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MORBIDITY AND MORTALITY WEEKLY REPORT

Surveillance Summary

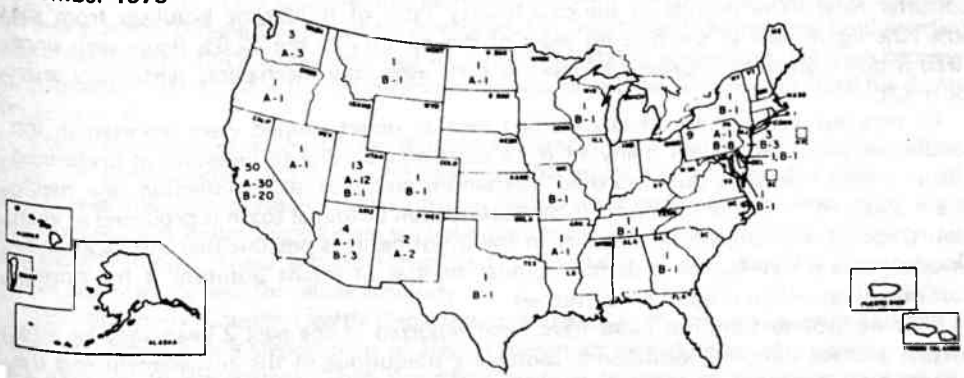
Botulism — United States, 1978

Cases of botulism in humans in the United States are now classified into 4 categories. Foodborne botulism, which caused the most reported cases in 1978, is an intoxication caused by ingestion of preformed botulinal toxin in contaminated food. Infant botulism, the most recently recognized form of botulism, is an intoxication caused by absorption of botulinal toxin produced *in vivo* in the intestinal tract of an infant after colonization and multiplication of *Clostridium botulinum* organisms. Wound botulism, the rarest form of botulism, results from elaboration of botulinal toxin *in vivo* after multiplication of *C. botullnum* in an infected, traumatized wound. Finally, there is an undetermined classification for those cases of botulism in individuals older than 12 months in which no food or wound source has been implicated.

Foodborne: Twelve outbreaks of foodborne botulism involving 58 cases occurred in the United States in 1978. This compares with 17 outbreaks with 80 cases in 1977 and an average of 7.9 outbreaks with 18.7 cases from 1970 through 1976. No changes from previous years were noted in the age distribution of cases in 1978 nor in the ratio of affected males to females. Of the 58 cases, 55 were due to *C. botulinum* type A toxin and 3 to type B toxin. The case-fatality rate of 5.2% (3 deaths) in 1978 approximated the 6.3% figure for 1977. In 1978 epidemiologically implicated foods, including those in which a laboratory confirmed the presence of toxin, included olives, vegetables, fish, spaghetti sauce, tamales, and pork and beans—all of which were home-processed.

Two large type A botulism outbreaks occurred in 1978. Thirty-four people contracted the disease after eating bean or potato salad at a private club in New Mexico (*1*), and 8 persons became ill after eating potato salad prepared at a restaurant in Colorado (*2*).

FIGURE 1. Cases of infant botulism by state and toxin type, January 1975 through December 1978



Botulism – Continued

Infant Botulism: Since the recognition of infant botulism as a disease entity (*3,4*), 21 states have reported a total of 98 laboratory-proven cases to CDC (Figure 1). In addition, single cases have been reported from England and Australia. The single 1975 case was identified retrospectively in 1976 (*5*). Fifteen cases were reported in 1976, and 43 cases in 1977. In 1978, 12 states reported 39 infant botulism cases, and cases were reported for the first time from Arkansas, Delaware, Georgia, Maryland, Missouri, and New Mexico.

Review of the data since 1975 shows no seasonality of infant botulism cases or of toxin type. Age at onset has ranged from 22 days to 8 months, with a median age of 2½ months. The geographic distribution of infant botulism cases by toxin type parallels the distribution of *C. botulinum* toxin types in the environment. Of the 18 cases east of the Mississippi River, 17 (94%) were type B; 52 (65%) of the 80 cases west of the Mississippi River were type A.

Regarding risk factors, a case-control study of 41 cases in California (*6*) showed that in 29.2% (both type A and B) the infants had received honey before the onset of constipation, but use of honey was significantly associated with only the type B cases ($p = 0.005$). In the same study the source of milk was evaluated, but the numbers of infants included in each feeding category (only breast milk, mainly breast milk, half breast milk and half formula, mainly formula, and only formula) were too small to allow for definitive statistical comparison.

Wound Botulism: Fourteen cases of wound botulism were reported in the 7-year period 1970–1976; none were reported in 1977 or 1978.

Classification Undetermined: This category includes illnesses in persons over 12 months old characterized by the symptoms and signs of botulism but for which no vehicle was identified. Ten unclassifiable outbreaks involving 13 persons were reported in 1978; 4 cases were associated with 1 outbreak, and the others were single-case outbreaks. This compares with 3 outbreaks, which involved a total of 5 cases, in 1977. An average of 3.3 such outbreaks involving an average of 7.1 cases occurred from 1970 through 1976.

Nine unclassifiable cases in 1978 were caused by type A toxin, while no toxin was recovered from 4 patients. In 1977, 2 of the 5 cases were caused by type A toxin, and in 3 no toxin was recovered. From 1970 through 1976, 29 type A cases, 3 type B cases, and 1 type E case were reported; no toxin was recovered in 16 cases.

Reported by Enterobacteriology Br, Bacteriology Div, Bur of Laboratories, Enteric Diseases Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: The decline in the case-fatality ratio of foodborne botulism from the 60%-70% figure seen in the first 50 years of this century to the 12.6% figure seen since 1970 is due mainly to improved supportive care, especially mechanical ventilatory assistance (*7*).

In previous years those cases classified here as undetermined were reported in the foodborne totals. Although many of these cases may be due to ingestion of preformed toxin, another possible but unproved mechanism could be toxicoinfection, the mechanism involved in infant botulism. In toxicoinfection botulinal toxin is produced *in vivo*, after *C. botulinum* organisms multiply in the intestine. It is possible that intoxication of an adult could develop in a manner similar to that of infant botulism if the normal host-microbial relationships were disturbed.

