



## TECHNICAL REPORT

# Immunizing Parents and Other Close Family Contacts in the Pediatric Office Setting

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**KEY WORDS**

parental immunization, adults, vaccines, Tdap, cocooning

**ABBREVIATIONS**

CDC—Centers for Disease Control and Prevention

Tdap—tetanus toxoid, reduced diphtheria toxoid, and reduced-content acellular pertussis vaccine

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## abstract

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Additional strategies are needed to protect children from vaccine-preventable diseases. In particular, very young infants, as well as children who are immunocompromised, are at especially high risk for developing the serious consequences of vaccine-preventable diseases and cannot be immunized completely. There is some evidence that children who become infected with these diseases are exposed to pathogens through household contacts, particularly from parents or other close family contacts. Such infections likely are attributable to adults who are not fully protected from these diseases, either because their immunity to vaccine-preventable diseases has waned over time or because they have not received a vaccine. There are many challenges that have added to low adult immunization rates in the United States. One option to increase immunization coverage for parents and close family contacts of infants and vulnerable children is to provide alternative locations for these adults to be immunized, such as the pediatric office setting. Ideally, adults should receive immunizations in their medical homes; however, to provide greater protection to these adults and reduce the exposure of children to pathogens, immunizing parents or other adult family contacts in the pediatric office setting could increase immunization coverage for this population to protect themselves as well as children to whom they provide care. *Pediatrics* 2012;129:e247–e253

## INTRODUCTION

Prevention of infectious diseases through administration of vaccines according to recommended childhood and adolescent immunization schedules is an effective strategy to improve child health. Childhood immunizations are one of the greatest advances in modern medicine, markedly reducing morbidity and mortality. Data from the Centers for Disease Control and Prevention (CDC)'s 2009 National Immunization Survey of more than 17 000 households revealed that immunization rates against most vaccine-preventable diseases in children 19 to 35 months of age were >90%; <1% of children received no vaccines.<sup>1</sup> Despite widespread adherence to childhood immunization schedules, some children remain unprotected.<sup>2</sup> This includes infants who are too young to be vaccinated, children who do not receive all scheduled immunizations at appropriate times, young infants who have not received a full primary series and are not yet fully immune, and vaccine recipients who experience vaccine failure or waning immunity in

adolescence or adulthood.<sup>3</sup> Children who receive immunosuppressive agents as a result of cancer, organ transplantation, autoimmune diseases, and other primary and secondary immune deficiencies may be incapable of mounting an adequate immune response to any vaccine, and certain live-attenuated vaccines (eg, measles-mumps-rubella and varicella vaccines) may be contraindicated for medical reasons.

Thus, additional strategies are needed to protect children from vaccine-preventable diseases, such as immunizing household contacts of children to reduce their exposure to vaccine-preventable pathogens. This can be facilitated by immunizing parents and other close family contacts in the pediatric office setting. With this in mind, the goals of this technical report are as follows:

1. review the literature to determine how immunization of close family contacts could be used to protect vulnerable children;
2. explore potential issues surrounding implementation of this practice in the pediatric office setting; and
3. develop objectives and a research plan to advance this concept.

## BACKGROUND

The objective of providing immunizations for parents and other close family contacts of children in pediatric practice is to decrease infections in the family member, with subsequent reduction in exposure to the children. This strategy is referred to as “cocooning.”<sup>4–6</sup> Exposure to infected parents or family members is a risk factor for many infections. For example, infants with pertussis are often infected in their home by family members or other close contacts.<sup>7–10</sup> Bisgard et al<sup>9</sup> examined 774 cases of infant pertussis from 4 states and determined the source of contagion in

these infants through family interviews. An infectious source was identified in 43% of the case infants; of these, mothers were the source in 32% of cases, and another family member was the source in 43% of cases. The specific ages of the infectious source persons were described in 36% of reports; of these, 38 (17%) were 0 to 4 years of age, 16 (7%) were 5 to 9 years of age, 43 (20%) were 10 to 19 years of age, 45 (21%) were 20 to 29 years of age, and 77 (35%) were 30 years of age or older. Thus, more than half of the infectious sources were adults. Similarly, a prospective study conducted between 2006 and 2008 concluded that if parental immunity to pertussis was maintained, 35% to 55% of infant pertussis cases could have been prevented.<sup>10</sup>

