



## 1988 Annual Report of the American Association of Poison Control Centers National Data Collection System

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The American Association of Poison Control Centers (AAPCC) National Data Collection System has grown since its inception in 1983, with a dramatic annual increase in the number of participating poison centers, population served by those centers, and reported human exposures (Table 1).<sup>1-5</sup> This report in-

cludes 1,368,748 human exposure cases reported by 64 participating poison centers during 1988.

### CHARACTERIZATION OF PARTICIPATING CENTERS

Of the 64 reporting centers, 61 submitted data for the entire year. Thirty-two of the 64 centers were cer-

From the Data Collection Committee, American Association of Poison Control Centers.

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Centers participating in this report include Children's Hospital of Alabama Poison Control Center, Birmingham, AL; Alabama Poison Center, Tuscaloosa, AL; Arizona Poison Control System, Tucson, AZ; Samaritan Regional Poison Center, Phoenix, AZ; Fresno Regional Poison Control Center, Fresno, CA; University of California Irvine Regional Poison Center, Orange, CA; University of California Davis Regional Poison Control Center, Sacramento, CA; San Diego Regional Poison Center, San Diego, CA; San Francisco Bay Area Regional Poison Center, San Francisco, CA; Santa Clara Valley Medical Center, San Jose, CA; Rocky Mountain Poison Center, Denver, CO; National Capital Poison Center, Washington, DC; Florida Poison Center, Tampa, FL; Idaho Poison Control Center, Boise, ID; Indiana Poison Center, Indianapolis, IN; St Luke's Poison Center, Sioux City, IA; Mid-America Poison Center, Kansas City, KS; Kentucky Regional Poison Center of Kosair Children's Hospital, Louisville, KY; Louisiana Regional Poison Control Center, Shreveport, LA; Maryland Poison Center, Baltimore, MD; Children's Hospital of Michigan Poison Control Center, Detroit, MI; Blodgett Regional Poison Center, Grand Rapids, MI; Saginaw Region Poison Center, Saginaw, MI; Hennepin Poison Center, Minneapolis, MN; Minnesota Poison Control System, St Paul, MN; Cardinal Glennon Children's Hospital Regional Poison Center, St Louis, MO; Mid-Plains Poison Control Center, Omaha, NE; New Jersey Poison Information and Education System, Newark, NJ; Triad Poison Center, Greensboro, NC; North Dakota Poison Center, Fargo, ND; Nassau County Medical Center's Long Island Regional Poison Control Center, East Meadow, NY; New York City Poison

Center, New York, NY; Akron Regional Poison Center, Akron, OH; Stark County Poison Control Center, Canton, OH; Cincinnati Drug and Poison Information Center, Cincinnati, OH; Greater Cleveland Poison Control Center, Cleveland, OH; Central Ohio Poison Control Center, Columbus, OH; Mahoning Valley Poison Center, Youngstown, OH; Oregon Poison Center, Portland, OR; LeHigh Valley Poison Center, Allentown, PA; Keystone Region Poison Center, Altoona, PA; Hamot Poison Center, Erie, PA; Northwest Poison Center, Erie, PA; Capital Area Poison Center, Hershey, PA; Delaware Valley Regional Poison Control Center, Philadelphia, PA; Pittsburgh Poison Center, Pittsburgh, PA; Rhode Island Poison Center, Providence, RI; Dakota-Midlands Poison Control Center, Aberdeen, SD; McKennan Poison Center, Sioux Falls, SD; Southern Poison Center, Inc., Memphis, TN; Middle Tennessee Regional Poison Center, Nashville, TN; North Texas Poison Center, Dallas, TX; Intermountain Regional Poison Control Center, Salt Lake City, UT; Blue Ridge Poison Center, Charlottesville, VA; Tidewater Poison Center, Norfolk, VA; Central Virginia Poison Center, Richmond, VA; Seattle Poison Center, Seattle, WA; Spokane Poison Center, Spokane, WA; Mary Bridge Poison Center, Tacoma, WA; Central Washington Poison Center, Yakima, WA; West Virginia Poison Center, Charleston, WV; Green Bay Poison Center, Green Bay, WI; University of Wisconsin Hospital Regional Poison Control Center, Madison, WI; Milwaukee Children's Hospital Poison Center, Milwaukee, WI.

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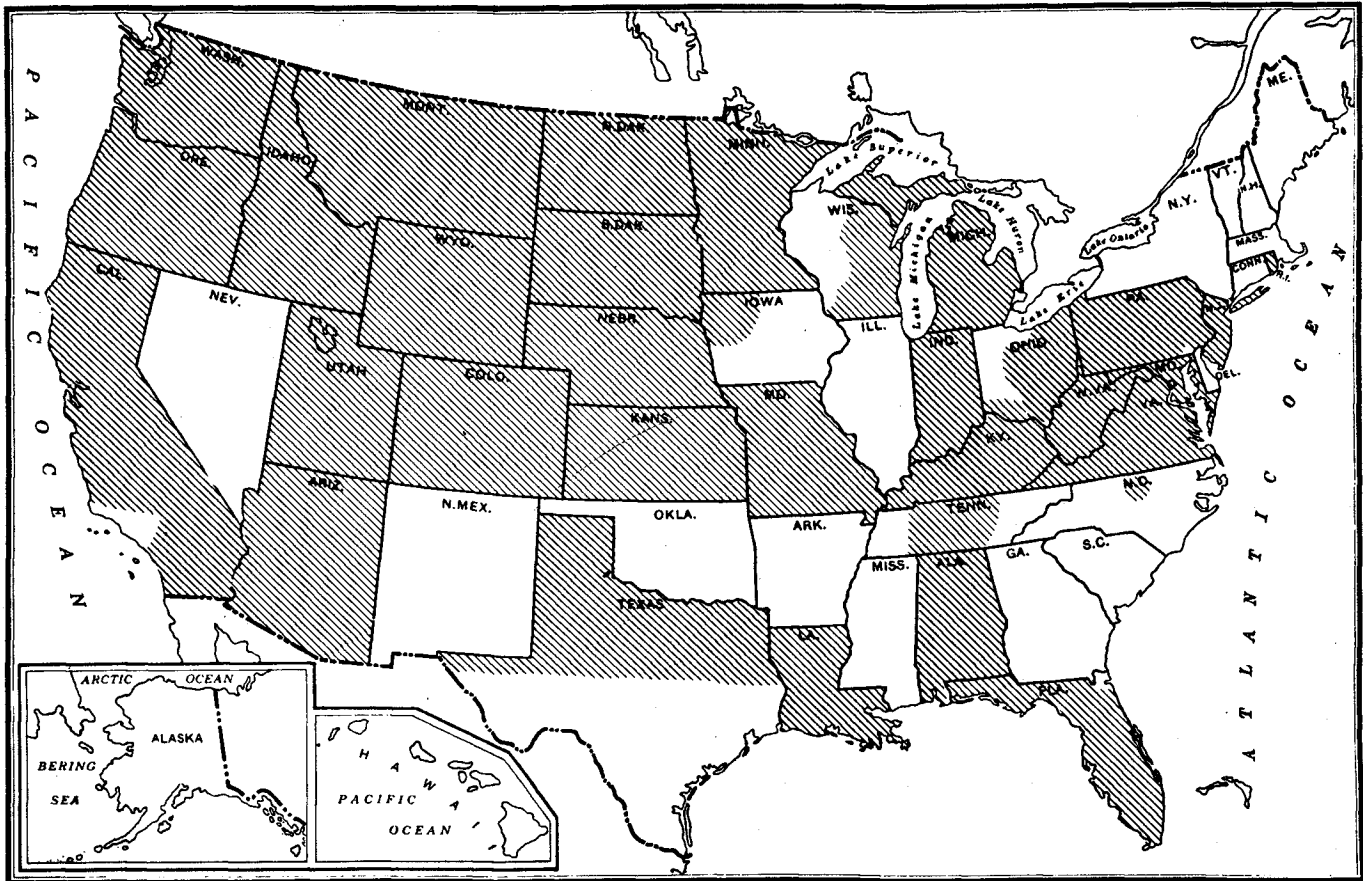


FIGURE 1. Sixty-four poison centers participated in the Data Collection System in 1988. The cross-hatched areas denote regions served by reporting centers. (Map adapted from Hammond's Outline Map of the United States.)

tified as regional poison centers by the AAPCC. Annual center call volumes (human exposure cases only) ranged from 340 to 61,014 (mean, 21,387). Center penetrance ranged from 3.7 to 19.0/1,000, with a mean of 8.8 reported exposures per 1,000 population. (Penetrance is defined as the number of human poison exposure cases reported to a center divided by the population served by that center).

A total population of 155.7 million was served by the participating centers, including portions of 34 states and the District of Columbia (Fig 1). Noting the 245.8 million estimated US population, the data presented represent an estimated 63% of the human poison ex-

posures which precipitated poison center contacts in the United States during 1988. Extrapolating from the 1,368,748 human poison exposures reported in this database, more than two million human poison exposures are estimated to have been reported to all US poison centers in 1988. However, extrapolations from the number of reported poisonings to the number of actual poisonings occurring annually in the United States cannot be made from these data alone because considerable variations in poison center penetrance were noted. Indeed, assuming all centers reached the penetrance level of 19.0 poisonings/1,000 population

TABLE 1. Growth of the AAPCC National Data Collection System

| Year | No. of Participating Poison Centers | Population Served (Millions) | Human Exposures Reported |
|------|-------------------------------------|------------------------------|--------------------------|
| 1983 | 16                                  | 43.1                         | 251,012                  |
| 1984 | 47                                  | 99.8                         | 730,224                  |
| 1985 | 56                                  | 113.6                        | 900,513                  |
| 1986 | 57                                  | 132.1                        | 1,098,894                |
| 1987 | 63                                  | 137.5                        | 1,166,940                |
| 1988 | 64                                  | 155.7                        | 1,368,748                |

TABLE 2. Site of Caller and Site of Exposure, Human Exposure Cases

|                      | Site of Caller (%) | Site of Exposure (%) |
|----------------------|--------------------|----------------------|
| Residence            | 81.1               | 91.8                 |
| Workplace            | 1.5                | 2.6                  |
| Health Care Facility | 15.2               | 0.6                  |
| School               | 0.6                | 0.9                  |
| Other                | 1.2                | 2.0                  |
| Unknown              | 0.4                | 2.1                  |
| Total                | 100.0              | 100.0                |

**TABLE 3.** Age and Sex Distribution of Human Poison Exposure Cases

| Age (yr)      | Male    |        | Female  |        | Unknown |       | Total     |         | Cumulative Total |         |
|---------------|---------|--------|---------|--------|---------|-------|-----------|---------|------------------|---------|
|               | No.     | (%)    | No.     | (%)    | No.     | (%)   | No.       | (%)     | No.              | (%)     |
| <1            | 57,515  | (4.2)  | 51,420  | (3.8)  | 1,466   | (0.1) | 110,401   | (8.1)   | 110,401          | (8.1)   |
| 1             | 134,495 | (9.8)  | 118,266 | (8.6)  | 2,064   | (0.2) | 254,825   | (18.6)  | 365,226          | (26.7)  |
| 2             | 144,977 | (10.6) | 123,647 | (9.0)  | 2,318   | (0.2) | 270,942   | (19.8)  | 636,168          | (46.5)  |
| 3             | 69,478  | (5.1)  | 56,239  | (4.1)  | 1,061   | (0.1) | 126,778   | (9.3)   | 762,946          | (55.7)  |
| 4             | 29,447  | (2.2)  | 22,644  | (1.7)  | 548     | (0.0) | 52,639    | (3.8)   | 815,585          | (59.6)  |
| 5             | 15,553  | (1.1)  | 12,206  | (0.9)  | 302     | (0.0) | 28,061    | (2.1)   | 843,646          | (61.6)  |
| 6-12          | 40,875  | (2.9)  | 30,398  | (2.2)  | 651     | (0.0) | 71,924    | (5.3)   | 915,570          | (66.9)  |
| 13-19         | 32,760  | (2.4)  | 48,067  | (3.5)  | 408     | (0.0) | 81,235    | (5.9)   | 996,805          | (72.8)  |
| 20-29         | 40,978  | (2.9)  | 47,107  | (3.4)  | 321     | (0.0) | 88,406    | (6.5)   | 1,085,211        | (79.3)  |
| 30-39         | 30,009  | (2.2)  | 36,928  | (2.7)  | 273     | (0.0) | 67,210    | (4.9)   | 1,152,421        | (84.2)  |
| 40-49         | 13,381  | (0.9)  | 18,259  | (1.3)  | 105     | (0.0) | 31,745    | (2.3)   | 1,184,166        | (86.5)  |
| 50-59         | 6,780   | (0.5)  | 9,864   | (0.7)  | 54      | (0.0) | 16,698    | (1.2)   | 1,200,864        | (87.7)  |
| 60-69         | 4,882   | (0.4)  | 7,828   | (0.6)  | 46      | (0.0) | 12,756    | (0.9)   | 1,213,620        | (88.7)  |
| 70-79         | 2,866   | (0.2)  | 5,156   | (0.4)  | 20      | (0.0) | 8,042     | (0.6)   | 1,221,662        | (89.3)  |
| 80-89         | 1,327   | (0.1)  | 3,031   | (0.2)  | 18      | (0.0) | 4,376     | (0.3)   | 1,226,038        | (89.6)  |
| 90-99         | 262     | (0.0)  | 637     | (0.0)  | 4       | (0.0) | 903       | (0.0)   | 1,226,941        | (89.6)  |
| Unknown adult | 58,350  | (4.3)  | 75,537  | (5.5)  | 7920    | (0.6) | 141,807   | (10.4)  | 1,368,748        | (100.0) |
| Total         | 683,935 | (50.0) | 667,234 | (48.7) | 17,579  | (1.3) | 1,368,748 | (100.0) | 1,368,748        | (100.0) |

**TABLE 4.** Distribution of Age and Sex of 545 Fatalities

| Age (yr)      | Male | Female | Unknown | Total | %     | Cumulative % |
|---------------|------|--------|---------|-------|-------|--------------|
| <1            | 2    | 1      | 0       | 3     | 0.6   | 0.6          |
| 1             | 10   | 6      | 0       | 16    | 2.9   | 3.5          |
| 2             | 2    | 0      | 0       | 2     | 0.4   | 3.9          |
| 3             | 3    | 1      | 0       | 4     | 0.7   | 4.6          |
| 4             | 2    | 0      | 0       | 2     | 0.4   | 5.0          |
| 5             | 2    | 1      | 0       | 3     | 0.6   | 5.5          |
| 6-12          | 1    | 2      | 0       | 3     | 0.6   | 6.1          |
| 13-19         | 29   | 28     | 0       | 57    | 10.5  | 16.5         |
| 20-29         | 75   | 43     | 0       | 118   | 21.7  | 38.2         |
| 30-39         | 61   | 47     | 0       | 108   | 19.8  | 58.0         |
| 40-49         | 31   | 31     | 0       | 62    | 11.4  | 69.4         |
| 50-59         | 20   | 21     | 0       | 41    | 7.5   | 76.9         |
| 60-69         | 17   | 28     | 0       | 45    | 8.3   | 85.1         |
| 70-79         | 14   | 20     | 0       | 34    | 6.2   | 91.4         |
| 80-89         | 11   | 13     | 0       | 24    | 4.4   | 95.8         |
| 90-99         | 1    | 2      | 0       | 3     | 0.6   | 96.3         |
| Unknown adult | 7    | 12     | 1       | 20    | 3.7   | 100.0        |
| Total         | 288  | 256    | 1       | 545   | 100.0 | 100.0        |

reported for one state, then 4.7 million poisonings would have been reported to poison control centers in 1988. Because of the growth and development of this relatively new data collection project, with increasing center participation from year to year, the data do not directly identify a trend in the overall incidence of poisonings in the United States. However, an analysis of data from 53 centers that participated for the entirety of 1987 and 1988 indicates a 5.6% increase in reported poison exposures from 1987 to 1988 within the regions served by these 53 centers. This increase may reflect greater public awareness of poison center services rather than an actual increase in poisonings.

**TABLE 5.** Number of Substances Involved in Human Poison Exposure Cases

| No. of Substances | No. of Cases | % of Cases |
|-------------------|--------------|------------|
| 1                 | 1,284,991    | 93.9       |
| 2                 | 62,474       | 4.6        |
| 3                 | 13,690       | 1.0        |
| 4                 | 3,805        | 0.3        |
| 5                 | 1,475        | 0.1        |
| 6                 | 610          | 0.0        |
| 7                 | 337          | 0.0        |
| 8                 | 121          | 0.0        |
| 9                 | 52           | 0.0        |
| ≥10               | 237          | 0.0        |
| Unknown           | 956          | 0.1        |
| Total             | 1,368,748    | 100.0      |

**TABLE 6.** Reason for Human Exposure Cases

| Reason                  | No.              | %            |
|-------------------------|------------------|--------------|
| <b>Accidental</b>       |                  |              |
| General                 | 1,130,588        | 82.6         |
| Misuse*                 | 42,049           | 3.1          |
| Occupational            | 25,368           | 1.9          |
| Environmental           | 7,565            | 0.6          |
| Unknown                 | 1,426            | 0.1          |
| Total                   | 1,206,996        | 88.2         |
| <b>Intentional</b>      |                  |              |
| Suicidal                | 91,757           | 6.7          |
| Misuse†                 | 16,040           | 1.2          |
| Abuse‡                  | 14,589           | 1.1          |
| Unknown                 | 13,885           | 1.0          |
| Total                   | 136,271          | 10.0         |
| <b>Adverse reaction</b> |                  |              |
| Drug                    | 11,273           | 0.8          |
| Food                    | 4,921            | 0.4          |
| Other                   | 1,907            | 0.1          |
| Total                   | 18,101           | 1.3          |
| <b>Unknown</b>          | 7,380            | 0.5          |
| <b>Total</b>            | <b>1,368,748</b> | <b>100.0</b> |

\* Improper use of a substance where therapeutic or beneficial results were intended, eg, an overdose occurring because both parents gave the same medication to a child and neither was aware (at the time) of the other's action or a case in which misreading the label of a product results in an unintended exposure.

† Intentional incorrect use of a substance where psychotropic effect was not sought, eg, intentional excessive dosing to obtain a more rapid, or superior pharmacological effect for presumed "therapeutic purposes."

‡ Improper use of a substance where the patient was seeking a psychotropic effect.

**REVIEW OF THE DATA**

The 1,368,748 human poison exposures reported to the AAPCC in 1988 represent the largest poison exposure database ever compiled in the United States and a 17.3% increase in total reports from 1987. An analysis of the data indicates that 91.8% of exposures occurred in the home (Table 2). Two unlikely sites of poisonings, health care facilities and schools, accounted for 7,929 (0.6%) and 12,003 (0.9%) poison exposures, respectively. Poison center peak call volumes were noted from 5 to 9 PM, although call frequency remained consistently high between 9 AM and 10 PM, with 82% of calls logged during this 13-hour period.

The age and sex distribution of human poison exposure victims is outlined in Table 3. Children aged <3 years were involved in 46.5% of cases; 62.0% of the cases occurred in children aged <6 years. A male predominance is found among poison exposure victims aged <13 years, but the gender distribution is reversed in teenagers and adults. Table 4 gives the age and sex distribution for 545 fatalities.

A single substance was implicated in 93.9% of reports, and only 1.4% of patients were exposed to more than two possibly poisonous drugs or products (Table 5). Most cases of human exposure were acute (98.1%), as were most poison-related fatalities (88.3%). (Chronic exposures were arbitrarily defined as re-

**TABLE 7.** Distribution of Reason for Exposure by Age, Human Exposure Cases Only

| Reason           | <6 Years       |               | 6-12 Years    |              | 13-17 Years   |              | 18-64 Years    |               | >64 Years     |              | Unknown       |              | Total            |                |
|------------------|----------------|---------------|---------------|--------------|---------------|--------------|----------------|---------------|---------------|--------------|---------------|--------------|------------------|----------------|
|                  | No.            | (%)           | No.           | (%)          | No.           | (%)          | No.            | (%)           | No.           | (%)          | No.           | (%)          | No.              | (%)            |
| Accidental       | 840,511        | (61.4)        | 67,409        | (4.9)        | 28,056        | (2.0)        | 245,539        | (17.9)        | 15,707        | (1.1)        | 9,774         | (0.7)        | 1,206,996        | (88.2)         |
| Intentional      | 2,556          | (0.2)         | 3,910         | (0.3)        | 31,350        | (2.3)        | 93,927         | (6.9)         | 2,138         | (0.2)        | 2,390         | (0.2)        | 136,271          | (10.0)         |
| Adverse reaction | 2,151          | (0.2)         | 1,122         | (0.0)        | 847           | (0.0)        | 13,010         | (1.0)         | 774           | (0.0)        | 197           | (0.0)        | 18,101           | (1.3)          |
| Unknown          | 572            | (0.0)         | 406           | (0.0)        | 1,049         | (0.0)        | 4,599          | (0.3)         | 295           | (0.0)        | 459           | (0.0)        | 7,380            | (0.5)          |
| <b>Total</b>     | <b>845,790</b> | <b>(61.8)</b> | <b>72,847</b> | <b>(5.3)</b> | <b>61,302</b> | <b>(4.5)</b> | <b>357,075</b> | <b>(26.1)</b> | <b>18,914</b> | <b>(1.4)</b> | <b>12,280</b> | <b>(0.9)</b> | <b>1,368,748</b> | <b>(100.0)</b> |

**TABLE 8.** Distribution of Reason for Exposure and Age for 545 Human Fatalities

| Reason                  | <6 Years  | 6-12 Years | 13-17 Years | >17 Years  | Total      |
|-------------------------|-----------|------------|-------------|------------|------------|
| <b>Accidental</b>       |           |            |             |            |            |
| General                 | 16        | 0          | 0           | 10         | 26         |
| Environmental           | 6         | 0          | 0           | 9          | 15         |
| Misuse                  | 5         | 0          | 0           | 24         | 29         |
| Occupational            | 0         | 0          | 1           | 17         | 18         |
| Total                   | 27        | 0          | 1           | 60         | 88         |
| <b>Intentional</b>      |           |            |             |            |            |
| Suicide                 | 0         | 1          | 24          | 272        | 297        |
| Misuse                  | 1         | 1          | 1           | 19         | 22         |
| Abuse                   | 0         | 0          | 12          | 62         | 74         |
| Unknown                 | 0         | 0          | 1           | 32         | 33         |
| Total                   | 1         | 2          | 38          | 385        | 426        |
| <b>Adverse reaction</b> | 0         | 0          | 0           | 3          | 3          |
| <b>Unknown</b>          | 0         | 0          | 0           | 28         | 28         |
| <b>Total</b>            | <b>28</b> | <b>2</b>   | <b>39</b>   | <b>476</b> | <b>545</b> |

**TABLE 9.** Distribution of Route of Exposure for Human Poison Exposure Cases and 545 Fatalities

| Route            | All Cases |        | Fatalities |        |
|------------------|-----------|--------|------------|--------|
|                  | No.       | (%)    | No.        | (%)    |
| Ingestion        | 1,113,101 | (77.9) | 424        | (75.6) |
| Dermal           | 97,631    | (6.8)  | 4          | (0.7)  |
| Ophthalmic       | 83,885    | (5.9)  | 0          | (0.0)  |
| Inhalation       | 76,592    | (5.4)  | 72         | (12.8) |
| Bites and stings | 45,318    | (3.2)  | 1          | (0.2)  |
| Parenteral       | 4,258     | (0.3)  | 31         | (5.5)  |
| Other/unknown    | 8,979     | (0.6)  | 29         | (5.2)  |

Multiple routes of exposure were observed in many poison exposure victims. Percentage is based on the total number of exposure routes (1,429,764 for all patients, 561 for fatal cases) rather than the total number of human exposures (1,368,748) or fatalities (545).

**TABLE 10.** Symptom Assessment at Time of Initial Call to Poison Center

| Symptom Assessment                 | No.       | (%)     |
|------------------------------------|-----------|---------|
| Asymptomatic                       | 883,728   | (64.6)  |
| Symptomatic, related to exposure   | 372,647   | (27.2)  |
| Symptomatic, unrelated to exposure | 21,179    | (1.5)   |
| Symptomatic, unknown if related    | 63,045    | (4.6)   |
| Unknown                            | 28,149    | (2.1)   |
| Total                              | 1,368,748 | (100.0) |

**TABLE 11.** Management Site of Human Poison Exposure Cases

| Site   | No.       | (%)     |
|--|-----------|---------|
| Non-health care facility                       | 993,681   | (72.6)  |
| Health care facility                           |           |         |
| Already there at time of call to poison center | 176,726   | (12.9)  |
| Referred by poison center                      | 169,881   | (12.4)  |
| Other/unknown                                  | 28,460    | (2.1)   |
| Total  | 1,368,748 | (100.0) |

**TABLE 12.** Medical Outcome of Human Poison Exposure Cases by Patient Age

| Outcome                     | <6 Years |        | 6-12 Years |       | 13-17 Years |       | >17 Years |        | Unknown |       | Total     |         |
|-----------------------------|----------|--------|------------|-------|-------------|-------|-----------|--------|---------|-------|-----------|---------|
|                             | No.      | (%)    | No.        | (%)   | No.         | (%)   | No.       | (%)    | No.     | (%)   | No.       | (%)     |
| No effect                   | 450,916  | (32.9) | 25,735     | (1.9) | 15,423      | (1.1) | 66,468    | (4.9)  | 2,971   | (0.2) | 561,513   | (41.0)  |
| Minor effect                | 114,958  | (8.4)  | 22,152     | (1.6) | 24,415      | (1.8) | 158,245   | (11.6) | 2,149   | (0.1) | 321,919   | (23.5)  |
| Moderate effect             | 7,152    | (0.5)  | 1,545      | (0.1) | 3,513       | (0.3) | 25,265    | (1.8)  | 342     | (0.0) | 37,817    | (2.8)   |
| Major effect                | 426      | (0.0)  | 76         | (0.0) | 369         | (0.0) | 3,260     | (0.2)  | 56      | (0.0) | 4,187     | (0.3)   |
| Death                       | 30       | (0.0)  | 3          | (0.0) | 39          | (0.0) | 473       | (0.0)  | 0       | (0.0) | 545       | (0.0)   |
| Unknown, nontoxic*          | 242,828  | (17.7) | 18,303     | (1.3) | 9,279       | (0.7) | 61,882    | (4.5)  | 4,673   | (0.3) | 336,965   | (24.6)  |
| Unknown, potentially toxic† | 17,488   | (1.3)  | 3,023      | (0.2) | 6,971       | (0.5) | 45,012    | (3.3)  | 2,319   | (0.2) | 74,813    | (5.5)   |
| Unrelated effect            | 11,616   | (0.8)  | 1,957      | (0.1) | 1,227       | (0.1) | 15,053    | (1.1)  | 268     | (0.0) | 30,121    | (2.2)   |
| Unknown                     | 376      | (0.0)  | 53         | (0.0) | 66          | (0.0) | 331       | (0.0)  | 42      | (0.0) | 868       | (0.0)   |
| Total                       | 845,790  | (61.8) | 72,847     | (5.3) | 61,302      | (4.5) | 375,989   | (27.5) | 12,820  | (0.9) | 1,368,748 | (100.0) |

\* No follow-up provided because exposure was assessed as nontoxic.

† Patient lost to follow-up. Exposure was assessed as potentially toxic.

peated exposures to the same toxic substance or a single exposure lasting longer than eight hours.)

The vast majority (88.2%) of poison exposures were accidental; suicidal intent was present in 6.7% of cases (Table 6). Nearly a quarter (23.0%) of cases with suicidal intent occurred in patients who were 13 through 17 years old. Accidental poisonings outnumbered intentional poisonings in all age groups except 13- to 17-year-olds, in whom they were nearly equal (Table 7). In contrast, of the 545 human poisoning fatalities reported, 81% of deaths in adults (aged >17 years) were intentional (Table 8).

Ingestions accounted for 77.9% of poison exposures (Table 9), followed in frequency by dermal exposures, ophthalmic exposures, inhalation, bites and stings, and parenteral exposures. For the 545 fatalities, ingestion, followed by inhalation and parenteral exposure, was the predominant exposure route.

Table 10 displays the symptom assessment at the time of the initial call to the participating poison center. In addition to the 27.2% of patients with initial symptoms clearly related to the exposure, symptoms developed during the subsequent course in 11,499 initially asymptomatic patients. Thus symptoms definitely related to the exposure eventually developed in at least 28.1% of patients.

The majority of cases reported to poison centers were managed in a non-health care facility (72.6%), usually at the site of exposure, the patient's own home (Table 11). Treatment in a health care facility was rendered or recommended in 25.3% of cases; of these, 54.5% involved treatment and release, 18.4% involved admission for medical care, and 2.8% involved admission for psychiatric treatment; 8.2% refused referral, and 16.1% were lost to follow-up.

Table 12 displays the medical outcome in the human poison exposure victims distributed by age, emphasizing the more severe outcome observed in the older age groups. Table 13 compares medical outcome and rea-

**TABLE 13.** Distribution of Medical Outcome by Reason for Exposure for Human Poison Exposure Victims

| Outcome                    | Accidental |        | Intentional |        | Adverse Reaction |       | Unknown |       | Total     |         |
|----------------------------|------------|--------|-------------|--------|------------------|-------|---------|-------|-----------|---------|
|                            | No.        | (%)    | No.         | (%)    | No.              | (%)   | No.     | (%)   | No.       | (%)     |
| No effect                  | 532,906    | (38.9) | 26,314      | (1.9)  | 1,030            | (0.1) | 1,263   | (0.1) | 561,513   | (41.0)  |
| Minor effect               | 263,194    | (19.2) | 47,826      | (3.5)  | 9,030            | (0.7) | 1,869   | (0.1) | 321,919   | (23.5)  |
| Moderate effect            | 23,171     | (1.7)  | 12,686      | (0.9)  | 1,329            | (0.1) | 631     | (0.0) | 37,817    | (2.8)   |
| Major effect               | 1,197      | (0.1)  | 2,744       | (0.2)  | 81               | (0.0) | 165     | (0.0) | 4,187     | (0.3)   |
| Death                      | 88         | (0.0)  | 426         | (0.0)  | 3                | (0.0) | 28      | (0.0) | 545       | (0.0)   |
| Unknown, nontoxic          | 317,293    | (23.2) | 15,595      | (1.1)  | 3,133            | (0.2) | 944     | (0.1) | 336,965   | (24.6)  |
| Unknown, potentially toxic | 42,613     | (3.1)  | 28,634      | (2.1)  | 1,704            | (0.1) | 1,862   | (0.1) | 74,813    | (5.5)   |
| Unrelated effect           | 25,870     | (1.9)  | 1,884       | (0.1)  | 1,776            | (0.1) | 591     | (0.0) | 30,121    | (2.2)   |
| Unknown                    | 664        | (0.0)  | 162         | (0.0)  | 15               | (0.0) | 27      | (0.0) | 868       | (0.1)   |
| Total                      | 1,206,996  | (88.2) | 136,271     | (10.0) | 18,101           | (1.3) | 7,380   | (0.5) | 1,368,748 | (100.0) |

son for exposure, emphasizing the greater frequency of serious outcome in intentional exposures.

Table 14 outlines the use of initial decontamination procedures, specific antidotes, and measures to enhance elimination in the treatment of patients reported

**TABLE 14.** Therapy Provided in Human Exposure Cases

| Therapy                                   | No.     |
|---|---------|
| Initial decontamination                   |         |
| Dilution                                  | 548,084 |
| Irrigation/washing                        | 250,513 |
| Ipecac syrup                              | 115,157 |
| Activated charcoal                        | 89,026  |
| Cathartic                                 | 76,270  |
| Gastric lavage                            | 32,601  |
| Other emetic                              | 3,282   |
| Measures to enhance elimination           |         |
| Alkalinization (with or without diuresis) | 4,060   |
| Hemodialysis                              | 389     |
| Forced diuresis                           | 370     |
| Hemoperfusion (charcoal)                  | 108     |
| Acidification (with or without diuresis)  | 47      |
| Exchange transfusion                      | 32      |
| Peritoneal dialysis                       | 30      |
| Hemoperfusion (resin)                     | 24      |
| Specific antidote administration          |         |
| Naloxone                                  | 5,308   |
| N-acetylcysteine (oral)                   | 4,762   |
| Hydroxocobalamin                          | 704     |
| Atropine                                  | 620     |
| Deferoxamine                              | 594     |
| Antivenin/antitoxin                       | 394     |
| Ethanol                                   | 381     |
| FAB fragments                             | 331     |
| Physostigmine                             | 269     |
| N-acetylcysteine (IV)                     | 173     |
| Pralidoxime (2-PAM)                       | 157     |
| Penicillamine                             | 139     |
| Dimercaprol (BAL)                         | 138     |
| Cyanide antidote kit                      | 113     |
| Pyridoxine                                | 105     |
| Methylene blue                            | 66      |
| EDTA                                      | 53      |

in this database. These must be interpreted as minimum frequencies because of the limitations of telephone data gathering. Ipecac syrup was administered in 8.4% of cases. In children, ipecac syrup was most often administered outside a health care facility (Table 15).

A summary of the 545 fatal exposures is presented in Table 16. Each of these cases was abstracted and/or verified by the reporting center, with only those exposures deemed "probably" or "undoubtedly" responsible for the fatality included in this compendium. Confirmation of the cause of death by a postmortem report was obtained in 35.8% of cases. The highest blood level of implicated substances is provided where available to the reporting poison center. Cases with prehospital cardiac or respiratory arrests are indicated. Prehospital arrests occurred in 28.6% of all fatalities. Abstracts are provided in the appendix for interesting or unusual cases.

Tables 17 and 18 provide comprehensive demographic data on patient age, reason for exposure, medical outcome, and use of a health care facility for all 1,368,748 exposures, presented by category. Table 17 focuses on nonpharmaceuticals; Table 18 presents drugs. A breakdown of plant exposures is provided for those most commonly implicated (Table 19). The reader is cautioned to interpret this as frequency of involvement of plants in calls to poison centers with no correlation to severity of toxicity. Indeed, several of the plants on this list pose little if any ingestion hazard. Table 20 presents the most common categories listed by frequency of exposure. Table 21 lists the substance categories with the largest number of reported deaths. Note the more than twofold increase in cocaine deaths from 1987 to 1988. A remarkable chronologic constancy of selected demographic data elements is demonstrated in Table 22, despite the considerable overall growth of the data collection system. Note the decline in ipecac use and the corresponding increase in activated charcoal use over the past few years.