That no wound botulism cases have been reported in the past 2 years may be a reporting artifact. Since *C. botulinum* spores are ubiquitous in the environment and the sources of wounds seen in previous patients are not uncommon (auto, motorcycle, buckshot, handsaw, and machine part accidents), continued occurrence of cases would be

Botulism — Continued

expected. Search for a wound source should always be included in the evaluation of each patient with suspected botulism (*8*).

Infant botulism is now being recognized more frequently throughout the country. California, a state with a special surveillance system for infant botulism, reported all but 20% of the U.S. cases in 1976, while in 1978, 68% were reported from other states.

References

1. MMWR 27:138, 1978
2. MMWR 27:483, 1978
3. Pickett J, Berg B, Chaplain E, Brunstetter-Shafer MA: Syndrome of botulism in infancy: Clinical and electrophysiologic study. N Engl J Med 295:770-772, 1976
4. Arnon SS, Midura TF, Clay SA, Wood RM, Chin J: Infant botulism: Epidemiological, clinical and laboratory aspects. JAMA 237:1946-1951, 1977
5. MMWR 25:269, 1976
6. Arnon SS, Midura TF, Damus K, Thompson B, Wood RM, Chin J: Honey and other environmental risk factors for infant botulism. J Pediatr 94:331-336, 1979
7. CDC: Botulism in the United States, 1899-1973, Handbook for Epidemiologists, Clinicians, and Laboratory Workers. Atlanta, CDC, 1974
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Epidemiologic Notes and Reports

Human Rabies — Pennsylvania

The first case of human rabies in 1979 has been reported to CDC. On January 19, 1979, the diagnosis of rabies was made for a 50-year-old man from Wheeling, West Virginia, who had died on January 4.

The patient had been healthy until December 1, 1978, when he developed pain in his right scapula. Over the next 3 days the pain worsened and spread to his back and right arm, and after an episode of nausea and vomiting, he was admitted to a hospital in Wheeling with a presumptive diagnosis of a myocardial infarction. There, a myocardial infarction was ruled out by serial electrocardiograms and studies of cardiac enzymes. Two days after admission, he developed a fever of 38.3 C (101 F), was noted to have cool, mottled legs, and was transferred to a hospital in Pittsburgh, Pennsylvania, for evaluation of a possible dissecting thoracic aortic aneurysm. On admission he was noted to have persisting pain, weakness in his right wrist and hand, muscle fasciculations in his right arm, and mottling in his legs. Cardiac catherization with coronary angiography revealed coronary artery disease but no aortic aneurysm. On December 8, he became bradycardic, had a cardiorespiratory arrest, and had an episode of status epilepticus. He then became comatose and exhibited a flaccid paralysis. He was placed on a respirator until his death on January 4.

Cerebrospinal fluid (CSF) studies done on December 8 showed 26 polymorphonuclear cells, 44 lymphocytes, and a protein level of 104 mg/dl. At autopsy the diagnosis of rabies was made when eosinophilic inclusion bodies were noted within neurons by light microscopy and bullet-shaped viral particles consistent with a rhabdovirus were seen by electromicroscopy. There was no serum or CSF available at the time the diagnosis of rabies was made to test for rabies antibody.

The Allegheny County Health Department, Pittsburgh, Pennsylvania, with assistance from the Pennsylvania Department of Health, began an investigation of persons potentially exposed to the patient. They identified hospital contacts by reviewing medical records and consulting with hospital personnel. All contacts were interviewed, and those

Human Rabies – Continued

with open cuts or wounds or mucous membranes potentially in contact with saliva, tracheal secretions, or autopsy material were recommended to receive rabies postexposure treatment. A total of 371 hospital employees in Pittsburgh were interviewed; 186 of these were judged to have had probable exposure and were advised to receive rabies postexposure treatment. Of these contacts 166 are being treated with human rabies immune globulin (HRIG) and duck embryo vaccine (DEV). Three persons were begun on HRIG and Wyeth Laboratories experimental human diploid cell strain rabies vaccine (HDCS) because of allergies to DEV. Ten elected not to receive therapy, and 7 started but later discontinued therapy. The Wheeling-Ohio County (West Virginia) Health Department identified persons who had had contact with the patient in Wheeling and advised them to discuss with their private physician the need for treatment. Four persons were begun on DEV and HRIG.

No clear source of rabies for this case has been identified. According to family, friends, and work associates, he had no known animal bites and did not have significant risk of rabies exposure in his work as a carpenter or in his recreational activities. On November 20, 1978, he had gone deer hunting but had no known exposure to the deer his companions had shot or to other wild animals. There were no animals reported rabid in the patient's county of residence in 1977 or 1978. In the 5 surrounding counties in 1977 and 1978, 1 skunk was reported rabid.

(Continued on page 81)

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

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

DISEASE	7th WEEK ENDING		MEDIAN	CUMULATIVE, FIRST 7 WEEKS		
	February 17, 1978	February 18, 1978*	1974-1978**	February 17, 1978	February 18, 1978*	MEDIAN 1974-1978**
Aseptic meningitis	36	48	33	330	274	257
Brucellosis	1	5	5	7	17	19
Chickenpox	4,823	3,934	4,454	35,314	24,423	25,382
Diphtheria	–	4	4	18	12	12
Encephalitis: Primary (arthropod borne & unspec.)	4	8	19	60	62	86
Post-infectious	1	2	4	13	20	26
Hepatitis, Viral: Type B	155	270	219	1,526	1,949	1,741
Type A	477	541	689	3,501	3,539	4,701
Type unspecified	178	146	149	1,307	1,050	1,055
Malaria	7	4	5	45	56	36
Measles (rubeola)	200	401	528	1,153	1,910	2,977
Meningococcal infections: Total	47	57	36	364	335	229
Civilian	47	56	34	364	333	222
Military	–	1	1	–	2	2
Mumps	304	374	1,263	2,027	2,603	7,945
Pertussis	30	41	28	201	316	177
Rubella (German measles)	173	285	386	837	1,107	1,552
Tetanus	2	1	1	4	4	7
Tuberculosis	401	475	542	3,280	3,119	3,505
Tularemia	1	–	–	15	12	12
Typhoid fever	4	15	6	34	38	41
Typhus fever, tick borne (Rky. Mt. spotted)	2	1	–	17	6	9
Venereal diseases:						
Gonorrhea: Civilian	12,805	16,548	17,148	119,280	122,685	129,326
Military	448	353	488	3,436	3,213	4,015
Syphilis, primary & secondary: Civilian	318	338	444	2,865	2,584	3,118
Military	8	4	4	38	35	42
Rabies in animals	45	61	34	305	304	288

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1978		CUM. 1978
Anthrax	–	Poliomyelitis: Total	2
Botulism	3	Paralytic	2
Congenital rubella syndrome	3	Psittacosis † (Tenn. 1)	15
Leprosy † (Tex. 2)	24	Rabies in man	1
Leptospirosis (Wyo. 1)	10	Trichinosis † (Mass. 3)	6
Plague	1	Typhus fever, flea-borne (endemic, murine) (Tex. 1)	2

*Delayed reports received for calendar year 1978 are used to update last year's weekly and cumulative totals.

