Toxicology

A special contribution from the American Association of Poison Control Centers.

2004 Annual Report of the American Association of Poison Control Centers Toxic Exposure Surveillance System

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1. Introduction

Toxic Exposure Surveillance System (TESS) data are compiled by the American Association of Poison Control Centers (AAPCC) on behalf of the US poison centers. These data are used to identify hazards early, focus prevention education, guide clinical research, direct training, and detect chemical/bioterrorism incidents. TESS data have prompted product reformulations, repackaging, recalls, and bans; are used to support regulatory actions; and form the basis of postmarketing surveillance of newly released drugs and products.

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US poison centers make possible the compilation and reporting of this comprehensive description of human exposures to potentially toxic substances through their meticulous documentation of each case using standardized definitions and compatible computer systems. Participating centers include the Regional Poison Control Center, Birmingham, AL; Alabama Poison Center, Tuscaloosa, AL; Arizona Poison and Drug Information Center, Tucson, AZ; Banner Poison Control Center, Phoenix, AZ; Arkansas Poison and Drug Information Center, Little Rock, AK; California Poison Control System–Fresno/Madera Division, CA; California Poison Control System–Sacramento Division, CA; California Poison Control System–San Diego Division, CA; California Poison Control System–San Francisco Division, CA; Rocky Mountain Poison and Drug Center, Denver, CO; Connecticut Poison Control Center, Farmington, CT; National Capital Poison Center, Washington, DC; Florida Poison Information Center, Tampa, FL; Florida Poison Information Center, Jacksonville, FL; Florida Poison Information Center, Miami, FL; Georgia Poison Center, Atlanta, GA; Illinois Poison Center, Chicago, IL; Indiana Poison Center, Indianapolis, IN; Iowa Statewide Poison Control Center, Sioux City, IA; Mid-America Poison Control Center, Kansas City, KA; Kentucky Regional Poison Center, Louisville, KY; Louisiana Drug and Poison Information Center, Monroe, LA; Northern New England Poison Center, Portland, ME; Maryland Poison Center, Baltimore, MD; Regional Center for Poison Control and Prevention Serving Massachusetts and Rhode Island, Boston, MA; Children's Hospital of Michigan Regional Poison Control Center, Detroit, MI; DeVos Children's Hospital Regional Poison Center, Grand Rapids, MI; Hennepin Regional Poison Center, Minneapolis, MN; Mississippi Regional Poison Control Center, Jackson, MS; Missouri Regional Poison Center, St Louis, MO; Nebraska Regional Poison Center, Omaha, NE; New Hampshire Poison Information Center, Lebanon, NH; New Jersey Poison Information and Education System, Newark, NJ; New Mexico Poison and Drug Information Center, Albuquerque, NM; New York City Poison Control Center, New York, NY; Long Island Regional Poison and Drug Information Center, Mineola, NY; Finger Lakes Regional Poison and Drug Information Center, Rochester, NY; Central New York Poison Center, Syracuse, NY; Western New York Poison Center, Buffalo, NY; Carolinas Poison Center, Charlotte, NC; Cincinnati Drug and Poison Information Center, Cincinnati, OH; Central Ohio Poison Center, Columbus, OH; Greater Cleveland Poison Control Center, Cleveland, OH; Oklahoma Poison Control Center, Oklahoma City, OK; Oregon Poison Center, Portland, OR; Pittsburgh Poison Center, Pittsburgh, PA; The Poison Control Center, Philadelphia, PA; Palmetto Poison Center, Columbia, SC; Tennessee Poison Center, Nashville, Tenn; Southern Poison Center, Memphis, TN; Central Texas Poison Center, Temple, TX; North Texas Poison Center, Dallas, TX; Southeast Texas Poison Center, Galveston, TX; Texas Panhandle Poison Center, Amarillo, TX; West Texas Regional Poison Center, El Paso, TX; South Texas Poison Center, San Antonio, TX; Utah Poison Control Center, Salt Lake City, UT; Virginia Poison Center, Richmond, VA; Blue Ridge Poison Center, Charlottesville, VA; Washington Poison Center, Seattle, WA; West Virginia Poison Center, Charleston, WV; and Children's Hospital of Wisconsin Poison Center, Milwaukee, WI.

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Table 1A Growth of the AAPCC TESS

Year	No. of participating centers	Population served (in millions)	Human exposures reported	Exposures per thousand population
1983	16	43.1	251 012	5.8
1984	47	99.8	730 224	7.3
1985	56	113.6	900 513	7.9
1986	57	132.1	1 098 894	8.3
1987	63	137.5	1 166 940	8.5
1988	64	155.7	1 368 748	8.8
1989	70	182.4	1 581 540	8.7
1990	72	191.7	1 713 462	8.9
1991	73	200.7	1 837 939	9.2
1992	68	196.7	1 864 188	9.5
1993	64	181.3	1 751 476	9.7
1994	65	215.9	1 926 438	8.9
1995	67	218.5	2 023 089	9.3
1996	67	232.3	2 155 952	9.3
1997	66	250.1	2 192 088	8.8
1998	65	257.5	2 241 082	8.7
1999	64	260.9	2 201 156	8.4
2000	63	270.6	2 168 248	8.0
2001	64	281.3	2 267 979	8.1
2002	64	291.6	2 380 028	8.2
2003	64	294.7	2 395 582	8.1
2004	62	293.7	2 438 644	8.3
Total			38 655 222	

From its inception in 1983, TESS has grown dramatically, with increases in the number of participating poison centers, population served by those centers, and reported human exposures (Table 1A) [1-21].

The cumulative AAPCC database now contains 38.7 million human poison exposure cases. This report includes 2 438 644 human exposure cases reported by 62 participating poison centers during 2004, an increase of 1.8% compared to 2003. The data do not directly identify a trend in the overall incidence of poisonings in the United States because the percentage of poisonings reported to poison centers is unknown (Fig. 1).

2. Characterization of participating centers

Of the 62 reporting centers, 60 submitted data for the entire year. Fifty-two of the 62 participating centers were certified as regional poison centers by the AAPCC at the end of 2004. The annual human exposure case volume by center ranged from 12 124 to 111 242 (mean 40 521) for centers participating for the entire year. The number of human poison exposure cases reported per 1000 population per year was calculated by state and ranged from 5.5 to 18.1 (mean 8.3) reported exposures per 1000 population.

The entire population of the 50 states and the District of Columbia (293.7 million) was served by the participating centers. Extrapolations from the number of reported poison exposures to the number of actual poisonings occurring annually in the United States cannot be made from these data alone, as considerable variations in poison center penetrance were noted. Indeed, assuming all centers reached the penetrance level of 18.1 poison exposures per 1000 population reported for 1 state, 5.3 million poison exposures would have been reported to poison centers in 2004. Although this report focuses on the human exposure cases reported to TESS in 2004, the database also contains data (not presented here) on animal poison exposures (139 769 cases, primarily companion animals), human confirmed nonexposures (7797), animal confirmed nonexposures (407), and information calls (1 278 649). An additional 4009 duplicate reports (reported to more than 1 participating poison center) were excluded. This total of 3 865 266 cases and information calls reported to TESS in 2004 does not reflect the full extent of poison center effort. In addition, nearly 2.8 million follow-up calls were placed by poison centers during the year to provide further patient guidance, confirm compliance with recommendations, and gather final outcome data. Follow-ups were done in 44.8% of human exposure cases. One

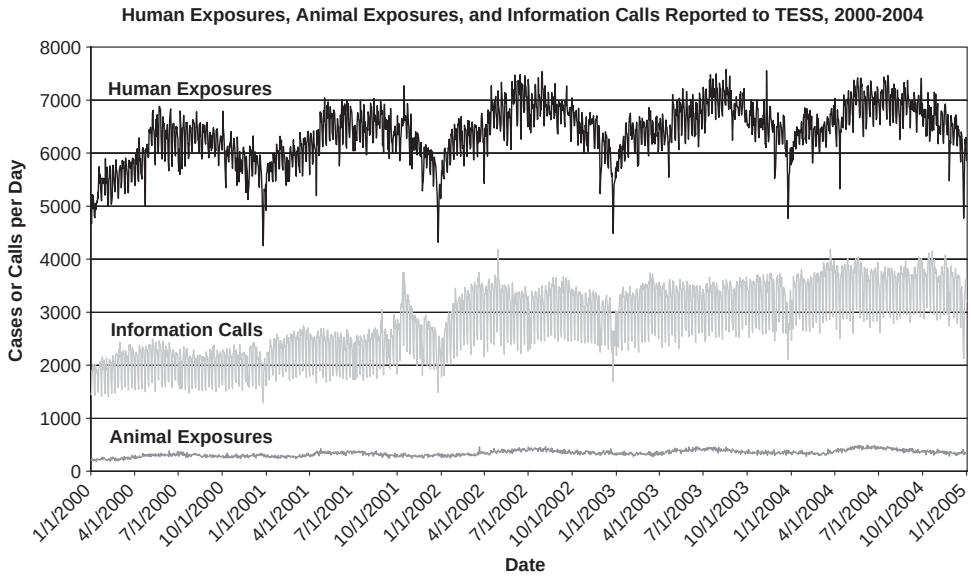

Fig. 1 Daily count of human poison exposures, animal poison exposures, and information calls reported to US poison control centers, 2000 to 2004.

Table 1B Distribution of information calls

Information call type	No. of calls	%
Drug identification		
Public inquiry: drug sometimes involved in abuse	279703	21.87
Public inquiry: drug not known to be abused	180210	14.09
Public inquiry: unknown abuse potential	12567	0.98
Public inquiry: unable to identify	80697	6.31
Health professional inquiry: drug sometimes involved in abuse	19768	1.55
Health professional inquiry: drug not known to be abused	36652	2.87
Health professional inquiry: unknown abuse potential	2822	0.22
Health professional inquiry: unable to identify	16655	1.30
Law enforcement inquiry: drug sometimes involved in abuse	47149	3.69
Law enforcement inquiry: drug not known to be abused	28068	2.20
Law enforcement inquiry: unknown abuse potential	1678	0.13
Law enforcement inquiry: unable to identify	11558	0.90
Other drug identification	5733	0.45
Subtotal	723260	56.56
Drug information		
Adverse effects (no known exposure)	18814	1.47
Brand/generic name clarifications	5117	0.40
Calculations	384	0.03
Compatibility of parenteral medications	365	0.03
Compounding	1129	0.09
Contraindications	2257	0.18
Dietary supplement, herbal, and homeopathic	1904	0.15
Dosage	15438	1.21
Dosage form/formulation	4440	0.35
Drug use during breast-feeding	8078	0.63
Drug-drug interactions	33721	2.64
Drug-food interactions	1970	0.15
Foreign drug	2808	0.22
Generic substitution	722	0.06
Indications/therapeutic use	27178	2.13
Medication administration	3425	0.27
Medication availability	3127	0.24
Medication disposal	808	0.06
Pharmacokinetics	4166	0.33
Pharmacology	2873	0.22
Regulatory	2115	0.17
Stability/storage	3354	0.26
Therapeutic drug monitoring	1169	0.09
Other drug information	34312	2.68
Subtotal	179674	14.05
Environmental information	32914	2.57
Medical information	33699	2.64
Occupational information	1860	0.15
Poison information	106863	8.36
Substance abuse	12423	0.97
Teratogenicity information	5921	0.46
Other information	44090	3.45
Administrative (optional)	23742	1.86
Caller referred (optional)	60709	4.75
Prevention/safety/education (optional)	53494	4.18
Total	1278649	100.00

follow-up call was made in 22.2% of human exposure cases, and multiple follow-up calls (range 2-111) were placed in 22.6% of cases.

A total of 1278649 information calls were reported to TESS in 2004, including 137945 calls coded in optional reporting categories such as administrative, immediate referral, and prevention/safety/education (Table 1B). These latter call types were reported inconsistently as they were not required to be reported by participating poison centers. Overall, the volume of information calls handled by US poison centers increased 9.5% from 2003 to 2004.

The most frequent information call was for drug identification, comprising 723260 calls to poison centers during the year. Of these, 108910 (15.1%) could not be identified over the telephone. Of the drug identification calls, 76.5% were received from the public, 10.5% from health professionals, and 12.2% from law enforcement. Forty-eight percent of drug identification requests involved drugs sometimes involved in abuse; however, these cases were categorized based on the abuse potential, generally without knowledge of whether abuse was actually intended.

Drug information calls (179674 calls) comprised 14.1% of all information calls. Of these, 18.8% were questions about drug-drug interactions, 15.1% were questions about therapeutic use and indications, and 10.5% were questions about adverse effects. Environmental inquiries comprised 2.6% of all information calls. Of these, 20.3% related to cleanup of mercury thermometers, and 11.3% involved pesticides. Poison information comprised 8.4% of information calls, with 11.9% of these involving food poisoning or food preparation practices and 10.0% involving plant toxicity.

3. Review of the data

No changes to the data collection format were implemented in 2004. Prior revisions occurred in 1984, 1985, 1993, 2000, 2001, and 2002. Data reported after January 1, 2000, allow an unlimited number of substances for each case, a factor that should be considered when comparing substance data with prior years.

Of the 2438644 human exposures reported in 2004, 92.7% occurred at a residence (Table 2). Exposures occurred in the workplace in 2.0% of cases, in schools (1.4%), health care facilities (0.3%), and restaurants or food services (0.4%). Poison center peak call volumes were from 4 to 11 PM, although call frequency remained consistently high between 8 AM and midnight, with 89.8% of calls logged during this 16-hour period. The average number of human poison exposure consultations handled per day by all participating US poison centers was 6663. Higher volumes

Table 2 Site of caller and site of exposure, human exposure cases

	Site of caller (%)	Site of exposure (%)
Residence		
Own	75.6	89.7
Other	2.4	3.0
Health care facility	14.3	0.3
Workplace	1.4	2.0
School	0.6	1.4
Public area	0.4	1.1
Restaurant/food service	0.0	0.4
Other	4.9	0.9
Unknown	0.3	1.1

Table 3 Age and sex distribution of human exposure cases

Age (y)	Male		Female		Unknown		Total		Cumulative total	
	No.	Row %	No.	Row %	No.	Row %	No.	Col %	No.	Col %
<1	72230	51.6	67182	48.0	522	0.4	139934	5.7	139934	5.7
1	208082	52.0	191606	47.9	559	0.1	400247	16.4	540181	22.2
2	209872	52.6	188167	47.2	654	0.2	398693	16.4	938874	38.5
3	96696	55.0	78812	44.8	333	0.2	175841	7.2	1114715	45.7
4	46934	56.2	36426	43.6	187	0.2	83547	3.4	1198262	49.1
5	26892	56.6	20417	43.0	178	0.4	47487	2.0	1245749	51.1
Unknown child ≤ 5	2278	47.6	1956	40.9	553	11.6	4787	0.2	1250536	51.3
6-12	89276	57.5	65056	41.9	906	0.6	155238	6.4	1405774	57.7
13-19	78372	44.5	96985	55.1	730	0.4	176087	7.2	1581861	64.9
Unknown child	2869	40.5	2480	35.0	1738	24.5	7087	0.3	1588948	65.2
Total children (<20)	833501	52.5	749087	47.1	6360	0.4	1588948	65.2	1588948	65.2
20-29	87592	45.0	106772	54.9	252	0.1	194616	8.0	1783564	73.1
30-39	71128	42.3	96809	57.6	151	0.1	168088	6.9	1951652	80.0
40-49	60668	41.4	85759	58.5	105	0.1	146532	6.0	2098184	86.0
50-59	36469	38.7	57637	61.2	62	0.1	94168	3.9	2192352	89.9
60-69	18899	36.2	33251	63.7	30	0.1	52180	2.1	2244532	92.0
70-79	12922	34.5	24529	65.5	18	0.1	37469	1.5	2282001	93.6
80-89	6885	31.5	14990	68.5	17	0.1	21892	0.9	2303893	94.5
90-99	1025	27.8	2661	72.1	5	0.1	3691	0.2	2307584	94.6
Unknown adult	45821	39.1	67425	57.5	3950	3.4	117196	4.8	2424780	99.4
Total adults	341409	40.9	489833	58.6	4590	0.6	835832	34.3	2424780	99.4
Unknown age	4578	33.0	5856	42.2	3430	24.7	13864	0.6	2438644	100.0
Total	1179488	48.4	1244776	51.0	14380	0.6	2438644	100.0	2438644	100.0

were observed in the warmer months, with a mean of 7007 consultations per day in July compared with 6184 per day in December. On average, ignoring time of day and seasonal fluctuations, US poison centers handled 1 poison exposure every 13 seconds.

The age and sex distribution of human poison exposure victims is outlined in Table 3. Children younger than 3 years were involved in 38.5% of cases, and 51.3% occurred in children younger than 6 years. A male predominance is found among poison exposure victims younger than 13 years, but the sex distribution is reversed in teenagers and adults. Of all poison exposures captured, 8431 occurred in pregnant women. Of those with known pregnancy duration, 32.0% occurred in the first trimester, 37.6% in the second trimester, and 30.5% in the third trimester. In 5.3% of cases (130056 cases), multiple patients were implicated in the poison exposure episode (eg, siblings "shared" a household product, or multiple patients inhaled vapors at a hazardous material spill).

Fatalities differed from the total exposure data set in several ways. Table 4 presents the age and sex distribution for the 1183 reported fatalities. Although responsible for the majority of poisoning reports, children younger than 6 years comprised just 2.3% (27) of the fatalities. Fifty-six percent of poisoning fatalities occurred in 20- to 49-year-old individuals. A single substance was implicated in 91.4% of reports, and 2.9% of patients were exposed to more than 2 possibly poisonous drugs or products (Table 5). In contrast,

Table 4 Distribution of age and sex for 1183 fatalities

Age (y)	Male	Female	Unknown	Total (%)	Cumulative total (%)
<1	2	2	1	5 (0.4)	5 (0.4)
1	7	2	0	9 (0.8)	14 (1.2)
2	4	2	0	6 (0.5)	20 (1.7)
3	2	0	0	2 (0.2)	22 (1.9)
4	1	0	0	1 (0.1)	23 (1.9)
5	1	2	0	3 (0.3)	26 (2.2)
Unknown child (<6)	0	0	1	1 (0.1)	27 (2.3)
6-12	5	11	0	16 (1.4)	43 (3.6)
13-19	49	41	0	90 (7.6)	133 (11.2)
20-29	116	79	0	195 (16.5)	328 (27.7)
30-39	106	103	0	209 (17.7)	537 (45.4)
40-49	124	140	0	264 (22.3)	801 (67.7)
50-59	102	80	0	182 (15.4)	983 (83.1)
60-69	31	35	1	67 (5.7)	1050 (88.8)
70-79	26	33	0	59 (5.0)	1109 (93.7)
80-89	11	15	0	26 (2.2)	1135 (95.9)
90-99	0	5	0	5 (0.4)	1140 (96.4)
Unknown adult	21	11	0	32 (2.7)	1172 (99.1)
Unknown	4	2	5	11 (0.9)	1183 (100.0)
Total	612	563	8	1183 (100.0)	1183 (100.0)

Table 5 Number of substances involved in human exposure cases

No. of substances	No. of cases	% Of cases
1	2 229 172	91.4
2	139 122	5.7
3	40 995	1.7
4	15 960	0.7
5	6656	0.3
6	3018	0.1
7	1662	0.1
8	828	0.0
≥9	1231	0.1
Total	2 438 644	100.0

50.6% of fatal cases involved 2 or more drugs or products. The overwhelming majority of human exposures were acute (91.9%) compared with 55.9% of poison-related fatal exposures. Chronic exposures comprised 1.8% of all poison exposure reports, and acute-on-chronic exposures comprised 5.5%. (Chronic exposures were defined as continuous or repeated exposures occurring over a period exceeding 8 hours.)

Reason for exposure was coded according to the following definitions:

Unintentional general: All unintentional exposures not otherwise defined below. Most unintentional exposures in children are reported here.
Environmental: Any passive, nonoccupational exposure that results from contamination of air, water, or soil. Environmental exposures are usually caused by man-made contaminants.
Occupational: An exposure that occurs as a direct result of the person being on the job or in the workplace.
Therapeutic error: An unintentional deviation from a proper therapeutic regimen that results in the wrong dose, incorrect route of administration, administration to the wrong person, or administration of the wrong substance. Only exposures to medications or products used as medications are included. Drug interactions resulting from unintentional administration of drugs or foods which are known to interact are also included.
Unintentional misuse: Unintentional improper or incorrect use of a nonpharmaceutical substance. Unintentional misuse differs from intentional misuse in that the exposure was unplanned or not foreseen by the patient.
Bite/sting: All animal bites and stings, with or without envenomation, are included.
Food poisoning: Suspected or confirmed food poisoning; ingestion of food contaminated with microorganisms is included.
Unintentional unknown: An exposure determined to be unintentional, but the exact reason is unknown.
Suspected suicidal: An exposure resulting from the inappropriate use of a substance for reasons that are suspected to be self-destructive or manipulative.
Intentional misuse: An exposure resulting from the intentional improper or incorrect use of a substance for reasons other than the pursuit of a psychotropic or euphoric effect.
Intentional abuse: An exposure resulting from the intentional improper or incorrect use of a substance where the victim was likely attempting to achieve a euphoric or psychotropic effect. All recreational use of substances for any effect is included.
Intentional unknown: An exposure that is determined to be intentional, but the specific motive is unknown.
Contaminant/tampering: The patient is an unintentional victim of a substance that has been adulterated (either maliciously or unintentionally) by the introduction of an undesirable substance.
Malicious: This category is used to capture patients who are victims of another person's intent to harm them.
Withdrawal: Effect related to decline in blood concentration of a pharmaceutical or other substance after discontinuing therapeutic use or abuse of that substance.
Adverse reaction: An adverse event occurring with normal, prescribed, labeled, or recommended use of the product, as opposed to overdose, misuse, or abuse. Included are cases with an unwanted effect because of an allergic, hypersensitive, or idiosyncratic response to the active ingredients, inactive ingredients, or excipients. Concomitant use of a contraindicated medication or food is excluded and coded instead as a therapeutic error.

The vast majority (84.1%) of poison exposures were unintentional; suicidal intent was present in 8.0% of cases (Table 6A). Therapeutic errors comprised 9.1% of exposures (222 644 cases), with unintentional nonpharmaceutical product misuse comprising another 3.9% of exposures.

Table 6A Reason for human exposure cases

Reason	No.	%
Unintentional		
General	1 511 748	62.0
Therapeutic error	222 644	9.1
Misuse	96 124	3.9
Bite/sting	89 562	3.7
Environmental	55 725	2.3
Food poisoning	36 851	1.5
Occupational	34 452	1.4
Unknown	3496	0.1
Subtotal	2 050 602	84.1
Intentional		
Suspected suicidal	196 164	8.0
Abuse	45 562	1.9
Misuse	43 514	1.8
Unknown	16 014	0.7
Subtotal	301 254	12.4
Other		
Malicious	9291	0.4
Contamination/tampering	4592	0.2
Withdrawal	1022	0.0
Subtotal	14 905	0.6
Adverse reaction		
Drug	42 812	1.8
Food	5319	0.2
Other	13 123	0.5
Subtotal	61 254	2.5
Unknown	10 629	0.4
Total	2 438 644	100.0

Table 6B Scenarios for therapeutic errors

	No. of cases	<6 y (Row %)	6-12 y (Row %)	13-19 y (Row %)	>19 y (Row %)	Unknown (row %)
Inadvertently took/given medication twice	74028	25.4	12.8	5.9	55.5	0.3
Other incorrect dose	31159	38.0	12.6	7.4	41.6	0.4
Wrong medication taken/given	29245	18.5	12.6	6.8	61.6	0.4
Inadvertently took/given someone else's medication	23034	21.1	18.8	7.1	52.7	0.2
Medication doses given/taken too close together	18194	25.6	10.5	7.5	56.1	0.3
Other/unknown therapeutic error	13277	24.8	11.2	7.8	55.3	0.8
Confused units of measure	9146	61.0	14.6	5.1	19.0	0.3
Incorrect dosing route	7043	15.4	6.6	4.8	72.2	1.0
Incorrect formulation or concentration given	6988	53.0	16.8	4.8	25.0	0.4
More than 1 product containing same ingredient	5928	33.4	15.4	12.3	38.7	0.1
Dispensing cup error	5120	64.2	17.3	4.4	13.9	0.2
Health professional/iatrogenic error	4053	31.1	9.5	5.8	51.9	1.7
Incorrect formulation or concentration dispensed	1816	45.6	15.1	6.6	31.8	0.8
10-Fold dosing error	1301	65.0	3.7	3.8	27.1	0.4
Drug interaction	976	11.0	7.3	8.7	72.0	1.0
Exposure through breast milk	145	93.8	0.0	0.0	2.8	3.4

The types of therapeutic errors observed in each age group are delineated in Table 6B. Thirty-three percent of therapeutic errors involved double-dosing. Dispensing cup errors were seen in 5120 cases, 10-fold dosing errors in 1301 cases, iatrogenic or dispensing errors in 5869 cases, and errors resulting from exposure to multiple products with common ingredients in 5928 cases.

Unintentional poisonings outnumbered intentional poisonings in all age groups (Table 7). In contrast, of the 1183 human poisoning fatalities reported, 87.8% of adolescent deaths and 80.2% of adult deaths (older than 19 years) were intentional (Table 8).

Ingestion was the route of exposure in 76.8% of cases (Table 9), followed in frequency by dermal, inhalation, and ocular routes. For the 1183 fatalities, ingestion, inhalation, and parenteral were the predominant exposure routes.

Clinical effects (signs, symptoms, or laboratory abnormalities) were coded in 30.2% of cases (16.1% had 1 effect, 7.9% had 2 effects, 4.0% had 3 effects, 1.4% had 4 effects, 0.4% had 5 effects, and 0.4% had >5 effects). Of 1645092 clinical effects coded, 80.5% were deemed related, 8.6% were considered not related, and 11.0% were coded as "unknown if related."

The majority of cases reported to poison centers were managed in a non–health care facility (77%), usually at the site of exposure, the patient's own residence (Table 10). This includes the 2% of cases that were referred to a health care facility but refused to go. Treatment in a health care facility was rendered in 22.4% of cases. The percentage of patients treated in a health care facility varied considerably with age. Only 10.2% of children younger than 6 years and only 13.4% of children between 6 and 12 years were managed in a health care facility compared with 48.5% of teenagers (13-19 years) and 36.7% of adults (>19 years). Of cases managed in a health care facility, 51.9% were treated and released without admission, 14.7% were admitted for critical care, and 7.7% were admitted for noncritical care. Where treatment was provided in a health care facility, 32.2% of the patients were referred in by the poison center, and 67.8% were already in or en route to the health care facility when the poison center was contacted. Health care facilities included acute care hospitals (83.8%), physician offices or clinics (8.4%), and freestanding emergency centers (3.0%).

Table 11 displays the medical outcome of the human poison exposure cases distributed by age, showing a greater rate of severe outcomes in the older age groups. Table 12 compares medical outcome and reason for exposure and shows a greater frequency of serious outcomes in intentional exposures. Table 13 demonstrates an increasing duration of the clinical effects observed with more severe outcomes. Medical outcome categories were as follows:

No effect: The patient developed no signs or symptoms as a result of the exposure.

Minor effect: The patient developed some signs or symptoms as a result of the exposure, but they were minimally bothersome and generally resolved rapidly with no residual disability or disfigurement. A minor

Table 7 Distribution of reason for exposure by age

Reason	<6 y		6-12 y		13-19 y		>19 y		Unknown*		Total	
	No.	Row %	No.	Row %	No.	Row %	No.	Row %	No.	Row %	No.	Col %
Unintentional	1242735	60.6	140758	6.9	85176	4.2	567362	27.7	14571	0.7	2050602	84.1
Intentional	1116	0.4	8474	2.8	81937	27.2	205427	68.2	4300	1.4	301254	12.4
Other	1099	7.4	1989	13.3	2361	15.8	9108	61.1	348	2.3	14905	0.6
Adverse reaction	4960	8.1	3303	5.4	4975	8.1	47142	77.0	874	1.4	61254	2.5
Unknown	626	5.9	714	6.7	1638	15.4	6793	63.9	858	8.1	10629	0.4
Total	1250536	51.3	155238	6.4	176087	7.2	835832	34.3	20951	0.9	2438644	100.0

* Includes unknown child and unknown age.

Table 8 Distribution of reason for exposure and age for 1183 fatalities

Reason	<6 y	6-12 y	13-19 y	>19 y	Unknown	Total
Unintentional						
General	10	1	0	5	0	16
Therapeutic error	3	0	0	38	0	41
Bite/sting	1	0	0	4	0	5
Misuse	0	0	0	4	0	4
Environmental	6	7	6	41	0	60
Food poisoning	0	0	0	0	0	0
Occupational	0	0	0	11	0	11
Unknown	0	2	0	6	0	8
Subtotal	20	10	6	109	0	145
Intentional						
Suicide	0	0	46	591	2	639
Abuse	0	1	24	123	3	151
Misuse	0	0	2	41	1	44
Unknown	0	0	7	78	0	85
Subtotal	0	1	79	833	6	919
Other						
Contamination/ tampering	0	0	0	0	0	0
Malicious	2	0	0	6	0	8
Withdrawal	0	0	0	0	0	0
Subtotal	2	0	0	6	0	8
Adverse reaction	1	4	0	20	0	25
Unknown	4	1	5	71	5	86
Total	27	16	90	1039	11	1183

effect is often limited to the skin or mucus membranes (eg, self-limited gastrointestinal symptoms, drowsiness, skin irritation, first-degree dermal burn, sinus tachycardia without hypotension, and transient cough).

Moderate effect: The patient exhibited signs or symptoms as a result of the exposure that were more pronounced, more prolonged, or more systemic in nature than minor symptoms. Usually, some form of treatment is indicated. Symptoms were not life-threatening, and the patient had no residual disability or disfigurement (eg, corneal abrasion, acid-base disturbance, high fever, disorientation, hypotension that is rapidly responsive to treatment, and isolated brief seizures that respond readily to treatment).

Major effect: The patient exhibited signs or symptoms as a result of the exposure that were life-threatening or resulted in significant residual disability or disfigurement (eg, repeated seizures or status epilepticus, respiratory compromise requiring intubation, ventricular tachycardia with hypotension, cardiac or respiratory arrest, esophageal stricture, and disseminated intravascular coagulation).

Death: The patient died as a result of the exposure or as a direct complication of the exposure. Only those deaths that were probably or undoubtedly related to the exposure are coded here.

Not followed, judged as nontoxic exposure: No follow-up calls were made to determine the outcome of the exposure because the substance implicated was nontoxic, the amount implicated was insignificant, or the route of exposure was unlikely to result in a clinical effect.

Not followed, minimal clinical effects possible: No follow-up calls were made to determine the patient's outcome because the exposure was likely to result in only minimal toxicity of a trivial nature. (The patient was expected to experience no more than a minor effect.).

Unable to follow, judged as a potentially toxic exposure: The patient was lost to follow-up, refused follow-up, or was not followed, but the exposure was significant and may have resulted in a moderate, major, or fatal outcome.

Unrelated effect: The exposure was probably not responsible for the effect.

Confirmed nonexposure: This outcome option was coded to designate cases where there was reliable and objective evidence that an exposure initially believed to have occurred actually never occurred (eg, all missing pills are later located). All cases coded as confirmed nonexposure are excluded from this report.

Table 9 Distribution of route of exposure for human exposure cases and 1183 fatalities

Route	All exposure cases		Fatal exposure cases	
	No.	%	No.	%
Ingestion	1 964 500	76.8	996	74.8
Dermal	190 762	7.5	12	0.9
Inhalation	150 336	5.9	135	10.1
Ocular	133 370	5.2	3	0.2
Bites and stings	89 609	3.5	5	0.4
Parenteral	12 837	0.5	52	3.9
Otic	2734	0.1	0	0.0
Aspiration	1449	0.1	21	1.6
Rectal	929	0.0	2	0.2
Vaginal	866	0.0	0	0.0
Other	2575	0.1	4	0.3
Unknown	8839	0.3	102	7.7
Total	2 558 806	100.0	1332	100.0

Multiple routes of exposure were observed in many poison exposure victims. Percentage is calculated on the total number of exposure routes (2 558 806 for all patients; 1332 for fatal cases) rather than the total number of human exposures (2 438 644) or fatalities (1183).

Table 10 Management site of human exposure cases

Site	No.	%
Managed on-site, nonhealth care facility	1 801 037	73.9
Managed in health care facility		
Treated and released	283 620	11.6
Admitted to critical care	80 326	3.3
Admitted to noncritical care	42 226	1.7
Admitted to psychiatry	44 397	1.8
Lost to follow-up; left AMA	95 659	3.9
Subtotal	546 228	22.4
Other	27 567	1.1
Refused referral	49 362	2.0
Unknown	14 450	0.6
Total	2 438 644	100.0

AMA indicates against medical advice.

Tables 14 and 15 outline the use of decontamination procedures, specific antidotes, and measures to enhance elimination in the treatment for patients reported in this database. These must be interpreted as minimum frequencies because of the limitations of telephone data gathering. Table 16 demonstrates the continuing decline in the use of ipecac-induced emesis in the treatment of poisoning. Ipecac was administered in only 4701 human poison exposures in 2004. A 49.4% decrease in ipecac syrup use in 2004 compared with 2003 was observed, likely as a result of

Table 11 Medical outcome of human exposure cases by patient age

Outcome	<6 y		6-12 y		13-19 y		>19 y		Unknown*		Total	
	No.	Col %	No.	Col %	No.	Col %	No.	Col %	No.	Col %	No.	Col %
No effect	321862	25.7	25772	16.6	27874	15.8	94482	11.3	3192	15.2	473182	19.4
Minor effect	108105	8.6	26594	17.1	45583	25.9	193374	23.1	2568	12.3	376224	15.4
Moderate effect	9699	0.8	4058	2.6	18951	10.8	84490	10.1	711	3.4	117909	4.8
Major effect	686	0.1	254	0.2	1974	1.1	12997	1.6	51	0.2	15962	0.7
Death	27	0.0	16	0.0	90	0.1	1039	0.1	11	0.1	1183	0.1
No follow-up, nontoxic	266593	21.3	24321	15.7	9846	5.6	53099	6.4	2382	11.4	356241	14.6
No follow-up, minimal toxicity	505506	40.4	66306	42.7	49591	28.2	288823	34.6	6077	29.0	916303	37.6
No follow-up, potentially toxic	19781	1.6	4050	2.6	17683	10.0	71130	8.5	5390	25.7	118034	4.8
Unrelated effect	18277	1.5	3867	2.5	4495	2.6	36398	4.4	569	2.7	63606	2.6
Total	1250536	51.3	155238	6.4	176087	7.2	835832	34.3	20951	0.9	2438644	100.0

* Includes unknown child and unknown age.

ipecac use guidelines issued in late 2003. A joint Guidelines Consensus Panel formed by the American Association of Poison Control Centers, American College of Medical Toxicology, and American Academy of Clinical Toxicology issued a guideline which concluded that the circumstances in which ipecac syrup is the appropriate or desired method of gastric decontamination are rare [22]. The American Academy of Pediatrics went a step further, concluding not only that "ipecac should no longer be used routinely as a home treatment strategy," but also recommending disposal of ipecac currently in homes [23].

Table 17A presents the most common substance categories involved in human exposures, listed by frequency of exposure. Tables 17B and 17C present similar data for children and adults, respectively, and show the considerable differences between pediatric and adult poison exposures. Table 18 lists the substance categories with the largest number of reported deaths; analgesics and sedative/hypnotics/antipsychotics lead this list. Although analgesics are the most frequently involved substance category for both deaths and nonlethal human exposures, there is otherwise little correlation between the frequency of exposures to a substance and the number of deaths. Table 19 shows little variation over the past 2 decades in the percentage of cases reported to TESS that are fatal poisonings and in the percentage of reported fatalities as a result of suicide. A breakdown of plant exposures is provided for those most commonly implicated (Table 20).

A summary of the 1183 fatal exposures is presented in Table 21. Each fatality reported to TESS was verified and abstracted by the reporting poison center. After extensive review, those exposures determined to be either "probably" or "undoubtedly" responsible for the fatality were included in Table 21. Abstracts of selected interesting or unusual cases, including most incidents with multiple fatalities, are included in Appendix B. Table 21 also reports the highest blood concentrations for the responsible agents, where that information is known. In addition, Table 21 identifies those cases reported indirectly to the poison center (5.8% of cases) and those cases in which a prehospital cardiac and/or respiratory arrest occurred (39.5% of cases). Deaths are categorized in Table 21 according to the agent deemed most responsible for the death, by agreement of the medical director of the reporting center and at least 2 additional toxicologist reviewers. Single agents were considered responsible for 49% of deaths. Additional agents implicated (up to a maximum of 3 total agents) are listed below the primary agent. Cases in which more than 3 agents were involved are also identified. The age distribution of reported fatalities is similar to that in the past years, with the overwhelming majority of fatal cases occurring in adults.

Table 12 Distribution of medical outcome by reason for exposure in human exposure cases

Outcome	Unintentional		Intentional		Other		Adverse Reaction		Unknown		Total	
	No.	Col %	No.	Col %	No.	Col %	No.	Col %	No.	Col %	No.	Col %
No effect	416342	20.3	53055	17.6	1651	11.1	1220	2.0	914	8.6	473182	19.4
Minor effect	272266	13.3	83626	27.8	3366	22.6	15466	25.2	1500	14.1	376224	15.4
Moderate effect	50893	2.5	56187	18.7	1115	7.5	8026	13.1	1688	15.9	117909	4.8
Major effect	2929	0.1	11518	3.8	108	0.7	743	1.2	664	6.2	15962	0.7
Death	145	0.0	919	0.3	8	0.1	25	0.0	86	0.8	1183	0.1
No follow-up, nontoxic	349891	17.1	4199	1.4	811	5.4	1100	1.8	240	2.3	356241	14.6
No follow-up, minimal toxicity	855266	41.7	32448	10.8	5047	33.9	21934	35.8	1608	15.1	916303	37.6
No follow-up, potentially toxic	55337	2.7	54103	18.0	1767	11.9	4077	6.7	2750	25.9	118034	4.8
Unrelated effect	47533	2.3	5199	1.7	1032	6.9	8663	14.1	1179	11.1	63606	2.6
Total	2050602	84.1	301254	12.4	14905	0.6	61254	2.5	10629	0.4	2438644	100.0

Table 13 Duration of clinical effects by medical outcome

Duration of effect	Minor effect	Moderate effect	Major effect
	Col %	Col %	Col %
≤ 2 h	39.1	6.5	2.5
>2 h, ≤ 8 h	25.6	21.8	7.7
>8 h, ≤ 24 h	16.8	30.2	25.6
>24 h, ≤ 3 d	5.4	17.9	30.4
>3 d, ≤ 1 wk	1.7	6.7	15.7
>1 wk, ≤ 1 mo	0.5	1.9	5.5
>1 mo	0.2	0.6	1.2
Anticipated permanent	0.2	0.4	2.6
Unknown	10.6	14.2	8.8

There were 27 fatalities reported in children younger than 6 years, similar to numbers reported over the last decade and less than the aberrant 34 cases reported in 2003 (Table 19). As a percentage of total reported fatalities, the pediatric cases represent 2.3%, similar to percentages reported over most of the last 6 years. The percentage of pediatric fatalities related to total pediatric calls was 0.0022%. By comparison, 0.12% of all adult exposures reported resulted in death. Of the reported deaths in children younger than 6 years, 20 were known to be unintentional. Of these, 6 were from carbon monoxide, and 3 were therapeutic errors. There were 2 deaths in children younger than 6 years resulting from malicious intent, and there was 1 death from an adverse drug reaction. Of the 19 medication-associated deaths, 5 were from nonprescription medications, and 14 were associated with prescription medications. Of the prescription medications, 9 contained opioids, including 4 from methadone. Compared with previous years, this represents a worrisome increase in opioid-related deaths in this age range. There was only a single fatality related to a household product, a decrease from previous years. Interestingly, there were no pediatric fatalities from iron or antidepressants, agents which have been problems in some past years.

In the age range 6 to 12 years, there were 16 reported fatalities, including 3 from adverse drug reactions and no suspected suicides. Of these cases, 10 were unintentional, including 7 from carbon monoxide. The number of deaths in this age range is higher than in the previous 5 years (mean 7.8 deaths per year), although there is no clear pattern in terms of agents.

In the age range 13 to 19 years, there were 90 reported fatalities. This number is the largest reported in any prior year (mean 67 deaths per year over the last 5 years). Looking at the reasons for the adolescent fatalities, 51.1% were presumed suicides, and 26.7% were caused by intentional abuse. These numbers are similar to those in most recent years except for 2003 when abuse was the most common reason. As in the past years, only a small number (6.7%) of adolescent fatalities are unintentional; most of these were related to carbon monoxide.

The most common classes of substances involved as primary substance in fatalities were analgesics, antidepressants, stimulants and street drugs, sedative/hypnotics/antipsychotics, and cardiovascular agents. This relative order is similar to that seen in recent years. Of the 419 fatalities where an analgesic was felt to be the primary responsible agent, 67 were associated with acetaminophen as a single agent, 43 with acetaminophen plus 1 or 2 other drugs and 108 with acetaminophen in a combination product, usually containing an opioid. There were 22 fatalities where

Table 14 Decontamination and therapeutic interventions

Therapy	No. of patients	%
Decontamination only	1 208 961	49.6
Observation only	300 836	12.3
No therapy provided	227 639	9.3
Decontamination and other therapy	185 821	7.6
Other therapy only (no decontamination)	135 641	5.6
Unknown if therapy was provided/patient refused	357 563	14.7

Table 15 Therapy provided in human exposure cases

Therapy	No.
Decontamination	
Dilution/irrigation	1 127 564
Activated charcoal, single dose	130 938
Cathartic	44 664
Gastric lavage	16 179
Other emetic	8420
Ipecac syrup	4701
Whole bowel irrigation	2961
Measures to enhance elimination	
Activated charcoal, multidose	5031
Hemodialysis	1726
Other extracorporeal procedure	33
Hemoperfusion	29
Specific antidote administration	
Benzodiazepine	16 685
N-acetylcysteine (oral)	15 333
Naloxone	12 618
Calcium	7039
N-acetylcysteine (IV)	3807
Flumazenil	2148
Fomepizole	1099
Antivenom (Fab)	1001
Atropine	964
Glucagon	830
Insulin	690
Phytonadione	629
Folate	608
Fab fragments	515
Ethanol	466
Hyperbaric oxygen	449
Antivenom (excluding Fab)	446
Pyridoxine	418
Succimer	206
Octreotide	185
Cardiac pacing	180
Physostigmine	157
Pralidoxime (2-PAM)	98
Methylene blue	97
Deferoxamine	74
EDTA	71
Dimercaprol (BAL)	59
Sodium thiosulfate	55
Sodium nitrite	25
Amyl nitrite	11
Penicillamine	6
Other interventions	
Alkalinization	8654
Organ transplantation	29
ECMO	9

Table 16 Decontamination trends

Year	Human exposures reported	% of Exposures involving children <6 y	Ipecac administered (% of exposures)	Activated charcoal administered (% of exposures)
1983	251 012	64.0	13.4	4.0
1984	730 224	64.1	12.9	4.0
1985	900 513	63.4	15.0	4.6
1986	1 098 894	63.0	13.3	5.2
1987	1 166 940	62.3	10.1	5.2
1988	1 368 748	61.8	8.4	6.5
1989	1 581 540	61.1	7.0	6.4
1990	1 713 462	60.8	6.1	6.7
1991	1 837 939	59.9	5.2	7.0
1992	1 864 188	58.8	4.3	7.3
1993	1 751 476	56.0	3.7	7.3
1994	1 926 438	54.1	2.7	6.8
1995	2 023 089	52.9	2.3	7.7
1996	2 155 952	52.8	1.8	7.3
1997	2 192 088	52.5	1.5	7.1
1998	2 241 082	52.7	1.2	6.8
1999	2 201 156	50.5	1.0	6.6
2000	2 168 248	52.7	0.8	6.7
2001	2 267 979	51.6	0.7	6.6
2002	2 380 028	51.6	0.6	6.3
2003	2 395 582	52.0	0.4	5.9
2004	2 438 644	51.3	0.2	5.6

salicylate as a single agent was felt to be responsible. Once again, excluding the chronic ingestion cases, only half of these cases ever had salicylate concentrations measured that exceeded 100 mg/dL. Most of these cases did not receive dialysis in a useful time frame. These data suggest that more aggressive and earlier use of dialysis may be indicated in the treatment of large salicylate ingestions. There were marked increases in the numbers of deaths attributed primarily to either methadone (76 vs 38 cases in 2003) or oxycodone (31 vs 22 cases in 2003). There continued to be a large number of cases where long-acting opioid preparations (controlled release or transdermal) other than methadone were felt to be the primary responsible agent (33 deaths in 2004).