Several studies have documented that vaccination of pregnant women against influenza reduces the incidence of influenza in their offspring.<sup>11,12</sup> Although research has documented a benefit of influenza vaccination of pregnant women for their babies, no studies have been conducted to determine whether postpartum vaccination or vaccination of other close family contacts with influenza vaccine reduces the incidence of influenza in their children. A 2010 report by Rekhtman et al<sup>13</sup> found that 69% of infants younger than 2 months of age hospitalized with influenza A had a history of exposure to a family member with upper respiratory tract infection symptoms. The ages and immunization status of the contacts, however, were not reported.

Several parental immunization programs have been conducted to reduce the burden of disease in their children. Healy et al<sup>14</sup> provided tetanus toxoid, reduced diphtheria toxoid, and reduced-content acellular pertussis vaccine (Tdap) to medically underserved, uninsured women postpartum in Houston through a standing order

protocol. Nearly all (96%) of the women without self-reported contraindications to vaccination received Tdap before hospital discharge. Shah and colleagues<sup>15,16</sup> conducted several immunization campaigns of parents whose infants were hospitalized in NICUs. During one influenza season, all parents of infants admitted to the NICU were offered trivalent inactivated influenza vaccine at their infant's bedside. Of the 158 infants admitted to the NICU, 95% of the parents were immunized. Remarkably, 23% of the parent population had never received trivalent inactivated influenza vaccine previously, despite having indications for personal influenza immunization.<sup>15</sup> The same group offered Tdap to all parents of infants admitted to the NICU. During the 4-month study period, 352 children were admitted to the NICU, and 87% of their parents received Tdap. However, 11% of parents refused vaccination, citing that pertussis was not a significant health threat or that they did not believe that vaccinations were protective.<sup>16</sup> Overall, these programs highlight the observation that most parents are likely to agree to immunizations for the purpose of protecting their infants.

In addition to the hospital setting, the practice of offering Tdap to all parents of infants during the first month of life was evaluated in a pediatric office setting. Two hundred parents were approached for immunization. Of eligible parents, more than 50% (82/160) received the vaccine. Interestingly, 60% of these parents opting for immunization received the vaccine the first time they were approached, and 40% received the vaccine at a subsequent office visit during the baby's first month of life.<sup>4</sup>

In summary, there is considerable evidence that children are exposed to infections in their home environment from parents and other family members

and that parents are willing to be immunized to protect their infants from vaccine-preventable diseases.

## **BARRIERS TO IMMUNIZATION OF ADULTS**

Data from the CDC in 2010 reported that Tdap coverage among adults who have contact with an infant was only 5%.<sup>17</sup> Another study conducted in 2004–2005 reported that 74% of insured adults did not receive influenza vaccine.<sup>18</sup> With evidence to support the benefits of immunization of parents and other close family contacts for the protection of children, several barriers to adult immunization remain. First, there are patient factors, such as a reluctance of healthy adults to seek preventive health care. Many adults see little need for a visit to a health care provider in the absence of an acute or chronic illness. Even among insured adults, influenza vaccination represented the least frequently received preventative health service among routine recommended services (26%) during a 2-year study period.<sup>18</sup> Second, lack of insurance coverage for vaccine-eligible adults and potential loss of income (because of the need to take time from work for preventive care) add to the challenges. Third, many healthy adults are unaware of the continuing need for immunization and the risks to themselves or others when their immunizations are not current.<sup>19,20</sup> Therefore, many adults do not receive recommended adult immunizations.

Physician and health care system factors contribute to low immunization rates in adults. Physicians may not have enough time during health maintenance visits to address immunizations, given the multiple chronic conditions or acute illnesses they are frequently managing<sup>21,22</sup>; thus, patients may not become aware of the importance of immunization for their own health or

the health of their children. Physicians also face financial barriers in providing immunizations to adults. Pediatricians, for whom immunization is part of their core mission and business, report that economic concerns are a problem. Freed et al<sup>23</sup> reported in 2009 that 49% of pediatricians had delayed purchasing immunizations because of financial concerns. This study also reported that 5% of pediatricians and 21% of family practitioners were considering discontinuing immunization services. Presumably, practices in these disciplines have far more experience and expertise in the vaccine-purchasing realm than do practices that focus solely on adult patient populations. A survey of internists and family physicians published in 2011<sup>24</sup> found that although 96% of such practices stocked at least 1 adult immunization, only 27% stocked all recommended adult immunizations. Nearly three-quarters of respondents listed payment and coverage issues as a barrier. In addition, many adults seek specialty care and do not have a medical home where a primary care provider who routinely reviews the immunization status of patients. The adult health care system is often more focused on either treating disease or the secondary and tertiary levels of health prevention than on primary prevention associated with immunizations.<sup>19,20</sup>

