

Table 1
Microbiology test results of patients' and moisturizing creams' samples with growth of *Burkholderia*

Date	Sample	16S rDNA identification	ARDRA identification	RecA gene identification	Ribotyping identification
July 28, 2010	Blood – patient 1	<i>B cepacia</i>	<i>B stabilis/pyrrocinia</i>	<i>B stabilis</i>	ND
August 3, 2010	Blood – patient 2	<i>B cepacia</i>	<i>B cepacia/cenocepacia</i>	<i>B cenocepacia</i> IIIB	J1
August 8, 2010	Patient 1's cream	ND	<i>B cepacia/cenocepacia</i>	<i>B cepacia</i> complex	J2
August 12, 2010	Patient 2's cream	ND	<i>B cepacia/cenocepacia</i>	<i>B cenocepacia</i> IIIB	J1
August 12, 2010	Patient 3's cream	ND	<i>B cepacia/cenocepacia</i>	<i>B cenocepacia</i> IIIA	J2
August 12, 2010	Patient 4's cream	ND	<i>B cepacia/cenocepacia</i>	<i>B cepacia</i> complex	J1
August 12, 2010	Sealed cream - ICU	ND	<i>B cepacia/cenocepacia</i>	<i>B cenocepacia</i> IIIB	J2
August 15, 2010	Sealed cream - ICU	ND	ND	<i>B cepacia</i> complex	J2
August 15, 2010	Sealed cream - orthopedic department	ND	<i>B cepacia/cenocepacia</i>	<i>B cepacia</i> complex	J2
August 15, 2010	Sealed cream - internal medicine A department	ND	<i>B cepacia/cenocepacia</i>	<i>B cepacia</i> complex	J2
August 15, 2010	Sealed cream - internal medicine B department	ND	<i>B cepacia/cenocepacia</i>	<i>B cepacia</i> complex	J2
August 16, 2010	Sealed cream - oncology department	ND	ND	<i>B cenocepacia</i> IIIB	J1
August 16, 2010	Sealed cream - internal medicine A department	ND	ND	<i>B cepacia</i> complex	J2
August 16, 2010	Sealed cream - pharmacy	ND	ND	ND	J2

ARDRA, amplified 16S rDNA restriction analysis; ICU, intensive care unit; ND, not done; rDNA, ribosomal DNA.

References

- Segonds C, Heulin T, Marty N, Chabanon G. Differentiation of *Burkholderia* species by PCR-restriction fragment length polymorphism analysis of the 16S rRNA gene and application to cystic fibrosis isolates. *J Clin Microbiol* 1999;37:2201–8.
- Mahenthalingam E, Bischof J, Byrne S, Radomski C, Davies J, Av-Gay Y, et al. DNA-Based diagnostic approaches for identification of *Burkholderia cepacia* complex, *Burkholderia vietnamiensis*, *Burkholderia multivorans*, *Burkholderia stabilis*, and *Burkholderia cepacia* genomovars I and III. *J Clin Microbiol* 2000;38:3165–73.
- Baldwin A, Mahenthalingam E, Thickett KM, Honeybourne D, Maiden MC, Govan JR, et al. Multilocus sequence typing scheme that provides both species and strain differentiation for the *Burkholderia cepacia* complex. *J Clin Microbiol* 2005;43:4665–73.
- Dasen SE, LiPuma JJ, Kostman JR, Stull TL. Characterization of PCR-ribotyping for *Burkholderia (Pseudomonas) cepacia*. *J Clin Microbiol* 1994;32:2422–4.
- Alvarez-Lerma F, Maull E, Terradas R, Segura C, Planells I, Coll P, et al. Moisturizing body milk as a reservoir of *Burkholderia cepacia*: outbreak of nosocomial infection in a multidisciplinary intensive care unit. *Crit Care* 2008;12:R10.
- Scientific Committee on Cosmetic Products and Non Food Products' notes of guidance for the testing of cosmetic ingredients and their safety evaluation, 5th revision, 2003. SCCNFP/0690/03 final. http://ec.europa.eu/health/ph_risk/committees/sccp/documents/out242_en.pdf. Accessed January 13, 2014.

Yonit Wiener-Well, MD*

Infectious Disease Unit, Shaare Zedek Medical Center
affiliated with the Hadassah-Hebrew University Medical School
Jerusalem, Israel

Christine Segonds, PharmD
Laboratoire de Bactériologie-Hygiène
Institut Fédératif de Biologie
Hôpital Purpan, Toulouse, France

Betty Mazuz, RN
Infectious Disease Unit, Shaare Zedek Medical Center
affiliated with the Hadassah-Hebrew University Medical School
Jerusalem, Israel

Puah Kopuit, MA, RN
Infectious Disease Unit, Shaare Zedek Medical Center
affiliated with the Hadassah-Hebrew University Medical School
Jerusalem, Israel

Marc V. Assous, MD, PhD
Clinical Microbiology Laboratory, Shaare Zedek Medical Center
affiliated with the Hadassah-Hebrew University Medical School
Jerusalem, Israel

* Address correspondence to Yonit Wiener-Well, MD, Infectious Disease Unit, Shaare Zedek Medical Center, PO Box 3235, Jerusalem 91301, Israel.