The second most common class of drugs primarily responsible for fatalities was antidepressants, accounting for 119 deaths, similar to other recent years. Amitriptyline, either alone or in combination, is the single most common agent, as in the past years. Newer agents continue to produce numerous deaths, although no one agent appears disproportionately responsible. There were, however, significantly more deaths related to bupropion (26 vs 8 deaths in 2003) and venlafaxine (16 vs 11 deaths in 2003).

The third most common class of drugs associated with fatalities was stimulants and street drugs. The number (40) of deaths related to cocaine as the primary agent was the

Table 17A Substances most frequently involved in human exposures

Substance	No.	%*
Analgesics	279 955	11.5
Cleaning substances	229 040	9.4
Cosmetics and personal care products	224 792	9.2
Sedatives/hypnotics/antipsychotics	129 885	5.3
Foreign bodies	122 011	5.0
Topicals	113 489	4.7
Cough and cold preparations	108 814	4.5
Antidepressants	103 155	4.2
Pesticides	102 754	4.2
Bites/envenomations	97 263	4.0
Plants	74 811	3.1
Alcohols	74 268	3.0
Cardiovascular drugs	74 145	3.0
Antihistamines	72 762	3.0
Food products, food poisoning	69 915	2.9
Antimicrobials	64 768	2.7
Vitamins	62 562	2.6
Hydrocarbons	54 766	2.2
Hormones and hormone antagonists	48 359	2.0

Despite a high frequency of involvement, these substances are not necessarily the most toxic, but rather may be the most readily accessible.

* Percentages are based on the total number of human exposures (2 438 644) rather than the total number of substances.

Table 17B Substances most frequently involved in pediatric exposures (children younger than 6 years)

Substance	No.	%*
Cosmetics and personal care products	168 021	13.4
Cleaning substances	124 962	10.0
Analgesics	98 237	7.9
Topicals	92 482	7.4
Foreign bodies	91 101	7.3
Cough and cold preparations	67 494	5.4
Plants	55 078	4.4
Pesticides	52 174	4.2
Vitamins	48 989	3.9
Antihistamines	34 401	2.8
Antimicrobials	33 528	2.7
Gastrointestinal preparations	30 289	2.4
Arts/crafts/office supplies	29 798	2.4
Electrolytes and minerals	24 886	2.0
Hormones and hormone antagonists	22 877	1.8

Despite a high frequency of involvement, these substances are not necessarily the most toxic, but rather may be the most readily accessible.

* Percentages are based on the total number of exposures in children younger than 6 years (1 250 536) rather than the total number of substances.

Table 17C Substances most frequently involved in adult exposures (>19 years)

Substance	No.	%*
Analgesics	124 186	14.9
Sedatives/hypnotics/antipsychotics	97 714	11.7
Cleaning substances	82 854	9.9
Antidepressants	67 479	8.1
Bites/envenomations	62 027	7.4
Cardiovascular drugs	46 470	5.6
Alcohols	44 809	5.4
Pesticides	40 328	4.8
Food products, food poisoning	39 327	4.7
Cosmetics and personal care products	38 081	4.6
Chemicals	27 743	3.3
Hydrocarbons	27 589	3.3
Fumes/gases/vapors	26 968	3.2
Anticonvulsants	26 555	3.2
Antihistamines	24 079	2.9
Stimulants and street drugs	23 265	2.8
Antimicrobials	22 479	2.7
Hormones and hormone antagonists	21 102	2.5
Cough and cold preparations	18 673	2.2
Muscle relaxants	17 526	2.1

Despite a high frequency of involvement, these substances are not necessarily the most toxic, but rather may be the most readily accessible.

* Percentages are based on the total number of exposures in adults older than 19 years (835 832) rather than the total number of substances.

Table 18 Categories with largest numbers of deaths

Category	No.	% of all exposures in category
Analgesics	658	0.235
Sedative/hypnotics/antipsychotics	371	0.286
Antidepressants	299	0.290
Stimulants and street drugs	214	0.472
Cardiovascular drugs	162	0.218
Alcohols	114	0.153
Gases and fumes	83	0.206
Anticonvulsants	81	0.202
Chemicals	62	0.133
Muscle relaxants	61	0.261
Antihistamines	55	0.076
Hormones and hormone antagonists	46	0.095
Cough and cold preparations	30	0.028
Automotive products	27	0.185
Cleaning substances	25	0.011

This table and Tables 22A and 22B are based on all substances coded per exposure, whereas Table 21 only includes up to 3 substances per case. Unknown drug category is excluded from this table.

fewest reported since 2000, whereas the number (22 cases) of heroin-related fatalities remained virtually identical to the 23 deaths reported in 2003. There was modest increase in deaths primarily related to methamphetamine (26 vs 23 cases in 2003) and a significant decrease in the number of MDMA-related fatalities (3 deaths in 2004 and 12 deaths in 2003). For the second year in a row, there were no reported deaths involving γ-hydroxybutyrate or related compounds.

The vast majority (77.7%) of reported fatalities in 2004, as in the past years, were the result of intentional actions. The percentage of fatalities attributable to other reasons remained little changed from previous years (Table 10). A disturbing number of deaths continue to occur because of therapeutic errors, although the 41 cases reported in 2004

Table 19 22-Year comparisons of fatality data

Year	Total fatalities		Suicides		Pediatric deaths (<6 y)
	No.	% of cases	No.	% of deaths	No. (% of deaths)
1983	95	0.038	60	63.2	10 (10.5)
1984	293	0.040	165	56.3	21 (7.2)
1985	328	0.036	178	54.3	20 (6.1)
1986	406	0.037	223	54.9	15 (3.7)
1987	397	0.034	226	56.9	22 (5.5)
1988	545	0.040	297	54.5	28 (5.1)
1989	590	0.037	323	54.7	24 (4.1)
1990	612	0.036	350	57.2	25 (4.1)
1991	764	0.042	408	53.4	44 (5.8)
1992	705	0.038	395	56.0	29 (4.1)
1993	626	0.036	338	54.0	27 (4.3)
1994	766	0.040	410	53.5	26 (3.4)
1995	724	0.036	405	55.9	20 (2.8)
1996	726	0.034	358	49.3	29 (4.0)
1997	786	0.036	418	53.2	25 (3.2)
1998	775	0.035	421	54.3	16 (2.1)
1999	873	0.040	472	54.1	24 (2.7)
2000	920	0.042	476	51.7	20 (2.2)
2001	1074	0.047	552	51.4	26 (2.4)
2002	1153	0.048	629	54.6	23 (2.0)
2003	1106	0.046	592	53.5	34 (3.1)
2004	1183	0.049	639	54.0	27 (2.3)

Table 20 Frequency of plant exposures by plant type

Botanical name	Common name	Frequency
Spathiphyllum spp	Peace lily	2972
Ilex spp	Holly	2597
Philodendron spp	Philodendron	2421
Euphorbia pulcherrima	Poinsettia	2206
Phytolacca americana	Pokeweed, inkberry	1697
Toxicodendron radicans	Poison ivy	1490
Ficus spp	Rubber tree, weeping fig	1136
Solanum spp	Nightshade, Jerusalem cherry	1046
Malus spp	Apple, crabapple (plant parts)	920
Schlumbergera bridgesii	Christmas cactus	918
Crassula spp	Jade plant	817
Nerium oleander	Oleander	785
Epipremnum aureum	Pothos, devil's ivy	725
Chrysanthemum spp	Chrysanthemum	716
Caladium spp	Caladium	711
Dieffenbachia spp	Dumbcane	707
Hedera helix	English ivy	705
Cactus spp	Cactus	700
Taraxacum officinale	Dandelion	668
Liriope muscari	Lilyturf	634

This table provides the frequency of involvement of plants in exposures reported to poison centers with no correlation with severity of toxicity. Several of the plants on the list pose little, if any, ingestion hazard.

are less than the numbers in the 2 previous years (48 cases in 2003 and 54 in 2002). Adverse drug reactions also accounted for 24 deaths. There were fewer deaths reported in 2004 related to occupational exposures (11 cases) than in any year since 1999. As in the prior 3 years, there were no reported fatalities from either food poisoning or tampering.

Tables 22A and 22B provide comprehensive demographic data on patient age, reason for exposure, medical outcome, and use of a health care facility for all 2 438 644 exposures, presented by substance categories. Table 22A focuses on nonpharmaceuticals; Table 22B presents drugs. Of the 2 776 925 substances logged in Tables 22A and 22B, 50.0% were nonpharmaceuticals, and 50.0% were pharmaceuticals. The reason for the exposure was intentional for 29.5% of pharmaceutical substances implicated compared with 5.4% of nonpharmaceutical substances. Correspondingly, treatment in a health care facility was provided in a higher percentage of exposures to pharmaceutical substances (38.7%) compared with nonpharmaceutical substances (16.6%). Pharmaceutical exposures also had more severe outcomes. Of substances implicated in fatal cases, 85.2% were pharmaceuticals, compared with 50.0% of substances reported in nonfatal cases. Similarly, 85.4% of substances implicated in major outcomes were pharmaceuticals.

In 2004, real-time monitoring of cases submitted to TESS was expanded to include GIS mapping, new surveillance case definitions, and enhanced toxicosurveillance at the local level. Monitoring results were reviewed at least daily. The core approach included monitoring increased individual poison center activity, increased reporting of clinical effects, and cases that met surveillance case definitions as described in the 2003 AAPCC TESS Annual Report.

Sixty US poison centers (all except Puerto Rico) continue to submit data to TESS in near real time, with

most centers submitting every 4 to 10 minutes. Surveillance query results are automatically sent to clinical toxicologists at the AAPCC when outliers are identified. Additional information is obtained by e-mail or telephone from reporting poison control centers when reports of potential importance are detected. Public health issues are brought to the attention of the National Center for Environmental Health/Agency for Toxic Substances Disease Registry at the Centers for Disease Control and Prevention. Affected state or local health departments are also alerted.

Data on outlier clinical effects are provided daily to 43 individual poison centers, covering all or parts of 39 states. In a few cases, results are also sent directly to state or local health departments; in most states, results are interpreted by poison control center staff before the communications of significant outliers to the appropriate health authorities. Individual poison control centers have developed surveillance case definitions, and new monitors identify cases that meet these definitions. Current surveillance case definitions identify cases that have clinical effects suggestive of nerve agents, cyanide, arsenic, botulism, ricin, anthrax (systemic and dermal), irritant gases, smallpox, arenavirus, radiation, and puffer fish ingestions with neurological effects. These monitors have been implemented in response to public health issues or concerns and are run at 1- to 12-hour intervals. Previous case definitions included both early and late paraquat/diquat toxicity and anticoagulant rodenticides. Cases coded as specific substances, for example, arsenic, ricin, carbon monoxide, and food poisoning/food products, are also monitored. Surveillance processes continue to be developed, refined, and evaluated.

Preliminary projects to assess the utility of TESS to provide dose-response data show promising results [24,25]. TESS substance, amount, and patient weight data were used to determine dose-response for acute pediatric exposures to clonidine and amlodipine. Additional evaluations and development of approaches to enhance the methodology are underway.

In closing, we gratefully acknowledge the extensive contributions of each participating poison center and the assistance of the many health care providers who provided comprehensive data to the poison centers for inclusion in this database. We especially acknowledge the dedicated efforts of the Specialists in Poison Information who meticulously coded 2.4 million poison exposures in 2004.

Table 21 Summary of fatal exposures reported to TESS in 2004

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
NONPHARMACEUTICALS							
Alcohols							
1 i	33 y	Ethanol	A/C	Ing	Int abuse	607 mg/dL§	
2 p	42 y	Ethanol	A/C	Ing	Int abuse	537 mg/dL	
3 p	42 y	Ethanol	A	Ing	Int suicide		
4	44 y	Ethanol	A	Ing	Int abuse	218 mg/dL	
5 p	44 y	Ethanol	A/C	Ing	Int abuse		
6	46 y	Ethanol	A/C	Ing	Int abuse	358 mg/dL	
7	55 y	Ethanol	A	Ing	Int abuse	500 mg/dL	
8 p	52 y	Ethanol	A	Ing	Int suicide	164.2 mg/dL	
		Acetaminophen/propoxyphene				171 μg/mL¥	
9 p	55 y	Ethanol	A	Ing	Int suicide	490 mg/dL	
		Acetaminophen/propoxyphene				78 μg/mL¥	
10 p	34 y	Ethanol	U	Ing/unk	Int unk		
		Benzodiazepine					
		Opioid					
11 a	76 y	Ethanol	C	Ing	Int abuse		
		Lead				115 μg/dL	
12	39 y	Ethanol	A/C	Ing	Int abuse	250 mg/dL	
		Oxycodone (long-acting)				170 ng/mL	
		Cyclobenzaprine				0.19 μg/mL	
13	46 y	Ethanol (denatured)/ethyl acetate/ methanol/heptane	A	Ing	Unk	Methanol 570 mg/dL§	
14 a	45 y	Ethanol /isopropyl alcohol hand sanitizer	A	Ing	Int abuse	Ethanol 32.5 mg/dL	
15	28 y	Ethanol/methanol/methyl isobutyl ketone	A	Ing	Int abuse	Methanol 520 mg/dL	
16 p	50 y	Isopropyl alcohol	A	Ing	Int suicide		
17	63 y	Isopropyl alcohol	U	Ing	Int abuse		
18	90 y	Isopropyl alcohol	A	Ing	Int suicide		
		Iodine					
19	39 y	Isopropyl alcohol	U	Ing	Int abuse		
		Mouthwash (ethanol)					
		Acetaminophen				43.8 μg/mL	
20 p	60s y	Methanol	A	Ing	Int suicide	4 mg/dL	
21 i	22 y	Methanol	A	Ing	Int suicide	234 mg/dL	
		Fluoxetine					
		Quetiapine					

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
NONPHARMACEUTICALS							
Alcohol							
22 p	39 y	Methanol Chlorofluorocarbon	U	Ing	Int abuse		
23	61 y	Methanol Pine oil/isopropyl alcohol cleaner	A	Ing	Int unk	740 mg/dL	
See also cases 88, 91, 98, 102, 104, 135, 210, 332 to 337, 357, 379, 432, 435, 437, 456, 493, 494, 503, 510, 516, 517, 578 to 586, 611, 617, 641, 645, 646, 655, 676, 683, 721, 727, 728, 755, 762, 776, 783 to 785, 793, 828, 876, 914 to 916, 920, 934, 969, 974, 978, 985, 994, 1002, 1004, 1059, 1080, 1085, 1115, 1122, 1164, 1165, 1182, and 1183 (ethanol); 104, 494, and 575 (isopropyl alcohol).							
Automotive/aircraft/boat products							
24	19 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	36.7 mg/dL	
25 p	27 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide		
26	31 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	50 mg/dL	
27	34 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	65 mg/dL	
28 i/p	36 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	0.091 mg/dL§	
29	41 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	40 mg/dL	
30 p	42 y	Antifreeze (ethylene glycol)	A	Ing/unk	Int suicide	27 mg/dL	
31 p	45 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	267 mg/dL	
32 p	46 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide		
33	47 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	256 mg/dL	
34	47 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	183 mg/dL	17 h
35	48 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide		
36	50 y	Antifreeze (ethylene glycol)	A/C	Ing	Int unk		
37	63 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide	9 mg/dL	
38	78 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide		
39	84 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide		
40 p	>19 y	Antifreeze (ethylene glycol)	A	Ing	Int suicide		
41 a	43 y	Antifreeze (ethylene glycol) Cocaine	A	Ing/unk	Int suicide	138 mg/dL Benzoylecgonine 0.562 μg/mL§	
42	24 y	Antifreeze (ethylene glycol) Diphenhydramine	A	Ing	Int suicide	120 mg/dL	
43 p	43 y	Antifreeze (ethylene glycol) Drain opener (sodium hydroxide)	A	Ing	Int unk		
44	54 y	Antifreeze (ethylene glycol) Mouthwash (ethanol/methyl salicylate)	A	Ing	Int abuse	118 mg/dL	
45	47 y	Antifreeze (ethylene glycol) Sertraline Boric acid	A	Ing	Int unk	712.3 mg/dL	
46 a/p	33 y	Carburetor cleaner	A/C	Inh	Int abuse	Dichloromethane 106 μg/mL§ Methanol 20 mg/dL§ Toluene 6.3 μg/mL§	
47	38 y	Carburetor cleaner (acetone/methanol/xylene)	A	Inh	Int abuse		
48	27 y	Carburetor cleaner (methanol/hydrocarbons)	A	Inh	Int abuse		
49	36 y	Windshield washer fluid (methanol)	A	Asp/ing	Int suicide	460 mg/dL	
See also case 378 (antifreeze [ethylene glycol]).							
Batteries							
50	46 y	battery acid (sulfuric acid)	A	Ing	Int suicide		
Bites and envenomations							
51	44 y	*Bothrops alternatus*	A	Bite/sting	Bite/sting		
52 a	50 y	*Crotalidae*, unk Fentanyl	A	Bite/sting/ Paren	Bite/sting		
53 a	55 y	*Crotalus horridus horridus*	A	Bite/sting	Bite/sting		
54	44 y	*Hymenoptera*	A	Bite/sting	Bite/sting		
55 a	5 y	*Loxosceles reclusa* (brown recluse)	A	Bite/sting	Bite/sting		
Chemicals							
56 a	25 y	Aluminum fluoride	A	Ing	Int suicide		
57 p	23 y	Ammonia (anhydrous)	U	Inh	Env	>5 mmol/L	
58 a/p	Unk	Ammonia (anhydrous)	A	Derm/inh	Int misuse		
59 p	23 y	Chloroform	A	Inh	Int suicide		
60 a	26 y	Cyanide	A	Ing	Int suicide	0.27 μg/mL§	
61 a	37 y	Cyanide	A	Ing	Int suicide	0.3 μg/mL	
62	40 y	Cyanide	A	Ing	Int suicide		
63 p	40s y	Cyanide	A	Ing	Int suicide		
64 a/p	50 y	Cyanide	A	Unk	Int suicide		
65 p	38 y	Diphenylmethyl diisocyanate	A	Derm/inh/ocu	Occ		

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
NONPHARMACEUTICALS							
Chemicals							
66	22 y	Ethylene glycol	U	Ing	Int unk	45 mg/dL	
67	26 y	Ethylene glycol	A	Ing	Int suicide	65 mg/dL	
68 p	26 y	Ethylene glycol	A	Ing	Unk		
69	31 y	Ethylene glycol	A	Ing	Int unk	77 mg/dL	
70	33 y	Ethylene glycol	A	Ing	Int suicide	2000 mg/dL	
71	39 y	Ethylene glycol	A	Ing	Int suicide		
72	42 y	Ethylene glycol	U	Ing	Unk		
73	43 y	Ethylene glycol	A	Ing	Unk		
74	48 y	Ethylene glycol	A	Ing	Int suicide	26 mg/dL	
75 a	49 y	Ethylene glycol	A	Ing	Int suicide	838 mg/dL	
						Glycolic acid 348 mg/dL	
76	50 y	Ethylene glycol	A	Ing	Unk	43.3 mg/dL	
77	51 y	Ethylene glycol	A	Ing	Int suicide	28 mg/dL	
78	51 y	Ethylene glycol	U	Ing	Unk	14 mg/dL	
79	52 y	Ethylene glycol	U	Ing	Unk	7 mg/dL	
80	56 y	Ethylene glycol	A	Ing	Unk	15 mg/dL	
81	71 y	Ethylene glycol	A	Ing	Int suicide	250 mg/dL	
82	82 y	Ethylene glycol	A	Ing	Int suicide	40 mg/dL	
83	>19 y	Ethylene glycol	A	Ing	Int suicide		
84	59 y	Ethylene glycol	A	Ing	Int suicide		
		Alprazolam					
85	38 y	Ethylene glycol	A	Ing	Int suicide	46 mg/dL	
		Aspirin/carisoprodol					
		Paroxetine[A]					
86	50 y	Ethylene glycol	A	Ing	Int suicide		
		Clonazepam					
87 p	61 y	Ethylene glycol	U	Ing	Int suicide	60 mg/dL	
		Cyanide				0.26 μg/mL	
88	52 y	Ethylene glycol	U	Ing	Unk	30 mg/dL	
		Ethanol				167 mg/dL	
89	32 y	Ethylene glycol	A	Ing	Int suicide	219 mg/dL	
		Methylenedioxymethamphetamine					
90	48 y	Ethylene glycol	A	Ing	Int suicide		
		Morphine				250 ng/mL§	
91 p	26 y	Ethylene glycol	U	Ing/unk	Unk		
		Unknown substance					
		Ethanol				>200 mg/dL	
92	42 y	Hydrochloric acid	A	Ing	Int suicide		
93	55 y	Hydrochloric acid	A	Ing	Int suicide		
94 a	71 y	Hydrochloric acid	A	Ing	Int suicide		
95 a	58 y	Hydrofluoric acid	A	Ing	Malicious		
96	60 y	Hydrofluoric acid	A	Derm	Occ		
97	29 y	Industrial cleaner (acetone/ methyl ethyl ketone)	A	Ing	Int suicide		
		Acetaminophen/hydrocodone					
98 a	47 y	Propylene glycol	A	Ing	Unk	1171 μg/mL§	
		Ethanol					
99 a	58 y	Sodium hydroxide	A	Asp/ing/inh	Occ		
		Polyaluminum hydroxychlorosulfate					
		Corrosion inhibitor					
100 p	>19 y	Strychnine	A	Ing	Int suicide		
101	70 y	Sulfuric acid	A	Ing	Unint misuse		
102	35 y	Sulfuric acid	A	Ing	Int suicide		
		Ethanol					
103	47 y	Unknown acid	A	Ing	Int suicide		
104	41 y	Unknown alkali	U	Ing	Int abuse		
		Isopropyl alcohol				15 mg/dL	
		Ethanol				38 mg/dL	
105	37 y	Unknown chemical	U	Unk	Unk		
See also cases 45 (boric acid); 99 (corrosion inhibitor); 87, 208, and 209 (cyanide); 99 (polyaluminum hydroxychlorosulfate); 347 (propylene glycol); 213 (sulfuric acid); 213 (trihydroxytriazine); and 212 and 461 (unknown chemical).							
Cleaning substances (household)							
106	87 y	Disinfectant (phenol/alkali)	A	Ing	Int suicide		
107 p	73 y	Disinfectant (sodium hypochlorite, 12.5%)	A	Ing/inh	Occ		
		Industrial cleaner (acid)					
		Dextromethorphan				0.367 μg/mL§	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
NONPHARMACEUTICALS							
Cleaning substances (household)							
108	55 y	Drain opener (alkali)	A	Ing	Int suicide		
109	45 y	Drain opener (alkali)	A	Ing	Int suicide		
		Turpentine					
		Iodine					
110	57 y	Drain opener (hydrochloric acid, 15%-25%)	A	Derm/ing/ocu	Int suicide		
111	54 y	Drain opener (hydrochloric acid, 5-15%)	A	Ing	Int suicide		
112	76 y	Drain opener (sodium hypochlorite 4.5%/sodium hydroxide, 2.3%)	A	Ing	Unint gen		
113	65 y	Drain opener (potassium hydroxide)	A	Ing	Int suicide		
114	43 y	Drain opener (sodium hydroxide, 54%)	A	Ing	Int suicide		
115	40 y	Drain opener (sodium hydroxide, 50%-60%)	A	Ing	Int suicide		
116	81 y	Drain opener (sulfuric acid)	A	Ing	Int suicide		
		Acetaminophen				153 μg/mL	
		Naproxen					
117	65 y	Drain opener (sulfuric acid, 95%)	A	Ing	Int suicide		
118	50s y	Laundry detergent (anionic/cationic)	A	Ing	Unint gen		
119	49 y	Oven cleaner (sodium hydroxide, 5%-10%)	A	Ing	Unint gen		
120 p	42 y	Pine oil/isopropyl alcohol cleaner	A	Asp/ing	Int unk		
121	52 y	Pine oil/isopropyl alcohol cleaner	A	Ing	Int suicide		
122	61 y	Rust remover (phosphoric acid, 44.99%)	A	Ing	Int suicide		
123 a	51 y	Toilet bowl cleaner (hydrochloric acid)	A	Ing	Int suicide		
124	84 y	Toilet bowl cleaner (hydrochloric acid, 15%)	A	Ing	Int suicide		
125	30 y	Toilet bowl cleaner (hydrochloric acid, 15%-25%)	A	Ing	Int suicide		
126	59 y	Toilet bowl cleaner (hydrochloric acid, 9.5%)	A	Ing	Int suicide		
127 a	1 y	Wheel cleaner (ammonium bifluoride)	A	Ing	Unint gen		
See also cases 43 (drain opener [sodium hydroxide]) and 23 (pine oil/isopropyl alcohol cleaner).							
Industrial cleaners							
See also case 107 (industrial cleaner [acid]).							
Cosmetics/personal care products							
128	72 y	Aftershave	A	Ing	Int suicide		
See also cases 19 (mouthwash [ethanol]) and 44 (mouthwash [ethanol/methyl salicylate]).							
Deodorizers							
129 a/p	11 y	Air freshener	U	Inh	Int abuse		
130 i/p	16 y	Air freshener	A	Inh	Int abuse		
Dyes							
131	79 y	Fluorescein dye	A	Paren	Adv rxn		
		Phenylephrine					
Food products/food poisoning							
132 p	>19 y	Cashew nuts	A	Ing	Adv rxn		
Foreign bodies/toys/miscellaneous							
133 a	63 y	Activated charcoal	A	Asp/ing	Ther err		
		Acetaminophen/butalbital/caffeine				73 μg/mL¥	
		Zolpidem					
134	12 y	Activated charcoal	A	Asp/ing	Adv rxn		
		Diphenhydramine					
		Citalopram					
135	24 y	Activated charcoal	A	Asp/ing	Adv rxn		
		Ethanol				213 mg/dL	
		Quetiapine					
See also cases 401 and 1012 (activated charcoal).							
Fumes/gases/vapors							
136 p	48 y	Asphyxiant, unk	A	Inh/unk	Env		
137 p	19 y	Butane	A	Inh	Int abuse		
138 p	>19 y	Carbon monoxide	A	Inh	Occ	84%§	
139 i/p	3 mo	Carbon monoxide	U	Inh	Env	19%	
140	2 y	Carbon monoxide	A	Inh	Env		
141 p	5 y	Carbon monoxide	C	Inh	Env	53%	
142 p	7 y	Carbon monoxide	A	Inh	Env		

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
NONPHARMACEUTICALS							
Fumes/gases/vapors							
143 i	9 y	Carbon monoxide	A	Inh	Env		
144	9 y	Carbon monoxide	A	Inh	Env		
145 i/p	11 y	Carbon monoxide	A	Inh	Env		
146 p	14 y	Carbon monoxide	A	Inh	Env	44.3%	
147 i/p	15 y	Carbon monoxide	A	Inh	Env		
148 p	15 y	Carbon monoxide	A	Inh	Env		
149 p	16 y	Carbon monoxide	A	Inh	Int suicide	21%	
150 i/p	16 y	Carbon monoxide	A	Inh	Int suicide		
151 a/i/p	17 y	Carbon monoxide	A	Inh	Env		
152 a/i/p	17 y	Carbon monoxide	A	Inh	Env		
153 a/i/p	17 y	Carbon monoxide	A	Inh	Env		
154 i/p	21 y	Carbon monoxide	A	Inh	Unk		
155 p	24 y	Carbon monoxide	U	Inh	Env		
156 p	25 y	Carbon monoxide	A	Inh	Int suicide	39%	
157 p	25 y	Carbon monoxide	C	Inh	Env		
158 i/p	26 y	Carbon monoxide	A	Inh	Env		
159 p	36 y	Carbon monoxide	U	Inh	Env		
160 i/p	36 y	Carbon monoxide	A	Inh	Env		
161 p	38 y	Carbon monoxide	A	Inh	Int suicide	46%	
162 i/p	40 y	Carbon monoxide	A	Inh	Env		
163 p	40 y	Carbon monoxide	A/C	Inh	Env		
164 p	40 y	Carbon monoxide	A	Inh	Env	42%	
165 i/p	41 y	Carbon monoxide	A	Inh	Env		
166 i/p	42 y	Carbon monoxide	A	Inh	Env		
167 i/p	43 y	Carbon monoxide	A	Inh	Env		
168 i/p	45 y	Carbon monoxide	A	Inh	Unk		
169 i/p	46 y	Carbon monoxide	A	Inh	Unk	79.03%§	
170 p	46 y	Carbon monoxide	A	Inh	Env		
171	46 y	Carbon monoxide	A	Inh	Env	6%	
172 i/p	50 y	Carbon monoxide	A	Inh	Env	44%§	
173	51 y	Carbon monoxide	C	Inh	Env	21%	
174 p	51 y	Carbon monoxide	A	Inh	Occ	80%§	
175 p	52 y	Carbon monoxide	A	Inh	Env	43.4%	
176 i/p	53 y	Carbon monoxide	A	Inh	Env		
177 i/p	56 y	Carbon monoxide	A	Inh	Env		
178 i/p	57 y	Carbon monoxide	A	Inh	Env		
179 p	59 y	Carbon monoxide	A	Inh	Int suicide		
180 p	60 y	Carbon monoxide	A	Inh	Env		
181 i/p	69 y	Carbon monoxide	A	Inh	Env		
182 i/p	70 y	Carbon monoxide	A	Inh	Int suicide		
183 i/p	71 y	Carbon monoxide	A	Inh	Env		
184 a/p	72 y	Carbon monoxide	A	Inh	Env		
185 i/p	72 y	Carbon monoxide	A	Inh	Int suicide		
186 i/p	83 y	Carbon monoxide	A	Inh	Int suicide	80%§	
187 i/p	>19 y	Carbon monoxide	A	Inh	Env		
188 i/p	>19 y	Carbon monoxide	A	Inh	Env	55%§	
189 p	>19 y	Carbon monoxide	A	Inh	Int suicide		
190 p	>19 y	Carbon monoxide	A	Inh	Env	23.1%	
191 p	>19 y	Carbon monoxide	A	Inh	Env		
192 i/p	>19 y	Carbon monoxide	A	Inh	Int suicide		
193 p	49 y	Carbon monoxide	A	Ing/inh	Int suicide	59.5%§	
		Acetaminophen/codeine				42 μg/mL§,¥	
						Codeine 23.482 μg/mL§	
		Bupropion (long-acting)[A]				711 ng/mL§	
194 p	17 y	Carbon monoxide	A	Ing/inh	Int suicide	35.7%§	
		Bupropion (long-acting)					
195 p	51 y	Carbon monoxide	A	Ing/inh	Int suicide	>80%§	
		Fluoxetine					
		Olanzapine					
196 p	19 mo	Carbon monoxide/smoke	A	Inh	Env	38%§	
197 p	3 y	Carbon monoxide/smoke	A	Inh	Env	44.6%	
198 i/p	6 y	Carbon monoxide/smoke	A	Inh	Env		
199 p	6 y	Carbon monoxide/smoke	A	Inh	Env	34%	
200 i/p	7 y	Carbon monoxide/smoke	A	Inh	Env		
201	30 y	Carbon monoxide/smoke	A	Inh	Env	38.9%	
202 p	30s y	Carbon monoxide/smoke	A	Inh	Env		
203 p	35 y	Carbon monoxide/smoke	A	Inh	Env	30.5%	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
NONPHARMACEUTICALS							
Fumes/gases/vapors							
204 p	39 y	Carbon monoxide/smoke	A/C	Inh	Env	37.4%	
205 p	55 y	Carbon monoxide/smoke	A	Inh	Env	62%	
206 p	76 y	Carbon monoxide/smoke	A	Inh	Malicious	40%	
207	>19 y	Carbon monoxide/smoke	A	Inh	Env		
208 p	30s y	Carbon monoxide/smoke Cyanide	A	Inh	Env	50%	
209 p	76 y	Carbon monoxide/smoke Cyanide	A	Inh	Env	10%	6 h
210 p	47 y	Carbon monoxide/smoke Ethanol	A	Ing/inh	Env	33% 250 mg/dL	
211 p	4 y	Carbon monoxide/smoke Midazolam	A	Inh/paren	Env	51.8%	
212 p	74 y	Chlorine Other swimming pool product Unk chemical	A	Inh	Unint misuse		
213	38 y	Chlorine Sulfuric acid Trihydroxytriazine	A	Inh	Env		
214 p	43 y	Helium	A	Inh	Int abuse		
215 a/p	22 y	Hydrogen sulfide	A	Inh	Occ		
216 p	28 y	Hydrogen sulfide	A	Inh	Env		
217 p	32 y	Methane	A	Inh	Occ		
See also case 948 (cyclopropane).							
Heavy metals							
218 a	42 y	Algaecide (copper)	A	Ing	Int suicide	Copper 3.24 μg/mL	16 h
219	64 y	Arsenic	A	Ing	Int suicide		
220	67 y	Arsenic Ricin	U	Unk	Malicious		
221	25 y	Copper	C	Other	Env		
See also case 11 (lead).							
Hydrocarbons							
222 p	16 y	Chlorofluorocarbon	A	Inh	Int abuse		
223 p	18 y	Chlorofluorocarbon	A	Inh	Int abuse		
224 p	20 y	Chlorofluorocarbon	A	Inh	Int abuse		
225 a/i/p	>19 y	Chlorofluorocarbon	A	Inh	Occ		
226 p	20 y	Gasoline Chloral hydrate	A/C	Ing/inh	Int suicide	Trichloroethanol 3.5 μg/mL§	
See also cases 22 (chlorofluorocarbon), 233 (gasoline), and 109 and 377 (turpentine).							
Mushrooms							
227 a	83 y	*Amanita bisporigera*	A	Ing	Unint misuse		
228 a/p	44 y	*Amanita muscaria*	A	Ing	Int misuse		
229 a	70 y	*Amanita phalloides*	A	Ing	Unint misuse		
230 i	76 y	Unk mushroom	A	Ing	Int suicide		
See also case 751 (Amanita muscaria).							
Paints and stripping agents							
231 p	40 y	Spray paint Amphetamine Trazodone[A]	U	Ing/inh	Int unk		
Pesticides: herbicides (including algaecides, defoliants, desiccants, and plant growth regulators)							
232 a	34 y	2,4-Dichloro-phenoxyacetic acid	A	Ing	Int suicide		
233	30 y	2,4-Dichloro-phenoxyacetic acid Gasoline	A	Ing	Int suicide		
234 a	75 y	Glyphosate	A	Ing	Int suicide		
Pesticides: insecticides (including insert growth regulators, molluscicides, nematicides)							
235	24 y	Cypermethrin/imiprothrin	A	Asp/ing	Int suicide		
236	89 y	Diazinon	A	Ing	Int suicide		
237	>19 y	Organophosphate	A	Ing/paren	Int suicide		
238 a	38 y	Terbufos	A	Ing	Int suicide		
Pesticides: rodenticides							
See also case 457 (long-acting anticoagulant rodenticide).							

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
NONPHARMACEUTICALS							
Plants							
239 a	19 y	*Datura* spp	A	Ing	Int abuse		
See also case 220 (ricin).							
Swimming pool/aquarium							
240 a	56 y	Algaecide (benzylammonium chloride)	A	Ing	Int suicide		
241	23 y	Chlorine	A	Derm/inh/ocu	Unint gen		
See also case 212 (other swimming pool product).							
Other/unk nondrug substances							
242 p	24 y	Unk substance	U	Unk	Unk		
243 p	39 y	Unk substance Unk drug	A	Ing	Unk		
See also cases 91 and 1153 (unk substance).							
PHARMACEUTICALS							
Analgesics							
244 a	2 y	Acetaminophen	C	Ing/rectal	Ther err	72 μg/mL	8 h
245 a	3 y	Acetaminophen	C	Ing	Ther err	52 μg/mL	16 h
246	15 y	Acetaminophen	A	Ing	Int suicide	15 μg/mL	
247	18 y	Acetaminophen	A	Ing	Int suicide	90 μg/mL	
248	18 y	Acetaminophen	A/C	Ing	Int suicide	>210 μg/mL	
249	19 y	Acetaminophen	A	Ing	Int suicide	650 μg/mL	
250	19 y	Acetaminophen	A	Ing	Int suicide	35 μg/mL	
251	21 y	Acetaminophen	A	Ing	Int suicide	144 μg/mL	
252	22 y	Acetaminophen	A	Ing	Int suicide	41 μg/dL	
253	22 y	Acetaminophen	A	Ing	Int suicide	158 μg/mL	24 h
254	24 y	Acetaminophen	A	Ing	Int suicide	21 μg/mL	24 h
255	27 y	Acetaminophen	A	Ing	Int suicide		
256	29 y	Acetaminophen	A	Ing	Int suicide		
257	29 y	Acetaminophen	C	Ing	Int misuse	66 μg/mL	
258	29 y	Acetaminophen	A	Ing	Int unk	32 μg/mL	69 h
259	33 y	Acetaminophen	U	Ing	Int suicide	117 μg/mL	
260	33 y	Acetaminophen	A	Ing	Int suicide	129 μg/mL	
261	34 y	Acetaminophen	A	Ing	Int suicide	68 μg/mL	28 h
262	36 y	Acetaminophen	A	Ing	Int suicide	41 μg/mL	2 d
263	36 y	Acetaminophen	U	Ing	Int suicide	24 μg/mL	24 h
264	37 y	Acetaminophen	C	Ing	Int misuse	29.8 μg/mL	
265	38 y	Acetaminophen	A	Ing	Unk	78 μg/mL	
266	38 y	Acetaminophen	C	Ing	Ther err		
267	38 y	Acetaminophen	A	Ing	Int suicide		
268	39 y	Acetaminophen	A	Ing	Int suicide	74 μg/mL	
269	39 y	Acetaminophen	U	Ing	Int unk	13 μg/mL	
270	39 y	Acetaminophen	A/C	Ing	Int suicide	198 μg/mL	l3 d
271 p	39 y	Acetaminophen	U	Ing	Unk	20 μg/mL	
272 p	40 y	Acetaminophen	C	Ing	Ther err	43 μg/mL	
273	40 y	Acetaminophen	U	Ing	Unk	50 μg/mL	
274 a	40 y	Acetaminophen	A	Ing	Malicious	101 μg/mL	
275	40 y	Acetaminophen	A	Ing	Int suicide	48.3 μg/mL	36 h
276	42 y	Acetaminophen	C	Ing	Int misuse	23 μg/mL	
277	43 y	Acetaminophen	C	Ing	Ther err	28 μg/mL	
278	43 y	Acetaminophen	A/C	Ing	Int suicide	42 μg/mL	
279	43 y	Acetaminophen	A	Ing	Int suicide	116 μg/mL	
280	45 y	Acetaminophen	A	Ing	Int unk	64 μg/mL	
281	45 y	Acetaminophen	C	Ing	Int misuse	8 μg/mL	24 h
282	45 y	Acetaminophen	A/C	Ing	Int suicide	82.3 μg/mL	
283	46 y	Acetaminophen	C	Ing	Int misuse		
284	46 y	Acetaminophen	A	Ing	Int suicide		
285	47 y	Acetaminophen	U	Ing	Int unk	381 μg/mL	
286	50 y	Acetaminophen	A	Ing	Int suicide	>200 μg/mL	13 h
287	51 y	Acetaminophen	U	Ing	Int misuse	95 μg/mL	
288 a	51 y	Acetaminophen	U	Ing	Int suicide	1180.6 μg/mL	
289	51 y	Acetaminophen	C	Ing	Int misuse		
290	52 y	Acetaminophen	A	Ing	Int suicide	328 μg/mL	
291	52 y	Acetaminophen	U	Ing	Int suicide	289 μg/mL	
292	53 y	Acetaminophen	C	Ing	Int misuse		
293	53 y	Acetaminophen	U	Ing	Unk	12 μg/mL	
294	54 y	Acetaminophen	C	Ing	Int suicide	469 μg/mL	
295	55 y	Acetaminophen	C	Ing	Int suicide	681.5 μg/mL	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
296	56 y	Acetaminophen	A/C	Ing	Int misuse	136 μg/mL	3 d
297	57 y	Acetaminophen	A/C	Ing	Int suicide	68 μg/mL	
298 p	58 y	Acetaminophen	U	Ing	Int suicide	>200 μg/mL	
299	60 y	Acetaminophen	U	Ing	Int suicide		
300	61 y	Acetaminophen	A	Ing	Int suicide	315 μg/mL	
301	63 y	Acetaminophen	U	Ing	Int unk	302 μg/mL	
302	67 y	Acetaminophen	A/C	Ing	Int suicide	194 μg/mL	
303 i	69 y	Acetaminophen	C	Ing	Ther err	50 μg/mL	
304	70 y	Acetaminophen	C	Ing	Ther err	74 μg/mL	
305	70 y	Acetaminophen	C	Ing	Int misuse	70 μg/mL	
306	76 y	Acetaminophen	A	Ing	Int suicide		
307	81 y	Acetaminophen	A	Ing	Int suicide	223 μg/mL	
308	82 y	Acetaminophen	U	Ing	Unk	96.6 μg/mL	
309	60 y	Acetaminophen	C	Ing	Int misuse	10 μg/mL	
		Acetaminophen/aspirin/caffeine				13 mg/dL¶	
310	71 y	Acetaminophen	C	Ing	Int misuse	47 μg/mL	
		Acetaminophen/dextromethorphan/ doxylamine/pseudoephedrine					
311	20 y	Acetaminophen	A	Ing	Int suicide	142 μg/mL	24 h
		Acetaminophen/diphenhydramine					
312	23 y	Acetaminophen	A	Ing	Int suicide	549 μg/mL	
		Acetaminophen/diphenhydramine				Diphenhydramine 2.3 μg/mL	
		Clomipramine[A]					
313 p	34 y	Acetaminophen	A/C	Ing	Int misuse	171.5 μg/mL	
		Acetaminophen/hydrocodone					
314	34 y	Acetaminophen	C	Ing	Int misuse	29 μg/mL	
		Acetaminophen/hydrocodone					
315	25 y	Acetaminophen	A	Ing	Int suicide	88 μg/mL	
		Alprazolam					
		Tricyclic antidepressant[A]					
316 p	43 y	Acetaminophen	U	Ing	Int abuse	5.4 μg/mL	
		Amphetamine					
		Benzodiazepine					
317	32 y	Acetaminophen	A	Ing	Int suicide	33 μg/mL	24 h
		Aspirin				12.2 mg/dL	24 h
318 a	15 y	Acetaminophen	A	Ing	Int suicide	155 μg/mL	12 h
		Buprenorphine					
		Codeine/guaifenesin					
319	41 y	Acetaminophen	A	Ing	Int suicide		
		Carisoprodol					
320	72 y	Acetaminophen	A	Ing/inh	Int suicide	51 μg/mL	
		Chlordiazepoxide					
		Marijuana					
321	56 y	Acetaminophen	A/C	Ing	Int suicide	414 μg/mL	
		Clonazepam					
		Paroxetine					
322	18 y	Acetaminophen	A	Ing/unk	Int suicide	210 μg/mL	
		Cocaine					
323	40s y	Acetaminophen	U	Ing/unk	Int suicide	10 μg/mL	
		Cocaine					
324	47 y	Acetaminophen	A	Ing/unk	Int suicide		
		Cocaine					
325	67 y	Acetaminophen	A	Ing	Int suicide	154 μg/mL	24 h
		Codeine					
326 p	29 y	Acetaminophen	A/C	Ing	Int suicide	648 μg/mL	
		Diazepam					
		Alprazolam					
327	54 y	Acetaminophen	A	Ing	Int suicide	316.3 μg/mL	
		Diphenhydramine				1.114 μg/mL§	
328 p	49 y	Acetaminophen	U	Ing	Int suicide	143 μg/mL	
		Diphenhydramine					
		Acetaminophen/codeine					
329	28 y	Acetaminophen	A	Ing/unk	Int abuse	342 μg/mL	
		Diphenhydramine					
		Cocaine					
330	41 y	Acetaminophen	U	Ing	Unk	22.3 μg/mL	
		Ephedrine					
		Meprobamate[A]					