TABLE 15. Ipecac Administration by Site and Age

| Age<br>(yr) | Non-Health<br>Care Facility |        | Health<br>Care Facility |        | Unknown |       | Total   |         |
|-------------|-----------------------------|--------|-------------------------|--------|---------|-------|---------|---------|
|             | No.                         | (%)    | No.                     | (%)    | No.     | (%)   | No.     | (%)     |
| <1          | 1,077                       | (0.9)  | 1,557                   | (1.4)  | 10      | (0.0) | 2,644   | (2.3)   |
| 1           | 11,481                      | (10.0) | 7,821                   | (6.8)  | 42      | (0.0) | 19,344  | (16.8)  |
| 2           | 21,325                      | (18.5) | 13,346                  | (11.6) | 80      | (0.1) | 34,751  | (30.2)  |
| 3           | 10,360                      | (9.0)  | 6,317                   | (5.5)  | 51      | (0.0) | 16,728  | (14.5)  |
| 4           | 3,463                       | (3.0)  | 1,943                   | (1.7)  | 16      | (0.0) | 5,422   | (4.7)   |
| 5           | 1,283                       | (1.1)  | 723                     | (0.6)  | 8       | (0.0) | 2,014   | (1.7)   |
| 6-12        | 1,390                       | (1.2)  | 1,325                   | (1.2)  | 3       | (0.0) | 2,718   | (2.4)   |
| 13-17       | 428                         | (0.4)  | 9,361                   | (8.1)  | 12      | (0.0) | 9,801   | (8.5)   |
| >17         | 1,035                       | (0.9)  | 19,914                  | (17.3) | 27      | (0.0) | 20,976  | (18.2)  |
| Unknown     | 230                         | (0.2)  | 527                     | (0.5)  | 2       | (0.0) | 759     | (0.7)   |
| Total       | 52,072                      | (45.2) | 62,834                  | (54.6) | 251     | (0.2) | 115,157 | (100.0) |

TABLE 16. Summary of Fatal Exposures

| Case No.   | Age   | Substances   | Route of<br>Exposure | Reason      | Blood<br>Levels   |
|--|-------|--|----------------------|-------------|-------------------|
| <b>Alcohols</b>  |       |  |                      |             |                   |
| 1*   | 2 d   | Ethanol (70%)  | Parenteral           | Acc misuse  | 150 mg/dL, 7 h    |
| 2*   | 3 yr  | Ethanol  | Ingestion            | Acc gen     | 45 mg/dL, >12 h   |
| 3  | 35 yr | Ethanol  | Ingestion            | Int abuse   | 610 mg/dL         |
| 4  | 38 yr | Ethanol  | Ingestion            | Int abuse   | 315 mg/dL         |
| 5  | 40 yr | Ethanol  | Ingestion            | Int abuse   |                   |
| 6†   | 46 yr | Ethanol  | Ingestion            | Int abuse   |                   |
| 7‡   | 48 yr | Ethanol  | Ingestion            | Int suicide | 480 mg/dL         |
| 8  | 54 yr | Ethanol  | Ingestion            | Int suicide |                   |
|  |       | beta blocker (unspecified)   |                      |             |                   |
|  |       | calcium channel blocker<br>(unspecified)                           |                      |             |                   |
| 9‡   | 25 yr | Ethanol  | Ingestion            | Int suicide | 190 mg/dL§        |
|  |       | chlordiazepoxide   |                      |             | 0.5 µg/dL§        |
| 10†  | 31 yr | Ethanol  | Ingestion            | Int abuse   | 207 mg/dL         |
|  |       | chlordiazepoxide   | Parenteral           |             | 10.9 µg/mL        |
| 11   | 45 yr | Ethanol  | Ingestion            | Int abuse   | 380 mg/dL         |
|  |       | diazepam   |                      |             | 0.2 µg/mL         |
| 12   | 31 yr | Ethanol  | Ingestion            | Int suicide |                   |
|  |       | diazepam   |                      |             |                   |
|  |       | aspirin/butalbital/caffeine  |                      |             |                   |
| 13   | 18 yr | Methanol   | Ingestion            | Int misuse  |                   |
| 14*  | 20 yr | Methanol   | Ingestion            | Int suicide | 1,200 mg/dL, 38 h |
| 15   | 62 yr | Methanol   | Ingestion            | Int suicide | 907 mg/dL, >24 h  |
| <i>See also cases 27, 156, 172, 173, 204, 208, 211, 221, 249, 254, 255, 256, 257, 263, 269, 289, 300, 304, 306, 321, 323, 324, 339, 400, 435, 442, 451, 460, 461, 470, 471, 512, 513, 514, 529, 539, 540 (ethanol); 541 (isopropyl alcohol).</i> |       |  |                      |             |                   |
| <b>Arts/crafts/office supplies</b>   |       |  |                      |             |                   |
| 16*‡   | 14 yr | Typewriter correction fluid<br>(trichloroethane/trichloroethylene) | Inhalation           | Int abuse   |                   |
| 17‡  | 19 yr | Typewriter correction fluid<br>(trichloroethane/trichloroethylene) | Inhalation           | Int abuse   |                   |
| 18*‡   | 20 yr | Typewriter correction fluid<br>(trichloroethane/trichloroethylene) | Inhalation           | Int abuse   |                   |
| <b>Automotive/aircraft/boat products</b>   |       |  |                      |             |                   |
| 19   | 25 yr | Ethylene glycol antifreeze   | Ingestion            | Int unknown | 38 mg/dL          |
| 20   | 29 yr | Ethylene glycol antifreeze   | Ingestion            | Int suicide |                   |
| 21*  | 34 yr | Ethylene glycol antifreeze   | Ingestion            | Int suicide | 209 mg/dL§        |
| 22   | 50 yr | Ethylene glycol antifreeze   | Ingestion            | Int suicide | 17.3 mg/dL        |
| 23*  | 59 yr | Windshield washer solvent (methanol)                               | Ingestion            | Int abuse   | 22 mg/dL, 2 d     |
| <b>Bites and envenomations</b>   |       |  |                      |             |                   |
| 24‡  | 47 yr | Red wasp sting   | Bite/sting           | Adv rxn     |                   |

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No.  | Age    | Substances  | Route of Exposure | Reason          | Blood Levels |
|---|--------|---|-------------------|-----------------|--------------|
| <b>Chemicals</b>                                    |        |   |                   |                 |              |
| 25*   | 40 yr  | Ammonium nitrate (50%) ice pack   | Ingestion         | Int suicide     |              |
|   |        |   |                   | methemoglobin   | 50%          |
| 26  | 48 yr  | Carburetor cleaner (40%-60% methylene chloride, 20% cresylic acid)        | Dermal            | Acc gen         |              |
| 27*   | 62 yr  | Chloroform ethanol  | Ingestion         | Int suicide     | 140 mg/dL    |
| 28‡   | 18 yr  | Cyanide   | Ingestion         | Int suicide     | 4.7 µg/mL    |
| 29‡   | 33 yr  | Cyanide   | Ingestion         | Int suicide     | 11.8 µg/mL   |
| 30*‡  | 35 yr  | Cyanide   | Ingestion         | Int suicide     |              |
| 31  | 36 yr  | Cyanide   | Ingestion         | Int suicide     |              |
| 32  | 36 yr  | Cyanide cocaine   | Ingestion         | Int suicide     | 4.96 µg/mL§  |
|   |        |   |                   | benzoylecgonine | 1.09 µg/mL   |
| 33  | 28 yr  | Hard water ring and stain remover (HF/HCL)                                | Ingestion         | Int suicide     |              |
| 34  | 24 yr  | Ethylene glycol   | Ingestion         | Unknown         | 25 mg/dL     |
| 35  | 48 yr  | Ethylene glycol   | Ingestion         | Int suicide     |              |
| 36‡   | 56 yr  | Ethylene glycol   | Ingestion         | Int suicide     | 31 mg/dL     |
| 37*   | 58 yr  | Formaldehyde/methanol solution  | Ingestion         | Int suicide     | 33.1 mg/dL   |
| 38*   | 19 yr  | Hydrogen cyanide  | Inhalation        | Acc occup       | 2.5 µg/mL    |
| 39*‡  | 21 yr  | Hydrogen cyanide  | Inhalation        | Acc occup       |              |
| 40*‡  | 25 yr  | Hydrogen cyanide  | Inhalation        | Acc occup       |              |
| 41*‡  | 29 yr  | Hydrogen cyanide  | Inhalation        | Acc occup       |              |
| 42*‡  | 29 yr  | Hydrogen cyanide  | Inhalation        | Acc occup       |              |
| 43  | 30 yr  | Methylene chloride carburetor and parts cleaner                           | Ing/Inh/Derm      | Acc occup       |              |
| See also cases 92 (cyanide); 305 (ethylene glycol). |        |   |                   |                 |              |
| <b>Cleaning substances</b>                          |        |   |                   |                 |              |
| 44*   | 23 yr  | Aluminium brightener (HF) cocaine   | Ingestion         | Int suicide     |              |
| 45  | 17 yr  | Cleaner concentrate (KOH, sodium silicate) quarternary ammonium detergent | Inhalation        | Acc occup       |              |
| 46*   | 2 yr   | Drain opener (NaOH)   | Ingestion         | Acc gen         |              |
| 47  | 20 yr  | Drain opener liquid (sodium hypochlorite, NaOH, Na silicate)              | Ingestion         | Int suicide     |              |
| 48  | 22 yr  | Drain opener (hydrofluosilicic acid)                                      | Ingestion         | Acc gen         |              |
| 49  | 70 yr  | Drain opener (sodium hypochlorite, NaOH, sodium silicate)                 | Ingestion         | Int suicide     |              |
| 50*   | 71 yr  | Drain opener (65% KOH)  | Ingestion         | Int suicide     |              |
| 51  | 83 yr  | Drain opener (93% H <sub>2</sub> SO <sub>4</sub> )                        | Ingestion         | Unknown         |              |
| 52  | 90 yr  | Drain opener (H <sub>2</sub> SO <sub>4</sub> )                            | Ingestion         | Int suicide     |              |
| 53*   | 70 yr  | Enzyme laundry detergent  | Ingestion         | Acc gen         |              |
| 54*   | 81 yr  | Laundry detergent   | Ingestion         | Acc gen         |              |
| 55  | 32 yr  | Phenol disinfectant   | Ingestion         | Int suicide     |              |
| 56*   | 52 yr  | Pine oil cleaner  | Ingestion         | Int suicide     |              |
| 57*   | 20 yr  | Rust stain remover (4.9% HF)  | Ingestion         | Int suicide     |              |
| 58  | 22 yr  | Toilet bowl cleaner (23% HCL)   | Ingestion         | Int unknown     |              |
| 59  | 37 yr  | Toilet bowl cleaner (21.8% HCL)   | Ingestion         | Int suicide     |              |
| 60*   | 37 yr  | Toilet bowl cleaner (23% HCL)   | Ingestion         | Int suicide     |              |
| 61  | >17 yr | Toilet bowl cleaner (acid)  | Ingestion         | Int unknown     |              |
| 62  | >17 yr | Toilet bowl cleaner (15% HCL)   | Ingestion         | Int suicide     |              |
| See also case 45 (quarternary ammonium detergent).  |        |   |                   |                 |              |
| <b>Cosmetics/personal care products</b>             |        |   |                   |                 |              |
| 63‡   | 16 yr  | Antiperspirant (aerosol)  | Inhalation        | Int abuse       |              |
| 64  | 83 yr  | Denture cleaning tablets  | Ingestion         | Acc gen         |              |
| 65*‡  | 17 yr  | Nail enamel dryer (N-butane, propane, and other volatiles)                | Inhalation        | Int abuse       |              |

(Continued on following page)



TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No.                                       | Age    | Substances                           | Route of Exposure       | Reason      | Blood Levels     |
|--|--------|--------------------------------------|-------------------------|-------------|------------------|
| <b>Deodorizers</b>                             |        |                                      |                         |             |                  |
| 66*‡   | 16 yr  | Air freshener (propane, isobutane)   | Inhalation              | Int abuse   |                  |
| <b>Foreign bodies</b>                          |        |                                      |                         |             |                  |
| <i>See also case 230 (activated charcoal).</i> |        |                                      |                         |             |                  |
| <b>Fumes, gases, and vapors</b>                |        |                                      |                         |             |                  |
| 67*‡   | 15 mo  | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ | 48%              |
| 68‡  | 22 mo  | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ | 57%              |
| 69*‡   | 2 yr   | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ | >50%             |
| 70*‡   | 3 yr   | Carbon monoxide                      | Inhalation              | Acc environ | 33.4%            |
| 71‡  | 5 yr   | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ |                  |
| 72‡  | 11 yr  | Carbon monoxide                      | Inhalation              | Unknown     | 60.7%            |
| 73   | 18 yr  | Carbon monoxide                      | Inhalation              | Acc environ | 2.2%             |
| 74‡  | 22 yr  | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ | 34%              |
| 75*‡   | 24 yr  | Carbon monoxide                      | Inhalation              | Acc environ | 49%              |
| 76‡  | 25 yr  | Carbon monoxide                      | Inhalation              | Int suicide | 30%              |
| 77‡  | 33 yr  | Carbon monoxide                      | Inhalation              | Int suicide |                  |
| 78‡  | 35 yr  | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ | 40%              |
| 79‡  | 37 yr  | Carbon monoxide                      | Inhalation              | Acc environ | 97%              |
| 80‡  | 40 yr  | Carbon monoxide                      | Inhalation              | Acc environ |                  |
| 81‡  | 45 yr  | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ | >40%             |
| 82‡  | 53 yr  | Carbon monoxide                      | Inhalation              | Int suicide | 38.2%            |
| 83‡  | 55 yr  | Carbon monoxide                      | Inhalation              | Int suicide | 78%              |
| 84‡  | 65 yr  | Carbon monoxide                      | Inhalation              | Int suicide | 16.6%, 1 h       |
| 85‡  | 72 yr  | Carbon monoxide                      | Inhalation              | Int suicide | 40.7%            |
| 86   | 84 yr  | Carbon monoxide                      | Inhalation              | Int suicide | 62%              |
| 87‡  | 85 yr  | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ |                  |
| 88‡  | 88 yr  | Carbon monoxide/smoke inhalation     | Inhalation              | Acc environ | 37%              |
| 89‡  | >17 yr | Carbon monoxide                      | Inhalation              | Int suicide |                  |
| 90   | >17 yr | Carbon monoxide                      | Inhalation              | Int suicide |                  |
| 91   | >17 yr | Carbon monoxide                      | Inhalation              | Int suicide |                  |
| 92*‡   | 4 yr   | Carbon monoxide<br>cyanide           | Inhalation              | Acc environ | 43%<br>0.1 µg/mL |
| 93   | 37 yr  | Carbon monoxide<br>propoxyphene      | Inhalation<br>Ingestion | Int suicide | 30%              |
| 94*‡   | 16 yr  | Freon television tuner cleaner spray | Inhalation              | Int abuse   |                  |
| 95‡  | 24 yr  | Hydrogen sulfide                     | Inhalation              | Acc occup   |                  |
| 96‡  | 25 yr  | Hydrogen sulfide                     | Inhalation              | Acc occup   |                  |
| 97‡  | 30 yr  | Hydrogen sulfide                     | Inhalation              | Acc occup   |                  |
| 98*‡   | 30 yr  | Hydrogen sulfide                     | Inhalation              | Acc occup   |                  |
| 99*‡   | 32 yr  | Hydrogen sulfide                     | Inhalation              | Acc occup   |                  |
| 100‡   | 32 yr  | Hydrogen sulfide                     | Inhalation              | Acc occup   |                  |
| 101*   | 34 yr  | Hydrogen sulfide                     | Inhalation              | Acc occup   |                  |
| 102‡   | >17 yr | Methane                              | Inhalation              | Acc occup   |                  |
| 103  | 14 yr  | Propane or butane                    | Inhalation              | Int abuse   |                  |
| 104‡   | 17 yr  | Propane                              | Inhalation              | Int abuse   |                  |
| 105  | 20 yr  | Propane                              | Inhalation              | Int abuse   |                  |
| 106*‡  | 53 yr  | Sulfur dioxide                       | Inhalation              | Acc occup   |                  |
| <b>Fungicides</b>                              |        |                                      |                         |             |                  |
| <i>See also case 107 (benomyl).</i>            |        |                                      |                         |             |                  |
| <b>Heavy metals</b>                            |        |                                      |                         |             |                  |
| 107*   | 69 yr  | Copper chloride<br>benomyl           | Derm & Inh              | Acc gen     |                  |
| 108*†  | 49 yr  | Elemental mercury                    | Inhalation              | Acc occup   | 710 µg/mL        |
| 109*   | 83 yr  | Thallium coyote killer               | Ingestion               | Int suicide |                  |
| <b>Herbicides</b>                              |        |                                      |                         |             |                  |
| 110*   | 52 yr  | 2,4-D herbicide                      | Ingestion               | Int suicide |                  |
| 111  | 78 yr  | 2,4-D herbicide<br>amitriptyline     | Ingestion               | Int suicide |                  |

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No.   | Age   | Substances  | Route of Exposure | Reason          | Blood Levels     |
|--|-------|---|-------------------|-----------------|------------------|
| 112*   | 16 yr | Diquat  | Ingestion         | Int suicide     | 9.6 µg/mL, 3.5 h |
| 113*   | 34 yr | Diquat  | Ingestion         | Int suicide     |                  |
| 114*   | 34 yr | Paraquat (29.1%)                                    | Ing/Inh/Derm      | Acc occup       |                  |
| <b>Hydrocarbons</b>                                    |       |   |                   |                 |                  |
| 115*‡  | 16 yr | Butane  | Inhalation        | Int abuse       | 622 µg/mL§       |
| 116*‡  | 16 yr | Butane lighter fluid                                | Inhalation        | Int abuse       | 0.8%§            |
|  |       | marijuana   |                   | Ingestion       | 1 ng/mL§         |
|  |       | diazepam  | Ingestion         |                 | 0.2 µg/mL +      |
| 117‡   | 13 yr | Fabric protector (trichloroethane/freon propellant) | Inhalation        | Int abuse       |                  |
| 118  | 18 mo | Lamp oil (kerosene)                                 | Ingestion         | Acc gen         |                  |
| 119*   | 20 mo | Methylene iodide                                    | Ingestion         | Acc gen         |                  |
| 120*   | 25 yr | Red furniture polish (mineral seal oil)             | Ingestion         | Unknown         |                  |
| 121‡   | 32 yr | Refrigerant (freon)                                 | Inhalation        | Int unknown     |                  |
| <i>See also case 521 (trichloroethane).</i>            |       |   |                   |                 |                  |
| <b>Insecticides and pesticides</b>                     |       |   |                   |                 |                  |
| 122  | 53 yr | Cythioate   | Ingestion         | Int suicide     |                  |
|  |       | chlordiazepoxide/clindinium                         |                   |                 |                  |
| 123*   | 65 yr | Diazinon  | Ingestion         | Int suicide     |                  |
| 124  | 78 yr | Diazinon  | Ingestion         | Int suicide     |                  |
| 125  | 40 yr | Endosulfan  | Ingestion         | Int suicide     |                  |
| 126  | 34 yr | Malathion   | Ingestion         | Int unknown     |                  |
| 127  | 60 yr | Malathion   | Ingestion         | Int suicide     |                  |
| 128  | 74 yr | Malathion   | Ingestion         | Int suicide     |                  |
| 129  | 49 yr | Malathion   | Ingestion         | Int suicide     | 11.8 µg/mL§      |
|  |       | cocaine   |                   |                 | 0.59 µg/mL§      |
|  |       |   |                   | benzoylecgonine | 1.41 µg/mL§      |
| 130  | 86 yr | Organophosphate                                     | Ingestion         | Unknown         |                  |
| 131‡   | 49 yr | Organophosphate                                     | Ingestion         | Int suicide     |                  |
|  |       | brodifacoum rodenticide                             |                   |                 |                  |
| 132*   | 57 yr | Sodium arsenate ant killer                          | Ingestion         | Int suicide     |                  |
|  |       |   |                   | urine arsenic   | 30,859 µg/L      |
| 133*‡  | 18 mo | Unknown type fire ant killer                        | Ingestion         | Acc gen         |                  |
| <b>Moth repellents</b>                                 |       |   |                   |                 |                  |
| <i>See also case 413 (mothballs, unspecified type)</i> |       |   |                   |                 |                  |
| <b>Plants</b>  |       |   |                   |                 |                  |
| 134*‡  | 42 yr | <i>Cicuta douglasii</i> (water hemlock)             | Ingestion         | Acc gen         |                  |
| <b>Rodenticides</b>                                    |       |   |                   |                 |                  |
| 135*†  | 36 yr | Warfarin rodenticide                                | Ingestion         | Int suicide     |                  |
| <i>See also case 131 (brodifacoum rodenticide)</i>     |       |   |                   |                 |                  |
| <b>Sporting equipment</b>                              |       |   |                   |                 |                  |
| 136*   | 18 mo | Saddle dressing (aliphatic hydrocarbons)            | Ingestion         | Acc gen         |                  |
| <b>Tobacco products</b>                                |       |   |                   |                 |                  |
| 137*   | 18 yr | Nicotine alkaloids                                  | Ingestion         | Int suicide     |                  |
| <b>Analgesics</b>                                      |       |   |                   |                 |                  |
| 138*†  | 5 yr  | Acetaminophen (adult)                               | Ingestion         | Int misuse      | 215 µg/mL        |
| 139*†  | 8 yr  | Acetaminophen (adult)                               | Ingestion         | Int misuse      | 14 µg/mL         |
| 140  | 15 yr | Acetaminophen (adult)                               | Ingestion         | Int suicide     | 16 µg/mL >60 h   |
| 141  | 19 yr | Acetaminophen                                       | Ingestion         | Int misuse      | 29 µg/mL, 24 h   |
| 142  | 23 yr | Acetaminophen                                       | Ingestion         | Int misuse      |                  |
| 143  | 25 yr | Acetaminophen (adult)                               | Ingestion         | Int suicide     | 133 µg/mL, 2 h   |
| 144  | 25 yr | Acetaminophen (adult)                               | Ingestion         | Int suicide     | 160 µg/mL, 18 h  |
| 145†   | 28 yr | Acetaminophen (adult)                               | Ingestion         | Acc misuse      | 100 µg/mL        |
| 146  | 29 yr | Acetaminophen (adult)                               | Ingestion         | Int suicide     | 203 µg/mL, 20 h  |
| 147  | 31 yr | Acetaminophen (adult)                               | Ingestion         | Int suicide     | 68 µg/mL, 96 h   |
| 148†   | 35 yr | Acetaminophen                                       | Ingestion         | Int suicide     | 252 µg/mL        |

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age    | Substances                     | Route of Exposure | Reason           | Blood Levels                   |
|----------|--------|--------------------------------|-------------------|------------------|--------------------------------|
| 149      | 43 yr  | Acetaminophen                  | Ingestion         | Int suicide      | 289 µg/mL                      |
| 150†     | 63 yr  | Acetaminophen (adult)          | Ingestion         | Int misuse       |                                |
| 151      | 64 yr  | Acetaminophen (adult)          | Ingestion         | Int unknown      | 8 µg/mL, >24 h                 |
| 152      | 87 yr  | Acetaminophen (adult)          | Ingestion         | Int suicide      | 720 µg/mL                      |
| 153*†    | >17 yr | Acetaminophen (adult)          | Ingestion         | Int misuse       | 37 µg/mL                       |
| 154*     | 62 yr  | Acetaminophen (adult)          | Ingestion         | Int unknown      | 338 µg/mL                      |
|          |        | aspirin                        |                   |                  | 48 mg/dL                       |
| 155*     | 25 yr  | Acetaminophen                  | Ingestion         | Int suicide      | 669 µg/mL, 10-24 h             |
|          |        | desipramine                    |                   |                  |                                |
|          |        | flurazepam                     |                   |                  |                                |
| 156†     | 42 yr  | Acetaminophen                  | Ingestion         | Int misuse       | 48 µg/mL                       |
|          |        | ethanol                        |                   |                  | 5 mg/dL                        |
| 157      | 21 yr  | Acetaminophen                  | Ingestion         | Int suicide      | 134 µg/mL, 9 h                 |
|          |        | iron                           |                   |                  | 304 µg/dL, 9 h                 |
| 158      | >17 yr | Acetaminophen                  | Ingestion         | Unknown          |                                |
|          |        | nortriptyline                  |                   |                  |                                |
| 159†     | 40 yr  | Acetaminophen/codeine          | Ingestion         | Int misuse       |                                |
| 160†     | 64 yr  | Acetaminophen/codeine          | Ingestion         | Int misuse       | 21.8 µg/mL, 25 h               |
|          |        | acetaminophen (adult)          |                   |                  |                                |
| 161†     | 61 yr  | Acetaminophen/codeine          | Ingestion         | Int misuse       | 95 µg/mL <sup>  </sup>         |
|          |        | acetaminophen/aspirin          |                   |                  | 60 mg/dL <sup>  </sup>         |
|          |        | aspirin/butalbital/caffeine    |                   |                  |                                |
| 162      | 60 yr  | Acetaminophen/codeine          | Ingestion         | Int suicide      | 130 µg/mL, 16 h                |
|          |        | alprazolam                     |                   |                  |                                |
| 163      | 77 yr  | Acetaminophen/codeine          | Ingestion         | Acc misuse       | 50.6 µg/mL <sup>  </sup>       |
|          |        | aspirin                        |                   |                  |                                |
| 164      | 30 yr  | Acetaminophen/codeine          | Ingestion         | Int suicide      | 92 µg/mL, 36 h                 |
|          |        | carisoprodol                   |                   |                  |                                |
| 165‡     | 22 yr  | Acetaminophen/codeine          | Ingestion         | Int unknown      |                                |
|          |        | cyclobenzaprine                |                   |                  |                                |
| 166‡     | 27 yr  | Acetaminophen/codeine          | Ingestion         | Int abuse        | 5.1 µg/mL, <sup>  </sup>       |
|          |        | diazepam                       |                   |                  | >15.5 h                        |
| 167‡     | 30 yr  | Acetaminophen/opiates          | Ingestion         | Unknown          |                                |
|          |        | ephedrine                      |                   |                  |                                |
| 168      | 58 yr  | Acetaminophen/oxycodone        | Ingestion         | Int suicide      | 27 µg/mL <sup>  </sup>         |
|          |        | diazepam                       |                   |                  |                                |
| 169      | 27 yr  | Acetaminophen/phenyltoloxamine | Ingestion         | Int suicide      | 85 µg/mL <sup>  </sup>         |
|          |        | acetaminophen/codeine          |                   |                  |                                |
|          |        | alprazolam                     |                   |                  |                                |
| 170      | 27 yr  | Acetaminophen/propoxyphene     | Ingestion         | Int suicide      | 40 µg/mL <sup>  </sup>         |
| 171      | 57 yr  | Acetaminophen/propoxyphene     | Ingestion         | Unknown          | 65 µg/mL <sup>  </sup>         |
| 172      | 24 yr  | Acetaminophen/propoxyphene     | Ingestion         | Int unknown      |                                |
|          |        | cocaine                        |                   |                  |                                |
|          |        | ethanol                        |                   |                  |                                |
| 173      | 40 yr  | Acetaminophen/propoxyphene     | Ingestion         | Int suicide      | 61 µg/mL, <sup>  </sup> 8 h    |
|          |        |                                |                   | propoxyphene     | 6.0 mg/dL <sup>§</sup>         |
|          |        |                                |                   | nor-propoxyphene | 0.09 mg/dL <sup>§</sup>        |
|          |        | ethanol                        |                   |                  |                                |
|          |        | diazepam                       |                   |                  | 0.04 mg/dL <sup>§</sup>        |
|          |        |                                |                   | nor-diazepam     | 0.04 mg/dL <sup>§</sup>        |
| 174      | 39 yr  | Acetaminophen/propoxyphene     | Ingestion         | Int suicide      | 690 µg/mL, <sup>  </sup> 1-4 h |
|          |        | hydrochlorothiazide            |                   |                  |                                |
| 175‡     | 30 yr  | Acetaminophen/propoxyphene     | Ingestion         | Int suicide      | 254.5 µg/mL, <sup>  </sup> 4 h |
|          |        | prazepam                       |                   |                  |                                |
|          |        | meclofenamate                  |                   |                  |                                |
| 176*     | 3 yr   | Aspirin (pediatric)            | Ingestion         | Acc gen          | 102 mg/dL, 6 h                 |
| 177*     | 16 yr  | Aspirin (adult)                | Ingestion         | Int suicide      | 117 mg/dL, 10-11 h             |
| 178      | 23 yr  | Aspirin                        | Ingestion         | Int suicide      | 156 mg/dL, 3 h                 |
| 179      | 29 yr  | Aspirin                        | Ingestion         | Int suicide      | 112.2 mg/dL                    |
| 180†     | 31 yr  | Aspirin                        | Ingestion         | Int suicide      |                                |
| 181      | 40 yr  | Aspirin                        | Ingestion         | Int suicide      | 107.4 mg/dL, 33 h              |
| 182†     | 47 yr  | Aspirin                        | Ingestion         | Int misuse       | 86 mg/dL                       |

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age   | Substances   | Route of Exposure | Reason      | Blood Levels   |
|----------|-------|--|-------------------|-------------|--|
| 183      | 52 yr | Aspirin  | Ingestion         | Int suicide |  |
| 184†     | 60 yr | Aspirin  | Ingestion         | Acc misuse  | 91.9 mg/dL   |
| 185      | 60 yr | Aspirin  | Ingestion         | Int suicide | 102 mg/dL  |
| 186      | 62 yr | Aspirin  | Ingestion         | Int suicide | 127 mg/dL  |
| 187†     | 67 yr | Aspirin  | Ingestion         | Int misuse  | 121 mg/dL  |
| 188      | 70 yr | Aspirin  | Ingestion         | Unknown     | 113 mg/dL, >6 h  |
| 189      | 77 yr | Aspirin  | Ingestion         | Int misuse  | 78.9 mg/dL   |
| 190†     | 82 yr | Aspirin  | Ingestion         | Acc misuse  | 68.8 mg/dL   |
| 191      | 83 yr | Aspirin  | Ingestion         | Int suicide | 65 mg/dL   |
| 192      | 18 yr | Aspirin  | Ingestion         | Int suicide | 21 mg/dL, 2 h  |
|          |       | acetaminophen/codeine<br>ibuprofen                       |                   |             | 99 µg/mL, <sup>  </sup> 6-8 h  |
| 193      | 59 yr | Aspirin (adult)<br>amitriptyline<br>acetaminophen        | Ingestion         | Int suicide | 126 mg/dL, <6 h  |
|          |       |  |                   |             | 52 µg/mL, 11 h   |
| 194      | 39 yr | Aspirin<br>cocaine                                       | Ing & Paren       | Int suicide | 95 mg/dL§  |
| 195      | 35 yr | Aspirin<br>imipramine<br>acetaminophen/propoxyphene      | Ingestion         | Int suicide | 105.6 mg/dL§<br>1,900 ng/mL§<br>55.2 µg/mL§ <sup>  </sup><br>propoxyphene 1.6 µg/mL§ |
| 196      | 30 yr | Aspirin<br>cocaine                                       | Ingestion         | Int suicide | 102 mg/dL  |
| 197      | 49 yr | Aspirin<br>cyclobenzaprine                               | Ingestion         | Int suicide | 90 mg/dL, 1-6 h  |
| 198      | 52 yr | Aspirin (adult)<br>diphenoxylate/atropine<br>meprobamate | Ingestion         | Int unknown | 112 mg/dL, 10 h  |
| 199      | 64 yr | Aspirin<br>doxylamine sleep aid                          | Ingestion         | Int unknown | 140 mg/dL, >18.5 h   |
| 200      | 59 yr | Aspirin/oxycodone<br>acetaminophen/propoxyphene          | Ingestion         | Int suicide |  |
| 201‡     | 54 yr | Aspirin/propoxyphene<br>alprazolam<br>temazepam          | Ingestion         | Int suicide | 50 mg/dL¶  |
| 202*     | 60 yr | Colchicine   | Ingestion         | Int suicide |  |
| 203      | 15 yr | Colchicine<br>clonidine<br>tetracycline                  | Ingestion         | Int suicide | 26 ng/mL§  |
| 204      | 68 yr | Colchicine<br>ethanol                                    | Ingestion         | Int suicide |  |
| 205†     | 26 yr | Hydromorphone  | Parenteral        | Int abuse   |  |
| 206      | 20 yr | Hydromorphone<br>amphetamines                            | Ingestion         | Int suicide |  |
| 207      | 25 yr | Meperidine<br>cocaine<br>benzodiazepines                 | Unknown           | Int suicide |  |
| 208‡     | 43 yr | Methadone<br>ethanol                                     | Ingestion         | Int unknown | 0.1 mg/L§  |
| 209      | 37 yr | Morphine<br>codeine<br>barbiturates                      | Ingestion         | Unknown     | 260 µg/L§  |
| 210      | 26 yr | Morphine<br>diazepam                                     | Ingestion         | Int suicide |  |
| 211‡     | 23 yr | Morphine, sustained release<br>ethanol                   | Ingestion         | Int suicide | 520 µg/L§  |
| 212‡     | 53 yr | Morphine, sustained release<br>propoxyphene<br>atenolol  | Ingestion         | Int suicide |  |
| 213      | 30 yr | Opiates  | Parenteral        | Int unknown | morphine 850 µg/L§   |
| 214      | 32 yr | Opiates  | Unknown           | Int unknown | total 3,300 µg/L§  |

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age   | Substances                                     | Route of Exposure | Reason      | Blood Levels                |
|----------|-------|--|-------------------|-------------|-----------------------------|
| 215      | 32 yr | Opiates  | Unknown           | Int unknown |                             |
|          |       |  |                   |             | total 1,700 µg/L§           |
| 216‡     | 36 yr | Opiates  | Unknown           | Int abuse   |                             |
|          |       |  |                   |             | total 1,400 µg/L§           |
| 217      | 47 yr | Opiates  | Ingestion         | Int unknown |                             |
| 218*     | 39 yr | Propoxyphene                                   | Ingestion         | Int suicide | 8.0 µg/mL§                  |
|          |       |  |                   |             | nor-propoxyphene 9.6 µg/mL§ |
| 219‡     | 46 yr | Propoxyphene                                   | Ingestion         | Int suicide |                             |
| 220†     | 65 yr | Propoxyphene                                   | Ingestion         | Int misuse  | 337 µg/mL                   |
| 221‡     | 15 yr | Propoxyphene<br>ethanol                        | Ingestion         | Int unknown |                             |
| 222      | 58 yr | Propoxyphene<br>triazolam<br>cimetidine        | Ingestion         | Int suicide |                             |
| 223‡     | 3 yr  | Salicylates                                    | Ingestion         | Unknown     | 66 mg/dL§                   |
| 224†     | 83 yr | Salicylsalicylic acid<br>aspirin               | Ingestion         | Int misuse  |                             |
|          |       |  |                   |             | 84.7 mg/dL                  |
| 225      | 19 yr | Salsalate<br>acetaminophen/codeine<br>diazepam | Ingestion         | Int suicide | 86.9 mg/dL, 10 h            |

See also cases 160, 193, 249 (acetaminophen); 161 (acetaminophen/aspirin); 169, 192, 225, 250, 438, 460 (acetaminophen/codeine); 320 (acetaminophen/hydrocodone); 195, 200, 300, 395, 410, 462, (acetaminophen/propoxyphene); 154, 163, 224, 421, 422, 438, 442 (aspirin); 12, 161 (aspirin/butalbital/caffeine); 264 (aspirin/butalbital/caffeine/codeine); 209 (codeine); 192, 325, 326, 376 (ibuprofen); 175 (meclofenamate); 329, 447 (morphine); 379 (Italian analgesic/antipyretic containing dipyrone, adiphenine, diphenadione, benzetilum); 459, 520 (opiates); 93, 212, 307 (propoxyphene).

## Anesthetics

226\* 17 mo Dibucaine local anesthetic ointment Ingestion Acc gen

## Anticholinergics

See also cases 288, 290, 380, 465 (benztropine).

## Anticonvulsants

|       |       |   |           |             |                                    |
|-------|-------|---|-----------|-------------|------------------------------------|
| 227   | 18 yr | Carbamazepine                           | Ingestion | Int suicide | 31 µg/mL, 2-3 h                    |
| 228   | 42 yr | Carbamazepine<br>amoxapine<br>phenytoin | Ingestion | Int suicide | 28 µg/mL<br>143 ng/mL<br>1.4 µg/mL |
| 229†  | 59 yr | Phenytoin                               | Ingestion | Int unknown | 49 µg/mL                           |
| 230*† | 72 yr | Phenytoin<br>activated charcoal         | Ingestion | Acc misuse  | 39.1 µg/mL                         |
| 231*  | 24 yr | Valproic acid                           | Ingestion | Int suicide | 1,228 µg/mL                        |

See also cases 437 (carbamazepine); 228 (phenytoin); 457 (primidone).

## Antidepressants

|       |       |               |           |             |  |
|-------|-------|---------------|-----------|-------------|--|
| 232*‡ | 5 yr  | Amitriptyline | Ingestion | Acc gen     | 1,150 ng/mL§<br>nortriptyline 790 ng/mL§         |
| 233   | 20 yr | Amitriptyline | Ingestion | Int suicide |  |
| 234   | 23 yr | Amitriptyline | Ingestion | Int suicide | 5,700 ng/mL§<br>nortriptyline 1,700 ng/mL§       |
| 235   | 27 yr | Amitriptyline | Ingestion | Int suicide | 2,798 ng/mL, <7 h                                |
| 236   | 27 yr | Amitriptyline | Ingestion | Int suicide | 929 ng/mL<br>nortriptyline 510 ng/mL             |
| 237‡  | 28 yr | Amitriptyline | Ingestion | Int suicide |  |
| 238   | 30 yr | Amitriptyline | Ingestion | Int suicide |  |
| 239   | 31 yr | Amitriptyline | Ingestion | Int suicide |  |
| 240‡  | 32 yr | Amitriptyline | Ingestion | Int suicide | 3,300 ng/mL§                                     |
| 241‡  | 35 yr | Amitriptyline | Ingestion | Int suicide | 17,800 ng/mL§<br>nortriptyline 8,900 ng/mL§      |
| 242‡  | 36 yr | Amitriptyline | Ingestion | Int suicide |  |
| 243‡  | 40 yr | Amitriptyline | Ingestion | Int suicide | 2,264 ng/mL<br>total blood tricyclic 3,160 ng/mL |
| 244   | 44 yr | Amitriptyline | Ingestion | Int suicide |  |
| 245   | 49 yr | Amitriptyline | Ingestion | Int suicide |  |

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TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age    | Substances                          | Route of Exposure | Reason        | Blood Levels             |
|----------|--------|-------------------------------------|-------------------|---------------|--------------------------|
| 246‡     | 68 yr  | Amitriptyline                       | Ingestion         | Int suicide   | 350 ng/mL§               |
| 247      | >17 yr | Amitriptyline                       | Ingestion         | Int suicide   | nortriptyline 410 ng/mL§ |
| 248      | 73 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | amitriptyline/chlordiazepoxide      |                   |               |                          |
|          |        | doxepin                             |                   |               |                          |
| 249      | 16 yr  | Amitriptyline                       | Ingestion         | Int suicide   | 140 µg/mL                |
|          |        | acetaminophen (adult)               |                   |               |                          |
|          |        | ethanol                             |                   |               |                          |
| 250      | >17 yr | Amitriptyline                       | Ingestion         | Int unknown   |                          |
|          |        | acetaminophen/codeine               |                   |               |                          |
| 251      | 36 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | chlorpromazine                      |                   |               |                          |
|          |        | chlordiazepoxide                    |                   |               |                          |
| 252      | 34 yr  | Amitriptyline                       | Ingestion         | Int suicide   | 2,800 ng/dL              |
|          |        | diazepam                            |                   |               |                          |
| 253      | 20 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | diphenhydramine                     |                   |               |                          |
| 254      | 23 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | ethanol                             |                   |               |                          |
| 255      | 44 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | ethanol                             |                   |               |                          |
| 256‡     | 49 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | ethanol                             |                   |               |                          |
| 257      | 62 yr  | Amitriptyline                       | Ingestion         | Int suicide   | 5,400 ng/mL§             |
|          |        | ethanol                             |                   | nortriptyline | 1,400 ng/mL§             |
|          |        | chlorpromazine                      |                   |               | 700 mg/dL§               |
|          |        |                                     |                   |               | 300 ng/mL§               |
| 258      | 20 yr  | Amitriptyline                       | Ingestion         | Int suicide   | 2,868 ng/mL              |
|          |        | lithium                             |                   | nortriptyline | 200 ng/mL                |
| 259‡     | 51 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | lorazepam                           |                   |               | 870 ng/mL                |
| 260      | 64 yr  | Amitriptyline                       | Ingestion         | Int unknown   |                          |
|          |        | lorazepam                           |                   |               |                          |
| 261      | >17 yr | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | promethazine                        |                   |               |                          |
|          |        | spironolactone                      |                   |               |                          |
| 262      | 28 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | sedative/hypnotic, unidentified     |                   |               |                          |
| 263‡     | 41 yr  | Amitriptyline/chlordiazepoxide      | Ingestion         | Int suicide   |                          |
|          |        | ethanol                             |                   |               | 232 mg/dL                |
| 264      | 31 yr  | Amitriptyline                       | Ingestion         | Int suicide   |                          |
|          |        | aspirin/butalbital/caffeine/codeine |                   |               |                          |
| 265      | 52 yr  | Amitriptyline/perphenazine          | Ingestion         | Unknown       | 93 ng/mL                 |
|          |        |                                     |                   | nortriptyline | 293 ng/mL                |
| 266      | 24 yr  | Amitriptyline/perphenazine          | Ingestion         | Int suicide   |                          |
|          |        | cyclobenzaprine                     |                   |               |                          |
| 267      | 33 yr  | Amitriptyline/perphenazine          | Ingestion         | Int suicide   |                          |
|          |        | lorazepam                           |                   |               |                          |
| 268      | 18 yr  | Amoxapine                           | Ingestion         | Int suicide   |                          |
| 269*     | 27 yr  | Amoxapine                           | Ingestion         | Int suicide   |                          |
|          |        | ethanol                             |                   |               |                          |
| 270      | 21 yr  | Amoxapine                           | Ingestion         | Int suicide   |                          |
|          |        | iron                                |                   |               |                          |
|          |        | levothyroxine                       |                   |               |                          |
| 271*     | 15 mo  | Desipramine                         | Ingestion         | Acc gen       | 2,556 ng/mL              |
| 272‡     | 14 yr  | Desipramine                         | Ingestion         | Int suicide   | 878 ng/mL§               |
| 273      | 14 yr  | Desipramine                         | Ingestion         | Int suicide   |                          |
| 274      | 17 yr  | Desipramine                         | Ingestion         | Int suicide   |                          |
| 275      | 17 yr  | Desipramine                         | Ingestion         | Int suicide   |                          |