**Medians for gonorrhea and syphilis are based on data for 1976-1978.

†The following delayed reports will be reflected in next week's cumulative totals: Leprosy: Fla. 3, Calif. 2; Psittacosis: Calif. 1; Trichinosis: Calif. 1.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending February 17, 1979, and February 18, 1978 (7th week)

REPORTING AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKENPOX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-infectious	B	A	Unspecified		
	1978	1978	1978	1978	CUM. 1978	1978	1978*	1978	1978	1978	1978	1978	CUM. 1978
UNITED STATES	36	1	4,823	-	18	4	8	1	155	477	178	7	45
NEW ENGLAND	3	-	1,153	-	-	-	-	-	11	23	10	-	3
Maine	-	-	117	-	-	-	-	-	-	-	-	-	-
N.H.	-	-	17	-	-	-	-	-	-	2	-	-	-
Vt.	-	-	-	-	-	-	-	-	-	4	1	-	-
Mass.	-	-	555	-	-	-	-	-	1	11	9	-	-
R.I.	2	-	194	-	-	-	-	-	-	3	-	-	3
Conn.	1	-	270	-	-	-	-	-	10	3	-	-	-
MID. ATLANTIC	4	-	471	-	-	-	1	-	16	33	12	1	5
Upstate N.Y.	1	-	191	-	-	-	-	-	4	19	5	-	2
N.Y. City	3	-	63	-	-	-	-	-	5	4	4	1	3
N.J.	-	-	NN	-	-	-	1	-	7	10	3	-	-
Pa.†	-	-	217	-	-	-	-	-	-	-	-	-	-
E.N. CENTRAL	4	-	1,744	-	-	1	4	1	26	69	12	1	2
Ohio	-	-	273	-	-	-	1	-	5	13	-	-	1
Ind.†	1	-	-	-	-	-	-	-	1	3	2	-	-
Ill.	-	-	221	-	-	-	-	-	8	19	1	-	-
Mich.	2	-	728	-	-	1	3	-	11	28	9	1	1
Wis.	1	-	522	-	-	-	-	-	1	6	-	-	-
W.N. CENTRAL	-	-	682	-	-	-	2	-	27	52	7	3	4
Minn.	-	-	3	-	-	-	-	-	4	17	-	2	3
Iowa	-	-	415	-	-	-	-	-	2	5	1	-	-
Mo.	-	-	70	-	-	-	2	-	13	6	5	1	1
N. Dak.	-	-	-	-	-	-	-	-	-	1	-	-	-
S. Dak.	-	-	-	-	-	-	-	-	-	13	-	-	-
Nebr.	-	-	-	-	-	-	-	-	3	8	-	-	-
Kans.	-	-	194	-	-	-	-	-	5	2	1	-	-
S. ATLANTIC	1	-	164	-	-	1	-	-	20	32	11	-	8
Del.	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-
Md.	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	2
D.C.	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	2
Va.†	1	-	12	-	-	-	-	-	11	6	6	-	3
W. Va.†	-	-	134	-	-	-	-	-	2	-	-	-	-
N.C.	-	-	NN	-	-	1	-	-	4	9	3	-	-
S.C.†	-	-	6	-	-	-	-	-	1	10	-	-	-
Ga.	-	-	-	-	-	-	-	-	-	-	-	-	-
Fla.	-	-	12	-	-	-	-	-	2	7	2	-	1
E.S. CENTRAL	11	1	191	-	-	2	-	-	18	32	6	-	-
Ky.	2	-	162	-	-	-	-	-	2	5	3	-	-
Tenn.	2	1	NN	-	-	1	-	-	16	23	2	-	-
Ala.†	7	-	18	-	-	1	-	-	-	1	1	-	-
Miss.	-	-	11	-	-	-	-	-	-	3	-	-	-
W.S. CENTRAL	8	-	156	-	-	-	1	-	14	104	47	1	5
Ark.	-	-	-	-	-	-	1	-	2	2	1	-	1
La.	2	-	NN	-	-	-	-	-	3	13	4	-	-
Okla.	-	-	-	-	-	-	-	-	1	1	2	-	-
Tex.	6	-	156	-	-	-	-	-	8	88	40	1	4
MOUNTAIN	-	-	84	-	1	-	-	-	17	110	66	-	-
Mont.	-	-	28	-	-	-	-	-	-	11	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	9	1	-	-
Wyo.	-	-	-	-	-	-	-	-	-	1	-	-	-
Colo.	-	-	56	-	-	-	-	-	7	14	1	-	-
N. Mex.†	-	-	-	-	-	-	-	-	3	24	3	-	-
Ariz.	-	-	NN	-	1	-	-	-	4	42	58	-	-
Utah	-	-	-	-	-	-	-	-	1	5	1	-	-
Nev.	-	-	-	-	-	-	-	-	2	4	2	-	-
PACIFIC	5	-	178	-	17	-	-	-	6	22	7	1	18
Wash.	-	-	146	-	17	-	-	-	1	13	4	-	-
Oreg.	4	-	1	-	-	-	-	-	2	4	2	-	2
Calif. †	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	15
Alaska	-	-	15	-	-	-	-	-	-	4	1	-	-
Hawaii	1	-	16	-	-	-	-	-	3	1	-	1	1
Guam†	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-
P.R.	2	-	11	-	-	-	-	-	1	3	3	-	-
V.I.	-	-	-	-	-	-	-	-	-	-	-	-	-
Pac. Trust Terr.	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-

NN: Not notifiable. NA: Not available.

*Delayed reports received for 1978 are not shown below but are used to update last year's weekly and cumulative totals.

