

Carolina School of Medicine, Chapel Hill, North Carolina; 3. Department of Biostatistics, City of Hope, Duarte, California.

Address correspondence to Sandrine Leroy, MD, PhD, Institut de Recherche pour le Développement, Unité Mixte Internationale 233, INSERM U1175, Université de Montpellier, 911 avenue Agropolis, BP 64501, F-34394 Montpellier CEDEX 5, France (sandrin.leroy@gmail.com).

*Infect Control Hosp Epidemiol* 2015;36(7):852–854

© 2015 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2015/3607-0021. DOI: 10.1017/ice.2015.88

## REFERENCES

1. Bénet T, Ecochard R, Vanhems P. Letter to the editor regarding “Impact of vaginal-rectal ultrasound examinations with covered and low-level disinfected transducers on infectious transmissions in France” by Leroy et al. *Infect Control Hosp Epidemiol* 2015; DOI: 10.1017/ice.2015.87.
2. Leroy S, M’Zali F, Kann M, Weber DJ, Smith DD. Impact of vaginal-rectal ultrasound examinations with covered and low-level disinfected transducers on infectious transmissions in France. *Infect Control Hosp Epidemiol* 2014;35:1497–1504.
3. Buffet-Bataillon S, Vallee A, Lebrun B, Cormier M, Poulian P, Jolivet-Gougeon A. Contrôle microbiologique de la désinfection de sondes endovaginales et d’échographie transoesophagienne au CHU de Rennes. In: Program and Abstracts of the 20th Congress of the Société Française d’Hygiène Hospitalière (SFHH) and Société des Infirmiers et Infirmières en Hygiène Hospitalière de France (SIHH). Nice, France: SFHH and SIHH, 2009. Abstract 312009.
4. Kac G, Gueneret M, Rodi A, et al. Evaluation of a new disinfection procedure for ultrasound probes using ultraviolet light. *J Hosp Infect* 2007;65:163–168.
5. Kac G, Podglajen I, Si-Mohamed A, Rodi A, Grataloup C, Meyer G. Evaluation of ultraviolet C for disinfection of endocavitary ultrasound transducers persistently contaminated despite probe covers. *Infect Control Hosp Epidemiol* 2010;31:165–170.
6. Thorpe LE, Ouellet LJ, Hershov R, et al. Risk of hepatitis C virus infection among young adult injection drug users who share injection equipment. *Am J Epidemiol* 2002;155:645–653.
7. Meyers J, Ryndock E, Conway MJ, Meyers C, Robison R. Susceptibility of high-risk human papillomavirus type 16 to clinical disinfectants. *J Antimicrob Chemother* 2014;69:1546–1550.
8. Casalegno JS, Le Bail Carval K, Eibach D, et al. High risk HPV contamination of endocavity vaginal ultrasound probes: an underestimated route of nosocomial infection? *PLOS ONE* 2012;7:e48137.
9. Leroy S. Infectious risk of endovaginal and transrectal ultrasonography: systematic review and meta-analysis. *J Hosp Infect* 2013;83:99–106.
10. Bénet T, Ritter J, Vanhems P. Risk of human immunodeficiency virus and hepatitis C virus infection related to endocavitary ultrasound probe exposure in France. *Infect Control Hosp Epidemiol* 2014;35:1429–1431.
11. Department of Health, Social Services and Public Safety, UK (DHSSPS). MDA/2012/037. DHSSPS website. Available at: <http://www.dhsspsni.gov.uk/mda-2012-037.pdf>.
12. Lesourd F, Izopet J, Mervan C, et al. Transmissions of hepatitis C virus during the ancillary procedures for assisted conception. *Hum Reprod* 2000;15:1083–1085.