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age   | Substances   | Route of Exposure | Reason      | Blood Levels  |
|----------|-------|--|-------------------|-------------|---|
| 276‡     | 18 yr | Desipramine  | Ingestion         | Int suicide | 2,600 ng/mL§  |
| 277‡     | 23 yr | Desipramine  | Ingestion         | Int suicide | 10,400 ng/mL  |
| 278‡     | 24 yr | Desipramine  | Ingestion         | Int suicide | 11,200 ng/mL  |
| 279‡     | 24 yr | Desipramine  | Ingestion         | Int suicide | 16,000 ng/mL§   |
| 280      | 29 yr | Desipramine  | Ingestion         | Int suicide |   |
| 281      | 29 yr | Desipramine  | Ingestion         | Int suicide | 1,500 ng/mL   |
| 282      | 31 yr | Desipramine  | Ingestion         | Int suicide |   |
| 283      | 39 yr | Desipramine  | Ingestion         | Int suicide |   |
| 284      | 67 yr | Desipramine  | Ingestion         | Int suicide |   |
| 285      | 39 yr | Desipramine<br>alprazolam  | Ingestion         | Int suicide |   |
| 286‡     | 17 yr | Desipramine<br>amitriptyline                                       | Ingestion         | Int suicide |   |
| 287      | 60 yr | Desipramine<br>amitriptyline<br>perphenazine                       | Ingestion         | Int suicide | 13,000 ng/mL§   |
| 288      | 33 yr | Desipramine<br>benztropine<br>thiothixene                          | Ingestion         | Int suicide | 789 ng/mL, 1-2 h                                      |
| 289      | 27 yr | Desipramine<br>ethanol   | Ingestion         | Int suicide | 1,840 ng/mL<br>232 mg/dL                              |
| 290      | 48 yr | Desipramine<br>perphenazine<br>benztropine                         | Ingestion         | Int suicide |   |
| 291      | 37 yr | Desipramine<br>phenelzine<br>alprazolam                            | Ingestion         | Int suicide |   |
| 292      | 73 yr | Desipramine<br>temazepam   | Ingestion         | Int suicide |   |
| 293      | 41 yr | Desipramine<br>trazodone<br>flurazepam                             | Ingestion         | Int suicide |   |
| 294      | 16 yr | Doxepin  | Ingestion         | Int suicide | 14,500 ng/mL§   |
| 295‡     | 17 yr | Doxepin  | Ingestion         | Int suicide |   |
| 296*‡    | 20 yr | Doxepin  | Ingestion         | Int suicide |   |
| 297      | 26 yr | Doxepin  | Ingestion         | Int suicide |   |
| 298      | 28 yr | Doxepin  | Ingestion         | Int unknown | 55 ng/mL  |
| 299‡     | 39 yr | Doxepin  | Ingestion         | Int suicide | desmethyldoxepin 353 ng/mL                            |
| 300‡     | 62 yr | Doxepin<br>acetaminophen/propoxyphene<br>ethanol                   | Ingestion         | Int suicide | 24,000 ng/mL<br>52 µg/mL <sup>  </sup><br>91 mg/dL    |
| 301‡     | 10 yr | Doxepin<br>desipramine   | Ingestion         | Int suicide | 346 ng/mL<br>415 ng/mL                                |
| 302      | 72 yr | Doxepin<br>diltiazem   | Ingestion         | Int suicide |   |
| 303      | 43 yr | Doxepin<br>diphenhydramine<br>chlorazepate                         | Ingestion         | Int suicide |   |
| 304‡     | 20 yr | Doxepin<br>ethanol   | Ingestion         | Int suicide | 11,210 ng/mL§<br>20 mg/dL§                            |
| 305      | 52 yr | Doxepin<br>ethylene glycol<br>haloperidol                          | Ingestion         | Int suicide |   |
| 306‡     | 33 yr | Doxepin  | Ingestion         | Int suicide | 1,775 ng/mL§<br>nordoxepin 154 ng/mL§                 |
| 307      | 39 yr | lorazepam<br>ethanol<br>Doxepin<br>propoxyphene<br>methamphetamine | Ingestion         | Int suicide | 278 mg/dL§<br>905 ng/mL<br>desmethyldoxepin 449 ng/mL |

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TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age    | Substances  | Route of Exposure | Reason      | Blood Levels             |
|----------|--------|---|-------------------|-------------|--------------------------|
| 308‡     | 14 yr  | Imipramine  | Ingestion         | Int suicide | 4,100 ng/mL              |
| 309      | 17 yr  | Imipramine  | Ingestion         | Int suicide | desipramine 2,200 ng/mL  |
| 310      | 21 yr  | Imipramine  | Ingestion         | Int suicide | 8,300 ng/mL              |
| 311      | 29 yr  | Imipramine  | Ingestion         | Int suicide | desipramine 2,100 ng/mL  |
| 312      | 30 yr  | Imipramine  | Ingestion         | Int suicide | 560 ng/mL                |
| 313      | 33 yr  | Imipramine  | Ingestion         | Int suicide | desipramine 630 ng/mL    |
| 314      | 35 yr  | Imipramine  | Ingestion         | Unknown     |                          |
| 315      | 39 yr  | Imipramine  | Ingestion         | Int suicide | >10,000 ng/mL, 1.5 h     |
| 316      | 40 yr  | Imipramine  | Ingestion         | Int suicide |                          |
| 317‡     | 42 yr  | Imipramine  | Ingestion         | Int suicide | 10,900 ng/mL§            |
| 318      | 50 yr  | Imipramine  | Ingestion         | Int suicide | desipramine 5,900 ng/mL§ |
| 319      | >17 yr | thioridazine<br>Imipramine  | Ingestion         | Int suicide |                          |
| 320‡     | 16 yr  | Imipramine  | Ingestion         | Int suicide |                          |
| 321      | 26 yr  | acetaminophen/hydrocodone<br>trazodone<br>Imipramine                          | Ingestion         | Int suicide |                          |
| 322      | 21 yr  | alprazolam<br>ethanol<br>Imipramine   | Ingestion         | Int suicide |                          |
| 323      | 29 yr  | cocaine<br>alprazolam<br>Imipramine   | Ingestion         | Int suicide | 1.65 µg/mL§              |
| 324      | 40 yr  | ethanol<br>Imipramine   | Ingestion         | Int suicide |                          |
| 325*     | 16 yr  | ethanol<br>Imipramine   | Ingestion         | Int suicide |                          |
| 326*     | 30 yr  | Imipramine  | Ingestion         | Int suicide | 923 ng/mL, >48 h         |
| 327†     | 34 yr  | ibuprofen<br>phenylephrine/phenylpropanol-<br>amine/guaifenesin<br>Imipramine | Ingestion         | Adv rxn     |                          |
| 328      | 42 yr  | thioridazine<br>Imipramine  | Ingestion         | Int suicide | 5,280 ng/mL              |
| 329*     | 20 yr  | desipramine<br>Imipramine   | Ingestion         | Int suicide | 1,385 ng/mL              |
| 330†     | 80 yr  | thioridazine<br>morphine<br>Lithium   | Ingestion         | Acc misuse  | 3.4 mEq/L                |
| 331      | 37 yr  | Lithium   | Ingestion         | Int suicide |                          |
| 332*‡    | 46 yr  | mesoridazine<br>fluoxetine<br>Loxapine  | Ingestion         | Int suicide | 6,900 ng/mL§             |
| 333      | 30 yr  | Loxapine  | Ingestion         | Int suicide | 7,700 ng/mL§             |
| 334      | 40 yr  | triazolam<br>Monoamine oxidase inhibitors<br>phenothiazines                   | Ingestion         | Int suicide |                          |
| 335      | 36 yr  | Nortriptyline   | Ingestion         | Int suicide |                          |
| 336      | 41 yr  | Nortriptyline   | Ingestion         | Int misuse  | 310 ng/mL§               |
| 337*     | 43 yr  | Nortriptyline   | Ingestion         | Int suicide | 1,240 ng/mL              |
| 338‡     | 50 yr  | Nortriptyline   | Ingestion         | Int suicide | 3,700 ng/mL§             |
| 339      | 36 yr  | diazepam<br>Nortriptyline<br>diazepam<br>ethanol                              | Ingestion         | Int suicide | 0.07 µg/mL§              |



TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age   | Substances                       | Route of Exposure | Reason          | Blood Levels |
|----------|-------|----------------------------------|-------------------|-----------------|--------------|
| 340†     | 81 yr | Nortriptyline                    | Ingestion         | Acc misuse      |              |
|          |       | digoxin                          |                   |                 | >5 ng/mL     |
| 341      | 24 yr | Nortriptyline                    | Ingestion         | Int suicide     | 3,300 ng/mL§ |
|          |       | trifluoperazine                  |                   |                 |              |
| 342      | 34 yr | Phenelzine                       | Ingestion         | Int suicide     |              |
|          |       | lithium                          |                   |                 | 1.3 mEq/L    |
|          |       | clonazepam                       |                   |                 |              |
| 343*     | 37 yr | Tranlycypromine                  | Ingestion         | Int suicide     |              |
|          |       | flurazepam                       |                   |                 |              |
| 344      | 33 yr | Trimipramine                     | Ingestion         | Int suicide     |              |
|          |       |                                  |                   | total tricyclic | 2,150 ng/mL  |
|          |       | triazolam                        |                   |                 |              |
| 345‡     | 23 yr | Unknown tricyclic antidepressant | Ingestion         | Int suicide     | 3,800 ng/mL  |
|          |       | bupirone                         |                   |                 |              |
| 346      | 30 yr | Unknown tricyclic antidepressant | Ingestion         | Int suicide     | 2,300 ng/mL  |
|          |       | perphenazine                     |                   |                 |              |
| 347      | 42 yr | Unknown tricyclic antidepressant | Ingestion         | Int suicide     |              |
|          |       | thioridazine                     |                   |                 |              |
|          |       | fluoxetine                       |                   |                 |              |

See also cases 228, 425 (amoxapine); 111, 193, 286 (amitriptyline); 248 (amitriptyline/chlordiazepoxide); 374 (amitriptyline/perphenazine); 345 (bupirone); 155, 301, 396 (desipramine); 248, 410, 511 (doxepin); 331, 347, 404 (fluoxetine); 195, 448 (imipramine); 258, 342 (lithium); 158, 405 (nortriptyline); 291 (phenelzine); 293, 310, 396 (trazodone).

**Antihistamines**

|      |       |  |           |             |           |
|------|-------|--|-----------|-------------|-----------|
| 348* | 15 mo | Diphenhydramine                          | Ingestion | Acc gen     | 9.8 µg/mL |
| 349  | 26 yr | Diphenhydramine                          | Ingestion | Int suicide |           |
| 350  | 66 yr | Diphenhydramine                          | Ingestion | Int suicide |           |
| 351  | 15 yr | Diphenhydramine                          | Ingestion | Int suicide | 1 µg/mL   |
|      |       | diet aid (phenylpropanolamine, caffeine) |           |             |           |

See also cases 222 (cimetidine); 253, 303, 423 (diphenhydramine).

**Antimicrobials**

|      |       |             |           |             |  |
|------|-------|-------------|-----------|-------------|--|
| 352‡ | 17 yr | Chloroquine | Ingestion | Int suicide |  |
|------|-------|-------------|-----------|-------------|--|

See also case 203 (tetracycline).

**Asthma therapies**

|       |       |                            |             |             |                    |
|-------|-------|----------------------------|-------------|-------------|--------------------|
| 353*† | 21 mo | Theophylline               | Ingestion   | Unknown     | 55.6 µg/mL         |
| 354*  | 15 yr | Theophylline (long-acting) | Ingestion   | Int suicide | 273 µg/mL, 21 h    |
| 355*‡ | 28 yr | Theophylline (long-acting) | Ingestion   | Int suicide | 119 µg/mL          |
| 356   | 47 yr | Theophylline               | Ingestion   | Int suicide | 213 µg/mL          |
| 357†  | 54 yr | Theophylline               | Ingestion   | Acc misuse  | 41 µg/mL           |
| 358   | 55 yr | Theophylline (long-acting) | Ingestion   | Int suicide | 138 µg/mL, 1.5-7 h |
| 359   | 60 yr | Theophylline (long-acting) | Ingestion   | Int suicide | 127.4 µg/mL        |
| 360   | 61 yr | Theophylline               | Ingestion   | Int unknown | 152 µg/mL          |
| 361†  | 61 yr | Theophylline               | Ingestion   | Int misuse  | 51 µg/mL           |
| 362†  | 65 yr | Theophylline               | Ingestion   | Acc misuse  | 32.5 µg/mL         |
| 363†  | 70 yr | Theophylline               | Ing & Paren | Acc misuse  | >40 µg/mL          |
| 364†  | 70 yr | Theophylline (long-acting) | Ingestion   | Acc misuse  | 64 µg/mL           |
| 365†  | 70 yr | Theophylline               | Ingestion   | Acc misuse  | 57 µg/mL           |
| 366†  | 73 yr | Theophylline (long-acting) | Ingestion   | Acc gen     | 61 µg/mL           |
| 367†  | 75 yr | Theophylline               | Ingestion   | Adv rxn     | 29 µg/mL           |
| 368†  | 75 yr | Theophylline (long-acting) | Ingestion   | Acc misuse  | 49 µg/mL           |
| 369†  | 77 yr | Theophylline               | Ingestion   | Unknown     | 95 µg/mL           |
| 370*† | 79 yr | Theophylline               | Ingestion   | Acc misuse  | 82 µg/mL           |
| 371   | 79 yr | Theophylline (long-acting) | Ingestion   | Int suicide | 230 µg/mL          |
| 372†  | 83 yr | Theophylline               | Ingestion   | Acc misuse  | 50 µg/mL           |
| 373†  | 85 yr | Theophylline (long-acting) | Ingestion   | Acc misuse  | 49 µg/mL           |
| 374   | 53 yr | Theophylline               | Ingestion   | Int suicide | 134 µg/mL, 10 h    |
|       |       | amitriptyline/perphenazine |             |             |                    |

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**TABLE 16.** Summary of Fatal Exposures (Cont'd)

| Case No.   | Age    | Substances  | Route of Exposure | Reason      | Blood Levels   |
|--|--------|---|-------------------|-------------|----------------|
| 375  | 20 yr  | Theophylline (long-acting)<br>cocaine   | Ingestion         | Int suicide | 520 µg/mL      |
| 376  | 22 yr  | Theophylline<br>ibuprofen   | Ingestion         | Int suicide | 53 µg/mL       |
| 377*   | 41 yr  | Theophylline (long-acting)<br>levothyroxine   | Ingestion         | Int suicide | 133 µg/mL, 6 h |
| 378  | 77 yr  | Theophylline<br>terbutaline   | Ingestion         | Int suicide | 46 µg/mL       |
| <i>See also cases 378 (terbutaline); 401 (theophylline).</i> |        |   |                   |             |                |
| Cardiovascular drugs   |        |   |                   |             |                |
| 379*‡  | 43 yr  | Ajmaline (anti-arrhythmic)<br>Italian analgesic/antipyretic<br>(dipyron, adiphenine,<br>diphenadione, benzetilum) | Ingestion         | Int suicide | 4.52 µg/mL§    |
| 380  | 53 yr  | Captopril<br>haloperidol<br>benztropine   | Ingestion         | Int suicide |                |
| 381*   | 37 yr  | Clonidine   | Ingestion         | Int suicide |                |
| 382*   | 2 d    | Digoxin   | Parenteral        | Acc misuse  | 22 ng/mL       |
| 383  | 60 yr  | Digoxin   | Ingestion         | Int suicide | 12 ng/mL, 6 h  |
| 384†   | 60 yr  | Digoxin   | Ingestion         | Unknown     | 3 ng/mL        |
| 385‡   | 70 yr  | Digoxin   | Ingestion         | Int suicide |                |
| 386  | 77 yr  | Digoxin   | Ingestion         | Int suicide | 25 ng/mL       |
| 387†   | 80 yr  | Digoxin   | Ingestion         | Acc misuse  | 3.7 ng/mL      |
| 388†   | 80 yr  | Digoxin   | Ingestion         | Acc misuse  | 62 ng/mL       |
| 389†   | 82 yr  | Digoxin   | Ingestion         | Unknown     | 5.7 ng/mL      |
| 390  | 85 yr  | Digoxin   | Parenteral        | Acc misuse  | 7.5 ng/mL      |
| 391†   | 85 yr  | Digoxin   | Ingestion         | Acc misuse  | 8.2 ng/mL      |
| 392  | 89 yr  | Digoxin   | Ingestion         | Unknown     | 9 ng/mL        |
| 393†   | 92 yr  | Digoxin   | Ingestion         | Acc misuse  | 2.8 ng/mL      |
| 394‡   | >17 yr | Digoxin   | Ingestion         | Int misuse  | 4.6 ng/mL      |
| 395  | 17 yr  | Digoxin<br>acetaminophen/propoxyphene   | Ingestion         | Int suicide | 5 ng/mL, 48 h  |
| 396  | 36 yr  | Digoxin<br>desipramine<br>trazodone   | Ingestion         | Int suicide |                |
| 397*   | 58 yr  | Digoxin<br>diltiazem  | Ingestion         | Int suicide | 16.5 ng/mL     |
| 398  | 71 yr  | Digoxin<br>diltiazem<br>chlorpromazine  | Ingestion         | Int suicide |                |
| 399  | 82 yr  | Digoxin<br>glipizide<br>triazolam   | Ingestion         | Int suicide | 58 ng/mL       |
| 400  | 17 yr  | Digoxin<br>methyldopa<br>ethanol  | Ingestion         | Int suicide |                |
| 401  | 56 yr  | Diltiazem<br>digoxin<br>theophylline  | Ingestion         | Int suicide |                |
| 402†‡  | 74 yr  | Flecainide  | Ingestion         | Acc misuse  | 1,065 ng/mL    |
| 403  | 15 yr  | Flecainide<br>digoxin   | Ingestion         | Int suicide |                |
| 404  | 42 yr  | Guanfacine<br>fluoxetine<br>alprazolam  | Ingestion         | Int suicide |                |
| 405  | 66 yr  | Labetalol<br>thiothixene<br>nortriptyline   | Ingestion         | Int suicide |                |
| 406  | 35 yr  | Methyldopa  | Ingestion         | Int suicide |                |

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age   | Substances   | Route of Exposure | Reason                          | Blood Levels                 |
|----------|-------|--|-------------------|---------------------------------|------------------------------|
| 407      | 15 yr | Minoxidil<br>hydralazine<br>prazosin                   | Ingestion         | Int suicide                     |                              |
| 408      | 39 yr | Nadolol<br>verapamil                                   | Ingestion         | Int suicide                     |                              |
| 409      | 17 yr | Nifedipine   | Ingestion         | Int suicide                     | 0.12 mg/dL§                  |
| 410      | 25 yr | Nifedipine<br>acetaminophen/propoxyphene<br>doxepin    | Ingestion         | Int suicide                     | 128 µg/mL,† 2 h              |
| 411      | 61 yr | Procainamide   | Ingestion         | Unknown<br>N-acetylprocainamide | 6.21 µg/mL<br>80.2 µg/mL     |
| 412†     | 75 yr | Procainamide<br>digoxin                                | Ingestion         | Acc misuse                      | 2.7 ng/mL                    |
| 413      | 32 yr | Propranolol<br>mothballs (unspecified type)            | Ingestion         | Unknown                         |                              |
| 414      | 60 yr | Propranolol  | Ingestion         | Int suicide                     |                              |
| 415      | 19 yr | Propranolol, sustained-release<br>verapamil            | Ingestion         | Int suicide                     |                              |
| 416*     | 35 yr | Quinidine  | Ingestion         | Int suicide                     | 8.0 µg/mL, 2 h               |
| 417      | 53 yr | Quinidine  | Ingestion         | Int suicide                     |                              |
| 418      | 74 yr | Quinidine  | Ingestion         | Unknown                         | 15.5 µg/mL                   |
| 419‡     | 56 yr | Verapamil, sustained-release                           | Ingestion         | Int misuse                      |                              |
| 420      | 40 yr | Verapamil  | Ingestion         | Int suicide                     |                              |
| 421      | 24 yr | Verapamil<br>aspirin                                   | Ingestion         | Int suicide                     | 7.2 mg/dL                    |
| 422      | 42 yr | Verapamil, sustained-release<br>aspirin                | Ingestion         | Int suicide                     | 5,360 µg/mL§<br>126.6 mg/dL§ |
| 423*     | 23 yr | Verapamil<br>diphenhydramine                           | Ingestion         | Int suicide                     |                              |
| 424      | 35 yr | Verapamil<br>hydralazine<br>oxitriphylline/guaifenesin | Ingestion         | Int suicide                     |                              |
| 425      | 69 yr | Verapamil<br>metoprolol<br>amoxapine                   | Ingestion         | Int suicide                     |                              |
| 426*‡    | 4 yr  | Verapamil<br>phenothiazine                             | Ingestion         | Acc gen                         | 2,020 ng/mL§                 |
| 427      | 20 yr | Verapamil<br>propranolol                               | Ingestion         | Int suicide                     |                              |

See also cases 212 (atenolol); 8 (beta blocker, unspecified); 8 (calcium channel blocker, unspecified); 203 (clonidine); 340, 401, 403, 412 (digoxin); 302, 297, 398 (diltiazem); 407, 424 (hydralazine); 400 (methyldopa); 425 (metoprolol); 407 (prazosin); 427 (propranolol); 408, 415 (verapamil).

#### Cold and cough preparations

|       |       |   |            |            |  |
|-------|-------|---|------------|------------|--|
| 428*  | 17 mo | Decongestant syrup (phenylephrine,<br>chlorpheniramine, pyrilamine)   | Parenteral | Acc misuse |  |
| 429*‡ | 3 mo  | Pseudoephedrine/carbinoxamine cold<br>preparation<br><br>promethazine | Ingestion  | Acc misuse | ephedrine 0.6 mg/dL<br>carbinoxamine 0.04 mg/dL<br>0.04 mg/dL§ |

See also cases 167 (ephedrine); 326 (phenylephrine/phenylpropanolamine/guaifenesin); 424 (oxitriphylline/guaifenesin).

#### Diuretics

See also cases 174 (hydrochlorothiazide); 261 (spironolactone).

#### Electrolytes and minerals

|      |       |                         |           |             |             |
|------|-------|-------------------------|-----------|-------------|-------------|
| 430* | 15 mo | Ferrous sulfate tablets | Ingestion | Acc gen     | 1,200 µg/dL |
| 431  | 36 yr | Iron preparation        | Ingestion | Int suicide | 345 µg/dL   |

See also cases 157, 270 (iron).

#### Gastrointestinal preparations

See also case 198 (diphenoxylate/atropine).

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No.   | Age    | Substances  | Route of Exposure | Reason      | Blood Levels                                |
|--|--------|---|-------------------|-------------|---|
| <b>Hormones and hormone antagonists</b>                                    |        |   |                   |             |   |
| 432*   | 15 mo  | Insulin   | Parenteral        | Acc misuse  |   |
| 433  | 24 yr  | Insulin   | Parenteral        | Int unknown |   |
| 434  | 38 yr  | Insulin   | Parenteral        | Int suicide |   |
| 435‡   | 30 yr  | cocaine<br>Glipizide<br>triazolam<br>ethanol              | Ingestion         | Int suicide |   |
| <i>See also case 399 (glipizide); 270, 377 (levothyroxine).</i>            |        |   |                   |             |   |
| <b>Miscellaneous drugs</b>   |        |   |                   |             |   |
| 436*   | 57 yr  | Monooctanoin  | Parenteral        | Acc misuse  |   |
| 437  | 64 yr  | Quinine<br>carbamazepine                                  | Ingestion         | Int suicide | 10 µg/mL§<br>11 µg/mL§                      |
| <b>Muscle relaxants</b>  |        |   |                   |             |   |
| 438†   | 51 yr  | Carisoprodol<br>aspirin<br>acetaminophen/codeine          | Ingestion         | Int suicide |   |
| <i>See also cases 164 (carisoprodol); 165, 197, 266 (cyclobenzaprine).</i> |        |   |                   |             |   |
| <b>Sedative/hypnotic and antipsychotic agents</b>                          |        |   |                   |             |   |
| 439  | 72 yr  | Alprazolam<br>chloral hydrate                             | Ingestion         | Int suicide |   |
| 440‡   | 42 yr  | Chloral hydrate<br>alprazolam                             | Ingestion         | Int suicide |   |
| 441*   | 75 yr  | Chlordiazepoxide  | Ingestion         | Int suicide | 29 mg/L                                     |
| 442‡   | 38 yr  | Chlordiazepoxide<br>ethanol<br>aspirin                    | Ingestion         | Int suicide |   |
| 443‡   | 30 yr  | Chlorpromazine  | Ingestion         | Int suicide |   |
| 444  | 37 yr  | Chlorpromazine  | Ingestion         | Int suicide |   |
| 445‡   | 39 yr  | Flurazepam  | Ingestion         | Int suicide |   |
| 446*   | 67 yr  | Flurazepam  | Ingestion         | Int suicide |   |
| 447  | 24 yr  | Glutethimide<br>codeine                                   | Ingestion         | Int suicide |   |
| 448  | 56 yr  | Glutethimide  | Ingestion         | Int suicide | 5.2 mg/L<br>4-hydroxyglutethimide 31.0 mg/L |
| 449‡   | 68 yr  | imipramine<br>benzodiazepine<br>Lorazepam<br>perphenazine | Ingestion         | Int suicide |   |
| 450  | 69 yr  | Meprobamate<br>diazepam                                   | Ingestion         | Int suicide | 120.5 µg/mL                                 |
| 451‡   | 27 yr  | Methyprylon<br>alprazolam<br>ethanol                      | Ingestion         | Int suicide |   |
| 452‡   | 74 yr  | Pentobarbital   | Ingestion         | Int suicide | 12 µg/mL                                    |
| 453  | 75 yr  | Pentobarbital   | Ingestion         | Int suicide |   |
| 454  | 61 yr  | Phenobarbital   | Ingestion         | Int suicide | 107 µg/mL                                   |
| 455  | 61 yr  | Phenobarbital   | Ingestion         | Int suicide | 252 µg/mL                                   |
| 456‡   | >17 yr | Phenobarbital   | Ingestion         | Int suicide |   |
| 457‡   | 56 yr  | Phenobarbital<br>primidone                                | Ingestion         | Unknown     | 52.0 µg/mL                                  |
| 458  | 68 yr  | Secobarbital<br>benzodiazepines                           | Ingestion         | Int suicide | 4 µg/mL, 3 d                                |
| 459‡   | 33 yr  | Secobarbital/amobarbital<br>opiates                       | Ingestion         | Int suicide |   |
| 460  | 34 yr  | Temazepam<br>acetaminophen/codeine<br>ethanol             | Ingestion         | Int suicide |   |
| 461‡   | 37 yr  | Temazepam<br>ethanol<br>alprazolam                        | Ingestion         | Int suicide | 929 ng/mL<br>120 mg/dL<br>38 ng/mL          |

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No.  | Age    | Substances                                 | Route of Exposure | Reason      | Blood Levels                                   |
|---|--------|--|-------------------|-------------|--|
| 462‡  | 42 yr  | Thioridazine<br>acetaminophen/propoxyphene | Ingestion         | Int suicide | >800 µg/mL <sup>  </sup>                       |
| 463   | 67 yr  | Triazolam                                  | Ingestion         | Int suicide |  |
| 464   | 52 yr  | Triazolam<br>alprazolam<br>flurazepam      | Ingestion         | Int suicide |  |
| 465‡  | 25 yr  | Trifluoperazine<br>benztropine             | Ingestion         | Int suicide |  |
| <p>See also cases 162, 169, 201, 285, 291, 321, 322, 404, 440, 451, 461, 464, 509 (alprazolam); 209 (barbiturates); 297, 448, 458 (benzodiazepines); 439 (chloral hydrate); 303 (chlorazepate); 9,10, 251 (chlordiazepoxide); 122 (chlordiazepoxide/clindinium); 251, 257, 398 (chlorpromazine); 342 (clonazepam); 11, 12, 116, 166, 168, 176, 210, 225, 252, 338, 339, 450, 510 (diazepam); 199 (doxylamine sleep aid); 155, 293, 343, 464 (flurazepam); 305, 380 (haloperidol); 249, 260, 267, 306 (lorazepam); 198 (meprobamate); 331 (mesoridazine); 290, 346, 449 (perphenazine); 334, 426 (phenothiazines); 175 (prazepam); 261, 429 (promethazine); 262 (sedative/hypnotic, unidentified); 201, 292 (temazepam); 318, 327, 328, 329, 347 (thioridazine); 288, 405 (thiothixene); 222, 333, 344, 399, 435 (triazolam); 341 (trifluoperazine).</p> |        |  |                   |             |  |
| Stimulants and street drugs   |        |  |                   |             |  |
| 466‡  | 25 yr  | Amphetamine<br>heroin                      | Unknown           | Unknown     |  |
| 467   | 17 yr  | Caffeine                                   | Ingestion         | Int misuse  | 11 µg/mL                                       |
| 468*‡   | 22 yr  | Caffeine (diet aid)                        | Ingestion         | Int suicide | 1,560 µg/mL                                    |
| 469*  | 27 yr  | Caffeine (diet aid)                        | Ingestion         | Int suicide | 305 µg/mL§                                     |
| 470   | 40 yr  | Caffeine<br>ethanol                        | Ingestion         | Int suicide | 82 µg/mL§<br>130 mg/dL§                        |
| 471‡  | >17 yr | Caffeine<br>ethanol                        | Ingestion         | Int suicide | 93.5 µg/mL§<br>26 mg/dL§                       |
| 472   | 15 yr  | Cocaine                                    | Inhalation        | Int abuse   |  |
| 473*  | 21 yr  | Cocaine                                    | Ingestion         | Int abuse   |  |
| 474   | 21 yr  | Cocaine                                    | Ingestion         | Int misuse  |  |
| 475   | 23 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 476‡  | 25 yr  | Cocaine                                    | Parenteral        | Int abuse   |  |
| 477   | 25 yr  | Cocaine                                    | Ingestion         | Int suicide |  |
| 478   | 25 yr  | Cocaine                                    | Ingestion         | Int abuse   |  |
| 479*‡   | 26 yr  | Cocaine                                    | Ingestion         | Int unknown |  |
| 480*‡   | 26 yr  | Cocaine                                    | Parenteral        | Int unknown |  |
| 481   | 27 yr  | Cocaine                                    | Ingestion         | Int abuse   |  |
| 482‡  | 27 yr  | Cocaine                                    | Ingestion         | Int unknown | 7,600 ng/mL§#                                  |
| 483‡  | 28 yr  | Cocaine                                    | Ing & Inh         | Int abuse   |  |
| 484   | 29 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 485   | 29 yr  | Cocaine                                    | Parenteral        | Int abuse   |  |
| 486‡  | 29 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 487‡  | 29 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 488   | 29 yr  | Cocaine                                    | Unknown           | Unknown     |  |
| 489   | 30 yr  | Cocaine                                    | Parenteral        | Int abuse   |  |
| 490‡  | 30 yr  | Cocaine                                    | Parenteral        | Int unknown | 10.7 µg/mL§<br>benzoylecgonine 6.8 µg/mL§      |
| 491‡  | 30 yr  | Cocaine                                    | Unknown           | Int abuse   | benzoylecgonine 0.22 µg/mL                     |
| 492   | 30 yr  | Cocaine                                    | Inhalation        | Int abuse   |  |
| 493   | 31 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 494‡  | 31 yr  | Cocaine                                    | Inhalation        | Int abuse   |  |
| 495   | 31 yr  | Cocaine                                    | Ingestion         | Int abuse   | 27,640 ng/mL§<br>benzoylecgonine 11,610 ng/mL§ |
| 496‡  | 31 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 497   | 31 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 498   | 35 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 499   | 35 yr  | Cocaine                                    | Unknown           | Int unknown |  |
| 500‡  | 37 yr  | Cocaine                                    | Unknown           | Unknown     |  |
| 501‡  | 37 yr  | Cocaine                                    | Parenteral        | Int abuse   |  |
| 502*†   | 41 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 503‡  | 48 yr  | Cocaine                                    | Unknown           | Int abuse   |  |
| 504   | >17 yr | Cocaine                                    | Parenteral        | Int abuse   |  |
| 505   | >17 yr | Cocaine                                    | Ingestion         | Int abuse   |  |

(Continued on following page)

TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No. | Age    | Substances  | Route of Exposure       | Reason      | Blood Levels  |
|----------|--------|---|-------------------------|-------------|---|
| 506      | >17 yr | Cocaine   | Unknown                 | Int unknown |   |
| 507      | >17 yr | Cocaine   | Ing & Inh               | Int abuse   |   |
| 508‡     | >17 yr | Cocaine   | Unknown                 | Unknown     |   |
| 509‡     | 25 yr  | Cocaine   | Ingestion               | Int suicide |   |
| 510‡     | 40 yr  | alprazolam<br>Cocaine                             | Unknown                 | Int abuse   | benzoylecgonine 0.08 µg/mL                              |
| 511‡     | 47 yr  | diazepam<br>marijuana<br>Cocaine                  | Ingestion               | Int unknown |   |
| 512‡     | 21 yr  | doxepin<br>ethanol<br>Cocaine                     | Ingestion               | Int abuse   | 140 mg/dL   |
| 513      | 29 yr  | ethanol<br>Cocaine                                | Ingestion               | Int abuse   | 189 mg/dL   |
| 514‡     | 44 yr  | ethanol<br>Cocaine                                | Parenteral<br>Ingestion | Int abuse   |   |
| 515‡     | 30 yr  | Cocaine   | Parenteral              | Int abuse   | benzoylecgonine 0.29 µg/mL§<br>morphine 0.184 µg/mL§    |
| 516‡     | 34 yr  | heroin<br>Cocaine                                 | Parenteral              | Int abuse   |   |
| 517*     | 24 yr  | heroin<br>Cocaine                                 | Parenteral              | Int abuse   | cocaine metabolites 5,000 ng/mL§<br>morphine 720 ng/dL§ |
| 518      | 46 yr  | phencyclidine<br>Cocaine                          | Inhalation              | Int abuse   |   |
| 519      | 22 yr  | marijuana<br>Cocaine                              | Unknown                 | Unknown     |   |
| 520*‡    | 20 yr  | methamphetamine<br>Cocaine                        | Parenteral              | Int abuse   | 600 ng/mL<br>morphine 170 ng/mL§                        |
| 521‡     | 20 yr  | opiates<br>ethanol<br>Cocaine                     | Ing/Inh                 | Int abuse   | 80 mg/dL<br>0.76 µg/mL§<br>benzoylecgonine 0.12 µg/mL§  |
| 522‡     | 15 yr  | trichloroethane<br>Heroin                         | Inhalation              | Int abuse   |   |
| 523‡     | 35 yr  | Heroin  | Parenteral              | Int abuse   | unconjugated morphine 0.125 µg/mL§                      |
| 524‡     | 39 yr  | Heroin  | Parenteral              | Int abuse   |   |
| 525‡     | 24 yr  | Heroin  | Unknown                 | Unknown     |   |
| 526      | 40 yr  | cocaine<br>Heroin                                 | Inh & Paren             | Int abuse   | benzoylecgonine 1.28 µg/mL§                             |
| 527‡     | 40 yr  | cocaine (crack)<br>Heroin                         | Parenteral              | Int abuse   |   |
| 528‡     | 29 yr  | cocaine<br>Heroin                                 | Parenteral              | Int abuse   | opiates 0.8 mg/L§                                       |
| 529*‡    | 18 yr  | cocaine<br>marijuana<br>Isobutyl nitrite ("Rush") | Inhalation<br>Unknown   | Int unknown | methemoglobin 0.7%                                      |
| 530*     | 18 yr  | Methamphetamine                                   | Inhalation              | Int abuse   |   |
| 531*     | 24 yr  | Methamphetamine                                   | Ingestion               | Int abuse   |   |
| 532*     | 25 yr  | Methamphetamine                                   | Inhalation              | Int abuse   | 0.7 µg/mL   |
| 533‡     | 28 yr  | Methamphetamine                                   | Unknown                 | Int unknown |   |
| 534*     | 44 yr  | Methamphetamine                                   | Unknown                 | Int abuse   |   |
| 535*†    | 51 yr  | Methamphetamine                                   | Parenteral              | Int abuse   | 0.59 µg/mL<br>amphetamine 0.09 µg/mL                    |
| 536      | 28 yr  | Methamphetamine<br>marijuana                      | Unknown                 | Int abuse   | 0.25 µg/mL§   |

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TABLE 16. Summary of Fatal Exposures (Cont'd)

| Case No.  | Age   | Substances                                | Route of Exposure | Reason      | Blood Levels             |
|---|-------|---|-------------------|-------------|--------------------------|
| 537 <sup>@</sup>  | 18 yr | Methylenedioxyamphetamine                 | Ingestion         | Int abuse   |                          |
| 538   | 26 yr | Phencyclidine                             | Unknown           | Int abuse   |                          |
| 539 <sup>^</sup>  | 18 yr | Phencyclidine                             | Ingestion         | Int abuse   | 0.12 µg/mL§<br>20 mg/dL§ |
| 540 <sup>^</sup>  | 18 yr | Phenylpropanolamine (diet aid)<br>ethanol | Ingestion         | Int suicide | <10 mg/dL                |
| See also cases 206 (amphetamines); 32, 44, 129, 172, 194, 196, 207, 322, 375, 434, 525, 526, 527, 528 (cocaine); 351 (diet aid containing phenylpropanolamine and caffeine); 466, 515, 516, 517 (heroin); 116, 510, 518, 528, 535, 536 (marijuana); 307, 519 (methamphetamines); 517 (phencyclidine). |       |   |                   |             |                          |
| Topical   |       |   |                   |             |                          |
| 541 <sup>*</sup>  | 18 mo | Methyl salicylate<br>isopropyl alcohol    | Ingestion         | Acc gen     | 80 mg/dL, 20 h           |
| 542 <sup>*</sup>  | 80 yr | Methyl salicylate                         | Ingestion         | Acc gen     | 115 mg/dL, 4 h           |
| 543   | 91 yr | Methyl salicylate                         | Ingestion         | Acc gen     | 101 mg/dL, 2 h           |
| Vitamins  |       |   |                   |             |                          |
| 544 <sup>*</sup>  | 17 mo | Prenatal vitamins with iron               | Ingestion         | Acc gen     | 25,000 µg/dL, 6 h        |
| 545 <sup>*</sup>  | 17 mo | Prenatal vitamins with iron               | Ingestion         | Acc gen     | 1,400 µg/dL              |

\* Abstract of case provided in appendix.

† Chronic exposure.

‡ Prehospital (cardiac and/or respiratory) arrest.

§ Level obtained postmortem.

|| Acetaminophen level.

¶ Aspirin level.