†The following delayed reports will be reflected in next week's cumulative totals: Asep. meng.: Calif. +17; Bruc.: Ala. −1, Calif. +2; Chickenpox: Pa. +137, Ind. +614, W. Va. +7, Calif. +87, Guam +2; Diph.: Calif. +1; Enceph.: Calif. +3; Hep. B: S.C. +1, Calif. +52, Guam +1; Hep. A: Va. −1, S.C. −1, N. Mex. −1, Calif. +80, Guam +1; Hep. unsp.: Calif. +34; Malaria: Calif. +1.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending February 17, 1979, and February 18, 1978 (7th week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1979	CUM. 1979	CUM. 1978*	1979	CUM. 1979	CUM. 1978*	1979	CUM. 1979	1979	1979	CUM. 1979	CUM. 1979
UNITED STATES	200	1,153	1,910	47	364	335	304	2,027	30	173	807	4
NEW ENGLAND	16	99	59	1	8	21	32	108	3	42	129	-
Maine	-	-	24	-	-	3	18	59	1	1	10	-
N.H.	-	1	6	-	1	2	-	2	-	3	11	-
Vt.	-	2	5	-	-	-	-	3	-	10	40	-
Mass.	-	-	23	-	3	9	-	6	2	15	53	-
R.I.	16	96	-	-	-	3	-	5	-	3	3	-
Conn.	-	-	1	1	4	4	14	33	-	10	12	-
MID. ATLANTIC	10	77	136	4	50	42	15	113	4	38	121	1
Upstate N.Y.	26	54	74	2	24	16	2	27	3	9	35	1
N.Y. City	3	18	32	2	15	13	1	19	1	1	8	-
N.J.	-	-	1	-	9	5	6	46	-	-	37	-
Pa.†	1	5	29	-	2	8	6	21	-	28	41	-
E.N. CENTRAL	54	261	937	4	34	31	125	811	9	42	217	1
Ohio	-	2	5	1	10	2	72	249	5	-	10	-
Ind.†	-	20	28	2	9	9	-	45	-	-	31	-
Ill.	8	54	129	-	-	6	4	108	3	5	21	-
Mich.	27	139	731	-	12	13	14	137	1	35	128	1
Wis.†	19	46	44	1	3	2	35	272	-	2	27	-
W.N. CENTRAL	69	171	21	2	9	12	13	107	-	6	30	-
Minn.	-	11	2	-	1	2	-	1	-	-	-	-
Iowa	-	1	6	-	3	1	6	37	-	2	2	-
Mo.	46	151	1	2	4	8	3	26	-	-	4	-
N. Dak.	-	1	-	-	-	-	-	1	-	-	4	-
S. Dak.	-	-	-	-	-	-	-	1	-	-	-	-
Nebr.	-	-	1	-	-	-	-	2	-	-	-	-
Kans.	3	7	10	-	1	1	4	39	-	4	20	-
S. ATLANTIC	3	80	398	10	98	99	5	65	1	20	78	-
Del.	NA	-	3	-	2	-	NA	4	NA	NA	-	-
Md.	NA	1	-	-	4	3	NA	3	NA	NA	-	-
D.C.	NA	-	-	-	-	-	NA	1	NA	NA	-	-
Va.†	2	11	234	2	14	10	4	22	1	-	3	-
W. Va.†	-	22	77	-	3	3	1	13	-	12	30	-
N.C.	1	2	23	4	18	22	-	4	-	7	15	-
S.C.†	-	-	38	4	45	10	-	1	-	-	-	-
Ga.	-	1	-	-	18	13	-	1	-	-	-	-
Fla.	-	43	23	-	24	38	-	16	-	1	30	-
E.S. CENTRAL	12	26	169	5	31	23	17	358	2	11	39	1
Ky.	2	7	32	2	10	8	5	311	-	1	12	-
Tenn.	2	6	109	1	9	8	12	30	2	8	11	-
Ala.†	8	12	1	-	5	6	-	4	-	2	9	1
Miss.	-	1	27	2	7	1	-	13	-	-	7	-
W.S. CENTRAL	18	127	82	14	67	49	55	270	2	3	24	1
Ark.	1	5	1	-	4	6	2	78	-	-	-	1
La.	8	14	20	12	34	6	1	8	-	-	-	-
Okla.	-	-	3	1	6	3	-	-	-	1	3	-
Tex.	9	108	58	1	23	25	52	184	2	2	21	-
MOUNTAIN	1	48	35	3	23	4	5	56	9	7	25	-
Mont.	-	15	22	-	2	1	1	5	2	1	11	-
Idaho	1	1	1	-	1	-	-	-	-	6	8	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-	-
Colo.	-	3	5	1	1	-	3	35	3	-	2	-
N. Mex.	-	10	-	-	2	1	-	-	3	-	-	-
Ariz.	-	2	4	2	14	2	1	6	1	-	4	-
Utah	-	15	1	-	2	-	-	4	-	-	-	-
Nev.	-	2	2	-	1	-	-	6	-	-	-	-
PACIFIC	17	264	73	4	44	63	37	139	-	4	144	-
Wash.†	16	190	12	2	5	11	22	64	-	3	27	-
Oreg.	-	3	1	2	4	3	-	18	-	-	10	-
Calif.†	NA	63	59	-	33	46	NA	53	NA	NA	105	-
Alaska	-	-	-	-	-	1	1	4	-	-	-	-
Hawaii	1	8	1	-	2	-	1	7	-	1	2	-
Guam	NA	-	1	-	-	-	NA	-	NA	NA	-	-
P.R.	5	12	27	-	-	-	27	62	1	-	2	-
V.I.	-	1	1	-	-	-	-	-	-	-	-	-
Pac. Trust Terr.	NA	2	186	-	1	2	NA	4	NA	NA	-	-

NA: Not available.

*Delayed reports received for 1978 are not shown below but are used to update last year's weekly and cumulative totals.