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
331	76 y	Acetaminophen	U	Ing	Int suicide	16.5 μg/mL	3 d
		Esomeprazole					
		Rabeprazole (long-acting)[A]					
332	20 y	Acetaminophen	U	Ing	Int unk	300 μg/mL	
		Ethanol					
333	21 y	Acetaminophen	A	Ing	Int suicide	73 μg/mL	12 h
		Ethanol					
334	39 y	Acetaminophen	A	Ing	Int suicide	27 μg/mL	21 h
		Ethanol					
335	46 y	Acetaminophen	C	Ing	Int suicide	63 μg/mL	
		Ethanol					
336	21 y	Acetaminophen	A	Ing	Int suicide	36.9 μg/mL	
		Ethanol					
		Aspirin				7.2 mg/dL	
337	54 y	Acetaminophen	U	Ing/inh	Int suicide	726.5 μg/mL	
		Ethanol				187 mg/dL	
		Marijuana					
338	21 y	Acetaminophen	A	Ing	Int suicide	1780 μg/mL	
		Fluoxetine				930 ng/mL§	
		Amitriptyline				550 ng/mL§	
339	36 y	Acetaminophen	A/C	Ing	Int suicide	44 μg/mL	
		Gabapentin					
		Topiramate[A]					
340	17 y	Acetaminophen	A	Ing	Int suicide	120 μg/mL	26 h
		Hydroxyzine					
341	36 y	Acetaminophen	A	Ing	Int suicide	7.6 μg/mL	2 d
		Ibuprofen					
342	36 y	Acetaminophen	C	Ing	Int misuse		
		Ibuprofen					
343	26 y	Acetaminophen	A	Ing	Int suicide		
		Iron				336 μg/dL	
344 p	40s y	Acetaminophen	A	Ing	Int suicide	33 μg/mL	
		Morphine					
345	26 y	Acetaminophen	A	Ing	Int suicide		
		Multiple vitamins with iron				Iron 333 μg/dL	
346	24 y	Acetaminophen	A	Ing/unk	Unk	147 μg/mL	
		Phencyclidine					
		Marijuana					
347	58 y	Acetaminophen	U	Ing	Int unk	145 μg/mL	
		Propylene glycol					
348 p	41 y	Acetaminophen	A	Ing	Int suicide	570 μg/mL	
		Tricyclic antidepressant					
349	51 y	Acetaminophen	U	Ing	Unk		
		Unk drug					
350	14 y	Acetaminophen	A	Ing	Int suicide		
		Zolpidem					
		Risperidone[A]					
351	21 y	Acetaminophen	A	Ing	Int suicide	163 μg/mL	
		Zolpidem					
		Risperidone[A]					
352	33 y	Acetaminophen (long-acting)	A	Ing	Int suicide	196 μg/mL	
353	35 y	Acetaminophen (long-acting)	A	Ing	Int suicide	2 μg/mL	48 h
354	48 y	Acetaminophen/aspirin/caffeine	C	Ing	Ther err	92 μg/mL¥	
		Acetaminophen/hydrocodone					
355	34 y	Acetaminophen/codeine	C	Ing	Ther err		
356	55 y	Acetaminophen/codeine	A/C	Ing	Int suicide		
		Acetaminophen/hydrocodone					
		Escitalopram					
357	59 y	Acetaminophen/codeine	A	Ing	Int suicide	67 μg/mL¥	
		Acetaminophen/hydrocodone					
		Ethanol[A]					
358	52 y	Acetaminophen/codeine	A/C	Ing	Int suicide	335 μg/mL¥	
						Codeine 3 μg/mL§	
						Morphine 36 ng/mL§	
		Carisoprodol				8.3 μg/mL§	
						Meprobamate 75 μg/mL§	
		Diphenhydramine[A]				1 μg/mL§	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
359	31 y	Acetaminophen/codeine Chlordiazepoxide	C	Ing	Int unk	27.3 μg/mL¥	
360	66 y	Acetaminophen/codeine Naproxen Ibuprofen[A]	A	Ing	Int suicide	116 μg/mL¥ Codeine 0.7 μg/mL§	4 h
361 p	74 y	Acetaminophen/codeine Thioridazine Lorazepam[A]	A/C	Ing	Int suicide		
362	20 y	Acetaminophen/diphenhydramine	A/C	Ing	Int suicide	88 μg/mL¥	24 h
363	20 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	500 μg/mL¥	
364	24 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	449.2 μg/mL¥	18 h
365	25 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	69 μg/mL¥	
366	25 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	50 μg/mL¥	48 h
367 p	28 y	Acetaminophen/diphenhydramine	U	Ing	Int suicide	507 μg/mL¥	
368	29 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	93 μg/mL¥	36 h
369	29 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	63 μg/mL¥	
370	33 y	Acetaminophen/diphenhydramine	A	Asp/ing	Int suicide	589 μg/mL¥	4.3 h
371	39 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	467 μg/mL¥	4 h
372	39 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	194 μg/mL¥	
373	45 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide		
374	46 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	405 μg/mL¥	3 h
375 p	51 y	Acetaminophen/diphenhydramine	A	Ing	Int suicide	153 μg/mL¥	
376	25 y	Acetaminophen/diphenhydramine Acetaminophen	A/C	Ing	Int unk	52 μg/mL¥	
377	23 y	Acetaminophen/diphenhydramine Acetaminophen/aspirin Turpentine	A	Ing	Int suicide	>300 μg/mL¥	
378	18 y	Acetaminophen/diphenhydramine Antifreeze (ethylene glycol)	U	Ing	Int suicide	175 μg/mL¥ 97 mg/dL	
379	33 y	Acetaminophen/diphenhydramine Ethanol	A	Ing	Int suicide	 12 mg/dL	
380 i	51 y	Acetaminophen/diphenhydramine Naproxen	U	Ing	Int suicide	173.3 μg/mL¥	
381	32 y	Acetaminophen/diphenhydramine Quetiapine Lorazepam[A]	A	Ing	Int suicide	738 μg/mL¥	7.5 h
382 p	49 y	Acetaminophen/diphenhydramine Zolpidem	A	Ing	Int suicide	770 μg/mL¥	
383 p	2 y	Acetaminophen/hydrocodone	A	Ing	Unint gen	Hydrocodone 1200 ng/mL§	
384 p	15 y	Acetaminophen/hydrocodone	A	Ing	Int unk	41.2 μg/mL§,¥ Hydrocodone 260 ng/mL§	
385	19 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	143 μg/mL¥	
386	21 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	31 μg/mL¥	
387	26 y	Acetaminophen/hydrocodone	C	Ing	Int misuse	70.6 μg/mL¥	
388	29 y	Acetaminophen/hydrocodone	A	Ing	Int suicide		
389	37 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	73 μg/mL¥	
390 p	39 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	183.7 μg/mL¥	
391	39 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	169.5 μg/mL¥	
392	42 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	36 μg/mL¥	
393	44 y	Acetaminophen/hydrocodone	A	Ing	Int suicide		
394 p	48 y	Acetaminophen/hydrocodone	U	Ing	Int suicide	157 μg/mL¥ Hydrocodone 110 ng/mL	8 h
395 p	48 y	Acetaminophen/hydrocodone	A/C	Ing	Int unk		
396	62 y	Acetaminophen/hydrocodone	C	Ing	Int unk		
397	63 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	320 μg/mL¥	24 h
398	>19 y	Acetaminophen/hydrocodone	A/C	Ing	Int misuse	Hydrocodone 780 ng/mL§	
399	48 y	Acetaminophen/hydrocodone Acetaminophen/antihistamine Carisoprodol	C	Ing	Int misuse	47 μg/mL¥	
400	34 y	Acetaminophen/hydrocodone Acetaminophen/tramadol Aspirin[A]	A/C	Ing	Int abuse	7.3 μg/mL¥ 7.9 mg/dL	
401	44 y	Acetaminophen/hydrocodone Activated charcoal	A	Asp/ing	Int suicide	1.2 μg/mL¥	

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
402 p	24 y	Acetaminophen/hydrocodone	A	Ing	Int suicide		
		Alprazolam					
403 p	38 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	31.8 μg/mL§,¥	
						Hydrocodone 160 ng/mL§	
		Alprazolam				62 ng/mL§	
404 p	74 y	Acetaminophen/hydrocodone	U	Ing	Unk		
		Alprazolam					
405 p	20 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	12.8 μg/mL¥	
						Hydrocodone 250 ng/mL	
						Hydromorphone 40 ng/mL	
		Alprazolam				30 ng/mL	
		Carisoprodol[A]				7.9 μg/mL	
						Meprobamate 10.7 μg/mL	
406	48 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide		
		Amitriptyline					
407	51 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	192 μg/mL¥	
		Atropine/hyoscyamine/ phenobarbital/scopolamine					
		Diazepam					
408 p	31 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	61 μg/mL§,b	
						Hydrocodone 250 ng/mL§	
						Dihydrocodone 47 ng/mL§	
		Buspirone					
		Alprazolam[A]				44 ng/mL§	
409	31 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide		
		Carisoprodol					
410	32 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	88 μg/mL¥	
		Carisoprodol					
411	36 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	132 μg/mL¥	
		Carisoprodol					
412	41 y	Acetaminophen/hydrocodone	A/C	Ing	Int misuse	66 μg/mL¥	
		Carisoprodol					
413	42 y	Acetaminophen/hydrocodone	C	Ing	Int misuse	73 μg/mL¥	
		Carisoprodol					
414	42 y	Acetaminophen/hydrocodone	A	Ing	Int suicide		
		Carisoprodol					
415	43 y	Acetaminophen/hydrocodone	A/C	Ing	Int misuse	50 μg/mL¥	
		Carisoprodol					
416	45 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	16 μg/mL¥	
		Carisoprodol					
417	46 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	65.48 μg/mL§,¥	
						Hydrocodone 110 ng/mL§	
		Carisoprodol				2.44 μg/mL§	
418	37 y	Acetaminophen/hydrocodone	C	Ing	Int abuse	21 μg/mL¥	
		Carisoprodol					
		Alprazolam					
419	37 y	Acetaminophen/hydrocodone	A	Ing	Int unk	190 μg/mL¥	
		Carisoprodol					
		Alprazolam					
420 p	48 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide		
		Carisoprodol					
		Alprazolam					
421 p	20 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	22.8 μg/mL¥	24 h
		Carisoprodol					
		Baclofen					
422	61 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	16 μg/mL¥	
		Carisoprodol					
		Diazepam[A]					
423	44 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide		
		Diazepam					
424	59 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide	319 μg/mL¥	
		Diazepam					
		Methadone[A]					
425 p	38 y	Acetaminophen/hydrocodone	U	Ing	Int suicide		
		Escitalopram					
		Clonazepam					

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
426 p	31 y	Acetaminophen/hydrocodone	U	Ing	Unk		
		Methadone				0.6 μg/mL§	
427	47 y	Acetaminophen/hydrocodone	A	Ing	Int suicide	59.4 μg/mL¥	
						Hydrocodone 119 ng/mL§	
		Temazepam				900 ng/mL	
428	52 y	Acetaminophen/hydrocodone	A/C	Ing	Int suicide		
		Tiagabine					
		Amitriptyline[A]					
429	44 y	Acetaminophen/oxycodone	C	Ing	Ther err	17 μg/mL¥	9 h
430	53 y	Acetaminophen/oxycodone	A/C	Ing	Ther err	153 μg/mL¥	
431	63 y	Acetaminophen/oxycodone	A/C	Ing	Int suicide	151 μg/mL¥	
432	43 y	Acetaminophen/oxycodone	A	Ing	Int suicide	26 μg/mL¥	
		Acetaminophen/butalbital/caffeine					
		Ethanol					
433	52 y	Acetaminophen/oxycodone	U	Ing	Int suicide	56 μg/mL¥	
		Acetaminophen/codeine				Codeine 0.914 μg/mL§	
						Morphine 270 ng/mL§	
		Diazepam[A]					
434	49 y	Acetaminophen/oxycodone	A	Ing	Int suicide	5.1 μg/mL¥	
		Acetaminophen/hydrocodone					
		Methocarbamol[A]					
435	86 y	Acetaminophen/oxycodone	A	Ing	Int suicide	172 μg/mL¥	
		Aspirin				43 mg/dL	36 h
		Ethanol					
436 p	28 y	Acetaminophen/oxycodone	A	Ing	Int suicide	19.4 μg/mL¥	
		Carisoprodol					
437 p	37 y	Acetaminophen/oxycodone	A	Ing	Int unk	48 μg/mL¥	2 h
		Ethanol					
438	46 y	Acetaminophen/oxycodone	A	Ing	Int suicide	120 μg/mL¥	
		Fluoxetine					
		Eletriptan[A]					
439 i/p	40 y	Acetaminophen/oxycodone	A	Ing	Int suicide	32 μg/mL§,¥	
						Oxycodone 1300 ng/mL§	
		Mirtazapine				200 ng/mL§	
		Carisoprodol[A]				12 μg/mL§	
440	69 y	Acetaminophen/oxycodone	A/C	Ing	Int suicide		
		Phenytoin					
		Zolpidem[A]					
441 p	45 y	Acetaminophen/oxycodone	A	Inh	Int abuse		
		Unk drug					
442 p	25 y	Acetaminophen/propoxyphene	A	Ing	Int suicide		
443 p	34 y	Acetaminophen/propoxyphene	A	Ing	Int suicide	151 μg/mL§,¥	
						Propoxyphene 3.7 μg/mL§	
444 p	42 y	Acetaminophen/propoxyphene	A	Ing	Int suicide	229 μg/mL¥	
445	47 y	Acetaminophen/propoxyphene	C	Ing	Int misuse	90 μg/mL¥	
446	52 y	Acetaminophen/propoxyphene	A	Ing	Int suicide	48.2 μg/mL¥	
		Acetaminophen					
447 p	14 y	Acetaminophen/propoxyphene	A	Ing	Int suicide	160 μg/mL§,¥	
						Propoxyphene >10 μg/mL§	
		Acetaminophen					
		Unk cough/cold medication					
448 p	35 y	Acetaminophen/propoxyphene	A	Ing	Int suicide		
		Acetaminophen/hydrocodone					
		Alprazolam[A]					
449	72 y	Acetaminophen/propoxyphene	A/C	Ing	Int suicide	72 μg/mL¥	
		Alprazolam					
		Cyclobenzaprine					
450	63 y	Acetaminophen/propoxyphene	A	Ing	Int suicide	53 μg/mL¥	
						Propoxyphene 0.19 μg/mL	
						Norpropoxyphene 0.16 μg/mL	
		Alprazolam				110 ng/mL	
		Paroxetine[A]				140 ng/mL	
451	49 y	Acetaminophen/propoxyphene	A/C	Ing	Int suicide	15 μg/mL¥	
		Amitriptyline					
		Oxycodone (long-acting)[A]					

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
452	55 y	Acetaminophen/propoxyphene	A/C	Ing	Int suicide	336 μg/mL¥	14 h
		Bupropion (long-acting)					
		Cyclobenzaprine[A]					
453	37 y	Acetaminophen/propoxyphene	U	Ing	Int suicide		
		Carisoprodol					
		Unk drug					
454	52 y	Acetaminophen/propoxyphene	A/C	Ing	Int suicide		
		Cyclobenzaprine					
455	56 y	Acetaminophen/propoxyphene	A/C	Ing	Int suicide	23.6 μg/mL¥	
		Diphenoxylate/atropine					
456	25 y	Acetaminophen/propoxyphene	A	Ing/unk	Int suicide	78 μg/mL¥	
		Ethanol				112 mg/dL	
		Cocaine					
457 p	38 y	Acetaminophen/propoxyphene	A	Ing	Int suicide	Norpropoxyphene 0.69 μg/mL§	
		Long-acting anticoagulant rodenticide					
458 p	28 y	Acetaminophen/propoxyphene	A	Ing	Int suicide		
		Methadone					
		Unk drug					
459	43 y	Acetaminophen/propoxyphene	A/C	Ing	Int suicide	232 μg/mL¥	
						Propoxyphene 3.8 μg/mL§	
						Norpropoxyphene 4.8 μg/mL§	
		Mirtazapine				2200 ng/mL§	
		Carisoprodol				17 μg/mL§	
						Meprobamate 44 μg/mL§	
460	25 y	Acetaminophen/propoxyphene	A	Ing	Int suicide		
		Morphine					
461	73 y	Acetaminophen/propoxyphene	U	Derm/ing	Int suicide	27 μg/mL¥	
		Quetiapine					
		Unk chemical					
462 a	11 y	Aspirin	C	Ing	Adv rxn	66 mg/dL	
463 p	23 y	Aspirin	A	Ing	Int suicide	73.9 mg/dL	
464	36 y	Aspirin	A	Ing	Int suicide	141 mg/dL	
465	38 y	Aspirin	A	Ing	Int suicide	105 mg/dL	23 h
466 a	38 y	Aspirin	A	Ing	Int suicide	97.7 mg/dL	11 h
467	41 y	Aspirin	C	Ing	Int misuse	82 mg/dL	
468	43 y	Aspirin	A	Ing	Int suicide		
469	45 y	Aspirin	A	Ing	Int unk	96 mg/dL	
470	47 y	Aspirin	A	Ing	Int suicide	91.7 mg/dL§	
471	47 y	Aspirin	A	Ing	Int suicide	101 mg/dL	
472	49 y	Aspirin	A	Ing	Int unk	100 mg/dL	
473	52 y	Aspirin	A	Ing	Int suicide	103 mg/dL	
474	53 y	Aspirin	A	Ing	Int suicide	120 mg/dL	22 h
475	58 y	Aspirin	A	Ing	Int suicide	82.3 mg/dL	
476	68 y	Aspirin	A	Ing	Int suicide	98.4 mg/dL	
477	77 y	Aspirin	A/C	Ing	Int suicide	141.7 mg/dL	
478	78 y	Aspirin	A	Ing	Int suicide	42.5 mg/dL	
479	80 y	Aspirin	U	Ing	Unk	97 mg/dL	
480	90 y	Aspirin	A	Ing	Unk	73 mg/dL	
481 i	>19 y	Aspirin	A	Ing	Int suicide	137 mg/dL	
482	97 y	Aspirin	C	Ing	Unint gen	88.9 mg/dL	
483	Unk	Aspirin	U	Ing	Unk		
484	21 y	Aspirin	A	Ing	Int suicide	143 mg/dL	
		Acetaminophen				340 μg/mL	
485	51 y	Aspirin	A	Ing	Int suicide	54 mg/dL	
		Acetaminophen				300 μg/mL	
486	56 y	Aspirin	A	Ing	Int suicide	103 mg/dL	
		Acetaminophen				53 μg/mL	
487	66 y	Aspirin	A/C	Ing	Int suicide	39 mg/dL	
		Acetaminophen				13.9 μg/mL	
488 i	25 y	Aspirin	A	Ing/unk	Int suicide	36.5 mg/dL	
		Acetaminophen				126 μg/mL	
		Cocaine[A]					
489	47 y	Aspirin	A	Ing	Int suicide	63 mg/dL	
		Acetaminophen/hydrocodone				120 μg/mL¥	
						Hydrocodone 70 ng/mL§	
		Acetaminophen/dextromethorphan/				Pseudoephedrine 2.1 μg/mL§	
		doxylamine/pseudoephedrine[A]				Doxylamine 0.45 μg/mL§	
						Dextromethorphan 0.19 μg/mL§	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
490	38 y	Aspirin	A	Ing	Int suicide	94.6 mg/dL	
		Acetaminophen/propoxyphene				191 μg/mL¥	
491	47 y	Aspirin	A	Ing	Int suicide	92 mg/dL	
		Benzodiazepine					
		Barbiturate (long-acting)					
492	83 y	Aspirin	A	Ing	Int suicide	>300 mg/dL	
		Diltiazem					
		Acetaminophen[A]				248 μg/mL	
493	32 y	Aspirin	A	Ing	Int suicide	136.8 mg/dL	
		Ethanol					
494	39 y	Aspirin	A	Ing	Int suicide	51.5 mg/dL	
		Isopropyl alcohol					
		Ethanol				263 mg/dL	
495	55 y	Aspirin	U	Ing	Int suicide	75 mg/dL	
		Mirtazapine					
		Trazodone[A]					
496	51 y	Aspirin	A	Ing	Int suicide	73 mg/dL	
		Olanzapine					
497	41 y	Aspirin	A	Ing	Int suicide	69 mg/dL	
		Quetiapine					
498	14 y	Aspirin	A	Ing	Int suicide	69 mg/dL	
		Quetiapine					
		Acetaminophen/brompheniramine/ pseudoephedrine[A]				34 μg/mL¥	
499	65 y	Aspirin	A	Ing	Int suicide	104 mg/dL	16 h
		Valproic acid (long-acting)				50 μg/mL	4 h
		Clonazepam				50 ng/mL§	
500 i	77 y	Aspirin/butalbital/caffeine	U	Ing	Int suicide		
		Acetaminophen/hydrocodone					
501 p	42 y	Aspirin/codeine	A	Ing	Int suicide	24 mg/dL¶	
502	54 y	Aspirin/oxycodone	A/C	Ing	Int misuse	44.4 mg/dL¶	
						Oxycodone 210 ng/mL	
503 i/p	30s y	Buprenorphine/naloxone	A/C	Ing	Int abuse		
		Ethanol					
504 p	78 y	Codeine	A	Ing	Int suicide		
505	52 y	Codeine	A/C	Ing	Int suicide		
		Acetaminophen				14.6 μg/mL	5 h
506	33 y	Colchicine	C	Ing	Ther err		
507 a	51 y	Colchicine	A	Ing	Int suicide		
508	84 y	Colchicine	C	Ing	Ther err		
509	57 y	Colchicine	A/C	Ing	Int suicide		
		Acetaminophen/codeine				229.2 μg/mL¥	10 h
		Allopurinol[A]					
510 p	24 y	Etodolac	U	Ing	Unk		
		Unk drug					
		Ethanol					
511 p	44 y	Fentanyl	A	Ing	Int abuse		
512 p	25 y	Fentanyl lozenge	A	Ing	Int abuse		
513 p	19 y	Fentanyl patch	A	Derm	Int abuse		
514 p	42 y	Fentanyl patch	A	Ing/paren	Int abuse		
515 a/p	48 y	Fentanyl patch	A/C	Derm	Int abuse	29.7 ng/mL§	
516 p	31 y	Fentanyl patch	U	Derm/ing	Int unk		
		Ethanol					
517 p	34 y	Fentanyl patch	A	Ing	Int abuse		
		Ethanol					
518	29 y	Fentanyl patch	A/C	Ing	Int abuse		
		Flurazepam					
519 p	29 y	Fentanyl patch	A	Ing	Int suicide		
		Ma huang					
520 p	22 y	Fentanyl patch	A/C	Ing/unk	Int suicide		
		Morphine					
521	34 y	Fentanyl patch	A	Derm/ing	Int suicide		
		Sertraline					
		Acetaminophen					
522 p	37 y	Fentanyl patch	U	Ing	Int suicide		

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
522 p	37 y	Fentanyl patch	U	Ing	Int suicide		
		Zonisamide					
		Trazodone					
523 i	40 y	Hydromorphone	U	Ing	Int unk		
		Alprazolam					
524	>19 y	Meperidine	A	Ing	Int unk		
525 a/p	10 mo	Methadone	A	Ing	Malicious	0.67 μg/mL§	
526 a/i	15 mo	Methadone	A	Ing	Unint gen	0.4 μg/mL§	
527 a	20 mo	Methadone	A	Ing	Unint gen		
528	<6 y	Methadone	U	Unk	Unk		
529 i	14 y	Methadone	A	Unk	Unk		
530 p	17 y	Methadone	A	Ing	Int unk		
531 p	17 y	Methadone	A	Ing	Int abuse		
532 p	17 y	Methadone	A	Ing	Int abuse		
533 p	18 y	Methadone	A	Ing	Int suicide	0.1 μg/mL	
534 p	19 y	Methadone	U	Ing	Int unk		
535 p	19 y	Methadone	A	Ing	Int unk	4.2 μg/mL	
536 p	20 y	Methadone	A	Ing	Int abuse		
537 p	20 y	Methadone	A	Ing	Int abuse		
538 p	21 y	Methadone	A/C	Ing	Int suicide		
539 i/p	23 y	Methadone	A/C	Ing	Int unk		
540	25 y	Methadone	U	Ing	Int suicide		
541 p	26 y	Methadone	A/C	Ing	Int abuse	0.13 μg/mL§	
542 p	32 y	Methadone	A/C	Ing	Int suicide		
543	33 y	Methadone	U	Ing	Int suicide		
544 p	34 y	Methadone	A	Ing	Int unk	0.2 μg/mL§	
545 p	39 y	Methadone	A/C	Ing	Int unk	16.302 μg/mL	
546 p	40 y	Methadone	A/C	Paren	Int suicide		
547 p	41 y	Methadone	U	Ing	Unk		
548 p	48 y	Methadone	U	Ing	Int abuse		
549	51 y	Methadone	A	Ing	Int suicide		
550 p	53 y	Methadone	A	Ing	Int abuse		
551 p	54 y	Methadone	A	Ing	Unk		
552 p	62 y	Methadone	A/C	Ing	Int suicide		
553 p	64 y	Methadone	A/C	Ing	Int suicide		
554	74 y	Methadone	A/C	Ing	Int suicide		
555 p	>19 y	Methadone	A	Ing	Unk		
556 i/p	Unk	Methadone	U	Unk	Unk		
557 p	23 y	Methadone	U	Ing	Int unk		
		Acetaminophen					
558 p	27 y	Methadone	U	Ing	Int unk	0.7 μg/mL§	
		Acetaminophen/hydrocodone				Hydrocodone 60 ng/mL§	
559 p	45 y	Methadone	U	Ing	Unk	0.3 μg/mL§	
		Acetaminophen/hydrocodone				Hydrocodone 50 ng/mL§	
		Alprazolam				20 ng/mL§	
560 p	46 y	Methadone	U	Ing	Int suicide	0.65 μg/mL§	
		Acetaminophen/hydrocodone				Hydrocodone 100 ng/mL§	
		Alprazolam[A]					
561 p	26 y	Methadone	U	Ing	Int abuse	0.19 μg/mL	
		Acetaminophen/hydrocodone				50 ng/mL	
		Sertraline				Norsertraline 10 ng/mL	
562	24 y	Methadone	A	Ing	Int suicide		
		Acetaminophen/pseudoephedrine					
563 p	22 y	Methadone	U	Ing	Int suicide		
		Alprazolam					
564 p	40 y	Methadone	U	Ing/paren	Int abuse	1.9 μg/mL§	
		Alprazolam				40 ng/mL§	
		Methamphetamine				0.7 μg/mL§	
565	50 y	Methadone	A/C	Ing	Int unk		
		Amitriptyline				91 ng/mL	
		Acetaminophen/hydrocodone[A]					
566 p	47 y	Methadone	U	Ing	Int suicide	0.912 μg/mL	
		Benzodiazepine					
567 p	54 y	Methadone	A	Ing	Int suicide	1.36 μg/mL§	
		Benzodiazepine					
568 p	21 y	Methadone	A	Ing	Int suicide	0.17 μg/mL§	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
568 p	21 y	Methadone	A	Ing	Int suicide	0.17 μg/mL§	
		Carisoprodol					
569 i/p	6 y	Methadone	A	Ing	Unk	0.51 μg/mL§	
		Chloral hydrate				2,2,2-Trichloroethanol 8.3 μg/mL§	
		Hydroxyzine				0.54 μg/mL§	
570 p	32 y	Methadone	A/C	Asp/ing	Int suicide		
		Clonazepam					
571 p	18 y	Methadone	A/C	Ing/inh	Int abuse	0.06 μg/mL§	
						EDDP 0.002 μg/mL§	
		Cocaine					
572	29 y	Methadone	A	Ing/unk	Int unk		
		Cocaine					
573	33 y	Methadone	U	Ing/unk	Int abuse		
		Cocaine					
		Benzodiazepine[A]					
574 p	40 y	Methadone	U	Ing	Int suicide		
		Diazepam					
		Baclofen[A]					
575 p	20 y	Methadone	A	Ing	Int abuse		
		Diazepam					
		Isopropyl alcohol					
576 p	62 y	Methadone	A/C	Ing	Int suicide	0.96 μg/mL	
		Diazepam				480 ng/mL#	
		Zolpidem					
577 p	28 y	Methadone	A	Ing	Int suicide		
		Doxylamine					
578 p	21 y	Methadone	A	Ing	Int abuse	0.112 μg/mL§	
		Ethanol					
579 p	21 y	Methadone	U	Ing	Int unk	0.4 μg/mL§	
		Ethanol				100 mg/dL§	
580 p	22 y	Methadone	A	Ing	Int misuse		
		Ethanol					
581 p	30 y	Methadone	U	Ing	Unk		
		Ethanol					
582 p	34 y	Methadone	U	Ing	Unk	0.2 μg/mL§	
		Ethanol				350 mg/dL§	
583	47 y	Methadone	A/C	Ing	Int abuse	2.834 μg/mL	18 h
		Ethanol					
584 p	55 y	Methadone	A	Ing	Int suicide	0.4 μg/mL§	
		Ethanol				280 mg/dL§	
585 p	16 y	Methadone	U	Ing/inh	Int abuse		
		Ethanol				180 mg/dL	
		Marijuana					
586 p	56 y	Methadone	U	Ing	Int unk	0.3 μg/mL§	
		Ethanol				140 mg/dL§	
		Metoprolol (long-acting)[A]					
587 p	22 y	Methadone	U	Ing	Unk	0.3 μg/mL§	
		Fluoxetine					
		Bupropion[A]					
588 p	20 y	Methadone	A/C	Ing	Int unk	0.52 μg/mL§	
		Gabapentin					
589 p	24 y	Methadone	A	Ing	Int abuse	0.17 μg/mL§	
		Lysergic acid diethylamide				432 ng/mL§	
		Citalopram				690 ng/mL§	
590	23 y	Methadone	U	Ing	Int abuse	0.37 μg/mL	
		Meprobamate				2.171 μg/mL	
		Diazepam				59 ng/mL§	
						Nordiazepam 292 ng/mL§	
591 p	21 y	Methadone	U	Ing	Int abuse		
		Methylenedioxymethamphetamine					
592	35 y	Methadone	A	Ing	Int abuse		
		Opioid					
		Benzodiazepine[A]					
593 p	19 y	Methadone	U	Unk	Int unk	0.1 μg/mL§	
		Oxycodone					
		Alprazolam				20 ng/mL§	
594 p	38 y	Methadone	A	Ing	Int abuse	0.7 μg/mL§	

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
594 p	38 y	Methadone	A	Ing	Int abuse	0.7 μg/mL§	
		Promethazine				150 ng/mL§	
595 p	42 y	Methadone	U	Ing	Int suicide		
		Quetiapine					
		Alprazolam[A]					
596	43 y	Methadone	A/C	Ing	Int suicide		
		Quetiapine					
		Citalopram[A]					
597	42 y	Methadone	A/C	Ing	Int unk		
		Tramadol					
		Escitalopram					
598 p	26 y	Methadone	C	Ing	Int unk	0.8 μg/mL§	
		Venlafaxine				100 ng/mL§	
599	19 y	Methadone	A	Ing	Int suicide	0.162 μg/mL	
		Venlafaxine (long-acting)				310 ng/mL	
		Unk drug					
600 p	46 y	Methadone	A	Ing	Int unk	1.7 μg/mL§	
		Zolpidem				1600 ng/mL§	
		Quetiapine[A]					
601 p	50 y	Morphine	A/C	Ing	Unk		
602	Unk	Morphine	U	Ing	Unk	436 ng/mL§	
603 p	45 y	Morphine	U	Ing	Int unk	1600 ng/mL§	
		Acetaminophen/aspirin/caffeine					
		Venlafaxine[A]				1300 ng/mL§	
604 p	38 y	Morphine	U	Ing	Unk		
		Benzodiazepine					
		Phenytoin					
605 p	57 y	Morphine	U	Ing	Unk	530 ng/mL§	
		Bupropion (long-acting)					
		Alprazolam[A]					
606 p	14 y	Morphine (long-acting)	A	Ing	Int abuse		
607 p	39 y	Morphine (long-acting)	A/C	Ing	Int unk		
608 p	56 y	Morphine (long-acting)	A/C	Ing	Unk		
		Chlordiazepoxide				200 ng/mL§	
		Diazepam[A]					
609 p	37 y	Morphine (long-acting)	U	Ing/unk	Unk	500 ng/mL§	
		Diazepam					
		Citalopram[A]					
610 p	60 y	Morphine (long-acting)	C	Ing	Int unk	40 ng/mL§	
		Diphenhydramine				0.2 μg/mL§	
		Sertraline[A]				400 ng/mL§,#	
611 p	47 y	Morphine (long-acting)	A/C	Ing	Int unk	240 ng/mL§	
						Free morphine 90 ng/mL§	
		Gabapentin				5 μg/mL§	
		Ethanol[A]				290 mg/dL§	
612 a/p	42 y	Nalbuphine	A	Paren	Adv rxn	46 ng/mL§	
		Propofol					
613 a/i/p	10 mo	Naproxen	A	Asp/ing	Unint gen	130 μg/mL§	
614 p	65 y	Opioid	U	Unk	Unk		
615	40 y	Opioid	A	Ing	Int abuse		
		Acetaminophen					
616 p	48 y	Opioid	U	Unk	Int abuse		
		Benzodiazepine					
		Unk drug					
617 p	24 y	Opioid	A/C	Inh/unk	Int unk		
		Marijuana					
		Ethanol					
618 p	20 y	Opioid	A	Unk	Int abuse		
		Phencyclidine					
		Marijuana					
619 p	49 y	Opioid	A	Ing/unk	Int unk		
		Unk drug					
620 p	1 y	Oxycodone	A	Ing	Unk	1200 ng/mL	
621 p	57 y	Oxycodone	A	Ing	Int suicide		
622	>19 y	Oxycodone	U	Ing	Unk	2600 ng/mL§	
623 a/p	14 mo	Oxycodone	U	Ing	Unk	220 ng/mL	
		Acetaminophen				12 μg/mL	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
624	37 y	Oxycodone	A/C	Ing	Int suicide		
		Acetaminophen/hydrocodone					
		Clonazepam[A]					
625 p	24 y	Oxycodone	A	Ing	Int abuse	1009 ng/mL§	
		Acetaminophen/propoxyphene				Propoxyphene 0.26 μg/mL§	
						Norpropoxyphene 0.702 μg/mL§	
626 p	28 y	Oxycodone	U	Ing/unk	Int unk		
		Cocaine					
627	19 y	Oxycodone	U	Ing/unk	Int abuse	200 ng/mL§	
		Cocaine				0.1 μg/mL§	
		Diazepam[A]				800 ng/mL§	
628 p	17 y	Oxycodone	A	Ing/unk	Int abuse		
		Marijuana					
629 p	24 y	Oxycodone	A	Ing	Int suicide		
		Methadone					
630 p	26 y	Oxycodone	U	Ing	Unk	100 ng/mL§	
		Methadone				0.08 μg/mL§	
		Alprazolam				50 ng/mL§	
631	53 y	Oxycodone	A/C	Ing	Int suicide		
		Primidone				35.6 μg/mL	4 h
						Phenobarbital 10.8 μg/mL	3 d
		Alprazolam[A]					
632	53 y	Oxycodone	U	Ing	Unk		
		Risperidone					
		Mirtazapine[A]					
633 p	21 y	Oxycodone	A/C	Ing	Int abuse	570 ng/mL§	
		Trazodone				410 ng/mL§	
		Zolpidem[A]				90 ng/mL§	
634	9 y	Oxycodone (long acting)	A	Ing	Unint gen		
		Morphine					
635 a/p	2 y	Oxycodone (long-acting)	A	Ing	Unint gen	560 ng/mL§	
						Oxymorphone 260 ng/mL§	
636 p	14 y	Oxycodone (long-acting)	A	Ing	Int abuse		
637	Unk	Oxycodone (long-acting)	U	Ing	Unk		
638 p	23 y	Oxycodone (long-acting)	A/C	Ing	Int unk	160 ng/mL§	
		Acetaminophen/hydrocodone					
		Alprazolam				250 ng/mL§	
639	39 y	Oxycodone (long-acting)	A/C	Ing	Int unk		
		Acetaminophen/hydrocodone					
		Diazepam[A]					
640 p	53 y	Oxycodone (long-acting)	A/C	Ing	Int suicide		
		Alprazolam					
641 p	33 y	Oxycodone (long-acting)	A/C	Ing	Int abuse		
		Benzodiazepine					
		Ethanol					
642 p	25 y	Oxycodone (long-acting)	U	Ing/unk	Int abuse		
		Cocaine					
643 p	42 y	Oxycodone (long-acting)	A/C	Ing/inh	Int suicide		
		Cocaine					
		Marijuana					
644	35 y	Oxycodone (long-acting)	U	Ing	Int suicide		
		Diazepam					
		Acetaminophen/oxycodone[A]					
645 p	19 y	Oxycodone (long-acting)	A	Ing	Int suicide		
		Ethanol					
646 p	23 y	Oxycodone (long-acting)	A	Ing	Int abuse		
		Ethanol				110 mg/dL	
647	54 y	Oxycodone (long-acting)	A/C	Ing	Int suicide		
		Hydromorphone					
648 p	31 y	Oxycodone (long-acting)	A	Ing	Int abuse	410 ng/mL§	
		Quetiapine				420 ng/mL§	
649 p	40 y	Oxycodone (long-acting)	U	Ing/unk	Int abuse		
		Quetiapine					
		Clonazepam					
650 p	40 y	Oxycodone (long-acting)	A	Ing	Int suicide		
		Valproic acid				37 μg/mL	
		Buspirone[A]					

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Analgesics							
651 p	28 y	Phenazopyridine	U	Ing	Unk		
		Unk drug					
652 a	29 y	Phenylbutazone	C	Ing	Int misuse	13 μg/mL§	
						Oxyphenbutazone 3.4 μg/mL§	
653 p	50 y	Propoxyphene	A/C	Ing	Int suicide		
654	46 y	Propoxyphene	A	Ing	Int suicide		
		Aspirin				35 mg/dL	
655	59 y	Propoxyphene	A/C	Ing	Int suicide	1.5 μg/mL	
						Norpropoxyphene 1.5 μg/mL	
		Ethanol				171 mg/dL	
656 p	37 y	Propoxyphene	A	Ing	Unk		
		Unk opioid					
657 p	39 y	Tramadol	U	Ing	Int suicide		
658 p	43 y	Tramadol	A/C	Ing	Int unk	7.15 μg/mL§	
		Amitriptyline				260 ng/mL§	
		Meprobamate				1.04 μg/mL§	
659	39 y	Tramadol	A/C	Ing	Int suicide		
		Diazepam					
		Acetaminophen/oxycodone[A]					
660 p	23 y	Tramadol	A/C	Ing/unk	Int suicide		
		Mirtazapine					
		Clonazepam					
661	52 y	Tramadol	A/C	Ing	Int unk		
		Oxycodone					
		Benzodiazepine					
662 p	41 y	Unk analgesic	A/C	Ing	Int unk		

See also cases 19, 116, 376, 446, 447, 484 to 488, 492, 505, 521, 557, 615, 623, 664, 672, 712, 713, 737, 757, 782, 876, 895, 925, 932, 953, 969, 1008, and 1152 (acetaminophen); 377 (acetaminophen/aspirin); 309 and 603 (acetaminophen/aspirin/caffeine); 133 and 432 (acetaminophen/butalbital/caffeine); 193, 328, 433, and 509 (acetaminophen/codeine); 311 and 312 (acetaminophen/diphenhydramine); 97, 313, 314, 354, 356, 357, 434, 448, 489, 500, 558 to 561, 565, 624, 638, 639, 758, 792, 873, 879, 923, 925, 942, 970, 982, 983, 1011, 1079, and 1147 (acetaminophen/hydrocodone); 644 and 659 (acetaminophen/oxycodone); 8, 9, 490, 625, 714, 809, 871, 884, 898, and 954 (acetaminophen/propoxyphene); 400 (acetaminophen/tramadol); 317, 336, 400, 435, 654, 668, 814, 884, 892, and 1046 (aspirin); 85 (aspirin/carisoprodol); 714 (aspirin/oxycodone); 318 (buprenorphine); 325 (codeine); 318 (codeine/guaifenesin); 1040 (diclofenac); 52 (fentanyl); 976 (fentanyl patch); 973, 974, and 1160 (hydrocodone); 647 (hydromorphone); 341, 342, 360, 829, and 1038 (ibuprofen); 987 and 1094 (meperidine); 424, 426, 458, 629, 630, 722, 724, 729, 766, 767, 813, 830, 947, 976, 986, 987, 1000, 1023, 1095, and 1096 (methadone); 90, 344, 460, 520, 634, 977, and 1030 (morphine); 116, 360, 380, and 829 (naproxen); 10, 592, 731, 785, 801, 978, 1060, 1158 (opioid); 593, 661, 781, and 1124 (oxycodone); 12, 451, 1001, 1036, and 1183 (oxycodone [long-acting]); 831 (propoxyphene); 597 and 816 (tramadol); and 656 and 1152 (unk opioid).

Anesthetics							
663 p	23 y	Ether	A	Inh/unk	Int abuse		
		Heroin					
		Phenobarbital[A]					
664	48 y	Halothane-like substance	C	Ing/inh	Occ		
		Acetaminophen					
665 a/p	17 y	Sevoflurane	A	Inh	Int abuse		

See also case 612 (propofol).