# Level includes metabolite and parent compound.

TABLE 17. Demographic Profile of Exposure Cases by Generic Category of Substances and Products: Nonpharmaceuticals

|                             | No. of Exposures | Age (yr) |       |        | Reason |        |         | Treated in Health Care Facility | Outcome* |        |          |       |       |
|-----------------------------|------------------|----------|-------|--------|--------|--------|---------|---------------------------------|----------|--------|----------|-------|-------|
|                             |                  | <6       | 6-17  | >17    | Acc    | Int    | Adv Rxn |                                 | None     | Minor  | Moderate | Major | Death |
| Adhesives/glues             | 15,866           | 8,887    | 2,029 | 4,787  | 15,634 | 178    | 39      | 2,778                           | 5,744    | 4,663  | 309      | 10    | 0     |
| Alcohols                    |                  |          |       |        |        |        |         |                                 |          |        |          |       |       |
| Ethanol†                    | 21,146           | 4,412    | 2,133 | 14,381 | 7,406  | 13,035 | 207     | 13,991                          | 4,432    | 7,336  | 1,869    | 290   | 36    |
| Isopropanol‡                | 5,412            | 3,841    | 320   | 1,218  | 4,924  | 440    | 3       | 1,389                           | 2,691    | 1,150  | 118      | 23    | 0     |
| Methanol                    | 947              | 311      | 70    | 554    | 844    | 82     | 3       | 546                             | 367      | 305    | 42       | 16    | 3     |
| Rubbing alcohol             |                  |          |       |        |        |        |         |                                 |          |        |          |       |       |
| Ethanol                     | 632              | 474      | 39    | 115    | 590    | 39     | 0       | 130                             | 377      | 125    | 12       | 0     | 0     |
| Isopropanol                 | 7,633            | 5,962    | 391   | 1,248  | 7,070  | 512    | 2       | 1,590                           | 3,868    | 1,409  | 108      | 9     | 1     |
| Unknown type                | 77               | 58       | 3     | 15     | 69     | 8      | 0       | 22                              | 40       | 13     | 0        | 0     | 0     |
| Other/unknown               | 1,365            | 405      | 153   | 795    | 768    | 561    | 15      | 739                             | 300      | 436    | 113      | 19    | 1     |
| Total                       | 37,212           | 15,463   | 3,109 | 18,326 | 21,671 | 14,677 | 230     | 18,407                          | 12,075   | 10,744 | 2,262    | 357   | 41    |
| Arts/crafts/office supplies | 24,325           | 19,163   | 3,278 | 1,752  | 23,949 | 340    | 17      | 1,287                           | 11,350   | 1,966  | 124      | 1     | 3     |
| Auto/aircraft/boat products |                  |          |       |        |        |        |         |                                 |          |        |          |       |       |
| Glycols                     | 3,095            | 923      | 232   | 1,908  | 2,966  | 116    | 3       | 1,247                           | 1,118    | 1,039  | 131      | 20    | 4     |
| Hydrocarbons                | 1,648            | 857      | 126   | 659    | 1,620  | 27     | 0       | 409                             | 641      | 666    | 42       | 4     | 0     |
| Methanol                    | 971              | 394      | 79    | 493    | 920    | 47     | 0       | 477                             | 436      | 342    | 31       | 5     | 1     |
| Other/unknown               | 1,294            | 651      | 126   | 508    | 1,280  | 14     | 0       | 398                             | 384      | 610    | 33       | 1     | 0     |
| Total                       | 7,008            | 2,825    | 563   | 3,568  | 6,786  | 204    | 3       | 2,531                           | 2,579    | 2,657  | 237      | 30    | 5     |
| Batteries                   |                  |          |       |        |        |        |         |                                 |          |        |          |       |       |
| Penlight/flashlight         |                  |          |       |        |        |        |         |                                 |          |        |          |       |       |
| dry cell                    | 2,226            | 1,497    | 465   | 251    | 2,168  | 55     | 0       | 355                             | 901      | 775    | 41       | 1     | 0     |
| Automotive                  | 1,667            | 270      | 184   | 1,198  | 1,658  | 7      | 0       | 638                             | 342      | 847    | 136      | 2     | 0     |
| Button batteries            | 1,487            | 1,049    | 234   | 199    | 1,463  | 15     | 1       | 1,061                           | 1,003    | 139    | 18       | 2     | 0     |
| Other/unknown               | 284              | 172      | 60    | 50     | 274    | 7      | 0       | 42                              | 115      | 96     | 1        | 1     | 0     |
| Total                       | 5,664            | 2,988    | 943   | 1,698  | 5,563  | 84     | 1       | 2,096                           | 2,361    | 1,857  | 196      | 6     | 0     |
| Bites and envenomations     |                  |          |       |        |        |        |         |                                 |          |        |          |       |       |
| Fish and coelenterate       | 1,455            | 116      | 273   | 1,047  | 1,443  | 3      | 8       | 495                             | 50       | 785    | 161      | 1     | 0     |
| Insects                     |                  |          |       |        |        |        |         |                                 |          |        |          |       |       |
| Bee/wasp/hornet             | 15,034           | 3,698    | 3,288 | 7,957  | 14,857 | 10     | 156     | 2,863                           | 925      | 10,643 | 640      | 11    | 1     |
| Scorpion                    | 4,004            | 369      | 624   | 2,998  | 3,994  | 1      | 5       | 471                             | 198      | 2,813  | 240      | 7     | 0     |
| Tick                        | 1,701            | 555      | 421   | 708    | 1,688  | 1      | 9       | 412                             | 557      | 463    | 27       | 1     | 0     |
| Other                       | 4,732            | 1,599    | 722   | 2,376  | 4,672  | 3      | 54      | 1,029                           | 474      | 2,767  | 190      | 3     | 0     |
| Mammals                     | 3,039            | 790      | 1,010 | 1,198  | 3,018  | 6      | 11      | 1,240                           | 485      | 1,470  | 73       | 0     | 0     |

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TABLE 17. Demographic Profile of Exposure Cases by Generic Category of Substances and Products: Nonpharmaceuticals (Cont'd)

|   | No. of Exposures | Age (yr) |       |        | Reason |       |         | Treated in Health Care Facility | Outcome* |        |          |       |       |
|---|------------------|----------|-------|--------|--------|-------|---------|---------------------------------|----------|--------|----------|-------|-------|
|   |                  | <6       | 6-17  | >17    | Acc    | Int   | Adv Rxn |                                 | None     | Minor  | Moderate | Major | Death |
| Reptile—other/unknown   | 398              | 176      | 131   | 87     | 395    | 2     | 1       | 70                              | 106      | 153    | 12       | 0     | 0     |
| Snakes—exotic   | 433              | 40       | 93    | 292    | 429    | 4     | 0       | 302                             | 46       | 205    | 76       | 7     | 0     |
| Snakes indigenous to US   |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Rattlesnake   | 339              | 29       | 55    | 252    | 333    | 5     | 0       | 310                             | 20       | 105    | 133      | 35    | 0     |
| Copperhead  | 6                | 0        | 1     | 5      | 6      | 0     | 0       | 3                               | 2        | 3      | 0        | 0     | 0     |
| Coral   | 28               | 4        | 7     | 17     | 27     | 0     | 1       | 25                              | 4        | 10     | 7        | 0     | 0     |
| Cottonmouth   | 24               | 2        | 6     | 15     | 24     | 0     | 0       | 23                              | 7        | 5      | 6        | 1     | 0     |
| Nonpoisonous snake  | 454              | 65       | 249   | 135    | 450    | 0     | 4       | 80                              | 114      | 242    | 1        | 0     | 0     |
| Unknown type of snake   | 1,394            | 159      | 508   | 709    | 1,391  | 1     | 2       | 738                             | 262      | 650    | 87       | 17    | 0     |
| Spiders   |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Black widow   | 1,993            | 265      | 250   | 1,467  | 1,989  | 1     | 2       | 606                             | 330      | 1,044  | 232      | 7     | 0     |
| Brown recluse   | 925              | 117      | 103   | 686    | 916    | 0     | 7       | 581                             | 40       | 427    | 160      | 9     | 0     |
| Other/unknown   | 11,870           | 2,530    | 1,789 | 7,445  | 11,759 | 6     | 90      | 2,972                           | 734      | 6,950  | 691      | 12    | 0     |
| Total   | 47,829           | 10,514   | 9,530 | 27,394 | 47,391 | 43    | 350     | 12,220                          | 4,354    | 28,735 | 2,736    | 111   | 1     |
| Building/construction supplies                                      | 5,528            | 3,137    | 342   | 2,012  | 5,475  | 30    | 8       | 1,209                           | 2,029    | 1,401  | 255      | 6     | 0     |
| Chemicals   |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Acetone (excluding nail polish removers)                            | 1,001            | 445      | 86    | 462    | 947    | 45    | 2       | 351                             | 310      | 334    | 44       | 1     | 0     |
| Acids   |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Hydrofluoric acid   | 999              | 52       | 31    | 909    | 986    | 11    | 0       | 832                             | 86       | 500    | 253      | 18    | 2     |
| Other/unknown acid  | 5,874            | 875      | 601   | 4,307  | 5,741  | 111   | 8       | 2,863                           | 1,002    | 3,140  | 507      | 22    | 1     |
| Alkali  | 4,508            | 1,885    | 382   | 2,201  | 4,453  | 50    | 0       | 1,868                           | 1,215    | 1,919  | 393      | 24    | 0     |
| Ammonia   | 4,012            | 1,400    | 444   | 2,134  | 3,874  | 116   | 5       | 1,475                           | 751      | 2,081  | 227      | 13    | 0     |
| Borates/boric acid (excluding topicals and insecticides)            | 2,413            | 1,550    | 163   | 676    | 2,288  | 108   | 6       | 477                             | 1,075    | 285    | 27       | 1     | 0     |
| Chlorates (excluding matches and fireworks)                         | 38               | 8        | 12    | 18     | 35     | 3     | 0       | 13                              | 9        | 14     | 2        | 0     | 0     |
| Cyanide (excluding rodenticides)                                    | 494              | 15       | 15    | 456    | 447    | 42    | 1       | 368                             | 128      | 192    | 28       | 7     | 11    |
| Dioxin  | 16               | 1        | 0     | 15     | 15     | 0     | 0       | 9                               | 3        | 4      | 3        | 0     | 0     |
| Formaldehyde/formalin   | 1,268            | 306      | 177   | 773    | 1,219  | 40    | 4       | 514                             | 301      | 565    | 55       | 1     | 1     |
| Glycols (excluding automotive products)                             | 2,233            | 1,262    | 132   | 820    | 2,132  | 74    | 16      | 651                             | 851      | 568    | 84       | 17    | 4     |
| Ketones   | 1,093            | 364      | 48    | 664    | 1,077  | 9     | 4       | 544                             | 258      | 521    | 76       | 0     | 0     |
| Methylene chloride (excluding paint strippers)                      | 1,372            | 327      | 136   | 899    | 1,339  | 20    | 7       | 615                             | 278      | 711    | 97       | 1     | 2     |
| Nitrates and nitrites (excluding medications and abused substances) | 693              | 207      | 162   | 317    | 633    | 55    | 2       | 238                             | 259      | 191    | 27       | 2     | 1     |
| Phenol/creosote (excluding disinfectants)                           | 1,299            | 230      | 132   | 919    | 1,276  | 14    | 6       | 570                             | 206      | 743    | 102      | 5     | 0     |
| Strychnine (excluding rodenticides)                                 | 17               | 4        | 1     | 11     | 11     | 5     | 0       | 14                              | 4        | 3      | 1        | 2     | 0     |
| Toluene diisocyanate  | 528              | 67       | 29    | 423    | 524    | 3     | 0       | 256                             | 80       | 269    | 44       | 2     | 0     |
| Other   | 15,682           | 7,217    | 1,546 | 6,755  | 14,459 | 849   | 176     | 5,504                           | 3,936    | 3,953  | 613      | 69    | 2     |
| Total   | 43,540           | 16,215   | 4,097 | 22,759 | 41,456 | 1,555 | 237     | 17,162                          | 10,772   | 15,993 | 2,583    | 185   | 24    |
| Cleaning substances   |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Ammonia cleaners  | 4,139            | 2,127    | 277   | 1,715  | 3,968  | 151   | 1       | 944                             | 1,416    | 1,503  | 143      | 5     | 0     |
| Bleaches (household)  |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Hypochlorite-containing   | 25,886           | 12,730   | 1,978 | 10,987 | 25,077 | 716   | 23      | 5,735                           | 7,509    | 10,470 | 706      | 14    | 0     |
| Other/unknown   | 1,977            | 1,321    | 97    | 537    | 1,937  | 30    | 9       | 314                             | 793      | 570    | 27       | 1     | 0     |
| Cleansers   |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Anionic/nonionic  | 6,359            | 5,270    | 262   | 806    | 6,236  | 109   | 9       | 544                             | 3,073    | 1,198  | 91       | 4     | 0     |
| Other/unknown   | 1,208            | 916      | 60    | 221    | 1,179  | 28    | 1       | 185                             | 553      | 299    | 21       | 0     | 0     |
| Disinfectants (household)   |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Hypochlorite-containing   | 3,370            | 1,312    | 392   | 1,630  | 3,298  | 63    | 8       | 977                             | 891      | 1,622  | 144      | 5     | 0     |
| Phenol  | 2,707            | 1,828    | 186   | 676    | 2,529  | 157   | 6       | 558                             | 1,076    | 794    | 58       | 2     | 1     |
| Pine oil  | 8,604            | 6,884    | 302   | 1,373  | 8,325  | 250   | 8       | 1,939                           | 4,344    | 1,933  | 135      | 8     | 1     |
| Other/unknown   | 763              | 418      | 68    | 269    | 728    | 33    | 0       | 251                             | 256      | 283    | 31       | 1     | 0     |
| Drain Cleaners  |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Acid  | 556              | 72       | 45    | 434    | 537    | 18    | 0       | 283                             | 63       | 325    | 71       | 6     | 3     |
| Alkali  | 1,519            | 419      | 126   | 958    | 1,401  | 109   | 1       | 737                             | 260      | 749    | 173      | 20    | 3     |
| Other/unknown   | 124              | 20       | 12    | 89     | 118    | 6     | 0       | 45                              | 26       | 63     | 10       | 1     | 0     |
| Electric dishwasher detergent                                       |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Alkali  | 5,450            | 4,820    | 107   | 512    | 5,434  | 14    | 1       | 241                             | 3,201    | 910    | 47       | 1     | 0     |
| Other/unknown   | 1,367            | 1,172    | 42    | 150    | 1,361  | 4     | 0       | 95                              | 770      | 263    | 12       | 0     | 0     |
| Fabric softeners  |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Cationic  | 1,046            | 928      | 25    | 89     | 1,027  | 13    | 6       | 83                              | 530      | 144    | 8        | 0     | 0     |
| Other/unknown   | 53               | 42       | 3     | 7      | 53     | 0     | 0       | 3                               | 27       | 9      | 1        | 0     | 0     |
| Glass cleaners (household)  | 7,246            | 6,014    | 453   | 751    | 7,136  | 104   | 1       | 487                             | 3,321    | 1,588  | 49       | 4     | 0     |
| Hand dishwashing detergents   | 8,194            | 6,155    | 484   | 1,513  | 8,100  | 72    | 10      | 413                             | 2,943    | 2,543  | 76       | 0     | 0     |

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TABLE 17. Demographic Profile of Exposure Cases by Generic Category of Substances and Products: Nonpharmaceuticals (Cont'd)

|   | No. of Exposures | Age (yr)      |              |               | Reason         |              |            | Treated in Health Care Facility | Outcome*      |               |              |            |           |  |
|---|------------------|---------------|--------------|---------------|----------------|--------------|------------|---------------------------------|---------------|---------------|--------------|------------|-----------|--|
|   |                  | <6            | 6-17         | >17           | Acc            | Int          | Adv Rxn    |                                 | None          | Minor         | Moderate     | Major      | Death     |  |
| <b>Industrial cleaners</b>                |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Acids                                     | 570              | 97            | 45           | 419           | 558            | 12           | 0          | 339                             | 90            | 337           | 63           | 2          | 0         |  |
| Alkali                                    | 1,258            | 235           | 121          | 888           | 1,236          | 19           | 0          | 773                             | 219           | 684           | 135          | 6          | 0         |  |
| Other/unknown                             | 1,159            | 312           | 100          | 734           | 1,110          | 35           | 11         | 590                             | 266           | 573           | 85           | 2          | 0         |  |
| <b>Laundry detergents</b>                 |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Anionic/nonionic                          | 6,870            | 5,504         | 265          | 1,058         | 6,784          | 54           | 25         | 696                             | 2,899         | 1,902         | 83           | 1          | 2         |  |
| Alkali                                    | 3,766            | 3,267         | 117          | 371           | 3,738          | 19           | 6          | 536                             | 1,652         | 1,234         | 70           | 3          | 0         |  |
| Other/unknown                             | 1,223            | 944           | 67           | 206           | 1,185          | 17           | 18         | 170                             | 489           | 381           | 27           | 0          | 0         |  |
| <b>Miscellaneous</b>                      |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Acid                                      | 482              | 222           | 32           | 225           | 474            | 8            | 0          | 172                             | 183           | 169           | 39           | 2          | 0         |  |
| Alkali                                    | 5,851            | 2,997         | 415          | 2,385         | 5,677          | 142          | 21         | 1,975                           | 1,941         | 2,321         | 328          | 22         | 2         |  |
| Anionic/nonionic                          | 6,773            | 4,799         | 348          | 1,575         | 6,572          | 108          | 83         | 996                             | 2,662         | 1,893         | 117          | 5          | 0         |  |
| Cationic                                  | 3,221            | 2,031         | 240          | 928           | 3,135          | 76           | 2          | 794                             | 1,352         | 963           | 91           | 7          | 0         |  |
| Methanol/glycols                          | 2,108            | 1,609         | 123          | 371           | 2,075          | 30           | 1          | 281                             | 847           | 703           | 27           | 2          | 0         |  |
| Isopropanol                               | 774              | 624           | 39           | 107           | 763            | 11           | 0          | 107                             | 407           | 158           | 4            | 0          | 0         |  |
| Ethanol                                   | 358              | 274           | 17           | 66            | 352            | 5            | 0          | 70                              | 149           | 123           | 3            | 0          | 0         |  |
| Other/unknown                             | 2,180            | 1,429         | 141          | 590           | 2,147          | 30           | 1          | 483                             | 883           | 562           | 52           | 6          | 1         |  |
| <b>Oven cleaners</b>                      |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Alkali                                    | 3,109            | 1,082         | 243          | 1,757         | 3,062          | 37           | 6          | 1,409                           | 505           | 1,715         | 295          | 7          | 0         |  |
| Other/unknown                             | 201              | 47            | 31           | 122           | 199            | 1            | 0          | 89                              | 50            | 81            | 20           | 0          | 0         |  |
| <b>Rust removers</b>                      |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Hydrofluoric acid                         | 954              | 102           | 67           | 784           | 947            | 5            | 0          | 656                             | 147           | 539           | 166          | 4          | 1         |  |
| Other acid                                | 342              | 137           | 17           | 186           | 335            | 7            | 0          | 92                              | 108           | 134           | 21           | 2          | 0         |  |
| Other/unknown                             | 254              | 73            | 16           | 163           | 243            | 8            | 3          | 55                              | 75            | 109           | 8            | 0          | 0         |  |
| <b>Spot remover/dry cleaning agents</b>   |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Starch                                    | 1,098            | 759           | 65           | 267           | 1,070          | 25           | 2          | 183                             | 435           | 374           | 21           | 2          | 0         |  |
| Other/unknown                             | 596              | 520           | 24           | 51            | 582            | 11           | 1          | 30                              | 253           | 70            | 1            | 0          | 0         |  |
| <b>Toilet bowl cleaners</b>               |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Acid                                      | 2,714            | 1,230         | 188          | 1,273         | 2,607          | 99           | 4          | 826                             | 910           | 1,161         | 130          | 12         | 5         |  |
| Other/unknown                             | 2,093            | 1,714         | 75           | 291           | 2,061          | 30           | 1          | 253                             | 1,091         | 282           | 30           | 2          | 0         |  |
| <b>Wall/floor/tile cleaners</b>           |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Alkali                                    | 2,695            | 1,374         | 122          | 1,179         | 2,654          | 36           | 3          | 831                             | 748           | 1,239         | 133          | 5          | 0         |  |
| Anionic/nonionic                          | 1,022            | 745           | 61           | 209           | 1,003          | 10           | 4          | 135                             | 441           | 252           | 9            | 1          | 0         |  |
| Glycols                                   | 814              | 658           | 21           | 130           | 809            | 4            | 0          | 78                              | 390           | 184           | 6            | 1          | 0         |  |
| Other/unknown                             | 4,187            | 2,160         | 207          | 1,781         | 4,114          | 61           | 5          | 1,050                           | 1,461         | 1,674         | 150          | 2          | 0         |  |
| <b>Total</b>                              | <b>137,240</b>   | <b>87,393</b> | <b>8,126</b> | <b>40,833</b> | <b>133,936</b> | <b>2,777</b> | <b>281</b> | <b>27,503</b>                   | <b>51,705</b> | <b>45,083</b> | <b>3,917</b> | <b>168</b> | <b>19</b> |  |
| <b>Cosmetics/personal care products</b>   |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Bath oil/bubble bath                      | 3,753            | 3,518         | 122          | 104           | 3,711          | 19           | 20         | 128                             | 1,856         | 518           | 17           | 0          | 0         |  |
| Creams, lotions, make-up                  | 10,124           | 8,725         | 351          | 1,004         | 9,893          | 138          | 76         | 517                             | 4,888         | 847           | 72           | 1          | 0         |  |
| Dental care products                      | 2,549            | 1,469         | 193          | 873           | 2,460          | 43           | 34         | 225                             | 1,136         | 581           | 27           | 0          | 1         |  |
| Deodorants                                | 6,928            | 6,126         | 273          | 503           | 6,824          | 86           | 10         | 337                             | 3,078         | 1,032         | 57           | 0          | 1         |  |
| Depilatories                              | 410              | 186           | 44           | 176           | 365            | 17           | 28         | 119                             | 126           | 171           | 15           | 0          | 0         |  |
| Douches                                   | 258              | 185           | 10           | 62            | 239            | 4            | 11         | 32                              | 114           | 40            | 2            | 0          | 0         |  |
| Eye products                              | 942              | 809           | 28           | 100           | 929            | 6            | 7          | 44                              | 437           | 82            | 10           | 0          | 0         |  |
| Hair care products                        | 16,064           | 12,489        | 1,182        | 2,318         | 15,531         | 399          | 113        | 1,801                           | 6,728         | 4,026         | 258          | 7          | 0         |  |
| Lipsticks and lip balms                   | 2,220            | 2,100         | 59           | 51            | 2,204          | 11           | 4          | 35                              | 1,043         | 126           | 6            | 0          | 0         |  |
| Mouthwash                                 | 4,696            | 3,164         | 721          | 800           | 4,384          | 276          | 17         | 632                             | 2,372         | 819           | 72           | 6          | 0         |  |
| Nail polish                               | 6,847            | 6,302         | 271          | 244           | 6,783          | 57           | 5          | 458                             | 3,126         | 1,585         | 53           | 0          | 0         |  |
| Nail polish removers                      | 7,923            | 6,600         | 509          | 775           | 7,724          | 181          | 2          | 1,054                           | 4,113         | 1,516         | 44           | 2          | 0         |  |
| Nail products, miscellaneous              | 1,664            | 1,302         | 77           | 280           | 1,643          | 19           | 2          | 277                             | 678           | 482           | 38           | 1          | 1         |  |
| Perfume/cologne/aftershave                | 26,290           | 24,566        | 724          | 903           | 25,970         | 271          | 18         | 1,757                           | 14,312        | 3,583         | 129          | 2          | 0         |  |
| Peroxide                                  | 7,926            | 4,748         | 653          | 2,475         | 7,710          | 181          | 9          | 631                             | 3,215         | 1,640         | 36           | 7          | 0         |  |
| Powders                                   | 2,591            | 2,401         | 80           | 99            | 2,567          | 19           | 2          | 292                             | 1,180         | 663           | 18           | 0          | 0         |  |
| Soaps (bar, hand complexion)              | 6,885            | 5,781         | 314          | 748           | 6,758          | 78           | 37         | 436                             | 2,968         | 1,426         | 72           | 0          | 0         |  |
| Suntan/sunscreen products                 | 2,476            | 2,089         | 172          | 209           | 2,440          | 6            | 26         | 182                             | 973           | 769           | 26           | 0          | 0         |  |
| <b>Total</b>                              | <b>110,546</b>   | <b>92,560</b> | <b>5,783</b> | <b>11,724</b> | <b>108,135</b> | <b>1,811</b> | <b>421</b> | <b>8,957</b>                    | <b>52,343</b> | <b>19,906</b> | <b>952</b>   | <b>26</b>  | <b>3</b>  |  |
| <b>Deodorizers (not for personal use)</b> |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Air Fresheners                            | 6,336            | 5,726         | 254          | 337           | 6,296          | 26           | 9          | 419                             | 3,394         | 726           | 28           | 0          | 1         |  |
| Diaper pail deodorizers                   | 1,357            | 1,335         | 16           | 6             | 1,352          | 4            | 0          | 43                              | 814           | 78            | 1            | 0          | 0         |  |
| Other                                     | 2,966            | 2,496         | 101          | 355           | 2,931          | 26           | 6          | 432                             | 1,528         | 530           | 18           | 1          | 0         |  |
| <b>Total</b>                              | <b>10,659</b>    | <b>9,557</b>  | <b>371</b>   | <b>698</b>    | <b>10,579</b>  | <b>56</b>    | <b>15</b>  | <b>894</b>                      | <b>5,736</b>  | <b>1,334</b>  | <b>47</b>    | <b>1</b>   | <b>1</b>  |  |
| <b>Dyes</b>                               | 2,330            | 1,928         | 186          | 206           | 2,293          | 15           | 17         | 153                             | 1,194         | 177           | 14           | 0          | 0         |  |
| <b>Essential oils</b>                     | 1,957            | 1,361         | 294          | 290           | 1,832          | 99           | 20         | 386                             | 598           | 877           | 33           | 3          | 0         |  |
| <b>Fertilizers</b>                        | 6,936            | 5,097         | 596          | 1,198         | 6,883          | 34           | 8          | 423                             | 3,604         | 623           | 44           | 0          | 0         |  |
| <b>Fire extinguishers</b>                 | 1,549            | 201           | 327          | 985           | 1,499          | 36           | 2          | 506                             | 403           | 742           | 44           | 0          | 0         |  |
| <b>Food products/food poisoning</b>       | 39,226           | 10,356        | 4,867        | 23,642        | 34,452         | 247          | 4,409      | 4,343                           | 8,692         | 13,166        | 964          | 12         | 0         |  |
| <b>Foreign bodies/toys/miscellaneous</b>  |                  |               |              |               |                |              |            |                                 |               |               |              |            |           |  |
| Bubble blowing solutions                  | 2,400            | 2,283         | 81           | 28            | 2,395          | 2            | 3          | 69                              | 1,024         | 613           | 15           | 0          | 0         |  |
| Christmas ornaments                       | 1,345            | 1,243         | 63           | 32            | 1,339          | 5            | 1          | 67                              | 507           | 112           | 1            | 0          | 0         |  |
| Coins                                     | 3,754            | 3,211         | 464          | 59            | 3,740          | 11           | 0          | 1,243                           | 1,750         | 433           | 34           | 2          | 0         |  |
| Dessicants                                | 10,161           | 1,321         | 605          | 287           | 10,102         | 48           | 1          | 371                             | 4,850         | 144           | 23           | 0          | 0         |  |
| Feces/urine                               | 1,460            | 9,209         | 39           | 95            | 1,439          | 14           | 1          | 66                              | 649           | 69            | 6            | 0          | 0         |  |
| Glass                                     | 1,082            | 569           | 130          | 372           | 1,071          | 10           | 1          | 128                             | 498           | 113           | 4            | 0          | 0         |  |

(Continued on following page)

TABLE 17. Demographic Profile of Exposure Cases by Generic Category of Substances and Products: Nonpharmaceuticals (Cont'd)

|   | No. of Exposures | Age (yr) |       |        | Reason |       |         | Treated in Health Care Facility | Outcome* |        |          |       |       |
|---|------------------|----------|-------|--------|--------|-------|---------|---------------------------------|----------|--------|----------|-------|-------|
|   |                  | <6       | 6-17  | >17    | Acc    | Int   | Adv Rxn |                                 | None     | Minor  | Moderate | Major | Death |
| Soil  | 1,720            | 1,559    | 37    | 116    | 1,713  | 4     | 2       | 99                              | 751      | 161    | 12       | 0     | 0     |
| Thermometer   | 9,110            | 5,248    | 2,396 | 1,383  | 9,051  | 48    | 4       | 537                             | 4,318    | 308    | 25       | 1     | 0     |
| Toys  | 3,136            | 2,712    | 347   | 65     | 3,117  | 16    | 2       | 142                             | 1,523    | 207    | 19       | 0     | 0     |
| Other/unknown foreign body                              | 13,206           | 9,299    | 2,125 | 1,706  | 13,066 | 88    | 32      | 1,945                           | 6,016    | 2,076  | 116      | 3     | 1     |
| Total   | 47,374           | 36,654   | 6,287 | 4,143  | 47,033 | 246   | 47      | 4,667                           | 21,886   | 4,236  | 255      | 6     | 1     |
| <b>Fumes/gases/vapors</b>                               |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Carbon monoxide   | 6,030            | 805      | 795   | 4,355  | 5,740  | 242   | 9       | 3,679                           | 845      | 3,070  | 498      | 84    | 27    |
| Chloramine  | 1,210            | 49       | 58    | 1,093  | 1,189  | 21    | 0       | 392                             | 54       | 771    | 87       | 0     | 0     |
| Chlorine gas (mixing household products)                | 313              | 7        | 21    | 281    | 308    | 4     | 0       | 104                             | 22       | 228    | 31       | 1     | 0     |
| Chlorine gas (other)                                    | 4,493            | 443      | 817   | 3,183  | 4,457  | 25    | 8       | 1,870                           | 471      | 2,945  | 367      | 8     | 0     |
| Hydrogen sulfide  | 531              | 42       | 35    | 449    | 525    | 3     | 1       | 240                             | 71       | 283    | 32       | 7     | 7     |
| Methane   | 1,251            | 164      | 114   | 952    | 1,196  | 46    | 0       | 581                             | 235      | 559    | 80       | 8     | 1     |
| Polymer fume fever                                      | 3                | 0        | 0     | 3      | 3      | 0     | 0       | 0                               | 0        | 3      | 0        | 0     | 0     |
| Propane/simple asphyxiants                              | 1,144            | 101      | 213   | 819    | 1,033  | 106   | 0       | 531                             | 160      | 571    | 89       | 8     | 3     |
| Other/unknown   | 2,193            | 216      | 225   | 1,729  | 2,156  | 26    | 6       | 1,060                           | 375      | 1,048  | 175      | 12    | 1     |
| Total   | 17,168           | 1,827    | 2,278 | 12,864 | 16,607 | 473   | 24      | 8,457                           | 2,233    | 9,478  | 1,359    | 128   | 39    |
| <b>Fungicides (nonmedicinal)</b>                        | 1,496            | 641      | 121   | 717    | 1,464  | 21    | 8       | 373                             | 587      | 407    | 37       | 2     | 1     |
| <b>Heavy metals</b>                                     |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Arsenic   | 527              | 91       | 35    | 390    | 464    | 28    | 3       | 280                             | 132      | 134    | 37       | 6     | 0     |
| Copper  | 746              | 199      | 190   | 353    | 724    | 18    | 3       | 258                             | 218      | 310    | 20       | 1     | 1     |
| Lead  | 1,738            | 830      | 223   | 666    | 1,686  | 39    | 1       | 621                             | 595      | 260    | 49       | 4     | 0     |
| Mercury   | 1,331            | 704      | 130   | 480    | 1,259  | 57    | 6       | 294                             | 539      | 121    | 21       | 3     | 1     |
| Metal fume fever  | 1,009            | 37       | 27    | 933    | 1,005  | 2     | 1       | 326                             | 71       | 607    | 105      | 2     | 0     |
| Selenium  | 55               | 17       | 2     | 35     | 47     | 3     | 3       | 19                              | 15       | 14     | 2        | 0     | 0     |
| Thallium  | 19               | 12       | 1     | 6      | 16     | 1     | 1       | 7                               | 8        | 0      | 0        | 2     | 1     |
| Other/unknown   | 1,531            | 601      | 174   | 743    | 1,491  | 22    | 12      | 567                             | 502      | 393    | 65       | 5     | 0     |
| Total   | 6,956            | 2,491    | 782   | 3,606  | 6,692  | 170   | 30      | 2,372                           | 2,080    | 1,839  | 299      | 23    | 3     |
| <b>Herbicides</b>                                       |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| 2,4-D or 2,4,5-T  | 1,657            | 628      | 171   | 837    | 1,621  | 24    | 8       | 420                             | 555      | 526    | 52       | 4     | 2     |
| Diquat/paraquat   | 262              | 31       | 45    | 184    | 248    | 11    | 0       | 152                             | 81       | 80     | 11       | 0     | 3     |
| Other/unknown   | 2,630            | 685      | 290   | 1,617  | 2,593  | 19    | 11      | 863                             | 791      | 841    | 78       | 5     | 0     |
| Total   | 4,549            | 1,344    | 506   | 2,638  | 4,462  | 54    | 19      | 1,435                           | 1,427    | 1,447  | 141      | 9     | 5     |
| <b>Hydrocarbons</b>                                     |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Benzene   | 100              | 30       | 1     | 67     | 96     | 4     | 0       | 58                              | 30       | 30     | 4        | 0     | 0     |
| Diesel fuel   | 1,756            | 492      | 219   | 1,037  | 1,689  | 65    | 0       | 467                             | 517      | 754    | 110      | 2     | 0     |
| Gasoline  | 14,851           | 5,299    | 2,597 | 6,846  | 14,279 | 523   | 3       | 2,903                           | 4,567    | 7,337  | 246      | 8     | 0     |
| Halogenated hydrocarbons                                | 5,040            | 676      | 431   | 3,854  | 4,853  | 170   | 4       | 1,676                           | 1,376    | 2,065  | 208      | 9     | 4     |
| Kerosene  | 3,093            | 2,256    | 206   | 620    | 3,024  | 54    | 3       | 1,145                           | 1,150    | 1,184  | 140      | 12    | 0     |
| Lighter fluid/naphtha                                   | 3,176            | 2,203    | 209   | 738    | 3,057  | 107   | 2       | 1,027                           | 1,372    | 1,042  | 138      | 12    | 0     |
| Lubricating/motor oils                                  | 3,263            | 2,543    | 168   | 532    | 3,220  | 35    | 1       | 412                             | 1,921    | 560    | 31       | 3     | 0     |
| Mineral seal oil  | 1,907            | 1,756    | 39    | 107    | 1,881  | 25    | 0       | 293                             | 1,308    | 231    | 17       | 1     | 1     |
| Mineral spirits/varsol                                  | 5,084            | 3,210    | 354   | 1,487  | 4,943  | 127   | 6       | 1,249                           | 2,159    | 1,824  | 114      | 9     | 1     |
| Toluene/xylene  | 2,239            | 643      | 178   | 1,385  | 2,094  | 134   | 3       | 1,013                           | 596      | 997    | 123      | 4     | 0     |
| Turpentine  | 1,430            | 784      | 145   | 490    | 1,288  | 123   | 2       | 496                             | 512      | 518    | 38       | 2     | 0     |
| Other/unknown   | 10,515           | 6,425    | 742   | 3,261  | 10,265 | 222   | 9       | 3,043                           | 4,535    | 3,288  | 370      | 15    | 2     |
| Total   | 52,454           | 26,317   | 5,289 | 20,424 | 50,689 | 1,589 | 33      | 13,782                          | 20,043   | 19,830 | 1,539    | 77    | 8     |
| <b>Insecticides/pesticides (excluding rodenticides)</b> |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Arsenic—pesticides only                                 | 1,846            | 1,564    | 86    | 171    | 1,777  | 65    | 1       | 586                             | 1,318    | 159    | 29       | 12    | 1     |
| Borates/boric acid                                      | 2,138            | 1,778    | 83    | 270    | 2,079  | 54    | 2       | 341                             | 1,095    | 156    | 15       | 0     | 0     |
| Carbamates  | 4,744            | 3,148    | 253   | 1,307  | 4,643  | 78    | 8       | 1,000                           | 2,440    | 769    | 88       | 5     | 0     |
| Chlorinated hydrocarbon                                 | 3,568            | 1,966    | 323   | 1,252  | 3,400  | 124   | 26      | 1,191                           | 1,595    | 774    | 92       | 16    | 1     |
| Metaldehyde   | 244              | 200      | 11    | 30     | 240    | 4     | 0       | 46                              | 133      | 31     | 2        | 0     | 0     |
| Organophosphate alone                                   | 9,853            | 3,584    | 724   | 5,431  | 9,556  | 231   | 30      | 3,157                           | 3,447    | 2,792  | 349      | 46    | 9     |
| Organophosphate and carbamate                           | 3,073            | 1,435    | 239   | 1,379  | 2,936  | 123   | 6       | 614                             | 1,277    | 798    | 54       | 5     | 0     |
| Organophosphate and chlorinated hydrocarbon             | 357              | 100      | 43    | 212    | 346    | 6     | 2       | 90                              | 126      | 95     | 11       | 1     | 0     |
| Organophosphate and other pesticide                     | 921              | 445      | 68    | 399    | 884    | 25    | 7       | 250                             | 339      | 271    | 13       | 2     | 0     |
| Piperonyl butoxide alone                                | 109              | 40       | 15    | 52     | 107    | 1     | 1       | 32                              | 38       | 32     | 5        | 0     | 0     |
| Piperonyl butoxide and pyrethrins                       | 3,244            | 1,439    | 382   | 1,407  | 3,107  | 83    | 49      | 793                             | 980      | 1,055  | 111      | 5     | 0     |
| Pyrethrins alone  | 2,600            | 1,038    | 272   | 1,259  | 2,531  | 34    | 33      | 685                             | 778      | 888    | 98       | 8     | 0     |
| Insect repellants                                       | 2,457            | 1,797    | 380   | 264    | 2,420  | 16    | 20      | 392                             | 1,088    | 767    | 24       | 1     | 0     |
| Other/unknown   | 6,345            | 3,602    | 457   | 2,203  | 6,168  | 123   | 33      | 1,274                           | 2,773    | 1,345  | 127      | 12    | 1     |
| Total   | 41,499           | 22,136   | 3,336 | 15,636 | 40,194 | 967   | 218     | 10,451                          | 17,427   | 9,932  | 1,018    | 113   | 12    |
| <b>Lacrimators</b>                                      | 3,198            | 1,058    | 1,036 | 1,057  | 3,038  | 121   | 6       | 694                             | 333      | 2,235  | 96       | 0     | 0     |
| <b>Matches/fireworks/explosives</b>                     |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Matches   | 2,354            | 2,256    | 39    | 45     | 2,336  | 16    | 0       | 91                              | 1,245    | 68     | 8        | 0     | 0     |
| Other/unknown   | 774              | 575      | 127   | 68     | 753    | 20    | 0       | 120                             | 340      | 161    | 18       | 2     | 0     |
| Total   | 3,128            | 2,831    | 166   | 113    | 3,089  | 36    | 0       | 211                             | 1,585    | 229    | 26       | 2     | 0     |
| <b>Moth repellants</b>                                  |                  |          |       |        |        |       |         |                                 |          |        |          |       |       |
| Napthalene  | 2,779            | 2,408    | 113   | 236    | 2,750  | 25    | 0       | 611                             | 1,702    | 246    | 28       | 3     | 0     |