†The following delayed reports will be reflected in next week's cumulative totals: Measles: Pa. +1, Ind. +4, Va. -2, S.C. +9, Ala. +4, Calif. +23; Men. inf.: Wis. -1, Wash. +2, Calif. +13; Mumps: Pa. +5, Ind. +19, Calif. +6; Pertussis: Ind. +4, Calif. +4; Rubella: Pa. +5, Ind. +25, W. Va. +2, Calif. +53.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending February 17, 1979, and February 18, 1978 (7th week)

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
	1979	CUM. 1979	CUM. 1979	1979	CUM. 1979	1979	CUM. 1979	1979	CUM. 1978	CUM. 1978*	1979	CUM. 1979	CUM. 1978*	CUM. 1978
UNITED STATES	401	3,280	15	4	34	2	17	12,805	119,280	122,685	318	2,865	2,584	305
NEW ENGLAND	15	101	-	-	6	-	-	560	3,581	2,931	16	67	75	6
Maine	1	8	-	-	-	-	-	32	248	206	1	1	1	6
N.H.†	-	1	-	-	-	-	-	11	101	141	-	2	1	-
Vt.	-	3	-	-	-	-	-	7	54	91	-	-	-	-
Mass.	13	59	-	-	4	-	-	227	1,518	1,350	7	44	52	-
R.I.	1	10	-	-	1	-	-	40	286	144	1	1	1	-
Conn.	-	20	-	-	1	-	-	243	1,374	999	7	19	20	-
MID. ATLANTIC	80	550	-	-	6	2	3	1,429	13,071	13,166	31	461	349	2
Upstate N.Y.	14	93	-	-	2	2	3	453	2,552	1,622	9	39	19	2
N.Y. City	29	217	-	-	2	-	-	NA	4,520	5,392	NA	303	243	-
N.J.	14	102	-	-	1	-	-	121	2,481	2,480	6	67	47	-
Pa.†	23	138	-	-	1	-	-	855	3,518	3,672	16	52	40	-
E.N. CENTRAL	64	483	-	-	4	-	2	1,507	16,389	16,675	26	284	229	18
Ohio	7	96	-	-	-	-	2	720	5,484	4,844	22	96	28	1
Ind.†	12	77	-	-	-	-	-	170	1,391	2,027	2	19	18	1
Ill.	23	189	-	-	2	-	-	393	3,748	4,071	-	111	149	13
Mich.	16	102	-	-	2	-	-	NA	4,012	4,157	NA	43	25	-
Wis.	6	19	-	-	-	-	-	224	1,754	1,576	2	15	9	3
W.N. CENTRAL	19	128	6	-	-	-	1	769	5,999	6,095	16	45	45	67
Minn.	2	19	-	-	-	-	-	149	1,037	1,103	7	19	9	13
Iowa	3	17	-	-	-	-	-	126	817	842	-	4	5	22
Mo.	12	66	5	-	-	-	-	277	2,470	2,291	6	14	18	15
N. Dak.	-	2	-	-	-	-	-	9	97	155	-	-	-	4
S. Dak.	-	6	-	-	-	-	-	24	227	256	-	-	1	8
Nebr.	-	2	1	-	-	-	-	60	368	480	-	-	1	-
Kans.	2	16	-	-	-	-	1	124	983	968	3	8	11	5
S. ATLANTIC	91	765	-	-	2	-	7	3,129	30,011	29,672	100	801	696	45
Del.	NA	8	-	NA	-	NA	-	NA	420	630	NA	4	3	-
Md.	NA	115	-	NA	-	NA	4	NA	3,314	4,155	NA	46	49	-
D.C.	NA	41	-	NA	1	NA	-	NA	1,625	1,964	NA	59	57	-
Va.	12	86	-	-	-	-	-	377	2,936	2,665	9	82	66	-
W. Va.	6	30	-	-	-	-	-	88	479	461	-	16	-	-
N.C.	10	119	-	-	-	-	2	746	4,708	3,834	12	83	61	-
S.C.	4	22	-	-	-	-	1	416	2,739	2,491	8	48	29	11
Ga.	13	122	-	-	-	-	-	719	5,696	5,702	23	202	174	34
Fla.	46	222	-	-	1	-	-	783	8,094	7,774	48	261	257	-
E.S. CENTRAL	32	295	2	-	3	-	3	1,602	11,503	10,444	45	239	104	11
Ky.	-	47	-	-	2	-	-	234	1,619	1,182	5	23	13	6
Tenn.	2	70	2	-	-	-	-	520	3,951	3,522	24	112	35	3
Ala.	12	74	-	-	1	-	3	512	3,500	3,313	10	43	16	2
Miss.	18	104	-	-	-	-	-	336	2,433	2,427	6	61	40	-
W.S. CENTRAL	75	384	2	2	3	-	-	2,380	17,572	17,772	78	510	405	131
Ark.	3	14	2	-	-	-	-	336	1,584	1,004	2	17	23	34
La.	27	90	-	-	-	-	-	485	3,076	2,635	20	101	67	-
Okla.	4	59	-	-	-	-	-	160	1,495	1,554	1	8	17	23
Tex.†	41	221	-	2	3	-	-	1,359	11,417	12,579	55	384	298	74
MOUNTAIN	15	100	5	-	1	-	1	840	5,185	4,366	-	45	56	1
Mont.	-	3	-	-	-	-	-	29	220	320	-	1	-	-
Idaho	-	2	-	-	-	-	-	44	226	149	-	3	-	-
Wyo.	1	4	-	-	-	-	-	32	143	87	-	3	3	-
Colo.†	-	-	-	-	-	-	-	200	1,358	1,252	-	21	20	-
N. Mex.	3	18	1	-	-	-	-	94	715	630	-	6	13	-
Ariz.	8	58	-	-	-	-	-	320	1,546	981	-	6	11	1
Utah	2	3	4	-	-	-	-	49	244	260	-	-	2	-
Nev.	1	12	-	-	1	-	1	75	733	687	-	5	7	-
PACIFIC	10	474	-	2	9	-	-	589	15,969	21,564	6	413	625	24
Wash.	-	4	-	-	-	-	-	298	1,851	1,372	NA	19	23	-
Oreg.	8	32	-	-	-	-	-	150	1,510	1,481	4	24	13	-
Calif.†	NA	390	-	NA	5	NA	-	NA	11,632	17,726	NA	361	580	24
Alaska	-	9	-	-	-	-	-	78	643	599	-	2	2	-
Hawaii	2	39	-	2	4	-	-	63	333	386	2	7	7	-
Guam†	NA	-	-	NA	-	NA	-	NA	-	15	NA	-	-	-
P.R.	9	40	-	-	-	-	-	23	222	350	10	73	53	-
V.I.	-	-	-	-	-	-	-	6	21	40	-	-	3	-
Pac. Trust Terr.	NA	6	-	NA	-	NA	-	NA	34	68	NA	-	-	-

NA: Not available.

