tions in Acute Care Hospitals,"[1] and we appreciate the attention of Kerry J. Edgar to this article.[2] It appears that the greatest concern expressed in the letter reflects the fact that we restricted our comments in section 4, subsection III, point 3 to positive-pressure needleless connectors with mechanical valves rather than addressing needleless connectors with mechanical valves in general. The letter reviews 4 studies that note an increased incidence of catheter-related infection with use of mechanical valves. These are the studies we referenced in the compendium.[1] As noted in the letter, of these 4 recently published studies in the peer-reviewed literature about the association of mechanical valves with an increased incidence of catheter-related infections, 3 involved positive-pressure devices. Thus, on the basis of the literature review performed while drafting the compendium, the recommendation as written is accurate in that it represents a summary of the evidence available at that time. The letter refers to the abstract by Garcia and Jendresky[3] that did not find a difference in the rate of central line–associated bloodstream infection with the use of positive-pressure connectors, compared with the use of split-septum connectors. However, we did not include another abstract by Karchmer et al.[4] that showed a significantly higher rate of central line–associated bloodstream infections with the use of mechanical valve connectors, some of which were positive-pressure connectors, because the methodology of the compendium included citations of peer-reviewed publications only.

The letter notes that "The mechanical valves studied were not utilized according to the manufacturer's instructions for use," suggesting that a breach in aseptic technique when handling the device, rather than the device itself, is associated with an increased risk of infection. This is a crucial point in the use of any medical device, and we addressed this issue by including the importance of education in section 4, subsection III, point 3: "Do not routinely use positive-pressure needleless connectors with mechanical valves before a thorough assessment of risks, benefits, and education regarding proper use." Nevertheless, it is hoped that manufacturing of such devices in the future will involve fail-safe engineering advances aimed at further mitigation of the risk of infection in the complex hospital environment in which they are used. Both SHEA and the IDSA remain committed to keeping the compendium in alignment with current published evidence, and, together, the societies are undertaking a formal review and updating process.

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REFERENCES

1. Marschall J, Mermel LA, Classen D, et al. Strategies to prevent central line–associated bloodstream infections in acute care hospitals. *Infect Control Hosp Epidemiol* 2008; 29(Suppl 1):S22-S30.
2. Edgar KJ. Does the evidence support the SHEA-IDSA recommendation on the use of positive-pressure mechanical valves? *Infect Control Hosp Epidemiol* 2009; 29:402-403 (in this issue).
3. Garcia R, Jendresky L. A study of the effects on bacteremia and sharps injury rates after introduction of an advanced luer activated device (LAD) for intravascular access in a large hospital setting. *Am J Infect Control* 2007; 35:E75.
4. Karchmer TB, Cook EM, Palaveccino E, Ohl CA, Sherertz RJ. Needleless valve ports may be associated with a high rate of catheter-related bloodstream infection. In: Program and abstracts of the 15th Annual Meeting of the Society for Healthcare Epidemiology; April 9–12, 2005; Los Angeles, CA. Abstract 307.

Strategies to Prevent Catheter-Associated Urinary Tract Infection

To the Editor—We commend the Society of Healthcare Epidemiologists of America (SHEA) and the Infectious Disease Society of America (IDSA) for developing the recently published Compendium of Strategies to Prevent Healthcare-Associated Infections,[1] which offers practical approaches for developing comprehensive infection prevention programs. Unfortunately, the methodology used for literature search or data extraction is not mentioned. It appears that some relevant articles were not reviewed, and that data from some reviewed articles were misinterpreted, particularly for the article by Lo et al.[2] on strategies to prevent catheter-associated urinary tract infection.

Lo et al.[2] offer 3 references[3-5] for their statement that "Reviews and meta-analyses of silver-coated urinary catheters... *consistently conclude* [italics added] that evidence does not support a recommendation for the uniform use of such devices."[2(pS43)] In the first reference, however, Brosnahan et al.[3] conclude that silver alloy catheters "significantly" reduce the rates of both symptomatic and asymptomatic catheter-associated urinary tract infection,[3(p1)] and that "results suggest that the use of silver alloy indwelling catheters for catheterizing hospitalized adults reduces the risk of catheter-acquired urinary tract infection."[3(p2)] Johnson et al.[4] conclude that "according to fair-quality evidence, antimicrobial urinary cath-

eters can prevent bacteriuria in hospitalized patients during short-term catheterization..."[4(p116)] Lastly, Niel-Weise et al.[5] do conclude that there are insufficient data to support the use of silver-coated catheters because of the paucity of well-controlled studies.[5] However, in another meta-analysis (not referenced in the compendium), Saint et al.[6] conclude that "this meta-analysis clarifies discrepant results among trials of silver-coated urinary catheters by revealing that silver alloy catheters are significantly more effective in preventing urinary tract infections than are silver oxide catheters."[6(p236)]