## **IMMUNIZATION VENUES FOR ADULTS**

In addition to the traditional medical home, there are a number of venues for immunizing adults.<sup>25</sup> At the start of the influenza season each year, “flu clinics” in pharmacies, supermarkets, department stores, workplace settings, and even airports are common. Many local and state health departments provide annual seasonal influenza vaccine clinics. Hospitals have been implementing standing orders for pneumococcal

and influenza immunization before patient discharge for many years. Additionally, greater numbers of women have been immunized in obstetric offices, given the increased appreciation of the burden of influenza in this population. Recent immunization coverage rates among pregnant women during the 2009–2010 influenza season, according to the CDC, were 51% for seasonal influenza and 47% for 2009 H1N1. In addition, women for whom vaccination was recommended by their health care provider were three- to 10-fold more likely to receive vaccine than were women whose health care provider did not encourage vaccination. A 50% coverage rate is encouraging, but because it is recommended that all pregnant women receive influenza vaccine, much work remains to ensure that the Healthy People 2020 goal of 80% influenza vaccine coverage is achieved.<sup>26,27</sup>

The American College of Obstetricians and Gynecologists, American Academy of Pediatrics, American Academy of Family Physicians, and CDC recommend that when possible, postpartum women should receive Tdap before being discharged from the hospital to protect them and their infants from pertussis and that immunization should be confirmed during the 6-week follow-up visit.<sup>28,29</sup> Additionally, in June 2011, the Advisory Council on Immunization Practices voted to recommend Tdap immunization to pregnant women in the late second or third trimester.<sup>30</sup> A recent provider survey of members of the American College of Obstetricians and Gynecologists, however, found that only 78.7% routinely stock and administer vaccines.<sup>31</sup> Among that group, 91% stocked human papillomavirus vaccine, 66.8% stocked influenza vaccine, and 30% stocked Tdap. The overwhelming majority reported financial issues as the major barrier to providing immunization services. Of

respondents who provide primary care, 61% reported that they administer influenza vaccine, and only 30% reported that they administer Tdap. Respondent obstetrician-gynecologists also reported that immunization training during medical school and residency was not adequate (40% and 35%, respectively). Because obstetrician-gynecologists are the primary care providers for many women of childbearing age, the lack of immunization opportunities in that setting is concerning.<sup>31</sup>

### **POTENTIAL BENEFITS AND CONCERNS OF IMMUNIZING PARENTS IN THE PEDIATRIC OFFICE SETTING**

There are many potential benefits of adding the pediatric office as another venue for adult immunization. Probably the most compelling is convenience for parents who must balance parenting responsibilities with work demands. Limited access to immunizations has been identified as one of the primary barriers to adult immunization.<sup>32</sup> One study reported that alternative locations for immunization, such as the workplace, can successfully address the issue of inconvenience in the vaccination decision.<sup>33</sup> Parents visit the pediatric office frequently with their infants and young children, where most vaccines needed for immunization of both children and adults are available. These visits represent an opportunity to immunize parents or other adult caregivers with minimal disruption for both the adults and the practice. Immunizations represent a major focus for pediatric care, and many educational opportunities exist for the pediatrician to explain the benefits of immunization for the child and for close family contacts. Thus, convenience, physician vaccine knowledge and encouragement, and vaccine availability are strong factors for immunizing parents and close family contacts in the pediatric office.

However, there are a number of concerns. First, most parents and close family contacts would be older than the usual patients seen by pediatricians. Pediatricians may be comfortable immunizing this population but are not likely to deliver other types of preventive health care. It is possible that adults who receive immunizations in the pediatric office may defer other preventive services usually delivered by family physicians, internists, and obstetrician-gynecologists.<sup>34</sup> Effort should be made to avoid compromising the adult medical home, and attempts should be made to ensure this does not happen. Parents and close family contacts should be encouraged to receive other primary care services in their medical homes.