*Delayed reports received for 1978 are not shown below but are used to update last year's weekly and cumulative totals.

†The following delayed reports will be reflected in next week's cumulative totals. TB: Pa. +29, Calif. +74, Guam +1; Tularemia: Calif. +1; T. fever: Tex. - 1, Calif. +3; GC: Pa. +296 civ., Ind. +32 civ., Calif. +3093 civ., +88 mil., Guam +3, civ., +3 mil.; Syphilis: Ind. +1 civ., Colo. - 3 civ. +1 mil., Calif. +86 civ.; An. rabies: N.H. +1, Calif. +12.

TABLE IV. Deaths in 121 U.S. cities,* week ending February 17, 1979 (7th week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	≤1	
NEW ENGLAND	675	418	180	32	24	40
Boston, Mass.	203	118	53	14	5	13
Bridgeport, Conn.	51	34	13	1	2	–
Cambridge, Mass.	25	19	5	1	–	1
Fall River, Mass.	26	20	6	–	–	–
Hartford, Conn.	47	28	11	4	3	3
Lowell, Mass.	33	19	10	3	–	3
Lynn, Mass.	12	7	5	–	–	1
New Bedford, Mass.	17	12	5	–	–	–
New Haven, Conn.	65	43	14	1	5	1
Providence, R.I.	66	38	19	3	5	5
Somerville, Mass.	7	4	3	–	–	–
Springfield, Mass.	38	26	11	–	1	2
Waterbury, Conn.	29	17	9	2	1	4
Worcester, Mass.	56	33	16	3	2	7
MID. ATLANTIC	2,317	1,515	578	119	52	98
Albany, N.Y.	40	25	11	–	3	–
Allentown, Pa.††	21	14	6	1	–	1
Buffalo, N.Y.	135	88	31	5	7	5
Camden, N.J.	30	22	7	–	1	–
Elizabeth, N.J.	30	23	5	2	–	1
Erie, Pa.†	32	19	10	1	2	1
Jersey City, N.J.	68	45	18	3	–	2
Newark, N.J.	66	35	20	8	1	4
N.Y. City, N.Y.	1,532	1,010	366	84	32	67
Paterson, N.J.	45	18	20	4	3	–
Philadelphia, Pa.†	195	127	41	15	6	14
Pittsburgh, Pa.†	79	41	28	4	3	3
Reading, Pa.	34	24	9	–	1	4
Rochester, N.Y.	115	72	34	5	1	6
Schenectady, N.Y.	38	26	9	3	–	–
Scranton, Pa.†	31	28	1	1	1	1
Syracuse, N.Y.	89	59	25	2	3	2
Trenton, N.J.	33	24	9	–	–	2
Utica, N.Y.	20	15	3	1	–	2
Yonkers, N.Y.	21	15	5	1	–	2
E.N. CENTRAL	2,274	1,391	572	151	80	77
Akron, Ohio	72	40	21	3	6	–
Canton, Ohio	19	13	5	–	1	–
Chicago, Ill.	572	333	150	52	19	15
Cincinnati, Ohio	159	102	37	9	7	4
Cleveland, Ohio	187	102	63	11	5	7
Columbus, Ohio	133	67	38	10	9	3
Dayton, Ohio	96	58	22	5	3	2
Detroit, Mich.	259	157	63	20	9	9
Evansville, Ind.	38	28	7	–	3	6
Fort Wayne, Ind.	50	33	11	2	1	7
Gary, Ind.	24	14	7	2	–	–
Grand Rapids, Mich.	55	40	10	2	1	3
Indianapolis, Ind.	152	95	37	7	6	2
Madison, Wis.	44	34	7	1	–	5
Milwaukee, Wis.	144	95	31	11	5	3
Peoria, Ill.	32	17	11	2	2	6
Rockford, Ill.	37	20	10	5	2	1
South Bend, Ind.††	45	31	10	2	1	3
Toledo, Ohio	87	65	13	5	–	1
Youngstown, Ohio	69	47	19	2	–	–
W.N. CENTRAL	741	488	159	37	27	26
Des Moines, Iowa	60	43	9	4	2	–
Duluth, Minn.	26	21	4	–	1	–
Kansas City, Kans.	49	28	13	4	1	1
Kansas City, Mo.	113	78	26	4	3	7
Lincoln, Nebr.	33	21	8	2	1	5
Minneapolis, Minn.	112	72	18	9	4	3
Omaha, Nebr.	84	58	16	4	2	2
St. Louis, Mo.	141	81	40	5	8	4
St. Paul, Minn.	54	42	7	2	2	–
Wichita, Kans.	69	44	18	3	3	4

