



FIGURE 1. (A) Distribution of positive blood cultures over the study period (2010–2015). (B) Year distribution of gram-positive to gram-negative ratio.

of these patients. Moreover, BSIs may prolong the hospital admission of patients and significantly increase the costs of their clinical management. Thus, any strategy that may help reduce the incidence of infections in allotransplanted patients should be considered by hospital administrators. In our view, adequate nurse staffing levels to provide direct patient care should be considered as an important measure to reduce infection in allotransplanted patients.

#### ACKNOWLEDGMENTS

*Financial support:* No financial support was provided relevant to this article.

*Potential conflicts of interest:* All authors report no conflicts of interest relevant to this article.

Michele Malagola, MD, PhD;<sup>1</sup>  
 Bendetta Rambaldi, MD;<sup>1</sup>  
 Giuseppe Ravizzola, MD;<sup>2</sup>  
 Nicola Polverelli, MD;<sup>1</sup>  
 Alessandro Turra, MD;<sup>1</sup>  
 Enrico Morello, MD;<sup>1</sup>  
 Cristina Skert, MD;<sup>1</sup>  
 Valeria Cancelli, MD;<sup>1</sup>  
 Federica Cattina, MD;<sup>1</sup>  
 Simona Bernardi, PhD;<sup>1</sup>  
 Simone Perucca, PhD;<sup>1</sup>

Liana Signorini, MD;<sup>3</sup>  
 Roberto Stellini, MD;<sup>3</sup>  
 Francesco Castelli, MD;<sup>3</sup>  
 Arnaldo Caruso, MD;<sup>2</sup>  
 Domenico Russo, MD<sup>1</sup>

Affiliations: 1. Clinical and Experimental Sciences Department, University of Brescia, Bone Marrow Transplant Unit, ASST-Spedali Civili, Brescia, Italy; 2. Institute of Microbiology, Department of Molecular and Transplant Medicine, University of Brescia, Italy; 3. Chair of Infectious Diseases, Division of Infectious and Tropical Diseases, University of Brescia, Italy.

Address correspondence to Michele Malagola, MD, PhD, Chair of Hematology, Clinical and Experimental Sciences Department, University of Brescia, Bone Marrow Transplant Unit, ASST-Spedali Civili 1, 25123 Brescia, Italy (michelemalagola@yahoo.it).

*Infect Control Hosp Epidemiol* 2017;38:1131–1132

© 2017 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2017/3809-0027. DOI: 10.1017/ice.2017.157

#### REFERENCES

- Marena C, Zecca M, Carenini ML, et al. Incidence of, and risk factors for, nosocomial infections among hematopoietic stem cell transplantation recipients, with impact on procedure-related mortality. *Infect Control Hosp Epidemiol* 2001;22:510–517.
- Poutsiaka DD, Price LL, Ucuzian A, Chan GW, Miller KB, Snyderman DR. Blood stream infection after hematopoietic stem cell transplantation is associated with increased mortality. *Bone Marrow Transplant* 2007;40:63–70.
- Collin BA, Leather HL, Wingard JR, Ramphal R. Evolution, incidence, and susceptibility of bacterial bloodstream isolates from 519 bone marrow transplant patients. *Clin Infect Dis* 2001;33:947–953.
- Almyroudis NG, Fuller A, Jakubowski A, et al. Pre- and post-engraftment bloodstream infection rates and associated mortality in allogeneic hematopoietic stem cell transplant recipients. *Transpl Infect Dis* 2005;7:11–17.
- Lukenbill J, Rybicki L, Sekeres MA, et al. Defining incidence, risk factors, and impact on survival of central line-associated blood stream infections following hematopoietic cell transplantation in acute myeloid leukemia and myelodysplastic syndrome. *Biol Blood Marrow Transplant* 2013;19:720–724.
- Busca A, Cavecchia I, Locatelli F, et al. Blood stream infections after allogeneic stem cell transplantation: a single-center experience with the use of levofloxacin prophylaxis. *Transpl Infect Dis* 2012;14:40–48.
- Malagola M, Rambaldi R, Ravizzola G, et al. Bacterial blood stream infections negatively impact on outcome of patients treated with allogeneic stem cell transplantation: 6-year single-centre experience. *Mediterr J Hematol Infect Dis* 2017 (in press).

## High Levels of Hand-Hygiene Compliance Are a Worthwhile Pursuit

*To the Editor*—We read with great interest the excellent review of evidence-based recommendations for the prevention of

*Clostridium difficile* infection (CDI) by Louh et al.<sup>1</sup> In this article, the authors reviewed 4 studies that assessed the impact of hand-hygiene campaigns to reduce CDI. Based on these papers, the authors did not recommend any hand-hygiene interventions to reduce CDI.