(Continued on following page)

**TABLE 17. Demographic Profile of Exposure Cases by Generic Category of Substances and Products: Nonpharmaceuticals (Cont'd)**

|                                 | No. of Exposures | Age (yr) |       |       | Reason |     |         | Treated in Health Care Facility | Outcome* |        |          |       |       |
|---------------------------------|------------------|----------|-------|-------|--------|-----|---------|---------------------------------|----------|--------|----------|-------|-------|
|                                 |                  | <6       | 6-17  | >17   | Acc    | Int | Adv Rxn |                                 | None     | Minor  | Moderate | Major | Death |
| Paradichlorobenzene             | 433              | 361      | 19    | 49    | 429    | 3   | 0       | 44                              | 244      | 50     | 4        | 0     | 0     |
| Other/unknown                   | 1,963            | 1,706    | 100   | 142   | 1,943  | 16  | 0       | 383                             | 1,167    | 135    | 5        | 1     | 1     |
| Total                           | 5,175            | 4,475    | 232   | 427   | 5,122  | 44  | 0       | 1,038                           | 3,113    | 431    | 37       | 4     | 1     |
| Mushrooms                       | 7,839            | 6,404    | 481   | 920   | 7,432  | 327 | 53      | 1,894                           | 5,576    | 924    | 194      | 7     | 0     |
| Paints and stripping agents     | 17,105           | 10,335   | 1,262 | 5,396 | 16,802 | 255 | 26      | 2,865                           | 6,397    | 4,119  | 421      | 14    | 0     |
| Photographic products           | 921              | 550      | 97    | 268   | 906    | 11  | 2       | 192                             | 346      | 206    | 15       | 0     | 0     |
| Plants                          |                  |          |       |       |        |     |         |                                 |          |        |          |       |       |
| Anticholinergic                 | 504              | 265      | 98    | 136   | 371    | 125 | 1       | 237                             | 225      | 116    | 62       | 7     | 0     |
| Cardiac glycosides              | 2,438            | 1,897    | 273   | 251   | 2,369  | 59  | 6       | 530                             | 1,510    | 217    | 24       | 1     | 0     |
| Colchicine                      | 21               | 16       | 3     | 2     | 21     | 0   | 0       | 3                               | 13       | 0      | 0        | 0     | 0     |
| Cyanogenic glycosides           | 3,235            | 2,596    | 396   | 229   | 3,183  | 31  | 18      | 204                             | 1,769    | 154    | 9        | 1     | 0     |
| Depressants                     | 45               | 36       | 4     | 5     | 43     | 2   | 0       | 8                               | 25       | 6      | 2        | 0     | 0     |
| Dermatitis                      | 12,598           | 7,938    | 1,336 | 3,229 | 12,393 | 83  | 113     | 1,232                           | 4,363    | 3,908  | 372      | 4     | 0     |
| Gastrointestinal irritants      | 17,435           | 15,124   | 1,049 | 1,156 | 17,212 | 169 | 35      | 1,152                           | 9,729    | 1,602  | 117      | 1     | 0     |
| Hallucinogenic                  | 239              | 176      | 35    | 26    | 213    | 22  | 3       | 46                              | 131      | 24     | 1        | 0     | 0     |
| Nicotine (no tobacco products)  | 244              | 124      | 44    | 73    | 224    | 13  | 6       | 91                              | 104      | 69     | 6        | 0     | 0     |
| Nontoxic plant                  | 23,458           | 21,435   | 986   | 912   | 23,296 | 89  | 58      | 539                             | 11,163   | 956    | 57       | 2     | 0     |
| Oxalate                         | 17,159           | 15,907   | 628   | 558   | 17,057 | 89  | 7       | 725                             | 9,824    | 2,464  | 103      | 0     | 0     |
| Solanine                        | 1,844            | 1,583    | 134   | 116   | 1,821  | 14  | 8       | 350                             | 1,262    | 175    | 22       | 0     | 0     |
| Stimulants                      | 301              | 235      | 28    | 38    | 292    | 8   | 1       | 76                              | 182      | 43     | 3        | 1     | 1     |
| Toxalbumins                     | 253              | 164      | 50    | 38    | 248    | 5   | 0       | 97                              | 166      | 42     | 4        | 0     | 0     |
| Other/unknown                   | 14,201           | 11,854   | 1,333 | 932   | 13,929 | 140 | 102     | 1,376                           | 7,681    | 1,525  | 179      | 4     | 0     |
| Total                           | 93,975           | 79,350   | 6,397 | 7,701 | 92,672 | 849 | 358     | 6,666                           | 48,147   | 11,301 | 961      | 21    | 1     |
| Polishes and waxes              | 4,290            | 3,493    | 215   | 562   | 4,228  | 55  | 5       | 481                             | 2,156    | 970    | 40       | 0     | 0     |
| Radio-isotopes                  | 110              | 20       | 18    | 71    | 101    | 2   | 4       | 46                              | 31       | 17     | 3        | 0     | 0     |
| Rodenticides                    |                  |          |       |       |        |     |         |                                 |          |        |          |       |       |
| Anticoagulants                  | 4,190            | 3,725    | 101   | 320   | 4,017  | 161 | 0       | 1,124                           | 2,189    | 161    | 23       | 3     | 1     |
| Long-acting anticoagulant       | 5,133            | 4,726    | 111   | 272   | 4,951  | 169 | 1       | 1,682                           | 3,139    | 172    | 18       | 1     | 1     |
| Strychnine                      | 178              | 55       | 14    | 106   | 117    | 53  | 3       | 123                             | 71       | 28     | 17       | 7     | 0     |
| Other/unknown                   | 1,125            | 900      | 46    | 164   | 1,051  | 63  | 0       | 458                             | 560      | 83     | 11       | 3     | 0     |
| Total                           | 10,626           | 9,406    | 272   | 862   | 10,136 | 446 | 4       | 3,387                           | 5,959    | 444    | 69       | 14    | 2     |
| Sporting equipment              | 825              | 527      | 182   | 112   | 803    | 17  | 2       | 180                             | 452      | 109    | 12       | 1     | 1     |
| Swimming pool/aquarium products | 3,831            | 2,226    | 423   | 1,163 | 3,805  | 20  | 1       | 532                             | 1,570    | 1,066  | 88       | 2     | 0     |
| Tobacco products                | 9,246            | 8,697    | 205   | 325   | 9,119  | 99  | 14      | 1,717                           | 4,801    | 2,029  | 75       | 2     | 1     |
| Unknown nondrug substances      | 6,841            | 3,574    | 906   | 2,293 | 6,615  | 100 | 70      | 1,477                           | 2,593    | 1,744  | 129      | 8     | 0     |

Patients with totally unknown age, reason or medical outcome were omitted from the respective tabulations.

ABBREVIATIONS: Acc, accidental; Adv Rxn, adverse reaction; Int, intentional.

\* Medical outcome data were also collected in categories labelled "unknown, nontoxic," "unknown, potentially toxic," and "unrelated effect." Thus, the numbers listed here do not represent the total poison exposure experience.

† Excluding rubbing alcohol.

**TABLE 18. Demographic Profile of Exposure Cases by Generic Category of Substance: Pharmaceuticals**

|  | No. of Exposures | Age (yr) |       |       | Reason |       |         | Treated in Health Care Facility | Outcome* |       |          |       |       |
|--|------------------|----------|-------|-------|--------|-------|---------|---------------------------------|----------|-------|----------|-------|-------|
|  |                  | <6       | 6-17  | >17   | Acc    | Int   | Adv Rxn |                                 | None     | Minor | Moderate | Major | Death |
| <b>Analgesics</b>                      |                  |          |       |       |        |       |         |                                 |          |       |          |       |       |
| <b>Acetaminophen only</b>              |                  |          |       |       |        |       |         |                                 |          |       |          |       |       |
| Adult formulation                      | 16,929           | 5,053    | 5,281 | 6,455 | 7,681  | 8,825 | 112     | 10,778                          | 7,416    | 3,031 | 698      | 121   | 19    |
| Pediatric formulation                  | 45,276           | 43,386   | 1,506 | 257   | 44,729 | 440   | 65      | 5,905                           | 27,464   | 1,674 | 206      | 6     | 0     |
| Unknown type                           | 6,054            | 3,229    | 1,208 | 1,561 | 3,872  | 2,059 | 34      | 2,852                           | 3,085    | 803   | 235      | 54    | 5     |
| <b>Acetaminophen combination with:</b> |                  |          |       |       |        |       |         |                                 |          |       |          |       |       |
| Aspirin                                | 1,602            | 339      | 553   | 699   | 575    | 946   | 50      | 1,031                           | 536      | 507   | 54       | 4     | 1     |
| Codeine                                | 6,483            | 1,263    | 1,055 | 4,109 | 2,452  | 3,581 | 352     | 4,381                           | 1,715    | 2,145 | 316      | 58    | 13    |
| Oxycodone                              | 1,921            | 316      | 200   | 1,378 | 727    | 1,016 | 138     | 1,224                           | 477      | 617   | 99       | 23    | 1     |
| Propoxyphene                           | 3,046            | 522      | 350   | 2,137 | 966    | 1,906 | 92      | 2,323                           | 796      | 1,028 | 227      | 43    | 11    |
| Other narcotic/analog                  | 1,783            | 224      | 233   | 1,307 | 624    | 972   | 132     | 1,204                           | 402      | 592   | 97       | 13    | 2     |
| Other drug                             | 3,288            | 744      | 658   | 1,856 | 1,208  | 1,917 | 105     | 2,268                           | 1,057    | 1,061 | 156      | 29    | 0     |
| <b>Aspirin only</b>                    |                  |          |       |       |        |       |         |                                 |          |       |          |       |       |
| Adult formulation                      | 5,652            | 1,844    | 1,633 | 2,130 | 2,563  | 2,924 | 82      | 3,469                           | 2,154    | 1,322 | 306      | 25    | 8     |
| Pediatric formulation                  | 1,174            | 1,075    | 71    | 21    | 1,131  | 34    | 5       | 249                             | 710      | 98    | 10       | 0     | 1     |
| Unknown type                           | 9,678            | 2,307    | 3,130 | 4,141 | 3,538  | 5,778 | 106     | 6,737                           | 2,996    | 2,756 | 638      | 82    | 22    |
| <b>Aspirin in combination with:</b>    |                  |          |       |       |        |       |         |                                 |          |       |          |       |       |
| Codeine                                | 1,067            | 193      | 140   | 721   | 367    | 634   | 43      | 737                             | 226      | 396   | 80       | 12    | 1     |
| Oxycodone                              | 598              | 117      | 48    | 431   | 218    | 330   | 38      | 403                             | 137      | 173   | 48       | 6     | 1     |
| Propoxyphene                           | 164              | 25       | 24    | 113   | 57     | 91    | 10      | 115                             | 45       | 59    | 14       | 5     | 1     |
| Other narcotic/analog                  | 317              | 68       | 45    | 200   | 129    | 156   | 29      | 200                             | 92       | 104   | 20       | 2     | 0     |
| Other drug                             | 3,417            | 882      | 946   | 1,559 | 1,383  | 1,879 | 79      | 2,222                           | 1,153    | 1,068 | 173      | 14    | 0     |

(Continued on following page)

TABLE 18. Demographic Profile of Exposure Cases by Generic Category of Substance: Pharmaceuticals (Cont'd)

|                                      | No. of Exposures | Age (yr)      |               |               | Reason        |               |              | Treated in Health Care Facility | Outcome*      |               |              |              |            |
|--------------------------------------|------------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------------------------|---------------|---------------|--------------|--------------|------------|
|                                      |                  | <6            | 6-17          | >17           | Acc           | Int           | Adv Rxn      |                                 | None          | Minor         | Moderate     | Major        | Death      |
| <b>Narcotics</b>                     |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Codeine                              | 1,114            | 492           | 162           | 450           | 672           | 365           | 60           | 589                             | 387           | 296           | 41           | 12           | 2          |
| Meperidine                           | 515              | 85            | 39            | 384           | 209           | 256           | 33           | 358                             | 99            | 176           | 44           | 11           | 0          |
| Methadone                            | 245              | 36            | 18            | 187           | 70            | 156           | 10           | 202                             | 28            | 65            | 41           | 10           | 1          |
| Morphine                             | 240              | 44            | 26            | 165           | 119           | 97            | 15           | 170                             | 49            | 50            | 25           | 5            | 4          |
| Pentazocine                          | 297              | 32            | 22            | 240           | 93            | 159           | 36           | 192                             | 56            | 116           | 28           | 6            | 0          |
| Propoxyphene                         | 830              | 101           | 91            | 626           | 243           | 535           | 27           | 634                             | 161           | 304           | 73           | 19           | 8          |
| Other/unknown                        | 807              | 205           | 79            | 515           | 382           | 338           | 72           | 487                             | 174           | 241           | 57           | 21           | 9          |
| Nonaspirin salicylates               | 730              | 363           | 90            | 273           | 478           | 212           | 27           | 334                             | 304           | 155           | 33           | 5            | 1          |
| <b>Nonsteroidal antiinflammatory</b> |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Ibuprofen, OTC                       | 13,379           | 8,424         | 2,176         | 2,706         | 9,547         | 3,562         | 150          | 4,443                           | 7,035         | 1,714         | 153          | 11           | 1          |
| Ibuprofen, Rx                        | 6,146            | 1,825         | 1,155         | 3,125         | 2,750         | 3,201         | 111          | 3,556                           | 2,332         | 1,314         | 199          | 29           | 1          |
| Ibuprofen, unknown if OTC or Rx      | 2,617            | 771           | 599           | 1,218         | 1,168         | 1,347         | 64           | 1,524                           | 985           | 577           | 102          | 10           | 1          |
| Other/unknown                        | 7,151            | 2,656         | 1,063         | 3,358         | 3,880         | 2,787         | 385          | 3,683                           | 2,809         | 1,562         | 241          | 26           | 3          |
| Other analgesics, misc               | 930              | 620           | 95            | 211           | 711           | 182           | 31           | 393                             | 434           | 169           | 23           | 1            | 1          |
| <b>Total</b>                         | <b>143,450</b>   | <b>77,241</b> | <b>22,696</b> | <b>42,533</b> | <b>92,542</b> | <b>46,685</b> | <b>2,493</b> | <b>62,663</b>                   | <b>65,314</b> | <b>24,173</b> | <b>4,437</b> | <b>663</b>   | <b>118</b> |
| <b>Anesthetics</b>                   |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 4,577            | 3,354         | 320           | 880           | 4,298         | 186           | 81           | 954                             | 2,239         | 899           | 71           | 14           | 1          |
| <b>Anticholinergic</b>               |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 2,718            | 824           | 291           | 1,580         | 1,301         | 1,222         | 131          | 1,836                           | 842           | 864           | 268          | 52           | 2          |
| <b>Anticoagulants</b>                |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 518              | 300           | 32            | 180           | 403           | 103           | 8            | 259                             | 253           | 73            | 28           | 4            | 0          |
| <b>Anticonvulsants</b>               |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Carbamazepine                        | 2,883            | 1,086         | 513           | 1,263         | 1,784         | 988           | 63           | 1,910                           | 907           | 892           | 386          | 89           | 3          |
| Phenytoin                            | 3,198            | 749           | 328           | 2,085         | 1,651         | 1,306         | 135          | 2,286                           | 944           | 1,010         | 353          | 43           | 2          |
| Valproic acid                        | 735              | 295           | 154           | 280           | 549           | 154           | 23           | 327                             | 343           | 153           | 38           | 7            | 1          |
| Other/unknown                        | 130              | 71            | 29            | 30            | 108           | 20            | 1            | 57                              | 68            | 27            | 3            | 1            | 0          |
| <b>Total</b>                         | <b>6,946</b>     | <b>2,201</b>  | <b>1,024</b>  | <b>3,658</b>  | <b>4,092</b>  | <b>2,468</b>  | <b>222</b>   | <b>4,580</b>                    | <b>2,262</b>  | <b>2,082</b>  | <b>780</b>   | <b>140</b>   | <b>6</b>   |
| <b>Antidepressants</b>               |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| <b>Cyclic antidepressants</b>        |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Amitriptyline                        | 4,784            | 704           | 484           | 3,535         | 1,353         | 3,205         | 94           | 4,146                           | 823           | 1,472         | 935          | 409          | 35         |
| Amoxapine                            | 359              | 36            | 31            | 289           | 82            | 260           | 9            | 322                             | 67            | 114           | 63           | 28           | 4          |
| Desipramine                          | 1,400            | 223           | 201           | 963           | 432           | 919           | 30           | 1,181                           | 307           | 477           | 187          | 89           | 25         |
| Doxepin                              | 2,504            | 226           | 211           | 2,031         | 568           | 1,830         | 38           | 2,210                           | 382           | 861           | 436          | 180          | 15         |
| Imipramine                           | 2,696            | 627           | 481           | 1,562         | 1,038         | 1,531         | 83           | 2,198                           | 726           | 813           | 356          | 122          | 24         |
| Maprotiline                          | 287              | 47            | 27            | 209           | 91            | 184           | 7            | 243                             | 72            | 89            | 32           | 11           | 0          |
| Nortriptyline                        | 1,252            | 94            | 146           | 995           | 283           | 906           | 34           | 1,043                           | 201           | 445           | 196          | 71           | 8          |
| Protriptyline                        | 77               | 13            | 9             | 55            | 21            | 49            | 5            | 61                              | 20            | 25            | 5            | 2            | 0          |
| <b>Formulated with a:</b>            |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Benzodiazepine                       | 417              | 55            | 35            | 321           | 106           | 295           | 2            | 342                             | 82            | 151           | 62           | 20           | 2          |
| Phenothiazine                        | 905              | 187           | 81            | 625           | 281           | 590           | 12           | 781                             | 177           | 305           | 161          | 43           | 4          |
| Other/unknown                        | 724              | 73            | 62            | 580           | 172           | 502           | 22           | 630                             | 111           | 270           | 138          | 38           | 8          |
| Lithium                              | 2,393            | 273           | 216           | 1,867         | 849           | 1,338         | 128          | 1,958                           | 588           | 791           | 304          | 90           | 4          |
| MAO inhibitor                        | 688              | 77            | 22            | 585           | 216           | 331           | 126          | 544                             | 137           | 211           | 128          | 30           | 4          |
| Trazodone                            | 1,825            | 172           | 180           | 1,454         | 515           | 1,201         | 66           | 1,458                           | 402           | 718           | 183          | 17           | 1          |
| Other/unknown                        | 1,124            | 80            | 112           | 915           | 232           | 779           | 84           | 917                             | 277           | 386           | 108          | 37           | 1          |
| <b>Total</b>                         | <b>21,435</b>    | <b>2,887</b>  | <b>2,298</b>  | <b>15,986</b> | <b>6,239</b>  | <b>13,920</b> | <b>740</b>   | <b>18,034</b>                   | <b>4,372</b>  | <b>7,128</b>  | <b>3,294</b> | <b>1,187</b> | <b>135</b> |
| <b>Antihistamines</b>                |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| <b>H<sub>2</sub> blockers</b>        |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Diphenhydramine                      | 10,692           | 5,325         | 1,476         | 3,827         | 6,743         | 3,625         | 199          | 5,063                           | 4,016         | 3,173         | 513          | 51           | 7          |
| Other/unknown                        | 8,502            | 4,308         | 1,438         | 2,699         | 5,777         | 2,414         | 201          | 3,814                           | 3,816         | 1,937         | 276          | 29           | 2          |
| <b>Total</b>                         | <b>21,267</b>    | <b>10,417</b> | <b>3,245</b>  | <b>7,465</b>  | <b>13,707</b> | <b>6,811</b>  | <b>485</b>   | <b>9,924</b>                    | <b>8,692</b>  | <b>5,534</b>  | <b>858</b>   | <b>86</b>    | <b>9</b>   |
| <b>Antimicrobials</b>                |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| <b>Antibiotics</b>                   |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 34,426           | 22,233        | 4,453         | 7,511         | 26,378        | 5,354         | 2,470        | 8,114                           | 15,031        | 4,944         | 487          | 25           | 0          |
| <b>Antifungals</b>                   |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 3,977            | 3,114         | 202           | 646           | 3,822         | 101           | 52           | 270                             | 1,819         | 468           | 23           | 1            | 0          |
| <b>Anthelmintics</b>                 |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Diethylcarbamazine                   | 1,978            | 1,329         | 65            | 569           | 1,958         | 15            | 3            | 103                             | 1,100         | 67            | 9            | 0            | 0          |
| Other/unknown                        | 941              | 617           | 54            | 265           | 904           | 20            | 16           | 211                             | 426           | 163           | 15           | 2            | 0          |
| <b>Antiparasitics</b>                |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| <b>Antimalarials</b>                 |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Metronidazole                        | 792              | 205           | 127           | 452           | 392           | 255           | 132          | 340                             | 238           | 191           | 24           | 1            | 0          |
| Other/unknown                        | 468              | 285           | 46            | 132           | 365           | 41            | 60           | 95                              | 185           | 65            | 8            | 1            | 0          |
| <b>Antituberculars</b>               |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| Isoniazid                            | 238              | 50            | 62            | 124           | 90            | 130           | 8            | 195                             | 71            | 47            | 44           | 33           | 0          |
| Other/unknown                        | 50               | 19            | 4             | 26            | 31            | 11            | 7            | 24                              | 15            | 17            | 4            | 0            | 0          |
| <b>Antivirals</b>                    |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 315              | 124           | 24            | 163           | 195           | 99            | 19           | 154                             | 103           | 70            | 8            | 0            | 0          |
| Other/unknown                        | 89               | 52            | 11            | 26            | 70            | 12            | 7            | 30                              | 51            | 17            | 0            | 0            | 0          |
| <b>Total</b>                         | <b>43,374</b>    | <b>28,058</b> | <b>5,059</b>  | <b>9,972</b>  | <b>34,266</b> | <b>6,061</b>  | <b>2,790</b> | <b>9,604</b>                    | <b>19,077</b> | <b>6,073</b>  | <b>627</b>   | <b>66</b>    | <b>1</b>   |
| <b>Antineoplastics</b>               |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| <b>Asthma therapies</b>              |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| <b>Aminophylline/theophylline</b>    |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 5,924            | 1,921         | 1,556         | 2,411         | 3,558         | 1,958         | 293          | 3,896                           | 1,869         | 1,842         | 648          | 86           | 26         |
| β <sub>2</sub> agonists              | 4,347            | 3,053         | 661           | 601           | 3,677         | 519           | 117          | 1,723                           | 1,912         | 1,288         | 133          | 6            | 1          |
| Other/unknown                        | 238              | 150           | 43            | 42            | 201           | 22            | 14           | 53                              | 103           | 50            | 3            | 0            | 0          |
| <b>Total</b>                         | <b>10,509</b>    | <b>5,124</b>  | <b>2,260</b>  | <b>3,054</b>  | <b>7,436</b>  | <b>2,499</b>  | <b>424</b>   | <b>5,672</b>                    | <b>3,884</b>  | <b>3,180</b>  | <b>784</b>   | <b>92</b>    | <b>27</b>  |
| <b>Cardiovascular drugs</b>          |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
| <b>Antiarrhythmics</b>               |                  |               |               |               |               |               |              |                                 |               |               |              |              |            |
|                                      | 859              | 253           | 53            | 547           | 678           | 127           | 38           | 407                             | 416           | 146           | 31           | 13           | 8          |

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TABLE 18. Demographic Profile of Exposure Cases by Generic Category of Substance: Pharmaceuticals (Cont'd)

|   | No. of Exposures | Age (yr)      |              |               | Reason        |               |              | Treated in Health Care Facility | Outcome*      |               |              |            |           |
|---|------------------|---------------|--------------|---------------|---------------|---------------|--------------|---------------------------------|---------------|---------------|--------------|------------|-----------|
|   |                  | <6            | 6-17         | >17           | Acc           | Int           | Adv Rxn      |                                 | None          | Minor         | Moderate     | Major      | Death     |
| Antihypertensives   | 3,821            | 2,126         | 309          | 1,358         | 2,875         | 822           | 81           | 2,431                           | 1,688         | 886           | 298          | 65         | 7         |
| β blockers  | 4,523            | 1,876         | 452          | 2,160         | 3,027         | 1,348         | 90           | 2,715                           | 2,216         | 900           | 238          | 55         | 8         |
| Calcium antagonists   | 2,874            | 1,182         | 193          | 1,478         | 2,180         | 599           | 72           | 1,548                           | 1,412         | 521           | 144          | 59         | 17        |
| Cardiac glycosides  | 1,751            | 886           | 92           | 762           | 1,402         | 272           | 41           | 1,046                           | 847           | 253           | 154          | 47         | 23        |
| Vasodilators  | 3,839            | 2,666         | 205          | 939           | 3,336         | 416           | 59           | 1,366                           | 2,264         | 463           | 73           | 6          | 2         |
| Other/unknown   | 159              | 87            | 18           | 52            | 127           | 21            | 10           | 46                              | 75            | 21            | 2            | 1          | 0         |
| <b>Total</b>  | <b>17,826</b>    | <b>9,076</b>  | <b>1,322</b> | <b>7,296</b>  | <b>13,625</b> | <b>3,605</b>  | <b>391</b>   | <b>9,559</b>                    | <b>8,918</b>  | <b>3,190</b>  | <b>940</b>   | <b>246</b> | <b>65</b> |
| <b>Cold and cough preparations</b>                          |                  |               |              |               |               |               |              |                                 |               |               |              |            |           |
| Acetaminophen + decongestant/<br>antihistamine              | 9,029            | 5,140         | 1,394        | 2,455         | 6,541         | 2,183         | 214          | 3,418                           | 3,807         | 2,359         | 205          | 19         | 0         |
| Aspirin + acetaminophen<br>+ decongestant/<br>antihistamine | 133              | 57            | 25           | 50            | 81            | 48            | 3            | 66                              | 52            | 44            | 2            | 0          | 0         |
| Aspirin + decongestant/<br>antihistamine                    | 1,040            | 603           | 145          | 287           | 806           | 183           | 38           | 318                             | 479           | 206           | 24           | 0          | 0         |
| Expectorants/antitussives                                   | 5,706            | 4,512         | 536          | 641           | 5,106         | 467           | 109          | 1,216                           | 2,701         | 1,134         | 80           | 3          | 0         |
| Other formulations for<br>cough/colds                       | 60,658           | 48,587        | 5,761        | 6,127         | 54,570        | 5,010         | 873          | 16,404                          | 29,724        | 15,181        | 876          | 42         | 3         |
| <b>Total</b>  | <b>76,566</b>    | <b>58,899</b> | <b>7,861</b> | <b>9,560</b>  | <b>67,104</b> | <b>7,891</b>  | <b>1,237</b> | <b>21,422</b>                   | <b>36,763</b> | <b>18,924</b> | <b>1,187</b> | <b>64</b>  | <b>3</b>  |
| Diagnostic agents   | 324              | 162           | 15           | 141           | 280           | 22            | 21           | 120                             | 121           | 63            | 13           | 3          | 0         |
| Diuretics   | 4,462            | 2,501         | 520          | 1,416         | 3,375         | 941           | 89           | 1,904                           | 2,107         | 825           | 121          | 16         | 1         |
| <b>Electrolytes/minerals</b>                                |                  |               |              |               |               |               |              |                                 |               |               |              |            |           |
| Calcium salts   | 1,543            | 1,301         | 69           | 159           | 1,470         | 57            | 12           | 143                             | 717           | 113           | 14           | 1          | 0         |
| Fluoride (excluding<br>vitamins)                            | 3,823            | 3,476         | 246          | 90            | 3,769         | 41            | 9            | 347                             | 1,933         | 696           | 19           | 0          | 0         |
| Iron (excluding<br>vitamins)                                | 3,699            | 2,667         | 349          | 665           | 3,021         | 626           | 27           | 1,932                           | 1,782         | 816           | 175          | 13         | 5         |
| Magnesium salts   | 158              | 60            | 17           | 79            | 146           | 7             | 2            | 67                              | 55            | 52            | 3            | 1          | 0         |
| Potassium salts   | 807              | 491           | 72           | 235           | 684           | 105           | 9            | 262                             | 417           | 115           | 12           | 3          | 0         |
| Sodium salts  | 1,331            | 980           | 192          | 153           | 1,275         | 47            | 3            | 261                             | 633           | 276           | 19           | 1          | 0         |
| Zinc  | 760              | 369           | 60           | 319           | 710           | 35            | 14           | 215                             | 247           | 234           | 23           | 2          | 0         |
| Other/unknown   | 75               | 45            | 9            | 20            | 67            | 6             | 2            | 2                               | 29            | 8             | 2            | 0          | 0         |
| <b>Total</b>  | <b>12,196</b>    | <b>9,389</b>  | <b>1,014</b> | <b>1,720</b>  | <b>11,142</b> | <b>924</b>    | <b>78</b>    | <b>3,229</b>                    | <b>5,813</b>  | <b>2,310</b>  | <b>267</b>   | <b>21</b>  | <b>5</b>  |
| Eye/ear/nose/throat<br>preparations                         | 10,819           | 7,260         | 753          | 2,764         | 10,388        | 294           | 114          | 1,931                           | 5,072         | 2,281         | 175          | 7          | 0         |
| <b>Gastrointestinal preparations</b>                        |                  |               |              |               |               |               |              |                                 |               |               |              |            |           |
| Antacids  | 12,388           | 11,309        | 472          | 572           | 12,136        | 155           | 80           | 547                             | 5,991         | 558           | 60           | 2          | 0         |
| Antidiarrheals/<br>antispasmodics                           | 3,121            | 1,699         | 423          | 974           | 2,129         | 846           | 106          | 1,772                           | 1,389         | 756           | 131          | 13         | 1         |
| Laxatives   | 10,299           | 8,232         | 709          | 1,316         | 9,628         | 530           | 99           | 1,700                           | 3,790         | 2,694         | 199          | 5          | 0         |
| Other/unknown   | 1,683            | 1,186         | 133          | 357           | 1,375         | 221           | 74           | 476                             | 749           | 237           | 39           | 5          | 0         |
| <b>Total</b>  | <b>27,491</b>    | <b>22,426</b> | <b>1,737</b> | <b>3,219</b>  | <b>25,268</b> | <b>1,752</b>  | <b>359</b>   | <b>4,495</b>                    | <b>11,919</b> | <b>4,245</b>  | <b>429</b>   | <b>25</b>  | <b>1</b>  |
| <b>Hormones and hormone antagonists</b>                     |                  |               |              |               |               |               |              |                                 |               |               |              |            |           |
| Corticosteroids   | 2,810            | 1,830         | 226          | 731           | 2,448         | 223           | 126          | 417                             | 1,178         | 260           | 34           | 0          | 0         |
| Insulin   | 369              | 43            | 20           | 300           | 219           | 125           | 17           | 226                             | 110           | 82            | 34           | 12         | 3         |
| Oral contraceptives   | 8,443            | 7,586         | 464          | 361           | 8,063         | 337           | 27           | 708                             | 3,955         | 383           | 41           | 0          | 0         |
| Oral hypoglycemics  | 1,171            | 655           | 98           | 408           | 914           | 225           | 21           | 848                             | 588           | 236           | 92           | 16         | 2         |
| Thyroid preparations  | 3,002            | 2,304         | 176          | 502           | 2,680         | 287           | 22           | 839                             | 1,708         | 241           | 48           | 7          | 1         |
| Other/unknown   | 2,423            | 1,619         | 199          | 586           | 2,023         | 322           | 61           | 551                             | 1,110         | 287           | 45           | 4          | 0         |
| <b>Total</b>  | <b>18,218</b>    | <b>14,037</b> | <b>1,183</b> | <b>2,888</b>  | <b>16,347</b> | <b>1,519</b>  | <b>274</b>   | <b>3,589</b>                    | <b>8,649</b>  | <b>1,489</b>  | <b>294</b>   | <b>39</b>  | <b>6</b>  |
| <b>Miscellaneous drugs</b>                                  |                  |               |              |               |               |               |              |                                 |               |               |              |            |           |
| Allopurinol   | 263              | 176           | 15           | 67            | 225           | 29            | 5            | 84                              | 165           | 15            | 4            | 2          | 0         |
| L-dopa and related<br>drugs                                 | 193              | 88            | 7            | 98            | 154           | 23            | 12           | 87                              | 86            | 38            | 10           | 2          | 0         |
| Disulfiram  | 608              | 40            | 27           | 532           | 222           | 320           | 58           | 463                             | 98            | 213           | 50           | 4          | 0         |
| Ergot alkaloids   | 663              | 308           | 65           | 286           | 431           | 182           | 44           | 350                             | 296           | 185           | 20           | 0          | 0         |
| Homeopathic/herbal<br>preparations                          | 990              | 753           | 45           | 190           | 865           | 79            | 39           | 228                             | 493           | 117           | 8            | 1          | 0         |
| Other   | 4,623            | 2,825         | 444          | 1,318         | 3,941         | 499           | 155          | 1,131                           | 1,887         | 1,084         | 121          | 17         | 1         |
| <b>Total</b>  | <b>7,340</b>     | <b>4,190</b>  | <b>603</b>   | <b>2,491</b>  | <b>5,838</b>  | <b>1,132</b>  | <b>313</b>   | <b>2,343</b>                    | <b>3,025</b>  | <b>1,652</b>  | <b>213</b>   | <b>26</b>  | <b>1</b>  |
| <b>Muscle relaxants</b>                                     | <b>4,182</b>     | <b>776</b>    | <b>521</b>   | <b>2,839</b>  | <b>1,456</b>  | <b>2,562</b>  | <b>85</b>    | <b>3,168</b>                    | <b>1,052</b>  | <b>1,406</b>  | <b>385</b>   | <b>75</b>  | <b>5</b>  |
| <b>Sedative/hypnotics/antipsychotics</b>                    |                  |               |              |               |               |               |              |                                 |               |               |              |            |           |
| <b>Barbiturates</b>   |                  |               |              |               |               |               |              |                                 |               |               |              |            |           |
| Long-acting   | 3,646            | 980           | 398          | 2,225         | 1,830         | 1,665         | 68           | 2,467                           | 968           | 1,213         | 381          | 127        | 4         |
| Short/intermediate-acting                                   | 2,003            | 233           | 230          | 1,516         | 547           | 1,349         | 51           | 1,617                           | 362           | 699           | 219          | 69         | 4         |
| Unknown type  | 29               | 2             | 3            | 23            | 6             | 21            | 0            | 26                              | 4             | 4             | 9            | 2          | 0         |
| Benzodiazepines   | 25,531           | 4,205         | 1,840        | 19,167        | 7,477         | 17,091        | 323          | 20,074                          | 4,812         | 9,511         | 2,213        | 456        | 42        |
| Chloral hydrate   | 346              | 90            | 19           | 233           | 139           | 190           | 14           | 267                             | 41            | 132           | 45           | 16         | 2         |
| Ethchlorvynol   | 271              | 15            | 18           | 234           | 44            | 215           | 1            | 246                             | 16            | 88            | 54           | 18         | 0         |
| Glutethimide  | 283              | 5             | 21           | 253           | 35            | 231           | 4            | 266                             | 21            | 126           | 63           | 24         | 2         |
| Meprobamate   | 500              | 65            | 52           | 377           | 119           | 360           | 6            | 417                             | 97            | 169           | 74           | 23         | 1         |
| Methaqualone  | 122              | 15            | 16           | 89            | 29            | 91            | 0            | 108                             | 15            | 34            | 14           | 3          | 0         |
| OTC sleep aids  | 4,426            | 267           | 671          | 3,421         | 744           | 3,543         | 18           | 3,800                           | 896           | 1,758         | 331          | 29         | 1         |
| Phenothiazines  | 8,384            | 1,397         | 888          | 6,024         | 2,854         | 4,949         | 377          | 6,713                           | 2,012         | 3,066         | 921          | 200        | 18        |
| Other/unknown   | 847              | 120           | 89           | 625           | 246           | 541           | 47           | 638                             | 196           | 291           | 48           | 18         | 3         |
| <b>Total</b>  | <b>46,388</b>    | <b>7,394</b>  | <b>4,245</b> | <b>34,187</b> | <b>14,070</b> | <b>30,246</b> | <b>909</b>   | <b>36,639</b>                   | <b>9,440</b>  | <b>17,091</b> | <b>4,372</b> | <b>985</b> | <b>77</b> |