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	≤1	
S. ATLANTIC	1,211	742	305	61	60	51
Atlanta, Ga.	166	85	32	14	24	3
Baltimore, Md.††	225	136	58	12	10	5
Charlotte, N.C.	67	37	16	3	7	4
Jacksonville, Fla.	69	47	15	3	3	3
Miami, Fla.	150	99	35	10	5	5
Norfolk, Va.	64	33	21	5	1	6
Richmond, Va.	98	56	36	1	2	5
Savannah, Ga.	35	19	13	1	–	3
St. Petersburg, Fla.	121	105	12	2	1	7
Tampa, Fla.	93	57	25	4	4	7
Washington, D.C.	70	36	28	4	1	1
Wilmington, Del.††	53	32	14	2	2	2
E.S. CENTRAL	779	466	206	52	19	25
Birmingham, Ala.	124	75	28	8	6	2
Chattanooga, Tenn.	56	35	17	3	–	3
Knoxville, Tenn.	58	42	13	1	1	1
Louisville, Ky.	113	62	34	9	2	7
Memphis, Tenn.	186	112	56	8	3	2
Mobile, Ala.	76	45	12	12	1	5
Montgomery, Ala.	44	26	13	2	1	1
Nashville, Tenn.	122	69	33	9	5	4
W.S. CENTRAL	1,355	768	354	104	68	50
Austin, Tex.	55	36	13	5	–	9
Baton Rouge, La.	45	21	11	9	–	2
Corpus Christi, Tex.	35	25	10	–	–	3
Dallas, Tex.	181	107	44	15	11	5
El Paso, Tex.	51	29	13	4	5	1
Fort Worth, Tex.	70	49	17	–	3	2
Houston, Tex.	339	173	98	33	17	8
Little Rock, Ark.††	68	38	18	5	4	4
New Orleans, La.	235	113	71	20	15	–
San Antonio, Tex.	157	108	28	7	6	4
Shreveport, La.	52	25	14	3	7	7
Tulsa, Okla.	67	44	17	3	–	5
MOUNTAIN	606	359	147	45	30	22
Albuquerque, N. Mex.	58	26	17	10	2	3
Colo. Springs, Colo.	36	23	6	3	1	2
Denver, Colo.	123	73	24	11	12	6
Las Vegas, Nev.	63	43	12	4	–	4
Ogden, Utah	15	12	2	1	–	1
Phoenix, Ariz.	160	99	38	9	6	1
Pueblo, Colo.	19	13	4	2	–	4
Salt Lake City, Utah	48	24	17	2	5	1
Tucson, Ariz.	84	46	27	3	4	–
PACIFIC	1,757	1,138	410	105	50	43
Berkeley, Calif.	18	14	1	2	–	–
Fresno, Calif.	69	43	16	7	2	4
Glendale, Calif.	19	15	4	–	–	–
Honolulu, Hawaii	66	32	21	3	1	2
Long Beach, Calif.	106	69	27	6	2	3
Los Angeles, Calif.	414	279	92	24	8	10
Oakland, Calif.	76	50	19	2	2	5
Pasadena, Calif.	33	27	5	–	1	2
Portland, Oreg.	141	97	36	2	3	–
Sacramento, Calif.	78	46	19	8	–	–
San Diego, Calif.	177	93	51	16	7	3
San Francisco, Calif.	163	112	33	8	4	–
San Jose, Calif.	156	100	37	12	1	4
Seattle, Wash.	157	96	33	9	15	5
Spokane, Wash.	59	41	11	4	2	3
Tacoma, Wash.	31	24	5	–	2	2
TOTAL	11,715	7,285	2,911	706	410	432
Expected Number	11,663	7,279	2,914	686	416	474

*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, there will now be 117 cities involved in the generation of the expected values used to monitor pneumonia and influenza activity in the United States. Data from these 4 cities will appear in the tables but will not be included in the totals for the United States and the Middle Atlantic Region.

††Data not available. Figures are estimates based on average percent of regional totals.

Human Rabies – Continued

Reported by J Hanrahan, MD, C Lamas, MD, A Stavrides, MD, Western Pennsylvania Hospital; AJ Martinez, MD, Pennsylvania Presbyterian Hospital, University of Pittsburgh, Pittsburgh; I Chaudry, DVM, MPH, FB Clark, VMD, MPH, NM Richards, MD, E Streiff, RN, MPH, Allegheny County Health Dept, Pittsburgh; JE Klemm, TL Thomas, MD, Wheeling-Ohio County Health Dept, West Virginia; W Parkin, DVM, DrPH, State Epidemiologist, EJ Witte, DVM, Pennsylvania Dept of Health; Pathology Div, Bur of Laboratories, Field Services Div, Respiratory and Special Pathogens Br, Viral Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: This is the third case of human rabies since August 1978 in which the diagnosis was not suspected until after death. None of the 3 patients manifested the excitement, agitation, difficulty swallowing, hydrophobia, or history of an animal bite classically associated with rabies. Without these classical findings most physicians probably would not suspect rabies, and in some cases each year the diagnosis is probably never made.

A postmortem diagnosis of rabies is facilitated by the availability of fresh or frozen material for fluorescent-antibody staining and virus isolation. However, in this case only fixed material was available, and the diagnosis rested on identifying the characteristic eosinophilic inclusions (Negri bodies) by light microscopy and the rhabdovirus by electron microscopy. The microscopic characteristics and distribution of Negri bodies and the associated encephalitis are quite specific for rabies (*1*). Except for rabies and the rabies-related viruses from North Africa, e.g., Mokola virus (*2*), no rhabdovirus is known to cause an encephalitis in humans. Thus, the combination of identifying Negri bodies by light microscopy and rhabdovirus by electron microscopy can be used to diagnose rabies on fixed brain material. If available, serum or CSF could also be used to identify rabies antibodies and thus make a postmortem diagnosis of rabies.

Documented presence of virus in saliva and other body fluids of patients dying from rabies (*3*) and reported transmission of rabies by non-bite exposures from other animals (*3*) suggest that rabies can be transmitted from person to person, although the risk is very low.

The difficulty persons had in remembering the circumstances of their contact with the patient, which had occurred 15-43 days earlier, and the many days the patient was hospitalized in an intensive care unit and not on isolation precautions led to the recommendation that many people receive rabies postexposure treatment.

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3. Hattwick MAW, Gregg MB: The disease in man, in Baer GM (ed): The Natural History of Rabies. New York, Academic Press, 1975, pp 281-304

Reye Syndrome Outbreak – Michigan

Since February 2, 1979, 15 children with confirmed diagnoses of Reye syndrome and 2 with suspected diagnoses have been admitted to 4 hospitals in Michigan and 1 hospital in Toledo, Ohio. One patient has died. All the children are from an 8-county (Hillsdale, Monroe, Wayne, Lenawee, Livingston, Macomb, Oakland, and Ingham) area in southern Michigan. Of the 4 patients from Hillsdale County, 3 attend the same school; 2 are half brothers. The age range of the patients is 20 months to 16 years; all but 1 case involve school-aged children. Nine of the patients are female.

Reye Syndrome — Continued

All the children experienced an influenza-like illness several days before onset of Reye syndrome. Influenza A (H1N1) virus was isolated from 1 patient; cultures and serology are pending on the other cases. Multiple schools in the 6 counties have reported increased absenteeism due to influenza-like illness. In addition, 2 counties, Lenawee and Livingston, have reported isolates of influenza A (H1N1). Studies are now underway to determine the extent of the outbreak and whether or not there is a further association with influenza type A.

