recommendation is for the vascular access team is to ensure the placement of permanent accesses and speedy removal of the CVC.

Kellen A. J., Patel, P. R., O'Grady, N. P., (2010).

Prevention of catheter-related bloodstream infections outside the intensive care unit and expanding prevention to new settings. *Clinical Infectious diseases*. 51 pp. 335-341

This article discusses the need for promoting Central Venous Catheter (CVC) outside of the intensive care unit. It also confirms that morbidity and mortality increases with the use of CVC's. This article discusses that many of the studies conducted on CVC are conducted in an ICU setting and studies should focus on outside of the hospital setting such as the dialysis setting.

Hospitalization rates increased by 100% during the periods of 1993-2006 and the largest contribution for hospitalization rates for dialysis patients was infection. This article

discusses the mechanisms by which catheters become infected suggesting the first step in decreasing the infection rate is at the insertion point .It was recommended that educating staff, demonstration of competence to perform care of the CVC and periodic evaluation may improve the adherence to protocol. This article also promotes the use of chlorhexidine for skin asepsis and disinfection of the catheter hub. The use of mechanical valve needleless connections has been discouraged because of the associated risk of BSI. Other measures that may prevent or decrease BSI the use of antimicrobial-impregnated catheters and chlorhexidine impregnated sponge dressings which may also decrease BSI rates.

Abad. C. L., Safdar, N. (2011). Catheter-related bloodstream infections. *Infectious Disease*

Special Edition. pp. 84-98

This article discusses the importance of CRBI's is being placed as a high priority issue in healthcare. To prove this point, the Center for Medicare and Medicaid Services (CMS) has included CRBI's as a Healthcare Acquired Infection (HAI) in which it will no longer pay for. This is the incentive advanced to the facility to reduce the incidents of HAI's. In 2011, the CMS mandated that all facilities had to report CRBI's to the National Healthcare and Safety Network (NHSN) failure to which it will result in the forfeiture of the 2% annual Medicare payment increase. In this article NHSN defines CRBSI.

In order to prevent CRBSI, emphasis on educating and training staff, use of chlorhexidine as an antiseptic agent, regular changing of CVC's and the use of antiseptic impregnated catheters along with chlorhexidine sponge dressing can

help decrease CRBSI's. This article also discusses using the Institute for Healthcare Improvement (IHI) "bundle" to reduce the risk of infection. The "bundle" consists of 3 to 5 practices which if performed correctly, will lead to improved outcomes in which studies have shown a 66% decrease in infection rate.

Onder, A. M., Chandar, J., Billings, A., Diaz, R., Francoeur, D., Abitbol, C., Ailleruela, G.

(2009). Chlorhexidine-based antiseptic solutions effectively reduce catheter-related bacteremia. *Pediatric Nephrology*. 24(1) pp. 1741-1747

This original retrospective study was to determine if Chlorhexidine-based antiseptic were more effective than providone-iodine in the exit site and hub care in the prevention of catheter related bacteremia (CRB) in pediatric patients. The hypothesis of this study whether the hub of the catheter was the entry site of CRB's. The study was conducted in two parts. In the first half of the study, providone-iodine was used for exit site care and in the second half of the study, chlorhexidine was used. Both were used on tunneled catheters and both groups used chlorhexidine-impregnated dressings. Approval was obtained from the Institutional Review Board (IRB), the study was conducted on 59 children on long-term dialysis, and 51 of those children were using tunneled-cuffed catheters. The results showed Chlorhexidine decreased CRB 1.0 versus 2.2 per 100 catheter days ($P=0.415$). The overall catheter survival was similar in both 4.6 days ($P = 0.535$). Hospital days were decreased by 2.3 days per 1000 hospital days ($P = 0.0416$). Infection-free catheter survival was also similar in both cases ($P = 0.1100$). Thus this study concluded chlorhexidine is more effective than

providone-iodine in the prevention of CRB thus proving the hypothesis that the hub is the entry of CRB. The limitations of this study were many including that it was a retrospective study and the overlapping patient population.