Anticholinergic drugs							
666	39 y	Benztropine	U	Ing	Int suicide		
		Doxepin					
		Fluoxetine[A]					
667	49 y	Benztropine	A/C	Ing	Int suicide		
		Ziprasidone					
		Memantine					

See also cases 790, 806, and 1009 (benztropine); 698 (trihexyphenidyl).

Anticoagulants							
668	50 y	Clopidogrel	A	Ing	Int suicide		
		Aspirin				14 mg/dL	
		Clonidine[A]					
669	60 y	Warfarin	C	Ing	Ther err		
670	71 y	Warfarin	C	Ing	Ther err		
671	41 y	Carbamazepine	A/C	Ing	Int suicide	39.7 μg/mL	
Anticonvulsants							
672	8 y	Carbamazepine	C	Ing	Unk	30 μg/mL	
		Acetaminophen					
673	40 y	Carbamazepine	A/C	Ing	Int suicide	43.9 μg/mL#	
		Phenytoin					

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Anticonvulsants							
674	51 y	Carbamazepine (long-acting)	A/C	Ing	Ther err	37.4 μg/mL	
675 a	18 mo	Fosphenytoin	A	Paren	Ther err		
676	62 y	Gabapentin	A	Ing	Int suicide		
		Isosorbide dinitrate					
		Ethanol[A]				250 mg/dL	
677 p	41 y	Lamotrigine	U	Ing	Int suicide		
678 p	27 y	Lamotrigine	A	Ing	Int suicide		
		Quetiapine					
679	30 y	Lamotrigine	A/C	Ing	Int suicide		
		Quetiapine					
		Oxcarbazepine[A]					
680	49 y	Lamotrigine	A	Ing	Int suicide		
		Venlafaxine (long-acting)					
		Quetiapine[A]					
681 p	19 y	Oxcarbazepine	U	Ing	Unk		
682 a	46 y	Oxcarbazepine	A/C	Ing	Int suicide		
683	46 y	Oxcarbazepine	A	Ing	Int suicide	188.8 μg/mL	18 h
		Ethanol				131 mg/dL	
		Benzodiazepine					
684 p	16 y	Topiramate	A	Ing	Int suicide		
685 p	18 y	Topiramate	A/C	Ing	Int suicide		
		Bupropion (long-acting)					
		Aripiprazole[A]					
686	23 y	Valproic acid	U	Ing	Int suicide	390 μg/mL	
687	26 y	Valproic acid	A/C	Ing	Int suicide	1272 μg/mL	
688	30 y	Valproic acid	A/C	Ing	Int suicide	927 μg/mL	
689	41 y	Valproic acid	A/C	Ing	Int suicide	909 μg/mL	
690 p	47 y	Valproic acid	A	Ing	Int suicide	720 μg/mL	
691 a	49 y	Valproic acid	A	Ing	Int suicide	1855 μg/mL	1 d
692	55 y	Valproic acid	A/C	Ing	Int suicide	>150 μg/mL	
693	35 y	Valproic acid	U	Ing	Int suicide	44 μg/mL	
		Bupropion				300 ng/mL§	
		Metformin					
694	58 y	Valproic acid	A	Ing	Int suicide	586.8 μg/mL	
		Escitalopram					
		Lorazepam					
695	30 y	Valproic acid	C	Ing	Adv rxn	43 μg/mL	
		Lamotrigine					
696	39 y	Valproic acid	A	Ing	Int suicide	>300 μg/mL	
		Paroxetine					
		Trazodone[A]					
697 p	45 y	Valproic acid	A	Ing	Int suicide	500 μg/mL§	
		Phenobarbital				23 μg/mL§	
		Clonazepam[A]					
698 p	45 y	Valproic acid	U	Ing	Unk		
		Trihexyphenidyl					

See also cases 339, 588, 611, 732, 1000, 1019, 1037, 1098, and 1102 (gabapentin); 695 and 1084 (lamotrigine); 679, 737, 754, 759, and 899 (oxcarbazepine); 440, 604, 673, 790, 858, and 1023 (phenytoin); 631 (primidone); 428 and 1006 (tiagabine); 339, 741, 744, and 794 (topiramate); 650, 907, 1041, 1051, and 1052 (valproic acid); 499 (valproic acid [long-acting]); and 522 and 809 (zonisamide).

Antidepressants							
699 p	16 y	Amitriptyline	A	Ing	Int unk	1700 ng/mL§	
						Nortriptyline 450 ng/mL§	
700	24 y	Amitriptyline	A	Ing	Int suicide	160 ng/mL	
						Nortriptyline 80 ng/mL	
701 p	36 y	Amitriptyline	A	Ing	Int suicide		
702 p	36 y	Amitriptyline	A/C	Ing	Int suicide		
703	40 y	Amitriptyline	A/C	Ing	Int suicide		
704	42 y	Amitriptyline	A	Ing	Int suicide		
705	45 y	Amitriptyline	A	Ing	Int suicide		
706 p	47 y	Amitriptyline	A	Ing	Int suicide		
707 p	50 y	Amitriptyline	A	Ing	Int suicide		
708	61 y	Amitriptyline	A/C	Ing	Int suicide		
709	83 y	Amitriptyline	A	Ing	Int suicide		
710	>19 y	Amitriptyline	A/C	Ing	Int suicide		
711	>19 y	Amitriptyline	U	Ing	Unk		
712 p	45 y	Amitriptyline	A	Ing	Int suicide	2100 ng/mL§	
		Acetaminophen				374.3 μg/mL§	

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Antidepressants							
713	37 y	Amitriptyline	C	Ing	Int suicide		
		Acetaminophen					
		Chlorpromazine					
714 p	55 y	Amitriptyline	A	Ing	Int unk		
		Acetaminophen/propoxyphene					
		Aspirin/oxycodone[A]					
715 p	>19 y	Amitriptyline	U	Ing	Int suicide		
		Alprazolam					
716 p	25 y	Amitriptyline	A	Ing	Int unk		
		Alprazolam					
		Escitalopram[A]					
717 p	49 y	Amitriptyline	A/C	Ing	Int suicide		
		Amitriptyline/chlordiazepoxide					
718 p	39 y	Amitriptyline	A	Ing	Int suicide		
		Aripiprazole					
		Venlafaxine[A]					
719	74 y	Amitriptyline	A/C	Ing	Int suicide	213 ng/mL	45 h
						Nortriptyline 221 ng/mL	45 h
		Chlorpromazine				231 ng/mL	45 h
720 p	62 y	Amitriptyline	A/C	Ing/unk	Int suicide	600 ng/mL§,#	
		Citalopram				400 ng/mL§	
		Methamphetamine				0.17 μg/mL§	
721	49 y	Amitriptyline	A/C	Ing	Int suicide		
		Clonazepam					
		Ethanol				258 mg/dL	
722 p	29 y	Amitriptyline	A/C	Ing/unk	Int suicide		
		Clonazepam					
		Methadone[A]					
723	19 y	Amitriptyline	A	Ing	Int suicide		
		Clonazepam					
		Quetiapine					
724 p	42 y	Amitriptyline	A	Ing	Int suicide		
		Clonidine					
		Methadone[A]					
725	46 y	Amitriptyline	A/C	Ing/unk	Int suicide		
		Cocaine					
726	24 y	Amitriptyline	A/C	Ing/unk	Unk		
		Escitalopram					
		Chlorpromazine[A]					
727	49 y	Amitriptyline	A	Ing	Int suicide	0.48 μg/mL#	22 h
		Ethanol				150 mg/dL	9 h
728	57 y	Amitriptyline	A/C	Ing	Int suicide		
		Ethanol					
729 p	43 y	Amitriptyline	C	Ing	Unk	460 ng/mL§	
						Nortriptyline 430 ng/mL§	
		Methadone				0.5 μg/mL§	
		Acetaminophen/dextromethorphan/					
		doxylamine/pseudoephedrine				Pseudoephedrine 0.86 μg/mL§	
730	48 y	Amitriptyline	A	Ing	Int suicide	1600 ng/mL	
						Nortriptyline 400 ng/mL	
		Olanzapine					
		Diazepam				4400 ng/mL	
731	44 y	Amitriptyline	A	Ing	Int suicide	964 ng/mL§	
						Nortriptyline 607 ng/mL§	
		Opioid					
732	48 y	Amitriptyline	A/C	Ing	Int suicide		
		Potassium chloride					
		Gabapentin[A]					
733 p	54 y	Amitriptyline	A/C	Ing	Int suicide	620 ng/mL	
		Unk drug					
734	43 y	Amitriptyline	A/C	Ing	Int suicide		
		Verapamil (long-acting)					
735 a	55 y	Amitriptyline	A	Ing/paren	Int suicide		
		Insulin					
736 p	32 y	Amoxapine	A/C	Ing	Int suicide		
		Trifluoperazine					
737 p	19 y	Bupropion	U	Ing/unk	Int suicide		
		Acetaminophen				107 μg/mL	
		Oxcarbazepine[A]					

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Antidepressants							
738	17 y	Bupropion	A/C	Ing	Int suicide		
		Acetaminophen/chlorpheniramine/ dextromethorphan					
739 p	29 y	Bupropion	U	Ing	Int suicide	7000 ng/mL§	
		Citalopram				4000 ng/mL§	
740	52 y	Bupropion	A/C	Ing	Int suicide		
		Escitalopram					
		Paroxetine					
741	39 y	Bupropion	A/C	Ing	Int suicide	1000 ng/mL	1 d
						Metabolites 20300 ng/mL	1 d
		Escitalopram				700 ng/mL	1 d
		Topiramate[A]				4.4 μg/mL§	
742	Unk	Bupropion	A	Ing	Int suicide	11000 ng/mL§	
		Olanzapine					
		Nortriptyline					
743	34 y	Bupropion	A	Ing	Int suicide		
		Phenobarbital				103.4 μg/mL	
744 p	21 y	Bupropion	U	Ing	Int suicide		
		Topiramate					
745 p	59 y	Bupropion	U	Ing	Int suicide	4100 ng/mL	
		Trifluoperazine					
746	20 y	Bupropion (long-acting)	A	Ing	Int suicide		
747	24 y	Bupropion (long-acting)	A/C	Ing	Int suicide	14000 ng/mL	3 h
748 p	33 y	Bupropion (long-acting)	A/C	Ing	Int suicide	445 ng/mL§	
749	43 y	Bupropion (long-acting)	A	Ing	Int suicide		
750	>19 y	Bupropion (long-acting)	A	Ing	Int suicide		
751 p	20 y	Bupropion (long-acting)	A	Ing	Int abuse		
		Buspirone					
		Amanita muscaria[A]					
752 p	23 y	Bupropion (long-acting)	A	Ing	Int suicide	1300 ng/mL§	
		Citalopram					
753	41 y	Bupropion (long-acting)	A	Ing	Int suicide		
		Clonazepam					
754	30 y	Bupropion (long-acting)	A/C	Ing	Int suicide		
		Escitalopram					
		Oxcarbazepine[A]					
755	39 y	Bupropion (long-acting)	A	Ing	Int suicide		
		Ethanol				333 mg/dL	3 h
756 p	44 y	Bupropion (long-acting)	A/C	Ing	Int suicide	600 ng/mL§	
						Metabolites 2540 ng/mL§	
		Lithium					
		Propranolol[A]					
757	35 y	Bupropion (long-acting)	A	Ing	Int suicide		
		Metaxalone					
		Acetaminophen[A]				57 μg/mL	
758	55 y	Bupropion (long-acting)	A	Ing	Int suicide		
		Metoprolol (long-acting)					
		Acetaminophen/hydrocodone[A]					
759	21 y	Bupropion (long-acting)	A/C	Ing	Int suicide		
		Oxcarbazepine					
760	42 y	Bupropion (long-acting)	A	Ing	Int suicide	9300 ng/mL§	
		Venlafaxine				10000 ng/mL§	
		Clonazepam[A]					
761	45 y	Bupropion (long-acting)	A	Ing	Int suicide	880 ng/mL§,#	
		Venlafaxine (long-acting)				2100 ng/mL§	
						Norvenlafaxine 570 ng/mL§	
		Zopiclone[A]					
762	41 y	Bupropion (long-acting)	A	Ing	Int suicide		
		Ethanol				46 mg/dL	
763	19 y	Citalopram	A	Ing	Unk	1410 ng/mL	
		Phenobarbital				13.1 μg/mL§	
		Quetiapine					
764	57 y	Doxepin	A/C	Ing	Int suicide	1520 ng/mL§	
						Nordoxepin 1640 ng/mL§	
		Benzodiazepine					
		Hydrochlorothiazide/valsartan[A]					

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Antidepressants							
765	57 y	Doxepin	A/C	Ing	Int suicide	1010 ng/mL#	
		Enalapril					
		Risperidone					
766 p	48 y	Doxepin	A/C	Ing	Int suicide		
		Methadone					
767 p	55 y	Doxepin	U	Ing	Int unk	1550 ng/mL§	
		Methadone				1.95 μg/mL§	
768	19 y	Doxepin	A	Ing	Int suicide		
		Quetiapine					
769	40 y	Doxepin	A/C	Ing	Int suicide		
		Quetiapine					
		Clonazepam					
770	16 y	Escitalopram	A	Ing	Int suicide		
		Amphetamine/dextroamphetamine					
771	50 y	Escitalopram	A/C	Ing	Int suicide	Citalopram 1900 ng/mL§	
		Doxepin				990 ng/mL§	
		Metoprolol[A]				18.7 μg/mL§	
772 p	41 y	Escitalopram	A/C	Ing	Int suicide		
		Zolpidem					
		Atenolol[A]					
773	37 y	Fluoxetine	A/C	Ing	Int suicide	4500 ng/mL§	
774	27 y	Imipramine	A/C	Ing	Int suicide	3920 ng/mL§	
						Desipramine 1820 ng/mL§	
775 p	28 y	Imipramine	A	Ing	Int suicide		
776	37 y	Imipramine	A	Ing	Int suicide		
		Ethanol					
777	42 y	Lithium	C	Ing	Ther err	5.2 mEq/L	
778	43 y	Lithium	C	Ing	Ther err		
779	53 y	Lithium	C	Ing	Ther err	2.9 mEq/L	
780	83 y	Lithium	C	Ing	Ther err	5.1 mEq/L	
781 p	26 y	Mirtazapine	U	Ing	Ther err	87 ng/mL§	
		Fluoxetine				>2000 ng/mL§,#	
		Oxycodone[A]				343 ng/mL§	
782 p	49 y	Nortriptyline	U	Ing	Unk		
		Acetaminophen					
783 p	25 y	Nortriptyline	U	Ing	Int suicide	5200 ng/mL§	
		Ethanol				20 mg/dL§	
784	47 y	Nortriptyline	A	Ing	Int suicide	390 ng/mL§	
		Ethanol				191 mg/dL	
785 p	24 y	Paroxetine	U	Ing	Int suicide		
		Ethanol					
		Opioid[A]					
786	42 y	Sertraline	A	Ing	Adv rxn		
787	58 y	Sertraline	U	Ing	Int suicide		
788	33 y	Sertraline	A	Ing	Int suicide		
		Cyclobenzaprine					
		Diltiazem[A]					
789	37 y	Sertraline	A	Ing	Int suicide		
		Diphenhydramine					
790	38 y	Sertraline	A/C	Ing	Int suicide		
		Phenytoin					
		Benztropine[A]					
791	47 y	Tranylcypromine	A	Ing	Int suicide		
		Acrivastine/pseudoephedrine					
		Amlodipine/benazepril[A]					
792 p	19 y	Trazodone	A	Ing	Int suicide		
		Acetaminophen/hydrocodone				62 μg/mL¥	14 h
793 p	54 y	Trazodone	A	Ing	Int unk		
		Ethanol				234 mg/dL	
		Alprazolam[A]				13 000 ng/mL§	
794 p	30s y	Trazodone	A/C	Ing	Int suicide		
		Topiramate					
		Cyclobenzaprine					
795	47 y	Tricyclic antidepressant	A	Ing	Int suicide		
796 p	53 y	Tricyclic antidepressant	A/C	Ing	Int suicide	1300 ng/mL#	
797	54 y	Tricyclic antidepressant	A	Ing	Int suicide	900 ng/mL	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Antidepressants							
798	35 y	Tricyclic antidepressant Amphetamine	A	Ing	Int suicide		
799	41 y	Tricyclic antidepressant Bupropion (long-acting) Trazodone [A]	A	Ing	Int suicide		
800 p	49 y	Tricyclic antidepressant Marijuana Benzodiazepine	A	Ing/unk	Int suicide		
801	43 y	Tricyclic antidepressant Opioid Cocaine[A]	A	Ing/unk	Int suicide		
802 p	54 y	Venlafaxine	U	Ing	Int suicide	7300 ng/mL§	
803	28 y	Venlafaxine Glipizide	A	Ing	Int suicide		
804 a	39 y	Venlafaxine Lorazepam Diphenoxylate/atropine[A]	A	Ing	Int suicide		
805	43 y	Venlafaxine Methocarbamol	A	Ing	Int suicide	1500 ng/mL 61 μg/mL	24 h 24 h
806 p	40 y	Venlafaxine Quetiapine Benztropine[A]	A/C	Ing	Int suicide		
807 p	19 y	Venlafaxine Ziprasidone Atomoxetine[A]	A/C	Ing	Int suicide	100 000 ng/mL§ Nor metabolites 19 900 ng/mL§ 140 ng/mL§ 8.3 μg/mL§	
808	43 y	Venlafaxine Ziprasidone Trazodone[A]	A/C	Ing	Int suicide		
809	40 y	Venlafaxine Zonisamide Acetaminophen/propoxyphene	A	Ing	Adv rxn		
810 p	19 y	Venlafaxine (long-acting)	A/C	Ing	Int suicide		
811	38 y	Venlafaxine (long-acting)	A	Ing	Int suicide		
812	56 y	Venlafaxine (long-acting)	A	Ing	Int suicide	123 000 ng/mL	
813 p	21 y	Venlafaxine (long-acting) Diazepam Methadone	A	Ing	Int suicide		
814	33 y	Venlafaxine (long-acting) Diphenhydramine Aspirin[A]	A	Ing	Int suicide	 15 mg/dL	
815	50 y	Venlafaxine (long-acting) Olanzapine Clomipramine[A]	U	Ing	Int suicide		
816	17 y	Venlafaxine (long-acting) Tramadol Methamphetamine	U	Ing	Int suicide		
817	23 y	Venlafaxine (long-acting) Zolpidem Lorazepam[A]	A/C	Ing/unk	Int suicide		

See also cases 338, 406, 428, 451, 565, 658, 826, 888, 914, 972, 997, and 1056 (amitriptyline); 717 (amitriptyline/chlordiazepoxide); 854 (amitriptyline/perphenazine); 587, 693, 931, 962, and 1127 (bupropion); 193, 194, 452, 605, 685, 799, 853, 885, 945, 1036, 1050, 1084, and 1104 (bupropion [long-acting]); 134, 589, 596, 609, 720, 739, 752, 827, 849, 955, 972, and 1117 (citalopram); 312 and 815 (clomipramine); 666 and 771 (doxepin); 1049 (duloxetine); 356, 425, 597, 694, 716, 726, 740, 741, 754, and 1031 (escitalopram); 21, 195, 338, 438, 587, 666, 781, 1018, and 1020 (fluoxetine); 756 and1032 (lithium); 439, 459, 495, 632, 660, 918, and 943 (mirtazapine); 742, 899, and 977 (nortriptyline); 85, 321, 450, 696, 740, 953, 1037, and 1038 (paroxetine); 45, 521, 561, 610, 960, 1006, 1041, and 1062 (sertraline); 231, 495, 522, 633, 696, 799, 808, and 905 (trazodone); 315, 348, and 1061 (tricyclic antidepressant); 598, 603, 718, 760, 879, 886, and 909 (venlafaxine); and 599, 680, 761, 853, and 943 (venlafaxine [long-acting]).

Antihistamines							
818 a/i/p	5 y	Diphenhydramine	A	Ing	Malicious	>10 μg/mL§	
819 p	17 y	Diphenhydramine	A	Ing	Int suicide	20.3 μg/mL§	
820 p	25 y	Diphenhydramine	A	Ing	Int suicide		
821	35 y	Diphenhydramine	A	Ing	Int suicide		
822	37 y	Diphenhydramine	A	Ing	Int suicide		
823 p	44 y	Diphenhydramine	A	Ing	Int suicide		

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Antihistamines							
824 p	48 y	Diphenhydramine	A/C	Ing	Int suicide		
825 p	79 y	Diphenhydramine	A	Ing	Int suicide	0.87 μg/mL§	
826	51 y	Diphenhydramine	A	Ing	Int suicide		
		Amitriptyline					
827	15 y	Diphenhydramine	A	Ing	Int suicide	17.24 μg/mL§	
		Citalopram				4610 ng/mL§	
						Norcitalopram 130 ng/mL§	
828 p	32 y	Diphenhydramine	A	Ing	Unk		
		Ethanol					
829	14 y	Diphenhydramine	A	Ing	Int suicide		
		Ibuprofen					
		Naproxen					
830	57 y	Diphenhydramine	A	Ing	Int suicide		
		Methadone				0.2 μg/mL§	
831 p	33 y	Diphenhydramine	U	Ing	Int suicide	6.8 μg/mL§	
		Propoxyphene				1.36 μg/mL§	
						Norpropoxyphene 1 μg/mL§	
		Phentermine[A]				0.16 μg/mL§	
832 p	17 y	Diphenhydramine	A	Ing	Int suicide		
		Unk drug					
See also cases 857 (cetirizine); 42, 134, 327, 328, 358, 610, 789, 814, 897, 933, and 956 (diphenhydramine); 340, 569, 850, and 877 (hydroxyzine); and 594, 885, 1011, and 1054 (promethazine).							
Antimicrobials							
833 a/i/p	7 y	Hydroxychloroquine	A	Ing	Unk	70 μg/mL§	
834 i	2 y	Isoniazid	U	Ing	Unk		
835 a	68 y	Isoniazid	C	Ing	Adv rxn		
		Rifampin					
836	34 y	Itraconazole	C	Ing	Adv rxn		
		Atorvastatin					
837	45 y	Lamivudine	A	Ing	Adv rxn		
		Stavudine					
		Glipizide[A]					
838	42 y	Lincomycin	A	Paren	Int misuse		
839 p	33 y	Quinine	A	Ing	Int suicide		
		Lisinopril					
		Olanzapine[A]					
840 a	40 y	Tilmicosin	A	Paren	Occ		
See also cases 835 (rifampin) and 837 (stavudine).							
Antineoplastics							
841	54 y	Capecitabine	C	Ing	Adv rxn		
842	68 y	Methotrexate	A	Paren	Adv rxn		
See also case 857 (methotrexate).							
Asthma therapies							
843	53 y	Theophylline	C	Ing	Ther err	22 μg/mL	
		Terbutaline					
844	68 y	Theophylline (long-acting)	A/C	Ing	Ther err	83 μg/mL	
845	74 y	Theophylline (long-acting)	C	Ing	Int misuse	78.9 μg/mL	
See also case 843 (terbutaline).							
Cardiovascular drugs							
846	55 y	Amiodarone	C	Ing	Ther err		
847	71 y	Amiodarone	C	Ing	Adv rxn		
848	55 y	Amlodipine	A	Ing	Int suicide		
		Amlodipine/benazepril					
		Acetaminophen/dextromethorphan/					
		doxylamine/pseudoephedrine					
849	49 y	Amlodipine	A/C	Ing	Int suicide		
		Citalopram				840 ng/mL§	
850	51 y	Amlodipine	A	Ing	Int suicide		
		Clonidine					
		Hydroxyzine[A]					
851	59 y	Amlodipine	A/C	Ing	Int suicide		
		Metoprolol (long-acting)					

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Cardiovascular drugs							
852	50 y	Amlodipine	A/C	Ing	Int suicide		
		Nifedipine (long-acting)					
		Potassium chloride (long-acting)[A]				8.9 mEq/L	36 h
853	63 y	Amlodipine	A	Ing	Int suicide		
		Venlafaxine (long-acting)					
		Bupropion (long-acting)[A]					
854	78 y	Amlodipine/benazepril	A/C	Ing	Int suicide		
		Amitriptyline/perphenazine					
		Levothyroxine[A]					
855	61 y	Atenolol	A	Ing	Int suicide		
		Amlodipine					
856 p	61 y	Calcium-channel blocker	A	Ing	Int suicide		
		Atenolol					
857	73 y	Clonidine	A/C	Ing	Int suicide		
		Methotrexate					
		Cetirizine[A]					
858 p	60 y	Clonidine	A/C	Ing	Int suicide	7.1 ng/mL	
		Potassium chloride				6.3 mEq/L	
		Phenytoin					
859	64 y	Digoxin	C	Ing	Ther err	3.2 ng/mL	
860 i/p	65 y	Digoxin	A	Ing	Int suicide	160 ng/mL	
861	66 y	Digoxin	C	Ing	Ther err	5.7 ng/mL	
862	68 y	Digoxin	C	Ing	Ther err	2.3 ng/mL	
863 p	69 y	Digoxin	C	Ing	Ther err	2.9 ng/mL	
864	70 y	Digoxin	C	Ing	Unk	2.94 ng/mL	
865 p	72 y	Digoxin	A/C	Ing	Ther err	3.8 ng/mL	
866	74 y	Digoxin	C	Ing	Ther err	6 ng/mL	
867	87 y	Digoxin	C	Ing	Ther err	3.59 ng/mL	
868	88 y	Digoxin	C	Ing	Ther err	2.5 ng/mL	
869	92 y	Digoxin	C	Ing	Unk	3.9 ng/mL	
870	56 y	Digoxin	A/C	Ing	Ther err	2.5 ng/mL	
		Atenolol					
		Furosemide[A]					
871	81 y	Digoxin	A/C	Ing	Int suicide	>6 ng/mL	
		Diltiazem (long-acting)					
		Acetaminophen/propoxyphene[A]					
872	51 y	Digoxin	A/C	Ing/paren	Int suicide	>5 ng/mL	
		Insulin					
873	78 y	Digoxin	A	Ing	Int suicide	29 ng/mL	
		Lorazepam					
		Acetaminophen/hydrocodone[A]					
874	73 y	Digoxin	C	Ing	Ther err	3.1 ng/mL	
		Metformin					
		Verapamil					
875	58 y	Diltiazem	A	Ing	Int suicide		
876	52 y	Diltiazem	A	Ing	Int suicide		
		Acetaminophen				14 μg/mL	
		Ethanol					
877	57 y	Diltiazem	A/C	Ing	Int suicide		
		Hydroxyzine					
		Hydrochlorothiazide					
878 p	36 y	Diltiazem	A	Ing	Int suicide		
		Metoprolol					
		Clonidine[A]					
879 p	62 y	Diltiazem	A	Ing	Int suicide		
		Venlafaxine					
		Acetaminophen/hydrocodone[A]					
880	54 y	Diltiazem (long acting)	A/C	Ing	Int suicide		
		Hydrochlorothiazide/triamterene					
		Lisinopril[A]					
881 a	10 mo	Diltiazem (long-acting)	A	Ing	Unint gen		
882	31 y	Diltiazem (long-acting)	A	Ing	Int suicide		
883	92 y	Diltiazem (long-acting)	A	Ing	Ther err		
884 p	83 y	Diltiazem (long-acting)	U	Ing	Int suicide		
		Acetaminophen/propoxyphene				444 μg/mL¥	5 h
		Aspirin[A]					

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Cardiovascular drugs							
885	46 y	Diltiazem (long-acting)	A/C	Ing	Int suicide		
		Bupropion (long-acting)					
		Promethazine[A]					
886	57 y	Diltiazem (long-acting)	A	Ing	Int suicide		
		Clonidine					
		Venlafaxine[A]					
887	49 y	Diltiazem (long-acting)	A/C	Ing	Int suicide		
		Diazepam					
888	54 y	Diltiazem (long-acting)	A/C	Ing	Int suicide		
		Lisinopril					
		Amitriptyline[A]					
889	37 y	Disopyramide	A/C	Ing	Int suicide		
890 a/p	15 mo	Flecainide	A/C	Ing	Unint gen	6.87 μg/mL	
891	48 y	Flecainide	A	Ing	Int suicide		
		Amisulpride					
892	23 y	Flecainide	A	Ing	Int suicide		
		Diltiazem (long-acting)					
		Aspirin					
893 i	77 y	Labetalol	A	Ing	Int suicide		
894	52 y	Lisinopril	A/C	Ing	Int suicide		
		Diltiazem (long-acting)					
		Metoprolol (long-acting)	A				
895	41 y	Metoprolol	U	Ing	Int suicide		
		Acetaminophen					
896	54 y	Metoprolol	A	Inh/paren	Adv rxn		
		Cocaine					
897	43 y	Nifedipine	A/C	Ing	Int suicide		
		Diphenhydramine					
898	37 y	Propranolol	A	Ing	Int suicide		
		Acetaminophen/propoxyphene					
		Quetiapine[A]					
899	31 y	Propranolol	U	Ing	Int suicide		
		Nortriptyline					
		Oxcarbazepine[A]					
900 p	54 y	Sildenafil	A/C	Ing	Adv rxn		
		Atenolol					
901	53 y	Verapamil	A/C	Ing	Int suicide		
902	55 y	Verapamil	A	Ing	Int suicide		
903	64 y	Verapamil	A/C	Ing	Int suicide		
904	52 y	Verapamil	A/C	Ing	Int suicide	9.5 μg/mL§	
		Atenolol				0.83 μg/mL§	
		Hydrochlorothiazide				1.1 μg/mL§	
905	48 y	Verapamil	A	Ing	Int suicide		
		Clonidine					
		Trazodone					
906	89 y	Verapamil	A/C	Ing	Int suicide		
		Fluvastatin					
		Tolterodine					
907	38 y	Verapamil	A	Ing	Int suicide		
		Quetiapine					
		Valproic acid[A]					
908	64 y	Verapamil (long acting)	A/C	Ing	Int suicide		
		Chlorpromazine					
909	29 y	Verapamil (long acting)	A/C	Ing	Int suicide		
		Venlafaxine					
910	42 y	Verapamil (long-acting)	A	Ing	Int suicide		
911	44 y	Verapamil (long-acting)	A/C	Ing	Int suicide		
912	81 y	Verapamil (long-acting)	C	Ing	Ther err		
913 p	28 y	Verapamil (long-acting)	A	Ing	Int suicide		
		Acetaminophen/chlorpheniramine					
		Benzodiazepine					
914	62 y	Verapamil (long-acting)	A/C	Ing	Int suicide	2.12 μg/mL§	
		Amitriptyline				345 ng/mL§	
						Nortriptyline 247 ng/mL§	
		Ethanol[A]				116 mg/dL	5 h
915	43 y	Verapamil (long-acting)	A/C	Ing	Int suicide	0.77 μg/mL§	
						Norverapamil 0.4 μg/mL§	
		Clonidine					
		Ethanol				190 mg/dL	

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Cardiovascular drugs							
916 i	36 y	Verapamil (long-acting) Ethanol	A/C	Ing	Int suicide		
917	71 y	Verapamil (long-acting) Metoprolol Lisinopril[A]	A	Ing	Int suicide		
918	60 y	Verapamil (long-acting) Mirtazapine Pravastatin[A]	A/C	Ing	Int suicide		
919	37 y	Verapamil/trandolapril (long-acting)	A/C	Ing	Int suicide		
920	32 y	Verapamil/trandolapril (long-acting) Ethanol	A	Ing	Int suicide		
See also cases 855, 984, and 1027 (amlodipine); 791 and 848 (amlodipine/benazepril); 772, 856, 870, 900, 904, and 991 (atenolol); 836 (atorvastatin); 668, 724, 850, 878, 886, 905, and 915 (clonidine); 492 and 788 (diltiazem); 871, 892, 894, 945, and 1086 (diltiazem [long-acting]); 765 and 956 (enalapril); 906 (fluvastatin); 764 (hydrochlorothiazide/valsartan); 676 (isosorbide dinitrate); 839, 880, 888, 917, 984, and 1012 (lisinopril); 959 (losartan); 771, 878, and 917 (metoprolol); 586, 758, 851, and 894 (metoprolol [long-acting]); 1086 (nifedipine); 852 (nifedipine (long-acting)); 918 (pravastatin); 960 (propafenone); 756 (propranolol); 1039 and1040 (simvastatin); 874 (verapamil); and 734 (verapamil [long-acting]).							
Cold and cough preparations							
921 p	29 y	Acetaminophen/chlorpheniramine	A/C	Ing	Int suicide		
922 p	18 y	Acetaminophen/chlorpheniramine/ dextromethorphan	A	Ing	Int suicide		
923	39 y	Acetaminophen/pseudoephedrine Acetaminophen/hydrocodone	C	Ing	Int suicide	29 μg/mL¥	
924 a/p	2 y	Benzonatate	A	Ing	Unint gen		
925	36 y	Brompheniramine/pseudoephedrine Acetaminophen Acetaminophen/hydrocodone[A]	A	Ing	Int suicide	64 μg/mL	
926 p	23 y	Chlorpheniramine/dextromethorphan Unk drug	A	Ing	Int abuse		
927	4 mo	Chlorpheniramine/guaifenesin/phenylephrine	A	Ing	Adv rxn	Chlorpheniramine 0.081 μg/mL§	
928 a/p	12 mo	Chlorpheniramine/hydrocodone	A	Ing	Unint gen		
929	50 y	Dextromethorphan/guaifenesin	U	Ing	Int suicide		
930 p	60 y	Dextromethorphan/guaifenesin Metformin Alprazolam[A]	A	Ing	Int suicide		
931 p	24 y	Fexofenadine/pseudoephedrine Bupropion	U	Ing	Int suicide	Pseudoephedrine 14 μg/mL 2000 ng/mL	
932	30 y	Ibuprofen/pseudoephedrine Acetaminophen	A	Ing	Int suicide		
933 p	32 y	Pseudoephedrine (long-acting) Diphenhydramine	A	Ing	Int suicide		
See also cases 399 (acetaminophen/antihistamine); 498 (acetaminophen/brompheniramine/pseudoephedrine); 913 (acetaminophen/chlorpheniramine); 738 (acetaminophen/chlorpheniramine/dextromethorphan); 310, 489, 729, and 848 (acetaminophen/dextromethorphan/doxylamine/pseudoephedrine); 562 (acetaminophen/pseudoephedrine); 791 (acrivastine/pseudoephedrine); 107 (dextromethorphan); 1005 (pseudoephedrine); and 447 (unk cough/cold medication).							
Dietary supplements/herbals/homeopathic							
934 a/p	33 y	Caffeine/ephedra Ethanol	C	Ing	Int misuse		
935	34 y	Ephedra	A	Ing	Int unk		
936 a	50s y	Laetrile	A	Ing	Int misuse	Cyanide 5.1 μg/mL	
See also cases 1058 and 1118 (ephedra) and 519 (ma huang).							
Diuretics							
See also cases 870 (furosemide); 877, 904, and 958 (hydrochlorothiazide); and 880 (hydrochlorothiazide/triamterene).							
Electrolytes and minerals							
937	71 y	Magnesium hydroxide	C	Ing	Ther err	Magnesium 15.4 mEq/L	
938 p	56 y	Potassium chloride	A	Ing	Int suicide		
See also cases 343 (iron); 732 and 858 (potassium chloride); and 852 (potassium chloride [long-acting]).							
Eye/ear/nose/throat preparations							
939	20s y	Propylhexedrine	A	Paren	Int abuse		
See also case 131 (phenylephrine).							
Gastrointestinal preparations							
940 a/i	19 y	Diphenoxylate Diazepam	A	Inh	Unk	40 mg/mL	12 h
941 a	44 y	Loperamide	A	Ing	Int suicide		
See also cases 407 (atropine/hyoscyamine/phenobarbital/scopolamine); 455, 804, and 1121 (diphenoxylate/atropine); 331 (esomeprazole); 331 (rabeprazole [long-acting]); and 906 (tolterodine).							

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Hormones and hormone antagonists							
942	79 y	Glimepiride	C	Ing	Int suicide		
		Acetaminophen/hydrocodone				44.1 μg/mL¥	
943	33 y	Glyburide	A/C	Ing	Int suicide		
		Venlafaxine (long-acting)					
		Mirtazapine[A]					
944 i	60 y	Insulin	A	Paren	Malicious		
945 p	46 y	Insulin	A	Ing/paren	Int suicide		
		Diltiazem (long-acting)					
		Bupropion (long-acting)	A				
946	61 y	Insulin	A	Ing/paren	Int suicide		
		Glyburide					
947	52 y	Insulin	A/C	Ing/paren	Int suicide		
		Methadone					
948 a	54 y	insulin	A	Inh/paren	Int suicide		
		Tiletamine/zolazepam					
		Cyclopropane					
949	37 y	Metformin	A	Ing	Int suicide		
950	47 y	Metformin	A/C	Ing	Int suicide		
951	57 y	Metformin	C	Ing	Adv rxn		
952	82 y	Metformin	C	Ing	Int misuse		
953	56 y	Metformin	A/C	Ing	Int suicide		
		Acetaminophen				105 μg/mL	
		Paroxetine[A]					
954 a	77 y	Metformin	A/C	Ing	Int suicide	64 μg/mL§	
		Acetaminophen/propoxyphene				33 μg/mL¥	4 h
955	71 y	Metformin	A	Ing	Int suicide	110 μg/mL§	
		Clonazepam				84 ng/mL§	
						7-Aminoclonazepam 170 ng/mL§	
		Citalopram[A]				66 ng/mL§	
956	15 y	Metformin	A	Ing	Int suicide		
		Diphenhydramine					
		Enalapril[A]					
957	33 y	Metformin	A	Ing	Int suicide		
		Glipizide					
958	>19 y	Metformin	C	Ing	Adv rxn		
		Hydrochlorothiazide					
		Glipizide[A]					
959	45 y	Metformin	A	Ing	Int suicide		
		Losartan					
960 p	88 y	Metformin	A/C	Ing	Int misuse	120 μg/mL	
		Propafenone					
		Sertraline					
961	79 y	Metformin	A/C	Ing	Int suicide		
		unk drug					
962	38 y	Metformin/rosiglitazone	A	Ing	Int suicide		
		Bupropion					
See also cases 803, 837, 957, and 958 (glipizide); 946 (glyburide); 735, 872, and 1003 (insulin); 854 (levothyroxine); and 693, 874, and 930 (metformin).							
Miscellaneous drugs							
963 a	74 y	Lepirudin	C	Paren	Ther err		
964 i/p	>19 y	Nicotine patch (long-acting)	U	Derm	Unk		
965 a/p	46 y	Succinylcholine	A	Paren	Int suicide		
See also cases 509 (allopurinol); 807 and 1062 (atomoxetine); 1181 (berberine); 438 (eletriptan); 998 (flumazenil); and 667 (memantine).							
Muscle relaxants							
966 a	12 y	Baclofen	A	Other	Adv rxn		
967 p	68 y	Baclofen	A/C	Ing/oth	Ther err		
968 p	17 y	Carisoprodol	A	Ing	Int suicide		
969 p	45 y	Carisoprodol	A/C	Ing	Int suicide	9.3 μg/mL§	
						Meprobamate 40 μg/mL§	
		Acetaminophen				97 μg/mL§	
		Ethanol					
970 p	50s y	Carisoprodol	A	Ing	Int suicide		
		Acetaminophen/hydrocodone					
		Diazepam					
971 p	53 y	Carisoprodol	A	Ing	Int suicide		
		Alprazolam					

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Muscle relaxants							
972	38 y	Carisoprodol	A	Ing	Int suicide	Meprobamate 6.8 μg/mL	
		Citalopram					
		Amitriptyline					
973 p	25 y	Carisoprodol	U	Ing	Int suicide	10 μg/mL§	
						Meprobamate 41 μg/mL§	
		Hydrocodone				100 ng/mL§	
		Diazepam[A]				200 ng/mL§	
						Nordiazepam 300 ng/mL§	
974	16 y	Carisoprodol	A	Ing	Int suicide		
		Hydrocodone					
		Ethanol[A]					
975 i	>19 y	Cyclobenzaprine	C	Ing	Unk	0.256 μg/mL§	
976 i	>19 y	Cyclobenzaprine	U	Derm/ing	Unk	0.42 μg/mL§	
		Methadone				0.33 μg/mL§	
		Fentanyl patch				6 ng/mL§	
977	39 y	Cyclobenzaprine	A/C	Ing	Int suicide		
		Nortriptyline					
		Morphine					
978	58 y	Tizanidine	A/C	Ing	Int suicide		
		Ethanol					
		Opioid					
979 p	32 y	Tizanidine	A/C	Ing	Int suicide		
		Zolpidem					
		Diazepam[A]					
See also cases 421 and 574 (baclofen); 319, 358, 399, 405, 409 to 422, 436, 439, 453, 459, 568, and 983 (carisoprodol); 12, 449, 452, 454, 788, 794, 1039, 1054, and 1120 (cyclobenzaprine); 757 (metaxalone); and 434 and 805 (methocarbamol).							
Narcotic antagonists							
See also case 1119 (naltrexone).							
Sedative/hypnotics/antipsychotics							
980	48 y	Alprazolam	A/C	Ing	Int suicide		
981	Unk	Alprazolam	A	Ing	Unk		
982	17 y	Alprazolam	U	Ing	Int suicide		
		Acetaminophen/hydrocodone					
983 p	64 y	Alprazolam	A/C	Ing	Int suicide		
		Acetaminophen/hydrocodone				Hydrocodone 470 ng/mL	
		Carisoprodol					
984	44 y	Alprazolam	A/C	Ing	Unk		
		Amlodipine					
		Lisinopril					
985 p	63 y	Alprazolam	A	Ing	Int suicide		
		Ethanol					
986 p	25 y	Alprazolam	A/C	Ing	Int suicide	35 ng/mL§	
		Methadone				0.514 μg/mL§	
987 p	25 y	Alprazolam	U	Ing	Int suicide	20 ng/mL	
		Methadone				0.08 μg/mL	
		Meperidine[A]				Normeperidine 0.3 μg/mL§	
988 p	24 y	Alprazolam	U	Ing/unk	Int unk		
		Phentermine					
		Methamphetamine[A]					
989 p	33 y	Alprazolam	A/C	Ing	Int suicide		
		Unk drug					
990	38 y	Alprazolam	A/C	Ing	Int suicide		
		Zolpidem					
991	56 y	Alprazolam	A/C	Ing	Int suicide		
		Zolpidem					
		Atenolol					
992 a	83 y	Amobarbital/secobarbital	A	Ing	Int suicide		
993	39 y	Barbiturate (long-acting)	A/C	Ing/inh	Int suicide		
		Benzodiazepine					
		Marijuana[A]					
994 p	27 y	Benzodiazepine	U	Ing/unk	Int unk		
		Ethanol				38 mg/dL	
		Cocaine					
995 p	39 y	Benzodiazepine	U	Unk	Unk		
		Unk drug					
		Marijuana					

