

number, randomized by sorting, and then sampled proportional to monthly totals. The proportion of patients receiving the correct vaccine according to ACIP recommendations (Tdap for those aged <65 years and Td for those aged ≥65 years) was calculated.

Of 2,085 tetanus vaccinations administered during the study period, 231 were sampled for study to detect a compliance of 95% (±5%). Of 231 charts reviewed, 19 were excluded because of various deficiencies (mainly missing data). The remaining 212 patients had a median age of 38 years (interquartile range: 24-54 years). Of those 212 patients, 184 (86.8%) were aged <65 years, 145 (68.4%) were male, 75 (35.4%) were trauma patients, and 151 (71.2%) were discharged home from the ED, whereas the remaining 61 (28.8%) were admitted. An emergency physician ordered 185 (87.3%) of the boosters, 170 (80.2%) were given for laceration or abrasion, 22 (10.4%) for a skin infection, and 20 (9.4%) for another indication.

Overall, 75.0% (95% confidence interval [CI]=69.1%-80.8%) of the patients were managed in accordance with ACIP recommendations (Tdap for patients aged <65 years and Td for patients aged ≥65 years). Among patients aged <65 years, adherence to the ACIP recommendation was 76.1% (CI=69.9%-82.3%), whereas for those aged ≥65 years, adherence was 67.9% (CI=49.4%-86.3%). For the 181 patients with both physician orders and nursing documentation, adherence to ACIP guidelines based on nursing documentation was 86.7% (CI=81.8%-91.7%). For 30 (16.6%) patients, the physician order differed from the vaccine dispensed. Of these, 25 (83.3%) were changed by nursing staff such that the appropriate vaccine (Tdap for those aged <65 years and Td for those aged ≥65 years) was dispensed despite an inappropriate vaccine being ordered. Based on nursing documentation alone, adherence to ACIP guidelines differed significantly by age. Those aged <65 years were appropriately vaccinated with Tdap 89.9% (CI=85.1%-94.6%) of the time compared with those aged ≥65 years, who were appropriately vaccinated with Td 65.2% (CI=44.2%-86.3%) of the time.

Overall adherence to ACIP guidelines for proper Tdap and Td administration was 75%. In this study, only patients who received tetanus boosters were studied; thus, data on the number of patients that failed to receive either Tdap or Td when it was indicated for wound management are not available. For patients aged 11-64 years, 76.1% received the ACIP-recommended Tdap vaccine. For adults aged ≥65 years, no licensed Tdap vaccine was available in the United States before 2010. Thus, all patients aged ≥65 years who were given a tetanus booster during the study period should have received Td; however, 32.1% received Tdap in place of the recommended Td. ACIP changed its recommendations in 2010 to recommend that adults aged ≥65 years receive Tdap in place of Td if they are health-care professionals or have close contact with an infant.<sup>2</sup> The new guidelines also removed the recommended 2-year interval between

tetanus vaccinations; no interval is now required between Td and Tdap vaccination. This study is of a single institution and might not be representative of all EDs. An electronic medical record reminder system for health-care providers might increase adherence to the ACIP guidelines.

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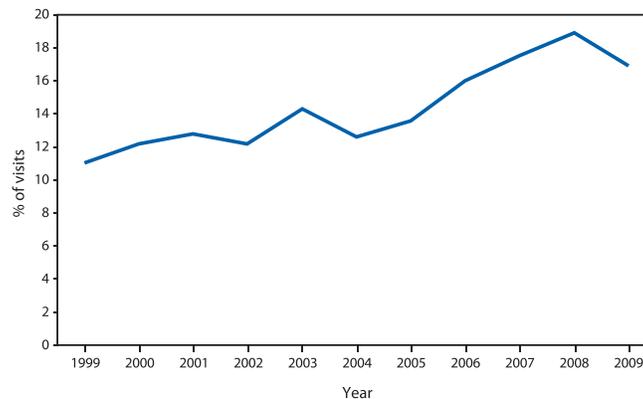
**REFERENCES**

1. CDC. Preventing tetanus, diphtheria, and pertussis among adults: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP) and recommendation of ACIP, supported by the Healthcare Infection Control Practices Advisory Committee (HICPAC), for use of Tdap among health-care personnel. *MMWR*. 2006; 55(RR-17):1-37.
2. Centers for Disease Control and Prevention (CDC). Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) vaccine from the Advisory Committee on Immunization Practices, 2010. *MMWR Morb Mortal Wkly Rep*. 2011;60(1):13-15.

**QuickStats**

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

**Percentage of Hospital Outpatient Department Visits in Which a Physician Assistant or Advance Practice Nurse\* Was Seen — National Hospital Ambulatory Medical Care Survey, United States, 1999–2009**



\* Includes visits to a physician assistant or advance practice nurse (e.g., nurse practitioner, nurse midwife, or other advance practice nurse), with or without a physician present. Estimates are based on sampled visits to hospital outpatient departments.

The percent of hospital outpatient department visits in which a patient saw a physician assistant or advance practice nurse increased from 11% in 1999 to 17% in 2009.

Sources: Hing E, Uddin S. Physician assistant and advance practice nurse care in hospital outpatient departments. NCHS Data Brief no. 77. Hyattsville, MD: US Department of Health and Human Services, CDC, National Center for Health Statistics; 2011. Available at <http://www.cdc.gov/nchs/data/databriefs/db77.htm>. National Hospital Ambulatory Medical Care Survey public use data file. Available at <http://www.cdc.gov/nchs/ahcd.htm>.

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