Garland, J. S., Alex, C. P., Uhing, M. R., Peterside, I. E., Rentz, A., Harris, M. C., (2009). Pilot

trial to compare tolerance of chlorhexidine gluconate to providone-iodine antiseptics for central venous catheter placement in neonates. *Journal of Perinatology* 29. pp. 808-813

This original article is a study designed around neonates and dermatitis with chlorhexidine and providone iodine and absorption of chlorhexidine gluconate. This study included infants older than 7 days old. The study focused on application of either antiseptics, recording dermatitis rates, catheter colonization and chlorhexidine gluconate uptake. The conclusion of the study was that neonates tolerated chlorhexidine but was cutaneously absorbed. Cutaneous antiseptics with chlorhexidine before CVC insertion reduced the risk for CR-BSI. The limitation of this study was the small number of participants.

Patel, P. R., Yi, S., H., Booth, S., Bren, V., Downham, G., Hess, S., Kelley, K., Lincoln, M.,

Morrisette, K., Lindberg, C., Jernigan, J. A., Kallen, A. J. (2013). Bloodstream infection rates in outpatient hemodialysis facilities participating in collaborative prevention effort: A quality improvement report. *American Journal of Kidney Disease* 62(2). pp. 322-330

This study was a quality improvement project, it included 17 outpatient dialysis clinics, these facilities reported monthly events and data to NHSN, guided by the CDC, and using evidence-based interventions which included chlorhexidine for

catheter exit site care. The use of staff training and competencies of catheter care, aseptic technique, hand hygiene, vascular access audits, with feedback provided on infection and adherence rates of staff proved to be an invaluable asset in decreasing BSI. Facilities participating in a collaborative effort successfully decreased BSI and access related BSI rates. Improving implementation of evidenced-based material with follow up observations can also decrease the BSI rate.

O'Grady, N. P., Alexander, R. N., Burns, L. A., Dellinger, P., Garland, J., Heard, S. O., Lipsett, P. A., Masur, H., Mermel, L. A., Pearson, M. I., Raad, I. I., Randolph, A., Rupp, M. E., Saint, S., & the Healthcare Infection Control Practices Advisory Committee (HICPAC). (2011). Guidelines for the prevention of intravascular catheter-related infections, 2011. Retrieved from: <http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf>

This guide was developed for healthcare workers who work with central venous catheters. The guideline was written with many contributors from various disciplines in healthcare. It was written with the aim of improving patient outcomes and reduce the healthcare cost. The guide suggests that decreasing BSI is a multidisciplinary approach. The summary of recommendations includes; educating and training of staff, selection of catheter site, hand hygiene and aseptic technique, use of maximal sterile barrier precautions, skin preparation and catheter site dressing. The guide has recommended categories that range from strongly recommended implementation to unresolved issues. This guide is intended to help the healthcare worker to reduce catheter related infection.

Association for Professionals in Infection Control and Epidemiology (APIC). (2010). Guide to

the elimination of infection in Hemodialysis. Retrieved from:

<http://www.apic.org/EliminationGuides>

This guide is specifically written for the hemodialysis units. Using evidence-based information as a guide for the prevention of infections in the dialysis unit based on the CDC's guidelines and other evidence-based practices. This guide is used for the professionals who have been tasked with the job of preventing infections in the dialysis clinic. It covers areas such as; environmental decontamination, disinfection of dialysis machine , auxiliary equipment cleaning, hand hygiene, vaccines, drug resistant organisms, medication injection practices, education of staff, staff competence, isolation precautions, cough etiquette, exit site care of CVC and the prevention of infections. This is an all in one guide for the dialysis clinic to either set up a program or to add to the existing program.

Bakke, C. K., (2010). Clinical and cost effectiveness of guidelines to prevent intravascular catheter-related infections in patients on hemodialysis. *Continuing Nursing Education* (37)6. pp. 601-615

This study was to provide information on the cost effectiveness of the guidelines to prevent catheter-related infections. The study was conducted from May 2009 to April 2010. The study was compared to a retrospective study of 198 patients from May 2008 to April 2009 which used standard care. The two groups were compared and a decrease in infections went from 1.7 to 0.2/1000 catheter days (p

= 0.005). The return on investment for implementing the program was 169% in one year. The projected savings according to hospital data was \$141,606, whereas in accordance with national data, the savings was \$179,010. CMS has now stopped paying for preventable infections, but instead utilizes pay-for-performance initiatives to boost morale among health workers. These incentives motivate them to provide high-quality care to their dialysis patients thus preventing catheter related infections. The hypothesis of this study was to show at least a 50% return on investment. This was a small sample group and comorbidities were not differentiated, but were previously established before establishing evidence-based practices.

