



Role of the pediatric dentist in optimization of childhood immunization

M. John Hicks, DDS, MS, PhD, MD Catherine M. Flaitz, DDS, MS

Pediatric dentists' responsibility for their patients extends beyond oral conditions to the children's overall medical, social, and emotional health. The pediatric dentist evaluates children from shortly after birth through their adolescent years, and therefore is in an opportune position to monitor use of preventive health care measures. One of the major issues in the pediatric community is the lack of adherence to immunization schedules. More than 2 million U.S. children from ages 19 to 36 months may be inadequately vaccinated,¹⁻⁶ possibly in part due to lack of follow-up by pediatricians and primary care providers. In addition, parents are not properly informed regarding the specific type and number of vaccine doses required by age 18 months. For this reason, the dental profession — particularly pediatric dentists — may provide an additional source of information and encouragement for parents to immunize their children. The need for timely immunization is emphasized by the fact that 17,000–23,000 cases of preventable infectious diseases are reported annually to the Centers for Disease Control and Prevention (CDC).⁵ The largest percentage of these cases are due to hepatitis B (63%), pertussis (25%), mumps (8%), and Haemophilus influenza (6%). Children younger than age 5 years represent about 20% of cases; however, more children may have infections such as hepatitis, which are typically asymptomatic and can go undetected for years.⁵ Inadequately immunized individuals may pass through early childhood without developing a disease, but are still at risk for acquiring a potentially preventable disease and, if infected, represent a potential risk to other nonimmunized, immunosuppressed, or immunocompromised individuals. The pediatric dentist is in a position to optimize immunization of children—especially children and adolescents who may have missed vaccinations or who have not received the more recently introduced hepatitis B or varicella vaccines.

Prevalence of immunization level: children (age 19–35 months)

Only three-quarters of children have received all the recommended vaccines by 35 months of age.^{1,3,6,7} The lowest immunization levels are associated with poverty (58.7%), African-American (61.8%) and nonwhite races (58.4%), and urban residence (62.1%).¹ However, those with higher immunization levels such as above poverty level (70.5%), white race (68.4%), and suburban (71.4%) or rural (66.0%) residence, do not have significantly better compliance with immunization than those with the lowest immunization records.¹ The highest compliance levels are with three doses of diphtheria, tetanus, pertussis (DTP, 93%) and measles, mumps and rubella (MMR) vaccines (89%), Haemophilus influenza (86%), and poliovirus (OPV, 83%).⁷ DTP with four or more doses has a slightly lower immunization level (77%).⁷ Hepatitis B (37%) has the lowest compliance rate.⁷ Overall, 75% of children from 19 to 35 months of age have received four DTP, three OPV and one MMR vaccines.⁷

There is considerable variability in immunization level by state. High vaccination levels have been found in Vermont (88%), Connecticut (86%), and Hawaii (86%), and low levels are reported in Michigan (61%), Idaho (64%), and Missouri (64%).⁷ One-quarter of U.S. children are not properly immunized by 3 years of age, which may be due to parents being unaware of or not informed about the exact immunization schedule. Furthermore, many parents are uninformed that 16 immunizations are currently required during the first 18 months, with an additional four booster vaccines necessary from age 4–16 years. The proportion of improperly immunized children is more disturbing because these surveys determine compliance with vaccinations that should be completed by 18 months of age. A survey of older children and adolescents to determine the proportion of children receiving vaccinations recom-

mended after age 3 years and into early adolescence would provide interesting and useful information. Pediatric dentists and other health care providers should remind parents of the need to complete immunization schedules for DTP, MMR, and diphtheria/tetanus toxoid and to vaccinate older children against the more recently introduced hepatitis B and varicella immunizations.

Recommended immunization schedule

The Table shows the recommended immunization schedule endorsed by the American Academy of Pediatrics, American Academy of Family Physicians, Food and Drug Administration, National Institute of Health, and the CDC.^{4,6,8} The recommendations regarding the varicella zoster vaccine (VZ)⁶, approved in March 1995 by the FDA, are somewhat provisional, and it is not certain at the present time whether a second immunization will be necessary for children between the ages of 12 months and 13 years, such as that recommended for MMR. For individuals older than age 13 years, two VZ doses are recommended to ensure immunity. Children with chronic disease states, immunosuppression, and who are immunocompromised should be referred to their pediatrician to determine which vaccines are indicated and safe. Certain conditions,⁶ which may contraindicate attenuated vaccine use include patients who:

1. Receive steroids
2. Live in households with potential immunocompromised contacts
3. Are immunocompromised secondary to congenital immunodeficiency, blood dyscrasias, leukemia, lymphoma, symptomatic HIV infection, or chemotherapy and/or radiotherapy for malignancy
4. Are pregnant or lactating
5. Have an allergy to neomycin or vehicles in the vaccines
6. Have intercurrent illness
7. Who receive immune globulins
8. Use salicylate, which must be suspended for at least 6 weeks following vaccination to avoid Reye's syndrome.