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TABLE 18. Demographic Profile of Exposure Cases by Generic Category of Substance: Pharmaceuticals (Cont'd)

|  | No. of Exposures | Age (yr) |       |       | Reason |        |         | Treated in Health Care Facility | Outcome* |       |          |       |       |
|--|------------------|----------|-------|-------|--------|--------|---------|---------------------------------|----------|-------|----------|-------|-------|
|  |                  | <6       | 6-17  | >17   | Acc    | Int    | Adv Rxn |                                 | None     | Minor | Moderate | Major | Death |
| Serums, toxoids, and vaccines            | 437              | 104      | 47    | 280   | 308    | 9      | 115     | 184                             | 95       | 164   | 18       | 0     | 0     |
| Stimulants and street drugs              |                  |          |       |       |        |        |         |                                 |          |       |          |       |       |
| Amphetamines                             | 4,322            | 1,355    | 987   | 1,920 | 2,261  | 1,896  | 99      | 2,966                           | 1,179    | 1,257 | 449      | 43    | 12    |
| Amyl/butyl nitrites                      | 166              | 26       | 38    | 100   | 76     | 88     | 1       | 104                             | 27       | 67    | 13       | 2     | 1     |
| Caffeine                                 | 5,238            | 1,453    | 1,982 | 1,760 | 2,332  | 2,725  | 83      | 2,896                           | 1,283    | 2,197 | 283      | 14    | 15    |
| Cocaine                                  | 3,648            | 161      | 251   | 3,173 | 451    | 3,055  | 24      | 3,243                           | 343      | 1,280 | 583      | 144   | 63    |
| Diet aids                                |                  |          |       |       |        |        |         |                                 |          |       |          |       |       |
| Phenylpropanolamine (PPA)                | 2,042            | 983      | 465   | 579   | 1,270  | 707    | 30      | 1,108                           | 864      | 564   | 89       | 7     | 1     |
| PPA and caffeine                         | 494              | 210      | 120   | 156   | 275    | 205    | 7       | 315                             | 187      | 162   | 19       | 1     | 1     |
| Other/unknown                            | 257              | 125      | 48    | 82    | 159    | 82     | 15      | 142                             | 85       | 63    | 14       | 1     | 0     |
| Heroin                                   | 499              | 12       | 9     | 467   | 47     | 434    | 7       | 453                             | 30       | 139   | 112      | 40    | 12    |
| LSD                                      | 708              | 29       | 285   | 384   | 130    | 557    | 5       | 545                             | 52       | 307   | 117      | 6     | 0     |
| Marijuana                                | 866              | 143      | 233   | 479   | 272    | 563    | 11      | 564                             | 108      | 328   | 83       | 7     | 4     |
| Mescaline/peyote                         | 225              | 61       | 58    | 105   | 131    | 91     | 2       | 125                             | 29       | 95    | 21       | 3     | 0     |
| Phencyclidine                            | 531              | 53       | 102   | 367   | 123    | 386    | 0       | 471                             | 33       | 226   | 120      | 25    | 2     |
| PPA-containing "look-alikes"             | 222              | 54       | 59    | 107   | 79     | 133    | 0       | 177                             | 59       | 80    | 27       | 0     | 0     |
| Other/unknown                            | 217              | 45       | 42    | 125   | 74     | 136    | 2       | 161                             | 42       | 74    | 26       | 2     | 0     |
| Total                                    | 19,435           | 4,710    | 4,679 | 9,804 | 7,680  | 11,058 | 286     | 13,270                          | 4,321    | 6,839 | 1,956    | 295   | 101   |
| Topicals                                 |                  |          |       |       |        |        |         |                                 |          |       |          |       |       |
| Acne preparations                        | 1,131            | 704      | 170   | 248   | 1,047  | 34     | 45      | 134                             | 478      | 255   | 18       | 0     | 0     |
| Boric acid antiseptics                   | 454              | 320      | 29    | 101   | 442    | 8      | 3       | 46                              | 225      | 68    | 5        | 0     | 0     |
| Calamine                                 | 4,342            | 3,509    | 194   | 622   | 4,278  | 51     | 9       | 393                             | 2,074    | 334   | 22       | 4     | 0     |
| Camphor                                  | 5,945            | 4,876    | 253   | 791   | 5,826  | 96     | 15      | 1,724                           | 3,465    | 988   | 78       | 7     | 0     |
| Camphor and methyl salicylate            | 1,058            | 823      | 55    | 177   | 1,020  | 16     | 21      | 270                             | 525      | 260   | 14       | 0     | 0     |
| Diaper care products                     | 11,605           | 11,239   | 113   | 211   | 11,566 | 28     | 9       | 170                             | 5,439    | 568   | 21       | 0     | 0     |
| Hexachlorophene antiseptics              | 183              | 115      | 7     | 61    | 170    | 11     | 2       | 42                              | 97       | 34    | 2        | 0     | 0     |
| Hydrogen peroxide                        | 5,949            | 3,574    | 465   | 1,876 | 5,801  | 129    | 7       | 508                             | 2,153    | 1,308 | 88       | 0     | 0     |
| Iodine antiseptics                       | 1,633            | 725      | 193   | 702   | 1,395  | 196    | 28      | 494                             | 647      | 380   | 32       | 0     | 0     |
| Mercurial antiseptics                    | 942              | 808      | 45    | 86    | 902    | 35     | 5       | 96                              | 532      | 74    | 9        | 0     | 0     |
| Methyl salicylate                        | 6,036            | 5,050    | 282   | 681   | 5,975  | 42     | 14      | 772                             | 3,018    | 1,237 | 46       | 3     | 3     |
| Podophyllin                              | 62               | 33       | 5     | 23    | 55     | 3      | 3       | 24                              | 14       | 12    | 8        | 1     | 0     |
| Steroids                                 | 5,705            | 4,899    | 157   | 617   | 5,631  | 29     | 38      | 164                             | 2,645    | 373   | 23       | 0     | 0     |
| Wart preparations                        | 1,645            | 1,227    | 156   | 251   | 1,604  | 26     | 13      | 216                             | 687      | 469   | 17       | 2     | 0     |
| Other/unknown                            | 2,940            | 2,167    | 203   | 553   | 2,844  | 70     | 17      | 444                             | 1,385    | 551   | 42       | 1     | 0     |
| Total                                    | 49,630           | 40,069   | 2,327 | 7,000 | 48,556 | 774    | 229     | 5,497                           | 23,384   | 6,911 | 425      | 18    | 3     |
| Veterinary drug (no human equivalent)    | 1,913            | 1,029    | 146   | 729   | 1,893  | 15     | 4       | 271                             | 910      | 317   | 17       | 0     | 0     |
| Vitamins                                 |                  |          |       |       |        |        |         |                                 |          |       |          |       |       |
| Multiple vitamins—adult preparations     |                  |          |       |       |        |        |         |                                 |          |       |          |       |       |
| No iron, no fluoride                     | 2,461            | 1,906    | 234   | 307   | 2,242  | 135    | 78      | 293                             | 1,394    | 83    | 18       | 1     | 0     |
| With iron, no fluoride                   | 5,453            | 4,326    | 584   | 518   | 4,873  | 521    | 38      | 1,454                           | 2,935    | 727   | 68       | 2     | 1     |
| With iron, with fluoride                 | 49               | 39       | 6     | 4     | 43     | 6      | 0       | 13                              | 25       | 12    | 2        | 0     | 0     |
| No iron, with fluoride                   | 159              | 152      | 7     | 0     | 159    | 0      | 0       | 6                               | 104      | 8     | 0        | 0     | 0     |
| Multiple vitamins—pediatric preparations |                  |          |       |       |        |        |         |                                 |          |       |          |       |       |
| No iron, no fluoride                     | 7,986            | 7,104    | 826   | 34    | 7,887  | 90     | 5       | 446                             | 4,275    | 525   | 45       | 0     | 0     |
| With iron, no fluoride                   | 10,043           | 9,070    | 903   | 45    | 9,904  | 124    | 2       | 1,894                           | 5,857    | 1,223 | 94       | 1     | 0     |
| With iron, with fluoride                 | 432              | 413      | 14    | 3     | 429    | 1      | 1       | 64                              | 245      | 41    | 10       | 0     | 0     |
| No iron, with fluoride                   | 2,241            | 2,146    | 73    | 15    | 2,228  | 11     | 2       | 121                             | 1,349    | 103   | 2        | 0     | 0     |
| Vitamin A                                | 607              | 446      | 57    | 104   | 544    | 45     | 15      | 104                             | 319      | 38    | 7        | 0     | 0     |
| Niacin                                   | 1,212            | 250      | 70    | 888   | 719    | 56     | 431     | 159                             | 114      | 765   | 33       | 0     | 0     |
| Pyridoxine                               | 211              | 135      | 22    | 54    | 158    | 39     | 11      | 54                              | 93       | 29    | 4        | 0     | 0     |
| Other B complex vitamins                 | 853              | 612      | 63    | 173   | 735    | 68     | 45      | 120                             | 390      | 130   | 6        | 0     | 0     |
| Vitamin C                                | 1,904            | 1,542    | 221   | 135   | 1,766  | 108    | 24      | 114                             | 855      | 187   | 10       | 0     | 0     |
| Vitamin D                                | 266              | 216      | 9     | 33    | 252    | 10     | 4       | 58                              | 148      | 21    | 5        | 0     | 0     |
| Vitamin E                                | 714              | 586      | 44    | 82    | 663    | 36     | 12      | 69                              | 360      | 44    | 4        | 0     | 0     |
| Other/unknown                            | 1,663            | 1,383    | 135   | 137   | 1,519  | 117    | 23      | 297                             | 772      | 176   | 7        | 3     | 0     |
| Total                                    | 36,254           | 30,326   | 3,268 | 2,532 | 34,121 | 1,367  | 691     | 5,266                           | 19,235   | 4,312 | 315      | 7     | 1     |
| Unknown drug                             | 12,408           | 4,970    | 1,834 | 5,390 | 9,463  | 2,192  | 334     | 5,952                           | 4,003    | 3,223 | 506      | 66    | 1     |

Patients with totally unknown age, reason or medical outcome were omitted from the respective tabulations.

ABBREVIATIONS: Acc, accidental; Adv Rxn, Adverse Reaction; Int, intentional; OTC, over-the-counter; R<sub>p</sub>, prescription; misc, miscellaneous.

\* Medical outcome data were also collected in categories labelled "unknown, nontoxic," "unknown, potentially toxic," and "unrelated effect." Thus, the numbers listed here do not represent the total poison exposure experience.

**TABLE 19.** Frequency of Plant Exposures by Plant Type

| Botanical Name                               | Common Name          | Frequency |
|--|----------------------|-----------|
| <i>Philodendron</i> spp                      | Philodendron         | 6,252     |
| <i>Dieffenbachia</i> spp                     | Dumbcane             | 3,806     |
| <i>Euphorbia pulcherrima</i>                 | Poinsettia           | 3,001     |
| <i>Crassula</i> spp                          | Jade plant           | 2,618     |
| <i>Ilex</i> spp                              | Holly                | 2,337     |
| <i>Brassaia</i> and<br><i>Schefflera</i> spp | Schefflera           | 1,835     |
| <i>Phytolacca americana</i>                  | Pokeweed, inkberry   | 1,832     |
| <i>Capsicum annuum</i>                       | Pepper               | 1,783     |
| <i>Taxus</i> spp                             | Yew                  | 1,388     |
| <i>Pyracantha</i> spp                        | Firethorn            | 1,382     |
| <i>Toxicodendron radicans</i>                | Poison Ivy           | 1,353     |
| <i>Saintpaulia</i> spp                       | African violet       | 1,252     |
| <i>Epipremnum aureum</i>                     | Pothos, devil's ivy  | 1,252,382 |
| <i>Spathiphyllum</i> spp                     | Peace lily           | 1,057     |
| <i>Rhododendron</i> spp                      | Rhododendron, azalea | 955       |
| <i>Ficus benjamina</i>                       | Weeping fig tree     | 809       |
| <i>Chrysanthemum</i> spp                     | Chrysanthemum        | 800       |
| <i>Ficus elastica</i>                        | Rubber tree          | 783       |
| <i>Hedera</i>                                | Ivy                  | 744       |
| <i>Chlorophytum</i> spp                      | Spider plant         | 773       |

**TABLE 20.** Substances Most Frequently Involved in Human Exposure

| Substance                          | No.     | %*   |
|------------------------------------|---------|------|
| Analgesics                         | 143,450 | 10.5 |
| Cleaning substances                | 137,240 | 10.0 |
| Cosmetics                          | 110,546 | 8.1  |
| Plants                             | 93,975  | 6.9  |
| Cough and cold preparations        | 76,566  | 5.6  |
| Hydrocarbons                       | 52,454  | 3.8  |
| Pesticides (includes rodenticides) | 52,125  | 3.8  |
| Topicals                           | 49,630  | 3.6  |
| Bites/envenomations                | 47,829  | 3.5  |
| Foreign bodies                     | 47,374  | 3.5  |
| Sedative/hypnotics/antipsychotics  | 46,388  | 3.4  |
| Chemicals                          | 43,540  | 3.2  |
| Antimicrobials                     | 43,374  | 3.2  |
| Food poisoning                     | 39,226  | 2.9  |
| Alcohols                           | 37,212  | 2.7  |
| Vitamins                           | 36,254  | 2.6  |

Despite a high frequency of involvement, these substances are not necessarily the most toxic, but rather often represent only ready availability.

\* Percentages are based on the total number of human exposures rather than the total number of substances.

**TABLE 21.** Categories with Largest Numbers of Deaths

| Category                            | No. | % of All Exposures in Category |
|-------------------------------------|-----|--------------------------------|
| Antidepressants                     | 135 | 0.630                          |
| Analgesics                          | 118 | 0.082                          |
| Stimulants and street drugs         | 101 | 0.520                          |
| Sedative/hypnotics                  | 77  | 0.166                          |
| Cardiovascular drugs                | 65  | 0.365                          |
| Alcohols/glycols                    | 41  | 0.110                          |
| Gases and fumes                     | 39  | 0.227                          |
| Asthma therapies                    | 27  | 0.257                          |
| Chemicals                           | 24  | 0.055                          |
| Cleaning substances                 | 19  | 0.014                          |
| Pesticides (including rodenticides) | 14  | 0.027                          |

**TABLE 22.** 6-Year Comparisons

|  | 1983    | 1984    | 1985    | 1986      | 1987      | 1988      |
|--|---------|---------|---------|-----------|-----------|-----------|
| No. of reported poison exposures             | 251,012 | 730,224 | 900,513 | 1,098,894 | 1,116,940 | 1,368,748 |
| % of exposures involving children aged <6 yr | 64.1    | 64.9    | 63.9    | 63.0      | 66.6      | 62.0      |
| No. of deaths                                | 95      | 293     | 328     | 406       | 397       | 545       |
| % of annual exposures that are deaths        | 0.038   | 0.040   | 0.036   | 0.037     | 0.034     | 0.040     |
| No. of suicides                              | 60      | 165     | 178     | 223       | 226       | 297       |
| % of annual deaths that are suicides         | 63.2    | 56.3    | 54.3    | 55.0      | 57.0      | 54.5      |
| No. of pediatric deaths (aged <6 yr)         | 10      | 21      | 20      | 15        | 22        | 28        |
| % of annual deaths that are pediatric        | 10.5    | 7.2     | 6.1     | 3.7       | 5.5       | 5.1       |
| Ipecac administration (% of exposures)       | 13.4    | 12.9    | 15.0    | 13.3      | 10.1      | 8.4       |
| Activated charcoal use (% of exposures)      | 4.0     | 3.6     | 4.6     | 5.2       | 5.2       | 6.5       |

In closing, we gratefully acknowledge the extensive contribution of time, effort, and case reports by each of the participating poison centers. The quality of the data submitted reflects their meticulous data collection. Further, we applaud the emergency physicians, nurses, and others who gathered and transmitted comprehensive data to the poison centers for inclusion in this database.

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**Case 1.** A 2-day-old, 34- to 35-week premature male infant (2 kg) with respiratory distress syndrome was inadvertently injected via an umbilical catheter with 10 mL 70% ethanol mistaken for a saline flush. Following the injection, the infant's lower extremities immediately blanched. Over the next several hours the lower extremities became blue-black, and within four hours hematuria was noted. Six hours after the event, the child required intubation for respiratory distress. Seven hours after the injection, the blood ethanol level was 150 mg/dL, acetone was 10 mg/dL, and anion gap was 21 mEq/L. Over the next 24 hours the child became more alert, but liver enzyme elevation was noted: aspartate aminotransferase, 207 IU/L; lactate dehydrogenase, 5,031 IU/L; creatine phosphokinase, 801 IU/mL. The lower extremities remained mottled with blue-black discoloration, especially on the soles and heels. Over the next several days, the lower extremities improved, urine output remained adequate, and dopamine was weaned. Eight days after the injection oral feedings were begun. Several hours later the infant had a grossly bloody stool and bilious emesis. Surgical exploration of the abdomen was performed the next day. No viable intestine could be found. The child died 17 days after the injection.

**Case 2.** A 3-year-old boy was found asleep with one fourth of a bottle of rum missing. He was put to bed and left to sleep the night. Eleven hours and 15 minutes later he was found unresponsive with evidence of recent vomiting. In the emergency department he had

rapid, shallow, noisy respirations and bilateral rhonchi and rales. Intermittent seizure activity was present beginning on the right side of the face and later becoming generalized. The child was responsive only to deep pain. Pupils were 4 mm, equal, and reactive. Eye movements were dysconjugate. In the intensive care unit, temperature was 38.7°C; pulse, 180/min; respirations, 27/min; BP, 104/59 mm Hg. The patient was intubated and given 100% oxygen. The chest radiograph initially was clear, but within 24 hours atelectasis and pneumonia were evident. Ceftriaxone and ampicillin were administered. The patient deteriorated with multiple organ failure. Arterial blood gases were pH, 7.06; PO<sub>2</sub>, 45.9 mm Hg; PCO<sub>2</sub>, 45.3 mm Hg. The admission blood ethanol concentration was 45.4 mg/dL. Tonsillar herniation secondary to increased intracranial pressure became evident on computerized tomography (CT). Brain flow studies 4 days after the ingestion showed an absence of perfusion in anterior and middle cerebral arteries compatible with brain death. An EEG confirmed electrocerebral silence, and ventilatory support was discontinued more than a month after the exposure.

**Case 14.** A 20-year-old woman attempted to commit suicide by ingesting approximately 300 mL of a 95% methanol solution 2 days prior to admission. She told her parents, but they did not take it seriously and she was kept at home. Twenty-four hours later she again attempted to commit suicide by slashing her wrists and was taken to a hospital. The lacerations were sutured and she was admitted to a psychiatric unit. After approximately 16 hours in the psychiatric unit the patient had two generalized seizures and a cardiorespiratory arrest. After resuscitation she was found to be in severe metabolic acidosis with a wide anion gap (41 mEq/L). Hemodialysis was instituted. Arterial pH at the start of dialysis was 6.76, bicarbonate was 17 mEq/L, and PO<sub>2</sub> was 400 mm Hg. Before the first dialysis, the methanol level was 1,200 mg/dL. Measured serum osmolality at the time of the dialysis was 383 mosm/kg H<sub>2</sub>O with a calculated osmolality of 318 mosm/kg H<sub>2</sub>O. After 6 hours of hemodialysis incorporating sodium bicarbonate into the dialysis fluid, the pH was 7.3 and the methanol level fell to 400 mg/dL. With repeat dialysis the methanol level fell to 250 mg/dL, but the patient developed disseminated intravascular coagulation. She was placed on continuous peritoneal dialysis with ethanol in the dialysate. The serum lactate level was measured at 17 mmol/L. She was found to have a cardiac output of 15 L/min prior to the first dialysis which decreased to 10 L/min postdialysis. She was ventilator dependent, her pupils were fixed and dilated, she was completely flaccid and areflexic, and an EEG was isoelectric. The patient died five days after the ingestion.



**Case 16.** A 14-year-old boy was discovered by paramedics in an alley with an empty bottle of typewriter correction fluid next to him. The patient was unresponsive, cyanotic, and pulseless. Cardiopulmonary resuscitation was begun and the patient was transported to the emergency department. An ECG showed random waves. Arterial blood gases revealed a pH of 6.8;  $PCO_2$  of 123 mm Hg; and  $PO_2$  of 6 mm Hg. The patient was unresponsive to resuscitation. Postmortem examination revealed a dilated heart; congested, atelectatic, focally hemorrhagic lungs; aspirated gastric contents; congested, cyanotic brain and viscera; and petechiae of the pleura and epicardium. Toxicology laboratory studies revealed the presence of 1,1,1-trichloroethane and trichloroethylene in brain tissue.

**Case 18.** A 20-year-old man with chronic inhalation abuse of solvents lost consciousness after inhaling fumes from four bottles of typewriter correction fluid (trichloroethylene and trichloroethane). When the rescue squad arrived he was in ventricular fibrillation. The patient was intubated and cardiopulmonary resuscitation was initiated. Upon the patient's arrival in the emergency department an ECG showed ventricular fibrillation. Asystole occurred 20 minutes later.

**Case 21.** A 34-year-old man ingested approximately 1 L of ethylene glycol antifreeze the day before he presented to the emergency department. He had vomited a few times but otherwise had no complaints. After sleeping through the night, the patient went to work, but was sent home because he looked ill. He collapsed as he walked to his car, and was admitted to the emergency department with seizures, atrial fibrillation, and an arterial pH of 6.5. After the seizures were controlled with diazepam, hemodialysis was attempted, but the patient developed ventricular tachycardia and could not be resuscitated. Postmortem ethylene glycol level was 209 mg/dL.

**Case 23.** A 59-year-old man with a history of ethanol abuse presented to the emergency department cyanotic and complaining of being unable to see after ingesting an unknown amount of windshield wiper antifreeze 1 to 2 days before. Arterial pH was 6.8; anion gap was 33 mEq/L. He was intubated and placed on a ventilator. Multiple seizures were poorly controlled with phenobarbital, phenytoin, and diazepam. On the second hospital day, blood ethanol concentration was 0 mg/dL. The patient received massive doses of intravenous sodium bicarbonate. BP was 40/20 to 27/19 mmHg on dopamine and levarterenol infusions. Pupils were dilated and fixed. Temperature was 37.7° to 38.9°C. On the third hospital day an ethanol infusion was initiated. The blood methanol concentration reported on the third hospital day was 803 mg/dL. An EEG was "flat" on the third hospital day. The patient died on the fifth hospital day.

**Case 25.** A 40-year-old schizophrenic man reportedly drank 150 mL of an instant ice pack containing ammonium nitrate 50%. Ipecac was given at the institution where the man was living, then the patient was transferred to an emergency department. Upon arrival, the patient was briefly asystolic but recovered. Six hours later the patient had bradycardia and hypotension with a  $PO_2 > 400$  mm Hg, marginal oxygen saturation, and methemoglobin level of 50%. BP was maintained with epinephrine and dopamine. The patient was intubated and received oxygen. Seven hours after ingestion, the patient was pronounced dead.

**Case 27.** A 62-year-old woman was found unresponsive, with shallow respirations. She had obtained a bottle of 100% chloroform from a pharmacy, and 150 mL of the 240-mL bottle was missing. She was intubated, lavaged, and given charcoal and N-acetylcysteine. BP was 130 mm Hg systolic with a heart rate of 68/min. Admission electrolytes were sodium, 141 mEq/L; chloride, 105 mEq/L; potassium 4.7 mEq/L; and bicarbonate, 14 mEq/L, with an anion gap of 22 mEq/L. Blood ethanol was 140 mg/dL. She progressively deteriorated over the next several hours, manifesting hematuria, decreased urine output, intravascular hemolysis, and a markedly distended abdomen. She remained unresponsive and hypotensive, requiring high doses of dopamine. The serum bicarbonate level was 11 mEq/L and pH was 7.2. A lactic acid level of 10.9 mmol/L was obtained. The metabolic acidosis was refractory to  $>250$  mEq sodium bicarbonate infused over 8 hours. Amylase was  $>1,000$  U/L; aspartate aminotransferase was 393 IU/L; and bilirubin was 2.7 mg/dL. She developed bloody stools and hematuria with low urine output progressing to anuria. The patient remained too unstable for hemodialysis and died 24 hours after the ingestion.

**Case 30.** A 35-year-old man swallowed cyanide in a glassful of water after being caught by police while operating an illegal narcotics laboratory. He convulsed shortly thereafter, and was in cardiorespiratory arrest on arrival at the emergency department. Treatment with oxygen and a cyanide kit was initiated without response.

**Case 37.** A 58-year-old man ingested 120 to 240 mL formalin (formaldehyde and 17.2% methanol) after arriving for work at a meat packing plant. The patient became semicomatose but rapidly awakened in the emergency department. Room air arterial blood gases were pH, 7.37;  $PCO_2$ , 17 mm Hg; and oxygen saturation, 99%. Activated charcoal and a cathartic were given. Electrolytes were sodium, 140 mEq/L; potassium, 3.8 mEq/L; chloride, 106 mEq/L; bicarbonate, 11 mEq/L; and glucose, 228 mg/dL. Five hours post-ingestion the patient deteriorated. He was dyspneic and obtunded, requiring intubation. Arterial blood

gases on 100% oxygen were pH, 6.8;  $PCO_2$ , 48 mm Hg; and  $PO_2$ , 200 mm Hg. Administration of bicarbonate and ethanol was initiated, and the patient was transferred for dialysis. The patient became hypotensive with a BP of 60/palpable despite dopamine. Disseminated intravascular coagulopathy was noted. A dialysis catheter and Swan-Ganz catheter were placed, but the patient arrested and could not be resuscitated. Autopsy revealed a fixed stomach consistent with formaldehyde ingestion. The patient's methanol level continued to increase even to the time of arrest. Ethanol was initiated approximately 6 hours after the ingestion. The peak level was 33.1 mg/dL. Formate levels increased from 14.3 mmol/L to 29.6 mmol/L 6 hours after ingestion, then fell to 12.9 mmol/L at the time of arrest.

**Case 38.** A 19-year-old man was transported to an emergency department after exposure to hydrogen cyanide gas resulting from the inadvertent mixture of muriatic acid and zinc cyanide sludge while cleaning an electroplating vat. He was unresponsive with decorticate posturing and red frothy sputum. Initial arterial blood gases were pH, 7.01;  $PCO_2$ , 93 mm Hg; and  $PO_2$ , 13 mm Hg. CT revealed massive cerebral edema and the EEG was nearly flat. A whole blood cyanide level of 2.5  $\mu$ g/mL was later reported. Treatment included administration of two cyanide antidote kits, 3.5 hours of hyperbaric oxygen therapy, mannitol, and hyperventilation. Dopamine was required for BP support for the first 24 hours, but over the next 24 hours increasing BP required the use of a nitroprusside infusion. Generalized tonic-clonic seizure activity was seen 48 hours after presentation. The patient remained completely unresponsive to all stimuli, with fixed, dilated pupils. A second flat EEG was observed, and no cerebral blood flow was noted on nucleotide scan. The patient was pronounced dead 2.5 days after the exposure.

**Case 39-42.** Four men aged 21 through 29 years were found dead at the scene of an industrial accident in an electroplating operation. By mistake, muriatic acid had been used instead of sodium hypochlorite to clean zinc cyanide sludge from a plating vat. Hydrogen cyanide gas was inadvertently released. A fifth patient, described above (case 38), was transported to a medical facility and died several days after the exposure.

**Case 44.** A 23-year-old man presented to the emergency department alert, oriented, diaphoretic, salivating, and combative. He had ingested an unknown amount of an aluminum brightener containing hydrofluoric acid. The initial respiratory rate was 26/min and arterial blood gases were pH, 7.45;  $PCO_2$ , 34 mm Hg; and  $PO_2$ , 107 mm Hg. Approximately one hour after presentation the patient became unresponsive, developed ventricular tachycardia, then succumbed to cardiopulmonary arrest (approximately 3 hours after presentation). Postmortem examination revealed hemor-

rhagic gastric mucosa, atelectatic lungs, a dilated heart, petechiae of the leurae, and petrous bones. Urine drug screen showed metabolites of cocaine.

**Case 46.** A 2-year-old boy ingested an alkaline drain opener, experienced immediate hematemesis, and was noted to have profuse bleeding from the mouth. He was given milk at home, then ice water lavage in the emergency department. He arrived at the hospital having respiratory difficulty and vomiting bright red blood. He was disoriented and acidotic (pH, 7.21). He was intubated and ventilated. Severe bradycardia, then ventricular fibrillation developed. He was defibrillated three times, then developed complete asystole unresponsive to atropine, epinephrine, and isoproterenol. Postmortem examination revealed hemorrhagic pulmonary edema and burns of the lips, mouth, tongue, larynx, trachea, bronchi, esophagus, and stomach.

**Case 50.** A 71-year-old man ingested a heavy-duty drain cleaner containing 65% potassium hydroxide, then vomited coffee ground material. Five hours later, on presentation to an emergency department, his tongue was swollen and burns were noted around his mouth. He was treated with fluids and corticosteroids. The next day the patient had evidence of mediastinitis and peritonitis. A subtotal gastrectomy and distal esophagotomy were performed. Dopamine was infused to maintain BP. The patient developed adult respiratory distress syndrome and premature ventricular contractions and died 17 days postingestion.

**Case 53.** A 70-year-old woman with a history of Alzheimer's disease ingested an unknown amount of a liquid laundry detergent (containing enzymes) at a nursing home. She vomited spontaneously and was transported to the emergency department, where she continued to vomit and developed diarrhea. There were no signs of aspiration of stomach contents at the time. She was noted to be cool and clammy, which was described as her baseline. She was discharged back to the nursing home following rehydration but returned to the hospital following the onset of respiratory difficulty. The patient was admitted to the intensive care unit, was placed on a ventilator, and died the following day.

**Case 54.** An 81-year-old woman ingested an estimated 240 mL of heavy-duty laundry detergent 2 hours prior to admission. The patient experienced initial vomiting and diarrhea, then developed pulmonary edema and respiratory depression which required intubation and mechanical ventilation. A gastroscopy performed on the second hospital day revealed small hemorrhagic areas in the stomach without necrosis. On the sixth hospital day she experienced a seizure and became hypotensive, requiring dopamine. The patient improved gradually over the next few weeks and was weaned off the dopamine and ventilator. She died suddenly on the 28th hospital day.

**Case 56.** A 52-year-old woman intentionally ingested an unknown amount of a pine oil cleaner. Approximately 11 hours later, she was found poorly responsive and had vomited. On arrival at the hospital, she was hypotensive with a systolic BP of 90 mm Hg and a heart rate of 130/min and required dopamine. A chest radiograph revealed adult respiratory distress syndrome. The pH was initially 6.95 and, despite resuscitative efforts, never exceeded 7.20. She arrested and could not be resuscitated approximately 12 hours after admission. Postmortem examination demonstrated pulmonary edema and evidence of chronic alcoholism.

**Case 57.** A 20-year-old woman ingested an unknown amount of a rust stain remover (containing 4.9% hydrofluoric acid) mixed in a carbonated beverage in a suicide attempt. She was brought to the emergency department 30 minutes after the ingestion, unconscious, with decreased respirations, a heart rate of 92/min, and a systolic BP of 50 mm Hg. The patient had vomited before arrival, continued to vomit, and developed profuse diarrhea. She was intubated and given 4 L of normal saline intravenously but continued to be hypotensive. Gastric lavage was initiated, with a bloody fluid return. Initial laboratory data showed an arterial pH of 7.36 and a serum calcium of 8.1 mg/dL. She was transferred to the intensive care unit, where she was described as responsive to painful stimuli only. The patient developed ventricular fibrillation approximately 3.5 hours after the ingestion. The resuscitative efforts included multiple attempts at defibrillation along with administration of lidocaine, dopamine, epinephrine, and sodium bicarbonate. She had also received multiple doses of calcium gluconate and calcium chloride during the resuscitation. A serum calcium level obtained during arrest was 4.4 mg/dL. The ventricular fibrillation was intractable and she was pronounced dead approximately 5 hours after the ingestion. Autopsy showed acute pulmonary and visceral congestion, focal hemorrhagic gastritis, duodenitis, jejunitis, and epicardial petechial hemorrhages.

**Case 60.** A 37-year-old woman ingested a toilet bowl cleaner containing 23% hydrochloric acid. She had abdominal pain, excessive bleeding, disseminated intravascular coagulopathy, an arterial pH of 6.6, and was started on steroids. She died 12 hours after the ingestion. Postmortem examination revealed hemorrhagic gastritis, corrosive esophagitis, duodenitis, pulmonary edema, and hemorrhagic diathesis.

**Case 65.** A 17-year-old boy was on a bridge sniffing a nail enamel dryer containing n-butane, propane, and other volatiles. It is unclear whether he fell off the bridge and started seizing or whether he was seizing when he fell off the bridge. Cardiopulmonary resuscitation was started at the scene. Arterial blood gases showed a  $P_{CO_2}$  of 123.4 mm Hg and a  $P_{O_2}$  of 19 mm Hg. All attempts at resuscitation failed, and he died 1

hour after arrival. Autopsy showed diffuse visceral congestion with mild cerebral edema, focal pulmonary atelectasis, and acute right-sided cardiac dilation.

**Case 66.** A 16-year-old boy was found unconscious in his room at a boarding school. Paramedics were called and the patient was found to be in ventricular fibrillation. He was taken to the closest emergency department, with cardiopulmonary resuscitation in progress. A history obtained from friends was that the patient had intentionally inhaled the contents of an aerosol can of air freshener and then collapsed. Upon arrival, the patient was in full cardiac arrest and could not be resuscitated. Postmortem examination revealed propane and isobutane in the patient's blood.

**Case 67.** A 15-month-old girl was found in cardiorespiratory arrest with two siblings in an apartment fire. Initial resuscitation was successful. Carbon monoxide level initially was 48%, decreasing to 17% after two hours of 100% oxygen. The patient was stable and was transferred to a hyperbaric chamber. Approximately 24 hours after the exposure, she died of irreversible hypoxia.

**Case 69.** A 2-year-old boy was found unconscious and unresponsive with two siblings in an apartment fire. He was brought to the local emergency department in full cardiorespiratory arrest and was resuscitated. Carbon monoxide level was over 50% and an attempt was made to transport him to a hyperbaric chamber; however, he sustained repeated cardiac arrests and developed bilateral pneumothoraces. He was stabilized, then had a final cardiac arrest.

**Case 70.** A 3½-year-old boy traveling in a 1960 Chevrolet was found unresponsive on the floor of the back seat after last being checked 10 to 20 minutes before. He was given mouth-to-mouth resuscitation. When paramedics arrived he was intubated and given 100% oxygen. Cardiopulmonary resuscitation was administered for 30 to 45 minutes prior to arrival in an emergency department. Initial laboratory data included pH, 7.14;  $P_{CO_2}$ , 31 mm Hg;  $P_{O_2}$ , 550 mm Hg; and a carboxyhemoglobin level of 33.4%. The patient went from asystole to a wide complex idioventricular rhythm, with establishment of normal sinus rhythm after a second epinephrine dose. Hyperbaric oxygen was administered but hypotension and hypothermia remained difficult to control. Diabetes insipidus developed and was treated with desmopressin. Persistent absence of cortical function was noted on clinical examination. Death occurred approximately nine hours after arrival at the hospital. Postmortem examination confirmed carbon monoxide as the cause of death.

**Case 75.** A 24-year-old man was dead on arrival to an emergency department via helicopter. He and his cousin had been camping and had slept in an enclosed pickup truck heated by a charcoal barbecue. The following morning he was found stiff, cold, and unre-

sponsive. The cousin complained of headache, nausea, and vomiting and was disoriented. On autopsy, the blood was noted to be a bright red color and the carboxyhemoglobin level was 49%.

**Case 92.** A 4-year-old boy was brought to an emergency department in full arrest after being exposed to carbon monoxide and possible cyanide gas from a fire in his house. Cardiopulmonary resuscitation was initiated, and the child was intubated. On arrival the arterial pH was 6.7, carboxyhemoglobin was 43%, and the cyanide level was 0.1  $\mu\text{g/mL}$ . The child was transferred for hyperbaric oxygen and remained unresponsive despite hyperbaric oxygen treatment for 90 minutes every 6 hours until 72 hours postexposure. Seven hours postexposure he was given sodium nitrite and sodium thiosulfate without improvement. Dopamine was started 48 hours after exposure. Serial EEGs demonstrated no electrical activity. The child remained on dopamine and a ventilator until he died 14 days after the exposure.

**Case 94.** A 16-year-old boy was found in full cardiac arrest by emergency medical technicians after inhaling television tuner cleaner containing fluorinated hydrocarbons. The patient had been unconscious for 10 minutes. Resuscitative efforts were continued en route to and in the emergency department but were unsuccessful. Postmortem examination demonstrated trace amounts of volatiles in the tracheal air, liver, and brain.

**Case 98.** A 30-year-old man was working in an oil field cutting pipes when he received a "direct blast" of hydrogen sulfide gas. He immediately fell back, and coworkers began cardiopulmonary resuscitation. The patient was transported to a local hospital where resuscitation attempts continued. Amyl nitrite was administered, but sodium nitrite could not be found. The patient was in an idioventricular rhythm and never converted. He was pronounced dead an hour after exposure to the gas.

**Case 99.** A 32-year-old man was exposed to hydrogen sulfide gas for approximately 4 to 10 minutes at work. He was in asystole when the paramedics arrived on the scene, and cardiopulmonary resuscitation was underway. In the emergency department the patient was in ventricular fibrillation. Amyl nitrite and sodium nitrite were administered, resulting in a methemoglobin level of 24%. Arterial pH was 6.74;  $\text{PO}_2$  was mm Hg; and  $\text{Pco}_2$  was 64 mm Hg on 100%  $\text{FiO}_2$ . The patient was extremely cyanotic with an odor of hydrogen sulfide. Asystole ensued despite multiple doses of epinephrine, atropine, sodium bicarbonate, and isoproterenol.

**Case 101.** A 34-year-old man was exposed to an estimated 10,000 ppm of hydrogen sulfide while working on an oil well. He was intubated, given sodium nitrite without response, then transferred for hyperbaric ox-

xygen. The systolic BP was 70 mm Hg on dopamine and he had no spontaneous respirations. Despite hyperbaric oxygen treatment he remained areflexic, with fixed, dilated pupils. CT showed dissolution of the brain ("pulp"). Life support was discontinued. Postmortem examination demonstrated pulmonary congestion and edema.

**Case 106.** A 53-year-old chemical transport firm employee, during delivery of tanks of sulfur dioxide, was exposed to the gas through a leak in a pipe valve. He fell to the ground and was in full cardiopulmonary arrest when rescue workers arrived. Resuscitation during transport and in the emergency department was unsuccessful. During intubation the anesthesiologist noted erythema and bleeding in the pharynx as well as bloody pulmonary secretions. The conjunctiva were erythematous.

**Case 107.** A 69-year-old man became ill 2 days after spraying copper chloride and benomyl in his yard. He was placed on a ventilator. The patient was in hemolytic crisis with evidence of hepatic and renal dysfunction. Seven days after the exposure he became hypotensive and suffered a cardiopulmonary arrest. Resuscitative efforts were unsuccessful.

**Case 108.** A 49-year-old man was engaged in the home recovery of gold using mercury. Five days before admission his exhaust fan failed and he suffered an acute mercury vapor exposure. Over the ensuing 4 to 5 days he experienced tremors and weakness which improved, but dyspnea progressed. On presentation he was febrile to 40°C, with a respiratory rate of 56/min, a pulse of 106/min, and a BP of 108/78 mm Hg. Diffuse rales were present. Admission arterial blood gases on 100% rebreather mask revealed pH, 7.49;  $\text{Pco}_2$ , 28 mm Hg; and  $\text{PO}_2$ , 28 mm Hg. Initial medications included D-penicillamine, 500 mg four times a day, steroids, metaproterenol, theophylline, and antibiotics. The blood mercury level measured at admission was 710  $\mu\text{g/mL}$ . Urine 24-hour collections for mercury performed on days 2, 7, and 18 showed 3,000  $\mu\text{g/L}$ , 484  $\mu\text{g/L}$ , and 100  $\mu\text{g/L}$  mercury, respectively. Increasing respiratory failure developed over the next 3 weeks. He was intubated on day 3 and suffered multiple recurrent pneumothoraces starting on day 6. He was febrile but culture-negative throughout his hospitalization. He died of respiratory failure on the 21st hospital day.