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Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Sedative/hypnotics/antipsychotics							
996	48 y	Chlordiazepoxide	A/C	Ing	Int suicide		
997 p	50 y	Clonazepam	A/C	Ing/inh	Int suicide		
		Amitriptyline					
		Heroin					
998	47 y	Clonazepam	A	Ing	Int suicide		
		Flumazenil					
		Methamphetamine[A]					
999 p	30 y	Clonazepam	A	Ing/unk	Int abuse		
		Heroin					
		Alprazolam[A]					
1000 p	44 y	Clonazepam	A/C	Ing	Int suicide		
		Methadone					
		Gabapentin					
1001 p	21 y	Clonazepam	U	Ing	Int unk	63.6 ng/mL§,e	
		Oxycodone (long-acting)				100 ng/mL§	
1002 p	41 y	Diazepam	A	Ing	Int suicide		
		Ethanol				365 mg/dL	
1003	57 y	Diazepam	A	Ing/paren	Int suicide		
		Insulin					
1004	27 y	Diazepam	A	Ing	Int unk		
		Methamphetamine					
		Ethanol[A]					
1005 p	17 y	Diazepam	U	Ing	Int suicide		
		Pseudoephedrine					
1006 p	24 y	Diazepam	A/C	Ing	Int suicide		
		Tiagabine					
		Sertraline[A]					
1007	21 y	Doxylamine	A	Ing/unk	Int suicide		
		Cocaine					
		Amphetamine[A]					
1008	28 y	Haloperidol	A	Ing	Int suicide		
		Acetaminophen				500.3 μg/mL	
		Clonazepam					
1009	59 y	Haloperidol	A/C	Ing	Adv rxn		
		Ziprasidone					
		Benztropine[A]					
1010 p	48 y	Lorazepam	A/C	Ing	Int suicide		
1011	44 y	Lorazepam	A	Ing	Int suicide		
		Acetaminophen/hydrocodone					
		Promethazine[A]					
1012	52 y	Lorazepam	A	Asp/ing	Int suicide		
		Activated charcoal					
		Lisinopril[A]					
1013	27 y	Lorazepam	A/C	Ing/inh	Int abuse		
		Dextroamphetamine					
		Marijuana					
1014	75 y	Meprobamate	A/C	Ing	Unk		
1015 p	34 y	Olanzapine	A	Ing	Int suicide		
1016 p	54 y	Olanzapine	A	Ing	Int suicide		
		Clonazepam					
1017 p	33 y	Olanzapine	U	Ing	Unk		
		Clonazepam					
		Unk drug					
1018 p	37 y	Olanzapine	A/C	Ing	Int suicide		
		Fluoxetine					
1019 p	40 y	Olanzapine	A	Ing	Int suicide		
		Gabapentin					
1020	14 y	Olanzapine	A	Ing	Int suicide	600 ng/mL§	
		Risperidone					
		Fluoxetine[A]				2500 ng/mL§	
						Norfluoxetine 600 ng/mL§	
1021 p	50 y	Phenobarbital	A	Ing	Int suicide	277 μg/mL	
1022	73 y	Phenobarbital	A	Ing	Int suicide	169 μg/mL	
1023	58 y	Phenobarbital	A	Ing	Int suicide	120 μg/mL	38 h
		Methadone					
		Phenytoin[A]					
1024 p	19 y	Quetiapine	U	Ing	Int suicide	26740 ng/mL§	
1025	41 y	Quetiapine	A	Ing	Int suicide		

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Sedative/hypnotics/antipsychotics							
1026	56 y	Quetiapine	A/C	Ing	Int suicide		
1027 p	76 y	Quetiapine Amlodipine	A	Ing	Int suicide		
1028	62 y	Quetiapine Clonazepam	A/C	Ing	Int suicide		
1029	64 y	Quetiapine Clonazepam	A	Ing	Int suicide		
1030	43 y	Quetiapine Cocaine Morphine[A]	A	Ing/unk	Int suicide		
1031 p	40 y	Quetiapine Escitalopram Clonazepam[A]	U	Asp/ing	Unk		
1032	47 y	Quetiapine Lithium Thiothixene[A]	A	Ing	Int suicide	 5.2 mEq/L	
1033 p	45 y	Quetiapine Methamphetamine	C	Ing	Int suicide	 0.09 μg/mL§	
1034	32 y	Quetiapine Olanzapine	A/C	Ing	Int suicide		
1035 p	38 y	Quetiapine Olanzapine Zolpidem[A]	A/C	Ing	Int suicide		
1036 p	21 y	Quetiapine Oxycodone (long-acting) Bupropion (long-acting)	A	Ing	Int suicide		
1037	45 y	Quetiapine Paroxetine Gabapentin[A]	A/C	Ing/unk	Int suicide		
1038	24 y	Quetiapine Paroxetine Ibuprofen[A]	A/C	Ing	Int suicide		
1039 i/p	46 y	Quetiapine Propranolol Cyclobenzaprine[A]	A	Ing	Int suicide		
1040 p	60 y	Quetiapine Simvastatin Diclofenac[A]	A	Ing	Int suicide		
1041 p	>19 y	Quetiapine Valproic acid Sertraline	U	Ing	Int suicide		
1042	32 y	Quetiapine Ziprasidone[A] Risperidone	C	Ing/paren	Adv rxn		
1043 p	32 y	Risperidone	A	Ing	Int suicide		
1044	47 y	Risperidone	A/C	Ing	Adv rxn		
1045	77 y	Risperidone Clorazepate	A/C	Ing	Int suicide		
1046	86 y	Risperidone Lorazepam Aspirin[A]	U	Ing	Int suicide	43.8 ng/mL§,# 45 mg/dL	
1047	77 y	Temazepam	A	Ing	Int suicide		
1048 a/p	19 y	Trimethobenzamide	A	Ing	Int suicide		
1049 p	20 y	Ziprasidone Duloxetine	A	Ing	Int suicide		
1050	41 y	Ziprasidone Lorazepam Bupropion (long-acting)	A/C A	Ing	Int suicide		
1051	45 y	Ziprasidone Valproic acid Fluphenazine	A/C	Ing	Unk	 12 μg/mL 400 ng/mL§	
1052	31 y	Ziprasidone Valproic acid Haloperidol[A]	A/C	Ing	Int suicide		
1053 p	>19 y	Zolpidem	U	Ing	Int suicide		

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Sedative/hypnotics/antipsychotics							
1054 p	51 y	Zolpidem	U	Ing/unk	Int abuse	1962 ng/mL§	
		Promethazine				792 ng/mL§	
		Cyclobenzaprine[A]				0.042 μg/mL§	
See also cases 84, 315, 326, 402 to 405, 408, 418 to 420, 448 to 450, 523, 559, 560, 563, 564, 593, 595, 605, 630, 631, 638, 640, 715, 716, 793, 930, 971, 999, 1080, 1096, and 1147 (alprazolam); 891 (amisulpride); 685 and 718 (aripiprazole); 491 (barbiturate [long-acting]); 10, 316, 491, 566, 567, 573, 592, 604, 616, 641, 661, 683, 764, 800, 913, 993, 1060, 1083, 1114, 1115, and 1148 (benzodiazepine); 408, 650, and 751 (buspirone); 226 and 569 (chloral hydrate); 320, 359, and 608 (chlordiazepoxide); 713, 719, 726, and 908 (chlorpromazine); 86, 321, 425, 499, 570, 624, 649, 660, 697, 721 to 723, 753, 760, 769, 955, 1008, 1016, 1017, 1028, 1029, 1031, and 1116 (clonazepam); 1045 (clorazepate); 326, 407, 422 to 424, 433, 574 to 576, 590, 608, 609, 627, 639, 644, 659, 730, 813, 887, 940, 970, 973, 979, and 1085 (diazepam); 329 (diphenhydramine); 577 (doxylamine); 1051 (fluphenazine); 518 (flurazepam); 1052 (haloperidol); 361, 381, 694, 804, 817, 873, 1046, 1050, and 1092 (lorazepam); 330, 590, and 658 (meprobamate); 211 (midazolam); 195, 496, 730, 742, 815, 839, 1034, 1035, and 1091 (olanzapine); 663, 697, 743, and 763 (phenobarbital); 21, 135, 381, 461, 497, 498, 595, 596, 600, 648, 649, 678 to 680, 723, 763, 768, 769, 806, 898, 907, 1102, and 1125 (quetiapine); 350, 351, 632, 765, 1020, 1042, and 1098 (risperidone); 427 (temazepam); 361 (thioridazine); 1032 (thiothixene); 736 and 745 (trifluoperazine); 667, 807, 808, 1009, and 1042 (ziprasidone); 133, 350, 351, 382, 440, 576, 600, 633, 772, 817, 979, 990, 991, and 1035 (zolpidem); and 761 (zopiclone).							
Stimulants and street drugs							
1055 p	39 y	Amphetamine	A	Unk	Int abuse		
1056	42 y	Amphetamine	A	Ing/unk	Int abuse		
		Amitriptyline					
		Marijuana					
1057 p	50 y	Amphetamine	A	Ing/unk	Int abuse		
		Cocaine					
		Heroin					
1058	52 y	Amphetamine	U	Ing	Int abuse		
		Ephedra					
1059 p	40 y	Amphetamine	U	Ing/unk	Unk		
		Ethanol					
1060	40 y	Amphetamine	A	Ing	Int abuse		
		Opioid					
		Benzodiazepine					
1061	26 y	Amphetamine	U	Unk	Unk		
		Tricyclic antidepressant					
1062 p	14 y	Amphetamine/dextroamphetamine	U	Ing	Unk		
		Atomoxetine					
		Sertraline					
1063	17 y	Cocaine	A	Ing	Int misuse		
1064 p	23 y	Cocaine	A	Unk	Int unk		
1065 i/p	25 y	Cocaine	A/C	Paren	Int abuse		
1066 a/p	25 y	Cocaine	A	Ing	Int misuse		
1067 a	26 y	Cocaine	A	Ing	Int misuse	1.2 μg/mL	
1068	30 y	Cocaine	A	Ing	Int misuse	>5 μg/mL§	
1069	30s y	Cocaine	A	Paren	Int abuse		
1070	31 y	Cocaine	C	Inh	Int abuse		
1071 a/p	40 y	Cocaine	A	Inh	Int abuse		
1072 p	41 y	Cocaine	A	Ing	Int abuse		
1073	43 y	Cocaine	U	Unk	Int unk		
1074 p	48 y	Cocaine	U	Unk	Int abuse		
1075	52 y	Cocaine	U	Unk	Int unk		
1076 i/p	>19 y	Cocaine	A	Ing	Int abuse		
1077 p	>19 y	Cocaine	A	Ing	Int misuse		
1078	Unk	Cocaine	U	Unk	Int suicide		
1079	42 y	Cocaine	A/C	Ing/unk	Int unk		
		Acetaminophen/hydrocodone				15 μg/mL¥	
1080 p	Unk	Cocaine	A	Ing/unk	Int abuse	Benzoylecgonine 0.144 μg/mL§	
		Alprazolam				151 ng/mL§	
		Ethanol				291 mg/dL§	
1081	33 y	Cocaine	A	Ing	Int misuse		
		Amphetamine					
1082 p	18 y	Cocaine	A	Ing/inh/paren	Int abuse		
		Amphetamine					
		Marijuana[A]					
1083 p	27 y	Cocaine	A	Ing/inh/unk	Int abuse		
		Benzodiazepine					
		Marijuana					
1084	19 y	Cocaine	A	Ing/unk	Int suicide		
		Bupropion (long-acting)					
		Lamotrigine[A]					

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Sedative/hypnotics/antipsychotics							
1085	39 y	Cocaine	A	Ing	Int suicide		
		Diazepam					
		Ethanol					
1086	47 y	Cocaine	A	Ing/inh	Int abuse	Benzoylecgonine 4.07 μg/mL	
						Ecgonine 0.766 μg/mL	
		Diltiazem (long-acting)				0.152 μg/mL	
		Nifedipine[A]					
1087 p	19 y	Cocaine	A	Ing/paren	Int abuse		
		Heroin					
1088	27 y	Cocaine	A/C	Inh/paren	Int abuse		
		Heroin					
1089	52 y	Cocaine	A	Inh/paren	Int abuse		
		Heroin					
1090 p	>19 y	Cocaine	C	Paren	Int abuse		
		Heroin					
1091 p	43 y	Cocaine	A	Ing/inh	Int abuse	Benzoylecgonine 0.52 μg/mL§	
		Heroin				Morphine 40 ng/mL§	
		Olanzapine					
1092	27 y	Cocaine	A/C	Ing/unk	Int unk	Benzoylecgonine 0.013 μg/mL	3 h
		Lorazepam				370 ng/mL	3 h
1093 p	47 y	Cocaine	A	Unk	Unk	Benzoylecgonine 2.279 μg/mL§	
		Marijuana					
1094	20 y	Cocaine	A/C	Rectal/unk	Int unk		
		Meperidine					
1095	54 y	Cocaine	A/C	Ing/inh	Int abuse		
		Methadone					
1096 p	30 y	Cocaine	A	Ing/unk	Int unk		
		Methadone				0.0876 μg/mL§	
		Alprazolam[A]					
1097 i/p	35 y	Cocaine	A/C	Unk	Unk		
		Methamphetamine					
1098 p	30 y	Cocaine	A	Ing	Int unk		
		Risperidone					
		Gabapentin					
1099	28 y	Cocaine	C	Ing/inh/unk	Int unk		
		Unk drug					
1100 i/p	48 y	Cocaine (crack)	A	Inh	Int abuse		
1101	55 y	Cocaine (crack)	A	Inh	Int abuse	Benzoylecgonine 1.47 μg/mL§	
1102 p	48 y	Cocaine (crack)	U	Ing/unk	Int abuse		
		Quetiapine					
		Gabapentin					
1103	46 y	Ephedrine	C	Ing	Int abuse		
1104	42 y	Ephedrine	A	Ing	Int suicide		
		Bupropion (long-acting)					
1105	21 y	Heroin	C	Paren	Int unk		
1106 p	23 y	Heroin	U	Inh	Int abuse		
1107 p	24 y	Heroin	U	Paren	Int abuse		
1108 p	25 y	Heroin	A/C	Paren	Int unk		
1109 p	47 y	Heroin	A	Unk	Malicious		
1110 p	48 y	Heroin	A/C	Paren	Int abuse		
1111 p	51 y	Heroin	A	Paren	Int abuse	Morphine 0.58 ng/mL	
						Free morphine 0.12 ng/mL	
1112 p	54 y	Heroin	U	Paren	Int abuse		
Stimulants and street drugs							
1113 p	56 y	Heroin	A	Paren	Int abuse		
1114 p	39 y	Heroin	A	Unk	Unk		
		Amphetamine					
		Benzodiazepine[A]					
1115	38 y	Heroin	A/C	Ing/paren	Int unk		
		Benzodiazepine					
		Ethanol				200 mg/dL	
1116 p	29 y	Heroin	A/C	Ing/paren	Int abuse		
		Clonazepam					
1117 p	36 y	Heroin	A	Ing/paren	Int abuse	Morphine 70 ng/mL§	
		Cocaine				0.03 μg/mL§	
		Citalopram[A]					

(*continued on next page*)

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Stimulants and street drugs							
1118 p	27 y	Heroin	U	Ing/inh/oth/unk	Int unk		
		Cocaine					
		Ephedra[A]					
1119 p	30 y	Heroin	A	Ing/paren	Unk	Morphine 100 ng/mL§	
		Cocaine				0.24 μg/mL§	
						Benzoylecgonine 1 μg/mL§	
		Naltrexone					
1120 p	42 y	Heroin	A/C	Ing/paren	Int abuse		
		Cyclobenzaprine					
1121 p	52 y	Heroin	U	Ing/paren	Unk		
		Diphenoxylate/atropine					
1122 p	22 y	Heroin	A/C	Ing/paren/unk	Int abuse	Morphine 50 ng/mL§	
						6-Acetylmorphine 15 ng/mL§	
		Ethanol				60 mg/dL§	
1123 p	22 y	Heroin	A	Unk	Int abuse		
		Marijuana					
1124 p	15 y	Heroin	U	Ing/inh/unk	Int abuse		
		Oxycodone					
		Marijuana					
1125 p	51 y	Heroin	A	Asp/ing/paren	Int suicide		
		Quetiapine					
1126	47 y	Heroin	A	Paren	Int abuse		
		Unk drug					
1127 a	18 y	Lysergic acid diethylamide	A	Ing	Int abuse		
		Bupropion					
1128	15 y	Methamphetamine	A	Inh	Int abuse		
1129 p	17 y	Methamphetamine	U	Unk	Int abuse		
1130	18 y	Methamphetamine	A	Ing	Int abuse		
1131	19 y	Methamphetamine	A	Ing	Int misuse	16 μg/mL	
1132	21 y	Methamphetamine	A	Unk	Int suicide		
1133 p	25 y	Methamphetamine	A	Unk	Int abuse		
1134	26 y	Methamphetamine	A	Paren	Int abuse		
1135 p	26 y	Methamphetamine	A	Ing	Int misuse		
1136	30 y	Methamphetamine	A/C	Ing/paren	Int misuse		
1137	31 y	Methamphetamine	A	Ing	Int abuse		
1138	31 y	Methamphetamine	A	Unk	Int abuse		
1139 p	31 y	Methamphetamine	U	Unk	Int suicide	1.69 μg/mL§	
1140 p	32 y	Methamphetamine	C	Unk	Int unk		
1141	33 y	Methamphetamine	A	Ing	Int suicide		
1142 a	34 y	Methamphetamine	A	Ing	Int abuse	21 μg/mL§	
						Amphetamine 0.38 μg/mL§	
1143	35 y	Methamphetamine	A	Ing	Int abuse	5.8 μg/mL§	
						Amphetamine 0.31 μg/mL§	
1144 p	38 y	Methamphetamine	A	Ing	Int misuse	11 μg/mL§	
1145 p	45 y	Methamphetamine	A	Unk	Int abuse		
1146	62 y	Methamphetamine	U	Unk	Int abuse		
1147	22 y	Methamphetamine	U	Ing	Int abuse	11 μg/mL§	
						Amphetamine 0.37 μg/mL§	
		Acetaminophen/hydrocodone					
		Alprazolam				62 ng/mL§	
1148 p	41 y	Methamphetamine	A/C	Ing/inh/paren	Int abuse		
		Amphetamine/dextroamphetamine					
		Benzodiazepine					
1149	29 y	Methamphetamine	A	Ing	Int abuse		
		Heroin					
1150	26 y	Methamphetamine	A	Ing/inh	Int abuse	4.8 μg/mL§	
		Marijuana					
1151 p	37 y	Methamphetamine	U	Inh	Int abuse		
		Marijuana					
1152 p	44 y	Methamphetamine	U	Ing/unk	Int abuse		
		Unk opioid					
		Acetaminophen				11 μg/mL	
1153	32 y	Methamphetamine	A	Unk	Int abuse		
		Unk substance					
1154 a	14 y	Methylenedioxyamphetamine	A	Ing	Int abuse	0.41 μg/mL	
						D-Methamphetamine 0.04 μg/mL	
1155 p	22 y	Methylenedioxymethamphetamine	U	Ing	Int abuse		

Table 21 continued

Case	Age	Substances	Chronicity	Route	Reason	Blood Concentrations	Interval after Exposure
PHARMACEUTICALS							
Stimulants and street drugs							
1156 a	29 y	Methylenedioxymethamphetamine	A	Unk	Int abuse		
1157	22 y	Methylenedioxymethamphetamine	A	Ing/unk	Int abuse		
		Cocaine					
1158	25 y	Phencyclidine	U	Unk	Int abuse		
		Opioid					
		Marijuana					
1159 p	43 y	Phentermine	A/C	Ing	Int suicide	16 μg/mL§	
1160 p	29 y	Phentermine	U	Unk	Unk	0.1 μg/mL§	
		Cocaine					
		Hydrocodone[A]					
1161 a	22 y	Phenylethylamine	A	Ing	Int abuse		
1162 p	21 y	Unk street drug	A	Unk	Int abuse		
1163 p	23 y	Unk street drug	U	Unk	Int unk		
1164 p	25 y	Unk street drug	U	Ing/unk	Unk		
		Ethanol				200 mg/dL	
1165	46 y	Unk street drug	A	Ing/unk	Int unk		
		Ethanol				445 mg/dL	

See also cases 231, 316, 798, 1007, 1081, 1082, and 1114 (amphetamine); 770, 1148 (amphetamine/dextroamphetamine); 41, 322 to 324, 329, 456, 488, 571 to 573, 626, 627, 642, 643, 725 ,801, 896, 994, 1007, 1030, 1057, 1117 to 1119, 1157, and 1160 (cocaine); 1013 (dextroamphetamine); 330 (ephedrine); 663, 997, 999, 1057, 1087 to 1091, and 1149 (heroin); 589 (lysergic acid diethylamide); 320, 337, 346, 585, 617, 618, 628, 643, 800, 993, 995, 1013, 1056, 1082, 1083, 1093, 1123, 1124, 1150, 1151, and 1158 (marijuana); 564, 720, 816, 988, 998, 1004, 1033, and 1097 (methamphetamine); 89 and 591 (methylenedioxymethamphetamine); 233 (methylphenidate [long-acting]); 346 and 618 (phencyclidine); and 831 and 988 (phentermine).

Topical preparations

See also cases 18 and 109 (iodine).

Veterinary drugs

See also case 948 (tiletamine/zolazepam).

Vitamins

See also case 345 (multiple vitamin with iron).

Unknown drugs

1166 p	10 y	Unk drug	A	Paren	Adv rxn		
1167 p	19 y	Unk drug	U	Ing	Int unk		
1168 i/p	19 y	Unk drug	A/C	Ing	Int suicide		
1169	28 y	Unk drug	U	Ing	Int suicide		
1170	34 y	Unk drug	U	Unk	Int abuse		
1171	40s y	Unk drug	U	Ing	Int suicide		
1172	42 y	Unk drug	A/C	Ing	Int suicide		
1173 i/p	44 y	Unk drug	A	Ing	Int suicide		
1174	49 y	Unk drug	A	Ing	Int unk		
1175 p	50 y	Unk drug	U	Ing	Unk		
1176	52 y	Unk drug	U	Unk	Int abuse		
1177	54 y	Unk drug	A	Ing	Int suicide		
1178	57 y	Unk drug	A	Ing	Int suicide		
1179 p	Unk	Unk drug	A	Unk	Int abuse		
1180 p	Unk	Unk drug	A	Unk	Int abuse		
1181	57 y	Unk drug	A	Ing	Unk		
		Berberine					
1182	39 y	Unk drug	A	Unk	Unk		
		Ethanol				84 mg/dL	
1183 p	17 y	Unk drug	A	Ing/inh	Int abuse		
		Ethanol					
		Oxycodone (long-acting)					

See also cases 243, 349, 441, 453, 458, 510, 599, 616, 619, 651, 733, 832, 926, 961, 989, 995, 1017, 1099, and 1126 (unk drug).

The term "long-acting" is used throughout for all sustained-release, extended-release, delayed-release, or long-acting formulations.

p Indicates prehospital (cardiac and/or respiratory) arrest; i, reported to poison center indirectly (by coroner, medical examiner, or from other source) after the fatality occurred; m, reported by medical examiner to poison center; C, chronic exposure; A, acute exposure; A/C, acute on chronic; derm, dermal; U, unknown; Ocu, ocular; Inh, inhalation; Ing, ingestion; Adv rxn, adverse reaction; Env, environmental; Int, intentional; Occ, occupational; Paren, parenteral; Ther err, therapeutic error; Unint gen, unintentional general.

§ Concentration obtained postmortem.

¥ Acetaminophen concentration.

[A] Additional substances not listed; abstract provided in Appendix B.

¶ Salicylate concentration.

Concentration includes metabolite and parent compound.

Table 22A Demographic profile of exposure cases by generic category of substances and products: nonpharmaceuticals

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Adhesives/glues														
Cyanoacrylate	10308	3869	1938	4384	9981	194	62	52	2180	1228	2109	369	2	0
Epoxy	767	325	50	388	737	14	0	15	202	166	160	50	0	0
Toluene/xylene	822	501	82	236	786	23	3	7	142	189	142	19	1	0
Nontoxic	1869	1265	432	156	1791	54	10	13	70	203	105	10	0	0
Unknown	4581	2143	672	1686	4319	125	50	79	805	810	897	167	2	0
Category total	18347	8103	3174	6850	17614	410	125	166	3399	2596	3413	615	5	0
Alcohols														
Ethanol: beverage	45370	1382	6412	37034	5662	37895	399	743	34191	4411	14117	9772	1810	97
Ethanol: other	8264	6340	721	1170	7927	274	36	19	522	2266	866	76	7	5
Higher alcohol	219	91	30	96	202	5	3	9	49	48	52	8	3	0
Isopropanol	7803	4558	676	2525	6623	1069	57	18	1698	2086	1409	387	56	5
Methanol	979	265	126	578	828	121	8	4	495	248	225	63	44	4
Rubbing alcohol														
Ethanol with methyl salicylate	12	11	1	0	12	0	0	0	1	3	1	0	0	0
Ethanol without methyl salicylate	280	194	18	68	257	18	1	4	40	82	25	7	1	0
Isopropanol with methyl salicylate	355	251	24	79	330	24	1	0	65	137	54	13	2	0
Isopropanol without methyl salicylate	3371	2272	224	868	3140	214	12	2	457	684	447	76	7	0
Unknown rubbing alcohol	6601	4029	534	2015	5676	828	55	17	1236	1596	1159	230	27	2
Other	548	413	48	84	532	10	0	4	44	160	54	7	1	0
Unknown	466	105	65	292	217	212	4	14	245	64	127	84	22	1
Category total	74268	19911	8879	44809	31406	40670	576	834	39043	11785	18536	10723	1980	114
Arts/crafts/office supplies														
Artist paint, nonwater color	2843	2019	361	455	2766	54	7	13	108	458	175	25	0	0
Chalk	1862	1685	123	46	1840	18	2	2	42	267	53	4	0	0
Clay	2482	2181	190	97	2461	14	2	3	68	265	96	3	1	0
Crayon	2416	2160	163	73	2403	12	0	0	35	234	26	6	0	0
Glaze	170	61	59	50	163	2	1	3	20	26	24	3	0	0
Office supplies: miscellaneous	500	331	39	126	489	10	0	1	42	101	37	10	0	0
Pencil	3099	1618	1235	221	2957	82	44	3	123	297	286	15	0	0
Pen/ink	19356	12238	6317	703	18767	503	33	42	389	2637	556	33	0	0
Typewriter correction fluid	2290	1612	469	195	2165	104	18	0	156	571	182	24	0	0
Water color	1411	1223	114	73	1395	12	0	4	16	217	43	0	0	0
Other	5862	4473	635	720	5649	147	26	34	258	783	300	53	1	0
Unknown	296	197	72	26	278	15	0	2	16	45	18	2	0	0
Category total	42587	29798	9777	2785	41333	973	133	107	1273	5901	1796	178	2	0
Automotive/aircraft/boat products														
Brake fluid	1431	365	135	922	1343	73	9	4	525	269	483	95	7	0
Ethylene glycol	5562	672	678	4157	4679	751	61	20	2109	1024	1012	422	195	23
Glycol: other	412	221	49	136	398	9	4	1	87	88	130	6	1	0
Glycol and methanol	249	59	50	135	234	14	1	0	71	58	80	6	0	0
Hydrocarbon	3186	1254	443	1461	2935	192	33	17	865	791	897	150	17	2
Methanol	1521	320	228	957	1298	197	17	3	684	393	409	86	25	2
Nontoxic	8	3	1	4	8	0	0	0	2	1	0	0	0	0
Other	2009	610	346	1030	1917	49	9	28	591	368	744	125	8	0
Unknown	219	63	18	136	206	8	0	1	97	35	64	18	3	0
Category total	14597	3567	1948	8938	13018	1293	134	74	5031	3027	3819	908	256	27
Batteries														
Automotive battery	1338	82	140	1096	1317	11	2	6	372	101	481	107	2	1
Disc batteries														
Alkaline (MnO_2)	136	87	29	19	131	3	0	0	88	79	8	5	2	0
Lithium	158	72	30	55	152	4	0	0	76	57	18	9	2	0
Mercuric oxide	6	2	1	3	6	0	0	0	5	5	1	0	0	0
Nickel cadmium	6	3	0	3	6	0	0	0	1	0	1	0	0	0
Silver oxide	43	24	3	16	41	2	0	0	32	29	2	0	0	0
Zinc air	105	40	16	49	101	3	0	0	68	63	4	0	0	0
Other	16	6	5	5	15	1	0	0	8	8	4	0	0	0
Unknown	3041	1894	859	263	2963	57	17	1	1935	1447	123	36	2	0
Dry cell battery	5695	3003	1231	1421	5395	243	19	26	820	1338	984	158	6	0
Other	77	32	13	31	75	1	0	1	15	16	14	4	0	0
Unknown	198	60	38	98	185	10	3	0	21	40	51	19	0	0
Category total	10819	5305	2365	3059	10387	335	41	34	3441	3183	1691	338	14	1

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Bites and envenomations														
Aquatic														
Coelenterate	1015	127	499	378	1012	1	1	1	132	3	300	75	1	0
Fish	1283	24	237	1012	1281	1	0	1	375	10	331	158	5	0
Other/unknown	516	239	92	175	494	15	5	2	59	71	108	19	1	0
Insects														
Ant/fire ant	2323	880	309	1120	2309	6	7	0	220	46	571	143	7	0
Bee/wasp/hornet	12424	2367	2352	7610	12407	8	2	4	1210	90	4040	632	29	1
Caterpillar	1961	460	501	974	1934	19	1	7	158	42	670	86	0	0
Centipede/millipede	2004	333	366	1284	1998	5	0	1	131	49	725	44	0	0
Mosquito	694	180	126	376	692	0	0	1	108	6	147	38	1	0
Scorpion	14950	1232	2913	10737	14944	5	0	0	907	66	2718	398	13	0
Tick	2159	477	433	1227	2153	1	1	0	375	72	326	65	2	0
Other	17197	3501	2869	10640	17032	46	66	36	2676	351	3755	1006	20	0
Mammals														
Bat	420	53	88	268	413	0	0	1	252	83	63	8	0	0
Cat	892	97	170	603	891	0	0	1	474	11	223	76	0	0
Dog	1920	371	750	772	1918	1	1	0	1310	31	580	157	4	0
Fox	23	0	8	15	23	0	0	0	13	2	6	0	0	0
Human	88	10	15	50	71	1	14	0	38	2	18	8	0	0
Raccoon	120	7	28	83	119	0	0	1	69	11	28	5	0	0
Rodent/lagomorph	1843	427	631	740	1827	1	6	5	424	70	424	21	0	0
Skunk	262	24	54	180	256	0	3	0	29	25	65	7	0	0
Other	1085	173	309	573	1071	3	1	2	463	61	206	30	2	0
Reptile: other/unknown	1101	371	419	287	1063	15	1	20	177	69	346	39	3	0
Snakes														
Copperhead	1098	64	213	816	1096	1	0	0	988	22	381	482	38	0
Coral	99	5	26	64	99	0	0	0	91	8	40	26	6	0
Cottonmouth	192	7	43	140	191	1	0	0	164	3	87	59	6	0
Crotaline: unknown	431	25	118	284	429	0	1	1	382	14	139	186	22	1
Rattlesnake	1178	49	165	957	1170	4	1	2	1034	33	253	549	79	1
Exotic snakes														
Poisonous	131	3	16	107	125	5	0	1	113	3	41	45	10	1
Nonpoisonous	131	16	46	67	131	0	0	0	44	2	44	6	0	0
Unknown if poisonous	2	0	0	2	1	0	0	0	2	0	2	0	0	0
Nonpoisonous snake	1803	179	709	897	1801	1	0	1	482	64	731	57	1	0
Unknown snake	2147	149	627	1347	2146	1	0	0	1343	75	947	344	22	0
Spiders														
Black widow	2720	231	404	2069	2715	3	1	0	860	137	762	380	13	0
Brown recluse	2859	206	381	2240	2853	2	0	2	1058	49	625	639	34	1
Necrotizing spider: other	325	39	61	221	323	0	0	1	105	5	82	61	1	0
Tarantula	240	14	77	144	233	2	0	5	56	5	62	8	0	0
Other spider	13205	1477	2353	9262	13160	15	6	14	2102	188	2971	894	16	0
Unknown insect or spider	5959	828	1052	4006	5956	0	0	0	740	27	647	183	2	0
Other/unknown bite/ envenomation	463	73	82	300	460	0	0	0	116	5	145	43	2	0
Category total	97263	14718	19542	62027	96797	163	118	110	19280	1811	23609	6977	340	5
Building and construction products														
Caulking compound and putty	2641	1842	192	586	2581	30	3	23	204	528	202	32	2	0
Cement, concrete	1810	458	144	1198	1762	19	4	22	671	189	398	355	14	0
Insulation														
Asbestos	747	82	101	547	724	2	2	13	127	114	54	21	0	0
Fiberglass	1529	635	257	619	1493	11	3	20	183	127	318	42	2	0
Urea/formaldehyde	109	52	11	42	109	0	0	0	11	14	17	9	0	0
Other	158	68	13	77	156	0	0	2	21	17	24	3	0	0
Unknown	78	36	11	31	77	1	0	0	11	11	10	6	0	0
Soldering flux	333	133	37	162	322	4	1	4	110	55	84	37	1	0
Other	2836	1486	251	1074	2772	32	3	25	507	503	440	146	11	0
Unknown	136	26	13	94	129	1	0	4	43	21	39	11	3	0
Category total	10377	4818	1030	4430	10125	100	16	113	1888	1579	1586	662	33	0
Chemicals														
Acetone	1188	299	142	726	1067	82	20	10	380	188	303	71	9	1
Acids														
Hydrochloric	3078	161	508	2358	2938	76	22	25	1149	218	1057	437	18	3
Hydrofluoric	996	43	49	897	965	10	5	10	765	76	356	277	18	2
Other	5413	522	904	3901	5179	117	31	69	2077	455	1869	754	38	4
Unknown	443	29	61	348	417	8	14	1	186	30	128	62	0	1

(*continued on next page*)

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Alkali	4860	880	803	3122	4618	97	64	61	2246	501	1486	847	57	4
Ammonia	4698	1104	566	2960	4396	173	45	53	1499	533	1470	500	35	2
Borate/boric acid	2443	1106	275	1041	2244	140	27	21	460	559	256	57	5	1
Chlorate	81	19	25	35	67	2	12	0	28	12	26	6	0	0
Cyanide	257	12	23	213	194	32	17	2	163	39	52	30	10	8
Dioxin	15	0	3	9	11	0	1	2	8	2	3	2	0	0
Ethylene glycol	808	84	73	637	471	281	11	5	522	116	103	114	150	26
Formaldehyde/formalin	1142	121	319	690	1016	97	13	13	457	185	343	80	7	0
Glycol: other	920	339	139	432	827	49	17	16	345	177	210	65	10	2
Ketone	772	265	42	455	750	7	5	8	340	138	252	79	1	0
Methylene chloride	450	90	63	293	434	7	0	7	179	56	157	45	2	0
Nitrate and nitrite	1366	354	496	497	1229	110	14	7	279	268	238	44	7	0
Phenol/creosote	602	46	57	490	570	11	3	17	271	63	168	96	3	0
Strychnine	60	14	6	39	28	16	12	2	32	13	10	3	1	1
Toluene diisocyanate	686	128	89	459	663	15	1	7	185	59	159	44	1	1
Other/unknown	16458	5285	2689	8141	14826	545	541	414	4621	2672	3383	1069	79	6
Category total	46736	10901	7332	27743	42910	1875	875	750	16192	6360	12029	4682	451	62
Cleaning substances (household)														
Ammonia cleaner	1963	673	173	1090	1831	99	12	20	388	292	528	121	1	0
Automatic dishwasher detergents														
Granular	4480	3765	138	559	4446	14	16	3	187	1461	588	30	1	0
Liquid or gel	4943	4275	129	534	4895	22	18	8	239	1663	772	50	2	0
Tablet	1738	1635	25	77	1731	4	3	0	53	610	241	10	0	0
Rinse agent	1400	1287	21	90	1391	6	2	1	96	335	189	19	1	0
Other/unknown	1094	875	47	168	1078	4	11	1	62	253	152	16	2	0
Bleaches														
Borate	596	294	45	250	557	18	4	17	99	101	165	31	1	0
Hypochlorite	57137	21259	5819	29430	53263	2637	485	615	10751	8511	17469	2529	64	0
Nonhypochlorite	821	306	86	414	742	40	4	31	176	118	254	44	6	0
Other/unknown	479	193	56	221	430	30	12	2	126	72	134	39	0	0
Carpet/upholstery cleaner	5268	3809	294	1140	5088	67	22	87	590	1109	918	132	3	0
Cleansers														
Anionic/nonionic	3578	2775	197	594	3490	59	3	22	290	924	448	50	1	0
Other/unknown	2340	1379	201	744	2183	81	38	32	437	546	516	110	3	0
Disinfectants														
Hypochlorite	3018	1479	274	1236	2889	67	40	20	700	491	733	204	3	1
Phenol	1636	1082	183	360	1525	76	16	14	201	293	365	33	3	1
Pine oil	4496	2451	371	1629	4026	345	45	63	968	1194	1197	99	14	2
Other/unknown	5275	3411	502	1318	4976	157	54	79	627	1197	1147	152	4	0
Drain openers														
Acid: hydrochloric	573	55	78	420	507	29	1	34	92	173	262	33	1	1
Acid: sulfuric	319	28	16	271	302	10	0	6	105	29	111	48	0	2
Acid: other/unknown	45	6	4	35	42	0	2	1	12	4	14	7	0	0
Alkali	3913	572	313	2971	3541	282	22	45	1231	513	1229	488	54	7
Other/unknown	794	129	59	586	723	52	9	6	212	119	223	92	4	0
Fabric softeners/antistatic agents														
Aerosol/spray	212	169	12	29	198	6	6	2	14	40	26	6	1	0
Dry/powder	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Liquid	1182	943	61	173	1135	32	3	11	125	305	150	15	0	0
Solid/sheet	458	380	24	54	446	8	0	4	14	95	31	2	0	0
Other/unknown	10	9	1	0	10	0	0	0	1	2	1	1	0	0
Glass cleaners														
Ammonia	7339	5810	580	911	6944	308	59	16	593	1675	1058	83	5	0
Anionic/nonionic	171	112	21	38	155	13	2	0	26	44	35	3	0	0
Isopropanol	2241	1676	182	362	2113	101	15	9	223	611	388	39	2	0
Other/unknown	1209	843	138	221	1120	73	9	5	155	262	210	17	2	0
Hand dishwashing														
Anionic/nonionic	5623	3650	498	1441	5362	118	79	56	443	758	1169	76	4	0
Other/unknown	1968	1208	187	562	1855	46	38	28	137	261	369	27	2	0
Laundry additives														
Bluing/brightening agent	51	22	7	22	48	2	1	0	8	9	9	6	0	0
Detergent booster	35	20	1	14	34	0	1	0	8	5	9	1	0	0
Enzyme/microbiologic additive	107	64	10	31	105	1	0	0	22	20	14	5	0	0
Water softener	62	21	11	30	52	2	2	6	13	10	21	2	1	0
Other/unknown	962	786	54	114	908	20	6	26	93	248	164	17	0	0

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Laundry detergents														
Granular	5066	4093	268	689	4911	93	12	46	550	1076	1196	102	2	0
Liquid	4687	3303	304	1058	4487	136	19	40	577	779	1135	99	5	1
Soap	62	38	7	16	55	3	1	1	7	7	8	1	1	0
Other/unknown	179	111	7	60	170	3	1	5	29	29	42	6	1	0
Laundry prewash/stain removers														
Dry solvent-based	3	3	0	0	3	0	0	0	0	1	0	0	0	0
Liquid solvent-based	934	740	43	149	915	9	1	7	125	302	159	16	2	0
Spray solvent-based	390	344	11	33	383	5	1	1	64	79	93	13	0	0
Other/unknown solvent-based	79	68	2	9	78	1	0	0	10	22	12	2	0	0
Dry surfactant-based	121	110	3	7	121	0	0	0	6	22	7	2	0	0
Liquid surfactant-based	2267	2004	76	177	2245	15	4	2	276	449	405	60	0	0
Spray surfactant-based	622	559	21	41	612	3	5	1	132	123	150	33	1	0
Other/unknown surfactant-based	80	73	3	3	79	1	0	0	5	9	7	1	0	0
Other/unknown	3616	2452	217	925	3545	31	13	24	326	804	719	59	1	0
Miscellaneous cleaners														
Acid	952	394	61	482	877	25	9	40	218	236	252	77	0	0
Alkali	7620	4716	572	2303	7259	243	49	61	1611	1611	1687	366	14	0
Anionic/nonionic	6422	4349	465	1557	6126	180	39	68	862	1330	1281	171	7	0
Cationic	2021	964	198	845	1893	95	13	13	554	392	496	112	2	0
Ethanol	289	151	83	55	275	9	4	1	37	57	65	3	0	0
Glycols	1329	883	176	266	1268	37	9	13	166	271	287	29	4	0
Isopropanol	1778	996	542	229	1682	63	27	4	166	397	413	18	0	0
Methanol	41	17	5	19	36	4	0	1	15	10	14	2	0	0
Phenol	17	3	1	12	16	1	0	0	10	2	6	3	0	0
Other/unknown	3993	2015	483	1460	3646	180	70	86	872	809	1094	186	6	0
Oven cleaners														
Acid	17	13	1	3	17	0	0	0	3	5	2	0	0	0
Alkali	2561	536	302	1677	2454	43	32	29	925	269	751	348	18	1
Detergent	17	8	2	7	16	0	1	0	2	2	3	1	0	0
Other/unknown	271	58	34	179	252	7	9	3	99	29	90	29	1	0
Rust removers														
Alkali	10	2	2	6	10	0	0	0	3	2	3	1	0	0
Anionic/nonionic	1	1	0	0	1	0	0	0	1	1	0	0	0	0
Hydrofluoric acid	458	73	25	354	423	11	7	12	190	121	196	45	6	0
Other acid	514	200	25	285	494	18	0	1	124	114	152	37	3	1
Other/unknown	320	49	31	239	294	7	1	17	70	41	124	32	1	0
Spot removers/dry cleaning agents														
Anionic/nonionic	340	283	13	42	338	0	0	1	32	75	49	6	0	0
Glycol	356	224	22	110	343	5	3	4	54	73	84	10	1	0
Perchloroethylene	31	17	2	12	31	0	0	0	4	8	9	1	0	0
Isopropanol	57	37	6	14	51	2	4	0	5	9	7	2	0	0
Other halogenated hydrocarbon	46	16	3	27	44	0	1	1	15	4	14	5	0	0
Other nonhalogenated hydrocarbon	812	354	85	364	766	22	8	14	219	138	238	46	0	0
Other/unknown	200	145	15	40	195	1	2	2	32	39	45	5	1	0
Starch/fabric finish/sizing	695	593	38	60	683	9	1	2	29	150	64	6	0	0
Toilet bowl cleaners														
Acid	3772	1201	394	2125	3458	234	7	71	874	785	1615	290	18	5
Alkali	2024	1234	88	688	1962	52	1	7	339	539	457	102	6	0
Other/unknown	2930	2125	111	667	2844	57	6	23	353	778	400	82	2	0
Wall/floor/tile cleaners														
Acid	5672	3022	371	2236	5426	150	13	79	968	1219	1734	274	7	0
Alkali	9708	5909	762	2947	9240	297	52	104	1906	2170	2535	488	15	0
Anionic/nonionic	7222	4377	595	2178	6773	335	47	48	1252	1571	1489	191	7	1
Cationic	2662	1687	232	723	2534	94	19	9	403	529	539	76	2	0
Ethanol	117	92	6	19	116	1	0	0	9	36	10	1	0	0
Glycol	2064	1518	124	418	1975	70	8	8	231	457	381	40	3	0
Isopropanol	922	642	53	207	856	26	13	23	89	279	185	16	5	0
Methanol	1	0	0	1	1	0	0	0	1	0	0	1	0	0
Other/unknown	1628	913	105	584	1534	58	5	28	283	426	454	71	0	0
Wheel cleaner: HF/bifluoride	98	31	13	54	94	3	1	0	64	17	35	18	1	1
Category total	215 630	121 197	17 826	74 800	204 048	7468	1558	2170	34 714	43 056	52 502	8222	328	24

