CENTERS FOR DISEASE CONTROL

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Epidemiologic Notes and Reports

Cholera — Texas

Two cases of cholera (defined here as gastrointestinal disease caused by toxigenic *Vibrio cholerae* O-group 1) were reported recently in Texas. These are the first culture-proven cases of domestically acquired cholera in the United States since 1978.

The first case occurred in a 42-year-old man who lived 10 miles west of Beaumont in Jefferson County. On May 7, he developed malaise, anorexia, abdominal pain, and diarrhea. The following day, he developed severe nausea and vomiting and was hypotensive when admitted to a referral hospital in Galveston. He improved rapidly with fluid replacement and was discharged on May 19. Toxigenic *V. cholerae* O1 was isolated from his stool.

The second case occurred in a 65-year-old man in the city of Orange in Orange County. On June 21, he experienced the sudden onset of vomiting and profuse, watery diarrhea. He initially refused to seek medical care, and on admission 14 hours later, he was severely dehydrated. His hospital course was complicated by acute tubular necrosis, a myocardial infarction, and respiratory insufficiency. Despite vigorous treatment, he died 2 weeks after admission with renal and pulmonary failure. Toxigenic *V. cholerae* O1 was isolated from his stool.

Although these 2 east Texas residents lived within 40 miles of one another, they had no other known connection. Both were of low socioeconomic status and often ate fish caught in local bayous. Precise food histories could not be obtained for either patient. The first ate locally caught fish and a turtle during the week before onset of illness. The second ate shrimp in a stew one week before his illness; cultures of samples of the frozen raw shrimp did not grow *V. cholerae* O1 strains.

Both *V. cholerae* O1 isolates from the patients were toxigenic, hemolytic, biotype El Tor, and serotype Inaba. Apparently identical toxigenic *V. cholerae* O1 strains were also isolated from standing water (thought to be rainwater) beside the home of the first patient. The water had no obvious connection to the house's septic tank or well. Moore swabs have been used to search for *V. cholerae* O1 in municipal sewage in Jefferson and Orange counties, and water from bayous in both counties has been cultured. To date, all samples from sewage and the environment have been negative.

Review of records for all persons with diarrheal disease seen in local emergency rooms between May 1 and July 28 identified 40 patients for whom cholera could not be ruled out and from whom convalescent-phase serum specimens were subsequently obtained. None of the 40 persons had simultaneously elevated antitoxic and vibriocidal antibody titers; this strongly suggests that they did not have cholera (*1*).

Laboratories in the area have been supplied with thiosulfate citrate bile salts sucrose

Cholera – Continued

(TCBS) agar for the isolation of *V. cholerae* O1, and physicians in the 2 counties have been advised by letter and telephone of the need to culture the stools of all persons with diarrheal disease for *V. cholerae.* An active surveillance program, including weekly Moore swab sampling of sewage in 3 cities and culturing using TCBS, of persons with diarrhea will continue through the end of September 1981.

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Editorial Note: In 1973, after more than 50 years without any known cases of domestically acquired cholera in the United States (except for a few laboratory-acquired cases), a case of cholera was discovered in Port Lavaca, Texas, on the Gulf Coast (*2*). No source of the infection was found. In 1978, 8 cases of cholera and 3 persons asymptomatically infected with *V. cholerae* O1 were found in southwestern Louisiana and traced to eating insufficiently cooked crabs caught in Gulf Coast marshes (*3*). Since the Texas and Louisiana strains were all biotype El Tor serotype Inaba, of the same unusual phage type, and hemolytic (most *V. cholerae* O1 strains worldwide are now nonhemolytic [4]), it was suggested that these organisms had persisted in the United States during the intervening 5 years and that more infections might be expected in the future (*3*). *V. cholerae* El Tor Inaba was isolated from the stool of a woman in Florida with a diarrheal illness in 1980 (*5*), but the strain subsequently was proven to be nontoxigenic. Although the 2 Texas strains have not yet been phage typed, they are both hemolytic El Tor Inaba and may be identical to the strains from 1973 and 1978.

The case in 1973 occurred in August, and the 1978 cases and isolates from sewage occurred from August through November; this is consistent with previous observations that cholera in temperate areas of the Northern Hemisphere tends to occur during the late summer and fall months. The cases in Texas this year occurred somewhat earlier in the year than might be expected. Physicians and health departments, particularly along the Gulf Coast, should be alert to the possible diagnosis of cholera in patients with diarrheal illnesses. Most cases of cholera present as a diarrheal illness of only mild or moderate severity.

Microbiology laboratories should use TCBS agar when culturing stools for *V. cholerae.* Surveillance using Moore swabs placed in sewers offers an effective way to determine if *V. cholerae* O1 infections are occurring in an area with sewage systems (*6*). Sewer swab surveillance can detect asymptomatic infections and mild disease which would not lead infected persons to seek medical assistance or to have stool cultures performed.

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Multistate Outbreak of Salmonellosis Caused by Precooked Roast Beef

In the first week of August 1981, 3 outbreaks of salmonellosis that affected more than 100 people in 3 northeastern states were reported to CDC. The first 2 outbreaks were traced to precooked roast beef from a Philadelphia meat-processing plant, and the third to delicatessen-style sliced sandwich meat served at a hospital cafeteria. Some of these meat slices were of the precooked roast beef processed in the Pennsylvania plant.

The first outbreak followed a wedding reception held on July 25 at Claymont, Delaware, attended by approximately 150 people, mostly residents of Delaware County, Pennsylvania. Of the 58 persons contacted for interview, 37 had had diarrhea. *Salmonella* group B was isolated from the stools of 13 patients (11 *S. chester*, 2 *S. typhimurium*). Illness was significantly associated with eating precooked roast beef at the reception ($p<0.001$, Chi-square). None of the meat served at the reception was available for culture.

The second outbreak followed a wedding reception held on July 25 in southern New Jersey; 47 of 92 persons who attended became ill, and illness was again associated with eating precooked roast beef ($p=0.0025$, Fisher exact test, 2-tailed). *Salmonella* was isolated from 18 of 20 stool cultures (17 *S. typhimurium*, 1 *S. newport*). *S. typhimurium* and *S. johannesburg* were isolated from an opened package of precooked roast beef provided by the caterer of the reception. Another unopened package of the same brand from the same caterer contained *S. typhimurium, S. newport*, and *S. anatum*.

The third outbreak, which occurred in a hospital in Philadelphia, Pennsylvania, was first recognized on July 24 after 2 patients had severe diarrhea. Subsequent investigation revealed 42 cases of diarrheal illness between July 20 and August 11. Six of the persons involved were inpatients, and 36 were hospital employees. *Salmonella* group B was isolated from stools from 18 persons (including 4 patients); *Salmonella* group C_2 was isolated from 1 employee. *Salmonella* group B was isolated from 5 of 71 asymptomatic dietary and nursing staff in a stool-culture survey. Preliminary analysis of a case-control study demonstrated an association between illness and eating sandwich-meat slices served at the hospital cafeteria ($p<0.001$, Mantel-Haenszel for variable number of controls per case). The meat slices included the same brand of precooked roast beef involved in the other outbreaks. Some of the infected persons had not eaten the beef; the other meats may have been contaminated by it. The suspected beef samples were not available for culture, but *Salmonella* group B was recovered from meat drippings in a tray containing remnants of meat from the cafeteria delicatessen.

On August 5, the U.S. Department of Agriculture (USDA) asked the Philadelphia producer to temporarily halt further distribution of the implicated beef. *S. typhimurium* was isolated from 1 of 64 specimens tested by the USDA. Assessment of the internal temperature of these products by the protein coagulase test showed that the core temperature ranged from 130 F–152 F, $\pm 5^{\circ}$ (54.4 C–66.7 C $\pm 2.8^{\circ}$). On August 10, the USDA issued a recall order of all precooked roast beef that had been processed by the Philadelphia company before August 6, 1981.

