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AAPCC 2007 ANNUAL REPORT OF THE NPDS

2007 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 25th Annual Report

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Abstract

***Background*:** This report is the 25th Annual Report of the American Association of Poison Control Centers (AAPCC; http://www.aapcc.org) National Poison Data System (NPDS). During 2007, 60 of the nation's 61 U.S. Poison Centers upload case data automatically. The median upload time is 14 [5.3, 55] (median [25%, 75%]) min creating a real-time national exposure database and surveillance system.

***Methodology*:** We analyzed the case data tabulating specific indices from NPDS. The methodology was similar to that of previous years. Where changes were introduced, the differences are identified. Fatalities were reviewed by a team of 29 medical and clinical toxicologists and assigned to 1 of 6 categories according to Relative Contribution to Fatality.

***Results*:** Over 4.2 million calls were captured by NPDS in 2007: 2,482,041 human exposure calls, 1,602,489 information requests, and 131,744 nonhuman exposure calls. Substances involved most frequently in all human exposures were analgesics (12.5% of all exposures). The most common exposures in children less than age 6 were cosmetics/personal care products (10.7% of pediatric exposures). Drug identification requests comprised 66.8% of all information calls. NPDS documented 1,597 human fatalities.

***Conclusions*:** Poisoning continues to be a significant cause of morbidity and mortality in the United States NPDS represents a valuable national resource to collect and monitor U.S. poisoning exposure cases. It offers one of the few real-time surveillance systems in existence, provides useful data, and is a model for public health surveillance.

WARNING: Comparison of exposure or outcome data from previous AAPCC Annual Reports is problematic. In particular, the identification of fatalities (attribution of a death to the exposure) differed from pre-2006 Annual Reports (see Fatality case review – methods). Likewise, Table 22 (Exposure cases by generic category) since year 2006 restricts the breakdown including deaths to single-substance cases to improve precision and avoid misinterpretation.

Participating poison centers

The collection of data and compilation of this report is made possible by the individuals who staff the U.S. Poison Centers (PCs) through their meticulous documentation of each case using standardized definitions and compatible computer systems. The 61 participating PCs in 2007 were as follows:

Alabama Poison Center
Arizona Poison and Drug Center
Arkansas Poison and Drug Information Center
Banner Poison Control Center
Blue Ridge Poison Center
California Poison Control System – Fresno/Madera Division
California Poison Control System – Sacramento Division
California Poison Control System – San Diego Division
California Poison Control System – San Francisco Division
Carolinas Poison Center
Central Ohio Poison Center
Central Texas Poison Center
Children's Hospital of MI Regional Poison Center
Cincinnati Drug and Poison Information Center
Connecticut Poison Control Center
DeVos Children's Hospital Regional Poison Center
Florida Poison Information Center – Miami
Florida Poison Information Center – Tampa
Florida/USVI Poison Information Center – Jacksonville
Georgia Poison Center
Greater Cleveland Poison Center
Hennepin Regional Poison Center
Illinois Poison Center
Indiana Poison Center
Iowa Statewide Poison Control Center
Kentucky Regional Poison Center
Long Island Poison Center
Louisiana Poison Center
Maryland Poison Center
Mississippi Regional Poison Center
Missouri Poison Center
National Capital Poison Center
Nebraska Regional Poison Center
New Jersey Poison Information and Education System
New Mexico Poison Center
New York City Poison Control Center
North Texas Poison Center
Northern New England Poison Center
Oklahoma Poison Control Center
Oregon Poison Center
Palmetto Poison Center
Pittsburgh Poison Center
Puerto Rico Poison Center
Regional Center for Poison Control and Prevention Serving Massachusetts and Rhode Island
Regional Poison Control Center – Alabama
Rocky Mountain Poison and Drug Center
Ruth A. Lawrence Poison and Drug Information Center
South Texas Poison Center
Southeast Texas Poison Center
Tennessee Poison Center
Texas Panhandle Poison Center
The Poison Control Center at the Children's Hospital of Philadelphia
University of Kansas Hospital Poison Control Center
Upstate NY Poison Center
Utah Poison Center
Virginia Poison Center
Washington Poison Center
West Texas Regional Poison Center
West Virginia Poison Center
Western New York Poison Center
Wisconsin Poison Center