Napalkov, P., Felici, D. M., Chu. L. K., Jacobs, J. R., Begelman, S. M., (2013). Incidence of catheter-related complications in patients with central venous or hemodialysis catheters: a health care claims database analysis. *BMC Cardiovascular Disorders* (13)86. pp. 1-10

This retrospective cohort analysis was conducted from May 2000 to January 2007. The cohort was patients with CVC and hemodialysis catheters, there were a total of 16,721 patients that were in the i3 InvisionDataMart, using the diagnostic and procedure codes. This study showed that the risk of catheter-related complications is highest during the first 90 days.

Ramanathan, V., Darouiche, R. O. (2012). Prevention and management of hemodialysis catheter infections. *Expert Review in Anti-Infective Therapy* 10(12). pp. 1447-1457

This article discusses the pathogenesis of catheter infections, including the migration of micro-organisms on the external surface of the catheter and the

endoluminal pathway for entry. With catheter there is a substance that forms on the surface called biofilm which serves as a growth medium for bacterial. This article has many suggestions to help prevent catheter related infections which include; personal hygiene, exit site care using a topical ointment, using antibiotic lock solutions, use of tunneled catheter impregnated with chlorhexidine and the use of chlorhexidine impregnated sponges as dressing.

Dinwiddie, L. C., Bhola, C. (2010). Hemodialysis catheter care: Current recommendations for nursing practice in North America. *Nephrology Nursing Journal*. 37(5) pp. 507 – 520

This article discusses the need for vascular accesses to sustain life for hemodialysis patients. Many of the dialysis patients are started on dialysis as an emergent procedure and needing dialysis with no access, and then the central venous catheter (CVC) is placed. This article reviews the numbers of infections per catheter days and also reviews the cost of catheter related infections. Recommendations from this article are the use of the “bundle” checklist for inserting a CVC, the use of chlorhexidine as aseptic solution for cleaning the exit site, the use of topical antibiotics and cleaning the hub prior to initiation and termination. These recommendations are the same recommendations conveyed by the Center for Disease Control and Prevention.

Al-Soaiman, Y., Estrada, E., Allon, M., (2011).The spectrum of infection in catheter-dependent hemodialysis patients. *Clinical Journal American Society of Nephrology* 6 (9).

pp. 2247-2252

This study looks at access-related and non-access related infection in the dialysis patient, the goal of the study was to be able to characterize the sign and symptoms of infections and decision making to admit to the hospital or treat as outpatient. This study suspected 305 cases of infection and 88% of those were confirmed. The study was conducted for 1.5 years with nearly 90% of suspected infections confirmed as accurate diagnosis. Fever was likely to be the presenting symptom with catheters versus a graft or a fistula, but physicians and nurses should assess the patient for other sources of infection. But only 47% of patients with probable bacteremia presented, had fever. Looking for secondary sources of infection is the focus in the dialysis unit. The limitations to this study were that it was conducted in one dialysis clinic and different nurses and physicians did the assessments, all which may vary in other clinics, also hospitalization in different clinics instead of treating the patient on an outpatient basis.

Goede, M. R., Coopersmith, C. M., (2009). Catheter-related bloodstream infection. *Surgical Clinics North America*. 89 pp. 463-474

This article reviews CR-BSI and touts and proves they are preventable. Supported by the Centers for Medicare and Medicaid Services listing, CR-BSI being listed on the “never” list of complications, and hospitals will not receive payment for these CR-BSI’s. The article covers way to help prevent CR-BSI’s which includes; hand hygiene, aseptic technique such as using Chlorhexidine to cleanse the exit site, using maximum barrier when placing the central venous catheter and using the sub-clavian vein for insertion. This article recommends changing the dressing every other day when using gauze, and transparent dressings every 5th day.

Recommendations include education of staff with regular follow up observation for hand hygiene and aseptic technique. A multi modal approach shows more improvement than just education alone.