The precooked roast beef from this company is distributed under 6 brand names (Joy, Lapin, Allied Farms, Big Apple, Twin Brothers, Vincent Giordano) to 77 distributors in Philadelphia, Harrisburg, and Chester, Pennsylvania; Rochester and Brooklyn, New York; and Washington, DC.

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Editorial Note: This is the first reported multistate outbreak of salmonellosis attributable to commercially produced precooked roast beef in 4 years. Until 1977, this problem had occurred frequently, particularly in the Northeast (*1-4*). In 1977, when multiple outbreaks of the disease involving several meat-processing companies were reported from Connecticut, Georgia, New York, New Jersey, Pennsylvania, and Virginia, the USDA instituted regulations requiring that raw beef be cooked until heated throughout to at least 145 F (62.8 C) (*5*).

The outbreaks reported here may have resulted from failure to achieve the required minimum temperature, as indicated by the USDA study. Also, recent evidence shows that under certain conditions even heating raw meat to 145 F (62.8 C) may not produce a completely *Salmonella*-free product (*6*). Further studies on the survival of *Salmonella* in raw beef may be indicated.

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Recommendation of the Immunization Practices Advisory Committee (ACIP)

Diphtheria, Tetanus, and Pertussis: Guidelines for Vaccine Prophylaxis and Other Preventive Measures

This is a revision of the 1977 ACIP statement on diphtheria, tetanus, and pertussis. It includes a review of the epidemiology of these diseases, a description of the available immunobiologic preparations, the appropriate immunization schedules, and precautions or contraindications to vaccine use. It contains no major changes in immunization policy.*

INTRODUCTION

Simultaneous immunization against diphtheria, tetanus, and pertussis during infancy and childhood has been a routine practice in the United States since the late 1940s. It has played a major role in markedly reducing the incidence of cases and deaths from each of these diseases.

DIPHTHERIA

Diphtheria has declined remarkably in the United States in recent years. From 1970 through 1976, an average of 248 cases were reported annually. Since then, the average

*Immunization Practices Advisory Committee. Diphtheria and tetanus toxoids and pertussis vaccine. MMWR 1977,26:401-2,407.

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has been 56. However, diphtheria remains a serious disease. About 5%-10% of respiratory diphtheria cases are fatal, the highest case-fatality ratios being in the very young and the elderly.

At one time respiratory diphtheria was common and occurred primarily in children. Now it is rare, especially in children. This is due, in part, to an apparently reduced circulation of toxigenic strains of *Corynebacterium diphtheriae* and to an increased proportion of children who are adequately immunized. Most cases, both in children and adults, occur in unimmunized or inadequately immunized persons. The age distribution of recent cases and the results of serosurveys conducted in the United States suggest that many American adults are not protected.

Toxigenic and nontoxigenic strains of *C. diphtheriae* can cause disease. However, only strains that produce toxin result in the common complications of myocarditis and neuritis. Furthermore, toxigenic strains are more often associated with severe or fatal illness in noncutaneous (respiratory or other mucosal surface) infections, and a higher proportion of them are recovered from respiratory than from cutaneous infections. *C. diphtheriae* can contaminate the skin of certain individuals, usually at the site of a wound. Although a sharply demarcated lesion with a pseudomembraneous base often results, the appearance may not be distinctive and the infection can be confirmed only by culture. Usually other bacterial species can also be isolated. Cutaneous diphtheria most commonly affects certain groups of American Indians and indigent adults.

Adequate immunization is thought to protect for at least 10 years. It significantly reduces both the risk of developing diphtheria and the severity of clinical illness. It does not, however, eliminate carriage of *C. diphtheriae* in the pharynx or on the skin.

TETANUS

The incidence of tetanus has decreased dramatically with routine use of tetanus toxoid. Nonetheless, the number of reported cases has remained relatively constant in the last decade (approximately 100 cases annually). In 1980, 95 tetanus cases were reported from 33 states. In recent years, approximately two-thirds of patients have been ≥50 years old. The disease has occurred almost exclusively in persons who are unimmunized or inadequately immunized or whose immunization history is unknown.

In 10%-20% of recent tetanus cases, no wound could be implicated. In 5%-10%, only minor acute wounds or chronic skin lesions, such as decubitus ulcers, were reported.

Neonatal tetanus occurs in infants born under conditions where infection is likely to mothers who are not adequately immunized. Immune pregnant women confer protection to their infants through transplacental maternal antibody.

Spores of *Clostridium tetani* are ubiquitous, and there is essentially no natural immunity to tetanus toxin. Thus, universal, primary immunization with subsequent maintenance of adequate antitoxin levels by means of appropriately timed boosters is necessary to protect all age groups. Tetanus toxoid is highly effective and generally induces protective levels of serum antitoxin which persist for at least 10 years after full immunization.

PERTUSSIS

General use of standardized pertussis vaccine has resulted in a substantial reduction in cases and deaths from pertussis. However, the number of reported cases has changed relatively little during the last 10 years, when there has been an annual average of 2,300 cases and 10 fatalities. Accurate data do not exist since many cases go unrecognized and

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diagnostic tests for *Bordetella pertussis*—culture and direct-immunofluorescence assay—may be unavailable, difficult to perform, or incorrectly interpreted. Most reported illnesses from *B. pertussis* occur in infants and young children; two-thirds of reported deaths occur in children less than 1 year old. In older children and adults, who may serve as reservoirs of infection, the disease may result in nonspecific symptoms of bronchitis or a severe upper respiratory tract infection; pertussis may not be diagnosed because classic signs, especially the inspiratory whoop, are often absent.

Pertussis is highly communicable (attack rates of over 90% have been reported for unimmunized household contacts). It frequently is associated with complications, severe sequelae, and a high case-fatality ratio in infants. Vaccination early in life is essential.

Because the incidence and severity of pertussis decrease with age and because the vaccine may cause side effects and adverse reactions, routine pertussis immunization is neither needed nor recommended for persons 7 years old or older, except under unusual circumstances (see **"VACCINE USAGE"**).

PREPARATIONS USED FOR IMMUNIZATION

Diphtheria and tetanus toxoids are prepared by formaldehyde treatment of the respective toxins and standardized for potency according to the regulations of the Food and Drug Administration. The Lf content (quantity of toxoid as assessed by flocculation) varies among the different products but does not necessarily reflect potency. The concentration of diphtheria toxoid in preparations intended for use in adults is lower than that of the pediatric formulation; this is to facilitate lower dosage because adverse reactions are thought to be related to both dose and age.

Tetanus toxoid is available in fluid and aluminum salt adsorbed forms. Although the rate of seroconversion is essentially equivalent with either form, adsorbed toxoids induce more persistent antitoxin titers and are therefore strongly recommended for both primary and booster injections.

Pertussis vaccine is a suspension of inactivated *B. pertussis* bacteria. Potency is assayed by comparison with the U.S. Standard Pertussis Vaccine in mouse protection tests. Each dose of vaccine contains an estimated 4 protective units.

The 2 toxoids and the pertussis vaccine are currently available in the United States singly and in various combinations:

1. Diphtheria and Tetanus Toxoids and Pertussis Vaccine Adsorbed (DTP) and Diphtheria and Tetanus Toxoids Adsorbed (For Pediatric Use) (DT) are combinations recommended for use in infants and children less than 7 years old.
2. Tetanus and Diphtheria Toxoids Adsorbed (For Adult Use) (Td) is a combined preparation recommended for use in persons 7 years old and older. This product contains a limited amount of diphtheria antigen (not more than 2 Lf/dose).
3. Single antigen products, such as Pertussis Vaccine Adsorbed (P),* Tetanus Toxoid and Tetanus Toxoid Adsorbed (T), and Diphtheria Toxoid Adsorbed (D), are available for situations when combined antigens should not be used.

VACCINE USAGE

(See also ACIP. *General recommendations on immunization.* MMWR 1980;29:76, 81-3.)

*Distributed by the Michigan State Department of Public Health within that state; available for use outside Michigan under special circumstances, by consultation with that department.

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Dosage and Administration

These products should be injected according to the recommendations in the manufacturers' package inserts. Adsorbed preparations should be administered intramuscularly. Jet injection may be associated with more frequent local reactions.