## Letter to the Editor Regarding “Efficacy of Alcohol Gel for Removal of Methicillin-Resistant *Staphylococcus Aureus* from Hands of Colonized Patients”

*To the Editor*—We have read with great interest the article by Sunkesula et al<sup>1</sup> on the effectiveness of alcohol 70% v/v against methicillin-resistant *Staphylococcus aureus* in a clinical study. Surprisingly, 2 mL of a commonly used, registered handrub product failed in 27 (40%) of 67 instances to completely eradicate MRSA. This result might be explained by several issues that were not discussed in detail in the article: (1) the hand hygiene product used has been previously shown to have a lower mean microbial reduction factor compared with reference alcohol—therefore not meeting the European Standards (EN 1500) requirements within 30 seconds of application,<sup>2</sup> (2) the volume of 2 mL might not have been sufficient, and (3) it is unclear whether the hand hygiene technique as outlined by the World Health Organization was strictly adhered to in this study. We recently found compliance with all 6 steps of the technique among healthcare workers at our institution to be as low as 8.5%, despite high compliance with hand hygiene indications.<sup>3</sup> Several studies showed that training in hand hygiene significantly improves antimicrobial effectiveness.<sup>4</sup> By any means, this study is important and might explain why many studies failed to decrease the spread of methicillin-resistant *Staphylococcus aureus* despite high compliance with hand hygiene.

## ACKNOWLEDGMENTS

*Financial support.* None reported.

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

**Andreas F. Widmer, MD, MSc;  
Sarah Tschudin-Sutter, MD, MSc**

Affiliations: Division of Infectious Diseases and Hospital Epidemiology, University Hospital Basel, Basel, Switzerland.

Address correspondence to Andreas F. Widmer, MD, MSc, Division of Infectious Diseases and Hospital Epidemiology, University Hospital Basel, Petersgraben 4, CH-4031 Basel, Switzerland (andreas.widmer@usb.ch).

*Infect Control Hosp Epidemiol* 2015;36(7):854–855

© 2015 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2015/3607-0022. DOI: 10.1017/ice.2015.94

## REFERENCES

1. Sunkesula V, Kundrapu S, Macinga DR, Donskey CJ. Efficacy of alcohol gel for removal of methicillin-resistant *Staphylococcus*

- aureus* from hands of colonized patients. *Infect Control Hosp Epidemiol* 2015;36:229–231.
- Kramer A, Rudolph P, Kampf G, Pittet D. Limited efficacy of alcohol-based hand gels. *Lancet* 2002;359:1489–1490.
  - Tschudin-Sutter S, Sepulcri D, Dangel M, Schuhmacher H, Widmer AF. Compliance with the WHO hand hygiene technique: a prospective observational study. *Infect Control Hosp Epidemiol* 2015;36:482–483.
  - Widmer AE, Dangel M. Alcohol-based handrub: evaluation of technique and microbiological efficacy with international infection control professionals. *Infect Control Hosp Epidemiol* 2004;25:207–209.

## Reply to Widmer and Tschudin-Sutter

*To the Editor*—We appreciate the interest in our recent article<sup>1</sup> and would like to respond to issues raised by Widmer and Tschudin-Sutter<sup>2</sup> as possible explanations why 2 mL of a 70% alcohol handrub product did not completely eradicate methicillin-resistant *Staphylococcus aureus* (MRSA) from the hands of colonized patients. First, the assertion that the handrub used in the study did not meet the European Standards (EN 1500) requirements within 30 seconds of application is inaccurate. Although a product of the same brand name was evaluated by Kramer et al.,<sup>3</sup> that was a previous formulation based on 62% (vol/vol) ethanol. The product used in the current study is based on 70% (vol/vol) ethanol and meets both the EN 1500 efficacy requirements within 30 seconds and the US Food and Drug Administration Healthcare Personnel Handwash requirements at a 2 mL application.<sup>4</sup> Therefore incomplete MRSA eradication cannot be attributed to a lack of efficacy of the handrub product. Second, we acknowledge that a larger volume of product may have been more effective because handrub efficacy is highly dependent on application volume. Further studies to investigate the impact of product volume on clinical efficacy are warranted. We point out, however, that there is a practical limit to the volume of product end users will apply, which is largely influenced by dry-time. The volume of handrub used in this study (2 mL) takes approximately 30 seconds to rub dry and is consistent with World Health Organization recommendations; in contrast, a volume of 3 mL typically remains wet longer than 30 seconds and can take as long as 90 seconds to dry on hands.<sup>5</sup> Third, as stated in our article, patients were asked to rub their hands for 30 seconds with coaching to ensure proper technique according to World Health Organization recommendations. A majority of participants studied were elderly and some displayed diminished hand dexterity, which may have impacted our results. However, there is still debate whether the 6-step technique outlined by the World Health Organization provides an efficacy benefit.<sup>6,7</sup> We agree that the ability of