In their discussion section, Louh et al stated, “Although older studies have shown a significant reduction in nosocomial infections by observing good hand hygiene, further benefit from promoting hand hygiene is unlikely, as the margin for improvement diminishes. Therefore, if any institution has adequate hand-hygiene processes, incremental efforts to improve hand hygiene may not be as beneficial as other interventions.” We have 2 concerns with this statement and their conclusion. First, the authors did not define a level of “adequate hand hygiene.” Second, their conclusion that moving from high to very high levels of hand-hygiene compliance offer diminishing benefits is not supported by the literature. We have previously demonstrated that an improvement in hand-hygiene compliance from a high baseline level (>80%) to an even higher level (>95%) led to a significantly decreased healthcare-associated infection rate ( $P=.0066$ ).<sup>2</sup> Based on our data, we believe that achieving very high levels of hand-hygiene compliance is both feasible and worthwhile to reduce healthcare-associated infections.

#### ACKNOWLEDGMENTS

*Financial support:* No financial support was provided relevant to this article.

*Potential conflicts of interest:* All authors report no conflicts of interest relevant to this article.

**Emily E. Sickbert-Bennett, PhD, MS,<sup>1,2</sup>**

**Lauren M. DiBiase, MS,<sup>1,2</sup>**

**David J. Weber, MD, MPH<sup>1,2</sup>**

Affiliations: 1. Department of Hospital Epidemiology, University of North Carolina Hospitals, Chapel Hill, North Carolina; 2. Division of Infectious Diseases, UNC School of Medicine, Chapel Hill, North Carolina.

Address correspondence to Emily Sickbert-Bennett, PhD, MS, 1063 West Wing, CB#7600, Hospital Epidemiology, UNC Hospitals, 101 Manning Drive, Chapel Hill, NC 27514 (esickber@unch.unc.edu).

*Infect Control Hosp Epidemiol* 2017;38:1132–1133

© 2017 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2017/3809-0028. DOI: 10.1017/ice.2017.152

#### REFERENCES

1. Louh IK, Greendyke WG, Hermann EA, et al. *Clostridium difficile* infection in acute care hospitals: systematic review and best practices for prevention. *Infect Control Hosp Epidemiol* 2017;38:476–482.
2. Sickbert-Bennett EE, DiBiase LM, Willis TM, Wolak ES, Weber DJ, Rutala WA. Reduction of healthcare-associated infections by exceeding high compliance with hand hygiene practices. *Emerg Infect Dis* 2016;22:1628–1630.

## Role of Ethanol Locks in Reducing Bloodstream Infections in Adults on Parenteral Nutrition

*To the Editor*—Central-line-associated bloodstream infections (CLABSIs) are one of the leading complications in patients receiving home parenteral nutrition (PN).<sup>1</sup> Parenteral nutrition is generally administered through intravenous catheters for prolonged periods of time, particularly in patients with chronic illnesses such as intestinal failure. Each CLABSI puts patients at greater risk of complications including: sepsis, endocarditis, multidrug-resistant (MDR) bacteria, thrombosis and malnutrition which may lead to more hospital stays, increased costs of care, and decreased quality of life.<sup>2,3</sup> Additionally, most bloodstream infections require catheter replacement for optimal management.<sup>4</sup> Ethanol lock therapy (ELT) is a proposed method to reduce CLABSIs requiring hospitalizations and associated line replacements by preventing catheters from becoming colonized.

Ethanol provides benefits over traditional antibiotic locks due to its ability to kill a broad spectrum of organisms, including MDR bacteria and fungi, with minimal side effects. Trials in the adult population have included patients with long-term central venous catheters, such as dialysis, oncology, and PN patients, and have shown variable results.<sup>5–8</sup>

The goal of this study was to further evaluate benefits of adding prophylactic ELT to all patients with silicone-based tunneled catheters in adult patients on home PN for an advanced form of intestinal failure (type 2 or type 3) as defined by the European Society for Clinical Nutrition and Metabolism (ESPEN).<sup>9</sup> The primary outcomes evaluated were the rates of CLABSI and resulting hospitalizations in patients before and after the initiation of the ELT protocol. Secondary outcomes included type of bacteria, number of line replacements, and number of hospital days.

This retrospective cohort study compared CLABSI rates and hospitalization days before and after ELT therapy protocol initiation in a 1,550-bed, tertiary-care, university-affiliated Hospital in Miami, Florida. Following institutional review board approval, all patients >18 years old receiving PN on the surgical nutrition service between April 1, 2009, and April 30, 2015, were identified using a web-based clinical surveillance software system, VigiLanz (VigiLanz, Minneapolis, MN), which utilizes data from electronic health records. Patients were assigned to the preimplementation group if they received PN between April 1, 2009, and March 30, 2012, or the postimplementation group if they received parenteral nutrition between May 1, 2012, and April 30, 2015. If the dates of PN administration spanned both groups, catheter days and hospitalizations were separated based on the study period.

The ELT protocol requires a 70% ethanol solution to dwell in the Hickman catheter for at least 4 hours, 3 days per week. Ethanol lock therapy may only be administered to patients with silicone-based tunneled catheters, such as Hickman