Childhood immunization provides an economic benefit of \$5.40 for every \$1.00 spent on vaccination.^{6,9-11} For example, the economic and social savings have been estimated for the newly introduced varicella vaccine program.^{6,9-11} More than 3.9 million cases of varicella occur annually in the United States with 8.7 school days lost per child and up to 1.8 work days lost per caretaker.^{10,11} Hospitalization is required in one of 400 cases with 90 deaths reported annually.^{6,9-11} Adults are 10 times more likely to require hospitalization and 20 times more likely to die from this disease.

The cost savings from routine immunization with varicella vaccine at 1 year of age was projected in 1994 to be \$384 million annually in the United States.¹⁰ Of

TABLE. RECOMMENDED CHILDHOOD IMMUNIZATION SCHEDULE

<i>Birth to 2 Months</i>	Hepatitis B
<i>2 Months</i>	Diphtheria, Tetanus, Pertussis, Haemophilus Influenza Type B, Poliovirus
<i>2 to 4 Months</i>	Hepatitis B
<i>4 Months</i>	Diphtheria, Tetanus, Pertussis, Haemophilus Influenza Type B, Poliovirus
<i>6 Months</i>	Diphtheria, Tetanus, Pertussis, Haemophilus Influenza Type B
<i>6 to 18 Months</i>	Hepatitis B, Poliovirus
<i>12 to 15 Months</i>	Diphtheria, Tetanus, Pertussis, Haemophilus Influenza Type B, Measles, Mumps, Rubella
<i>12 to 18 Months</i>	Varicella
<i>4 to 6 Years</i>	Diphtheria, Tetanus, Pertussis, Poliovirus, Measles, Mumps, Rubella (at 4-6 years or at 11-12 years)
<i>11 to 16 Years</i>	Diphtheria/Tetanus Toxoid
<i>Age > 13 Years</i>	Two doses Varicella if not immune or no documented history of Varicella, second Varicella dose 1 to 2 months after first Varicella dose

From: Advisory Committee on Immunization Practices, American Academy of Pediatrics, American Academy of Family Physicians, Food and Drug Administration, National Institutes of Health, and Centers for Disease Control and Prevention National Immunization Program, 1995.

course, these monetary savings do not reflect the avoidance of the morbidity associated with varicella such as encephalitis, pneumonitis, glomerulonephritis, and arthritis, which may leave residual effects.⁶ Also the treatment costs and discomfort of recurrent varicella zoster (shingles), which occurs in 15% of the population and is most often seen in debilitated, immunocompromised, or older individuals can be avoided.⁶

Pediatric dentists' contribution to optimal immunization

The pediatric dentist is in an opportune position to encourage and facilitate optimal vaccination of children

and adolescents. When scheduling the first examination appointment for the child patient, the parents should be asked to bring the child's immunization record. Developing an immunization tracking form and attaching it to the child's chart would provide a means of documentation. A brief review of the recommended immunization schedule with the uninformed parent may encourage compliance. Providing the parents with an immunization tracking form, an immunization schedule, and an immunization card for each child would emphasize the dentist's concern. An immunization and health history form along with an immunization schedule and immunization card could be sent to the parents prior to the initial appointment and reviewed during the first examination. For routine recall exams, parents should be asked to bring their children's updated immunization cards to verify immunizations and update the chart copy of the immunization tracking form. A postcard or telephone call reminding the parents of the scheduled appointment and need for immunization and health history update also may improve compliance. Documentation of a child's immunization record should be incorporated into the initial health history and the health history update at each recall.¹² This would result in minimal time expenditure. Parents need to be informed that they are primarily responsible for documenting their children's immunization records, and that such records are required for school and most daycare enrollments.

This parental responsibility for record keeping is emphasized by the most recent CDC survey⁷ on childhood immunization, which used a telephone interview. This survey found that vaccination histories were similar when provided by either health care providers or parents. However, parents tend to underestimate the number of doses received for multidose vaccines and overestimate coverage for single-dose vaccines.⁷ Parents' written records of vaccinations were found to be highly accurate. By providing the parents with an immunization schedule and record for each child and emphasizing the importance of recording this information, parental recordkeeping may improve. In the current health care market, a child is likely to have received vaccinations from a number of different providers, making it difficult to track the child's vaccination history, which further emphasizes the need for parental recordkeeping.