**Case 109.** An 83-year-old man presented alert and oriented 10 minutes after attempting suicide by ingesting less than 1 teaspoon of a coyote killer containing 99% thallium. The heart rate was 50/min, BP was 120/50 mm Hg, and respirations were 16/min. Emesis was induced with ipecac, then five drops of tincture of iodine with 1 teaspoon of salt was administered orally in a glass of water, per instructions on the package label. Seven hours after the ingestion, the patient experi-

enced tremors in his hands. Castor oil was administered and administration of intravenous fluids was initiated while preparations were made to obtain Prussian Blue from a chemical supply company. Nine hours postingestion, the patient became lethargic and less responsive to stimuli. Eleven hours postingestion, the patient developed hypotension that was unresponsive to dopamine. A cardiac monitor revealed ventricular fibrillation, and the patient suffered a respiratory arrest shortly thereafter. The patient was pronounced dead 12 hours after the ingestion.

**Case 110.** A 52-year-old woman was brought to the emergency department after ingesting an unknown quantity of an herbicide containing 2,4-D. She was comatose, required assisted ventilation, and had dilated pupils. BP was 50 mm Hg palpable and pulse was 55/min. Gastric lavage was performed and charcoal and a cathartic were given. In spite of intensive cardiovascular support with fluids and vasopressors, the patient developed severe hypotension followed by cardiac arrest, and died about 5 hours after ingestion.

**Case 112.** A 100-kg, 16-year-old boy presented 30 to 45 minutes after ingesting 30 to 45 mL of 21% diquat diluted in 60 to 90 mL water. He had spontaneous blood-tinged emesis. Lavage was performed, the 150 g bentonite in sorbitol was administered. Serum creatinine was 2.4 mg/dL and total bilirubin was 1.9 mg/dL (direct 0.8 mg/dL, other liver function tests normal) 2.5 hours postingestion. Within 75 minutes of admission, charcoal hemoperfusion and hemodialysis in tandem were initiated and continued for 6 hours (BP, 170/120 mm Hg). Serum and urine diquat levels 3 hours postingestion were 7.6  $\mu\text{g/mL}$  and 1,050  $\mu\text{g/mL}$ , respectively. A predialysis serum diquat level (3.5 hours postingestion) was 9.6  $\mu\text{g/mL}$ , and a postdialysis level was 1.3  $\mu\text{g/mL}$ . Following initial catheterization for a urine sample, the patient became anuric and remained so until his death. A repeat dose of 150 g bentonite was administered in the morning of the second day. At this point his only complaint was a sore throat. On the second day, creatinine was 3.3 mg/dL, WBC was 24,100/ $\mu\text{L}$ , total bilirubin was 1.9 mg/dL, LDH was 678 IU/L, and aspartate aminotransferase was 113 IU/L. That afternoon, charcoal hemoperfusion and hemodialysis were repeated for six hours with diquat levels of 1.45  $\mu\text{g/mL}$  and 0.48  $\mu\text{g/mL}$  before and after the procedure. Transdermal nitroglycerin and labetalol were given to control hypertension. A hemoperfusion-induced coagulopathy developed and was managed with fresh frozen plasma, vitamin K, and platelet transfusions. The patient became increasingly inappropriate, and aspiration of emesis was suspected. A chest radiograph revealed a patchy right upper lobe infiltrate. A flurry of grand mal seizure activity was treated with diazepam and phenytoin. He also experienced brisk bleeding from the nose and mouth second-

ary to highly friable oral and esophageal tissue (hemoglobin, 11.8 g/dL; hematocrit, 34.3%). Sucralfate, ranitidine, and pitressin were initiated. On day 3 his creatinine level was 6.5 mg/dL, total bilirubin was 2.5 mg/dL, lactate dehydrogenase was 956 IU/L, and aspartate aminotransferase was 221 IU/L. He was confused but followed some commands. Six hours of charcoal hemoperfusion and hemodialysis were performed that afternoon with diquat levels of 0.38  $\mu\text{g/mL}$  and 0.067  $\mu\text{g/mL}$  before and after the procedure. He experienced another seizure, after which he became unresponsive with fixed and dilated pupils (7 mm), no oculocephalic reflex, no ciliary reflex, no deep tendon reflexes or plantar reflexes, and no response to an iced saline caloric testing. Temperature increased to 39.7°C. He was intubated and a Swan-Ganz catheter was placed. EEG displayed minimal, possibly only background, activity. On day 3, creatinine was 7.2 mg/dL, total bilirubin was 1.4 mg/dL (direct 0.7 mg/dL), aspartate aminotransferase was 139 IU/L, hemoglobin was 9.9 g/dL, and hematocrit was 29.6%. Two units of packed cells were given. A chest radiograph revealed increasing right infiltrates with some patch infiltrates in the left base. An epinephrine drip was initiated for BP maintenance. Charcoal hemoperfusion and hemodialysis were performed for six hours with levels of 0.11  $\mu\text{g/mL}$  and 0.074  $\mu\text{g/mL}$  before and after the procedure. A chest radiograph on day 5 showed diffuse severe infiltrates. Creatinine increased to 9.1 mg/dL on day 6. Charcoal hemoperfusion and hemodialysis were done for four hours on days 6 and 7, with a postdialysis level of 0.017  $\mu\text{g/mL}$  on day 6. Brisk bleeding necessitated additional blood replacement. On day 8, a chest radiograph showed a severe bilateral alveolar consolidation. He had greatly decreased lung compliance with significant shunting. He developed a diffuse, flushed rash. Sputum grew out *Pseudomonas aeruginosa*. Norepinephrine was added, and the pulmonary capillary wedge pressure was 64 to 66 cm H<sub>2</sub>O. He continued to require high doses of pressors to maintain BP. Bradycardia developed, followed by ventricular tachycardia progressing to ventricular fibrillation, electromechanical dissociation, and a flatline EEG. He died 11.5 days after the diquat ingestion.

**Case 113.** A 34-year-old alcoholic man ingested an estimated 90 mL of diquat 4 hours before presentation. Initial symptoms included vomiting and diarrhea. Approximately 20 hours after the ingestion the patient became lethargic, respirations became labored and rapid, he became hyperthermic (39.4°C), and his face, head, and upper torso became erythematous. Activated charcoal and Fuller's earth were administered every 3 hours. On the second hospital day, the patient developed hematuria, nausea and vomiting continued, and respirations were rapid, shallow, and labored. On the third hospital day, the BUN was 98 mg/dL and

serum creatinine was 9.8 mg/dL. The patient experienced a cardiac arrest and died on the fourth hospital day.

**Case 114.** A 34-year-old man ingested an unknown amount of paraquat (29.1%) while spraying weeds. He developed nausea, vomiting, diarrhea, substernal chest pain, cough, and decreased urine flow over the next 2 days. Physical examination revealed shallow respirations, clear lung fields, and grimacing after coughing. BP was 140/70 mm Hg; pulse, 80/min; respirations, 32/min; and temperature, 37.6°C. Urinalysis revealed proteinuria (>300 mg/dL) and glucosuria (250 mg/dL). Serum creatinine was 4.1 mg/dL and BUN was 20 mg/dL. Six hours of hemodialysis in series with charcoal hemoperfusion was performed. On the second day, the patient's lungs remained clear, and the patient remained oliguric. Hemodialysis with hemoperfusion was performed for 4 additional hours. Bibasilar pulmonary infiltrates appeared on day 3, progressing to generalized infiltrates on day 4. He then required endotracheal intubation and mechanical ventilation with an  $\text{FiO}_2$  of 0.7. Positive end expiratory pressure of 10 cm water was added to decrease the oxygen requirement in an attempt to minimize pulmonary toxicity. Dialysis continued for his oliguria until day 6 (peak creatinine, 9.2 mg/dL on day 6). Evidence of mild hepatic damage was seen; however, this was not a factor in the clinical course. The next 8 days brought increasing pulmonary congestion and localized, patchy infiltrates. The  $\text{FiO}_2$ , which had been gradually decreased to 0.35, was increased to 0.80 with 15 cm water positive end expiratory pressure. Radiographic evidence of adult respiratory distress syndrome was present, and on day 15 the patient developed coarse rhonchi. A focal right lower infiltrate appeared on the chest radiograph with superimposed pneumonia. Oxygen saturation decreased, necessitating an increase in positive end expiratory pressure to 20 cm  $\text{H}_2\text{O}$  and  $\text{FiO}_2$  to 1.0. Bronchospasm and asystole developed, and the patient died of respiratory failure. Serum paraquat concentrations of 0.192  $\mu\text{g}/\text{mL}$  on day 1 (before dialysis), 0.074  $\mu\text{g}/\text{mL}$  on day 2 (after dialysis), and 0.160  $\mu\text{g}/\text{mL}$  on day 11 were reported.

**Case 115.** A 16-year-old boy arrived in the emergency department in full arrest. He and his brother had been inhaling butane by putting lighter fluid in a paper bag. The patient suddenly collapsed. Postmortem butane levels were blood, 622  $\mu\text{g}/\text{mL}$ ; liver, 65  $\mu\text{g}/\text{g}$ ; brain, 576  $\mu\text{g}/\text{g}$ ; heart, 68  $\mu\text{g}/\text{g}$ ; and lung, 0.211  $\mu\text{g}/\text{g}$ . Acute pulmonary edema and cerebral edema with left uncinate herniation were present on autopsy.

**Case 116.** A 16-year-old boy became agitated and collapsed after inhaling butane lighter fluid. Upon arrival at the emergency department the patient was in electromechanical dissociation, and resuscitation attempts were unsuccessful. Autopsy revealed pulmo-

nary edema and hepatosplenomegaly. Postmortem blood showed butane (0.8% saturation), tetrahydrocannabinol, 1 ng/mL, carboxy-tetrahydrocannabinol, 12 ng/mL, diazepam, 0.2  $\mu\text{g}/\text{mL}$ , nordiazepam, 0.1  $\mu\text{g}/\text{mL}$ , and oxazepam, 0.05  $\mu\text{g}/\text{mL}$ .

**Case 119.** A 20-month-old girl ingested 10 to 25 mL methylene iodide in a jeweler's product used by her father (to determine the specific gravity of gems). Lethargy, ataxia, and vomiting became apparent 1.5 to 2.5 hours after ingestion. In the emergency department she was lethargic and irritable with heart rate, 176/min; respiratory rate, 48/min; BP 104 mm Hg systolic and temperature, 37.4°C. The oropharynx was free of lesions, but the vomitus smelled of diiodomethane. The carboxyhemoglobin level was 13.4%, and an abdominal radiograph revealed flocculent opacities throughout the intestines. Over the next 2 days the child developed acute hepatic failure accompanied by coagulopathy and hepatic encephalopathy. She became febrile. At 51 hours postingestion, laboratory studies revealed prothrombin time, 151 seconds, partial thromboplastin time, 58 seconds; total bilirubin, 4.2 mg/dL (direct bilirubin 1.2 mg/dL); aspartate aminotransferase, 18,725 IU/L (up from 47 IU/L); alanine aminotransferase, 12,250 IU/L (up from 18 IU/L); and alkaline phosphatase, 486 IU/mL. Carboxyhemoglobin peaked at 14.2% then steadily decreased. The serum iodine level was 6,800  $\mu\text{g}/\text{dL}$  (reference range, 4.5 to 9.0  $\mu\text{g}/\text{dL}$ ) and the iodide level was 70  $\mu\text{g}/\text{mL}$ . The patient remained lethargic but arousable over the next few days then manifested complications of hepatic failure. She developed gastrointestinal bleeding, a refractory coagulopathy, hypoglycemia, and encephalopathy. She was transported to a liver transplant center for care. There she manifested respiratory compromise requiring mechanical ventilation, severe coagulopathy despite nearly continuous blood product infusions, a worsening encephalopathy, hypoglycemia, and bone marrow suppression. Liver function studies now revealed total bilirubin, 16.2 mg/dL; aspartate aminotransferase, 377 IU/L; and alanine aminotransferase, 930 IU/L. Mean arterial pressures were elevated although pulmonary capillary wedge pressure was 13 to 14 mm Hg and cardiac output was good. Renal function was fairly stable with BUN of 5 to 10 mg/dL and creatinine 0.5 to 1.0 mg/dL. Six days postingestion, the patient had two episodes of suddenly increasing mean arterial pressure associated with pupillary asymmetry, which responded to mannitol. A head CT scan was interpreted as diffuse edematous changes without shift or focal changes, with possible subarachnoid hemorrhage. An EEG demonstrated electrocerebral silence. This was confirmed by a negative brain arterial flow study performed on the eighth day after ingestion. In the face of fulminant hepatic failure, a diagnosis of brain death was made. The child



was removed from ventilatory support and died on the ninth day after the ingestion.

**Case 120.** A 25-year-old woman presented to an emergency department stating that 12 hours earlier she had ingested 4 ounces of a red furniture polish (containing mineral seal oil) which she claimed to have mistaken for red punch. Her respiratory rate was 34/min and chest radiograph showed bilateral pneumonitis. Two hours later, the PO<sub>2</sub> was 57 mm Hg while she was receiving 6 L of oxygen. Later that day she required ventilatory assistance. The second day after ingestion, the patient developed adult respiratory distress syndrome. She continued to deteriorate and died on the third day postingestion. Postmortem examination revealed diffuse aspiration pneumonitis due to petroleum distillate, acute renal tubular necrosis, and massive centrilobular necrosis of the liver.

**Case 123.** A 65-year-old woman with a history of prior suicide attempts ingested up to 1 L of a 25% diazinon insecticide. She presented in respiratory distress with copious oral secretions, marked pulmonary congestion, vomiting, diarrhea, pinpoint pupils, heart rate 100/min, and BP 220/100 mm Hg. She was intubated and given atropine and pralidoxime. Over the next 12 hours the patient became hypotensive. She developed an aspiration pneumonia with a superimposed staphylococcal pneumonia, then adult respiratory distress syndrome. Over the remaining hospital course she deteriorated, developing coagulopathy, oliguria, and marked hypotension requiring dopamine and dobutamine. Continuous arteriovenous hemofiltration was performed. The patient died on the 19th hospital day. An autopsy demonstrated diffuse alveolar damage and moderate to marked degeneration of the hepatic parenchymal cells in the region of the central vein. Focal necrosis was also noted in the pancreas and spleen.

**Case 132.** A 57-year-old woman ingested 45 to 60 mL of an ant killer containing 3% sodium arsenate and presented in an emergency department 3.5 hours later. (The patient had presented to the emergency department on three previous evenings before this occurrence with minor complaints.) The patient was lavaged and given one dose of charcoal. She began having loose stools late that evening. Medical history included asthma, diabetes, and an undefined underlying problem with renal function. On the second day, the patient received two more doses of activated charcoal and developed respiratory difficulty that did not require intubation. Laboratory findings included BUN, 32 mg/dL; sodium, 145 mEq/L; potassium, 3.6 mEq/L; chloride, 107 mEq/L; bicarbonate, 24 mEq/L; glucose, 115 mg/dL; and hematocrit, 44%. Benzodiazepines were found on a urine drug screen and the serum theophylline level was 2 µg/mL. A 120-mL urine sample was found to contain 30,859 µg/L arsenic. A simulta-

neous blood arsenic level was 73.9 µg/L. Urine output had declined. One dose of BAL (3.5 mg/kg) had been given approximately 16 hours postingestion. When the patient's BP became unstable, the patient was transferred to a tertiary care facility approximately 24 hours postingestion. A spot urine arsenic level at this time was 2,430 µg/L. The patient was placed on hemodialysis. Blood arsenic levels before and after dialysis were 230 µg/L and 120 µg/L, respectively. (Subsequent blood arsenic levels were 310 µg/L, 110 µg/L, and 40 µg/L; subsequent urine arsenic levels were 2,358 µg/L and 4,320 µg/L, at unclear times.) On the third day postingestion the patient was in renal failure, urine output was 100 mL/d, dimercaprol was being administered, and hemodialysis was being performed nearly continuously. At this time, the patient required ventilation. She was hypotensive and levarterenol and dopamine were begun. She was alert but not oriented. On the fifth day postingestion the patient's hypotension could not be controlled. The patient suffered a cardiac arrest, and resuscitation was unsuccessful. A postmortem examination confirmed arsenic as the cause of death.

**Case 133.** An 18-month-old girl ingested an unknown amount of fire ant killer. The child looked fine so the mother put her to bed. Six hours later she was unresponsive and "foaming at the mouth." Upon the patient's arrival at a rural hospital, cardiopulmonary resuscitation was initiated. All drugs, including atropine, were administered via endotracheal tube because all attempts to establish intravenous access failed. The child died 1 hour after arriving at the emergency department.

**Case 134.** A hungry 42-year-old man hiking with his girlfriend ingested a bulbous plant growing in water. Approximately one hour later he experienced extreme stomach pains followed by seizures. He died before medical assistance arrived. The stomach contained plant material at autopsy. Identical plants were identified as *Cicuta douglasii*, the western water hemlock.

**Case 135.** A 36-year-old man, upon learning he was HIV positive and jobless, began taking warfarin-containing rat pellets on a daily basis in a suicide attempt. After about 10 days he presented to the emergency department complaining of headache, dark urine, melena, epistaxis, and left periorbital swelling. The headache was severe and vascular in type; he denied photophobia, seizures, or weakness but did complain that he had had a stiff neck for about 1 day. Laboratory results included prothrombin time, >60 seconds; partial thromboplastin time, >100 seconds; hemoglobin, 11.5 g/dL; hematocrit, 33.1%; urine, gross blood; electrolytes, within normal limits; calcium, 8.6 mg/dL; magnesium, 1.3 mg/dL; and phosphorus, 2.6 mg/dL. A CT scan showed a small subdural bleed with no mass effect. Administration of fresh

frozen plasma was started. After the CT scan the patient began trembling, screaming, and not responding to verbal commands. A repeat scan showed that the hematoma had expanded. The patient rapidly deteriorated, responding only to painful stimuli with posturing. BP was 158/68 mm Hg; pulse, 108/min; and respirations, 21/min. The patient was admitted to an intensive care unit with gradual improvement of neurological status to the point of agitation. He was demanding release from the hospital and trying to pull out intravenous lines when suddenly he became comatose with decerebrate posturing to pain. His right pupil was fixed and dilated and he had Cheyne-Stokes respirations. A CT scan showed right temporal hemorrhage with surrounding edema and right shift with mass effect. The patient never regained consciousness and died on the eighth hospital day.

**Case 136.** An 18-month-old boy was found with a mouthful of saddle dressing (aliphatic hydrocarbons). At the time of ingestion, the child had been taking cefaclor for an upper respiratory infection. Initial symptoms included coughing and choking. He was taken to an emergency department, where he experienced a seizure and respiratory arrest. He was intubated on the second hospital day due to retractions and poor oxygenation. A left pneumothorax required insertion of two chest tubes. On day 6 he experienced a right pneumothorax, and two additional chest tubes were inserted. On day 9 he was transferred for extracorporeal membrane oxygenation (ECMO) due to poor oxygenation. At this point he could not be aroused. ECMO was continued for 6 days with no change in the patient's oxygenation status. The patient died 20 days postexposure.

**Case 137.** An 18-year-old man intentionally ingested an unknown volume of fluid from a bottle labeled "nicotine alkaloids" and convulsed immediately afterwards. Seizures continued, were unresponsive to clonazepam for more than 12 hours, and were finally controlled with phenytoin. A CT scan revealed cerebral edema with nearly occluded ventricles and was suggestive of brain stem infarction. Tachycardia and coma persisted. The patient died 6 days postexposure. Toxicologic analysis of body fluids and the bottle contents demonstrated only nicotine.

**Case 138.** A 5-year-old girl had developed a viral illness approximately 1 week prior to admission, for which she was given a bismuth subsalicylate antidiarrheal preparation and adult-strength acetaminophen tablets, either two 325-mg or two 500-mg tablets multiple times each day for several days. On the day of admission she became unresponsive and was taken to the hospital. There she was semicomatose with an aspartate aminotransferase of 4,000 IU/L, prothrombin time of 63 seconds, and partial thromboplastin time of 56 seconds. The child's 8-year-old sister, admitted 2

days later with a similar picture, also died. The differential diagnosis was narrowed to Reye's syndrome or acetaminophen toxicity. A subdural bolt was placed, and the intracranial pressure was found to be >20 torr. She began receiving mannitol and thiopental to lower her intracranial pressure, without success. Administration of N-acetylcysteine was begun on admission and continued for 3 days. Serum acetaminophen levels were 215  $\mu\text{g/mL}$  (admission, 6 hours after the last dose), 212  $\mu\text{g/mL}$  (12 hours after admission), 171  $\mu\text{g/mL}$  (24 hours), 111  $\mu\text{g/mL}$  (36 hours), 84  $\mu\text{g/mL}$  (48 hours), 39  $\mu\text{g/mL}$  (72 hours), 15  $\mu\text{g/mL}$  (96 hours), and < 10  $\mu\text{g/mL}$  (120 hours). The child died on the seventh hospital day after a scan showed no brain perfusion. Autopsy results showed centrilobular hepatic necrosis consistent with acetaminophen toxicity and not consistent with Reye's syndrome.

**Case 139.** An 8-year-old girl had developed a viral illness approximately 1 week prior to admission for which she was given a bismuth subsalicylate antidiarrheal preparation and adult-strength acetaminophen tablets, either two 325-mg or two 500-mg tablets multiple times each day for several days. On the day of admission she became unresponsive and was taken to the hospital. On admission, she was semicomatose with an aspartate aminotransferase level >15,000 IU/L; prothrombin time, 40.5 seconds; and partial thromboplastin time, 53 seconds. Acetaminophen level 2 days after the last dose was 14  $\mu\text{g/mL}$ . The child's 5-year-old sister had been admitted 2 days previously with similar clinical manifestations. A subdural bolt was placed, and the intracranial pressure was 19 torr. She began receiving mannitol and pentobarbital to lower her intracranial pressure, without success. Intracranial pressure 3 days after admission was >20 torr. The child died on the fourth hospital day after a scan showed no brain perfusion. Autopsy results showed centrilobular hepatic necrosis consistent with acetaminophen toxicity.

**Case 153.** An alert, oriented woman presented to an emergency department hypotensive, stating she had taken 15 acetaminophen tablets a day for 1 month. Admitting laboratory values included bilirubin, 5.9 mg/dL; aspartate aminotransferase, 9,500 IU/L; alanine aminotransferase, 3,350 IU/L; prothrombin time, 24 seconds (control, 11 seconds); and acetaminophen level, 37  $\mu\text{g/mL}$  4.5 hours after the last dose. Treatment included dopamine and trendelenburg positioning. Laboratory results the next day were aspartate aminotransferase, 8118 IU/L; lactate dehydrogenase, 11,875 IU/L; prothrombin time, 34 seconds (control 11 seconds); and bilirubin, 4.5 mg/dL. On the third hospital day, the patient developed pulmonary edema followed by asystole. Cardiopulmonary resuscitation and external cardiac pacing were performed without response.



**Case 154.** A 62-year-old woman was brought to the emergency department unresponsive 18 hours after ingesting "half a bottle" of "extra strength" acetaminophen. The patient was intubated and given ventilatory assistance. Lavage returned green, hematest-positive material. Laboratory results obtained on arrival included a potassium of 2.7 mEq/L, an arterial pH of 7.22, a salicylate level 48 mg/dL, and an acetaminophen level of 338 µg/mL. N-acetylcysteine (per nasogastric tube), potassium, and sodium bicarbonate were administered. A 4-hour course of hemoperfusion initiated 23 hours postingestion brought the acetaminophen and salicylate levels down to 131 µg/ml and 29 mg/dL, respectively. Persistent hypotension was treated with dobutamine. After hemoperfusion the patient's platelet count dropped below 35,000/µL and she began bleeding from all orifices. A total of ten units of fresh frozen plasma and two units of blood were administered. Disseminated intravascular coagulopathy was diagnosed. The patient aspirated blood, suffered a respiratory arrest, and was pronounced dead 28 hours after admission (46 hours postingestion). Postmortem examination demonstrated massive hepatocellular necrosis and markedly congested, edematous lungs.

**Case 155.** A 25-year-old man with a history of depression treated with desipramine and flurazepam was found drowsy, with adequate respirations, opening his eyes, and nodding to his name. Dried vomitus was found in his bed. In the emergency department the patient was barely arousable to deep pain and had shallow respirations, a BP of 120/70 mm Hg, a pulse of 116/min, respirations 28/min, and a QRS interval of 0.11 second. The patient was intubated and given a charcoal/sorbitol slurry. The acetaminophen level was 669 µg/mL 10 to 24 hours postingestion (probably 10 to 12 hours). Urine toxicology screen was positive for desipramine and metabolites, acetaminophen, benzodiazepines, diphenhydramine/dimenhydrinate, nicotine and metabolites, and caffeine. Admission liver function test results were alkaline phosphatase, 111 IU/L and aspartate aminotransferase, 110 IU/L. A repeat acetaminophen level of 408 µg/mL was determined on the morning of admission. Because the patient was not metabolizing the acetaminophen, hemodialysis was performed for 8 hours, with a subsequent acetaminophen level of 108 µg/mL. Approximately 24 hours after admission, the patient became acutely tachycardic to 160 to 170/min, diaphoretic, and very agitated. A chest radiograph showed a pneumomediastinum with a left pneumothorax. Bilateral chest tubes were placed and bronchoscopy was performed. Bronchoscopy revealed extensive pus throughout the tracheobronchial tree, tinged with charcoal, consistent with extensive aspiration. Gram stain revealed gram-positive cocci, and vancomycin administration was be-

gun. Intravenous fluids and dopamine were given for hypotension, and a 10% dextrose solution was infused after the glucose dropped to 41 mg/dL. The patient was given fresh frozen plasma for worsening coagulopathy, with a prothrombin time of 26 seconds. He had a sudden decrease in heart rate and went into asystole after Swan-Ganz catheter placement.

**Case 176.** A 3-year-old, 4.3-kg girl presented 5.5 hours after ingesting 30 chewable aspirin, 80 mg each, given to her by an older sibling. She had a history of Blackfan Diamond disease (congenital hypoplastic anemia) and Hirschsprung's disease with colostomy. The patient was awake, with tachypnea and gray, mottled skin (her normal color according to mother). She was given activated charcoal in sorbitol. Initial laboratory results were potassium, 3.2 mEq/L; chloride, 106 mEq/L; bicarbonate, 11.7 mEq/L; and Pco<sub>2</sub>, 22 mm Hg. Fluids and bicarbonate were administered. Six hours postingestion the salicylate level was 102 mg/dL; the level was 97 mg/dL and 37 mg/dL 9 hours and 20 hours postingestion, respectively. On admission the vital signs were BP, 90/50 mm Hg; pulse, 170/min; and respiratory rate, 40 to 70/min. The patient developed pulmonary edema and required intubation 21 hours postingestion. Laboratory values at this time were sodium, 154 mEq/L; chloride, 111 mEq/L; potassium, 4.3 mEq/L; BUN, 16 mg/dL; glucose, 49 mg/dL; pH, 7.41; Pco<sub>2</sub>, 29 mm Hg; Po<sub>2</sub>, 44 mm Hg; bicarbonate, 18.8 mEq/L; and serum osmolality, 314 mosm/kg H<sub>2</sub>O. Hemoglobin was 9.4 g/dL and hematocrit was 27.8%; packed cells were given. Serum glucose varied from 45 to 517 mg/dL. Her condition deteriorated. A chest radiograph showed complete white-out of both lung fields. Four days postingestion, the patient developed cardiomegaly; dopamine was required. The temperature fluctuated between 38° and 39°C. Facial edema was present. The child died of respiratory insufficiency 12 days postingestion.

**Case 177.** A 16-year-old boy ingested 150 to 200 aspirin, 325 mg each. Five hours postingestion he was referred to the emergency department, where he was slightly lethargic and hyperventilating. The serum salicylate level was 69.8 mg/dL. He received ipecac, lavage, activated charcoal, and a cathartic. A repeat salicylate level 8 hours postingestion was 89.7 mg/dL. He was lethargic, combative, and disoriented with a heart rate of 150/min, respiratory rate of 36/min, a respiratory alkalosis, and mild metabolic acidosis. Therapy included intravenous fluids, sodium bicarbonate, diazepam, and haloperidol. Serum salicylate level 10 to 11 hours postingestion was 117 mg/dL. Fourteen hours postingestion his temperature spiked to 40.3°C, respirations were labored, and urine output decreased. During preparation for hemodialysis he experienced a fatal cardiopulmonary arrest.

**Case 202.** A 60-year-old pharmacist took 50 to 75

tablets of colchicine, 0.6 mg, over a one-hour period 23 hours prior to presentation. When he was seen in the emergency department he was confused and complained of abdominal pain. However, vital signs were normal and he was awake and alert. Seventeen hours after presentation he became cyanotic, developed respiratory distress, and was intubated. The arterial pH at the time of the intubation was  $<7$ ; after intubation the pH was 7.11, and he was receiving bicarbonate. He was given pancuronium for ventilatory control, at which time he became hypotensive, requiring dopamine and norepinephrine. Prothrombin time increased to 25 seconds and partial thromboplastin time increased to 62 seconds. He deteriorated, his pupils became fixed and dilated, and he died approximately 24 hours after admission.

**Case 218.** A 39-year-old, 159-kg man ingested 40 capsules of propoxyphene, 65 mg, 30 minutes before summoning emergency transport. Shortly after presentation in the emergency department, the patient rapidly became diaphoretic then experienced two grand mal seizures followed by bradycardia and arrest. Attempts at resuscitation were unsuccessful. The postmortem examination was unremarkable except the lungs were edematous and congested with intraalveolar hemorrhages. The serum drug screen revealed propoxyphene, 8.0  $\mu\text{g/mL}$ ; norpropoxyphene, 9.6  $\text{mcg/mL}$ ; and caffeine.

**Case 226.** A 17-month-old girl presented listless and cyanotic with wet, slow, shallow respirations 30 minutes after ingesting 22.5 g dibucaine ointment. Cardiorespiratory arrest and convulsions developed shortly thereafter. Cardiopulmonary resuscitation continued for 1 hour, including intubation, diazepam for convulsions, sodium bicarbonate, isoproterenol, and atropine. The patient's BP was 46 mm Hg, and dopamine, albumin, and increased fluids were administered with a resultant increase in BP to 84 mm Hg. Arterial blood gases included a pH of 7.25, which increased after hyperventilation to 7.35, and a  $\text{PCO}_2$  of 38 mm Hg. The patient's color returned to pink and the blood did not appear chocolate brown. Activated charcoal and magnesium citrate were administered via nasogastric tube after placement and patency were confirmed. The patient suffered a cardiac arrest 3 hours after initial presentation during administration of activated charcoal and magnesium citrate per nasogastric tube. She could not be resuscitated. Attempts to aspirate activated charcoal from the endotracheal tube were unsuccessful, thus excluding charcoal aspiration as a factor in the patient's death.

**Case 230.** A 72-year-old woman receiving chronic phenytoin therapy arrived in the emergency department confused. The serum phenytoin level was 39.1  $\mu\text{g/mL}$ . She received activated charcoal and a cathartic, vomited several times, and aspirated the charcoal.

She was intubated and placed on a ventilator; BP and urine output decreased and she was given dopamine. She was febrile and began receiving antibiotics for sepsis. The serum phenytoin level decreased to 34.6  $\mu\text{g/mL}$  (approximately 12 hours after the initial level), 24.5  $\mu\text{g/mL}$  the next day, and 16.4  $\mu\text{g/mL}$  on the third day. She remained on the ventilator; norepinephrine was added for hypotension and a chest tube was placed. She had an inferior wall myocardial infarction and a chest radiograph showed adult respiratory distress syndrome. Her condition remained unchanged, and she died after a week of hospitalization.

**Case 231.** A 24-year-old woman ingested 100 to 120 capsules of valproic acid, 250 mg, at an unknown time. The patient initially appeared combative with normal vital signs but soon became unresponsive. Lavage was performed and activated charcoal and magnesium citrate were administered. Sodium valproate levels were 1,193  $\mu\text{g/mL}$ , then 1,228  $\mu\text{g/mL}$ . The patient's condition deteriorated over the following 5 hours, and she required ventilatory assistance after CNS depression deepened. Charcoal hemoperfusion was initiated approximately 14 hours after admission and continued for 8 hours. Three hours later the sodium valproate level was 21  $\mu\text{g/mL}$ . Hyponatremia, hypocalcemia, disseminated intravascular coagulopathy, and hypotension developed. The patient experienced a cardiac arrest which responded to epinephrine, but shortly thereafter the patient succumbed to a second cardiac arrest (32 hours after admission).

**Case 232.** A 5-year-old boy with cerebral palsy presented in cardiopulmonary arrest. The previous day, the child had been found playing with a bottle of amitriptyline; it was unknown if any had been ingested. He was also noted to have a fever and cough at that time. He was found unresponsive the next morning. Postmortem toxicology measurements revealed a serum amitriptyline concentration of 1,150  $\text{ng/mL}$  and a serum nortriptyline concentration of 790  $\text{ng/mL}$ . Necrotizing pneumonia of the left upper lung and pulmonary edema were also present. Death was attributed to both *Staphylococcus aureus* pneumonia and amitriptyline overdose.

**Case 269.** A 27-year-old woman ingested 50 amoxapine tablets and consumed five beers 1 hour before transport to the emergency department. She experienced a seizure en route and continued to convulse on arrival. She did not respond to diazepam or phenytoin and developed bradycardia with premature ventricular contractions. A pacemaker was inserted. Within 3 hours of admission the patient experienced a cardiac arrest that was unresponsive to resuscitation.

**Case 271.** A 15-month-old boy presented unresponsive and hypotensive after ingesting approximately 10 tablets of desipramine, 50 mg. The child was intubated, placed on a ventilator, and given dopamine and nor-

epinephrine without response. The desipramine level was 2,556 ng/ml. He died on the second hospital day.

**Case 296.** A 20-year-old woman ingested an unknown amount of doxepin 2 hours before presenting unresponsive with a BP of 70 mm Hg via doppler, ventricular tachycardia/ventricular fibrillation, and convulsions. She was defibrillated, lavage was performed, and charcoal, cathartic, diazepam, phenytoin, and bicarbonate were administered. Her rhythm stabilized with tachycardia without ectopics. Acidosis persisted and her respiratory status deteriorated. A blood toxicologic screen demonstrated doxepin, isopropanol, and ethanol. On the fifth hospital day both hands and forearms were cold and cyanotic. Temperature was 39.5°C, urine output was 150 mL over 8 hours, BP was 140/80 mm Hg, and pulse was 160/min. Arterial blood gases were pH, 7.45;  $PCO_2$ , 45 mm Hg;  $PO_2$ , 76 mm Hg on  $FiO_2$  80%. A chest radiograph showed early adult respiratory distress syndrome, and the patient was oozing blood from the nares and oral mucosa. The patient continued to deteriorate. Arteriogram and venogram showed small clots. All fingers were black and the left shoulder was twice the size of the right. Doppler pulses were weak. Fasciotomies were performed on the upper extremities and heparin administration was started. Tachycardia with frequent premature ventricular contractions developed. Antibiotics and a cooling blanket were started for elevated temperature. By the tenth hospital day the chest radiograph showed a right pneumothorax, and a chest tube was inserted. The patient remained agitated; pancuronium and diazepam were continued. By the 15th hospital day the patient's respiratory status began improving. Pulses in the arms began to strengthen and color in the fingers improved; however, there was some sloughing of tissue of the fingers. Heparin was continued and the patient responded appropriately to questions. On the 19th hospital day the patient's respiratory status began to deteriorate. The patient died on the 23rd hospital day.

**Case 325.** A 16-year-old girl ingested 165 ibuprofen tablets and 8.8 g of imipramine within 4 hours of presentation. She was lethargic with slight jerky movements. Two hours later she was comatose and on a ventilator, with a markedly widened QRS interval (0.5 second). Lavage was performed, activated charcoal and cathartic were administered, and she was managed with hyperventilation, sodium bicarbonate, an external pacemaker, and phenytoin. Shortly after the phenytoin administration was begun the QRS interval improved, but she had a seizure, sustained a cardiopulmonary arrest, and could not be resuscitated.

**Case 326.** A 30-year-old woman with a history of multiple overdose attempts with diazepam ingested approximately 47 (of a 100-tablet prescription) tablets of imipramine, 50 mg, in addition to ibuprofen, phen-

ylephrine/phenylpropanolamine/guafenesin, cefaclor, and diflunisal. Five and one half hours later she had a convulsion and was brought to the emergency department. BP was 40 mm Hg. She was intubated. An episode of ventricular tachycardia was cardioverted to sinus rhythm with widened QRS complex. Lidocaine, dopamine, and bicarbonate were administered. Status epilepticus developed, and administration of phenytoin was begun. Treatment over the next six hours included hemoperfusion, alkalinization, dopamine, norepinephrine, and phentolamine. On the second hospital day renal function rapidly deteriorated, with oliguria. Adult respiratory distress syndrome became apparent on the third day, with pH, 7.3;  $PCO_2$ , 40 mm Hg; and  $PO_2$ , 49 mm Hg on 100%  $FiO_2$ . Disseminated intravascular coagulation was noted 7 days after the ingestion, and laboratory results at that time included WBC, 29,200/ $\mu$ L; platelets, 8,000/ $\mu$ L; BUN, 45 mg/dL; creatinine, 2.7 mg/dL; lactic acid, 2.2 mmol/L; and fibrinogen, 288 mg/dL. Digital gangrene developed. The patient died 16 days after the ingestion secondary to bradycardia, cardiogenic shock, disseminated intravascular coagulation, adult respiratory distress syndrome, acute renal failure, and diffuse peripheral gangrene. The imipramine level 2 days postingestion was 923 ng/mL, and the desipramine level was 1280 ng/mL. The admission salicylate level was 9 mg/dL and the acetaminophen level was 0  $\mu$ g/mL.

**Case 332.** A 46-year-old man presented to the emergency department after he was found unconscious and apneic with evidence of ingestion of an undetermined amount of loxapine. Upon arrival the patient was comatose without respiratory effort, seizing, and experiencing supraventricular dysrhythmias. Naloxone (2 mg) was administered without response. Initial examination revealed a heart rate of 105/min and a QRS of 0.09 second. Arterial pH was 6.74. Lavage was performed and the patient was treated with bicarbonate and diazepam without improvement of seizures or arrhythmias. A cardiac arrest 4 hours after presentation was resistant to resuscitative measures. The postmortem examination revealed loxapine and amoxapine blood levels of 6,900 ng/mL and 7,700 ng/mL, respectively.

**Case 337.** A 43-year-old woman presented 1 hour after ingesting an undetermined amount of nortriptyline in a suicide attempt. Shortly after arrival, the patient became obtunded and required endotracheal intubation and mechanical ventilatory support. Gastric lavage was performed and activated charcoal was administered. The patient had supraventricular tachycardia with a QRS duration of 0.144 second. Prophylactic phenobarbital and lidocaine were administered. The patient was extubated after 24 hours. After 30 hours she was alert and oriented, neurologically stable, and without ECG changes or ectopy. The initial serum

drug panel revealed only nortriptyline, 1,240 ng/mL, which decreased to 390 ng/mL 43 hours postingestion. Fifty-four hours postingestion, the patient was up to bedside commode. She was found on the floor, incontinent. The BP was 60 mm Hg systolic and the heart rate was 132/min. The patient was alert and complaining of difficulty breathing. Despite dopamine, the BP could not be maintained. She became bradycardic and unresponsive and progressed to ventricular fibrillation. Cardiopulmonary resuscitation was unsuccessful. Autopsy revealed a massive bilateral pulmonary embolism.