Lo et al.[2] also state that "silver-alloy catheters may decrease bacteriuria but have not been shown to decrease symptomatic infection or other undesirable outcomes."[2(pS43)] This statement contradicts the statement by Brosnahan et al.[3] that "the risk of symptomatic urinary tract infection was also found to be reduced with the use of silver alloy catheters."[3(p1)] Other unreferenced publications, such as those by Newton et al.[7] and Karchmer et al.,[8] offer similar conclusions. In addition, the value of reducing bacteriuria is described in section 1.4[2(pS42)] of the article by Lo et al.,[2] wherein references are provided to support statements that bacteriuria can serve as a reservoir for organisms that can be transmitted to other patients or lead to sepsis.

Finally, section 4[2(pS43-46)] of the article by Lo et al.[2] lists many recommendations for implementing prevention and monitoring strategies. The great majority of these are people dependent and resource intensive. Nursing staff constraints and fatigue can lessen the impact of people-dependent measures, especially over time and during off-hour shifts. The use of silver alloy–coated catheters offers a strategy that is independent of infrastructure and bedside practices. Although cost-effectiveness data are limited, the data that exist support the use of these catheters.[9,10]

Device manufacturers share with clinicians a common goal dedicated to reducing the risk of healthcare-associated infection. We want to ensure that Foley catheters are used only when clinically indicated. For patients who need a Foley catheter, we want to reduce the risk of infection. The decision to use an antimicrobial-coated catheter should be based on the best available evidence, and we believe that the evidence supports the use of silver alloy–coated Foley catheters in patients at risk of a catheter-associated urinary tract infection.

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REFERENCES

1. Yokoe DS, Mermel LA, Anderson DJ, et al. Compendium of strategies to prevent healthcare-associated infections in acute care hospitals. *Infect Control Hosp Epidemiol* 2008; 29:S12-S21.
2. Lo E, Nicolle L, Classen D, et al. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals. *Infect Control Hosp Epidemiol* 2008; 29:S41-S50.
3. Brosnahan J, Jull A, Tracy C. Types of urethral catheters for management of short-term voiding problems in hospitalized adults. *Cochrane Database Syst Rev* 2004; 1:CD004013.
4. Johnson JR, Kuskowski MA, Wilt TJ. Systematic review: antimicrobial urinary catheters to prevent catheter-associated urinary tract infection in hospitalized patients. *Ann Intern Med* 2006; 144:116-127.
5. Niel-Weise BS, Arend SM, van den Broek PJ. Is there evidence for recommending silver-coated urinary catheters in guidelines? *J Hosp Infect* 2002; 52:81-87.
6. Saint S, Elmore JG, Sullivan SD, et al. The efficacy of silver alloy–coated urinary catheters in preventing urinary tract infection: a meta-analysis. *Am J Med* 1998; 105:236-241.
7. Newton T, Still JM, Law E. A comparison of the effect of early insertion of standard latex and silver-impregnated latex Foley catheters on urinary tract infections in burn patients. *Infect Control Hosp Epidemiol* 2002; 23: 217-218.
8. Karchmer TB, Gianetta ET, Muto CA, Strain BA, Farr BA. A randomized crossover study of silver coated urinary catheters in hospitalized patients. *Arch Intern Med* 2000; 160:3294-3298.
9. Lai KK, Fontecchio SA. Use of silver-hydrogel urinary catheters on the incidence of catheter-associated urinary tract infections in hospitalized patients. *Am J Infect Control* 2002; 30:221-225.
10. Saint S, Veenstra DL, Sullivan SD, Chenoweth C, Fendrick AM. The potential clinical and economic benefits of silver alloy urinary catheters in preventing urinary tract infection. *Arch Intern Med* 2000; 160:2670-2675.

Reply to Ciavarella and Ritter

To the Editor—Ciavarella and Ritter[1] discuss 4 meta-analyses in their letter questioning the recommendation that addresses routine use of antimicrobial-coated indwelling urethral catheters in the recently published compendium of strategies to prevent healthcare-associated infections.[2] They acknowledge Niel-Weise et al.[3] concluded that evidence does not support the use of antimicrobial catheters and that there are substantial problems with the quality of most reported studies. The Cochrane review of Brosnahan et al.,[4] as Ciavarella and Ritter[1] note, concluded that silver-alloy catheters are associated with a decrease in asymptomatic bacteriuria and symptomatic infection, but it also concluded that "further economic evaluation is required to confirm that the reduction of infection compensates for the increased cost." This Cochrane review was updated in 2008, subsequent to the publication of the compendium.[5] The updated review again concluded that catheters coated with silver alloy or antibiotics may decrease asymptomatic catheter-acquired bacteriuria but that study quality is generally poor and further economic analysis is needed. Symptomatic urinary infection was addressed in only one study in the update, with no benefit