Because pediatric dentists also provide care for ambulatory patients with contraindications to attenuated vaccine administration, it is important that these immunosuppressed children are not exposed to children who are not vaccinated and are a potential source of bacterial or viral infection. Using an immunization tracking system, the chance of viral transmission from a nonimmunized child to an immunosuppressed child is reduced. Informing parents of nonimmunized healthy children of the possible infectious risk to their children and to immunocompromised chil-

dren and of potential health complications may encourage compliance.

Children who are not properly immunized should be referred to their primary care physician or pediatrician. When a child does not have a physician or lacks financial means, the state or local department of health will provide a list of public clinics where immunizations are administered at low or no cost. If a local health department is not available, the American Academy of Pediatrics has established a National Immunization Information Hotline (800-232-2522) to provide information on where to go in each community for childhood immunizations. A number of state and local health departments sponsor no-cost immunization clinics and fairs in readily accessible locations in order to improve compliance as well.

The major concern of the pediatric dentist may be parents who, despite encouragement, fail to immunize their children. Each pediatric dentist will have to determine treatment policy and whether this is a sign of child neglect by parents or guardians. Consultation with local health officials regarding their approach to noncompliant parents may help the pediatric dentist establish a policy. In an endorsement of the immunization schedule recommended by the American Academy of Pediatrics, the American Academy of Pediatric Dentistry stated that "pediatric dentists should consider immunization status as a part of the periodic medical history for their patients and should encourage parents to seek appropriate immunization for their children".¹² However, no statements regarding policy for referral, discontinuation or denial of treatment, or guidelines for parental neglect were formulated. With the data previously presented, it may be assumed that about 25% of children in a pediatric dentist's practice currently are not immunized properly. With the majority of parents providing information about immunizations and expression of concern regarding their child's health probably will result in compliance with the recommended immunization schedule. Formulation of practice guidelines regarding immunization policy will be necessary for each practitioner, unless local, state or national pediatric dentistry organizations reach a consensus statement.

With currently available vaccines and immunization schedules, the prevention of many childhood diseases is feasible. The major obstacle to achieving optimal immunization for all children is parents' failure to either be familiar with or to follow the recommended guidelines. By providing information and encouragement, the pediatric dentist can make an important contribution to optimizing childhood immunizations.

Dr. Hicks is associate professor, department of pathology, Texas Children's Hospital and Baylor College of Medicine, and adjunct professor, division of pediatric dentistry, University of Texas—Houston Health Science Center, Dental Branch. Dr. Flaitz is associate professor, divisions of oral pathology and pediatric dentistry,

University of Texas—Houston Health Science Center, Dental Branch.

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Low-birth-weight teens with disabilities give high rating on quality of life

FIRST STUDY TO DIRECTLY MEASURE QUALITY OF LIFE FROM THOSE WITH LOW BIRTH WEIGHT

Adolescents who were extremely low-birth-weight (ELBW) infants and now have disabilities as a result, view their health-related quality of life (HRQL) as similar to adolescents without disabilities, according to an article in a recent issue of *The Journal of the American Medical Association*.

Saroj Saigal, MD, from the Department of Pediatrics, McMaster University, Hamilton, Ontario, and colleagues estimated and compared the self-assessed health status and HRQL of ELBW and control infants during adolescence.

The researchers write: “As a group, ELBW teenagers, many of whom were disabled, placed a high valuation on their health status as reflected in the relatively high HRQL scores. It is possible that over the years ELBW teenagers have learned to accept their disability and have recalibrated their personal expectations.”

They continue: “This is the first time that HRQL preference scores have been obtained directly from individuals who were born prematurely, and our findings provide an important insight into the relative preferences based on their life experiences.”

The researchers interviewed 141 (83%) of 169 ELBW survivors born between 1977 and 1982 and 124 (86%) of 145 controls aged 12 to 16 years. In addition, proxy responses obtained from parents were

used for nine severely impaired teenagers. Assessments were made of health status and HRQL.

The authors found that adolescents who were ELBW infants reported a higher number of attributes affected, as well as more complex and severe limitations in cognition, sensation, self-care and pain compared with controls. However, most ELBW and control teenagers viewed their HRQL as quite satisfactory. Seventy-one percent of ELBW teenagers viewed their HRQL as 0.95 (on a conventional scale where 0 = dead and 1.00 = perfect health) or better. The corresponding figure for control teenagers was 73%.

The researchers write: “It is not our intention to recommend, based on our study, that intensive care should be offered to all infants regardless of birth weight. We do not know what factors may have contributed to this positive self-perception, nor do we wish to underestimate the important roles of parents, our universal health-care system, and society in this process. We have not addressed the emotional and financial impact of the disabilities on the families, or the economic implications of the costs involved to society. Nevertheless, it is heartening that adolescents with disabilities have developed coping mechanisms, and, based on their perspective, the majority report that they are functioning well in society. We hope the outcome of the current survivors of more sophisticated neonatal intensive care will be even more positive.”