Primary Immunization

Children 6 weeks through 6 years old (up to the seventh birthday) (Table 1): One dose of DTP should be given intramuscularly on 4 occasions, the first 3 doses at 4- to 8-week intervals, beginning when the infant is approximately 6 weeks-2 months of age. The fourth (reinforcing) dose is given approximately 1 year after the third to maintain adequate antibody levels for the ensuing preschool years. This dose is an integral part of the primary immunizing course. If a contraindication to pertussis vaccination exists, DT should be substituted for DTP (see **"PRECAUTIONS AND CONTRAINDICATIONS"**).

Children 7 years old and older and adults (Table 2): A series of 3 doses of Td should be given intramuscularly; the second dose should be given 4-8 weeks after the first, and the third dose, 6 months to 1 year after the second. Td is the agent of choice for immuni-

TABLE 1. Routine diphtheria, tetanus, and pertussis immunization schedule summary for children less than 7 years old, 1981*

Dose	Age/interval	Product
Primary 1	6 weeks old or older	DTP‡
Primary 2†	4-8 weeks after first dose	DTP
Primary 3†	4-8 weeks after second dose	DTP
Primary 4†	approximately 1 year after third dose	DTP
Booster	4-6 years old, prior to entering kindergarten or elementary school (not necessary if fourth primary immunizing dose administered after fourth birthday)	DTP
Additional Boosters	every 10 years after last dose	Td

*Important details are in the text.
†Prolonging the interval does not require restarting series.
‡DT, if pertussis vaccine is contraindicated.

TABLE 2. Routine diphtheria and tetanus immunization schedule summary for persons 7 years old and older, 1981*

Dose	Age/interval	Product
Primary 1	first visit	Td
Primary 2†	4-8 weeks after first dose	Td
Primary 3†	6 months-1 year after second dose	Td
Boosters	every 10 years after last dose	Td

*Important details are in the text.
†Prolonging the interval does not require restarting series.

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zation of all patients 7 years old and older because side effects from higher doses of diphtheria toxoid are more common in older children and adults, and because pertussis in these age groups is infrequent and less severe than in infants and young children.

Interruption of primary immunization schedule: Interrupting the recommended schedule or delaying subsequent doses does not reduce the ultimate immunity. There is no need to restart a series regardless of the time elapsed between doses.

Booster Immunization

Children 4 through 6 years (up to the seventh birthday): Those who received all 4 primary immunizing doses before their fourth birthday should receive a single dose of DTP just before entering kindergarten or elementary school. This booster dose is not necessary if the fourth dose in the primary series was given after the fourth birthday.

Persons 7 years old and older: Tetanus toxoid should be given with diphtheria toxoid as Td every 10 years. If a dose is given sooner as part of wound management, the next booster is not needed for 10 years thereafter (see **"TETANUS PROPHYLAXIS IN WOUND MANAGEMENT"**). More frequent boosters are not indicated and have been reported to result in an increased incidence and severity of adverse reactions.

(Continued on page 401)

TABLE I. Summary – cases of specified notifiable diseases, United States

[Cumulative totals include revised and delayed reports through previous weeks.]

DISEASE	32nd WEEK ENDING		MEDIAN	CUMULATIVE, FIRST 32 WEEKS		
	August 15 1981	August 9 1980	1976-1980	August 15 1981	August 9 1980	MEDIAN 1976-1980
Aseptic meningitis	335	230	222	3,641	2,896	2,266
Brucellosis	2	3	3	91	116	116
Chickenpox	253	432	405	165,707	156,152	156,152
Diphtheria	–	–	–	3	2	56
Encephalitis: Primary (arthropod-borne & unspec.)	31	25	38	566	472	472
Post-infectious	2	7	5	52	137	140
Hepatitis, Viral: Type B	398	363	339	12,483	10,509	9,242
Type A	453	593	554	15,481	16,872	18,005
Type unspecified	214	234	198	6,922	6,898	5,426
Malaria	35	62	18	862	1,242	400
Measles (rubeola)	42	105	206	2,588	12,668	23,086
Meningococcal infections: Total	43	50	36	2,353	1,837	1,671
Civilian	43	50	36	2,340	1,824	1,649
Military	–	–	–	13	13	16
Mumps	48	54	102	2,992	6,859	13,005
Pertussis	39	82	51	679	898	830
Rubella (German measles)	11	33	76	1,660	3,118	10,483
Tetanus	–	2	2	36	50	39
Tuberculosis	608	636	579	16,524	16,536	17,971
Tularemia	6	7	4	136	122	95
Typhoid fever	8	15	10	302	273	273
Typhus fever, tick-borne (Rky. Mt. spotted)	35	68	60	837	759	691
Venereal diseases:						
Gonorrhea: Civilian	19,892	22,271	22,031	606,380	594,042	595,812
Military	521	875	618	17,834	16,689	16,689
Syphilis, primary & secondary: Civilian	624	672	443	18,259	15,922	14,528
Military	2	11	5	231	196	186
Rabies in animals	143	122	88	4,473	4,189	1,930

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1981		CUM. 1981
Anthrax	–	Poliomyelitis: Total	3
Botulism	34	Paralytic (Wash. 1)	3
Cholera	3	Psittacosis (Ohio 2, Tenn. 1, Calif. 1)	75
Congenital rubella syndrome	7	Rabies in man	1
Leprosy (Calif. 1)	158	Trichinosis (Mass. 1, N.H. 1, Upstate N.Y. 3, N.J. 2)	105
Leptospirosis (Wash. 1)	24	Typhus fever, flea-borne (endemic, murine) (Tex. 1)	31
Plague	5		

All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending August 15, 1981 and August 9, 1980 (32nd week)