(*continued on next page*)

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Industrial cleaners														
Acid	2216	707	150	1339	2086	90	13	24	571	401	564	163	10	1
Alkali	3544	1070	448	1995	3337	122	52	23	1571	476	1208	475	32	0
Anionic/nonionic	1136	545	115	466	1049	60	9	14	276	188	316	51	0	0
Cationic	475	124	63	280	422	44	4	5	210	75	173	43	2	0
Disinfectant	3942	572	444	2894	3666	205	46	19	1159	375	1306	405	12	0
Other/unknown	2097	747	253	1080	1969	62	29	33	709	303	674	198	10	0
Category total	13410	3765	1473	8054	12529	583	153	118	4496	1818	4241	1335	66	1
Cosmetics/personal care products														
Baby oil	3143	2960	73	102	3112	14	4	11	206	974	224	16	2	0
Bath oil/bubble bath	5609	5210	203	182	5554	30	5	18	203	1180	560	22	0	0
Cream/lotion/makeup	25065	21262	1223	2502	24325	292	45	391	876	4309	1497	124	3	0
Dental care products														
Denture cleaner	1440	288	80	1064	1392	39	2	5	88	298	113	12	0	0
Toothpaste with fluoride	24180	21890	1026	1213	23484	282	44	361	440	5187	1272	42	0	0
Toothpaste without fluoride	1616	1398	56	154	1540	16	4	56	30	312	93	5	0	0
Other	2212	838	406	955	1766	35	6	401	194	315	351	37	0	0
Deodorant	17566	15277	1129	1115	16707	239	94	523	490	2723	1467	92	1	0
Depilatory	1959	541	386	1021	1333	89	13	521	384	179	582	170	4	0
Douche	136	107	9	20	128	5	0	2	14	27	11	0	0	0
Eye product	1290	1125	49	113	1263	10	1	15	57	211	76	10	1	0
Hair care products														
Coloring agent	2347	847	244	1231	1918	33	2	392	447	355	585	135	2	0
Curl activator	59	39	7	12	54	4	0	1	12	19	11	1	0	0
Oil	266	233	10	23	258	4	0	4	45	57	37	8	0	0
Permanent wave solution	397	180	31	183	359	2	2	33	129	68	117	52	0	0
Relaxer: sodium hydroxide	768	530	43	188	738	4	0	26	364	151	268	96	1	0
Relaxer: other alkaline	847	637	47	163	818	6	2	21	328	215	267	84	1	0
Relaxer: other nonalkaline	66	48	5	12	61	0	0	5	18	14	12	3	0	0
Rinse/conditioner/relaxer	2688	2206	200	273	2573	83	11	21	222	625	307	46	2	0
Shampoo	6175	4827	523	801	5855	230	14	67	430	959	1039	64	2	0
Spray	2165	1328	288	535	1814	324	13	8	416	493	478	75	9	0
Other	3125	2194	247	661	2935	75	7	104	411	593	527	90	4	0
Lipstick/balm: with camphor	1192	1089	55	43	1173	9	2	6	22	256	63	2	0	0
Lipstick/balm: without camphor	4467	4189	170	94	4413	22	2	29	71	617	127	7	0	0
Mouthwash														
Ethanol	15727	4442	2586	8614	14222	1386	47	37	1422	2802	1172	268	35	2
Nonethanol	823	349	165	305	755	56	0	10	75	182	88	9	0	0
Fluoride	4004	2892	910	198	3961	33	1	7	50	871	90	5	0	0
Unknown	122	36	30	54	109	9	0	2	11	20	13	1	0	0
Nail products														
Acrylic nail adhesive	1558	569	481	497	1515	21	8	13	558	163	476	107	3	0
Acrylic nail primer	319	252	25	41	314	2	0	3	95	63	99	23	0	0
Acrylic nail remover	50	27	4	19	47	1	0	2	4	7	10	1	0	0
Polish	10786	9775	499	472	10650	95	18	16	556	2096	1464	66	0	0
Polish remover: acetone	2742	2065	242	427	2652	66	10	10	268	803	487	20	1	0
Polish remover: other	2114	1585	200	326	2049	46	10	9	175	653	344	14	2	0
Polish remover: unknown	8178	5902	896	1340	7888	223	43	18	843	1785	1315	87	5	0
Other	1692	985	64	629	1659	14	1	15	412	335	351	87	0	0
Perfume/cologne/aftershave	17627	14917	1468	1184	16919	540	111	39	1183	4107	3701	110	11	1
Peroxide	16550	6967	1515	7951	15771	390	66	290	1159	2706	2773	251	7	0
Powder: talc	2917	2513	180	219	2850	44	10	11	272	637	626	49	2	0
Powder: without talc	2532	2342	82	98	2499	24	4	3	126	463	478	20	1	0
Soap	17476	13411	1411	2593	16653	370	122	311	867	2689	2155	127	5	0
Suntan/sunscreen	10797	9749	573	454	10555	51	8	182	361	1636	1584	47	2	0
Category total	224792	168021	17841	38081	214641	5218	732	3999	14334	42155	27310	2485	106	3
Deodorizers														
Air fresheners														
Aerosol	3443	2490	556	384	3239	147	33	16	326	595	873	56	5	2
Liquid	6063	5347	323	380	5981	57	15	9	454	1462	1164	54	2	0
Solid	5187	4725	177	274	5153	17	4	13	233	1148	654	22	0	0
Other/unknown	1549	1144	192	204	1483	35	4	23	154	377	327	27	1	0
Diaper pail deodorizer	20	18	0	2	20	0	0	0	0	5	1	1	0	0
Toilet bowl deodorizer	784	691	29	60	767	10	2	4	84	239	57	9	0	0
Other	5612	4233	395	965	5434	94	39	44	640	1326	926	97	3	0
Unknown	74	49	9	16	69	4	1	0	12	23	16	0	0	0
Category total	22732	18697	1681	2285	22146	364	98	109	1903	5175	4018	266	11	2

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Dyes														
Fabric	418	310	38	70	406	3	0	5	21	89	19	2	0	0
Food	1242	1047	123	67	1193	22	15	11	33	207	46	4	1	0
Leather	122	101	12	9	118	1	0	3	5	14	5	1	0	0
Other	587	290	187	103	535	21	2	28	68	113	49	12	2	1
Unknown	77	47	6	24	68	4	0	5	14	18	8	1	0	0
Category total	2446	1795	366	273	2320	51	17	52	141	441	127	20	3	1
Essential oils														
Clove oil	444	277	26	137	420	9	0	15	68	103	106	8	0	0
Cinnamon oil	534	329	108	78	444	54	0	34	61	41	263	7	0	0
Eucalyptus oil	489	336	24	129	466	10	0	12	99	137	84	12	2	0
Pennyroyal oil	29	3	6	20	18	10	0	1	15	5	9	0	1	0
Tea tree oil	832	523	62	239	772	29	0	30	88	228	144	8	0	0
Other/unknown	3797	2950	287	540	3688	48	10	48	347	881	851	61	2	1
Category total	6125	4418	513	1143	5808	160	10	140	678	1395	1457	96	5	1
Fertilizers														
Household plant food	2742	1692	333	705	2697	21	19	5	71	499	109	4	0	0
Outdoor fertilizer	4319	2794	426	1066	4215	35	27	40	238	974	274	45	1	0
Plant hormone	44	17	5	22	43	0	0	0	12	9	4	1	0	0
Other	2149	1381	231	511	2104	16	6	22	182	452	174	24	0	0
Unknown	167	90	32	44	161	1	0	5	20	41	28	3	0	0
Category total	9421	5974	1027	2348	9220	73	52	72	523	1975	589	77	1	0
Fire extinguishers	3715	317	955	2305	3322	144	208	21	876	521	1065	218	2	0
Food products/food poisoning	69915	18342	11325	39327	63527	925	958	4331	5725	5672	12537	2517	82	1
Foreign bodies/toys/miscellaneous														
Ash	574	486	20	64	566	5	2	1	30	77	44	5	1	0
Bubble blowing solution	4939	4595	240	94	4899	23	13	4	128	613	1019	23	0	0
Charcoal	630	457	45	115	575	32	4	18	46	126	59	19	2	5
Christmas ornament	920	723	60	132	915	1	1	2	50	195	64	2	0	0
Coin	3905	3179	600	114	3821	70	8	1	1173	1021	384	39	3	0
Desiccant	44604	40015	2795	1543	44155	328	90	8	1217	5934	262	15	4	0
Feces/urine	6457	5286	336	789	6260	58	117	14	148	928	245	15	1	0
Glass	2302	810	258	1208	2169	26	95	7	238	377	196	32	0	0
Glow product	10368	5790	4177	313	10226	100	31	5	498	1224	2383	46	0	0
Incense, punk	261	217	17	22	258	3	0	0	22	51	28	7	0	0
Soil	2591	2265	130	189	2563	19	6	3	89	389	135	12	0	0
Thermometers														
Mercury	7651	3180	2023	2298	7564	55	4	9	458	1370	89	5	0	0
Other	1895	820	502	532	1864	19	3	4	66	408	79	1	0	0
Unknown	17	5	5	7	17	0	0	0	4	4	1	0	0	0
Toy	13796	9660	3725	352	13605	120	39	23	650	1777	1804	36	2	0
Other	20382	13116	3341	3733	19623	346	177	192	1784	3314	1385	181	5	0
Unknown	719	497	107	105	669	21	19	8	62	135	52	4	0	0
Category total	122011	91101	18381	11610	119749	1226	609	299	6663	17943	8229	442	18	5
Fumes/gases/vapors														
Carbon dioxide	661	55	256	342	591	56	2	11	125	49	181	38	3	0
Carbon monoxide	17115	2137	2759	11678	16523	458	11	64	6427	2514	4823	1599	203	74
Chloramine	785	39	78	664	769	15	1	0	191	55	284	117	3	0
Chlorine: acid mixed with hypochlorite	1208	55	120	1030	1171	34	2	1	326	88	578	250	0	0
Chlorine: other	6031	481	1227	4206	5803	124	10	88	1794	260	2508	914	17	2
Hydrogen sulfide	1980	149	495	1040	1976	0	0	4	375	750	407	119	9	2
Methane and natural gas	5514	906	873	3070	5435	45	7	15	1066	1250	1086	195	15	1
Polymer fume fever	19	7	1	11	18	0	0	0	2	9	2	0	0	0
Propane/simple asphyxiant	3222	304	690	2128	2893	271	21	23	952	427	841	279	27	4
Other	1766	209	251	1273	1662	56	11	32	423	261	478	143	7	0
Unknown	1937	146	197	1526	1852	21	31	13	399	246	502	125	5	0
Category total	40238	4488	6947	26968	38693	1080	96	251	12080	5909	11690	3779	289	83

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Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Heavy metals														
Aluminum	1000	518	102	367	941	14	28	9	109	126	71	25	0	0
Arsenic (excluding pesticide)	989	172	77	720	688	19	137	19	479	138	85	59	7	2
Barium	26	2	14	10	22	2	0	1	9	3	9	2	0	0
Cadmium	70	3	3	64	53	1	3	1	41	11	3	9	2	0
Copper	1002	184	332	480	926	39	11	19	296	123	338	58	4	2
Fireplace flame colors	27	20	3	4	27	0	0	0	2	7	4	0	0	0
Gold	1	0	0	1	1	0	0	0	0	0	0	0	0	0
Lead	3154	1505	477	1110	2975	47	60	13	1168	690	244	83	11	1
Manganese	85	6	14	65	74	2	2	5	45	5	15	8	1	0
Mercury: elemental	2818	344	655	1425	2582	89	36	58	582	705	108	33	5	0
Mercury: other/unknown	211	70	12	126	181	7	6	10	65	47	20	9	0	0
Metal fume fever	729	20	57	644	721	1	1	6	224	26	208	96	0	0
Selenium	135	47	10	77	111	5	1	15	38	26	21	7	1	0
Thallium	20	2	0	17	7	2	2	6	11	1	1	2	1	0
Other	2657	859	318	1426	2286	175	36	141	738	517	325	139	17	1
Unknown	44	8	8	28	33	1	5	3	18	5	3	1	0	0
Category total	12 968	3760	2082	6564	11 628	404	328	306	3825	2430	1455	531	49	6
Hydrocarbons														
Benzene	107	6	5	91	105	0	1	0	63	26	20	12	2	0
Carbon tetrachloride	36	6	1	29	35	0	1	0	18	13	3	1	1	0
Diesel fuel	1949	346	194	1391	1875	55	13	3	410	263	610	87	3	0
Fluorochlorocarbon/propellant	6868	506	1419	4851	6103	647	53	42	1574	1218	1463	456	23	5
Gasoline	20 103	5002	3428	11 503	18 828	1095	96	39	3069	2973	7505	605	21	2
Halogenated hydrocarbon: other	640	135	84	416	593	20	13	10	233	71	230	57	3	0
Kerosene	2040	1039	233	748	1952	61	14	11	608	421	569	133	3	0
Lamp oil	2907	2397	119	375	2844	45	14	2	950	900	728	273	24	0
Lighter fluid/naphtha	3421	1705	362	1331	3170	179	48	19	1040	800	943	199	15	0
Lubricating oil/motor oil	6119	3874	485	1723	5921	106	58	19	964	2027	1044	138	6	0
Mineral seal oil	64	42	6	16	63	1	0	0	12	22	11	1	0	0
Mineral spirits/varsol	2835	983	318	1504	2635	130	28	31	858	498	845	186	7	0
Toluene/xylene	1620	260	143	1160	1500	87	6	23	707	208	532	147	18	0
Turpentine	710	217	118	372	595	90	12	6	197	133	171	31	9	2
Other	4454	2212	504	1669	4180	149	49	69	1262	1008	968	306	13	0
Unknown	893	353	117	410	794	74	16	6	304	187	244	75	7	0
Category total	54 766	19 083	7536	27 589	51 193	2739	422	280	12 269	10 768	15 886	2707	155	9
Lacrimators														
Capsicum defense spray	5072	873	1674	2431	4099	189	582	93	980	107	2493	201	4	0
Lacrimator: CN	1444	242	480	682	1037	78	261	19	295	36	680	94	1	0
Lacrimator: CS	64	14	15	30	56	3	4	0	22	4	27	6	0	0
Other	95	13	5	76	95	0	0	0	27	4	22	7	0	0
Unknown	214	24	59	101	142	8	33	1	81	1	103	4	2	0
Category total	6889	1166	2233	3320	5429	278	880	113	1405	152	3325	312	7	0
Matches/Fireworks/Explosives														
Explosive	377	204	99	68	344	23	8	0	83	102	55	16	0	0
Firework	594	473	77	41	576	9	4	2	64	179	45	10	1	0
Match	1044	968	29	41	1027	12	2	0	26	237	15	3	0	0
Other	28	17	2	8	27	0	0	0	5	5	4	2	0	0
Unknown	5	1	2	2	4	1	0	0	2	0	4	0	0	0
Category total	2048	1663	209	160	1978	45	14	2	180	523	123	31	1	0
Mushrooms														
Coprine	12	6	1	5	11	0	0	1	4	5	2	3	0	0
Cyclopeptide	50	4	8	38	31	18	0	1	45	7	7	18	6	3
Gastrointestinal irritant	158	74	35	49	131	20	0	7	70	52	54	15	0	0
Hallucinogenic	994	48	563	365	158	816	10	2	730	70	162	420	22	0
Ibotenic acid	44	4	9	31	32	11	0	1	25	9	12	17	1	1
Miscellaneous, nontoxic	228	94	25	108	193	7	2	26	61	57	53	12	0	0
Monomethylhydrazine	52	2	4	45	43	4	0	5	24	14	21	7	0	0
Muscarine	36	8	5	23	23	6	0	7	18	5	7	4	1	0
Orellanine	3	0	1	2	2	1	0	0	3	0	0	2	0	0
Other potentially toxic	25	10	7	7	14	8	1	2	15	9	5	4	0	0
Unknown	6999	4697	1159	1106	6068	834	6	75	2494	3541	771	346	29	1
Category total	8601	4947	1817	1779	6706	1725	19	127	3489	3769	1094	848	59	5

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Paints and stripping agents														
Paints														
Antialgae	37	3	6	27	37	0	0	0	9	9	8	4	0	0
Anticorrosion	61	9	6	45	57	2	0	2	18	6	18	5	1	0
Oil-based	3642	1024	662	1909	3403	167	9	59	646	481	904	168	12	1
Water-based	6966	5330	445	1157	6850	42	15	56	457	1120	499	60	5	0
Stains	935	359	81	483	905	9	1	20	127	168	173	33	1	0
Stripping agents														
Methylene chloride	1097	156	111	826	1046	21	2	26	363	71	369	122	7	0
Other	912	177	57	669	879	14	4	12	401	80	254	118	5	0
Unknown	125	16	13	93	120	3	0	2	67	6	40	19	0	0
Varnish, lacquer	1777	510	178	1064	1707	34	5	25	352	239	424	102	4	0
Other paint/varnish/lacquer	778	304	62	391	729	17	4	26	160	106	141	60	4	0
Unknown paint/varnish/lacquer	7354	4505	586	2204	7110	118	25	87	910	1205	730	146	9	0
Category total	23 684	12 393	2207	8868	22 843	427	65	315	3510	3491	3560	837	48	1
Pesticides														
Fungicides (nonmedicinal)														
Carbamate	170	45	11	111	158	4	2	6	61	26	39	10	1	0
Copper compound	60	8	6	46	59	0	0	1	13	16	9	3	0	0
Mercurial	2	1	1	0	2	0	0	0	0	2	0	0	0	0
Nonmercurial	8	2	0	6	8	0	0	0	1	1	3	0	0	0
Phthalimide	96	52	13	30	95	0	1	0	8	18	7	4	0	0
Wood preservative	312	56	14	237	307	1	0	3	64	36	54	7	0	0
Other/unknown	753	173	57	514	723	11	2	17	166	147	148	42	1	0
Fumigants														
Aluminum phosphide	95	2	8	84	94	0	0	1	60	15	23	23	0	0
Metam sodium	2	0	0	2	2	0	0	0	2	0	0	1	0	0
Methyl bromide	12	0	0	12	12	0	0	0	10	0	9	1	0	0
Sulfuryl fluoride	330	59	48	221	323	1	4	2	49	35	47	5	0	0
Other	61	8	7	44	60	0	0	1	20	7	18	3	1	0
Unknown	79	11	8	59	76	2	1	0	16	9	13	6	0	0
Herbicides (includes algicides, defoliants, desiccants, and plant growth regulators)														
Carbamate	11	2	2	6	11	0	0	0	5	3	1	2	0	0
2,4-D or 2,4,5-T	89	33	3	51	84	1	1	3	17	17	14	4	0	0
Chlorophenoxy	2339	669	212	1421	2214	39	16	68	453	453	491	93	3	2
Diquat	263	73	27	160	250	5	0	8	54	76	49	13	0	0
Glyphosate	4425	1162	360	2872	4146	59	18	193	788	1024	1154	91	6	1
Paraquat	57	2	3	51	50	4	0	1	36	5	13	10	2	0
Paraquat/diquat	2	0	0	2	1	1	0	0	1	0	1	0	0	0
Triazine	474	101	37	333	451	4	2	17	100	67	101	16	0	0
Urea	75	25	9	40	70	5	0	0	20	14	16	3	0	0
Other	1567	366	140	1027	1499	15	6	42	442	234	356	79	2	0
Unknown	421	110	51	252	378	8	12	20	112	47	89	24	1	0
Insecticides (includes insect growth regulators, molluscicides, and nematicides)														
Arsenic pesticide	344	251	14	76	339	4	1	0	24	111	6	1	1	0
Borate/boric acid	3592	2980	122	474	3520	43	17	10	267	952	126	22	1	0
Carbamate only	2935	1233	282	1389	2768	94	26	37	604	533	435	127	11	0
Carbamate with other insecticide	697	152	69	470	659	23	8	6	92	95	152	17	2	0
Chlorinated hydrocarbon only	897	350	128	414	795	36	5	61	302	227	161	43	6	0
Chlorinated hydrocarbon with other insecticide	331	147	34	146	311	7	1	12	42	63	75	10	3	0
Insect growth regulator	100	49	16	34	96	0	1	3	14	19	6	5	0	0
Metaldehyde	255	105	15	132	244	4	6	1	46	57	29	3	0	0
Nicotine	7	4	0	3	7	0	0	0	1	0	3	1	0	0
Organophosphate	5874	1746	566	3491	5484	178	35	149	1525	1229	1250	297	56	3
Organophosphate/carbamate	112	33	9	69	107	2	2	1	13	20	19	8	0	0
Organophosphate/ chlorinated hydrocarbon	6	1	1	4	6	0	0	0	3	1	2	1	0	0
Organophosphate/other insecticide	1186	221	111	840	1140	20	6	20	212	190	291	51	0	0
Organophosphate/carbamate/ chlorinated hydrocarbon	3	0	0	3	3	0	0	0	0	0	0	0	0	0
Piperonyl butoxide only	1	0	0	1	1	0	0	0	0	1	0	0	0	0
Piperonyl butoxide/pyrethrin	321	110	33	175	290	7	0	23	74	30	103	22	0	0
Pyrethrins only	122	31	6	85	120	0	2	0	11	10	19	3	1	0

(*continued on next page*)

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Insecticides (includes insect growth regulators, molluscicides, and nematicides)														
Pyrethrin	5512	1936	663	2857	5076	144	22	260	947	934	1240	237	6	1
Pyrethroid	18214	5310	1951	10760	16869	495	122	696	3094	2925	4308	747	30	0
Rotenone	103	21	10	69	96	1	0	6	16	13	31	9	2	0
Veterinary insecticide	234	71	27	135	224	3	0	7	31	39	51	9	0	0
Other	9246	4863	791	3487	8897	114	30	188	926	1957	998	153	10	0
Unknown	3886	1059	406	2343	3494	135	108	123	987	540	728	214	15	0
Repellents														
Bird, dog, deer, or other mammal repellent	492	168	99	222	473	6	3	10	44	91	122	7	0	0
Insect repellent with DEET	10917	7485	1742	1632	10342	96	73	399	821	1741	3365	184	12	0
Insect repellent without DEET	2064	1598	201	246	1990	27	2	44	131	388	343	21	0	0
Insect repellent: unknown	120	72	9	36	112	1	1	6	12	16	28	5	0	0
Naphthalene	1678	1231	113	314	1651	21	0	4	377	675	117	20	1	0
Paradichlorobenzene	143	113	7	23	143	0	0	0	13	51	12	1	0	0
Other moth repellent	4	3	0	1	4	0	0	0	0	0	1	0	0	0
Unknown moth repellent	2223	1335	167	695	2134	54	12	17	372	627	209	29	2	0
Rodenticides														
α-Naphthylthiourea	2	0	2	0	1	1	0	0	0	0	1	0	0	0
Anticoagulant: warfarin type	337	292	12	25	319	16	0	0	102	124	2	2	0	0
Anticoagulant: long-acting, superwarfarin	16054	14229	434	1313	15334	570	89	23	4576	5087	204	96	23	1
Bromethalin	643	510	23	96	596	37	6	2	188	225	12	7	3	0
Cholecalciferol	6	6	0	0	6	0	0	0	3	1	0	0	0	0
Monofluoroacetate	2	0	1	1	1	1	0	0	1	0	0	1	0	0
Strychnine	121	6	13	97	49	28	29	0	65	11	11	13	6	0
Vacor	5	3	1	1	5	0	0	0	4	2	1	0	0	0
Zinc phosphide	94	30	5	54	81	13	0	0	33	24	16	4	1	0
Other	772	569	69	127	745	16	3	5	77	215	40	7	4	0
Unknown	1396	891	76	407	1134	165	76	2	620	389	65	36	6	0
Category total	102754	52174	9.245	40328	96739	2522	751	2498	19168	21865	17237	2853	219	8
Photographic products														
Developer/fixing/stop bath	394	30	139	220	386	0	2	6	122	33	149	37	0	0
Photographic coating fluid	6	5	0	1	6	0	0	0	1	0	2	0	0	0
Other	857	472	88	292	835	21	0	1	110	156	162	64	0	0
Unknown	13	6	4	3	13	0	0	0	6	2	4	1	0	0
Category total	1270	513	231	516	1240	21	2	7	239	191	317	102	0	0
Plants														
Amygdalin/cyanogenic glycoside	2842	1851	522	444	2703	68	4	65	124	636	112	14	1	0
Anticholinergic	1058	407	436	206	583	456	8	4	537	203	97	320	29	1
Cardiac glycoside	1461	849	253	349	1356	87	4	7	243	440	113	23	1	0
Colchicine	22	16	0	6	21	0	0	1	1	5	3	0	0	0
Depressant	353	215	42	92	265	70	3	10	64	60	33	18	4	0
Dermatitis	9610	5400	1345	2799	9030	191	13	356	747	1267	1078	307	6	0
Gastrointestinal irritant	13037	10092	1260	1600	12419	343	22	243	920	2772	1015	199	8	0
Hallucinogenic	436	144	169	114	238	184	5	8	172	76	60	86	3	2
Nicotine	126	50	31	43	117	5	0	4	57	31	32	18	2	0
Nontoxic	13559	10932	1300	1211	12963	178	29	367	453	1718	657	103	5	1
Oxalate	10258	8767	894	573	10047	171	10	23	364	2576	1299	61	1	0
Solanine	1255	936	124	189	1189	33	4	27	159	418	105	16	4	0
Stimulant	137	42	36	58	115	18	0	4	38	34	26	7	0	0
Toxalbumin	254	91	34	119	198	22	22	3	95	78	44	11	0	1
Other toxic	5008	3634	723	619	4736	141	5	115	446	1226	359	93	6	0
Unknown toxic or unknown if toxic	15395	11652	1904	1721	14826	310	21	223	1008	3442	1245	166	10	0
Category total	74811	55078	9073	10143	70806	2277	150	1460	5428	14982	6278	1442	80	5
Polishes and waxes	9601	7823	507	1237	9358	149	29	56	1050	3055	1451	138	12	0
Radioisotopes	333	19	59	247	302	4	6	17	91	37	46	23	0	0

Table 22A continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Sporting equipment														
Fishing bait	65	41	17	7	61	3	1	0	5	18	4	0	0	0
Fishing product: other	21	13	4	4	18	1	1	1	3	8	0	0	0	0
Golf ball	22	4	9	9	17	5	0	0	5	3	6	3	0	0
Gun bluing	70	42	7	21	68	1	1	0	35	26	15	6	0	0
Hunting product: other	369	176	88	101	324	25	8	6	122	100	37	7	2	0
Other	40	29	6	5	38	0	1	1	5	14	5	1	0	0
Unknown	2	2	0	0	2	0	0	0	0	1	1	0	0	0
Category total	589	307	131	147	528	35	12	8	175	170	68	17	2	0
Swimming pool/aquarium	11572	4667	2142	4659	11036	141	29	357	2070	1800	3514	718	14	3
Tobacco products	7671	6656	230	770	7238	306	43	63	1532	2693	1596	201	9	0
Weapons of mass destruction														
Anthrax	31	1	1	29	15	0	14	1	13	4	5	0	0	0
Other biologic weapon	54	16	9	29	49	0	2	2	13	9	4	1	0	0
Nerve gas	3	0	0	3	2	0	1	0	1	0	0	0	0	0
Other chemical weapon	119	0	4	110	113	2	2	0	68	29	31	20	0	0
Suspicious powder in envelope/package	123	3	2	115	22	0	97	1	18	71	13	1	0	0
Other suspicious powder	43	2	2	37	16	1	17	0	15	7	3	0	1	0
Other suspicious substance	11	0	2	9	0	0	7	0	3	9	2	0	0	0
Category total	384	22	20	332	217	3	140	4	131	129	58	22	1	0
Other/unknown nondrug substances	24399	10469	3937	9496	20139	623	2023	949	4580	3776	3784	1082	86	5
Total no. of nonpharmaceuticals	1387769	715976	174041	483990	1276973	74810	11422	20312	230822	232133	250036	56404	4734	372
% of nonpharmaceuticals		51.6%	12.5%	34.9%	92.0%	5.4%	0.8%	1.5%	16.6%	16.7%	18.0%	4.1%	0.3%	0.0%
% of all substances	50.0%	25.8%	6.3%	17.4%	46.0%	2.7%	0.4%	0.7%	8.3%	8.4%	9.0%	2.0%	0.2%	0.0%

Table 22B Demographic profile of exposure cases by generic category of substances and products: pharmaceuticals

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Analgesics														
Acetaminophen only														
Adult formulation	32395	7734	10263	14177	15852	15930	20	409	18762	8819	4906	2559	624	70
Pediatric formulation	21538	19590	1629	267	21058	353	5	100	2809	5128	350	93	18	2
Unknown formulation	8609	2035	2360	4117	3514	4817	8	103	5699	2073	1454	1132	382	78
Acetaminophen in combination with:														
Aspirin with other ingredient	6525	2070	1827	2586	3338	2907	0	255	3272	1605	1328	486	25	4
Aspirin without other ingredient	397	127	77	191	220	155	1	16	166	81	60	40	9	0
Codeine	5496	1018	1155	3273	2235	2746	6	443	3164	1233	1385	559	111	12
Hydrocodone	22594	2035	3285	16862	7517	13341	13	1330	13622	4200	5312	2868	751	86
Oxycodone	6949	805	808	5169	2513	3724	5	539	3598	1428	1459	833	228	16
Propoxyphene	6089	689	816	4505	2229	3494	3	278	3811	1327	1520	792	198	32
Other opioid	456	45	61	348	128	299	0	19	313	63	138	64	14	0
Other drug: adult formulation	22032	3121	5162	13528	7289	13886	7	680	14321	4582	5476	3025	530	27
Other drug: pediatric formulation	45	38	6	1	45	0	0	0	6	11	2	2	0	0
Aspirin alone														
Adult formulation	7031	2209	1834	2941	3623	3190	6	175	3895	1955	1147	926	88	17
Pediatric formulation	1039	715	148	175	887	120	2	26	302	413	65	29	1	0
Unknown formulation	10111	2051	2941	5020	3722	6020	8	215	7043	2270	2084	1850	310	37

(*continued on next page*)

Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Analgesics														
Aspirin in combination with:														
Carisoprodol	397	18	39	334	81	299	0	5	326	49	126	83	23	1
Codeine	243	32	34	172	70	156	0	10	164	45	57	45	11	1
Oxycodone	144	11	17	111	45	85	0	12	83	18	28	23	5	2
Propoxyphene	39	5	7	27	20	14	0	5	19	6	7	3	3	0
Other opioid	73	7	6	57	21	40	0	12	46	10	15	8	4	0
Other drug: adult formulation	1447	308	224	906	674	678	0	73	792	321	313	178	33	2
Other drug: pediatric formulation	2	2	0	0	2	0	0	0	2	1	0	0	0	0
Nonaspirin salicylate	952	508	121	316	727	184	0	35	296	244	136	57	7	0
Opioids														
Codeine	1281	467	291	506	802	370	0	98	468	282	215	87	11	4
Meperidine	444	43	56	335	170	210	1	58	248	54	97	75	17	5
Methadone	3965	260	404	3209	1045	2437	15	244	2817	398	798	967	425	96
Morphine	3097	270	297	2463	1216	1483	9	288	1732	459	536	572	173	18
Oxycodone	5510	494	641	4254	1951	3007	14	327	3269	863	1200	853	313	43
Pentazocine	175	18	29	125	62	92	0	16	102	30	53	21	1	0
Propoxyphene	417	37	45	330	116	261	0	27	291	54	84	92	31	8
Tramadol	3769	439	449	2843	1295	2071	2	324	2463	805	840	629	161	6
Other/unknown	6974	964	758	5178	2580	3253	18	897	4071	983	1425	1312	534	43
Other nonsteroidal anti-inflammatory drugs														
Colchicine	310	78	22	209	217	47	1	42	159	80	52	36	10	4
Cox-2 inhibitor	5834	2184	572	3048	3921	1437	2	438	2101	1595	666	436	83	6
Other nonsteroidal anti-inflammatory drugs														
Ibuprofen	70916	41498	13949	15110	51169	18297	31	1219	20043	17900	6484	2216	292	13
Ibuprofen with hydrocodone	60	5	9	44	26	28	0	6	24	8	19	5	0	0
Indomethacin	709	173	78	449	363	251	0	87	325	163	141	58	11	3
Ketoprofen	377	163	71	139	259	102	0	15	108	102	46	13	3	1
Naproxen	14273	3247	3592	7310	7105	6148	6	934	6377	3508	2479	890	137	10
Other	5133	1453	658	2989	3259	1532	1	297	1977	1268	744	371	85	8
Unknown	13	7	3	3	8	4	0	1	7	4	3	0	0	0
Phenacetin	1	0	1	0	1	0	0	0	0	0	0	0	0	0
Phenazopyridine	1597	1113	156	325	1330	157	3	101	442	577	195	58	19	2
Salicylamide	14	9	0	5	12	1	0	1	4	2	2	1	0	0
Other	237	120	28	86	183	34	0	17	54	65	28	14	1	0
Unknown	246	22	75	143	46	181	0	14	175	32	72	32	3	1
Category total	279955	98237	55004	124186	152946	113841	187	10191	129768	65114	43547	24393	5685	658
Anesthetics														
Inhalation anesthetics														
Nitrous oxide	199	30	63	105	90	75	1	32	85	13	43	23	6	0
Other	140	10	18	110	109	21	4	5	65	11	45	16	2	3
Ketamine and analogs	180	14	45	119	39	109	12	11	138	14	41	59	15	0
Local/topical anesthetics														
Dibucaine	49	38	2	9	48	1	0	0	7	22	0	1	0	0
Lidocaine	1903	844	282	762	1615	121	10	148	479	434	284	124	16	0
Other/unknown	6714	4801	536	1355	6192	163	22	317	880	2171	714	139	23	0
Other	25	11	1	13	17	2	0	6	11	9	2	3	2	1
Unknown	10	2	0	7	4	0	0	6	4	2	1	1	0	0
Category total	9220	5750	947	2480	8114	492	49	525	1669	2676	1130	366	64	4
Anticholinergic drugs	3970	415	340	3181	2656	1026	3	228	1593	826	550	546	115	10
Anticoagulants														
Glycoprotein IIb/IIIa inhibitor	14	0	0	13	10	0	0	4	12	5	2	1	1	0
Heparin	198	26	7	162	124	29	1	41	111	42	12	42	7	0
Warfarin (excluding rodenticide)	2732	828	104	1785	2145	400	4	154	1071	691	162	276	68	2
Other antiplatelet	1842	453	40	1345	1557	187	1	89	554	570	131	115	20	4
Other	38	14	1	22	30	3	0	5	23	12	2	4	0	0
Unknown	22	12	1	7	15	4	1	1	10	5	2	2	0	0
Category total	4846	1333	153	3334	3881	623	7	294	1781	1325	311	440	96	6

Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Anticonvulsants														
Carbamazepine	4845	1157	846	2820	2918	1602	0	243	2961	920	1226	860	232	4
Phenytoin	4059	542	250	3236	2032	1477	2	434	2721	807	948	751	119	7
Primidone	323	37	25	261	216	80	0	20	146	60	64	41	4	1
Succinimide	80	46	19	15	74	4	0	2	21	25	10	0	0	0
Valproic acid	9069	922	2045	6039	3685	4742	10	478	6018	1975	2162	1519	366	24
Other	21629	2985	4353	14172	9533	10663	8	1167	13618	4417	5346	3581	1000	45
Unknown	16	2	2	12	4	12	0	0	13	3	5	2	1	0
Category total	40021	5691	7540	26555	18462	18580	20	2344	25498	8207	9761	6754	1722	81
Antidepressants														
Cyclic antidepressants														
Amitriptyline	7430	823	857	5683	2186	4865	8	219	5792	960	1700	2065	803	51
Amoxapine	22	2	4	16	5	15	0	0	16	4	6	5	4	1
Desipramine	185	40	17	127	89	81	0	12	124	43	28	40	15	1
Doxepin	1288	77	122	1082	335	885	0	46	1021	145	334	328	158	8
Imipramine	819	191	230	393	420	344	1	43	527	199	161	142	41	3
Maprotiline	14	2	0	12	5	9	0	0	9	4	1	3	3	0
Nortriptyline	1152	119	174	845	417	647	2	64	826	221	217	245	82	6
Protriptyline	26	5	3	18	9	15	0	2	20	6	1	5	3	0
Other cyclic antidepressant	1117	71	163	871	360	660	1	32	850	137	239	318	169	11
Unknown cyclic antidepressant	35	2	7	26	3	25	0	1	34	2	9	10	4	3
Cyclic antidepressant formulated with a benzodiazepine	64	5	8	51	22	39	0	1	47	7	21	16	2	1
Cyclic antidepressant formulated with a phenothiazine	118	18	8	92	40	74	0	2	83	17	31	25	8	1
Lithium	5474	304	936	4185	1800	2772	3	724	4283	897	1278	1482	286	9
MAO inhibitor	260	32	5	220	153	64	0	39	145	66	33	60	12	1
SSRI	48204	8187	11680	27954	18567	27222	36	1917	31181	12460	10922	6761	1426	103
Trazodone	12227	711	1906	9468	2827	8951	10	328	9567	2178	3941	2334	436	14
Other	24635	3404	4658	16378	9498	13816	12	1032	17247	5406	5587	4748	1467	86
Unknown	85	5	17	58	13	64	1	5	56	10	14	12	1	0
Category total	103155	13998	20795	67479	36749	60548	74	4467	71828	22762	24523	18599	4920	299
Antihistamines														
Diphenhydramine: unknown if OTC or Rx	28100	12052	5119	10755	17347	9872	20	719	11297	5535	5029	3262	431	28
Diphenhydramine: Rx	10	3	1	6	5	3	0	2	8	1	4	2	0	0
Diphenhydramine: OTC	1391	413	222	750	624	735	0	29	744	247	290	199	23	2
H-2 receptor antagonist	8659	5750	705	2181	7379	1023	2	232	1724	2468	630	291	53	3
Other	34602	16183	7883	10387	25525	7717	17	1150	10725	8821	4419	2391	397	22
Category total	72762	34401	13930	24079	50880	19350	39	2132	24498	17072	10372	6145	904	55
Antimicrobials														
Antibiotics														
Systemic	38536	17478	6306	14512	28346	4791	24	5218	7775	6816	4080	1543	216	9
Topical	7344	5460	470	1378	7093	62	3	177	250	1259	425	50	4	0
Unknown	516	147	99	266	274	132	0	106	162	57	102	38	3	0
Antifungals														
Systemic	1524	747	206	562	1192	124	0	202	340	341	136	64	11	1
Topical	8979	6890	372	1678	8651	73	8	236	495	1567	641	55	1	0
Unknown	13	6	0	7	13	0	0	0	3	3	1	1	0	0
Anthelmintics														
Diethylcarbamazine	73	38	6	27	67	4	1	0	6	17	3	0	0	0
Piperazine	449	332	47	68	427	18	2	1	61	161	18	7	0	0
Other	1266	782	120	353	1196	28	1	40	125	349	99	11	3	0
Unknown	12	7	2	3	11	1	0	0	1	1	0	0	0	0
Antiparasitics														
Antimalarial	971	258	98	611	678	186	1	98	446	254	138	122	25	2
Metronidazole	1637	401	189	1038	991	304	0	334	411	251	254	71	9	1
Other	33	13	5	15	25	3	0	5	12	12	4	1	0	0

(*continued on next page*)

Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Antimicrobials														
Antituberculars														
Isoniazid	401	60	147	192	165	188	0	43	289	85	40	68	92	2
Rifampin	82	27	15	39	61	9	0	12	25	17	10	3	3	1
Other	25	4	4	17	14	2	0	9	10	3	3	5	2	0
Unknown	1	0	0	1	0	1	0	0	1	1	0	0	0	0
Antivirals														
Amantadine	272	77	36	157	176	62	0	27	135	62	41	40	12	0
Anti-influenza agent: other	93	30	14	49	65	21	0	7	33	24	13	7	1	0
Antiretroviral	832	151	41	633	432	337	0	58	464	227	117	86	18	2
Systemic	1232	411	150	654	907	191	1	123	306	295	123	62	8	0
Topical	192	86	18	84	176	5	1	10	10	25	24	0	0	0
Unknown	170	49	19	100	112	35	0	21	52	38	19	12	1	0
Other	99	74	3	22	91	2	0	6	13	26	7	2	0	0
Unknown	16	0	3	13	8	5	0	3	7	3	4	3	0	0
Category total	64 768	33 528	8370	22 479	51 171	6584	42	6736	11 432	11 894	6302	2251	409	18
Antineoplastics	1459	324	111	999	1119	98	1	230	562	349	154	119	36	3
Asthma therapies														
Albuterol	7239	5384	997	829	6496	391	16	315	1182	1879	890	393	10	3
Aminophylline/ theophylline	757	106	61	588	516	152	0	72	413	164	114	158	28	3
Terbutaline and other β_2 agonist	3254	1361	559	1322	3002	107	2	138	354	746	227	95	4	1
Other β agonist	773	132	262	372	714	27	0	30	304	81	327	96	0	0
Leukotriene antagonist/ inhibitor	11 929	9283	1739	876	11 336	477	1	97	1367	3188	373	96	26	1
Other	359	124	38	196	285	47	1	23	98	78	48	32	3	0
Unknown	10	1	3	5	5	4	0	0	3	0	0	3	0	0
Category total	24 321	16 391	3659	4188	22 354	1205	20	675	3721	6136	1979	873	71	8
Cardiovascular drugs														
ACE inhibitor	12 021	3896	659	7421	9609	1978	8	386	4409	4088	916	1046	210	17
a-blocker	1657	377	64	1209	1319	227	3	99	686	511	187	204	23	2
Angiotensin receptor blocker	5475	1533	263	3665	4593	712	1	158	1915	1991	434	362	68	3
Antiarrhythmic: other	1199	216	33	943	1041	91	1	63	453	450	78	90	28	7
Antihyperlipidemic	9831	3672	507	5611	8209	1094	3	481	2589	2655	659	517	112	11
Antihypertensive	1544	555	422	561	1262	228	1	46	717	564	214	143	17	0
β-blocker	17 057	4077	1161	11 754	12 853	3595	3	509	8186	6216	1408	1986	481	25
Calcium antagonist	10 513	2378	483	7613	8284	1874	3	305	5202	3853	893	1243	356	62
Cardiac glycoside	2891	677	93	2112	2245	240	2	338	1464	847	190	524	147	17
Clonidine	5802	1888	1695	2195	3970	1599	10	164	3659	1295	1284	1308	210	12
Hydralazine	245	59	16	169	208	30	0	7	109	78	31	25	0	0
Long-acting nitrate	1293	284	33	975	1115	138	0	36	482	472	123	134	24	3
Nitroglycerin	1570	921	79	563	1277	251	3	31	558	703	117	105	13	1
Nitroprusside	37	7	1	29	15	0	0	22	34	8	2	13	2	0
Vasodilator: other/ unknown	1402	445	116	829	962	274	21	131	540	433	152	132	15	2
Vasopressor	1502	205	546	743	1439	34	0	23	762	85	692	209	5	0
Other	34	4	0	30	27	3	0	4	18	8	5	4	2	0
Unknown	72	22	2	48	43	23	0	4	45	17	4	10	0	0
Category total	74 145	21 216	6173	46 470	58 471	12 391	59	2807	31 828	24 274	7389	8055	1713	162
Cold and cough preparations	108 814	67 494	22 302	18 673	88 595	16 655	74	3144	25 042	24 924	15 323	5376	387	30
Diagnostic agents	662	122	51	475	520	13	2	123	292	128	122	54	9	0
Dietary supplements/herbals/homeopathic														
Amino acids														
Creatine	217	63	53	101	112	39	3	58	92	25	27	26	4	0
Other amino acid dietary supplement	607	316	73	212	431	71	1	91	151	134	62	27	9	0

Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Cultural medicines														
Ayurvedic	10	5	1	4	7	2	0	0	3	1	1	0	1	0
Asian	111	44	16	51	77	15	0	18	58	17	26	10	6	0
Hispanic	11	5	2	4	5	2	2	2	11	1	4	0	0	0
Other	29	12	1	16	15	3	1	10	15	5	5	6	0	0
Botanical products														
Blue cohosh	2	1	1	0	1	1	0	0	2	1	0	0	0	0
Ginkgo biloba	209	98	24	87	143	27	0	34	60	36	33	13	1	0
Echinacea	573	392	87	90	481	37	1	45	74	158	23	8	2	0
Ginseng	295	153	42	100	196	53	3	41	90	75	46	27	0	0
Kava kava	82	19	9	54	33	39	2	8	48	16	9	10	2	0
Ma huang/ephedra (single ingredient)	1293	408	246	621	586	496	2	182	728	288	235	222	26	5
Citrus aurantium (single ingredient)	22	6	3	13	11	3	0	8	15	0	2	6	0	0
St John's wort	226	106	27	90	143	49	2	31	80	49	33	18	1	0
Valerian	288	64	44	176	136	118	0	31	150	58	54	31	3	0
Yohimbe	191	34	15	142	72	47	3	67	113	26	32	40	9	0
Multibotanical with ma huang	3934	1201	1080	1629	1782	1612	7	504	2233	842	902	638	51	2
Multibotanical without ma huang or *Citrus aurantium*	2535	1091	374	1058	1468	486	7	556	1020	560	527	249	20	0
Multibotanical with *Citrus aurantium*	489	114	141	227	189	211	0	84	305	79	151	77	4	0
Other single-ingredient botanical	2192	1156	200	817	1651	196	2	331	545	456	270	112	13	2
Homeopathic	6403	5784	197	403	6063	159	5	170	489	1725	218	52	5	0
Hormonal products														
Androgen/precursor (dietary supplement)	148	72	21	54	92	27	0	26	58	26	16	15	1	0
Phytoestrogen	134	60	6	68	96	13	0	25	31	25	15	10	1	0
Glandular	53	32	5	15	42	5	0	6	6	13	2	1	0	0
Melatonin	1705	934	361	401	1242	407	5	48	415	439	223	39	4	0
Other dietary supplements														
Blue-green algae	85	31	21	32	71	0	2	9	13	14	12	3	0	0
Glucosamine (with or without chondroitin)	811	526	45	237	717	30	1	63	108	199	42	16	0	1
Other single-ingredient nonbotanical	724	427	50	246	567	49	2	102	142	149	64	22	3	0
Unknown supplement/ homeopathic	1463	603	240	614	875	269	4	293	615	285	208	157	10	0
Category total	24842	13757	3385	7562	17304	4466	55	2843	7670	5702	3242	1835	176	10
Diuretics														
Furosemide	3126	1035	155	1923	2592	405	0	114	1182	903	375	280	67	3
Thiazide	4345	1425	288	2616	3375	775	5	163	1556	1313	421	363	65	12
Other	1835	633	113	1083	1456	260	0	104	627	549	171	143	34	2
Unknown	87	33	6	48	53	28	0	6	46	20	12	11	3	0
Category total	9393	3126	562	5670	7476	1468	5	387	3411	2785	979	797	169	17
Electrolytes and minerals														
Calcium	17168	15420	731	982	16774	255	5	126	731	2979	328	72	9	0
Chromium, trivalent	690	347	55	280	621	29	3	33	139	130	51	32	3	0
Colloidal silver	81	37	13	31	62	1	0	17	28	10	3	1	1	0
Fluoride	3571	3157	300	110	3507	24	2	36	135	774	223	9	0	0
Iron	3651	2017	410	1190	2890	586	5	160	1207	1015	449	142	15	1
Magnesium	1260	438	157	656	968	161	19	105	220	223	156	39	5	1
Potassium	1415	449	64	897	1188	167	1	50	469	439	124	83	22	7
Selenium	4	1	0	3	4	0	0	0	3	1	1	1	0	0
Sodium	3119	1782	560	753	2810	198	34	63	428	592	550	65	5	0
Vanadium	2	2	0	0	2	0	0	0	0	2	0	0	0	0
Zinc	1022	640	79	296	921	34	0	65	93	184	101	9	2	0
Multimineral dietary supplement	203	144	18	41	186	7	1	8	38	50	10	5	1	0

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Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Multimineral, multiherbal dietary supplement	730	432	78	218	546	118	2	61	210	185	94	31	5	0
Other	51	15	13	23	42	0	0	8	13	11	9	1	0	0
Unknown	11	5	0	4	8	3	0	0	5	2	1	0	1	0
Category total	32978	24886	2478	5484	30529	1583	72	732	3719	6597	2100	490	69	9
Eye/ear/nose/throat preparations														
Nasal preparations														
Tetrahydrozoline	59	41	5	13	56	0	1	2	19	24	8	3	0	0
Other decongestant	2216	1039	234	935	2029	51	6	128	273	593	305	37	2	1
Other	579	396	22	160	561	5	0	13	30	108	77	3	0	0
Unknown	13	3	3	7	8	1	3	1	2	4	1	1	0	0
Ophthalmic preparations														
Contact lens product	3400	1562	360	1461	3338	25	8	29	628	363	841	154	1	0
Glaucoma therapy	244	71	10	160	207	8	0	29	54	55	27	14	1	0
Tetrahydrozoline	1520	962	191	354	1296	81	104	32	371	659	139	41	2	0
Other sympathomimetic	799	370	119	301	638	48	45	59	179	258	89	16	2	1
Other	1335	660	154	509	1224	28	5	77	114	171	139	31	2	0
Unknown	32	8	3	21	27	1	3	1	12	6	7	2	0	0
Otic preparations														
Combination product	2438	1172	279	970	2401	7	1	28	268	456	782	38	1	0
Other	2134	816	205	1095	2110	9	0	15	258	249	678	57	2	0
Unknown	51	23	6	21	48	1	0	2	8	7	25	1	0	0
Steroid, topical for eye/nose/throat	2575	1466	455	646	2290	84	13	182	158	471	286	44	0	0
Throat preparations														
Lozenge without local anesthetic	943	759	88	90	891	22	1	29	35	168	38	10	0	0
Lozenge with local anesthetic	222	107	47	67	179	23	1	18	23	65	20	4	0	0
Other	405	194	87	121	345	45	2	12	86	113	58	7	0	0
Unknown	2	0	0	2	1	1	0	0	0	0	0	0	0	0
Category total	18967	9649	2268	6933	17649	440	193	657	2518	3770	3520	463	13	2
Gastrointestinal preparations														
Antacids														
Salicylate-containing	2734	2114	260	355	2433	139	2	151	281	734	149	26	5	0
Proton pump inhibitor	8005	3350	623	3997	6358	1217	3	389	2086	2021	692	437	92	9
Other	5608	4982	229	386	5430	100	6	65	206	991	116	19	3	0
Antidiarrheals														
Diphenoxylate/atropine	519	213	57	245	341	149	0	22	360	177	97	73	18	4
Loperamide	1125	629	110	382	876	167	3	74	369	431	113	53	7	1
Non-opioid	236	170	23	43	205	9	2	20	24	43	13	2	0	0
Paregoric	27	15	2	10	15	5	1	4	10	9	5	1	1	0
Antispasmodics														
Anticholinergic	3740	1383	487	1845	2626	852	6	223	1613	1080	591	402	56	4
Other	86	20	9	56	49	25	0	9	37	21	15	14	4	0
Laxative	13535	9255	1287	2923	12069	802	242	395	1598	2271	1653	261	23	2
Other	10416	8149	486	1736	9391	611	15	362	1488	2243	586	324	45	1
Unknown	21	9	1	11	11	5	1	4	9	5	3	1	1	0
Category total	46052	30289	3574	11989	39804	4081	281	1718	8081	10026	4033	1613	255	21
Hormones and hormone antagonists														
Androgen	434	130	62	232	261	116	2	48	174	73	73	35	6	1
Corticosteroid	8747	4263	1017	3417	7199	649	3	861	1276	1407	587	282	49	1
Estrogen	2278	1286	133	851	1924	226	2	116	461	542	140	80	30	1
Insulin	3366	130	170	3018	2697	548	14	90	1380	1096	197	612	69	8
Oral contraceptive	8915	7257	848	785	8203	514	12	173	746	1652	288	37	6	0
Oral hypoglycemics														
Biguanide	4246	1003	359	2860	3216	861	2	133	1751	1461	394	399	93	19
Sulfonylurea	4148	1486	218	2423	3236	745	1	135	2677	1669	316	872	104	9
Thiazolidinedione	1882	642	101	1130	1513	296	0	67	895	839	183	180	25	3
Other/unknown	476	202	31	239	393	66	0	15	269	207	31	74	8	0
Progestin	1230	670	132	419	1031	74	2	118	198	249	78	35	7	1
Selective estrogen receptor modulator	631	210	34	384	573	40	0	16	140	190	31	18	2	0
Thyroid preparation	10647	5140	776	4704	9472	953	3	187	2264	2407	510	346	99	3

Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Other hormone	814	270	194	348	651	88	1	70	232	217	97	42	13	0
Other hormone antagonist	522	183	55	278	430	54	0	37	109	109	26	26	4	0
Unknown hormone or antagonist	23	5	2	14	13	7	0	3	10	5	0	2	1	0
Category total	48359	22877	4132	21102	40812	5237	42	2069	12582	12123	2951	3040	516	46
Miscellaneous drugs														
Allopurinol	551	247	32	271	475	57	0	13	177	223	39	37	6	2
Disulfiram	386	7	5	368	81	221	2	74	232	28	101	73	15	0
L-dopa and related drug	951	225	17	704	797	90	0	54	327	256	144	93	17	0
Ergot alkaloid	307	144	36	124	212	63	0	30	198	111	50	25	5	0
Neuromuscular blocking agent	25	2	1	22	16	3	0	6	21	4	1	1	8	1
Nicotine pharmaceutical	867	358	84	420	618	79	2	160	183	194	176	48	3	1
Other	20514	8154	3594	8667	16646	2330	49	1364	5362	4799	3016	1186	186	11
Category total	23601	9137	3769	10576	18845	2843	53	1701	6500	5615	3527	1463	240	15
Muscle relaxants														
Carisoprodol (formulated alone)	8368	355	837	7063	1520	6510	6	165	6706	950	2851	1799	445	29
Cyclobenzaprine	7330	1379	936	4961	2684	4350	6	208	5110	1464	1945	1364	323	15
Methocarbamol	1533	207	191	1117	564	886	4	55	965	327	365	201	40	4
Other	5944	940	690	4256	2391	3156	3	297	3914	1203	1371	1158	302	13
Unknown	171	19	15	129	35	129	0	6	127	17	41	33	4	0
Category total	23346	2900	2669	17526	7194	15031	19	731	16822	3961	6573	4555	1114	61
Narcotic antagonists	304	10	22	264	102	131	0	55	203	38	60	74	14	1
Radiopharmaceuticals	28	1	0	27	19	0	0	8	15	2	6	2	0	0
Sedative/hypnotics/antipsychotics														
Atypical antipsychotic	38315	3154	8109	26774	11538	24577	40	1638	29260	6198	11002	8892	2098	94
Barbiturates														
Long-acting	2728	524	208	1974	1530	1081	6	60	1472	530	546	406	168	10
Short/intermediate-acting	349	17	48	280	128	193	1	14	241	46	93	66	20	1
Unknown type	72	3	13	54	8	61	0	0	66	7	19	25	6	0
Benzodiazepine	65998	6431	7020	51657	15805	47476	327	1327	49553	10099	21467	11489	2954	202
Buspirone	2033	233	273	1516	792	1132	2	84	1294	412	500	317	65	4
Chloral hydrate	212	40	24	146	78	108	3	16	158	23	64	60	13	2
Ethchlorvynol	3	0	1	2	0	3	0	0	2	0	1	1	0	0
Glutethimide	2	0	0	2	0	2	0	0	2	0	0	2	0	0
Meprobamate	81	5	10	66	21	52	0	4	61	12	18	20	8	5
Methaqualone	12	1	4	6	2	10	0	0	12	2	3	4	1	0
Phenothiazine	4518	685	564	3237	2032	2009	9	407	2959	858	1027	971	185	19
Sleep aid (OTC)	927	102	136	679	215	688	3	17	661	141	249	200	20	3
Other	14345	1048	2070	11093	3704	9849	13	565	10425	1849	4944	2624	485	30
Unknown	290	8	45	228	29	245	8	4	231	21	72	63	9	1
Category total	129885	12251	18525	97714	35882	87486	412	4136	96397	20198	40005	25140	6032	371
Serums, toxoids, and vaccines	2321	529	255	1484	1686	12	4	612	692	205	528	105	7	0
Stimulants and street drugs														
Amphetamine	10507	2742	4140	3529	6279	3615	45	397	5610	2338	2024	1662	297	26
Amyl/butyl nitrite	57	5	4	47	19	37	0	1	35	5	11	12	1	0
Caffeine	4605	901	1779	1889	1863	2299	17	379	2031	563	1263	711	22	0
Cocaine	7698	134	857	6593	636	6802	64	36	6910	858	1713	2441	729	73
Diet aids														
Phenylpropanolamine	42	17	4	21	29	10	0	3	19	12	7	8	0	0
Phenylpropanolamine and caffeine	11	4	3	4	5	2	0	3	7	1	1	4	0	0
Other: OTC	245	79	49	115	123	80	1	41	122	58	37	34	1	0
Other: Rx	131	47	19	63	80	38	0	13	67	32	24	15	2	0
Unknown	105	27	23	53	37	49	0	18	75	23	22	17	0	0
Ephedrine	1412	378	210	814	571	734	4	88	822	278	291	284	18	3
GHB and analog/precursor	715	6	99	591	77	395	186	18	565	26	129	257	116	0
Hallucinogenic amphetamine	1631	25	578	985	195	1311	93	5	1274	71	317	538	106	5
Heroin	1730	13	151	1533	159	1475	13	17	1553	154	334	530	242	34

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Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
LSD	221	6	107	103	27	173	17	1	165	14	41	75	9	2
Marijuana	3799	139	1554	2061	467	3132	56	58	3099	334	1074	1082	255	24
Mescaline/peyote	118	25	34	56	67	46	1	3	55	3	27	24	2	0
Methamphetamine	3025	109	511	2337	404	2427	70	41	2420	171	575	933	177	37
Methylphenidate	8336	1593	4814	1878	6035	1992	8	245	3224	2160	1331	940	73	3
Phencyclidine	511	8	136	358	75	391	20	5	443	27	110	187	61	3
Phenylpropanolamine look-alike drug	3	0	2	1	1	2	0	0	2	1	1	0	0	0
Other stimulant	59	17	16	26	29	22	1	7	38	10	19	8	1	0
Other hallucinogen	75	0	30	44	8	64	0	0	68	3	11	32	15	0
Unknown hallucinogen	13	0	5	8	0	9	3	0	8	0	2	3	1	0
Other stimulant/street drug	28	0	7	21	4	19	1	3	23	0	11	9	1	0
Unknown stimulant/street drug	217	11	66	135	33	145	21	9	158	10	45	55	11	4
Category total	45 294	6286	15 198	23 265	17 223	25 269	621	1391	28 793	7152	9420	9861	2140	214
Topical preparations														
Acne preparation	3225	1927	608	679	3001	78	1	141	222	640	406	29	3	0
Boric acid/borate	100	51	6	41	99	0	0	1	7	20	7	2	0	0
Calamine	3347	2488	156	700	3304	32	1	9	155	574	178	5	0	0
Camphor	10 303	8140	570	1571	10 049	159	16	70	896	3101	1315	72	8	0
Camphor/methyl salicylate	2015	1764	78	166	1982	3	0	30	180	701	286	12	2	0
Diaper care/rash product	53 626	51 769	707	1016	53 559	34	9	22	538	7649	824	21	0	0
Hexachlorophene antiseptic	41	19	6	16	33	4	0	4	8	8	10	3	0	0
Hydrogen peroxide	7190	2790	621	3745	7044	112	10	19	318	694	802	40	1	0
Iodine or iodide antiseptic	1507	462	261	761	1243	174	13	64	357	328	282	63	6	2
Mercury antiseptic	213	150	17	43	194	10	0	9	22	56	8	3	0	0
Methyl salicylate	9990	7832	693	1435	9827	62	16	78	741	2377	1781	64	3	0
Minoxidil	141	73	8	60	128	2	0	11	28	45	20	3	0	0
Podophyllin	39	8	6	25	25	7	0	7	13	6	9	3	0	0
Silver nitrate	314	67	110	135	272	26	1	15	51	38	56	23	1	0
Topical steroid	9401	6871	580	1919	9242	41	6	107	211	1339	369	21	1	0
Wart preparation	1592	994	236	352	1518	15	8	50	198	345	252	33	0	0
Topical steroid with antibiotic	1564	1022	138	392	1518	11	1	33	73	244	221	16	2	0
Other liniment	2484	1245	189	1041	2160	25	4	292	161	346	616	38	1	0
Other topical antiseptic	6397	4810	653	914	6174	129	51	38	392	1459	690	47	2	0
Category total	113 489	92 482	5643	15 011	111 372	924	137	1000	4571	19 970	8132	498	30	2
Veterinary drugs	3314	1284	265	1741	3150	71	16	73	389	829	559	89	13	1
Vitamins														
Multiple-vitamin tablets: adult formulations														
No iron, no fluoride	2656	1708	269	674	2268	231	2	146	444	623	180	69	3	0
With iron, no fluoride	7330	5051	534	1725	6551	595	1	167	1066	1999	410	90	10	1
With iron carbonyl (no fluoride)	249	191	16	42	233	13	0	3	34	71	20	4	0	0
With iron, with fluoride	72	50	5	17	67	4	0	1	9	18	4	0	0	0
No iron, with fluoride	42	36	2	3	41	0	0	1	2	6	0	0	0	0
Multiple-vitamin tablets: pediatric formulations														
No iron, no fluoride	12 995	10 997	1894	87	12 763	202	7	14	389	2701	231	6	0	0
With iron, no fluoride	19 032	17 290	1583	134	18 765	230	4	28	1422	4759	672	34	0	0
With iron carbonyl (no fluoride)	79	69	7	3	75	4	0	0	16	29	3	0	0	0
With iron, with fluoride	176	166	9	0	174	1	0	1	10	33	9	1	0	0
No iron, with fluoride	1756	1682	63	9	1744	10	0	2	54	387	14	2	0	0
Multiple-vitamin liquids: adult formulations														
No iron, no fluoride	173	103	15	55	143	16	0	13	37	43	15	6	0	0
With iron, no fluoride	202	109	19	74	172	23	0	7	30	40	16	1	1	0
With iron, with fluoride	6	2	0	4	5	0	0	1	1	3	1	0	0	0
No iron, with fluoride	3	3	0	0	3	0	0	0	0	0	0	0	0	0
Multiple-vitamin liquids: pediatric formulations														
No iron, no fluoride	453	422	24	5	439	3	1	10	20	75	20	2	0	0
With iron, no fluoride	763	729	30	3	740	4	1	18	37	150	33	3	0	0
With iron, with fluoride	43	43	0	0	40	0	0	3	2	6	3	0	0	0
No iron, with fluoride	515	499	16	0	512	1	0	2	13	78	17	1	0	0

Table 22B continued

	No. of Exposures	Age			Reason				Treated in Health Care Facility	Outcome				
		<6	6-19	>19	Unint	Int	Other	Adv Rxn		None	Minor	Moderate	Major	Death
Multiple vitamins, unspecified adult formulations														
No iron, no fluoride	64	42	4	18	51	7	0	6	14	15	4	3	0	0
With iron, no fluoride	2285	1555	225	499	2024	218	0	41	397	624	132	44	4	0
With iron, with fluoride	13	7	1	5	11	2	0	0	6	6	1	0	0	0
No iron, with fluoride	8	6	0	2	8	0	0	0	0	0	0	0	0	0
Multiple vitamins, unspecified pediatric formulations														
No iron, no fluoride	242	176	64	2	235	4	0	3	7	48	1	1	0	0
With iron, no fluoride	205	185	20	0	203	1	0	1	17	50	11	1	0	0
With iron, with fluoride	10	6	3	1	9	0	0	1	3	3	0	0	0	0
No iron, with fluoride	65	63	2	0	64	1	0	0	0	5	1	0	0	0
Other vitamins														
Vitamin A	623	448	29	144	560	33	2	26	63	113	37	5	2	0
Niacin (B_3)	3048	670	458	1888	1512	401	4	1122	508	210	1068	109	3	0
Pyridoxine (B_6)	394	255	42	93	316	56	0	21	88	104	26	9	9	0
Other B complex vitamins	3100	2201	130	754	2717	234	4	133	512	673	181	76	15	0
Vitamin C	2316	1750	221	337	2119	129	1	63	208	485	108	28	3	0
Vitamin D	284	139	21	123	243	16	1	21	47	67	22	6	0	1
Vitamin E	1726	1306	97	318	1589	64	1	58	197	354	85	26	1	1
Other	646	381	63	198	507	53	1	85	123	134	59	16	0	0
Unknown	988	649	142	177	813	115	1	49	197	287	69	23	2	0
Category total	62562	48989	6008	7394	57716	2671	31	2047	5973	14199	3453	566	53	3
Unknown drug	16323	4135	3619	8084	7028	6326	1024	885	10385	2921	2561	2299	631	41
Total no. of pharmaceuticals	1389156	581488	211747	586404	909709	409445	3542	54941	538233	301780	213112	126861	27603	2148
% of pharmaceuticals		41.9%	15.2%	42.2%	65.5%	29.5%	0.3%	4.0%	38.7%	21.7%	15.3%	9.1%	2.0%	0.2%
% of all substances	50.0%	20.9%	7.6%	21.1%	32.8%	14.7%	0.1%	2.0%	19.4%	10.9%	7.7%	4.6%	1.0%	0.1%

MAO indicates monoamine oxidase; SSRI, selective serotonin reuptake inhibitors; OTC, over-the-counter; ACE, angiotensin-converting enzyme; GHB, γ-hydroxybutyrate; LSD, lysergic acid diethylamide.

Appendix A

AAPCC's 2004 fatality verification process involved the preparation and review of abstracts on 1513 fatalities reported to poison centers, some of which were eventually determined to be unrelated to a poison exposure. The review process requires the dedication and commitment of hundreds of poison center staff members. . .more than could possibly be listed here. The following fatality abstract authors were identified by their poison centers as having made a major contribution to this effort. These individuals are acknowledged for their commitment to toxicosurveillance through the careful verification and preparation of clinical abstracts of poisoning cases. Without the dedicated contributions of these individuals, this report would not be possible.

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Garrison, James
Geib, Anne-Jeanette
Geller, Richard J.
Geller, Robert J.
Gracia, Rebecca
Gummin, David
Hantsch, Christina E.
Haynes, Jr, John F.
Henretig, Fred M.
Hesse, Carol L.
Hoffman, Robert S.
Holmes, Becky L.
Holstege, Christopher P.
Horowitz, Zane B.
Hughes, Michael P.
Jaramillo, Jeanie
Joshi, Prashant
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Kemmerer, David A.
Kerns, William
Kirk, Mark A.
Kostic, Mark A.
Kunisaki, Thomas A.
Lai, Melisa W.
Lawrence, Ruth A.
Liebelt, Erica
Ling, Louis J.
Lopez, Gaylord
LoVecchio, Frank
Lovely, Perry L.
Marraffa, Jeanna M.
McGoodwin, Lee
McGuigan, Michael A.
McKay, Charles
McNally, Jude T.
Maloney, Gerald
Mercurio-Zappala, Maria
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Morgan, David L.
Mowry, James B.
Mrvos, Rita
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Nichols, Michele
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Omslaer, Judith C.
Patton, Jill B.
Quang, Lawrence
Quershi, Shaima
Reed, Michael
Richardson, William H.
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Rivera, Wilfredo
Robertson, William O.
Rose, Rutherfoord S.
Rossi, Pamala R.
Ryan, Mark L.
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Scalzo, Anthony J.
Schultz, Debora
Scruton, Susan
Seger, Donna
Seifert, Steven A.
Serafin, David
Shum, Shu
Simmons, Henry F.
Simone, Karen E.
Smolinske, Susan C.
Snodgrass, Wayne
Spiller, Henry A.
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Appendix B

Drug and chemical concentrations provided in these abstracts were measured in blood, serum, or plasma unless otherwise indicated

Case 11. A 76-year-old disoriented man was admitted to the psychiatric unit with delirium tremens. His blood pressure increased, and he was transferred to the intensive care unit (ICU). Vital signs on admission to the ICU were normal except for tachycardia with a heart rate of 115 beats per minute. The patient was reclusive and had a history of **ethanol** abuse, with his beverage of choice being "moonshine." Initial laboratory values were unremarkable except for sodium, 122 mEq/L; and blood **lead**, 115 μg/dL. He was encephalopathic. British Anti-Lewisite (BAL) was instituted intramuscularly, followed by a continuous infusion of calcium EDTA. BAL was administered every 4 hours for 3 additional doses. The patient remained on intravenous (IV) calcium EDTA for 5 days with a blood lead concentration of 66 μg/dL after 48 hours of treatment. An erythrocyte protoporphyrin concentration was 12 μg/dL. The encephalopathy persisted. Over the next 2 weeks, he became febrile with presumed sepsis, became hypotensive, and expired.

Case 14. A 45-year-old man presented to the ED unresponsive, acidotic, and in acute renal failure. He had been found agitated and tachycardic by a park ranger, with blood glucose 20 to 30 mg/dL. He was believed to have consumed an **ethanol/isopropyl alcohol–containing hand sanitizer** as an alcohol substitute. Initial workup revealed a wide anion-gap acidosis with partial respiratory compensation. His blood ethanol concentration was 32.5 mg/dL. Fomepizole was ordered, and hemodialysis was initiated. Subsequently, ethylene glycol and methanol assays were negative. There was also no evidence of salicylate or iron poisoning. The acidosis did not resolve with supportive care, and he expired 24 hours after admission.

Case 41. A 43-year-old man ingested **antifreeze (ethylene glycol)**. At the time of the call to the poison center, he was unresponsive with bradycardia (heart rate 30 beats per minute), acidosis (pH 6.8), and hyperkalemia. He was mechanically ventilated, and hemodialysis and fomepizole were begun. His initial osmolality was 364 mOsm/kg with a serum creatinine of 4.8 mg/dL. Despite hemodialysis and fomepizole, he died on hospital day 2. Postmortem analysis revealed ethylene glycol, 138 mg/dL (antemortem sample); and the **cocaine** metabolite, benzoylecgonine, 0.562 μg/mL. Marked hyperhydration was noted on

postmortem. His weight at autopsy was 69 lb greater than his hospital admission weight.

Case 46. A 33-year-old man with a history of **carburetor cleaner** huffing over several months was found in cardiopulmonary arrest. He was last seen huffing several hours earlier. The patient could not be resuscitated in the field and was declared dead on arrival in the ED. He had first- and second-degree burns on his bilateral upper extremities and nonlinear second-degree burns/erythema on his chest wall. Autopsy revealed pulmonary congestion and cardiomegaly. Postmortem vena cava samples showed dichloromethane, 106 μg/mL; methanol, 20 mg/dL; and toluene, 6.3 μg/mL. Postmortem samples from the aorta showed toluene, 11 μg/mL; and dichloromethane, 38 μg/mL.

Case 52. A 50-year-old man was bitten on his left second finger by a snake; the snake was never positively identified but was presumed to be a copperhead (***Crotalidae***). He received polyvalent immune ovine Fab antivenin and underwent a dermotomy of his finger and a fasciotomy of his arm. He developed thrombocytopenia (platelet nadir, 51 000/μL) and was transfused. History revealed that he had hepatitis C, cirrhosis, and a "chronic low platelet count." The patient subsequently went into ethanol withdrawal and was started on lorazepam. He became increasingly agitated and also had diazepam, haloperidol, and **fentanyl** administered. He then had a respiratory arrest which responded to naloxone. He was intubated and placed on a ventilator. He was later extubated and taken back to the operating room for debridement of his arm wound. During surgery, he had another respiratory arrest and was reintubated. He appears to have aspirated during this episode and developed adult respiratory distress syndrome. His platelets never increased greater than 72 000/μL, and he developed myoglobinuria. Medical care was withdrawn, and he died.

Case 53. A 55-year-old man was bitten while feeding a captive **canebrake rattlesnake (*Crotalus horridus horridus*)**. Within seconds of the bite, the patient became dizzy. He then drove himself to a nearby ED. On arrival, he was noted to have 1 puncture mark on his hand that appeared to have entered a vein, and he immediately became hypotensive and unresponsive. The patient was intubated while IV access was being established, and vasopressors were begun. Because the facility had no antivenom, he was transported to a regional referral center. The patient remained hypotensive for most of the 2 hours from the time of the bite until arrival at the tertiary hospital. He received 14 vials of antivenom (Crotalidae polyvalent immune Fab) and aggressive resuscitation. The patient developed renal failure, disseminated intravascular coagulation (DIC) and circulatory collapse. He died 7 hours after the envenomation.

Case 55. A 5-year-old girl presented to the ED in apparent septic shock and DIC. She reportedly had been bitten on the foot by a **brown recluse spider**. Her laboratory values were prothrombin time (PT) more than 200 seconds, partial thromboplastin time more than 200 seconds, fibrinogen 89 mg/dL, d-dimer more than 55 mg/dL, and platelets 45 000/μL. Her blood pressure was 100/50 mm Hg while on an epinephrine infusion. She was intubated and mechanically ventilated and expired on the second hospital day. The reported findings from the autopsy were septic shock with DIC and a skin lesion on the right foot described as an ulcerated lesion 7/8 inch with a central ulcerated area (1/8 inch) surrounded by contusions. A sample from the lesion was negative for brown recluse spider venom. The postmortem report concluded that death was caused by septic shock and that "a possible spider or insect bite cannot be excluded as the cause of the foot lesion."

Case 56. A 25-year-old man presented to a remote clinic. Oral ethanol was begun for possible intoxication from ethylene glycol. Further inquiry found that the patient operated a water treatment facility. Search of his home revealed empty packets of **aluminum fluoride**. The patient's breathing had become more labored, and he was transported to an ED where he was intubated. His vital signs were temperature, 31.1°C; blood pressure, 140/80 mm Hg; and heart rate, 110 beats per minute with atrial fibrillation. Laboratory analysis showed potassium, 7.1 mEq/L; and serum calcium, 6.7 mg/dL. The patient was treated with calcium gluconate, insulin and glucose, and bicarbonate. He died while being resuscitated and awaiting transport to a tertiary medical center.

Case 58. A man was riding in a vehicle with a container of **anhydrous ammonia** for a suspected portable methamphetamine laboratory. The container ruptured. The patient exited the vehicle and ran away from the scene. He was found in cardiac arrest when emergency medical service (EMS) arrived. He was also noted to have second- and third-degree burns. Despite cardiopulmonary resuscitation (CPR), the patient expired shortly after arrival at the ED.

Case 60. A 26-year-old man fell in his room. He had a history of depression and a previous attempt to harm himself. His mother heard the fall, found him groggy, assumed his symptoms were related to recent sinus problems, and helped him back to bed. A few hours later, he was unresponsive and was brought to the ED with a reported ingestion of **cyanide**. He was treated with a cyanide antidote kit but remained unresponsive, hypotensive, and acidotic. He was intubated, ventilated, and given dopamine. By 12 hours after arrival, he had no response to stimuli but spontaneously moved and opened his eyes. At 24 hours after admission, he had decorticate posturing. The acidosis resolved, and he was maintaining his blood pressure without vasopressors. The electroencephalogram (EEG) showed general slowing. He died on the second hospital day. Blood cyanide levels were 0.18 μg/mL at about 16 hours after arrival at the ED and 0.13 μg/mL 10 hours later. Postmortem examination showed bilateral hemorrhagic infarcts of the caudate and putamen of the brain, hypoxic-ischemic encephalopathy, and acute pulmonary thromboemboli. The postmortem heart blood cyanide concentration was 0.27 μg/mL.

Case 61. A 37-year-old man with a psychiatric history ingested approximately 2 gulps of a **cyanide-containing gold-plating solution** in front of his girlfriend. She immediately called 911. EMS arrived within 15 minutes and described the patient as alert but cool, pale, and diaphoretic. Initial vital signs were blood pressure, 120/60 mm Hg; heart rate, 122 beats per minute; and respiratory rate, 16 breaths per minute. The paramedics had amyl nitrite ampules available, and the poison center recommended immediate inhalation of 1 ampule en route to the hospital. Activated charcoal and sodium thiosulfate were given on arrival at the ED. Approximately 1 hour after ingestion, the patient's mental status appeared to be declining, and he was given a second round of nitrite and thiosulfate. Two hours after ingestion, he was awake and talking; however, his mean arterial blood pressure was 47 to 50 mm Hg. An additional dose of sodium thiosulfate was given. Three hours after ingestion, his arterial blood gas values were pH 7.12; P_{CO_2}, 37 mm Hg; and P_{O_2}, 139 mm Hg. A methemoglobin concentration was not available. He was on high doses of phenylephrine and dopamine, and his systolic blood pressure remained 78 to 80 mm Hg. By 5 hours after ingestion, his mean arterial pressure was in the 40s mm Hg despite the addition of vasopressin and epinephrine. He had received several doses of IV bicarbonate and an additional dose of thiosulfate. Shortly after that, he had a bradycardic arrest and expired. Autopsy revealed marked pulmonary edema, acute gastritis, and edema of the intestinal tract and airways. His blood cyanide concentration was 0.3 μg/mL (time and location of sample not recorded). An ethanol concentration was 100 mg/dL.

Case 64. A 50-year-old chemist was found unresponsive and in respiratory distress at home after attempting suicide with **cyanide**. Shortly after EMS arrival, she developed apnea and was intubated en route to the ED. Initial electrocardiogram (ECG) was suggestive of acute cardiac injury. Other findings included tachycardia followed by bradycardia, marked ectopy, then sinus arrest. No cyanide antidote kit was available at the receiving hospital, and the patient expired shortly after arrival.

Case 75. A 49-year-old man was found unresponsive and blue in a hotel room. He had a history of an ethylene glycol ingestion 6 weeks previously, for which he had received dialysis. In the ED, he was noted to be comatose. He was intubated and started on an IV ethanol infusion. He also had hypotension and bradycardia and arrested twice in the ED. He was treated with dopamine, thiamine, pyridoxine, sodium bicarbonate, and atropine. Treatment also included continuous venovenous hemodiafiltration (CVVHD) because his blood pressure was too low to perform hemodialysis. On the second hospital day, he developed hyperthermia and tachycardia and remained hypotensive. He continued to receive CVVHD but did not show any improvement and died the following day. Blood collected while he was in the ED revealed an **ethylene glycol** concentration of 838 mg/dL and a glycolic acid concentration of 348 mg/dL.

Case 94. A 71-year-old man presented to the ED approximately 5 hours after ingesting an unknown quantity of brick cleaner later identified by police as **hydrochloric acid**. The patient initially appeared lethargic and required intubation. A nasogastric tube, placed postintubation, returned dark blood. Less than 1 hour after arrival in the ED, the patient sustained a cardiac arrest. Despite aggressive attempts at resuscitation, the patient expired. An antemortem arterial blood gas included a pH of 6.89. An autopsy revealed severe transmural hemorrhagic necrosis of the esophagus and stomach despite the absence of oropharyngeal burns.

Case 95. A 58-year-old man with a medical history of diabetes arrived in the ED with oral burning. He had been at a friend's home where he mixed scotch with the contents of a soda bottle that he believed contained soda and drank. The patient said that the liquid tasted like "acid." In the ED, the pH of the bottle's content was tested and found to be less than 5. Vital signs were heart rate, 78 beats per minute; respiratory rate, 17 breaths per minute; blood pressure, 103/84 mm Hg; and oxygen saturation 93% on room air. An arterial blood gas on a 100% nonrebreather mask showed pH 7.27; P_{O_2}, 209 mm Hg; and P_{CO_2}, 40 mm Hg. The patient had coffee-ground emesis and developed stridor and respiratory distress; oral burns were noted in the mouth. He was intubated, sedated, and started on IV fluids. No abnormalities were seen in the initial ECG and chest x-ray. Laboratory values on admission were sodium, 140 mEq/L; potassium, 5.2 mEq/L; bicarbonate, 21 mEq/L; blood urea nitrogen (BUN), 18 mg/dL; creatinine, 1.8 mg/dL; glucose, 320 mg/dL; and calcium, 4.2 mg/dL. Approximately 3 hours after presentation, a dysrhythmia was noted on the cardiac monitor. An ECG revealed absent P waves; diffuse T wave inversions; QRS, 168 milliseconds; and QTc, 505 milliseconds. The patient had already been given 1 ampule of calcium gluconate for hypocalcemia. He developed hypotension (74/43 mm Hg) and tachycardia (115 beats per minute). Repeat chemistries showed a total calcium of 3.0 mg/dL with an ionized calcium of 0.5 mg/dL. At 5 hours after presentation, blood pressure was 96/50 mm Hg on norepinephrine. He had received a total of 3 ampules of calcium gluconate, was on a bicarbonate drip, and had received 2 g of magnesium. The patient then became asystolic and died despite CPR. Autopsy revealed sloughing of the esophageal mucosa, hemorrhage of the gastric mucosa, and 300 mL of blood in the stomach. There were no perforations. Hepatic fluoride concentrations were elevated consistent with hydrofluoric acid poisoning. Further history revealed that grout cleaner containing **hydrofluoric acid** was stored in the soda bottle.

Case 98. A 47-year-old woman called EMS because she was short of breath. On arrival, EMS noted that she was next to an empty bottle of scotch and a marijuana "bong." She had bradycardia, hypotension, and poor mentation. She was given atropine which resulted in a heart rate of 50 beats per minute, and she was intubated. In the ED, she was noted to be in third-degree heart block which was

effectively treated with external cardiac pacing. Her hospital evaluation revealed a severe metabolic and respiratory acidosis, and an ECG revealed a wide QRS complex of 122 milliseconds and the presence of a terminal 40-millisecond axis deviation in lead aVR. Her lactic acid concentration was 25 mmol/L. Based on the cardiogram, the physician initiated bicarbonate therapy, and based on the elevated lactic acid concentration, sodium thiosulfate was given. In addition, she was given fomepizole and was hemodialyzed. Despite the aggressive therapy, the patient died less than 24 hours after presentation. Postmortem toxicological analysis revealed a **propylene glycol** concentration of 1171 μg/mL.

Case 99. A 58-year-old man was driving a coal truck. The brakes failed, and the truck went into a sludge pond where he aspirated the sludge. Prior analysis of the sludge pond contents had shown microbes and other debris, **sodium hydroxide**, **polyaluminum hydroxychlorosulfate**, and an alkaline **corrosion inhibitor**. His chest x-ray showed aspiration pneumonia, and he was intubated and ventilated. He was treated with antibiotics and respiratory supportive care. He expired from respiratory complications 17 days after the crash.

Case 123. A 51-year-old woman drank approximately 120 mL of a **toilet bowl cleaner containing hydrochloric acid** in a suspected suicide attempt. Her family gave her water and milk, after which she vomited. In the ED, she was made NPO and received IV fluids. Endoscopy revealed a normal esophagus and a necrotic perforated stomach. The patient underwent total gastrectomy. Postoperatively, she became septic, and multisystem organ failure developed. She died 4 days after ingestion.

Case 127. A 1-year-old boy reportedly ingested about 300 mL of a **wheel cleaner containing ammonium bifluoride**. He was transported to the nearest hospital by EMS. Plans were made to transfer him to a regional center with a pediatric ICU (PICU), but he arrested and died before transport could occur. He received 1 ampule of calcium during resuscitation.

Case 129. An 11-year-old girl was found by her mother collapsed on the bathroom floor near an aerosol **air freshener**. She had a white residue around her mouth. EMS found the patient in ventricular fibrillation and started CPR. On arrival to the ED, she was in asystole with a pH of 6.9. Resuscitative efforts were unsuccessful. On postmortem examination, the gross pathology was normal, and toxicology analysis was negative. The medical examiner ruled the cause of death to be cardiac arrest as a result of hydrocarbon inhalation.

Case 133. A 63-year-old man was admitted to the hospital after a presumed overdose. He was found with pill bottles around him and had a decreased level of consciousness that required intubation. The time of ingestion was unknown. His medications included **acetaminophen/butalbital/caffeine**, **zolpidem**, and clonazepam. He was started on dopamine. A nasogastric tube was placed, and **activated charcoal** was administered through the tube before tube placement was verified. The nasogastric tube was then noted to be in his lung. The patient received an additional dose of charcoal when a second nasogastric tube was placed into the stomach. He was started on IV *N*-acetylcysteine. His initial acetaminophen concentration was 73 μg/mL, with normal liver enzyme levels. A second acetaminophen concentration was 29 μg/mL. On hospital day 2, his liver enzymes remained normal. Both *N*-acetylcysteine and dopamine were discontinued. He was on propofol and fentanyl for sedation, and attempts to wean these drugs were unsuccessful. On hospital day 4, attempts to wean him from the ventilator caused tachycardia and hypertension. Charcoal was still being suctioned from his lungs. On hospital day 7, an EEG was consistent with anoxic brain injury. On hospital day 8, life support measures were withdrawn, and the patient died. An autopsy showed an activated charcoal–induced pneumonitis.

Case 151, 152, and 153. Two 17-year-old boys and a 17-year-old girl were found in cardiopulmonary arrest in a cave which they had been exploring with 2 other teenagers of similar age. All 3 died. One of the surviving teenagers was able to stumble out of the cave and call EMS. The children were burning a fire and were reported to have symptoms before their death consistent with **carbon monoxide** poisoning.

Case 184. A 72-year-old man was found dead in his apartment. The patient's carbon monoxide detector had gone off the night before, but he had apparently disabled it. Firefighters confirmed high concentrations of carbon monoxide in his apartment from a furnace malfunction.

Case 215. A 22-year-old man was transported by helicopter from a naval ship after being found unresponsive in a confined area where there was a large waste storage tank. The initial concern was that he had fallen and sustained injuries. He arrived in cardiac arrest and could not be resuscitated. Shortly after arriving at the trauma center, the staff was informed that the confined area was filled with **hydrogen sulfide** gas. At autopsy, significant pathological findings included marked edema/congestion of the lungs and acute brain swelling without herniation. Urine creatinine and thiosulfate concentrations were 3959 and 21 μg/mL, respectively. A carboxyhemoglobin concentration was 1%, and methemoglobin and sulfhemoglobin were undetectable.

