Just the Berries

Immunizing adults against tetanus and diphtheria

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Immunization status is an integral part of the health assessment of any adult. Opportunities to provide vaccines to adults are often missed. Preventing infection by immunization is a lifelong process that should be tailored to meet individual variations in risk resulting from age, underlying illness, lifestyle, occupation, and foreign travel.

Health Canada recommends that all Canadian adults receive tetanus and diphtheria immunization, preferably with Td vaccine. It is important to ensure that adults have primary immunization with Td. Boosters should be given at 10-year intervals (level IV evidence).

Influenza vaccine and pneumococcal vaccine are also important for all people older than 65 and those younger than 65 with certain medical conditions (level IV evidence). One practical approach to increasing coverage rates to levels recommended by several authorities, including the American Academy of Family Physicians, would be to consider checking vaccination status at age 50. All adults should receive a dose of Td vaccine at age 50 if they have not had a booster within the last 10 years. Vaccination status should be reviewed for all patients with high-risk medical conditions, such as chronic respiratory or cardiac disease, for whom influenza or pneumococcal vaccine is recommended.

"Just the Berries" for Family Physicians originated at St Martha's Regional Hospital in 1991 as a newsletter for members of the Department of Family Medicine. Its purpose was to provide useful, practical, and current information to busy family physicians. It is now distributed by the Medical Society of Nova Scotia to all family physicians in Nova Scotia. Topics discussed are suggested by family physicians and, in many cases, articles are researched and written by family physicians.

Just the Berries has been available on the Internet for several years. You can find it at **www.theberries.ns.ca**. Visit the site and browse the Archives and the Berries of the Week. We are always looking for articles on topics of interest to family physicians. If you are interested in contributing an article, contact us through the site. Articles should be short (350 to 1200 words), must be referenced, and must include levels of evidence and the resources searched for the data. All articles will be peer reviewed before publication.

History of tetanus and diphtheria

Because tetanus spores occur everywhere in our environment, immunization is the only effective means of protection. In the early 1900s more than 5000 cases of tetanus were seen in the United States every year. Since 1982, fewer than two cases per year have been reported in Canada.

Before 1900, diphtheria was one of the main causes of death among children. Since 1983, there have been fewer than five cases of diphtheria and no deaths from diphtheria in Canada. Most cases in Canada occurred in adults who had been only partially immunized or not immunized at all. In the former Soviet Union, 839 cases of diphtheria were reported in 1989. From 1990 to 1995, approximately 125 000 cases and 4000 deaths from diphtheria were reported in the newly independent states of the former Soviet Union. The main reason for the diphtheria epidemic in these places is thought to be deterioration of public health immunization programs: low immunization coverage rates among children (related to irregular supply of vaccines, decreased vaccine use by health care workers, and decreased acceptance of immunization by the public and the medical community resulting from anti-immunization propaganda); waning immunity among adults; and large

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movements of the population following the breakup of the former Soviet Union.

Serology of Canadians

After a primary series of properly spaced doses of tetanus toxoid, almost all recipients achieve serum antitoxin levels considered to exceed the minimal protective level of 0.01 IU/mL. The efficacy of tetanus toxoid has never been studied in a vaccine trial, but it can be inferred from levels of protective antitoxin that a complete tetanus toxoid series has a clinical efficacy of virtually 100%. Tetanus occurs extremely rarely in fully immunized people whose last dose was within the last 10 years. Following a properly administered primary series, virtually all patients develop a protective level of antitoxin that falls over time. While some people are protected for life, most people's antitoxin levels approach the minimum protective level by 10 years after last dose. Hence, routine boosters are recommended every 10 years.[1]

In July 1996, an adult immunization survey was done in the Ottawa area by field epidemiology students from Health Canada's Laboratory Centre for Disease Control (LCDC).[2] Weighted estimates of coverage were 50% for tetanus and 60% among those for whom influenza vaccine is recommended (ie, those 65 and older and those with certain chronic medical conditions).[2]

Opportunities for immunization were frequently missed: 83% of 94 patients who had not received tetanus toxoid vaccine in the past 10 years reported visiting a physician in the past year, as did 35% of the 89 influenza vaccine candidates who had not been immunized the previous year.[2]

In 1996, LCDC and the Canadian Red Cross surveyed healthy adult blood donors aged 20 to 80 years in five Canadian centres.[3] Diphtheria antitoxin levels were measured by an in vitro neutralization test. Overall, 20.3% (95% confidence interval [CI] 18.4% to 22.4%) had diphtheria antitoxin levels below the accepted protective threshold of 0.01 IU/mL. The proportion varied by age group, ranging from 9.5% (95% CI 6.8% to 13.0%) among those 30 to 39 years old to 36.3% (95% CI 29.7% to 43.3%) among those 60 and older. As well, the proportion of susceptible people differed by study centre, ranging from 13.4% (95% CI 10.0% to 17.7%) to 32.2% (95% CI 26.8% to 38.2%).

In all age groups except between 40 and 49 years, a higher proportion of men lacked protective antitoxin levels. Overall, 20.8% (95% CI 18.5% to 23.2%) of men and 19.0% (95% CI 15.4% to 23.3%) of women had antitoxin levels <0.01 IU/mL. Similarly low levels of diphtheria immunity were reported in another study of Canadian Red Cross adult donors in Toronto. Susceptibility ranged from 12.5% to 17.9% among donors younger than 40 to 40% to 42.6% among donors 60 and older.[3]

These surveys suggest Canadian adults lack immunity to diphtheria and leads to concerns that diphtheria could resurface in Canada. The results are particularly important because these studies were of relatively healthy populations and, therefore, actual levels of immunity in the general adult population are likely to be even lower. The resurgence of diphtheria in parts of Europe means that we must consider the possibility of resurgence in Canada.[3]

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