REPORTING AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKEN POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-infectious	B	A	Unspecified		
	1981	1981	1981	1981	CUM. 1981	1981	1980	1981	1981	1981	1981	1981	CUM. 1981
UNITED STATES	335	2	253	–	3	31	25	2	398	453	214	35	862
NEW ENGLAND	8	–	36	–	–	–	–	–	15	10	7	1	45
Maine	1	–	4	–	–	–	–	–	2	–	–	–	1
N.H.	1	–	–	–	–	–	–	–	1	–	–	–	3
Vt.	–	–	–	–	–	–	–	–	1	2	–	–	3
Mass.	3	–	8	–	–	–	–	–	–	6	7	1	26
R.I.	2	–	15	–	–	–	–	–	4	–	–	–	2
Conn.	1	–	9	–	–	–	–	–	7	2	–	–	10
MID. ATLANTIC	28	–	30	–	–	–	2	–	50	27	24	3	101
Upstate N.Y.	16	–	12	–	–	–	2	–	16	6	5	1	29
N.Y. City	4	–	18	–	–	–	–	–	10	2	3	1	33
N.J.	8	–	NN	–	–	–	–	–	24	19	16	1	28
Pa.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	11
E.N. CENTRAL	47	–	102	–	–	12	8	–	64	83	28	5	42
Ohio	–	–	9	–	–	–	2	–	17	15	8	1	7
Ind.	16	–	13	–	–	9	3	–	8	23	5	–	6
Ill.	7	–	16	–	–	–	2	–	20	20	7	3	14
Mich.	21	–	33	–	–	3	1	–	18	25	8	1	15
Wis.	3	–	31	–	–	–	–	–	1	–	–	–	–
W.N. CENTRAL	22	–	–	–	–	1	1	–	13	18	6	2	24
Minn.	–	–	–	–	–	–	1	–	6	4	2	–	9
Iowa	–	–	–	–	–	1	–	–	–	–	2	1	3
Mo.	15	–	–	–	–	–	–	–	5	5	2	–	3
N. Dak.	1	–	–	–	–	–	–	–	–	–	–	–	1
S. Dak.	–	–	–	–	–	–	–	–	–	–	–	–	1
Nebr.	–	–	–	–	–	–	–	–	–	–	–	–	1
Kans.	6	–	–	–	–	–	–	–	2	9	–	1	6
S. ATLANTIC	58	1	37	–	1	2	3	1	82	48	32	9	106
Del.	–	–	–	–	–	–	–	–	–	–	–	–	1
Md.	15	–	8	–	–	–	–	–	17	8	11	2	25
D.C.	–	–	–	–	–	–	–	–	1	1	–	–	8
Va.	19	–	5	–	–	1	1	1	12	6	7	3	18
W. Va.	1	–	7	–	–	–	–	–	10	2	1	–	3
N.C.	–	–	NN	–	–	–	1	–	4	1	1	–	7
S.C.	1	–	–	–	–	–	–	–	3	–	1	–	1
Ga.	3	–	–	–	–	–	–	–	16	3	–	–	8
Fla.	19	1	17	–	1	1	1	–	19	27	11	4	35
E.S. CENTRAL	54	–	5	–	–	8	5	–	27	14	2	–	10
Ky.	32	–	2	–	–	1	–	–	2	1	–	–	–
Tenn.	9	–	NN	–	–	4	–	–	10	4	2	–	–
Ala.	11	–	3	–	–	3	5	–	11	3	–	–	9
Miss.	2	–	–	–	–	–	–	–	4	6	–	–	1
W.S. CENTRAL	35	1	18	–	–	2	1	–	24	64	34	1	62
Ark.	2	–	–	–	–	–	–	–	2	6	4	1	5
La.	4	–	NN	–	–	–	–	–	2	21	7	–	3
Okla.	11	–	–	–	–	–	1	–	1	8	1	–	5
Tex.	18	1	18	–	–	2	–	–	19	29	22	–	49
MOUNTAIN	8	–	2	–	1	–	2	–	18	31	20	–	28
Mont.	1	–	–	–	1	–	–	–	–	10	–	–	1
Idaho	–	–	–	–	–	–	–	–	–	1	–	–	1
Wyo.	2	–	–	–	–	–	–	–	–	–	–	–	–
Colo.	5	–	2	–	–	–	–	–	8	9	2	–	13
N. Mex.	–	–	–	–	–	–	–	–	1	–	–	–	2
Ariz.	–	–	NN	–	–	–	2	–	7	9	13	–	4
Utah	–	–	–	–	–	–	–	–	1	1	2	–	4
Nev.	–	–	–	–	–	–	–	–	1	1	3	–	3
PACIFIC	75	–	23	–	1	6	3	1	105	158	61	14	444
Wash.	3	–	7	–	–	–	1	–	11	35	12	–	20
Oreg.	1	–	–	–	–	2	–	–	2	8	–	–	12
Calif.	71	–	5	–	–	4	2	1	87	111	46	13	404
Alaska	–	–	2	–	1	–	–	–	2	2	–	–	1
Hawaii	–	–	9	–	–	–	–	–	3	2	3	1	7
Guam	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	1
P.R.	–	–	11	–	–	–	–	–	–	7	1	–	9
V.I.	–	–	–	–	–	–	–	–	–	–	–	–	4
Pac. Trust Terr.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–

NN: Not notifiable. NA: Not available.
All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending August 15, 1981 and August 9, 1980 (32nd week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1981	CUM. 1981	CUM. 1980	1981	CUM. 1981	CUM. 1980	1981	CUM. 1981	1981	1981	CUM. 1981	CUM. 1981
UNITED STATES	42	2,588	12,668	43	2,353	1,837	48	2,992	39	11	1,660	36
NEW ENGLAND	–	75	667	3	149	109	2	144	1	–	105	2
Maine	–	5	33	–	22	5	–	27	–	–	33	–
N.H.	–	4	330	1	17	5	–	17	–	–	35	–
Vt.	–	1	226	–	6	13	–	6	–	–	–	–
Mass.	–	57	54	–	33	38	–	39	–	–	25	–
R.I.	–	–	2	1	14	7	–	20	1	–	–	–
Conn.	–	8	22	1	57	41	2	35	–	–	12	2
MID. ATLANTIC	3	786	3,717	7	326	316	8	532	7	1	198	2
Upstate N.Y.	2	208	675	1	103	105	6	97	7	1	92	1
N.Y. City	–	69	1,158	3	56	77	2	70	–	–	49	1
N.J.	1	55	821	3	76	69	–	83	–	–	46	–
Pa.	NA	454	1,063	–	91	65	NA	282	NA	NA	11	–
E.N. CENTRAL	–	84	2,378	5	287	235	6	834	5	2	346	7
Ohio	–	15	371	3	108	71	3	131	2	–	3	1
Ind.	–	15	90	–	40	36	1	94	1	–	122	2
Ill.	–	23	332	–	69	64	2	166	1	1	83	–
Mich.	–	30	231	2	66	51	–	297	1	–	34	3
Wis.	–	1	1,354	–	4	13	–	146	–	1	104	1
W.N. CENTRAL	–	6	1,326	2	104	73	–	177	2	–	76	3
Minn.	–	2	1,092	1	37	18	–	8	1	–	6	2
Iowa	–	1	20	–	18	9	–	41	1	–	4	–
Mo.	–	1	64	1	31	32	–	29	–	–	3	1
N. Dak.	–	–	–	–	1	1	–	–	–	–	–	–
S. Dak.	–	–	–	–	4	4	–	1	–	–	–	–
Nebr.	–	1	83	–	–	–	–	3	–	–	1	–
Kans.	–	1	67	–	13	9	–	95	–	–	62	–
S. ATLANTIC	7	346	1,856	7	528	433	10	424	10	1	132	7
Del.	–	–	3	–	4	2	–	9	–	–	1	–
Md.	2	4	71	2	38	43	1	81	–	–	1	–
D.C.	–	1	–	–	2	1	–	2	–	–	–	–
Va.	–	6	298	–	65	40	1	116	2	1	7	–
W. Va.	–	8	9	1	21	14	2	71	–	–	22	–
N.C.	–	4	128	1	76	82	1	14	1	–	5	2
S.C.	–	–	157	1	69	52	–	10	–	–	8	2
Ga.	–	109	799	–	87	72	–	33	5	–	35	1
Fla.	5	214	391	2	166	127	5	88	2	–	53	2
E.S. CENTRAL	–	4	327	2	172	167	1	71	–	1	29	2
Ky.	–	–	52	–	48	52	–	33	–	1	18	–
Tenn.	–	2	169	1	48	44	–	20	–	–	10	–
Ala.	–	2	22	1	57	45	–	15	–	–	1	2
Miss.	–	–	84	–	19	26	1	3	–	–	–	–
W.S. CENTRAL	23	914	930	11	398	194	2	170	6	2	145	5
Ark.	–	1	16	–	21	15	–	1	–	–	2	1
La.	–	2	11	6	99	71	–	4	–	–	9	2
Okla.	–	6	769	–	33	17	–	–	–	–	–	1
Tex.	23	905	134	5	245	91	2	165	6	2	134	1
MOUNTAIN	–	33	451	2	77	63	2	107	1	–	78	2
Mont.	–	–	2	–	6	3	1	9	–	–	4	–
Idaho	–	1	–	–	3	4	–	4	–	–	3	–
Wyo.	–	–	–	–	1	2	–	1	–	–	7	–
Colo.	–	9	23	–	32	15	–	42	–	–	27	–
N. Mex.	–	8	11	–	6	7	–	–	1	–	5	–
Ariz.	–	5	360	1	18	10	1	24	–	–	19	1
Utah	–	–	47	–	5	2	–	16	–	–	4	1
Nev.	–	10	8	1	6	20	–	11	–	–	9	–
PACIFIC	9	340	1,016	4	312	247	17	533	7	4	551	6
Wash.	–	3	174	1	59	47	3	137	1	–	94	–
Oreg.	–	3	–	1	47	43	2	61	–	–	31	–
Calif.	9	332	831	2	195	151	11	308	6	3	415	6
Alaska	–	–	5	–	7	6	–	7	–	–	1	–
Hawaii	–	2	6	–	4	–	1	20	–	1	10	–
Guam	NA	4	5	–	–	1	NA	6	NA	NA	1	–
P.R.	–	258	112	–	10	9	–	107	–	–	3	3
V.I.	–	24	6	–	1	1	–	4	–	–	1	–
Pac. Trust Terr.	NA	1	6	–	–	–	NA	8	NA	NA	1	–