Pediatricians may have concerns about safety, including whether they can obtain complete medical information to evaluate for contraindications and whether they have adequate facilities for dealing with adverse events in adults in a pediatric practice setting. Pediatricians may be concerned about liability if an adverse event occurs during adult immunization.<sup>34</sup> However, physicians are protected by the National Childhood Vaccine Injury Act of 1986 (Public Law No. 99-660), which limits the liability for vaccine manufacturers and established the Vaccine Injury Compensation Program. The act both protects and requires physicians to report suspected adverse events, and the Vaccine Injury Compensation Program covers all vaccines recommended for routine use in children, regardless of the age of the person being vaccinated. Claims arising from covered vaccines must be adjudicated through the program before civil litigation can be pursued.<sup>35</sup> Therefore, because both Tdap and influenza vaccines are recommended for children, this act would protect pediatricians when administering these vaccines to

adults.<sup>35</sup> In addition, pediatricians would need to provide the adult being immunized the required Vaccine Information Statement<sup>32,36</sup> prior to vaccination.

There also are a number of medical record issues. Vaccination of parents and close family contacts of pediatric patients, including any required consent for treatment, would need to be documented by the pediatric office. Thus, close family contacts would likely need their own brief medical record documenting the vaccines administered and any required consent. The vaccinated close family contacts could be provided with a vaccine card listing the names and dates of vaccines received. The type of communication between pediatric offices and adult primary care offices or state immunization registries regarding the immunization status of the adults would need to be determined.

Logistical and financial issues will need to be addressed. Obtaining adequate supplies of vaccine for both children and close family contacts will be critical. Although supplies of influenza vaccine have been plentiful in the past few years, there have been years of shortages and occasional rationing of various vaccines. Because nearly all privately supplied influenza vaccine is preordered months in advance, there is a risk of using the ordered supply too quickly when immunizing both close family contacts and children. This is less likely, given that increasing numbers of manufacturers are producing influenza vaccine annually. Alternatively, too much vaccine might be ordered if the pediatrician were planning on immunizing both adults and children. Influenza vaccine may not be returnable to the manufacturer, leaving practices at economic risk of unused doses. This is a significant concern, given the narrow financial margins for immunizations.<sup>34,37</sup>

Immunizing parents and close family contacts must be financially viable for

pediatric practices, and the practices must determine whether they are able or willing to submit vaccine charges to adult insurers or simply require payment at the time of service. Many practices that currently provide this service as a convenience for the close family contacts require payment at the time of service or before administration of vaccines. Issues of source of supply must also be considered. In universal purchase states, practices may be legally enjoined from charging parents for doses supplied by the state, although administration fees might be charged. Pediatricians in such states may not be able to provide immunizations for adults and should check with their state vaccine purchase programs regarding use of these vaccines for this purpose. In most states, vaccines supplied to pediatricians by the Vaccines for Children Program may not be used for adults and certainly cannot be billed. If a practice chooses to involve itself in the insurance coverage of parents and close family contacts, it will produce a significantly increased burden that may make the provision of such services nonviable. If parents wish to submit to insurance, they should be informed that receiving vaccines at a location outside of their primary provider's practice may not be reimbursed and, therefore, it may be financially beneficial for them to obtain the vaccine through their primary health care provider. Ultimately, financial arrangements will be up to the individual practice and the individual adult involved. Payment details must be carefully evaluated before the provision of this service and communicated clearly to the family contacts seeking immunization. Additional logistic concerns exist. For example, pediatric offices may need additional staff to immunize parents and close family contacts. However, it would seem logical that the same nurse providing care for the child

could also administer vaccine to the adult. In addition, pediatricians must decide whether to vaccinate only parents or also immunize grandparents, child care providers, and other household contacts, because the reasons for immunizing parents also apply to other care providers.<sup>6</sup> Finally, the spectrum of vaccinations available for close family contacts in the practice must be determined.

