

- tals. *Am J Infect Control* 1997;25:357-362.
8. Needleman J, Buerhaus P, Mattke S, Stewart M, Zelevinsky K. Nurse-staffing levels and the quality of care in hospitals. *N Engl J Med* 2002;346:1715-1722.
  9. Szucs TD, Ruef C, Muller D, Sokolovic E, Beeler I, Ostermayer W. The economic impact of influenza in a university hospital setting. *Infect Control Hosp Epidemiol* 2001;22:472-474.
  10. Boersma B, Rhames T, Keegan JM. Additional cost savings of an effective employee influenza program on prevention of nosocomial influenza. *Am J Infect Control* 1999;27:177-178.
  11. Wilde JA, McMillan JA, Serwint J, Butta J, O'Riordan MA, Steinhoff MC. Effectiveness of influenza vaccine in health care professionals: a randomized trial. *JAMA* 1999;281:908-913.
  12. Saxen H, Virtanen M. Randomized, placebo-controlled double blind study on the efficacy of influenza immunization on absenteeism of health care workers. *Pediatr Infect Dis J* 1999;18:779-783.
  13. Centers for Disease Control and Prevention. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2003;52(RR-8):1-34.
  14. Cunney RJ, Bialachowski A, Thornley D, Smaill FM, Pennie RA. An outbreak of influenza A in a neonatal intensive care unit. *Infect Control Hosp Epidemiol* 2000;21:449-454.
  15. Eisenfeld L, Perl T, Burke G, et al. Lack of compliance with influenza immunization for caretakers of neonatal intensive care unit patients. *Am J Infect Control* 1994;22:307-311.
  16. Munoz FM, Campbell JR, Atmar RL, et al. Influenza A virus outbreak in a neonatal intensive care unit. *Pediatr Infect Dis J* 1999;18:811-815.
  17. Sagrera X, Ginovart G, Raspall F, et al. Outbreaks of influenza A virus infection in neonatal intensive care units. *Pediatr Infect Dis J* 2002;21:196-200.
  18. Centers for Disease Control and Prevention. Notice to readers: delayed supply of influenza vaccine and adjunct ACIP influenza vaccine recommendations for the 2000-01 influenza season. *MMWR* 2001;49:619-622.
  19. Girouard S, Levine G, Goodrich K, et al. Pediatric Prevention Network: a multicenter collaboration to improve health care outcomes. *Am J Infect Control* 2001;29:158-161.
  20. Likert R, Gardner M. A technique for the measurement of attitudes. *Archives of Psychology* 1932;140:55.
  21. Whimbey E, Champlin RE, Couch RB, et al. Community respiratory virus infections among hospitalized adult bone marrow transplant recipients. *Clin Infect Dis* 1996;22:778-782.
  22. Ljungman P, Andersson J, Aschan J, et al. Influenza A in immunocompromised patients. *Clin Infect Dis* 1993;17:244-247.
  23. Weinstock DM, Eagan J, Malak SA, et al. Control of influenza A on a bone marrow transplant unit. *Infect Control Hosp Epidemiol* 2000;21:730-732.
  24. Nichol KL, Hauge M. Influenza vaccination of healthcare workers. *Infect Control Hosp Epidemiol* 1997;18:189-194.
  25. Weingarten S, Reidingen M, Bolton LB, Miles P, Ault M. Barriers to influenza vaccine acceptance: a survey of physicians and nurses. *Am J Infect Control* 1989;17:202-207.
  26. Pachucki CT, Pappas SA, Fuller GF, Krause SL, Lentino JR, Schaaff DM. Influenza A among hospital personnel and patients: implications for recognition, prevention, and control. *Arch Intern Med* 1989;149:77-80.
  27. Watanakunakorn C, Ellis G, Gemmel D. Attitude of healthcare personnel regarding influenza immunization. *Infect Control Hosp Epidemiol* 1993;14:17-20.
  28. Vesikari T, Karvonen A, Korhonen T, et al. A randomized, double-blind, placebo-controlled trial of the safety, transmissibility and phenotype stability of a live, attenuated, cold-adapted influenza virus vaccine (CAIV-T) in children attending daycare. Presented at the 41st Annual Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC); December 16-19, 2001; Chicago, IL.
  29. Centers for Disease Control and Prevention. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2004;53(RR-6):1-40.
  30. Adal KA, Flowers RH, Anglim AM, et al. Prevention of nosocomial influenza. *Infect Control Hosp Epidemiol* 1996;17:641-648.
  31. Harbarth S, Siegrist CA, Schira JC, Wunderli W, Pittet D. Influenza immunization: improving compliance of healthcare workers. *Infect Control Hosp Epidemiol* 1998;19:337-342.
  32. Carman WF, Elder AG, Wallace LA, et al. Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term care: a randomised controlled trial. *Lancet* 2000;355:93-97.

## Medical News

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### Hand Hygiene Perceptions Among Physicians

Research has shown that physician adherence to hand hygiene remains low in most hospitals. Pittet and colleagues from University of Geneva Hospitals, Geneva, Switzerland, reported on research to identify risk factors for nonadherence and assess beliefs and perceptions associated with hand hygiene among physicians using a cross-sectional survey of physician practices, beliefs, and attitudes toward hand hygiene in a large university hospital in Geneva. Individual observations were made of 163 physicians' hand hygiene practices during routine patient care with documentation of relevant risk factors and a questionnaire to measure the physicians' beliefs and perceptions. Logistic regression identified variables independently associated with adherence. Adherence averaged 57% and varied markedly across medical specialties. In multivariate analysis, adherence was associated with the awareness of being observed, the belief of being a role model for other colleagues, a positive attitude toward

hand hygiene after patient contact, and easy access to handrub solution. Conversely, high workload, activities associated with a high risk for cross-transmission, and certain technical medical specialties (surgery, anesthesiology, emergency medicine, and intensive care medicine) were risk factors for nonadherence. The authors concluded that physician adherence to hand hygiene is associated with work and system constraints, as well as knowledge and cognitive factors. At the individual level, strengthening a positive attitude toward hand hygiene and reinforcing the conviction that each individual can influence the group's behavior may improve adherence among physicians. Physicians who work in technical specialties should also be targeted for improvement.

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