Case 218. A 42-year-old woman ingested one half of a tall glass of an **algaecide** containing 9% elemental copper in a suspected suicide attempt. She complained of nausea and vomiting. She was taken to a local ED and was immediately transferred to a second hospital where she was found to have renal and hepatic failure. The patient's clinical status declined, and she was transferred to a tertiary care hospital. Upon arrival at the third facility, she was having dry heaves. Initial laboratory results included BUN, 24 mg/dL; creatinine, 2.0 mg/dL; aspartate aminotransferase (AST), 25457 U/L; and alanine aminotransferase (ALT), 6791 U/L. On day 2, the patient's BUN

increased to 34 mg/dL and creatinine to 2.5 mg/dL. A serum copper concentration was 3.24 μg/mL (reference range 0.75-1.45 μg/mL). The patient received BAL, which was not tolerated. On day 2, the patient experienced sloughing of her esophagus. Hemodialysis was performed, and calcium disodium EDTA was initiated. Repeat laboratory analyses showed BUN, 38 mg/dL; creatinine, 3.2 mg/dL; AST, 18345 U/L; ALT, 3375 U/L; and serum copper, 1.51 μg/mL. On days 4 and 5, the patient had gastrointestinal hemorrhage. She continued to receive hemodialysis. On day 5, the patient was intubated before upper gastrointestinal endoscopy. After intubation, the patient's respiratory and cardiac status declined, and she developed bradycardia with pulseless electrical activity. She could not be resuscitated.

Case 225. An adult man was found dead in the hold of an offshore fishing vessel. A leak in the **chlorofluorocarbon** refrigeration system was found. Three other crew members were taken for treatment of hypothermia, fasciculations, incontinence, and tachycardia.

Case 227. An 83-year-old man presented to the ED with gastrointestinal symptoms about 8 to 12 hours after ingesting 3 or 4 mushrooms he identified and picked himself. Initial liver transaminases were elevated. Laboratory values on hospital day 4 were AST, 460 U/L; ALT, 689 U/L; serum creatinine, 6.2 mg/dL; total bilirubin, 9.6 mg/dL; and lactic acid, 4 mg/dL. His hemoglobin dropped from 16 to 12 g/dL, and he developed abdominal pain and gastrointestinal bleeding. He received sodium bicarbonate for a metabolic acidosis, norepinephrine for blood pressure support, and IV *N*-acetylcysteine. The bicarbonate was stopped, and hemodialysis was started. By hospital day 5, the patient had developed DIC. He was given fresh frozen plasma (FFP) and platelets. Laboratory values were hemoglobin, 9.5 g/dL; platelet count, 28000/μL; serum creatinine, 2.4 mg/dL; total bilirubin, 9.5 mg/dL; alkaline phosphatase, 83 U/L; AST, 640 U/L; ALT, 824 U/L; international normalized ratio (INR), 1.81; d-dimer, 6554 μg/L; and fibrinogen, 240 mg/dL. On hospital day 6, the patient died. The mushrooms were identified by a mycologist as ***Amanita bisporigera***.

Case 228. A 44-year-old man ate 6 to 10 ***Amanita muscaria*** mushrooms purchased freeze dried from an internet site by a friend. After a prolonged period of unresponsiveness and possible seizure activity, EMS was contacted. He was in cardiorespiratory arrest when EMS arrived. After a lengthy resuscitation in the ED, the patient was admitted to the ICU. He was hypotensive and receiving vasopressors. On the first hospital day, an EEG showed constant subclinical seizure activity. He had a mildly elevated AST but normal ALT. A head computed tomography (CT) was consistent with anoxic brain injury. The patient expired on day 10.

Case 229. A 70-year-old woman developed vomiting and diarrhea after eating wild mushrooms picked in a local park. The time of onset of symptoms was unclear. The patient presented 2 days after the ingestion with blood pressure, 90/60 mm Hg; and heart rate, 130 beats per minute. Initial laboratory results showed AST, 4699 U/L; ALT, 2907 U/L; INR, 2.7; and serum creatinine 1.2 mg/dL. The patient was given IV fluids, high-dose penicillin, and multiple doses of activated charcoal. On the next day, her AST was 7005 U/L; ALT, 4083 U/L; and INR, 4. She became drowsy then hypotensive requiring vasopressors. Her case was discussed with the regional liver transplant service, but she was felt to be too unstable, and she died on the fourth hospital day. A mycologist identified the mushrooms as ***Amanita phalloides***.

Case 232. A 34-year-old man ingested **2,4-dichlorophenoxyacetic acid** in a suicide attempt. Upon presentation, the patient had altered mental status, miosis, increased oral secretions, and tachycardia. He was initially treated with atropine and pralidoxime for a presumed organophosphate exposure until the product container was found. Bicarbonate therapy was then instituted in an attempt to increase elimination via urinary alkalinization. The patient died on hospital day 2 after developing ventricular tachycardia, pulmonary edema, and renal insufficiency.

Case 234. A 75-year-old man with a history of Parkinson disease and a cardiac pacemaker was found unresponsive approximately 20 minutes after ingestion of an unknown amount of **glyphosate** concentrate. The patient was intubated in the field secondary to mental status depression and hypoventilation. He received 1 dose of activated charcoal en route to the ED. In the ED, he had central nervous system depression, but his vital signs and baseline laboratory values were all normal. He was treated with a propofol infusion for agitation. The patient developed hypotension requiring pressor support with dopamine, aspiration pneumonitis, and nonoliguric renal failure with a peak serum creatinine of 4.3 mg/dL. The hypotension resolved over the next 48 hours and the renal failure within a week. However, the patient's hospital course was complicated by hospital-acquired pneumonia, and he expired on hospital day 11.

Case 238. A 38-year-old man was brought to an ED after ingesting an unknown amount of concentrated **terbufos** (15%) granules in a suicide attempt. The patient reportedly mixed the granules with food and ate it. In the ED, he was initially alert but subsequently developed weakness and drooling. He was given 4 mg of atropine and intubated when he developed copious secretions. Before pralidoxime could be administered, he became asystolic. He could not be resuscitated and expired about 2 hours after the ingestion.

Case 239. A 19-year-old man was brought to the ED by the police. After initial evaluation in the ED, the patient was transferred to the trauma center because of visible evidence of traumatic injuries. On initial presentation, he had hyperthermia (41.1°C) with a heart rate of 200 beats per minute, dilated pupils, and absence of sweating. The patient then rapidly progressed to DIC, hypotension, and cardiac arrest. It was subsequently revealed by observers that the patient had crushed up **angel's trumpet (*Datura species)*** and drank it in the form of a tea.

Case 240. A 56-year-old man unintentionally ingested about 60 mL of a pool clarifier concentrate containing ***n*-alkyldimethyl benzylammonium chloride**. He went to the ED complaining of throat and abdominal pain. The patient had an emergent endoscopy and was noted to have necrotic burns of the stomach and esophagus. He was transferred to a tertiary care center and underwent exploratory laparotomy. No surgical repair was attempted because of the amount of necrosis present. The patient was provided with comfort measures only and expired less than 24 hours after his initial presentation.

Case 244. A 2-year-old girl with a fever for 5 days had been given **acetaminophen** in doses appropriate for a 6-year old, both orally and rectally. She was seen in an ambulatory clinic for vomiting and had an acetaminophen concentration of 72 μg/mL, approximately 8 hours after the last dose. The patient was admitted to the hospital. *N*-acetylcysteine was not administered. On the next day, the acetaminophen concentration was 44 μg/mL; AST, 9842 U/L; ALT, 6486 U/L; alkaline phosphatase, 970 U/L; ammonia, 320 μmol/L; bilirubin, 3.7 mg/dL; INR, 4.4; glucose, 23 mg/dL; pH 7.2; BUN, 33 mg/dL; and creatinine, 1.8 mg/dL. At this point, the patient had a blood pressure of 45/20 mm Hg, was obtunded, and had oral bleeding. She was intubated and given fluids, and IV *N*-acetylcysteine was started. Additional measures included dextrose, dopamine, bicarbonate, oral lactulose, and antibiotics. She continued to deteriorate with bleeding and was given vitamin K, packed red cells, and FFP. Prostaglandin E_1 was also started on the advice of the transplant center. The patient was not able to be transported to the pediatric liver transplant center and continued to deteriorate. After coding several times, the patient died.

Case 245. A 3-year-old boy was administered adult doses of **acetaminophen** for 5 days for an upper respiratory tract infection. The patient presented with hypotension, liver failure, and an acetaminophen concentration of 52 μg/mL, 16 hours after his last dose. He was transferred to a tertiary care hospital. On arrival, his initial laboratory values showed AST, 14 000 U/L; ALT, 40 000 U/L; and INR, 6. IV *N*-acetylcysteine was administered, and the patient was maintained on vasopressors. He developed a gastrointestinal tract bleed, renal failure, and sepsis. The patient died 8 days after being transferred to the tertiary care hospital.

Case 274. A 40-year-old man with a previous head injury was living in a group home. At an unknown time, his roommate allegedly forced him to take an overdose of **acetaminophen**. In the hospital, his laboratory values were acetaminophen concentration, 101 μg/mL; AST, 833 U/L; ALT, 1008 U/L; and ammonia, 213 μmol/L. The timing of these values relative to the ingestion is unknown. The patient was sedated and required mechanical ventilation. He was also started on *N*-acetylcysteine therapy, and supportive care was instituted. Despite this, he continued to deteriorate until he died 7 days after presentation. Postmortem examination revealed liver necrosis and signs of acute tubular necrosis and multiorgan failure. The death was ruled a homicide.

Case 288. A 51-year-old woman presented to an ED after being found unresponsive and surrounded by vomit, stool, and pills. **Acetaminophen** was the suspected drug of ingestion; the time of ingestion was unknown. The patient was also suspected to have aspirated. In the ED, she was acidotic and hypothermic and required intubation. Her initial laboratory values showed an acetaminophen concentration of 1121 μg/mL and a pH of 6.9. IV *N*-acetylcysteine therapy was initiated. On day 2, the patient remained unresponsive, intubated, and ventilated and did not require sedation. She then developed hypotension and tachycardia and was placed on dopamine, norepinephrine, and phenylephrine infusions. Subsequent acetaminophen levels were 936 and 1180.6 μg/mL at about 6 and 8 hours after the first level. Other laboratory results revealed AST, 125 U/L; PT, 21.5 seconds; and INR, 3.5. The patient was administered vitamin K. On day 3, the patient's status remained unchanged. Laboratory results included AST, 4465 U/L; ALT, 2337 U/L; PT, 50.8 seconds; INR, 18.9; calcium, 7.0 mg/dL; ammonia, 63 μmol/L; creatine kinase, 3047 U/L; and creatine kinase–myocardial band, 47.2 ng/mL. A screen for drugs of abuse was negative. The initial IV *N*-acetylcysteine regimen was completed, and a second 20-hour infusion was initiated. On day 4, the patient expired.

Case 318. A 15-year-old boy with a history of drug abuse presented to an outlying hospital 12 hours after ingesting unknown amounts of **acetaminophen** (500 mg), **buprenorphine**, and a **cough/cold product containing codeine and guaifenesin**. An acetaminophen concentration was 155 μg/mL at presentation, and IV *N*-acetylcysteine was started. Initial laboratory values were AST, 174 U/L; ALT, 208 U/L; total bilirubin, 1.4 mg/dL; and bicarbonate, 23 mEq/L. An ECG was noted to be normal. Fourteen hours later, his blood pressure was 160/70 mm Hg, and pulse rate was 90 beats per minute. Laboratory values at that time were AST, 779 U/L; ALT, 1469 U/L; PT, 40.9 seconds; INR, 4.05; PTT, 29.5 seconds; total bilirubin, 4.5 mg/dL; and total CO_2, 19 mmol/L. Twelve hours later, he was transferred to a tertiary care hospital with worsening liver function. The *N*-acetylcysteine was continued, and he received 2 U of FFP and vitamin K_1, but his INR increased to 7.0. He was alert and oriented with no signs of encephalopathy. Over the next 2 days, his AST and ALT were 462 and 4746 U/L, respectively. He showed increasing signs of encephalopathy as his ammonia increased to 366 μmol/L and his creatinine to 8.3 mg/dL. On the fifth hospital day, he received a liver transplant after a biopsy showed 70% necrosis. After transplant, he was noted to be unresponsive with nonreactive pupils. A head CT showed diffuse cerebral edema with transtentorial herniation, whereas a brain flow study showed global nonperfusion of the brain, consistent with brain death. He was removed from life support measures 7 days after presentation.

Case 462. An 11-year-old boy being treated for acute rheumatic fever with high-dose **aspirin** presented with altered mental status and a salicylate concentration of 66 mg/dL. IV bicarbonate was started, and additional laboratory tests revealed the patient to have elevated transaminases with an ALT of more than 1000 U/L and an INR of 2.9. An ammonia concentration subsequently returned at 457 μmol/L. The patient was treated with vitamin K and hemodialysis but developed cerebral edema and papilledema. IV *N*-acetylcysteine was given for elevated liver functions and lactulose for the elevated ammonia concentration. The patient continued to deteriorate neurologically in deep coma. A liver biopsy confirmed the diagnosis of Reye syndrome. Transaminases slowly declined as did the ammonia and salicylate concentrations. An EEG showed no brain activity, and after 2 weeks of supportive care without change in neurological status, the patient expired.

Case 466. A 38-year-old man presented to the ED 10.5 hours after the reported ingestion of 300 enteric coated regular-strength **aspirin** tablets. He was alert and oriented. His medical history was significant for a self-inflicted gunshot wound to the abdomen 3 months previously. On physical examination, he was diaphoretic and complained of abdominal pain. His heart rate was 113 beats per minute with a normal blood pressure. Laboratory values included a serum pH of 7.37 and a serum salicylate concentration of 97.7 mg/dL. IV fluids with sodium bicarbonate were begun. Within an hour of arrival, he was noted to have an altered mental status. He was sedated with lorazepam for agitation before having a CT of his abdomen, as there was concern over possible peritoneal signs and his history of abdominal injury. Hemodialysis was then started. The salicylate concentration dropped to 58.4 mg/dL after 6 hours, and hemodialysis was stopped. His salicylate concentration then rose to 90 mg/dL. He had a cardiopulmonary arrest 18 hours after arrival and died.

Case 507. A 51-year-old woman presented to the ED 5.5 hours after ingesting 150 **colchicine** tablets in a suspected suicide attempt. Her initial complaint was nausea and vomiting. Vital signs on presentation included blood pressure, 187/100 mm Hg; and heart rate, 115 beats per minute. Initial laboratory examinations included white blood cells, 16 600/μL; potassium, 3.3 mEq/L; bicarbonate, 25 mEq/L; and creatinine, 1.5 mg/dL. The patient was treated with antiemetics, crystalloid fluids, potassium supplementation, activated charcoal, gastric lavage, and antihypertensives. She was admitted to the ICU. Sixteen hours after ingestion, she developed hypotension, increased respiratory distress, and decreased urinary output. She remained alert and oriented with systolic blood pressure, 70 mm Hg; heart rate, 120 beats per minute; and respiratory rate, 40 breaths per minute. She was started on vasopressors. Twenty hours after ingestion, she developed cardiogenic shock, metabolic acidosis, and anuria. A repeat arterial blood gas showed a pH of 7.25. Her white blood cell count increased to 28 600/μL. The patient was treated with maximum vasopressor support and a balloon pump; evidence of vasospasm was seen during cardiac catheterization. Resuscitation was withheld, and the patient expired 31 hours after ingestion.

Case 515. A 48-year-old man with a medical history of nonspecific heart problems and drug abuse was found dead at home with 2 **fentanyl** patches on his shoulder. The autopsy revealed no evidence of trauma. Analysis of femoral blood revealed a fentanyl concentration of 29.7 ng/mL.

Case 525. A 10-month-old girl was brought to the ED after being found in cardiopulmonary arrest at home. Rigor mortis was apparent on presentation. A postmortem subclavian blood sample showed a **methadone** concentration of 0.67 μg/mL. The child's mother was on methadone. The mother and her companion were prosecuted for giving methadone to the child.

Case 526. A 15-month-old boy's mother was taking **methadone** and left it in a child's decorated cup in a kitchen cabinet. Another woman in the home thought it was juice and gave it to the child. According to the mother, she realized what had happened an hour later but did not do anything because the child looked fine. Approximately 2 hours after the ingestion, the other woman in the household noted that the child was not breathing and began CPR. The child was transported to the ED by EMS but died approximately 6 hours later. A postmortem blood methadone concentration was 0.4 μg/mL.

Case 527. A 20-month-old boy became sleepy and was put down for his usual afternoon nap. Eight hours later, the toddler was unarousable, and EMS was called. Upon EMS arrival, the patient was unresponsive with pinpoint pupils, decreased respirations, and eyes deviated to the right. Responsiveness improved slightly with naloxone. Medications available in the home were diazepam, liquid **methadone**, gabapentin, and amitriptyline. The patient's urine drug screen was positive for methadone. Multiple neurological investigations revealed marked hypoxic injury with brain stem herniation. The child died on the 24th hospital day.

Case 612. A 42-year-old man was administered **nalbuphine** and **propofol** in a dental office before a dental procedure. He developed respiratory insufficiency, and EMS was called. The patient was intubated and transferred to an ED. An arterial blood gas on arrival showed pH 7.06; P_{CO_2}, 79.3 mm Hg; P_{O_2}, 35.3 mm Hg; and oxygen saturation, 53.1%. His condition deteriorated in the ED, and he died despite resuscitative measures. An autopsy showed severe hemorrhagic pulmonary edema. Postmortem toxicology results for blood were reported as alprazolam 6 ng/ml and nalbuphine 46 ng/mL; propofol was not detected.

Case 613. A 10-month-old boy had apparently been given a bottle of **naproxen** tablets to use as a rattle. The child reportedly choked on the pills when the bottle opened. Attempts at resuscitation both at the scene and in the ED were unsuccessful. A naproxen blood concentration from an

unspecified site obtained approximately 2 days postmortem was 130 μg/mL. Anatomic examination revealed no identifiable pills or fragments, and additional extensive testing was all negative. The final cause of death was determined to be asphyxiation as a result of the aspiration of medication tablets.

Case 623. A 14-month-old boy was found by his mother to be unarousable and was brought to an ED. In the ED, he was in cardiopulmonary arrest and very acidemic. After 40 minutes of CPR, a pulse was returned. After 5 days with no return of function, he was declared brain-dead. Blood analysis showed an **acetaminophen** concentration of 12 μg/mL, and urine toxicology screen was positive for opiates, confirmed in blood as **oxycodone** with a concentration of 220 ng/mL.

Case 635. A 2-year-old boy was found unarousable by his father. Thirteen tablets of controlled-release **oxycodone** 80 mg were missing from the father's prescription bottle. Paramedics found the boy unresponsive, pulseless, and warm with circumoral cyanosis. He was lying supine with vomitus in his airway. The cardiac monitor showed ventricular fibrillation rapidly followed by asystole. CPR was started, and the child was intubated. There was no response to naloxone, atropine, or epinephrine via an intraosseous line. In the ED, additional doses of naloxone and epinephrine were administered without response, and the child was declared dead. Postmortem analysis of peripheral blood showed oxycodone, 560 ng/mL; and oxymorphone, 260 ng/mL.

Case 652. A 29-year-old woman was admitted to the ICU with a history of ingesting a veterinary analgesic, **phenylbutazone**. No further information was available regarding the time frame or amount ingested, although it was believed that she may have taken repeated doses for a headache. She had renal failure and liver failure and was bleeding secondary to DIC. Her vital signs on phenylephrine and dopamine infusions were heart rate, 120 beats per minute; and blood pressure, 117/51 mm Hg. On the following day, she remained in DIC and was intubated and on a ventilator. She was receiving infusions of propofol, insulin, sodium bicarbonate, dopamine, phenylephrine, furosemide, and total parenteral nutrition. She was bleeding from multiple sites, and further blood products were administered. On hospital day 3, supportive measures were discontinued, and the patient expired. Autopsy showed anasarca with bilateral pleural effusions, ascites, multiple areas of hemorrhage, and evidence of diffuse organ damage. Postmortem analysis showed serum phenylbutazone, 13 μg/mL; and oxyphenbutazone, 3.4 μg/mL.

Case 665. A 17-year-old man was found in respiratory and cardiac arrest next to an empty 250-mL bottle of **sevoflurane**. He was cardioverted and intubated in the field, then transported to the ED. At the ED, the patient was completely unresponsive with fixed dilated pupils. His systolic blood pressure was 180 mm Hg with a heart rate of 114 beats per minute while receiving sodium bicarbonate, calcium, epinephrine, and amiodarone. His initial serum pH was 6.86; serum calcium, 5.6 mg/dL, and his rectal temperature was 36.2°C. The patient was transferred and admitted to an ICU 2.5 hours after his arrival to the ED and was developing pulmonary edema. His clinical condition continued to decline, and he expired about 24 hours after the exposure.

Case 675. An 18-month-old boy weighing 11 kg was inadvertently administered 2000 mg of IV **fosphenytoin**. He developed bradycardia, then asystole. Despite aggressive resuscitative measures over the next 3 hours, including prolonged CPR, epinephrine, atropine, magnesium, albumin, and exchange transfusion, spontaneous circulation was not restored.

Case 682. A 46-year-old man presented to the ED after ingesting an estimated 75 **oxcarbazepine** 150-mg tablets. The patient was decontaminated with activated charcoal. One half hour after ED arrival and within 6 hours of the ingestion, the patient became hypotensive and required 6 L of IV fluid for resuscitation. The patient then developed asystole after a period of bradycardia and could not be resuscitated. A urine screen for drugs of abuse was negative.

Case 691. A 49-year-old woman reportedly ingested 400 **valproic acid** 500-mg tablets. She was ataxic and drowsy when evaluated by EMS. During transport, the patient became comatose and was intubated. The patient was rapidly stabilized in the ED and admitted to the ICU. Her initial valproic acid concentration was 980 μg/mL. Eight hours after admission to the ICU, the patient remained comatose. Her ammonia concentration had increased to 134 μmol/L, and her pH had decreased to 7.27. She continued to deteriorate. Four hours later, she was neurologically unresponsive with no corneal reflexes, no doll's eyes, and with pupils fixed and dilated. Her pH had dropped to 7.01, and 8 ampules of sodium bicarbonate were administered to get the pH back to 7.38. She became hypotensive with no response to dopamine. L-Carnitine was administered. The patient developed an ileus and was unable to hold down activated charcoal or polyethylene glycol electrolyte solution. Laboratory values from the morning of the second hospital day included ammonia, more than 300 μmol/L; and valproic acid, 1855 μg/mL. Her blood pressure continued to fall, and norepinephrine was added. In addition, there was evidence that the patient had aspirated activated charcoal, and an ileus had developed. Despite 100% oxygen, her Po_2 dropped to 40 mm Hg. She continued to deteriorate and expired later that day.

Case 735. A 55-year-old man ingested **amitriptyline** and injected NPH **insulin**. He was intubated and had a prolonged QTc but did not have a prolonged QRS. He was started on bicarbonate and a 10% dextrose in water infusion. The ECG had normalized by day 2. On hospital day 5, the patient collapsed on his way to the bathroom and died.

Case 804. A 39-year-old man admitted to an ingestion of "too many pills," including **venlafaxine**, **lorazepam**,

diphenoxylate/atropine, and hydrocodone. Significant numbers of venlafaxine and lorazepam tablets were missing. He presented to the ED obtunded with pinpoint pupils and poor respiratory effort. He awoke in response to the administration of 2 mg of naloxone. He was observed for 2 hours and released. He was found dead later that day.

Case 818. A 5-year-old boy was found dead in an empty home by a process server. The child had last been seen alive by his mother 36 hours previously, and it was estimated by the medical examiner that he had been dead for about 24 hours. A container of liquid beverage found at the scene contained a large amount of suspended **diphenhydramine**. A postmortem blood sample had a diphenhydramine concentration of more than 10 μg/mL.

Case 833. A 7-year-old girl was found dead in bed. She had complained of stomach cramps the afternoon before and was otherwise in good health. She was not taking any medications. The patient's father was taking **hydroxychloroquine** for rheumatoid arthritis. At autopsy, the postmortem blood concentration of hydroxychloroquine was 70 μg/mL, indicative of ingestion of a large number of pills.

Case 835. A 68-year-old man developed liver injury 1 month after starting **isoniazid** and **rifampin** for tuberculosis. He was transferred to a liver treatment center for care. At that time, his laboratory values were AST, 1150 U/L; ALT, 1180 U/L; potassium, 6.0 mEq/L; and INR, >10; BUN and serum creatinine were normal. Despite aggressive supportive care, the patient died 4 days after presentation.

Case 840. A 40-year-old man developed respiratory distress after unintentionally injecting himself with the veterinary antibiotic, **tilmicosin**, as he injected cattle. Treatment included 125 mg of methylprednisolone sodium succinate. The patient developed cardiac manifestations including bradycardia and died within 4 hours of arriving at the health care facility.

Case 881. A 10-month-old boy was found face down, shaking, and vomiting. He was thought to have possibly ingested extended-release **diltiazem**. In the ED, he was crying and had a heart rate of 80 beats per minute and a blood glucose greater than 300 mg/dL. An IV line was placed with no response from the infant, and calcium chloride and glucagon boluses were given without response. Hypotension and bradycardia progressively worsened despite continued boluses of calcium gluconate and glucagon and a dopamine infusion. The child vomited and had seizure-like activity leading to intubation and transfer to the PICU. In the PICU, the child received activated charcoal with whole bowel irrigation, an epinephrine infusion, and an insulin/glucose infusion. The child continued to deteriorate, requiring multiple doses of atropine and chest compressions for bradycardia. He expired about 7 hours after initial presentation.

Case 890. A 15-month-old girl with a history of supraventricular tachycardia was found with her bottle of **flecainide** liquid. She may have ingested a large swallow of the flecainide. The child had a prehospital cardiac arrest while en route to the ED in a private vehicle. Despite resuscitation efforts in the ED, the patient died within a few hours of the ingestion. The patient's antemortem blood flecainide level, at an unknown time after ingestion, was 6.87 μg/mL.

Case 924. A 2-year-old girl ingested an unknown quantity of **benzonatate**. A family member retrieved part of a perle with a finger sweep of the mouth. Within 5 minutes, the patient became unresponsive. On EMS arrival, the patient had apnea and cyanosis. On ED arrival, the patient had a seizure and asystole. A perfusing sinus rhythm developed when CPR was administered. Postresuscitation vital signs included blood pressure, 118/68 mm Hg; and heart rate, 145 beats per minute. A CT scan approximately 16 hours after the event showed cerebral edema. The patient remained unresponsive with absent brainstem reflexes and no cerebral blood flow. Autopsy results were consistent with anoxic-ischemic brain injury secondary to benzonatate ingestion.

Case 928. A 12-month-old boy ingested up to 20 mL of a **cough syrup containing chlorpheniramine and hydrocodone**. EMS performed CPR at the scene. After arrival at the tertiary care facility, the child was treated with naloxone and dopamine and had a thready pulse (157 beats per minute) and a blood pressure of 60/40 mm Hg. He was admitted to the PICU on a ventilator with dilated pupils and no spontaneous movement. He was also exhibiting diabetes insipidus. The child was treated with dopamine, epinephrine, and vasopressin. With no change in the patient over approximately 20 hours in the PICU and a poor prognosis, testing was done for brain death, and the child was pronounced dead about 27 hours after exposure.

Case 934. A 33-year-old woman had apparently been drinking **ethanol** and taking a **product containing ephedra and caffeine** for 3 days. She was found in asystole and was cold and with evidence of livor mortis.

Case 936. An approximately 50-year-old man who was receiving conventional treatments for lung cancer presented to the local ED with respiratory distress. Supportive resuscitation measures were begun, but the patient went into cardiac arrest and died despite CPR. During the code, the family of the patient produced a bottle of "Amygdalina" (**laetrile**) tablets that the patient had reportedly purchased via the internet. The family reported that the patient had ingested approximately 20 of the 100-mg tablets the previous evening in an attempt to speed his recovery from cancer. The patient was pronounced dead before antidotal therapy for cyanide exposure could be administered. Thiocyanate levels returned within reference range, and the serum cyanide concentration was 5.1 μg/mL.

Case 940. A 19-year-old man had a respiratory arrest and died after inhaling powdered **diphenoxylate** and **diazepam**. A diphenoxylate concentration of 40 mg/mL was measured an estimated 12 hours after exposure. Powder consisting of diphenoxylate and diphenhydramine was found with the body. No atropine was detectable in the powder.

Case 941. A 44-year-old woman ingested up to 100 **loperamide** 2-mg tablets. She was found asleep approximately

1 hour later. When she was awakened, she was confused and answered questions inappropriately. She was taken to the ED where she was sleepy and had an altered level of consciousness. Her heart rate was 96 beats per minute, and she was breathing normally. She was given activated charcoal. Her laboratory values were reported as normal, and salicylate and acetaminophen assays were negative. She was evaluated by psychiatry and discharged home after approximately 6 hours of observation. At home, she was more lethargic, and she was brought back to the ED shortly after the first discharge. At that time, she had pinpoint pupils and needed intubation. Four days later, she had flaccid extremities and fixed and dilated pupils, and remained intubated on pressor support. A CT scan of her head was normal. After an EEG on day 11, she was taken off the ventilator, and she died.

Case 948. A 54-year-old veterinarian with history of bipolar disorder and a prior suicide attempt was found by family unresponsive on an examination table at his office. He had a bruise consistent with a needle mark on his right thigh. **Cyclopropane** and nitrous oxide containers, an empty 10-mL container of **insulin**, and 5 empty bottles of a veterinary general anesthetic product containing **tiletamine** 250 mg and **zolazepam** 250 mg were found in close proximity. He was intubated en route to the hospital, where he was given activated charcoal. Initial vital signs were temperature, 33.5°C; heart rate, 68 beats per minute; respiratory rate, 14 breaths per minute; and blood pressure, 156/118 mm Hg. He was given naloxone. His blood glucose was 20 to 30 mg/dL, and he was given 50% dextrose and 2 doses of glucagon. Shortly after arrival in the ED, he developed hypotension and was started on a norepinephrine drip. He developed posturing, which responded to sedation with midazolam and propofol. His hospital course was complicated by the development of rhabdomyolysis and acute renal failure. Life support was withdrawn 1 week after admission, and the patient expired.

Case 954. A 77-year-old man was brought to the ED where he stated that he had taken 50 **metformin** tablets (1000 mg) and an unknown number of **acetaminophen/propoxyphene** tablets. Acetaminophen concentration, thought to be 4 hours after ingestion, was 33 μg/mL, and lactic acid concentration was 11 mg/dL. The patient was drowsy with bradycardia and a normal blood glucose. He later became more acidotic with pH 6.99; bicarbonate, 6 mEq/L; and lactic acid, 19.3 mg/dL. An osmolar gap was 28 mOsm/kg H_2O. CVVHD was initiated. He received bicarbonate as well as norepinephrine and dobutamine for hypotension. He became unresponsive and was intubated and ventilated. His lactic acid concentration rose to 35 mg/dL, and he expired 48 hours after ingestion. The postmortem metformin concentration was 64 μg/mL.

Case 963. A 74-year-old woman was started on **lepirudin** postoperatively after developing heparin-induced thrombocytopenia. Approximately 2 days later, the patient was coagulopathic, bleeding from various sites, and had a PTT greater than 150 seconds. The lepirudin had been discontinued. On the previous day, the patient's laboratory values had shown a new-onset renal insufficiency. The lepirudin infusion had been decreased at that time, adjusting for a creatinine clearance of 37 mL/min. Blood products were already being ordered, including FFP, platelets, and packed red blood cells. The patient underwent hemodialysis. Norepinephrine was also started for hemodynamic support. On the following day, she was reported to be unresponsive, hypotensive, and anuric. Laboratory values were hemoglobin, 6.4 g/dL; hematocrit, 17.7%; platelet count, 88 000/μL; PT, 19.4 seconds; PTT, 77 seconds; creatinine, 1.9 mg/dL; fibrinogen, 145 mg/dL; AST, 2935 U/L; and ALT, 1174 U/L. Despite the above measures, she continued to show signs of venous bleeding at various sites. Her clinical condition gradually deteriorated, and she expired on the third hospital day.

Case 965. A 46-year-old man was found in asystole by EMS at his home. The patient had started an IV on himself and injected approximately 600 mg of IV **succinylcholine**. Resuscitation efforts were discontinued on transport.

Case 966. A 12-year-old boy arrived in the ED with changes in mental status and a heart rate of 50 beats per minute. Two days previously, he had received his first intrathecal **baclofen** administration, presumably for spastic paraplegia. The patient's ECG showed third-degree heart block with a junctional escape rate of 50 to 70 beats per minute. The patient was not sedated or hypotensive but was lethargic. Baclofen overdose was suspected. Later in the evening, the patient went into ventricular fibrillation. By early morning, the patient was more alert but was still having heart block and premature ventricular contractions. There were no significant laboratory abnormalities. Later in the day, he was acting normally with stable vital signs. That night, the patient was alert and awake with no further episodes of ventricular fibrillation. He was in sinus rhythm, with hemodynamics supported with isoproterenol, milrinone, dobutamine, and heparin. He was still experiencing occasional premature ventricular contractions with no definitive diagnosis. He had a recurrence of heart block on hospital day 7. The dobutamine was discontinued, and an idioventricular rhythm was noted looking like ventricular tachycardia. The patient expired on the eighth day of admission.

Case 992. An 83-year-old unconscious woman was brought to the ED. She had last been seen the day before by her family and was found with an empty bottle of hypnotic capsules containing **secobarbital** (25 mg) and **amobarbital** (25 mg). Her blood pressure was 90/49 mm Hg with pulse of about 90 beats per minute. The patient appeared dehydrated. Large blisters were present on the patient's skin, and her skin was described as "peeling off in sheets." A urine toxicology screen was positive for barbiturates. The patient was mechanically ventilated and received aggressive hydration and vasopressor support. She died about 36 hours after presentation.

Case 1048. A 19-year-old girl was found unresponsive in the afternoon. She was suspected of having ingested a large number of **trimethobenzamide** tablets the previous evening. She arrived in the ED comatose, with seizures, followed by a respiratory arrest. After initial resuscitation, she had 2 prolonged episodes of asystole requiring CPR. After restoration of heart rate and blood pressure, she was transferred to a tertiary care facility for the possibility of hemodialysis or other enhanced elimination procedure. On arrival at the second hospital, more than 36 hours after suspected ingestion and 12 hours after cardiac arrest, the patient had fixed and dilated pupils, no cranial nerve responses, and a flat EEG. Dialysis and other procedures were deemed not to be indicated, and the patient expired shortly after ICU admission. Routine drug screens were negative.

Case 1066. A 25-year-old European man with an unknown medical history had a seizure on a flight from the Caribbean to Europe. He was given a total of 50 mg of diazepam but continued to seize for about 1.5 hours. The plane was diverted and landed on a Caribbean island. On EMS arrival, the patient was noted to still be seizing. He arrested en route and was found to be in pulseless electrical activity on arrival at the hospital. He regained a pulse after 30 minutes of CPR and was then started on an epinephrine drip. The patient had a wide complex bradycardia at 30 beats per minute and was unresponsive to both transcutaneous and transvenous pacing. He was hypotensive with a systolic blood pressure of 50 to 70 mm Hg. On examination, he had fixed and dilated pupils. Laboratory analysis revealed a combined metabolic and respiratory acidosis with a pH of 6.7 and a bicarbonate of 6.5 mEq/L. A urine toxicology screen was positive for **cocaine** and tetrahydrocannabinol. CTs of the head and chest were normal. CT of the abdomen revealed that the stomach and intestines were filled with packets. The patient subsequently passed 4 packets per rectum. At least 1 packet was visibly leaking drug contents. The patient was started on a bicarbonate drip but was too hemodynamically unstable to be taken to the OR and died about 5 hours after presentation.

Case 1067. A 26-year-old man celebrated his birthday with a large amount of **cocaine**. He then ingested what remained in his possession to avoid police arrest. He presented to the ED with seizures, tachycardia, and a temperature of 40.0°C. He developed status epilepticus and a temperature of 42.8°C. Seizures could not be controlled with intubation, ventilation, and benzodiazepine therapy. He received vasopressors for hypotension. He subsequently died. Postmortem analysis revealed a blood cocaine concentration of 1.2 μg/mL.

Case 1071. A 40-year-old man was found at home banging his head against a wall. EMS was called to the scene, but the patient had to be restrained with a stun gun. He was a **cocaine** abuser. He was placed in a body bag for restraint and transported. During transport, EMS noted that he became unresponsive and asystolic. He received CPR and had a pulse and blood pressure on arrival in the ED, where his core temperature was 39.7°C. On evaluation, he was noted to have a wide complex rhythm suspicious of hyperkalemia and treated as such. His laboratory evaluation revealed pH, 6.8; lactic acid, 13 mmol/L; potassium, 7.9 mEq/L; and creatine kinase, 65 000 U/L. He was unresponsive and stabilized. At some point between ED presentation and admission to the ICU, the patient died.

Case 1127. An 18-year-old woman was reported to have taken about "8 hits of **LSD**" earlier in the evening. She was a college student and had a medical history of depression treated with **bupropion**. No doses were missing by pill count. She presented in the ED agitated, with hypertension and tachycardia. In the ED, she had incomprehensible speech, a heart rate of 200 beats per minute and possible seizure activity. She was given 2 mg of lorazepam and had decreased respiratory effort requiring intubation. Status epilepticus developed, unresponsive to 2 mg of lorazepam and a loading dose of phenytoin. While in the ED, her temperature was 41.1°C. She was admitted to the ICU with intermittent seizure activity and started on a propofol drip. She required intermittent vasopressor support for hypotension. Initially in the ICU, her seizures appeared controlled, but continuous EEG showed return of seizure activity. No further hyperthermia was noted. A lumbar puncture showed no evidence of infection. The patient would irregularly have spikes in blood pressure and was placed on esmolol, then restarted on vasopressors when she was noted to be hypotensive. On day 2, she had an extreme blood pressure spike, and 1 pupil became fixed and dilated. No further EEG activity was noted, although she was still having intermittent autonomic instability. On day 3, she had bilateral fixed and dilated pupils and no neurological responses and was declared dead.

Case 1142. A 34-year-old man with a history of drug abuse was arrested. While in police custody, he ingested a bag which he said contained 0.25 oz of **methamphetamine**. Three hours after the reported ingestion, he was taken to a hospital. He was agitated and refused to cooperate with care. He would not allow vital signs to be taken, although a heart monitor revealed a pulse rate of about 140 beats per minute. The patient was placed in 4-point restraints and sedated with lorazepam and haloperidol. Activated charcoal and whole bowel irrigation were administered via nasogastric tube. IV fluid was given. A urine toxicology screen was positive for amphetamines. Four hours after presentation, he had a cardiac arrest and could not be resuscitated. Autopsy found a plastic bag in the duodenum. Postmortem blood (heart) contained methamphetamine at a concentration of 21 μg/mL and amphetamine at a concentration of 0.38 μg/mL.

Case 1154. A previously healthy 14-year-old girl reportedly ingested a single tablet of "double-stack valentine" ecstasy with her friends at a sleepover. Approximately 1 hour later, she complained of a headache for which she took 2 ibuprofen tablets. Over the next hour, her headache continued, and she vomited. She was crying, and her friends

tried to calm her down by massaging her head and giving her a bath. They also smoked some marijuana. They gave her bread, milk, and water, but she vomited again. She continued to vomit and "had no control over her body," so some older friends were called for advice. They arrived about 4 hours after the ingestion and recommended giving her water to drink. They tried to give her 10 to 15 cups of water, but she kept vomiting and moaning. About 8 hours after the ingestion, she had a convulsion, then began moaning loudly and repeatedly. This awakened an adult sleeping upstairs who entered the room and immediately called 911. Paramedics found her unconscious, somewhat combative, with minimal response to pain and incontinent of urine. Vital signs were blood pressure, 160/120 mm Hg; heart rate, 74 beats per minute; respiratory rate, 6 to 12 breaths per minute; and Glasgow Coma Scale, 6. Her glucose was 164 mg/dL. She was taken to a local ED where she was intubated without sedation. Initial laboratory values were Na, 123 mEq/L; bicarbonate, 11 mEq/L; and serum creatinine, 0.4 mg/dL. A head CT scan showed early signs of cerebral edema. She was given dexamethasone and mannitol and transferred to a tertiary care pediatric hospital. On arrival at the second hospital, she remained unresponsive with no spontaneous respirations. Her gag, corneal, and cold caloric reflexes were all absent. A repeat sodium value was 133 mEq/L. Hospital records do not indicate her body temperature at the first hospital, but it was 33.6°C at the second hospital. She remained completely unresponsive over the next 2 days and was declared brain-dead. Autopsy revealed cerebral swelling and herniation. Both hospital blood and urine samples were positive for methamphetamine, amphetamine, and **methylenedioxyamphetamine** (MDA), but not MDMA. Her blood levels of MDA and D-methamphetamine were 0.41 μg/mL and 0.04 μg/mL, respectively. One of the tablets was obtained by the investigating police. It was described as pink and shaped like a heart pierced by an arrow. It contained only MDA.

Case 1156. A 29-year-old man came to the ED complaining of neck and back pain. There was a questionable history of **ecstasy** use. Initial vital signs were blood pressure, 145/90 mm Hg; heart rate, 120 beats per minute; respiratory rate, 18 breaths per minute; and temperature, 36.5°C. He was prescribed oral analgesics, then became agitated and began screaming that the staff was trying to kill him. He began convulsing and was treated with midazolam, phenobarbital, and phenytoin. He was intubated and admitted to the ICU, where he continued to seize despite the anticonvulsants (including a midazolam infusion at 18 mg/h) and a propofol drip. His temperature climbed steadily over the next several hours reaching 41.7°C at approximately 12 hours after admission. At this time, his blood pressure was 98/33 mm Hg. A toxicology screen was positive for benzodiazepines, amphetamines, and opiates. A CT scan of his head and lumbar puncture were both normal. He was transferred to a tertiary care hospital where he continued to have seizure activity when the propofol drip was reduced. His serum creatine kinase was 22 500 U/L. He developed unstable temperatures (alternating hypothermia and hyperthermia) and hypotension requiring vasopressors. He expired 2 days after admission.

Case 1161. A 22-year-old quadriplegic man presented to his local ED with a complaint of blurred vision almost immediately after ingesting a small amount of "2C-T-21," which he had recently purchased via the internet from a chemical supply company. Later investigation revealed that one third to three fourths of the contents from a vial originally containing 1000 mg of **phenylethylamine** were missing and presumably ingested. Initial vital signs were heart rate, 132 beats per minute; blood pressure, 166/79 mm Hg; temperature, 39.0°C; and oxygen saturation, 98%. His current medications included gabapentin, tizanidine, lansoprazole, melatonin, paroxetine, and oxybutynin. He quickly developed frank hallucinations, seizures, and hyperthermia to 42.2°C. His pupils became fixed and dilated shortly thereafter. A CT scan performed the next day revealed cerebral edema and hemorrhage. Brain death was confirmed on hospital day 2.

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