**Case 343.** A 37-year-old woman ingested unknown amounts of **tranylcypromine** and **flurazepam** in a suicide attempt. Five hours postingestion she was comatose, with dilated, minimally responsive pupils, myoclonus of the lower extremities, diaphoresis, and anuria. Respiratory rate was 6/min and BP was 90/70 mm Hg. She received supportive care but became progressively less responsive and less stable. Hypotension persisted despite dopamine. She died 14 hours postingestion.

**Case 348.** A 15-month-old boy was brought to an emergency facility by his mother due to facial flushing and spastic arm and leg movements. She reported that she had found the child 3 hours earlier chewing on packets of decaffeinated coffee and that an open bottle of **diphenhydramine** capsules was found where the child was playing. The child began to convulse; **phenobarbital**, **phenytoin**, **lorazepam**, and **diazepam** were administered. The admission **diphenhydramine** level was 9.8  $\mu\text{g/mL}$ . He was intubated, and although anti-convulsant therapy was maintained (including a **pentobarbital** infusion), he continued to exhibit seizures. **Physostigmine** (0.1 mg) was administered seven times without response. This was discontinued when the cardiac rate dropped from 120/min to 105/min. Respiratory status stabilized after a suspected aspiration. Five days postadmission an EEG revealed no activity. The patient died on the eighth hospital day.

**Case 352.** A 17-year-old girl ingested a full bottle of her mother's **chloroquine** prophylaxis (for malaria) after attending a class at school in which suicide was discussed. She was brought to the hospital unresponsive. Asystole developed, and she never regained consciousness. Prolonged, unsuccessful resuscitative efforts included insertion of a pacemaker, which failed to capture.

**Case 353.** A 21-month-old boy receiving chronic **theophylline** therapy was brought to the emergency department convulsing. Vital signs were heart rate, 230/min; BP, 90 mm Hg systolic; and temperature, 40.6°C. He seized for approximately 1 hour before treatment with **diazepam** and **phenobarbital** was initiated. He was intubated and placed on a ventilator, lavage was performed, and charcoal was administered. Coffee-

ground material was noted on lavage. The serum **theophylline** level was 55.6  $\mu\text{g/mL}$ . He was admitted to the intensive care unit, where he received **phenytoin** for recurrent seizures, a cooling blanket, and multiple doses of activated charcoal and **propranolol** (which decreased his heart rate from 248/min to 215/min). A repeat serum **theophylline** level was 52  $\mu\text{g/mL}$ . He remained comatose with nonreactive pupils and hypotension. Massive diuresis developed and was treated with **vasopressin** and **desmopressin**. He died on the fourth hospital day.

**Case 354.** A 15-year-old girl presented to an emergency department 20 minutes after locking herself in a bathroom and allegedly ingesting **theophylline** (long-acting), a cough and cold preparation (**acetaminophen/ephedrine/doxylamine/diphenhydramine/propoxyphene**), **acetaminophen** with codeine, and a **phenylpropanolamine** diet aid. Lavage was performed and activated charcoal was administered. Levels measured 90 to 120 minutes after ingestion included **theophylline**, 5  $\mu\text{g/mL}$ ; **acetaminophen**, <1  $\mu\text{g/mL}$ ; and **salicylates**, 9.9 mg/dL. The patient was asymptomatic in the emergency department; vomiting occurred after admission and stopped 14 hours after ingestion. At 16 hours postingestion, the patient experienced seizures and persistent tremors followed by cardiac arrest. Venous pH at that time was 6.39, mean BP was in the 40s, and urine output ceased. She received >250 mEq sodium bicarbonate and was treated symptomatically with **propranolol**, **diazepam**, **phenytoin**, **phenobarbital**, and infusions of **levarterenol** and **dopamine**. Additional doses of activated charcoal were given along with **polyethylene glycol** gastrointestinal electrolyte solution. Serial **theophylline** levels were <200  $\mu\text{g/mL}$  at 16 hours, 265  $\mu\text{g/mL}$  at 19 hours, 273  $\mu\text{g/mL}$  at 21 hours, 215  $\mu\text{g/mL}$  at 27 hours, 223  $\mu\text{g/mL}$  at 31 hours, 217  $\mu\text{g/mL}$  at 39 hours, and 207  $\mu\text{g/mL}$  at 43 hours. By 47 hours postingestion she was only slightly responsive to painful stimuli. Urine output was minimal. Asystole occurred 49 hours postingestion.

**Case 355.** A 28-year-old man was found at home seizing after an intentional ingestion of **theophylline** (long-acting preparation). Within minutes he sustained a cardiac arrest. Cardiopulmonary resuscitation restored his rhythm with a systolic BP of 80 mm Hg and a pulse of 140/min. The patient was intubated and given fluids and pressors. The initial **theophylline** level was 119  $\mu\text{g/mL}$ . Before the initiation of hemodialysis the patient had two additional cardiac arrests. The **theophylline** level decreased to 58  $\mu\text{g/mL}$  after the first hemodialysis, then to 0  $\mu\text{g/mL}$  after the second dialysis. The patient continued to experience multiple seizures, and 18 hours postadmission he experienced a fatal cardiac arrest. Postmortem examination revealed a massive left ventricular myocardial infarction; blood and urine were negative for drugs of abuse.

**Case 370.** A 79-year-old woman receiving theophylline, 300 mg three times daily, for the treatment of asthma presented to an emergency department with grand mal seizures, tachycardia, and hypotension. Initial therapy included intubation, phenytoin, diazepam, and activated charcoal. The first theophylline level was 82  $\mu\text{g/mL}$  and a second level measured 4 hours later was 78  $\mu\text{g/mL}$ . She had renal insufficiency with minimal urinary output. Seizure activity continued despite repeated dosing with diazepam, phenobarbital, and phenytoin. Dopamine was administered in an attempt to improve the patient's urinary output. However, her condition continued to deteriorate and hemodialysis was initiated. Twelve hours postadmission the theophylline level was 68  $\mu\text{g/mL}$ . After dialysis the level was 28  $\mu\text{g/mL}$ . The patient continued to convulse and died approximately 20 hours after admission.

**Case 377.** A 41-year-old woman presented to the emergency department 4.5 hours after ingesting an unknown amount of theophylline (long-acting). The patient was known to be abusing levothyroxine. BP was 90/60 mm Hg, pulse was 130/min (regular), and respiratory rate was 28/min. The patient was agitated and tremulous. Arterial blood gases were pH, 7.23;  $\text{PCO}_2$ , 14 mm Hg; and  $\text{PO}_2$ , 109 mm Hg. Sodium concentration was 139 mEq/L, potassium was 2.6 mEq/L, chloride was 106 mEq/L, bicarbonate was 6.3 mEq/L, BUN was 8 mg/dL, creatinine was 1.4 mg/dL, glucose was 303 mg/dL, and calcium was 8.8 mg/dL. The patient was given metoclopramide for vomiting and started on multiple-dose activated charcoal. The first theophylline level (about 6 hours postingestion) was 133  $\mu\text{g/mL}$ . The patient had a grand mal seizure, then later developed atrial fibrillation with rates as high as 180/min and BPs in the range of 80 to 90/50 to 60 mm Hg. Treatment included potassium supplementation, unsuccessful attempts at cardioversion, and hemoperfusion (initiated 11.5 hours postingestion). The theophylline level decreased to 68  $\mu\text{g/mL}$  3 hours into charcoal hemoperfusion. The patient's heart rate decreased to 140/min 12 hours after the ingestion, with a theophylline level of 44  $\mu\text{g/mL}$ . Subsequently, the patient experienced atrial flutter with a rate of 116/min and a systolic BP of 84 mm Hg. Esmolol administration was started, then was discontinued when the patient's BP continued to drop and she became bradycardic (60/min, nodal rhythm). Hemoperfusion was discontinued after 6 hours because of hypotension. Ventricular tachycardia occurred but responded to treatment. The patient was receiving maximum doses of norepinephrine and dopamine but remained hypotensive (60 mm Hg systolic) with a rate of 194/min. A second cardiac arrest occurred 26.5 hours after the ingestion, and the patient died 31 hours postingestion. Theophylline level measured 26 hours postingestion had been 39.6  $\mu\text{g/mL}$ .

**Case 379.** A 43-year-old woman took an overdose of her Italian medications: 30 Ritmosedina (ajmaline, an antiarrhythmic) and an unknown amount of the analgesic-antipyretic Nisidina (dipyron, adiphene, diphenadione, benzetilum). She was noted to be stumbling and lethargic, and she subsequently became unconscious. Within 30 minutes she had agonal pulse and respirations with no palpable BP. Cardiopulmonary resuscitation was instituted during the 45-minute transport to the hospital. Administration of epinephrine and atropine en route resulted in return of a wide complex rhythm, palpable pulse, and BP. In the emergency department she was decontaminated with gastric lavage, activated charcoal, and a cathartic. She was placed on mechanical ventilation and her BP was maintained with intravenous infusions of dopamine, norepinephrine, and epinephrine. The systolic BP was 70 to 90 mm Hg and the heart rate was 160 to 170/min. Pupils were fixed and dilated. She subsequently developed adult respiratory distress syndrome, decreased renal function, diabetes insipidus, hyperglycemia, disseminated intravascular coagulation, and elevated serum transaminases. Her BP progressively dropped without response to increased doses of epinephrine. An EEG performed on the second hospital day revealed electrical silence. She died on the third hospital day. Postmortem toxicologic analysis revealed blood phenobarbital, 22.6  $\mu\text{g/mL}$ ; blood salicylate, 81.0  $\mu\text{g/mL}$ ; and serum ajmaline, approximately 4.52  $\mu\text{g/mL}$  (standards prepared from Ritmosedina tablets).

**Case 381.** A 37-year-old man with a history of diabetes, pancreatitis, and long-standing drug abuse was found unconscious by his social worker after ingesting an unknown number of clonidine hydrochloride tablets at an unknown time. In the emergency department, 0.4 mg naloxone was administered with minimal response (patient opened eyes and grunted). Tolazoline hydrochloride (10 mg) was administered shortly thereafter (with no apparent response), and gastric lavage was begun, returning green tablet fragments. Thirteen minutes after the tolazoline was administered, the patient suffered a cardiac arrest. There was no response to conventional resuscitation, including defibrillation and external pacing.

**Case 382.** A 2-day-old infant was in the intensive care nursery in critical condition secondary to multiple anomalies following an infection with Epstein-Barr virus in utero. The patient was given a dose of digoxin, 0.28 mg (the normal loading dose for a child this size should have been 0.084 mg), following which the serum digoxin level was 22 ng/mL. The child developed ventricular arrhythmias and was given one vial of sheep digoxin-specific antibody without response. The child died 30 minutes later.

**Case 397.** A 58-year-old woman ingested 60 digoxin tablets (unknown strength) and 90 diltiazem tablets (60

mg) at an unknown time. On presentation to the emergency department she was awake and combative with sinus tachycardia (117/min) and frequent premature ventricular contractions. The digoxin level was 16.5 ng/mL and the potassium level was 2.8 mEq/L. Lavage was performed, and potassium and activated charcoal in sorbitol were administered. Despite recommendations to initiate digoxin-specific antibody treatment, only multiple-dose activated charcoal was begun. Five hours after admission the patient developed ventricular ectopy with subsequent cardiac arrest.

**Case 416.** A 35-year-old woman presented 45 minutes after ingesting an undetermined amount of **quinidine gluconate**. She vomited spontaneously, and pill fragments were noted. The heart rate was 140/min. Ipecac was administered in the emergency department, and 30 minutes later she had a grand mal seizure, then vomited clear fluids and became unresponsive. Pupils were 4 mm and sluggish to react. Vital signs were BP, 62/40 mm Hg and heart rate, 120/min; nailbeds and lips were pale. Intravenous fluids were increased and the patient became responsive and pink. BP decreased to 56/30 mm Hg on dopamine. Slight anisocoria was observed, with sluggishly reactive pupils. The patient now responded only to pain. The heart rate decreased to 40/min with wide ventricular complexes and a BP of 56/38 mm Hg. Subsequent resuscitation, including placement of an external pacemaker, was unsuccessful. Quinidine level was 8.0  $\mu\text{g/mL}$ .

**Case 419.** A 56-year-old man with a history of atherosclerotic heart disease had 2 days of increasing chest pain. He took ten sustained-release verapamil, 240 mg, over 3 to 4 hours in an attempt to relieve his pain. Two hours later the patient was brought to the emergency department with a heart rate of 20/min, no detectable BP, and a respiratory rate of 5/min. He was intubated and given 1 g calcium chloride, isoproterenol, and dopamine, all with minimal effect. A pacemaker was inserted, and a pulse rate of 70/min with a corresponding systolic BP of 60 to 70 mm Hg was obtained. Glucagon (3 mg) caused conversion to normal sinus rhythm with a BP of 80 mm Hg systolic, but a continuous infusion failed to sustain this. While preparations for insertion of an intra-aortic balloon pump were being made, the patient suffered a cardiac arrest and could not be resuscitated.

**Case 423.** A 23-year-old woman presented to an emergency department in a coma after ingesting an unknown amount of verapamil (sustained-release) and possibly diphenhydramine capsules. The BP was 75/40 mm Hg and the pulse was 58/min on dopamine. An arterial blood gas showed pH, 7.25;  $\text{Pco}_2$ , 27 mm Hg; and  $\text{Po}_2$ , 200 mm Hg. The patient was intubated, lavage was performed, and activated charcoal, a cathar-

tic fluids, 5 g of calcium chloride, and 1 g of calcium gluconate were administered, with a transient response. Isoproterenol increased the pulse rate but not the BP. A pacemaker was inserted with an increase in both BP and pulse. Cardiac output was measured at 2.2 L/min. Over the next 12 hours the patient's condition improved and then deteriorated, requiring dopamine, dobutamine, and norepinephrine. Amrinone caused a transient improvement but had no sustained effect. The patient was prepared for cardiac balloon pump placement but improved dramatically and was weaned from all pressors. The heart rate was 60/min. Serum calcium was 20 mEq/H, but decreased prior to her deterioration. Over the next 6 hours the patient rapidly deteriorated with hypotension unresponsive to pressors, including glucagon, amrinone, and isoproterenol. During insertion of the aortic balloon pump, the patient had a cardiac arrest and could not be resuscitated. The patient never had anticholinergic symptoms.

**Case 426.** A 4-year-old boy was thought to have ingested an unknown number of his grandmother's pills in the evening. The next morning the child seized. Paramedics arrived and transported the child to the emergency department. En route, the child had a full cardiac arrest. Prolonged resuscitation efforts resulted in bradycardia but the child was declared brain dead 6 hours after the seizure. Autopsy showed cerebral edema, erosive esophagitis, and a blood verapamil level of 2.02  $\mu\text{g/mL}$ . A premortem toxicologic screen demonstrated an unknown phenothiazine.

**Case 428.** A 17-month-old boy, hospitalized since birth with pulmonary complications of meconium aspiration, was inadvertently given 5 mL of a pediatric decongestant syrup (containing phenylephrine, chlorpheniramine, and pyrilamine) intravenously rather than orally. Within 2 minutes the child was unresponsive, in complete cardiorespiratory arrest.

**Case 429.** The death of this 3-month-old boy was originally attributed to sudden infant death syndrome. However, toxicologic analysis of the serum revealed ephedrine, 0.6 mg/dL; carbinoxamine, 0.04 mg/dL; and promethazine, 0.04 mg/dL.

**Case 430.** A 15-month-old girl began vomiting 15 minutes after ingesting tablets of ferrous sulfate, 300 mg. In an emergency department 30 minutes after the ingestion she was lethargic, hypotonic, and vomiting blood. Initial laboratory results were sodium, 137 mEq/L; chloride, 102 mEq/L; potassium, 3.5 mEq/L; bicarbonate, 16 mmol/L; glucose, 358 mg/dL; BUN, 14 mg/dL; creatinine, 0.9 mg/dL; hematocrit, 31.6%; serum iron, 1,200  $\mu\text{g/dL}$ ; and total iron binding capacity, 1,220  $\mu\text{g/dL}$ . The child was given deferoxamine, 1 g over 4 hours, and lavage was performed with normal saline. A radiograph revealed nine tablet fragments in



the stomach. The child became cyanotic and apneic and had fixed and dilated pupils and a weak pulse of 80/min. Treatment with epinephrine, atropine, and normal saline boluses was given. Laboratory results included pH, 6.48; PCO<sub>2</sub>, 25 mm Hg; PO<sub>2</sub>, 268 mm Hg; hematocrit, 23.1%; hemoglobin, 7.3 g/dL; sodium, 154 mEq/L; bicarbonate, 6 mEq/L; potassium, 6 mEq/L; chloride, 107 mEq/L; glucose, 356 mg/dL; prothrombin time, 21.5 seconds; partial thromboplastin time, >80 seconds; serum iron, 896.4 µg/dL; and total iron binding capacity, 881.1 µg/dL. BP was 50/20 mm Hg. The child was intubated, warmed, and given dopamine, normal saline, potassium, deferoxamine, 15 mg/kg/h, isoproterenol, sodium bicarbonate, fresh frozen plasma, plasmanate, atropine, and epinephrine. Hyponatremia, bradycardia, and marked acidosis continued. The morning after admission the child experienced frequent dysrhythmias with BP in the low 30s and did not respond to resuscitative efforts.

**Case 432.** A 15-month-old boy was treated at a hospital for a fever. After the child's discharge, results revealing a blood glucose level of >300 mg/dL became available and the child was brought back to the hospital for admission. Apparently the child was immediately given insulin without remeasurement of the glucose and developed respiratory arrest. The glucose level was then found to be 0 mg/dL. He developed diabetes insipidus, coma with complete flaccidity, and pinpoint pupils, and was declared brain dead.

**Case 436.** A 57-year-old renal transplant patient was accidentally given <1 mL of monoctanoïn through a central venous catheter. The error was recognized immediately, and the nurse drew back on the syringe. The patient rapidly experienced respiratory, then cardiac, arrest. The patient was intubated and resuscitated over 4 hours with epinephrine, vecuronium, and dopamine. A liter of fluid was withdrawn from the lungs. Nine hours later, the patient experienced ventricular fibrillation. The patient was pronounced dead 9.5 hours after the inadvertent administration. Autopsy confirmed the cause of death as respiratory failure secondary to lung infiltrates of monoctanoïn.

**Case 441.** A 75-year-old man ingested 750 mg of chlordiazepoxide in a suicide attempt. Medical history included congestive heart failure, mitral valve insufficiency, and chronic atrial fibrillation; medications included digoxin and furosemide. He had been depressed and had stopped taking his medication for a few days. In the emergency department 5 hours post-ingestion he was lethargic. He received activated charcoal and was admitted to the intensive care unit. He remained lethargic, arterial blood gases were poor, and he experienced an episode of ventricular bigeminy. He was treated with 100% oxygen and lidocaine. The serum chlordiazepoxide level was 29 mg/L. He

developed an aspiration pneumonia and became totally unresponsive, febrile, and oliguric. He died on the fourth hospital day.

**Case 446.** A 67-year-old woman ingested 3.6 g flurazepam during the 8 hours prior to arrival in the emergency department. Despite naloxone, she was obtunded with spontaneous movements. Lavage was performed and intravenous fluids, multiple doses of activated charcoal, and a cathartic were administered. She became more responsive, then on the second hospital day she became unresponsive and was intubated, placed on a ventilator, and began receiving dopamine. On the third hospital day she was taken to the operating room, where dead bowel tissue was discovered. She died shortly thereafter.

**Case 468.** A 22-year-old woman arrived in the emergency department in cardiac arrest after ingesting an unknown number of diet pills. Resuscitation efforts were unsuccessful. It was later determined that she had consumed "mail-order" diet pills containing caffeine. The serum caffeine level measured during the resuscitation attempt was 1,560 µg/mL. Gastric contents measured 490 µg/mL caffeine (40 mL tested).

**Case 469.** A 27-year-old woman presented with tachycardia, 140/min, a systolic BP of 80 mm Hg, and dyspnea 40 minutes after ingesting a large number of mail-order diet pills containing caffeine. Lavage was performed and activated charcoal and a cathartic were administered. Arterial pH was 7.37 and PO<sub>2</sub> was 124 mm Hg. The heart rate increased to 200/min. She was intubated for increased difficulty in breathing and was given intravenous diazepam, naloxone, and lidocaine. After 1.5 hours in the emergency department, she began having runs of ventricular tachycardia and fibrillation treated with additional doses of lidocaine and with propranolol and bretylium. Heart rate ranged from 130 to 140/min and systolic BP was 80 to 90 mm Hg. Recurrent ventricular tachycardia occurred with hypotension, seizure activity, and subsequent cardiac arrest. She died 2.5 hours after arrival in the emergency department. The postmortem examination demonstrated intact but hyperemic gastric mucosa and a serum caffeine level of 305 µg/mL.

**Case 473.** A 21-year-old woman presented unresponsive and cyanotic after ingesting an unknown amount of cocaine. She subsequently suffered a cardiopulmonary arrest, was resuscitated, then developed seizures (which were treated with pancuronium) and gastrointestinal bleeding. Laboratory results included prothrombin time, normal; partial thromboplastin time, >150 seconds; WBC, 46,000/µL; hemoglobin, 17.6 g/dL; lactic dehydrogenase, 2,436 IU/L; and creatine phosphokinase, >1,500 IU/L. Toxicologic screen showed only a high concentration of cocaine. Treatment included vitamin K, potassium, activated char-

coal and cathartic, albumin, and platelets. An ECG showed anterolateral and inferolateral ischemia. CT scan of head was negative. Twenty-four hours after admission she was unresponsive with decerebrate movement in response to noxious stimuli. Laboratory results included serum creatinine, 6.6 mg/dL; BUN, 29 mg/dL; creatine phosphokinase, >30,000 IU/L; WBC, 50,000/ $\mu$ L; and prothrombin time, 46 seconds. On the third hospital day the EEG was "flat." After hemodialysis, laboratory results included serum creatinine, 12.2 mg/dL and prothrombin time, 99.9 seconds. The patient was given fresh frozen plasma. BP was 50 to 70 mm Hg systolic with dopamine. The patient died on the third hospital day.

**Case 479.** A 26-year-old man presented in respiratory arrest after ingesting 3 g of cocaine while being arrested. Two generalized tonic-clonic seizures occurred in the ambulance. Initial examination revealed a comatose individual receiving mechanical ventilation with a heart rate of 140/min and temperature of 41.8°C. The arterial pH was 6.93, and toxicology screens showed only cocaine. Initial treatment included sodium bicarbonate, a cooling blanket, lidocaine, phenytoin, and activated charcoal. Dopamine and norepinephrine infusions were needed throughout the hospital stay to maintain a systolic BP of 100 mm Hg. Hemodynamic monitoring on high-dose norepinephrine revealed a pulmonary artery wedge pressure of 22 mm Hg, central venous pressure of 16 mm Hg, cardiac output of 7.9 L/min, cardiac index of 4.2 L/min/m<sup>2</sup>, and systemic vascular resistance of 668 dyn·s/cm<sup>5</sup>. Persistent complications during his hospital stay included hyperkalemia from rhabdomyolysis, acute renal failure, hyperthermia, seizure activity, disseminated intravascular coagulation, and lactic acidosis. Treatment included daily dialysis, potassium exchange resins, antibiotics, hyperalimentation, phenytoin, fresh frozen plasma, and platelet transfusions. Cardiac arrests occurred 36 hours, 15 days, and, finally, 18 days after presentation.

**Case 480.** A 26-year-old man was found in status epilepticus. On arrival of paramedics he was pulseless and apneic. The cardiac monitor showed an idioventricular rhythm with a rate of 30. Intravenous drug abuse paraphernalia was present in the room. He was resuscitated to a supraventricular rhythm, with a rate of 120 and a systolic BP of 80 mm Hg but remained comatose with fixed and dilated pupils. Urine toxicology screen was positive only for metabolites of cocaine. He made no neurological recovery after 36 hours. At that time his pupils were 3 mm and nonreactive. He had no gag reflex, corneal reflex, or doll's eyes. There were no spontaneous respirations and he postured to painful stimuli. He developed diffuse myoclonic activity. CT of the brain showed global edema

consistent with anoxic cerebral injury. He died 48 hours after admission. An autopsy revealed severe cerebral edema secondary to anoxic encephalopathy and an acute infarction of the papillary muscle of the left ventricle.

**Case 502.** A 41-year-old man with a history of intravenous drug abuse collapsed while running on a typical hot Dallas summer day. The patient presented unresponsive with a temperature of 41.7°C. Respirations were shallow and rapid, pupils were constricted and nonreactive, and rigid extension of the bilateral lower extremities was noted. Doppler BP was 68 mm Hg; an ECG showed sinus tachycardia with occasional ventricular arrhythmias. The patient was intubated and placed on a ventilator and a cooling blanket. Lidocaine, dopamine and antibiotics were administered. Arterial blood gases on room air were pH, 7.28; Pco<sub>2</sub>, 37 mm Hg; and Po<sub>2</sub>, 79 mm Hg. Sodium was 144 mEq/L; potassium, 7.7 mEq/L; chloride, 111 mEq/L; bicarbonate, 18 mEq/L; creatinine, 2.9 mg/dL; glucose, 84 mg/dL; creatine phosphokinase, 4,500 IU/mL; aspartate aminotransferase, 153 IU/L; lactate dehydrogenase, 1,433 IU/L; lactate, 5.8 mmol/L; calcium, 10.8 mg/dL; magnesium, 2.3 mg/dL; and phosphorus, 4.2 mg/dL. On preliminary drug screen, cocaine, lidocaine, and ethylene glycol were detected. The patient was transferred to the intensive care unit with the diagnosis of malignant hyperthermia complicated by rhabdomyolysis, acute renal failure, lactic acidosis, hypotension, and hyperkalemia. Rectal temperature was 38.9°C, BP was 115/60 mm Hg, and pulse was 120/min. The patient developed disseminated intravascular coagulopathy. Peritoneal dialysis was started. Nine hours after admission, the pH was 7.14; calcium was 6.6 mg/dL, and potassium was 5.0 mg/dL. Rhabdomyolysis developed with a creatine phosphokinase of 434,500 IU/mL; lactate dehydrogenase, 67,900 IU/L; and aspartate aminotransferase, 7,527 IU/L. Twenty-two hours after admission he developed asystole and died. Autopsy showed massive widespread myonecrosis; petechiae and ecchymoses of the soft tissue, intestines, renal calices, testes, and subendocardium; fatty metamorphosis of liver; pulmonary congestion and edema; linear cutaneous scars on the left forearm; recent cutaneous "tracks" on the right forearm; generalized soft tissue and muscle swelling; and pigmented protein casts in the renal tubules.

**Case 520.** A 20-year-old man who was a known intravenous drug abuser was doing "speedballs" approximately 4 hours before arrival in the emergency department. Thirty minutes before arrival in the emergency department, a friend found him with labored breathing and he was transported to the emergency department by private automobile. He became apneic en route and was in cardiopulmonary arrest on arrival.



He was intubated and successfully resuscitated with atropine, epinephrine, and cardioversion, but remained comatose, requiring ventilatory and pressor support. He received 10 mg naloxone without apparent change. His toxicologic screen was positive for opiates, cocaine, and caffeine. The ethanol level was 80 mg/dL. He developed disseminated intravascular coagulopathy, pulmonary edema, and renal failure. He became flaccid and serial EEGs showed no activity. Supportive care was withdrawn and he died approximately 14 hours after admission. An autopsy showed a focal area of acute infarction of the posterior papillary muscle, cardiomegaly, early focal bronchopneumonia, and generalized visceral congestion. Antemortem toxicology showed a blood cocaine level of 600 ng/mL. Postmortem toxicology evaluation showed opiates and cocaine metabolite to be present. A postmortem morphine level of 170 ng/mL was obtained.

**Case 529.** An 18-year-old woman arrived in the emergency department in cardiopulmonary arrest. She may have been convulsing for up to 2 hours before she was found. "Rush" (isobutyl nitrite) was in her possession. She was resuscitated, placed on a ventilator, and given diazepam, phenytoin, and dopamine. Blood appeared dark, and she was given methylene blue although the methemoglobin level was 0.7%. She developed adult respiratory distress syndrome, had another cardiac arrest, and died the day she presented.

**Case 530.** An 18-year-old woman collapsed after insufflating an unknown amount of methamphetamine. In the emergency department she had a BP of 60 mm Hg systolic, heart rate of 220/min, and a rectal temperature of 42.8°C. Pupils were fixed and dilated. Treatment included dopamine, labetalol, and external cooling. About 2 hours after admission, the patient developed disseminated intravascular coagulation with a low fibrinogen, prothrombin time of 17.0 seconds (control, 12.0 seconds), and partial thromboplastin time of 51 seconds (control, 26 seconds). The patient died about 28 hours after admission. Postmortem examination showed large amounts of amphetamine and methamphetamine in the blood, urine, and liver.

**Case 531.** A 24-year-old man developed painful muscle contractions, stiffness of the jaw, and stiffness of peripheral muscles shortly after ingesting methamphetamine. Upon arrival, he had a temperature of 41.7°C and was in shock. Endotracheal intubation was performed, administration of intravenous fluids was started, and the patient was placed on a cooling blanket. Gastric lavage was performed and charcoal and a cathartic were placed in the stomach. Dopamine was started for hypotension. The patient developed myoglobinuric renal failure and disseminated intravascular coagulopathy over the next 24 hours and died 25 hours after admission. Postmortem examination showed

large amounts of methamphetamine in the urine and blood.

**Case 532.** A 25-year-old man was brought to an emergency department combative, agitated, and semi-comatose after snorting speed and smoking marijuana. The patient's medical history was significant for drug abuse, possible stroke, and hypertension with reported noncompliance with antihypertensive medication. On admission the patient was diaphoretic with miotic pupils. BP was 240/120 mm Hg with a heart rate of 90/min. The patient required intubation; lavage was performed and activated charcoal with sorbitol was administered. Vital signs immediately following the completion of lavage were BP, 250/150 mm Hg; heart rate, 57 to 88/min; and temperature, 35.9°C. The patient subsequently developed coupled premature ventricular contractions (treated with lidocaine) and hypotension with labile BP. A brain CT scan demonstrated an inoperable intracerebral hemorrhage. EEG was consistent with severe brain injury. General supportive management included nitroprusside and labetalol. The patient died 6 days after admission following termination of life support systems. Postmortem findings were significant for intracerebral hemorrhage with intraventricular extension; hypertensive arteriosclerotic heart disease; myocardial hypertrophy; left ventricular coronary atherosclerosis; and a severe confluent bilateral bronchopneumonia. Blood toxicologic results included 0.04 µg/mL amphetamine, 0.70 µg/mL methamphetamine, and 0.22 µg/mL diazepam.

**Case 534.** A 44-year-old known heavy "crystal" abuser presented to the emergency department hypotensive, apneic, and febrile to 40.6°C. He was placed on a ventilator and required dopamine for BP support. An EEG showed no activity. Creatine phosphokinase was >20,000 IU/mL; BUN was 89 mg/dL; serum creatinine was 6.7 mg/dL; and lactate dehydrogenase was 1,157 IU/L. Urine was positive for amphetamine and methamphetamine. The patient remained unchanged for five days, after which supportive care was terminated.

**Case 535.** A 51-year-old morbidly obese man with a history of parenteral amphetamine abuse presented agitated and disoriented with a swollen, tender right leg. BP was 120/70 mm Hg; heart rate was 100/min; temperature was 38.4°C, and WBC count was 16,000/µL. The patient was treated for sepsis and deep venous thrombosis with antibiotics and heparin. He subsequently had a cardiac arrest and was intubated, but he continued to have arrhythmias and died within 12 hours of admission. Toxicology screening revealed an antemortem blood amphetamine level of 0.09 µg/mL and a methamphetamine level of 0.59 µg/mL. Autopsy showed hypertrophic cardiomyopathy, focal organizing pneumonitis, splenic lymphoid depletion, multivis-

ceral congestion, and refractile material in the pulmonary tissue.

**Case 539.** An 18-year-old man was found thrashing in the bushes by police. After restraint by several police officers, he was brought to the emergency department agitated and confused. Vital signs on presentation revealed a heart rate of 146/min, a BP of 105/50 mm Hg, and a temperature of 38.4°C. Arterial blood gases were pH, 7.73;  $PO_2$ , 168 mm Hg; and  $PCO_2$ , 26 mm Hg. Initial electrolytes revealed a sodium of 147 mEq/L, potassium of 5.4 mEq/L, chloride of 94 mEq/L, and bicarbonate of 6 mEq/L with an anion gap of 47 mEq/L. Serum glucose was 197 mg/dL, urea nitrogen was 12 mg/dL, creatinine was 2.1 mg/dL, and phosphorus was 11.8 mg/dL. The patient was intubated, ventilated with 100% oxygen, and given large doses of sodium bicarbonate intravenously. Three hours after presentation the patient's temperature had risen to 40.0°C and he was obtunded. Four hours after presentation the patient developed ventricular tachycardia and a cardiac arrest; serum potassium was 9.4 mEq/L at the time. Despite cardiopulmonary resuscitation, insulin with glucose, sodium bicarbonate, calcium, and lidocaine, the patient died approximately 5 hours after presentation. Toxicologic analysis of the postmortem serum revealed a phencyclidine level of 0.12  $\mu$ g/mL and an ethanol level of 0.02 g/dL. Autopsy showed multiple minor contusions and abrasions on the neck, scalp, and extremities.

**Case 540.** An 18-year-old woman presented to the emergency department with left-sided weakness and lethargy 12 to 24 hours after ingesting at least 20 phenylpropanolamine diet aid capsules and 12 beers in a suicide attempt. Initial examination revealed a heart rate of 51/min, BP of 163/89 mm Hg, lethargy, slurred speech, decreased grip, and paralysis of the left side of the mouth. Intermittent decerebrate posturing (bilateral), hypertension, and tonic-clonic seizures developed. Treatment included nitroprusside, diazepam, lorazepam, and phenytoin. CT scan showed a right lateral basoganglial hemorrhage with intraventricular rupture, marked pressure effect, and a midline shift. Neurological examination at this time showed minimally reactive pupils of 6 mm and decorticate posturing. A right frontal lobectomy was performed with removal of the area of intracerebral hemorrhage and placement of an intracranial pressure monitor. Increased intracranial pressure was noted within 12 hours and was initially controlled with hyperventilation, mannitol, aspiration of CSF, and pentobarbital coma, but then became refractory to all treatment. Cerebral blood flow ceased and the patient died 3 days after presentation. The ethanol level was <10 mg/dL.

**Case 541.** An 18-month-old boy ingested several mouthfuls from a bottle of isopropyl alcohol to which

his grandfather had added an unknown amount of methyl salicylate. Five hours postingestion the child developed vomiting. Ten hours postingestion the child was brought to the emergency department. The child appeared ill with a BP of 95/45 mm Hg, a pulse of 200/min, a respiratory rate of 50/min, and a temperature of 36.3°C. The admission arterial blood gas was pH, 7.39;  $PCO_2$ , 11 mm Hg; and  $PO_2$ , 98 mm Hg. Rehydration, multiple-dose activated charcoal, and alkalization were started. The patient's mental status, vital signs, and acid-base disturbances improved until 18 hours postingestion, at which time the urine output decreased, urine pH dropped below 7, and early pulmonary edema became evident. Plans were made for hemodialysis; however, when the child improved with furosemide and an increased  $FiO_2$ , the transfer was aborted. A 20-hour salicylate level was 80 mg/dL. Thirty hours postingestion the child developed massive diarrhea (several liters), became hypotensive, acidotic, and developed respiratory failure. The patient was placed on dopamine and transferred for hemodialysis. He was intubated and placed on mechanical ventilation. A 24-hour salicylate level had decreased to 47 mg/dL. The serum sodium was 173 mEq/L. The patient developed hypotension, cardiogenic shock (high-output cardiac failure), cerebral edema, and diabetes insipidus. Despite aggressive treatment, including dialysis, he died 7 days postingestion.

**Case 542.** An 80-year-old woman accidentally ingested 10 mL of oil of wintergreen, thinking it was cough syrup. The patient tried to induce vomiting with bacon grease. She arrived at the emergency department 30 minutes to one hour after the ingestion. Activated charcoal, magnesium citrate, and bicarbonate were administered. The salicylate levels were 104 mg/dL (two hours) and 115 mg/dL (four hours). A cardiopulmonary arrest occurred approximately 5 hours postingestion.

**Case 544.** A 17-month-old boy ingested an unknown number of prenatal iron tablets belonging to a guest in the home sometime mid-morning on the day of admission. The patient vomited three times and had one diarrheal stool. Six hours after ingestion the iron level was 25,000  $\mu$ g/dL (hemolyzed); a 12-hour level was 4,400  $\mu$ g/dL. Initial arterial pH was 7.1 and the child received bicarbonate, plasma volume expanders, pressors, and fluids. Coagulopathy and bloody diarrhea developed. Continued acidosis was treated with several doses of bicarbonate. Deferoxamine was initiated approximately 7 hours after ingestion at 15 mg/kg/h and was increased to 45 mg/kg/h when the second iron level was known. Edema, anuria, rising liver enzymes, and massive bowel necrosis requiring resection were noted on the third day of hospitalization. The patient died on the fourth hospital day.

**Case 545.** A 17-month-old boy ingested an unknown number of prenatal vitamins containing ferrous sulfate, 325 mg. The child spontaneously vomited pill fragments, then became lethargic. On arrival at a health care facility, approximately 3.5 hours postingestion, the child had no palpable BP and a temperature of 31.7°C. An abdominal film revealed 40 to 50 residual tablets in the stomach, which were removed by repeated lavage (removal verified by abdominal radiograph). The serum iron level was 1,400 µg/dL and the arterial pH was 7.06. Deferoxamine therapy was begun at 15 mg/kg/h and increased to 30 mg/kg/h with continuous production of vin rose urine. Normal saline

hydration was begun and the systolic BP increased to 100 mm Hg. His condition improved after approximately 24 hours, with the child opening his eyes and then moving his extremities. Liver function parameters increased, with aminotransferases about 4,000 IU/L and amylase of approximately 1,000 U/L. The child then became comatose and developed pulmonary edema and shock. Dopamine, dobutamine, and epinephrine were required. Ascites developed and a minilaparoscopy was performed, demonstrating necrotic bowel. Prior to surgery, the child died. At autopsy, the child was found to have necrotic bowel with residual iron tablets.