Despite the challenges, pediatricians already are immunizing parents and other adults. One recent study quantified influenza vaccination of parents and guardians in pediatric offices and found that over the course of 2 influenza seasons, 43 (51%) of the 84 offices surveyed administered 2033 seasonal influenza vaccinations to parents or guardians.<sup>38</sup> The authors concluded that many pediatricians offered influenza vaccine to parents and other care providers, but that the actual number of doses administered was small. In addition, a 2006 survey of nonretired fellows of the American Academy of Pediatrics reported that 30% of respondent pediatricians usually offer influenza vaccination to parents of at-risk children.<sup>39</sup> No similar studies have evaluated the administration of Tdap by pediatric practices.

### RESEARCH NEEDS

Further studies are needed to investigate the extent of this practice; the level of family contact satisfaction with the practice; how practices handle the logistic, liability, legal, and financial barriers that limit or complicate this service; and most importantly, how this practice will affect disease rates in children and adults.

### SUMMARY

Although additional data are needed to assess the effects of pediatricians providing immunizations for parents

and close family contacts on the burden of infectious diseases in children, the following reasonable statements can be made at this time for pediatricians considering vaccinating parents and other adult care providers.

1. Pediatric offices may choose to serve as an alternate venue for adult care provider vaccination if the practice is acceptable to both pediatricians and the adults who are to be vaccinated. However, the practice's decision of whether to offer vaccinations to adult care providers is not a deviation from the pediatric standard of care.
2. Pediatric practices choosing to offer immunizations to parents and close family contacts may avoid compromising the adult medical home by inquiring about the availability and likelihood of the family contact obtaining vaccines in that setting and notifying their medical homes if vaccines are administered. Offering immunizations in the pediatric practice setting would not be intended to undermine the adult medical home model but could serve as an additional venue for adult care providers to receive vaccinations. Pediatricians may actively encourage all parents and close family contacts to have their own medical home for their health care needs.
3. As part of their anticipatory guidance, pediatricians can actively support educating adults about the value of immunizations and emphasize that such medical care is not just for children.
4. If choosing to vaccinate parents and close family contacts, appropriate indications, contraindications, and precautions to vaccination of adults would need to be assessed and documented in a medical record. A Vaccine Information Statement would need to be provided,

and necessary consent to treatment would need to be documented.

5. Parents and close family contacts immunized in the pediatric office would need to receive a record of administered immunizations. In addition, if adults are included in vaccine registries, the immunizations provided in the pediatric practice would need to be recorded in the registry.
6. At the present time, if a practice chooses to provide such services, the focus of parent and close family contact immunization in the pediatric practice would be centered on influenza (either inactivated or live-attenuated vaccine) and Tdap. Decisions about other vaccines can be made on an individual basis.
7. Liability issues surrounding parent and close family contact immunizations in the pediatric office may be discussed with the malpractice insurance carriers for the pediatric practice, with the knowledge that policies may vary on a state-by-state basis. Pediatricians providing the aforementioned vaccinations would be protected by the Vaccine Injury Compensation Program.
8. Pediatricians may investigate insurance regulations within their states. Expectations for method of payment for parents and close family contact immunizations would need to be clearly outlined with the adult seeking vaccination. Pediatricians also may need to be aware of any state funds available to provide vaccines to adults at no cost.
9. Further research is needed to address the clinical implications of

immunizing parents and close family contacts in the pediatric office, patient satisfaction, public health benefit, effects on adult medical homes, and cost-effectiveness.

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## REFERENCES

1. Centers for Disease Control and Prevention. CDC survey finds childhood immunization rates remain high [press release]. Atlanta, GA: Centers for Disease Control and Prevention; September 16, 2010. Available at: [www.cdc.gov/media/pressrel/2010/r100916.htm](http://www.cdc.gov/media/pressrel/2010/r100916.htm). Accessed June 30, 2011
2. Hammer LD, Curry ES, Harlor AD, et al; Committee on Practice and Ambulatory Medicine; Council on Community Pediatrics. Increasing immunization coverage. *Pediatrics*. 2010;125(6):1295–1304
3. Wendelboe AM, Van Rie A, Salmasso S, Englund JA. Duration of immunity against pertussis after natural infection or vaccination.