Introduction

Publication of this report marks the 25th Annual Report of the American Association of Poison Control Centers (AAPCC). AAPCC compiles real-time information reported from the 61 regional Poison Centers (PCs) into its National Poison Database System (NPDS), serving the entire population of the 50 U.S. States, American Samoa, District of Columbia, Federated States of Micronesia, Guam, Puerto Rico, and the U.S. Virgin Islands. Emphasis is placed on accurate data collection and coding, the continuing need for poison-related public and professional education, and exposure management.

The PCs are staffed by a variety of medical professionals including medical and clinical toxicologists, registered nurses, doctors of pharmacy, pharmacists, chemists, HAZMAT specialists, and epidemiologists. These centers are available at no charge to the caller 24 h a day every day of the year, PCs respond to questions from the public and health-care professionals. The continuous staff dedication at regional PCs is manifest as the number of exposure and information calls continues to rise (Table 1A).

Limitations and plans

As outlined above, the exposure reports that comprise NPDS are spontaneous, self-reported calls, and reflect the limitations of this type of reporting system (see Disclaimer). Nonetheless, scope and immediacy of these data have much to offer. The 25-year history offers a unique opportunity to assess the long-term (secular) trends in poisonings.

There are a number of plans to improve the data system and reporting. Among the specific plans for 2008 and beyond:

- Enhancements to NPDS real-time geographic information system (GIS) with more data display options for appropriate data analyses.
- Option of geocentric surveillance definitions and reports.
- Implementation of a communication system in the NPDS surveillance and fatality sections.
- Support for a federated approach to NPDS data provisioning. This is part of the NPDS initiative to develop a distributed (federated or grid) network that will allow members to merge NPDS data with other systems to provide simultaneous sharing of real-time data and to maximize collaboration and communication between centers, states, and external agencies.
- Integration with CDC's BioSense, the University of Pittsburgh's Real-time Outbreak and Disease Surveillance System (RODS), and other systems for the development of time series and other surveillance technologies.

Table 1A. Growth of the AAPCC population served and exposure reporting (1983–2007)

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	2,438,643	8.3
2005	61	296.4	2,424,180	8.2
2006	61	299.4	2,403,539	8.0
2007	61	305.6	2,482,041	8.1
Total			45,964,981	

Human exposures to substances reported to U.S. Poison Centers (PCs) and transmitted to the NPDS 1983–2007. Each case record represents a closed case where a caller reported an actual or suspected exposure to a substance. Duplicate cases reported to more than one PC are not counted.

Dynamics of the database

NPDS classifies all calls as either EXPOSURE (concern about an exposure to a substance) or INFORMATION (no exposed human or animal). A call may provide information about one or more exposed persons or animals (receptors). The information reported in this article reflects only those cases classified as CLOSED, that is, the PC has determined that no further follow-up/recommendations are required or no further information is available. Cases are followed to as precise an outcome as possible. Depending on the case specifics, most calls are "closed" in the first hours; some calls regarding hospitalized patients or fatalities may remain open for weeks or months. Follow-up calls provide a proven mechanism for monitoring the appropriateness of management recommendations, augmenting patient guidelines, providing poison prevention education, enabling continual updates of case information, and obtaining final medical outcome status to make the data collected as accurate as possible.

Information in the NPDS database is dynamic. Each year the database is locked prior to extraction of annual report data to prevent inadvertent changes and insure consistent, reproducible reports. The 2007 database was locked September 16, 2008.

Database record count summary

In 2007, the 61 participating PCs logged **4,224,157** total cases including 2,482,041 closed human exposure cases (Table 1A), 131,744 animal exposures (Table 1B), 1,602,489 information calls (Table 1C), 7,447 human confirmed nonexposures, and 436 animal confirmed nonexposures. An additional 382 calls were still open at the time of database lock.