E-mail address: yonitw@zahav.net.il (Y. Wiener-Well).

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Compliance with central line insertion bundles in an intensive care unit

To the Editor:

We read with great interest the article by Khalid et al.¹ who demonstrated that a rate of no incidence of central line-associated bloodstream infection (CLABSI) is achievable in 1 developing country in Asia.¹ CLABSI is associated with high morbidity and mortality and becomes a life-threatening issue in intensive care units (ICUs).^{2,3} Our ICU, which is located in southern Taiwan—another Asian country—is no exception.⁴ Although the incidence of CLABSI declined from 4.5 per 1,000 catheter-days in 2009 to 2.16 per 1,000 catheter-days in 2010 in our intensive care unit,⁴ we are still eager to improve the situation to achieve the goal of “Zero CLABSI.” Since March 2013, 2 major central line care bundles, including insertion bundles for reducing the risk of infection during the insertion of central venous catheters (CVCs) and maintenance bundles for minimizing the risk of infection while caring for a CVC during use, were implemented in our ICU to prevent CLABSI. Because studies about CVC insertion bundle compliance in ICUs is scarce, our study was conducted to investigate the adherence to a CVC insertion bundle during an improving quality-of-care process in our ICU.

Our study was carried out at a regional teaching hospital. Our ICU has 23 beds and 3 intensivists, and most of the admissions are attributed to medical conditions, including shock, acute respiratory failure, cancer, and sepsis. The insertion of a CVC is preferably performed by an intensivist; however, it is rarely performed by nonintensivists such as cardiologists, surgeons, and trained resident physicians. Since March 2013, a CVC insertion bundle, including 4 components—hand hygiene, ensuring maximal sterile barriers upon insertion, use of chlorhexidine gluconate (CHG) for skin preparation, and avoidance of the femoral vein as an access site—were implemented in our ICU. Compliance to the bundle was defined as the frequency of the number of performed actions to the number of CVC insertions.

During March–October 2013, a total of 205 CVC insertions were observed and 202 (98.5%) insertions were done by intensivists (the other insertions were performed 1 each by a cardiologist, surgeon, and trained resident physician). The overall compliance with all 4 components of the bundle was 70.7%. The compliance with each component was 100% for hand hygiene, 82.9% for ensuring maximal sterile barrier, 100.0% for the use of CHG, and 83.4% for optimal site selection (Fig 1). No case of CLABSI developed during this 8-month period.

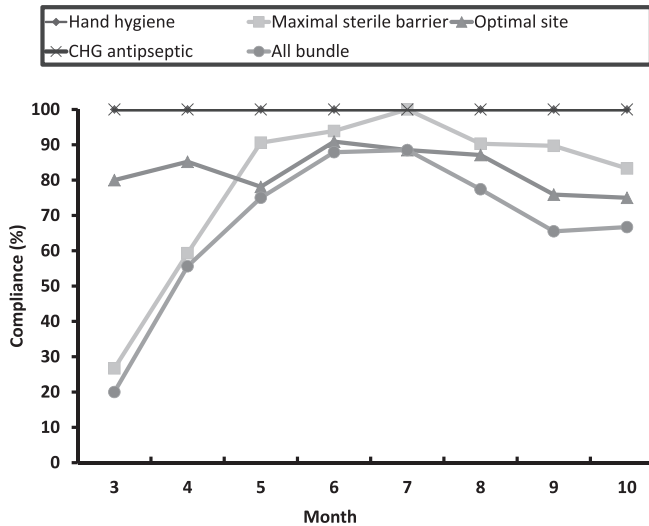


Fig 1. The trend of compliance with each central line insertion bundle component between March and October 2013.

Despite the fact that the goal of “Zero CLABSI” was reached during this observational study of 205 CVC insertions, the overall compliance with all components of the CVC insertion bundle was only about 70% in our ICU, especially during the initial and late stages of our project. This compliance is much lower than the 96%-99% experienced by Khalid et al.¹ The low compliance could be explained by lack of experience during the early stage and lack of maintenance during the late stage. It suggests that we should work harder to find out the deficit of this project and further enhance compliance.

