plasty generally should not be conducted in low-volume hospitals unless there are substantial overriding concerns about geographic or socioeconomic access. The impact of these findings on practice will largely depend on whether medical and government institutions can incorporate these data into policies that more effectively limit angioplasty to facilities meeting established standards. Ultimately, what matters even more than hospital or physician volume is ensuring highest-quality care and optimal outcomes for patients with myocardial infarction.

REFERENCES


State Mandates and Childhood Immunization

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ROUTINE PEDIATRIC IMMUNIZATION PROGRAMS HAVE eradicated many of the infectious diseases of childhood and have been one of the most remarkable public health accomplishments. In 2000, the United States has achieved the lowest rates of vaccine-preventable diseases and the highest rates of immunization ever recorded. But despite such successes, many individuals are challenging recommended vaccination programs. For instance, a congressman has scrutinized government reports, has conducted hearings to investigate the procedures for the licensure of vaccines by the US Food and Drug Administration and for establishing guidelines for vaccine use by the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention, and has suggested that vaccine manufacturers have unduly influenced vaccine policy. A recent television news program questioned whether a link exists between autism and the measles vaccine, causing many parents to consider whether to abandon measles immunization for their children. Internet Web sites are picturing children harmed by vaccines and are urging parents to forgo immunizations for their children.

Why are vaccines under attack? There are several possible explanations. First, cases of vaccine-preventable diseases such as Bordetella pertussis, measles, and Haemophilus influenzae type b (Hib) meningitis are currently rare, and many parents have never seen or heard of such diseases. Today’s parents of young children are too young to have experienced the summer outbreaks of crippling polio, the cases of encephalitis and death during measles epidemics, and the children disabled by Hib meningitis. When faced with more immediate concerns for their children, it is easy for parents to dismiss uncommon infections of years past as being unimportant.

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important and their prevention superfluous. Second, with low disease burdens, rates of local and systemic adverse events either causally or temporally related to vaccination appear more common than the diseases themselves. Warnings from the media, on the Internet, and by antivaccine groups that immunizations are dangerous and may lead to autism, seizures, diabetes, or a number of other disorders are disturbing to parents and can contribute to delay or refusal of vaccine administration. That vaccines are required for all children prior to day care or school entry greatly disturbs some parents because they feel that their right to make decisions for their children has been taken away.

Because of these concerns, some state legislators and interest groups are seeking to repeal state laws mandating vaccination prior to day care or school entry or to provide increased availability of philosophical exemptions for parents who do not want their children immunized. Are legislative mandates necessary to protect children from infectious diseases? Would voluntary administration of vaccines provide adequate disease control? Some of these critically important questions are addressed in this issue of THE JOURNAL in the article by Feikin and colleagues. The authors used a population-based retrospective cohort study of standardized records collected in Colorado in 1987-1998 to determine whether risk of measles and pertussis disease was associated with philosophical and religious exemptions to immunization at both the individual and community levels. Colorado, which has more than twice the national average of vaccination exemptors, was an ideal place to conduct the study. The authors report that in 1998 among school-aged children in Colorado, the rates of exemption from immunization were 0.12% for medical, 0.19% for religious, and 1.87% for philosophical reasons.

The findings of Feikin et al are striking. Children aged 3 to 18 years who had exemptions from vaccination were 22 times more likely to acquire measles and nearly 6 times more likely to acquire pertussis than immunized children. In children of day care or primary school age (3-10 years), the risks were more than 60-fold greater for contracting measles and 16-fold greater for pertussis. One might agree that if parents understood these risks, they could choose to accept them for their children and decline immunization. However, the rates of disease among children who were immunized but exposed to children who were exempt from immunization command attention. The annual incidence rates of measles and pertussis among vaccinated children aged 3 to 18 years were significantly associated with frequency of exemptions in that county, with relative risks of 1.6 and 1.9, respectively. The critical issue is whether some parents should be allowed to place other people’s children at increased risk for disease by refusing immunizations for their own children.

Public risk is the fundamental basis for legally requiring immunizations in the first place. As early as 1809, Massachusetts passed the first compulsory immunization law, which required universal smallpox immunization. When immunization laws were challenged, the US Supreme Court upheld the right of the states to pass compulsory immunization laws in 1905 and again in 1922. However, the modern era of immunization laws began in the 1960s and 1970s with efforts to eliminate measles transmission in schools. At this time, states with mandatory measles immunization laws had 40% to 51% lower rates of measles disease than states without laws. In 1976, a sustained measles outbreak occurred in Alaskan schools despite repeated attempts to administer free vaccine in voluntary school clinics. This situation convinced Alaskan legislators to legally require measles vaccination for school entry. Within 1 month of enforcement of this law, nearly all children had been immunized. Similar results were seen when vaccination laws were passed in California. A recent review of published data demonstrated that state vaccine laws increased immunization rates by a mean of 15% with a range of 5% to 35%, depending on the vaccine, the site, and the age of the subjects.

All immunization laws are state-based, with variations noted among individual states. Some state laws specify which vaccines and how many doses are required, whereas others authorize state health officers or a state health board to make such decisions. State officials often rely on recommendations of advisory bodies such as the ACIP to guide them in making decisions about which vaccines to mandate. However, it is not the responsibility of these advisory bodies to determine which vaccines are mandated; that decision resides with the state. In the 1998-1999 school year, all states required evidence of vaccination against diphtheria, measles, rubella, and polio prior to day care or school entry but often allowed exemptions for certain specified groups. Since diphtheria vaccine is nearly always administered simultaneously with tetanus and pertussis, this approach functions to universally immunize against pertussis and tetanus as well. These vaccines, legally mandated by all states, protect against highly contagious diseases that cause significant morbidity and mortality and can be prevented. Another disease that fulfills these criteria is varicella. Several states in which varicella vaccine has been recently mandated have reported subsequent declines in disease rates. State laws to mandate vaccines for diseases that are highly contagious, cause significant morbidity and mortality, and can be prevented with currently available vaccines are appropriate to maintain public health and should be supported.

However, all vaccines that are licensed and recommended for use in children should not necessarily be legally mandated for day care or school entry. Each state needs to assess each vaccine individually. Aided by local experts and advisory groups such as the ACIP, states should determine whether the disease to be prevented by the vaccine is highly contagious, results in significant morbidity and mortality, and poses a major health problem to both the individual and the community. Since federal funding for vac-
cines is determined by the ACIP through the Vaccines for Children (VFC) program, whenever possible the ACIP should endorse funding for vaccines that physicians and parents wish to administer. The ACIP recently used such an approach when it suggested that physicians and parents should decide whether to immunize children aged 2 to 5 years with the pneumococcal conjugate vaccine; funding for the vaccine would be provided by VFC if the parents wished the child to be immunized.15

In general, the public has been very accepting of immunization laws because it believes that these laws have contributed to disease control in our country. State immunization laws support the priority of vaccines and reinforce their importance. Most parents accept vaccination of their children and realize the health benefits that it affords. To maintain this confidence, it is necessary that states carefully consider each licensed vaccine and use the criteria of severity, contagion, and effectiveness prior to mandating that vaccine for all children. Vaccines remain the most important strategy to prevent infectious diseases in children. We must use our mandates wisely.

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