Table 1B. Nonhuman exposures by animal type

Animal	Number	%
Dog	118,371	89.8
Cat	11,818	9.0
Bird	364	0.3
Rodent/lagomorph	357	0.3
Horse	275	0.2
Sheep/goat	125	0.1
Aquatic	72	0.1
Cow	44	0.0
Other	318	0.2
Total	131,744	100

Number of nonhuman exposures recorded by U.S. Poison Centers (PCs) in 2007. Not all PCs manage or record calls about animal exposures and may refer callers to the American Society for the Prevention of Cruelty to Animals (ASPCA) Animal Poison Control Center.

The cumulative AAPCC database now contains close to 46 million human exposure case records (Table 1A). A total of 9,629,301 information calls (as described below) have been logged by NPDS since the year 2000.

The total of 4,084,530 human exposure cases and information calls reported to PCs in 2007 does not reflect the full extent of PC efforts that also include activities such as poison prevention and education and PC awareness.

PCs made 2,901,707 follow-up calls in 2007. Follow-up calls were done in 44.7% of human exposure cases. One follow-up call was made in 22.1% of human exposure cases, and multiple follow-up calls (range 2–135) were placed in 22.6% of cases.

Information calls to poison centers

Data from 1,602,489 information calls to PCs in 2007 (Table 1C) were transmitted to NPDS, including calls in optional reporting categories such as prevention/safety/education (39,455), administrative (28,606), and immediate referral (67,331). Overall, the volume of information calls handled by U.S. PCs increased by 7.6% over the 1,488,993 calls handled in 2006 (1).

The most frequent information call was for drug identification, comprising 1,070,537 calls to PCs during the year (Fig. 1). Of these, 147,670 (13.8%) could not be identified over the telephone. The majority of the drug identification calls were received from the public, followed by law enforcement and health professionals. Most of the drug identification requests involved drugs sometimes involved in abuse; however, these cases were categorized based on the drug's abuse potential without knowledge of whether abuse was actually intended.

Drug information calls (177,436 calls) comprised 11.1% of all information calls. Of these, the most common questions were regarding drug–drug interactions, followed by therapeutic use and indications, and questions about dosage. Environmental inquiries comprised 1.7% of all information calls. Of these environmental inquiries, questions related to cleanup of mercury thermometers were most common followed by questions involving pesticides.

Of all the information calls, poison information comprised 6.0% of information calls, with calls involving food poisoning or food preparation practices the most common followed by questions involving plant toxicity.

Trends in reported poisonings/exposures

These data (Fig. 2) do not directly identify a trend in the overall incidence of poisonings in the United States because the percentage of actual exposures and poisonings reported to PCs is unknown. The NPDS may be considered as providing "numerator data" because the "denominator" is not accurately determined. Attempts have been made to better define the incidence of poisoning. For example, based on the National Health Interview Survey (NHIS), the estimated number of poisoning episodes in the United States for the year 2000 was estimated to be 1,575,000 (2). During the same time AAPCC received reports of 2.2 million poisoning exposures of which 475,079 were managed in a health-care facility (see AAPCC 2000 Annual Report).

The frequency of any event rests on the definition used. National Center for Health Statistics (NCHS) defined poisoning as the event resulting from ingestion of or contact with harmful substances including overdose or incorrect use of any drug or medication (3). NCHS reported that the age-adjusted death rate for poisoning doubled from 1985 through 2004 to 10.3 deaths per 100,000 population. The rise was most evident between 1998 and 2000 when the poison fatalities increased by an average of 8.2% per year (3).

As of 2004, poisoning was the second leading cause of injury death and the rate was higher than at any time since 1968 when data were first reported by cause (3). Between 1999 and 2004, National Vital Statistics System mortality data show that unintentional poisoning deaths increased at a rate of 62.5% and poisoning by suicide increased by a rate of 10.8% (4). Of the unintentional poisoning deaths 95 and 75% of suicide by poisoning are the result of drug use (4).