Redmond, A., Donlon, S., Boyler, G. McCann, M., Einarsdottir, H. (2011). Prevention of infection in patients with chronic kidney disease part II: Healthcare-associated infections. *Journal of Renal Care* 37(1) pp. 52-62

This article covers the adverse impact that health care workers can have on chronic kidney disease patients. Blood borne pathogens such as Hepatitis B, Hepatitis C, Human immunodeficiency virus (HIV) are all possibilities in the dialysis setting. Multidrug-Resistant Organisms such as MRSA and VRE can be passed from healthcare worker to patients. This article aims to help in the prevention and transmission of organisms to patients. Disinfection of the dialysis machine and any ancillary equipment must be cleansed thoroughly before the next patient arrives. Water standards should be followed by the recommended guidelines. Safety measures are designed to keep the patient safe, skipping any procedure can result in the patient becoming infected.

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3b1 Learning Objectives

3b2 Course Content Outline

- I. WELCOME
- II. INTRODUCTION
 - 1. Brief overview of CVC's
 - 2. RN delegation and patient safety
- III. OVERVIEW OF CENTRAL VENOUS CATHETERS
 - 1. Catheter overview
 - 2. Catheter statistics
 - 3. Venous access options
 - a. Arteriovenous Fistulas
 - b. Arteriovenous Graft
 - c. Central Venous Catheters
 - 4. Why catheters are utilized
 - 5. Parts of a central venous catheter
 - a. Hub
 - b. Clamp
 - c. Lumen
 - d. Junction
 - e. Venous return
 - f. Arterial intake
 - 6. Types of CVC's used in dialysis
 - a. Non-Tunneled catheters
 - b. Tunneled catheters
 - c. Femoral catheters
 - 7. Key Points
- III. INFECTION CONTROL
 - 1. Hand hygiene

- a. Soap and water
 - b. Alcohol based hand gels/foam
 - c. Fingernails
 - d. Demonstration of hand washing
 - e. Return demonstration of hand washing
2. Personal protective equipment
 3. Glove removal
 3. Pathogen transmission
 4. Key points
- IV. Preventing catheter related-bloodstream infections (CR-BSI)
1. Catheters and infection
 2. Most common CR-BSI microorganisms
 - a. Coagulase negative *staphylococci*
 - b. *Staphylococci aureus*
 - c. Gram negative bacilli
 - d. *Candida* species
 3. Staff factors that reduce infection risk
 4. Patient education to reduce risk
 5. Key points
- V. Exit site care, CR-BSI identification and management
1. Signs and symptoms of exit site infections
 2. Nursing interventions and management
 3. Signs and symptoms of CR-BSI
 4. Intervention and management of CR-BSI
 5. Key points
- VI. CVC dressing change, exit site care and hub care
1. Catheter dressings

2. Catheter dressing inspection
3. Exit site care
4. Catheter hub scrub procedure
5. Patient education
6. Key points

VII. REMOVING ANTICOAGULANT AND ADMINISTRATION OF ANTICOAGULANT
TO MAINTAIN PATENCY BETWEEN TREATMENTS

1. Removing anticoagulant from CVC limb
2. Heparin
3. 4% Sodium Citrate
4. Key points

VIII. PUTTING IT ALL TOGETHER

1. Demonstration of exit site care
2. Demonstration of hub scrub
3. Return demonstration of exit site care procedure
4. Return demonstration of scrub hub procedure

VIII. REVIEW

1. CDC video

IX. Post test

3b3 Summary of Teaching Strategies/Resources to be used

The class will be conducted face to face with the employees in the Ashland classroom, small classes will be held with 10 students per class. Lecture will be utilized with a PowerPoint presentation, videos, and handouts. Demonstration and return demonstrations will be utilized to complete the skills checklist for exit site care, initiation and termination of treatment, and hand washing. Resources for the class are currently present in the Ashland classroom, which includes a TV, and DVD player. Each student will be provided with a central venous catheter to examine and later identify the parts of the catheter; these also are currently available in the classroom.

3b4 Power Point Presentation

Separate Attachment

3b5 Handouts

Separate Attachment

3b6 Skills Checklist for Return Demonstration

Employee Name _____ Clinic # _____ Date _____

Central Venous Catheter (CVC) Exit Site Care

MET CM OBS

1.	Wears appropriate personal protective equipment Gown, Shield, Mask, Gloves		
2.	Performs hand hygiene		
3.	Staff ask patient to wear mask and turn head in opposite direction		
4.	Places a clean blue absorbent pad under central venous catheter		
5.	Removes dressing, observing for drainage, notifies RN if soiled		
6.	Discards dressing and gloves		
7.	Visually inspect the CVC exit site for infection or complications Redness, warmth, edema, drainage, CVC pulled 2cm from entrance		
8.	Performs hand hygiene and applies clean gloves		
9.	Using Cloraprep (2% CHG with 70% alcohol) to disinfect site Using gentle back and forth friction cleanse the exit site working outward approximately 2 inches in concentric circles for a minimum of 30 seconds using both sides of the Cloraprep sponge		
10.	Allow the Cloraprep to dry at least 30 seconds		
11.	Apply antibiotic ointment if order by physician		
12.	Using aseptic technique open new dressing (gauze and tap or transparent dressing) per physician order		