When we investigated adherence to each component of the CVC insertion bundle, we found that in contrast to 100% compliance with hand hygiene and use of CHG, compliance was lower for avoidance of femoral venous access site and ensuring a maximal sterile barrier. This reveals that adherence with each component of a bundle may be different, and this kind of improving the quality of care process warrants more detailed investigation so each institution providing care can find out which specific areas have low compliance. In our ICU, it reminds us that our first priority is to enhance the compliance of 2 specific components of the CVC insertion bundle: ensuring maximal sterile barrier and optimal site selection.

References

- Khalid I, Al Salmi H, Qushmag I, Al Hroub M, Kadri M, Qabajah MR. Itemizing the bundle: achieving and maintaining “zero” central line-associated bloodstream infection for over a year in a tertiary care hospital in Saudi Arabia. *Am J Infect Control* 2013;41:1209-13.
- Centers for Disease Control and Prevention. Vital signs: central line-associated bloodstream infection – United States, 2001, 2008, and 2009. *MMWR Morb Mortal Wkly Rep* 2011;60:243-8.
- Fagan RP, Edwards JR, Park BJ, Fridkin SK, Magill SS. Incidence trends in pathogen-specific central line-associated bloodstream infections in US intensive care units. *Infect Control Hospital Epidemiol* 2013;36:893-9.
- Liu WL, Chen HT, Lin HL, Lai CC, Hsueh PR. Intervention to reduce catheter-related bloodstream infections in an intensive care unit at a regional hospital in southern Taiwan. *J Microbiol Immunol Infect* 2013;46:243-4.

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Hsueh-Wen Liang, RN
Hsin-Lan Lin, RN

Department of Nursing, Chi Mei Medical Center
Liouying, Tainan, Taiwan

* Address correspondence to Hsin-Lan Lin, RN, Department of Nursing, Chi-Mei Medical Center, Liouying, Tainan, Taiwan.
E-mail address: heartlan1002@gmail.com (H.-L. Lin).

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Reply: Compliance with central line insertion bundles in an intensive care unit

To the Editor:

The letter by Liang et al signifies the ongoing efforts to reduce central line-associated blood stream infections (CLABSI) in developing countries. The authors evaluated “insertion” and “maintenance” bundles for central venous catheters, but had problems achieving perfect compliance despite eliminating CLABSI for 8 consecutive months. This is likely because even partial compliance with bundles has shown reductions in CLABSI in previous studies.^{1,2} The authors describe their “insertion bundle” but do not elaborate on the “maintenance bundle” and its compliance rates, which are equally important in reducing CLABSI and could be the predominant factor in eliminating their CLABSIs. It would also be interesting to know if they observed any reduction in the number of total catheter days in their patients.

The main barriers faced by the authors during insertion were inability to achieve maximal sterile precautions and nonfemoral site selection, whereas they had excellent compliance with hand hygiene. These challenges are different from what we faced.³ Hand hygiene compliance in our study was done from random audits as opposed to the direct observation used by Liang et al. This could explain the difference in hand hygiene compliance and emphasizes the need for a standardized surveillance system.⁴ Use of full barrier precautions and nonfemoral site selection in our experience can be improved if mandated. Use of a unit-based quality nurse, in addition to education and reinforcement strategies, can also help improve overall bundle compliance.⁵

Nonetheless, our study and the results reported by Liang et al should encourage practitioners in developing countries to continue improving infection control practices, regardless of the geographic location of hospitals and demographics of patients. Every little improvement counts in reducing patient morbidity and the financial burden that results from CLABSI.

References

- Jeong IS, Park SM, Lee JM, Song JY, Lee SJ. Effect of central line bundle on central line-associated bloodstream infections in intensive care units. *Am J Infect Control* 2013;41:710-6.
- Apisarnthanarak A, Thongphubeth K, Yuekyen C, Warren DK, Fraser VJ. Effectiveness of a catheter-associated bloodstream infection bundle in a Thai tertiary care center: a 3-year study. *Am J Infect Control* 2010;38:449-55.
- Khalid I, Al Salmi H, Qushmaq I, Al Hroub M, Kadri M, Qabajah MR. Itemizing the bundle: achieving and maintaining “zero” central line-associated bloodstream infection for over a year in a tertiary care hospital in Saudi Arabia. *Am J Infect Control* 2013;41:1209-13.
- Reisinger HS, Yin J, Radonovich L, Knighton VT, Martinello RA, Hodgson MJ, et al. Comprehensive survey of hand hygiene measurement and improvement practices in the Veterans Health Administration. *Am J Infect Control* 2013;41:989-93.
- Thom KA, Li S, Custer M, Preas MA, Rew CD, Cafeo C, et al. Successful implementation of a unit-based quality nurse to reduce central line-associated bloodstream infections. *Am J Infect Control* 2013 Dec 17.

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