NA: Not available.
All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending August 15, 1981 and August 9, 1980 (32nd week)

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
	1981	CUM. 1981	CUM. 1981	1981	CUM. 1981	1981	CUM. 1981	1981	CUM. 1981	CUM. 1980	1981	CUM. 1981	CUM. 1980	CUM. 1981
UNITED STATES	608	16,524	136	8	302	35	837	19,892	606,380	594,042	624	18,259	15,922	4,473
NEW ENGLAND	19	469	1	-	12	1	8	462	15,036	14,815	8	378	322	22
Maine	2	28	-	-	1	-	-	31	776	862	-	2	4	10
N.H.	-	13	-	-	-	-	-	19	547	509	-	11	1	2
Vt.	1	15	-	-	-	-	-	9	259	332	-	13	5	-
Mass.	13	275	-	-	7	-	5	230	6,128	6,158	6	251	183	5
R.I.	1	28	-	-	-	1	1	54	819	935	-	21	19	-
Conn.	2	110	1	-	4	-	2	119	6,507	6,019	2	80	110	5
MID. ATLANTIC	85	2,604	10	3	51	-	32	1,945	72,000	64,098	56	2,724	2,257	55
Upstate N.Y.	38	477	10	1	11	-	12	716	12,109	11,739	7	249	183	39
N.Y. City	29	1,004	-	1	27	-	2	1,000	30,510	24,481	35	1,638	1,487	-
N.J.	18	545	-	1	9	-	8	229	13,631	12,006	14	375	275	12
Pa.	NA	578	-	NA	4	NA	10	NA	15,750	15,872	NA	462	312	4
E.N. CENTRAL	130	2,170	1	-	20	1	35	2,577	88,864	90,819	18	1,155	1,494	610
Ohio	20	421	-	-	2	-	28	1,143	30,542	23,788	6	167	233	49
Ind.	47	211	-	-	-	-	2	189	8,023	9,049	9	122	118	57
Ill.	36	851	-	-	10	1	4	324	22,368	28,734	-	588	846	432
Mich.	25	571	1	-	6	-	1	687	19,647	20,564	2	219	242	8
Wis.	2	116	-	-	2	-	-	234	8,284	8,684	1	59	55	64
W.N. CENTRAL	32	596	16	-	12	2	36	1,055	29,170	27,070	21	373	198	1,907
Minn.	10	105	-	-	2	-	1	207	4,557	4,491	7	134	73	334
Iowa	4	62	-	-	2	1	4	87	3,167	2,981	-	14	9	606
Mo.	14	265	15	-	3	1	19	526	13,576	11,690	10	194	97	145
N. Dak.	1	22	-	-	-	-	-	8	393	389	2	8	3	305
S. Dak.	-	43	-	-	1	-	-	18	786	841	-	2	2	236
Nebr.	1	19	1	-	2	-	3	98	2,238	2,167	1	5	6	140
Kans.	2	80	-	-	2	-	9	111	4,453	4,511	1	16	8	141
S. ATLANTIC	134	3,649	10	1	44	18	479	5,412	150,015	148,167	191	4,856	3,768	276
Del.	3	50	1	-	-	-	2	69	2,355	2,017	-	7	10	1
Md.	18	371	-	1	13	2	46	719	17,181	15,505	19	368	262	13
D.C.	8	232	-	-	1	-	-	243	8,949	10,278	9	389	273	-
Va.	17	377	-	-	1	5	80	277	13,478	13,175	8	431	349	49
W. Va.	2	118	-	-	4	-	4	45	2,244	1,951	-	15	15	13
N.C.	35	647	2	-	1	10	208	803	23,156	21,177	15	369	263	3
S.C.	5	337	3	-	-	1	81	484	14,460	14,034	10	319	212	17
Ga.	22	585	4	-	4	-	50	890	30,912	28,480	50	1,252	1,080	127
Fla.	24	932	-	-	20	-	8	1,882	37,280	41,550	80	1,706	1,304	53
E.S. CENTRAL	31	1,437	5	1	6	7	86	2,024	50,829	48,602	61	1,200	1,325	285
Ky.	11	377	2	-	-	-	2	295	6,389	7,193	5	58	89	88
Tenn.	9	472	3	1	2	2	55	702	19,047	17,458	17	449	561	150
Ala.	11	395	-	-	2	4	13	518	15,527	14,311	19	340	274	47
Miss.	-	193	-	-	2	1	16	509	9,866	9,640	20	353	401	-
W.S. CENTRAL	63	1,864	63	2	43	5	133	2,575	80,646	76,396	180	4,463	3,098	783
Ark.	7	195	35	-	4	2	29	168	5,870	5,843	-	83	93	106
La.	7	320	2	-	2	-	-	316	13,546	13,826	79	1,062	761	26
Okla.	8	222	14	-	3	3	77	327	8,580	7,599	4	103	59	153
Tex.	41	1,127	12	2	34	-	27	1,764	52,650	49,128	97	3,215	2,185	498
MOUNTAIN	10	466	25	1	21	1	23	721	23,806	23,012	4	477	383	136
Mont.	-	22	5	-	4	-	11	25	876	844	-	11	1	78
Idaho	-	6	4	-	-	-	5	50	1,072	1,016	-	17	14	1
Wyo.	-	7	1	-	-	-	4	20	535	686	-	7	8	6
Colo.	-	50	5	1	6	-	-	186	6,398	6,148	2	146	103	17
N. Mex.	4	89	1	-	-	-	-	83	2,588	2,851	-	87	64	20
Ariz.	6	221	-	-	10	-	-	207	7,241	6,350	-	105	129	11
Utah	-	34	8	-	1	-	1	46	1,120	1,072	1	17	10	1
Nev.	-	37	1	-	-	1	2	104	3,976	4,045	1	87	54	2
PACIFIC	104	3,269	5	-	93	-	5	3,121	96,014	101,063	85	2,633	3,077	399
Wash.	6	247	1	-	3	-	1	295	7,654	8,500	-	68	158	10
Oreg.	-	121	-	-	4	-	-	94	5,654	6,854	2	61	66	6
Calif.	96	2,768	4	-	85	-	4	2,551	78,370	81,265	81	2,450	2,738	369
Alaska	-	44	-	-	-	-	-	88	2,418	2,426	-	9	7	14
Hawaii	2	89	-	-	1	-	-	93	1,918	2,018	2	45	108	-
Guam	NA	7	-	NA	-	NA	-	NA	47	83	NA	-	4	-
P.R.	-	183	-	-	4	-	-	53	1,992	1,594	15	414	332	53
V.I.	-	1	-	-	6	-	-	12	129	108	-	15	10	-
Pac. Trust Terr.	NA	38	-	NA	-	NA	-	NA	211	257	NA	-	-	-