- Pediatr Infect Dis J.* 2005;24(5 Suppl): S58–S61
4. Walter EB, Allred N, Rowe-West B, Chmielewski K, Kretsinger K, Dolor RJ. Cocooning infants: Tdap immunization for new parents in the pediatric office. *Acad Pediatr.* 2009;9(5): 344–347
  5. Healy CM, Rench MA, Baker CJ. Implementation of cocooning against pertussis in a high-risk population. *Clin Infect Dis.* 2011;52(2):157–162
  6. Demaria A, Jr, Lett SM. Vaccinate the village. *Clin Infect Dis.* 2010;50(10):1346–1348
  7. Elliott E, McIntyre P, Ridley G, et al. National study of infants hospitalized with pertussis in the acellular vaccine era. *Pediatr Infect Dis J.* 2004;23(3):246–252
  8. Wendelboe AM, Njamkepo E, Bourillon A, et al; Infant Pertussis Study Group. Transmission of *Bordetella pertussis* to young infants. *Pediatr Infect Dis J.* 2007;26(4): 293–299
  9. Bisgard KM, Pascual FB, Ehresmann KR, et al. Infant pertussis: who was the source? *Pediatr Infect Dis J.* 2004;23(11):985–989
  10. de Greeff SC, Mooi FR, Westerhof A, et al. Pertussis disease burden in the household: how to protect young infants. *Clin Infect Dis.* 2010;50(10):1339–1345
  11. Poehling KA, Szilagyi PG, Staat MA, et al; New Vaccine Surveillance Network. Impact of maternal immunization on influenza hospitalizations in infants. *Am J Obstet Gynecol.* 2011;204(6 Suppl 1):S141–S148
  12. Zaman K, Roy E, Arifeen SE, et al. Effectiveness of maternal influenza immunization in mothers and infants [published correction appears in *N Engl J Med.* 2009;360(6):648]. *N Engl J Med.* 2008;359(15):1555–1564
  13. Rekhtman D, Wolf DG, Levy-Khademi F, Averbuch D, Kerem E, Wexler ID. Influenza A infection in young infants [published online ahead of print October 27, 2010]. *Arch Dis Child.*
  14. Healy CM, Rench MA, Castagnini LA, Baker CJ. Pertussis immunization in a high-risk postpartum population. *Vaccine.* 2009;27(41):5599–5602
  15. Shah SI, Caprio M, Hendricks-Munoz K. Administration of inactivated trivalent influenza vaccine to parents of high-risk infants in the neonatal intensive care unit. *Pediatrics.* 2007;120(3):e617–e621
  16. Dylag AM, Shah SI. Administration of tetanus, diphtheria, and acellular pertussis vaccine to parents of high-risk infants in the neonatal intensive care unit. *Pediatrics.* 2008;122(3):e550–e555
  17. Centers for Disease Control and Prevention (CDC). Tetanus and pertussis vaccination coverage among adults aged  $\geq 18$  years — United States, 1999 and 2008. *MMWR Morb Mortal Wkly Rep.* 2010;59(40):1302–1306
  18. Hughes MC, Hannon PA, Harris JR, Patrick DL. Health behaviors of employed and insured adults in the United States, 2004–2005. *Am J Health Promot.* 2010;24(5):315–323
  19. Johnson DR, Nichol KL, Lipczynski K. Barriers to adult immunization. *Am J Med.* 2008;121(7 Suppl 2):S28–S35
  20. National Foundation for Infectious Diseases. New data show unacceptably low adult immunization rates and that adults unaware of infectious disease threat [press release]. Washington, DC: National Foundation for Infectious Diseases; January 23, 2008. Available at: [www.nfid.org/pdf/pressconfs/release-1-23-08.pdf](http://www.nfid.org/pdf/pressconfs/release-1-23-08.pdf). Accessed June 30, 2011
  21. Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health.* 2003;93(4):635–641
  22. Østbye T, Yarnall KS, Krause KM, Pollak KI, Gradison M, Michener JL. Is there time for management of patients with chronic diseases in primary care? *Ann Fam Med.* 2005; 3(3):209–214
  23. Freed GL, Cowan AE, Clark SJ. Primary care physician perspectives on reimbursement for childhood immunizations. *Pediatrics.* 2009; 124(Suppl 5):S466–S471
  24. Freed GL, Clark SJ, Cowan AE, Coleman MS. Primary care physician perspectives on providing adult vaccines. *Vaccine.* 2011;29(9): 1850–1854