handrub products to meet established efficacy requirements, as well as product application volume and good technique to ensure adequate hand coverage, are all important variables that influence clinical efficacy. However, we caution against the generalization of the results obtained with this specific population of MRSA-colonized patients to make predictions on the ability of alcohol handrub products to eliminate transient MRSA from the hands of healthcare workers.

## ACKNOWLEDGMENTS

*Financial support.* Department of Veterans Affairs.

*Potential conflicts of interest.* C.J.D. reports that he has received research grants from Steris, Pfizer, 3M, Clorox, and GOJO, and has served on scientific advisory boards for 3M and Merck. D.R.M. reports that he is an employee of GOJO. All other authors report no conflicts of interest relevant to this article.

Venkata C. K. Sunkesula, MD, MS;<sup>1</sup>  
 Sirisha Kundrapu, MD, MS;<sup>1</sup>  
 David R. Macinga, PhD;<sup>2,3</sup>  
 Curtis J. Donskey, MD<sup>1,4</sup>

*Affiliations:* 1. Division of Infectious Diseases, Department of Medicine, Case Western Reserve University School of Medicine, Cleveland, Ohio; 2. Research and Development, GOJO Industries, Akron, Ohio; 3. Department of Integrative Medical Sciences, Northeastern Ohio Medical University, Rootstown, Ohio; 4. Geriatric Research, Education, and Clinical Center, Cleveland Veterans Affairs Medical Center, Cleveland, Ohio.

Address correspondence to Curtis J. Donskey, MD, Geriatric Research, Education, and Clinical Center, Cleveland Veterans Affairs Medical Center, 10701 East Blvd, Cleveland, Ohio 44106 (curtisid123@yahoo.com).

*Infect Control Hosp Epidemiol* 2015;36(7):855–856

© 2015 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2015/3607-0023. DOI: 10.1017/ice.2015.95

## REFERENCES

- Sunkesula V, Kundrapu S, Macinga DR, Donskey CJ. Efficacy of alcohol gel for removal of methicillin-resistant *Staphylococcus aureus* from hands of colonized patients. *Infect Control Hosp Epidemiol* 2015;36:229–231.
- Widmer AF, Tschudin-Sutter S. Letter to the editor regarding “Efficacy of alcohol gel for removal of methicillin-resistant *Staphylococcus aureus* from hands of colonized patients.” *Infect Control Hosp Epidemiol* 2015; doi:10.1017/ice.2015.94.
- Kramer A, Rudolph P, Kampf G, Pittet D. Limited efficacy of alcohol-based hand gels. *Lancet* 2002;359:1489–1490.
- Edmonds SL, Macinga DR, Mays-Suko P, et al. Comparative efficacy of commercially available alcohol-based hand rubs and WHO-recommended hand rubs: formulation matters. *Am J Infect Control* 2012;40:521–525.
- Macinga DR, Shumaker DJ, Werner H-P, et al. The relative influences of product volume, delivery format and alcohol concentration on dry-time and efficacy of alcohol-based hand rubs. *BMC Infect Dis* 2014;14:511.
- Kampf G, Reichel M, Feil Y, Eggerstedt S, Kaulfers PM. Influence of rub-in technique on required application time and hand coverage in hygienic hand disinfection. *BMC Infect Dis* 2008;8:149.