3b6 Check List for Return Demonstration

Employee Name _____ Clinic # _____

Date _____ **CVC INITIATION OF TREATMENT**

	MET	CM OBS
1. Wears appropriate personal protective equipment		
2. Performs hand hygiene		
3. Ensure that catheter limb clamps are closed		
4. Remove arterial limb cap. Using sterile alcohol pad scrub the hub (threads) of the luer lock vigorously, using a back and forth friction for 15 seconds and let dry, discard alcohol pad		
5. Connect a sterile 10 ml syringe to the arterial limb		
6. Remove venous limb cap. Using sterile alcohol pad scrub The hub (threads) of the luer lock vigorously, using a back and forth friction for 15 seconds and let dry, discard alcohol pad		
7. Connect a sterile 10 ml syringe to the venous limb		
8. Perform hand hygiene		
9. Remove heparin or sodium citrate from arterial catheter limb by unclamping limb and gently aspirating 5 ml (10 ml on lab day), reclamp limb. PCT's if you have problems aspirating notify the RN		
10. Remove heparin or sodium citrate from venous catheter limb by Unclamping limb and gently aspirating 5 ml (10 ml on lab day), reclamp limb. PCT's if you have problems aspirating notify the RN		
11. Using aseptic technique remove blood-filled syringe from arterial limb and immediately attach a 10 ml syringe filled with normal saline, open catheter limb clamp and flush limb using a push-pause method, then clamp arterial limb. PCT's if you experience any resistance when pushing normal saline notify the RN		

<p>12. Using aseptic technique remove blood-filled syringe from arterial limb and immediately attach a 10 ml syringe filled with normal saline, open catheter limb clamp and flush limb using a push-pause method, then clamp arterial limb. PCT's if you experience any resistance when pushing normal saline notify the RN</p>		
<p>13. Remove empty saline syringe from venous catheter limb and attach heparin-filled syringe (double check physicians order). Open venous catheter clamp, push heparin into catheter lumen. Gently aspirate and flush a couple of times. PCT's if you experience any resistance when pushing notify RN</p>		
<p>14. Clamp venous catheter limb, leaving syringe attached. Wait 5 minuets for systemic anticoagulation</p>		
<p>15. Remove the 10 ml syringe from the arterial catheter limb and aseptically connect the arterial blood line. Be careful not to touch either end of the connections</p>		
<p>16. Remove the 10 ml syringe from the arterial catheter limb and aseptically connect the arterial blood line. Be careful not to touch either end of the connections</p>		
<p>17. Apply Hemo-safe clip prior to starting treatment</p>		
<p>17. Unclamp the catheter limbs and the bloodlines, start treatment</p>		
<p>18. Any time you interrupt treatment (such as clotted dialyzers, bathroom breaks), you must scrub the hub (threads) with alcohol as in previous steps listed above.</p>		

3b6 Skills Checklist for Return Demonstration

Employee Name _____ Clinic # _____ Date _____ CVC

TERMINATION OF TREATMENT

	MET	CM OBS
1. Prepare heparin dwell (fill volume is found on the round disk in the center of the clamp on the CVC lumen, or on the lumen itself) using a 3 ml syringe		
2. Perform hand hygiene, apply appropriate PPE		
3. Apply mask to patient		
4. Return blood following policy and procedure		
5. Remove gloves perform hand hygiene		
6. Apply clean gloves, make sure clamps are closed, and remove Hemosafe		
7. Disconnect the arterial bloodline, scrub the hub (threads) let dry, attach a 10 ml syringe filled with normal saline to the limb		
8. Disconnect the venous bloodline, scrub the hub (threads) let dry, attach a 10 ml syringe filled with normal saline to the limb		
9. Open arterial clamp and flush limb with normal saline and clamp, attach heparin lock, open clamp and push heparin and clamp quickly, aseptically apply sterile caps to hub		
10. Open venous clamp and flush limb with normal saline and clamp, attach heparin lock, open clamp and push heparin and clamp quickly, aseptically apply sterile caps to hub. Remove gloves perform hand hygiene		