  25. Singleton JA, Poel AJ, Lu PJ, Nichol KL, Iwane MK. Where adults reported receiving influenza vaccination in the United States. *Am J Infect Control.* 2005;33(10):563–570
  26. US Department of Health and Human Services. Healthy people 2020 summary of objectives: immunizations and infectious diseases. Available at: [www.healthypeople.gov/2020/topicsobjectives2020/pdfs/Immunization.pdf](http://www.healthypeople.gov/2020/topicsobjectives2020/pdfs/Immunization.pdf). Accessed June 30, 2011
  27. Centers for Disease Control and Prevention (CDC). Seasonal influenza and 2009 H1N1 influenza vaccination coverage among pregnant women—10 states, 2009–10 influenza season. *MMWR Morb Mortal Wkly Rep.* 2010; 59(47):1541–1545
  28. Murphy TV, Slade BA, Broder KR, et al; Advisory Committee on Immunization Practices (ACIP) Centers for Disease Control and Prevention (CDC). Prevention of pertussis, tetanus, and diphtheria among pregnant and postpartum women and their infants recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep.* 2008;57(RR-4):1–51
  29. American Congress of Obstetricians and Gynecologists. Updated: Tdap. Tetanus, Diphtheria, and Pertussis (Tdap): The Right Vaccination, the Right Codes. Available at: [www.acog.org/acog\\_sections/dist\\_notice.cfm?recno=35&bulletin=10039](http://www.acog.org/acog_sections/dist_notice.cfm?recno=35&bulletin=10039). Accessed June 30, 2011
  30. Centers for Disease Control and Prevention, Advisory Committee on Immunization Practices. ACIP provisional recommendations. Available at: [www.cdc.gov/vaccines/recs/provisional/default.htm](http://www.cdc.gov/vaccines/recs/provisional/default.htm). Accessed July 12, 2011
  31. Power ML, Leddy MA, Anderson BL, Gall SA, Gonik B, Schulkin J. Obstetrician-gynecologists' practices and perceived knowledge regarding immunization. *Am J Prev Med.* 2009;37(3):231–234
  32. Pickering LK, Baker CJ, Freed GL, et al; Infectious Diseases Society of America. Immunization programs for infants, children, adolescents, and adults: clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis.* 2009;49(6): 817–840
  33. Lee BY, Mehrotra A, Burns RM, Harris KM. Alternative vaccination locations: who uses them and can they increase flu vaccination rates? *Vaccine.* 2009;27(32):4252–4256
  34. Lori O. Experts differ on whether benefits outweigh risks of providing influenza vaccine to parents. *AAP News.* 2009;30(1):8
  35. US Department of Health and Human Services. National Vaccine Injury Compensation Program. Covered vaccines. Available at: [www.hrsa.gov/vaccinecompensation/covered\\_vaccines.htm](http://www.hrsa.gov/vaccinecompensation/covered_vaccines.htm). Accessed June 30, 2011
  36. Centers for Disease Control and Prevention. Vaccine information sheets. Available at: [www.cdc.gov/vaccines/pubs/vis/default.htm](http://www.cdc.gov/vaccines/pubs/vis/default.htm). Accessed June 30, 2011
  37. Bednarczyk RA, Birkhead GS. Reducing financial barriers to vaccinating children and adolescents in the USA. *Curr Opin Pediatr.* 2011;23(1):105–109
  38. Toback SL, Carr W, Hackell J, Bhatt P, Ryan A, Ambrose CS. Influenza vaccination of parents and guardians by US pediatricians. *Hum Vaccin.* 2011;7(4):436–440
  39. American Academy of Pediatrics, Division of Health Services Research. Periodic survey of fellows no. 66. Pediatricians' attitudes and practices surrounding the delivery of immunizations. Part I—universal immunization and recently recommended vaccines. Elk Grove Village, IL: American Academy of Pediatrics; 2007. Available at: [www.aap.org/research/periodicsurvey/PS66%20Exec%20Summary%20New%20Vaccines%20Part%201.pdf](http://www.aap.org/research/periodicsurvey/PS66%20Exec%20Summary%20New%20Vaccines%20Part%201.pdf). Accessed June 30, 2011

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