NA: Not available.
All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE IV. Deaths in 121 U.S. cities,* week ending August 15, 1981 (32nd week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)						P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	652	414	152	42	21	23	44
Boston, Mass.	195	102	51	19	14	9	25
Bridgeport, Conn.	48	35	9	3	1	–	2
Cambridge, Mass.	20	15	2	3	–	–	1
Fall River, Mass.	27	22	4	1	–	–	–
Hartford, Conn.	52	33	15	2	–	2	2
Lowell, Mass.	19	15	3	1	–	–	–
Lynn, Mass.	17	15	1	1	–	–	–
New Bedford, Mass.	17	11	6	–	–	–	–
New Haven, Conn.	60	36	14	3	4	3	1
Providence, R.I. §	60	39	16	3	–	2	4
Somerville, Mass.	5	5	–	–	–	–	1
Springfield, Mass.	49	30	10	1	1	7	2
Waterbury, Conn.	34	25	9	–	–	–	2
Worcester, Mass.	49	31	12	5	1	–	4
MID. ATLANTIC	2,358	1,541	525	161	72	59	92
Albany, N.Y.	55	40	9	3	–	3	–
Allentown, Pa. §	18	15	3	–	–	–	–
Buffalo, N.Y.	100	56	26	7	5	6	12
Camden, N.J.	32	22	8	1	1	–	1
Elizabeth, N.J.	28	17	10	1	–	–	2
Erie, Pa.†	39	28	9	–	1	1	1
Jersey City, N.J.	73	50	12	4	4	3	3
N.Y. City, N.Y.	1,314	849	303	97	46	19	41
Newark, N.J.	57	29	14	8	4	2	1
Paterson, N.J.	37	24	6	4	1	2	1
Philadelphia, Pa.†	202	121	53	16	3	9	12
Pittsburgh, Pa.†	63	43	14	3	1	2	3
Reading, Pa.	38	28	8	1	1	–	2
Rochester, N.Y.	101	69	17	7	2	6	3
Schenectady, N.Y.	21	15	5	1	–	–	–
Scranton, Pa.†	23	16	5	2	–	–	2
Syracuse, N.Y.	76	53	12	5	2	4	–
Trenton, N.J.	29	23	5	1	–	–	3
Utica, N.Y.	25	22	2	–	1	–	2
Yonkers, N.Y.	27	21	4	–	–	2	3
E.N. CENTRAL	2,314	1,387	585	160	89	92	53
Akron, Ohio	91	59	18	5	2	7	–
Canton, Ohio	37	21	9	3	1	3	2
Chicago, Ill.	555	309	154	51	21	20	12
Cincinnati, Ohio	135	82	28	8	7	9	12
Cleveland, Ohio	226	117	65	17	7	20	1
Columbus, Ohio	130	85	35	3	3	4	3
Dayton, Ohio	87	59	18	5	4	1	2
Detroit, Mich.	233	123	61	26	9	14	2
Evansville, Ind.	42	30	9	–	2	1	2
Fort Wayne, Ind.	64	41	14	3	5	1	–
Gary, Ind.	10	6	2	1	–	1	–
Grand Rapids, Mich	68	48	13	5	1	1	2
Indianapolis, Ind.	167	96	42	18	7	4	1
Madison, Wis.	32	21	6	3	2	–	3
Milwaukee, Wis.	144	101	30	5	8	–	–
Peoria, Ill.	48	22	20	2	1	3	2
Rockford, Ill.	36	26	7	2	1	–	1
South Bend, Ind.	49	35	11	1	1	1	2
Toledo, Ohio	97	60	29	2	5	1	5
Youngstown, Ohio	63	46	14	–	2	1	1
W.N. CENTRAL	630	415	138	36	17	24	18
Des Moines, Iowa	45	36	6	1	1	1	–
Duluth, Minn.	12	9	2	1	–	–	1
Kansas City, Kans.	29	19	6	3	–	1	1
Kansas City, Mo.	128	86	29	7	2	4	–
Lincoln, Nebr.	17	13	4	–	–	–	1
Minneapolis, Minn.	82	56	12	5	1	8	4
Omaha, Nebr.	60	40	13	4	1	2	1
St. Louis, Mo.	153	82	42	12	10	7	7
St. Paul, Minn.	44	31	10	1	1	1	3
Wichita, Kans.	60	43	14	2	1	–	–

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)						P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,209	691	299	118	43	58	35
Atlanta, Ga.	141	67	43	8	7	16	1
Baltimore, Md.	202	130	51	13	4	4	2
Charlotte, N.C.	76	50	15	7	1	3	2
Jacksonville, Fla.	131	70	29	18	6	8	7
Miami, Fla.	115	58	30	16	7	4	1
Norfolk, Va.	46	24	13	4	3	2	1
Richmond, Va.	66	34	18	9	2	3	6
Savannah, Ga.	58	31	18	7	2	–	1
St. Petersburg, Fla.	94	77	11	2	3	1	8
Tampa, Fla.	73	44	17	9	–	3	3
Washington, D.C.	160	77	41	22	6	14	3
Wilmington, Del.	47	29	13	3	2	–	–
E.S. CENTRAL	697	409	173	54	23	38	36
Birmingham, Ala.	124	72	27	12	5	8	3
Chattanooga, Tenn.	39	28	8	3	–	–	6
Knoxville, Tenn.	47	30	15	1	1	–	–
Louisville, Ky.	108	62	31	11	3	1	4
Memphis, Tenn.	132	75	26	8	5	18	9
Mobile, Ala.	68	43	16	5	2	2	7
Montgomery, Ala.	58	34	13	3	4	4	3
Nashville, Tenn.	121	65	37	11	3	5	4
W.S. CENTRAL	1,056	618	244	70	49	75	32
Austin, Tex.	34	21	8	1	3	1	–
Baton Rouge, La.	30	15	8	6	1	–	1
Corpus Christi, Tex.	31	12	8	5	3	3	1
Dallas, Tex.	152	97	27	12	11	5	3
El Paso, Tex.	32	20	5	1	2	4	2
Fort Worth, Tex.	80	47	16	7	4	6	6
Houston, Tex.	170	88	40	13	9	20	3
Little Rock, Ark.	87	48	26	7	2	4	3
New Orleans, La.	142	79	34	6	11	12	–
San Antonio, Tex.	144	81	46	7	3	7	7
Shreveport, La.	67	48	15	–	–	4	1
Tulsa, Okla.	87	62	11	5	–	9	5
MOUNTAIN	612	339	149	53	40	31	28
Albuquerque, N.Mex.	63	35	15	7	6	–	3
Colo. Springs, Colo.	25	12	11	1	1	–	3
Denver, Colo.	121	64	33	11	5	8	3
Las Vegas, Nev.	78	41	24	6	7	–	6
Ogden, Utah	23	14	5	1	1	2	–
Phoenix, Ariz.	136	72	33	13	6	12	1
Pueblo, Colo.	28	17	6	4	1	–	4
Salt Lake City, Utah	47	26	8	2	6	5	1
Tucson, Ariz.	91	58	14	8	7	4	7
PACIFIC	1,656	1,022	387	125	69	53	60
Berkeley, Calif.	15	9	4	2	–	–	–
Fresno, Calif.	62	36	14	3	5	4	1
Glendale, Calif.	18	13	5	–	–	–	–
Honolulu, Hawaii	66	37	16	5	4	4	4
Long Beach, Calif.	66	44	13	4	1	4	3
Los Angeles, Calif.	463	273	116	41	21	12	16
Oakland, Calif.	69	36	17	5	5	6	1
Pasadena, Calif.	21	14	4	1	2	–	–
Portland, Oreg.	121	72	25	13	5	6	2
Sacramento, Calif.	60	38	13	4	5	–	2
San Diego, Calif.	148	91	39	9	6	3	4
San Francisco, Calif.	149	92	35	10	5	7	4
San Jose, Calif.	159	105	33	13	6	2	13
Seattle, Wash.	134	88	29	13	1	3	3
Spokane, Wash.	69	50	16	1	2	–	5
Tacoma, Wash.	36	24	8	1	1	2	2
TOTAL	11,184††	6,836	2,652	819	423	453	398

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza

†Because of changes in reporting methods in these 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available this week. Figures are estimates based on average percent of regional totals.

ACIP Recommendation for DTP – Continued

Special Considerations

Persons recovering from tetanus or diphtheria: Tetanus or diphtheria infection often does not confer immunity; therefore active immunization should be initiated or completed during convalescence.

Children recovering from pertussis: Children who have recovered from bacteriologically confirmed pertussis need not receive more pertussis vaccine. However, without reliable laboratory confirmation, DTP immunization should be completed because presumptive pertussis may have been caused by agents like other *Bordetella* species or some viruses.

Neonatal tetanus prevention: An unimmunized pregnant woman whose delivery may occur under circumstances and in surroundings where the infant could become infected should be immunized against tetanus with Td. The risk of neonatal tetanus is minimal if a previously unimmunized mother has received at least 2 properly spaced doses of toxoid before delivery. Inadequately immunized pregnant women or those immunized more than 10 years previously should have a booster dose.