Reported by NS Hayner, MD, State Epidemiologist, Michigan Dept of Public Health; J Baublis, MD, Dept of Pediatrics, University of Michigan School of Medicine; EL Arcinue, MD, Reye Syndrome Research Center, Michigan Children's Hospital, Detroit, Michigan; Immunization Div, Bur of State Services, Enteric and Neurotropic Viral Diseases Br, Viral Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: This is the fourth outbreak of Reye syndrome reported in 1979 (*1*); preliminary evidence suggests that the other outbreaks were also associated with outbreaks of influenza-like illness. To date, 85 cases of Reye syndrome have been reported to the CDC since December 1, 1978. Cases have been reported from 18 states. Many of the sporadic cases have also been reported from areas reporting influenza A activity.

Reference

1. MMWR 28:4, 1979

Pseudobacteremia due to *Staphylococcus aureus* — New York

In the period June 15-19, 1978, 11 patients in a New York community hospital had blood cultures positive for *Staphylococcus aureus*. Four of the 11 patients had more than 1 positive culture for *S. aureus*. All patients, except 1 premature infant, were febrile at the time cultures were obtained but had been admitted for a variety of reasons, including orthopedic injuries, cardiovascular diseases, and cerebrovascular disease. The patients were hospitalized on 4 different services, and none had *S. aureus* isolated from any site other than blood. Five of the 11 patients were placed on antimicrobial therapy for *S. aureus* infection.

Blood cultures in this hospital are initially inoculated into Brucella Broth.* At the time of the outbreak, specimens were subcultured routinely with a sterile applicator after a 24-hour incubation period to inoculate blood and chocolate agar plates. Investigation revealed that only subculture specimens were positive for *S. aureus*, while the original culture bottles remained sterile.

One of 7 technicians had subcultured all 31 blood-culture specimens on the 4 days involved. Nasopharyngeal cultures of this technician, who remained asymptomatic, revealed *S. aureus*, phage type 94/96, the same type as 8 of the 9 blood-culture isolates that were phage typed. Cultures from other laboratory personnel, the original blood-culture broth media, and subsequent blood cultures from involved patients were all negative for *S. aureus*. The implicated technician had nasopharyngeal cultures negative for *S. aureus* at the 1-week follow-up culture, and further cultures were not performed. Laboratory procedures were changed to avoid opening the original blood-culture bottles to the air during the subculturing, and no further cases of *S. aureus* pseudobacteremia have occurred.

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*Use of trade names is for identification only and does not constitute endorsement by the Public Health Service, U.S. Department of Health, Education, and Welfare.

Pseudobacteremia – Continued

Reported by J Dolan, MT, GR Joachim, MD, A Khapra, MD, Oceanside, New York; P Greenwald, MD, Acting State Epidemiologist, New York State Dept of Health; Hospital Infections Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: Outbreaks of pseudobacteremia due to contamination of blood cultures have been reported occasionally, but the contamination has usually been traced to a source in the inanimate environment such as contaminated media, disinfecting agents, and mist tents (*1-4*). The probable source of contamination in this outbreak was a laboratory technician transiently colonized with *S. aureus* in the nasopharynx. No further cases were noted after laboratory procedures were changed, but since the implicated technician no longer carried *S. aureus* in the nasopharynx on repeat culture, the efficacy of the improved procedures could not be evaluated.

That 5 of 11 patients received unnecessary antistaphylococcal therapy highlights the importance of conducting the necessary epidemiologic studies so that outbreaks of pseudobacteremia can be identified. Transient, asymptomatic nasal colonization with *S. aureus* is common, and other sources of contamination in laboratories are prevalent. Although outbreaks such as this one are rarely reported, 20% or more of positive blood cultures in hospitals may be due to organisms recognized as common skin contaminants (*5*). Thus, laboratory procedures for collecting and culturing patient specimens should be such as to prevent inadvertent contamination of patient cultures.

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4. Hoffman PC, Arnow PM, Goldmann DA, Parrott PL, Stamm WE, McGowan JE: False-positive blood cultures associated with nonsterile blood collection tubes. JAMA 236:2073-2075, 1976
5. Scheckler WE: Septicemia in a community hospital 1970 through 1973. JAMA 237:1938-1941, 1977

Lionfish Stings – Nevada

On February 1, 1979, a 15-year-old boy cleaning algae from a fish tank in a Las Vegas pet store was stung on his finger by a 10-inch lionfish* (*Pterois volitans*). He experienced excruciating pain radiating up his arm and was taken immediately to the local emergency room. On the boy's arrival, the physician noted erythema and edema of the finger and a red streak extending to the wrist. His blood pressure, heart rhythm, and mental status were within normal limits and were monitored closely over the next

*Also known as zebrafish, tigerfish, scorpionfish, turkeyfish, featherfish, and firefish.

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Lionfish Stings – Continued

2 hours. The patient's finger was immersed in hot water containing magnesium sulfate, and an intravenous drip was maintained. The symptoms subsided within 2 hours, and he was released. The pet store owner reported 1 other instance of a lionfish sting in a customer who apparently also had only a local reaction. Inquiry of 4 other tropical fish wholesalers uncovered 1 other anecdotal case.

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Editorial Note: *P. volitans* is an Asian saltwater fish prized by tropical fish fanciers for its beautiful colors and lacy fins. Thousands are imported yearly from the Philippines. It is in the same family as the Californian scorpion fish (*Scorpaena*) and stonefish (*Synanceja*), which are also venomous. Lionfish respond aggressively to perceived threats by erecting spines with which they pierce the invader's skin, releasing venom into the wound. The toxicity of *Pterois* venom is attributable to a nondialysable protein that produces profound hypotension, probably vasodilation, muscular weakness, and death by respiratory arrest in experimental animals (*1,2*).

In humans, lionfish stings commonly cause local cyanosis, inflammation, extensive swelling, severe pain, and occasionally necrosis of surrounding tissue with sloughing. Cardiovascular collapse has been reported (*3*), but no deaths have been documented. To remove venom from the wound, it should be irrigated immediately, and bleeding should be encouraged. The affected part should then be immersed for 30-90 minutes in water as hot as can be tolerated without tissue injury; magnesium sulfate should be added to the water as an anesthetic. Hypotension can be life-threatening and has been treated successfully with epinephrine.

The incidence of lionfish sting is unknown, but clearly the thousands of these fish owned by tropical fish fanciers in the United States present some risk to the uninitiated. Prevention consists of avoiding contact entirely by using long-handled nets and algae scrapers. Hands should be kept out of fish tanks since even heavy gloves can be pierced by the lionfish spine.

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