3c1 Review of Educational Model with Mentor

I sent the Power Point presentation to my mentor via e-mail; we discussed the presentation via phone conversation. The learning objectives were corrected (spelling errors), she stated the course content was a large amount of material to cover with each student having to demonstrate hand washing technique and competency in catheter care, even with a small class she suggested I remove some of the information, and only give the students what they need to know. She also stated the Power Point needed “more life”, she stated that it was “pretty generic and plain”, adding more graphics would appeal to more learners.

3d1 Review of Educational Model with Education Coordinator

I met with the Education Coordinator after changes were made to the Power Point presentation suggested by my mentor, no further changes to be made. The education coordinator was pleased with the results of the Power Point and speaker notes.

3d3 Review of Educational Model with Regional Education Director

I spoke with the Regional Education Director (RED) via phone, she had information from corporate regarding the use of Chlorhexidine and scrub the hub technique in this teaching session, she stated there would not be a need to change the policy, since a similar policy had been written in 2013, but had not been released pending the computer simulation to go with the program, she said she could not give me a copy of the policy since it had not been released to the clinics, but she would review the Power Point to ensure that it aligned with the company policy, she stated it was “close enough” that I could proceed with the class using the clinics that were identified previously. The RED directed me to make this a mandatory class and to provide three sessions to accommodate the staff from those clinics.

4b1 Flyer

Separate Attachment

5d Summary of Follow-Up Audits

Summary of evaluation	Clinic 1				Clinic 5				Clinic 6			
	Week 1	Week 2	Week3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
Removes gloves and sanitizes hands after dressing removal	80%	80%	92%	90%	50%	49%	70%	80%	70%	83%	90%	95%
Sanatizes hands before touching catheter	80%	80%	90%	90%	50%	49%	70%	80%	70%	83%	90%	95%
Observes the 15 second scrub the hub technique	95%	85%	90%	90%	80%	85%	90%	90%	100%	100%	95%	90%
Allows the hub to completely dry before applying syringe	75%	70%	95%	95%	90%	90%	100%	100%	90%	90%	90%	95%
Scrubs the exit site for 30 seconds in concentric circles with CHG	85%	80%	95%	100%	75%	85%	90%	95%	70%	85%	100%	100%
Allows the exit site to completely dry before applying dressing	100%	90%	100%	100%	80%	95%	95%	95%	90%	100%	100%	100%
Observes the 15 second scrub the hub technique prior to term	95%	90%	85%	90%	85%	90%	90%	85%	75%	85%	90%	100%
Allows the hub to completely dry before applying syringe	70%	70%	75%	80%	90%	75%	90%	95%	95%	100%	100%	100%
Observes the 5 moments of hand hygiene	82%	86%	80%	80%	70%	73%	70%	75%	80%	75%	90%	85%

The evaluation results from the above clinics showed an improvement in the percentages, for the short-term. It is also to be noted that the Director of Operations was present during the audits of these clinics. The auditor was an Education Coordinator trained in observation of catheter care and observing hand hygiene. The new exit site care and scrub the hub procedure does save time, but to help prevent catheter related blood-stream infections (CR-BSI's) it must be performed correctly at all times. There is still work to do in these clinics, thus observations and audits will be conducted more frequently to provide a more long-term outcome.

5e1 Feedback Report from Mentor and Education Coordinator

After sending the results to my mentor via e-mail, we discussed the results of the audits via phone conversation. She was pleased with the short-term outcomes, but voiced concern of what the long-term outcomes would be if not followed closely. Overall she stated the practicum experience was a learning experience for her as well, and felt that the program was researched thoroughly, the presentation was handled with maturity and poise with the disruptive class, and overall a great presentation.

Reviewed the follow-up results with the Education Coordinator, she expressed concern with the long-term outcomes for these clinics, but also stated more education would be provided in these clinics and more audits would be conducted in order to promote a new habit among the staff. She also stated that the presentation was good, and was impressed with the way I handled the disruptive class. She also stated that I appeared nervous during the first class and by the third class I looked more at ease with the presentation. Good job.