Pertussis immunization for persons 7 years old and older: Routine immunization against pertussis is not recommended for those 7 years old and older. In exceptional cases, such as persons with chronic pulmonary disease exposed to children with pertussis, or health-care personnel exposed during nosocomial or community outbreaks, a booster dose of adsorbed pertussis vaccine may be useful. A dose of 0.20-0.25 ml is most often used for adults. There is insufficient evidence to warrant routine pertussis vaccination of all hospital personnel.

SIDE EFFECTS AND ADVERSE REACTIONS

Local reactions, generally erythema and induration with or without tenderness, are common after the administration of vaccines containing diphtheria, tetanus, or pertussis antigens. These reactions are most common following DTP (40%-70% of doses) and are usually self-limited and require no therapy. A nodule may be palpable at the injection site of adsorbed products for several weeks. Abscess at the site of injection has been reported (6-10 per million doses*). Mild-to-moderate fever (38.0-40.4 C) occurs frequently in infants following DTP (about 50% of doses administered), generally within several hours of administration. The fever may persist for 1 to 2 days and is often accompanied by mild somnolence, vomiting, irritability, or malaise. Fever and other systemic symptoms are much less common following administration of preparations not containing pertussis vaccine.

Arthus-type hypersensitivity reactions, characterized by severe local reactions (generally starting 2 to 8 hours after an injection), may occur, particularly in persons who have received multiple prior boosters.

Rarely, severe systemic reactions such as generalized urticaria, anaphylaxis, or neurologic complications have been reported after receiving diphtheria, tetanus, and pertussis antigens. A few cases of peripheral neuropathy have been reported following tetanus toxoid administration, although a causal relationship has not been established.

Severe and occasionally fatal adverse events have been reported following administration of pertussis antigen-containing vaccines. It has not been possible to establish pertussis vaccine as the cause of these conditions as it is not known whether the rate of illness

*In 1978, 1 lot of DTP released in the United States was found to be associated with sterile abcesses in 1 per 1,000 vaccinees and was subsequently withdrawn from use.

ACIP Recommendation for DTP – Continued

following receipt of pertussis vaccine exceeds the expected incidence rates of conditions such as seizures and encephalopathy in children in the age groups usually receiving DTP.

In 1 recently reported case-control study from England, children with serious neurologic disorders were more likely to have received DTP in the 7 days preceding onset than were their age-, sex-, and neighborhood-matched controls. However, pertussis vaccine could account for only a small proportion of cases of serious neurologic disorders in the population studied.

The exact frequency of severe events following pertussis vaccination is unknown; reported ranges for some are shown in the following list.* Should any of these events occur, further vaccination with pertussis antigen is contraindicated.

1. Collapse or shock-like state (60-300 per million doses).
2. Persistent screaming episodes—prolonged periods of peculiar crying or screaming which cannot be controlled by comforting the infant (70-2,000 per million).
3. High temperature—≥40.5 C. (≥104.9 F)
4. Isolated convulsion(s) with or without fever (40-700 per million).
5. Encephalopathy, with or without convulsions, manifested by a bulging fontanel, changes in the level of consciousness, or focal neurologic signs; the encephalopathy may lead to permanent neurologic deficit (1.3-30 per million).

Sudden infant death syndrome (SIDS) has been reported rarely following administration of DTP. A causal relationship between DTP immunization and SIDS has not been established. It should be recognized that the first 3 primary immunizing doses of DTP are usually administered to infants 2 to 6 months old and that approximately 85% of SIDS cases occur at ages 1 through 6 months, with the peak incidence being at 2 to 4 months. In countries where immunizations with pertussis antigen-containing vaccines are started at 6 months of age, the age distribution of SIDS is the same as that reported in the United States.

Comments on Adverse Reactions

When there is a marked reaction following DTP administration which is not in itself a contraindication to further pertussis vaccination, some health-care providers divide the remaining inoculations into multiple, small doses. There has not been adequate study of the efficacy of such schedules by clinical or serologic means or of the effects on the subsequent frequency and severity of adverse reactions.

Reporting of adverse reactions temporally related to antigen administration by parents and patients should be encouraged. Reports of severe or unusual reactions should be forwarded by health-care providers to local and/or state health departments.

PRECAUTIONS AND CONTRAINDICATIONS

When an infant or child returns for the next dose in a series of DTP injections, the parent should be questioned about severe side effects or adverse reactions after the previous dose. If any of the following occurred, additional doses of pertussis antigen are contraindicated, and immunization should be completed with DT: collapse or shock, persistent screaming episodes, temperature ≥40.5 C, convulsion(s) with or without accompanying fever, severe alterations of consciousness, generalized and/or focal neurologic

*Reported risks of events following vaccination with DTP vary greatly, perhaps due to differences in 1) the baseline rate of an illness due to all other causes, 2) the criteria used to define adverse events, 3) the methods of collecting adverse event reports, 4) the denominators and/or the clarity of their descriptions (e.g., doses distributed, doses administered, or the number of children vaccinated); and 5) the many preparations used and populations studied in various countries.

ACIP Recommendation for DTP — Continued

signs, systemic allergic reactions, thrombocytopenia, or hemolytic anemia. Lesser reactions than these do not, in themselves, preclude the further use of DTP.

The presence of an evolving neurologic disorder contraindicates use of pertussis vaccine. A static neurologic condition like cerebral palsy or a family history of neurologic disease is not a contraindication to giving vaccines containing pertussis antigen.

The only contraindication to tetanus and diphtheria toxoids is a history of neurologic or severe hypersensitivity reaction following a previous dose. Local side effects alone do not preclude continued use. If a systemic reaction is suspected to represent allergic hypersensitivity, appropriate skin testing may be useful before discontinuing tetanus toxoid immunization altogether; this would be helpful in documenting immediate hypersensitivity although mild, nonspecific skin-test reactivity to tetanus toxoid appears to be fairly common. Most vaccinees develop cutaneous delayed hypersensitivity to the toxoid.

Major local reactions generally beginning 2-8 hours after injection have been reported in some adults, particularly those who have received frequent (e.g., annual) doses of tetanus toxoid. Persons experiencing these severe reactions usually have very high serum tetanus antitoxin levels. They should not be given further routine or emergency booster doses of Td more frequently than every 10 years.

If a contraindication to using tetanus toxoid-containing preparations exists, passive immunization against tetanus should be considered whenever an injury other than a clean, minor wound is sustained (see **"TETANUS PROPHYLAXIS IN WOUND MANAGEMENT"**).

A severe febrile illness is reason to defer routine vaccination. Minor illness without fever, such as a mild upper respiratory infection, should not be cause for postponing vaccination.

Immunosuppressive therapies including irradiation, corticosteroids, antimetabolites, alkylating agents, and cytotoxic drugs may reduce the immune response to vaccines. Routine vaccination should be deferred, if possible, while patients are receiving such therapy.

DIPHTHERIA PROPHYLAXIS FOR CASE CONTACTS

All household contacts of patients with suspected respiratory diphtheria—particularly persons previously unimmunized or inadequately immunized—should receive an injection of a diphtheria toxoid-containing preparation appropriate for their age and should be examined daily for 7 days for evidence of disease. In addition, asymptomatic unimmunized or inadequately immunized household contacts should have prompt chemoprophylaxis with either intramuscular injection of benzathine penicillin (600,000 units for persons less than 6 years old and 1,200,000 units for those 6 years old and older) or a 7-day course of oral erythromycin. (Erythromycin may be slightly more effective, but intramuscular benzathine penicillin is preferred since it avoids problems of noncompliance with an oral drug regimen.) Primary immunization should be completed in persons who will have received fewer than the recommended number of doses as a result of the prophylaxis. Bacteriologic cultures before and after antibiotic prophylaxis may aid in management and follow-up. Identified untreated carriers of toxigenic *C. diphtheriae* should receive antibiotics as recommended above for unimmunized household contacts. Penicillin-therapy failures should receive a 7- to 10-day course of oral erythromycin.

Controlled studies demonstrating the efficacy of chemoprophylaxis have not been done. Therefore, a few experts have recommended the use of equine diphtheria anti-

ACIP Recommendation for DTP – Continued

toxin in unimmunized contacts when close surveillance is impossible. However, the risk of allergic reaction to horse serum constrains prophylactic antitoxin use. Immediate hypersensitivity reactions occur in about 7% and serum sickness in 5% of adults receiving the recommended prophylactic dose of equine antitoxin. The risk of adverse reaction must be weighed against the small risk of diphtheria in an unimmunized household contact who receives chemoprophylaxis. Therefore, antitoxin in **not** generally recommended. If it is to be used, the usually recommended dose is 5,000-10,000 units intramuscularly—after appropriate testing for sensitivity—at a site separate from that of toxoid injection. The immune response to simultaneous diphtheria antitoxin and toxoid inoculation has not been adequately studied. These recommendations for household contacts of respiratory diphtheria cases also apply to other contacts with unusually intimate exposure.

Most recent cases of cutaneous diphtheria represent infections with nontoxigenic strains of *C. diphtheriae*. Often a case, whether due to a toxigenic or nontoxigenic strain, is not definitively diagnosed for some time after onset. An infection highly suspected of being cutaneous diphtheria should be considered as having been caused by a toxigenic strain until proven otherwise. Recommendations for prophylaxis of close case contacts are the same as for respiratory diphtheria since cutaneous diphtheria may be more contagious for close contacts than is respiratory infection. If a cutaneous case is known to be due to a nontoxigenic strain, routine investigation or prophylaxis of contacts is not necessary.

TETANUS PROPHYLAXIS IN WOUND MANAGEMENT

Chemoprophylaxis against tetanus is neither practical nor useful in managing wounds; proper immunization plays the more important role. The need for active immunization, with or without passive immunization, depends on the condition of the wound and the patient's immunization history (Table 3; see also **"PRECAUTIONS AND CONTRAINDICATIONS"**). Rarely have cases of tetanus occurred in persons with a documented primary series of toxoid injections.

Available evidence indicates that complete primary immunization with tetanus toxoid provides longlasting protection—10 years or more in most recipients. Consequently,

TABLE 3. Summary guide to tetanus prophylaxis in routine wound management, 1981*

History of tetanus immunization (doses)	Clean, minor wounds		All other wounds	
	Td†	TIG	Td†	TIG
Uncertain	Yes	No	Yes	Yes
0-1	Yes	No	Yes	Yes
2	Yes	No	Yes	No‡
3 or more	No§	No	No¶	No

*Important details are in the text.

†For children less than 7 years old DTP (DT, if pertussis vaccine is contraindicated) is preferred to tetanus toxoid alone. For persons 7 years old and older, Td is preferred to tetanus toxoid alone.

‡None, if wound is more than 24 hours old.

§Yes, if more than 10 years since last dose.

¶Yes, if more than 5 years since last dose. (More frequent boosters are not needed and can accentuate side effects.)

ACIP Recommendation for DTP – Continued

after complete primary tetanus immunization, boosters—even for wound management—need be given only every 10 years unless the wound is "tetanus prone" (e.g., a severe, deep puncture). In this case, a booster is appropriate if the patient has not received tetanus toxoid within the preceding 5 years. Antitoxin antibodies develop rapidly in persons who have previously received at least 2 doses of tetanus toxoid.

Persons who have not completed a full primary series of injections may require tetanus toxoid and passive immunization at the time of wound cleaning and debridement. It is not sufficient to ascertain only the interval since the most recent toxoid dose. A careful attempt should be made to determine whether a patient has previously completed primary immunization and, if not, how many doses have been given.

Td is the preferred preparation for active tetanus immunization in managing the wounds of patients 7 years old and older. This is to enhance diphtheria protection, since a large proportion of adults are susceptible. Thus, by taking advantage of acute health-care visits, such as for wound management, some patients can be protected who otherwise would remain susceptible. For routine wound management in children less than 7 years old, DTP (or DT, if pertussis immunization is contraindicated) should be used instead of Td or tetanus toxoid alone. Primary immunization should ultimately be completed in persons documented to have received fewer than the recommended number of doses including those given as part of wound management (Tables 1 and 2).

If passive immunization is needed, human tetanus immune globulin (TIG) is the product of choice. It provides longer protection than antitoxin of animal origin and causes few adverse reactions. The currently recommended prophylactic dose of TIG for wounds of average severity is 250 units intramuscularly. When tetanus toxoid and TIG are given concurrently, separate syringes and separate sites should be used. Most experts consider the use of adsorbed toxoid mandatory in this situation.

PERTUSSIS PROPHYLAXIS FOR CASE CONTACTS

Spread of pertussis can be limited by decreasing infectivity of the case and by protecting close contacts of that case. To shorten the period of infectivity, oral erythromycin is recommended for patients with clinical pertussis. Chemotherapy, however, probably does not affect the duration or severity of disease.

There are 2 possible approaches for protecting close contacts of patients with pertussis, such as children exposed in a household or day-care center—active immunization and chemoprophylaxis. Close contacts less than 7 years old who have not completed the 4-dose primary series of DTP injections or who have not received a dose of DTP within 3 years of exposure should be given a dose of vaccine. Children who will not have completed the primary series with this dose should receive further immunizations in accordance with the schedule in Table 1.

The usefulness of chemoprophylaxis with oral erythromycin has never been demonstrated. It may be prudent to consider a 7- to 10-day course of erythromycin in close contacts less than 1 year old and unimmunized close contacts less than 7 years old.

Prophylactic postexposure passive immunization is not recommended. Studies have shown that use of human pertussis immune globulin alters neither the incidence nor the severity of the illness.

ACIP Recommendation for DTP -- Continued

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Notice to Readers

Discontinuation of Duck Embryo Rabies Vaccine

On August 10, 1981, Eli Lilly and Company announced that it will cease domestic sales of its duck embryo rabies vaccine on November 30, 1981. Marketing outside the United States will terminate in the second quarter of 1982.

Reported by Eli Lilly and Company, Indianapolis, Indiana; and Viral Diseases Div, Center for Infectious Diseases, CDC.

Editorial Note: Duck embryo vaccine, exclusively produced and marketed by Eli Lilly and Company, has been widely used in the United States for over 2 decades for preexposure and post-exposure rabies prophylaxis. The only other rabies vaccine currently licensed for human use in the United States is the human diploid cell vaccine (HDCV), produced by Merieux Institute.

Duck Embryo Rabies Vaccine – Continued

Merieux's HDCV has been licensed and used in the United States since June 1980. This vaccine has proven to be highly immunogenic and to cause low reaction rates in recipients (*1*). However, the cost of HDCV is approximately twice that of post-exposure treatment with duck embryo vaccine. Also, HDCV is not directly available to the private medical sector but must be obtained through state health departments or their appointed representatives. Physicians requiring HDCV should contact their state epidemiologist or county health department.

Reference

1. CDC. Adverse reactions to human diploid cell rabies vaccine. MMWR 1980;29:609-10.

The Morbidity and Mortality Weekly Report, circulation 90,000, is published by the Centers for Disease Control, Atlanta, Georgia. The data in this report are provisional, based on weekly telegraphs to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Send reports to: Attn: Editor, Morbidity and Mortality Weekly Report, Centers for Disease Control, Atlanta, Georgia 30333.

Send mailing list additions, deletions and address changes to: Attn: Distribution Services, Management Analysis and Services Office, 1-SB-419, Centers for Disease Control, Atlanta, Georgia 30333. When requesting changes be sure to give your former address, including zip code and mailing list code number, or send an old address label.

With this issue of the MMWR, Anne D. Mather retires as Managing Editor. She joined CDC and the Bureau of Epidemiology's Editorial and Graphic Services Staff in October of 1975. Anne and her many talents will be greatly missed.

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