AAPCC surveillance system

As noted previously, 60 of the 61 U.S. PCs upload case data automatically to NPDS. The median time to upload data is 14 [5.3, 55] (median [25%, 75%]) min creating a real-time national exposure database and surveillance system. This unique real-time upload is the foundation of the NPDS surveillance system permitting both spatial and temporal case volume and case-based surveillance. NPDS software allows creation of volume- and case-based definitions at will. Definitions can be then applied to national, regional, state, or zip code coverage areas. For the first time this functionality is available not only to the AAPCC surveillance team but also to every regional PC. Centers also have the ability to share NPDS real-time surveillance technology with their state and local health departments or other regulatory agencies. Another unique NPDS feature is the ability to generate system alerts on adverse drug events and other products of public health interest such as contaminated food or product recalls. NPDS can thus provide real-time adverse event monitoring.

Surveillance definitions can be created to monitor a variety of volume parameters, any desired substance or commercial product, or case-based definitions using a variety of mathematical

Table 1C. Distribution of information calls

Information call type	No. of calls	% of information calls
Drug identification		
Public inquiry: drug sometimes involved in abuse	482,111	30.09
Public inquiry: drug not known to be abused	256,395	16.00
Public inquiry: unknown abuse potential	11,057	0.69
Public inquiry: unable to identify	119,217	7.44
HCP inquiry: drug sometimes involved in abuse	15,186	0.95
HCP inquiry: drug not known to be abused	28,494	1.78
HCP inquiry: unknown abuse potential	1,625	0.10
HCP inquiry: unable to identify	12,756	0.80
Law enforcement inquiry: drug sometimes involved in abuse	78,086	4.87
Law enforcement inquiry: drug not known to be abused	44,116	2.75
Law enforcement inquiry: unknown abuse potential	1,743	0.11
Law enforcement inquiry: unable to identify	15,697	0.98
Other drug ID	4,054	0.25
Subtotal	1,070,537	66.80
Drug information		
Adverse effects (no known exposure)	16,158	1.01
Brand/generic name clarifications	5,331	0.33
Calculations	344	0.02
Compatibility of parenteral medications	459	0.03
Compounding	1,060	0.07
Contraindications	2,244	0.14
Dietary supplement, herbal, and homeopathic	1,264	0.08
Dosage	16,304	1.02
Dosage form/formulation	4,126	0.26
Drug use during breast-feeding	6,716	0.42
Drug–drug interactions	33,079	2.06
Drug–food interactions	1,936	0.12
Foreign drug	1,724	0.11
Generic substitution	834	0.05
Indications/therapeutic use	29,688	1.85
Medication administration	5,240	0.33
Medication availability	1,322	0.08
Medication disposal	2,064	0.13
Pharmacokinetics	3,444	0.21
Pharmacology	2,719	0.17
Regulatory	4,036	0.25
Stability/storage	3,904	0.24
Therapeutic drug monitoring	948	0.06
Other drug info	32,492	2.03
Subtotal	177,436	11.07
Environmental information		
Air quality	2,258	0.14
Carbon monoxide – no known patient(s)	1,198	0.07
Carbon monoxide alarm use	631	0.04
Chemical/bioterrorism/weapons (suspected or confirmed)	25	0.00
Clarification of media reports of environmental contamination	49	0.00
Clarification of substances involved in a HAZMAT incident – no known victim(s)	193	0.01
General questions about contamination of air and/or soil	740	0.05
HAZMAT planning	162	0.01
Lead – no known patient(s)	1,639	0.10
Mercury thermometer cleanup	4,323	0.27
Mercury (excluding thermometers) cleanup	1,114	0.07
Notification of a HAZMAT incident – no known patient(s)	385	0.02
Pesticide application by a professional pest control operator	813	0.05
Pesticides (other)	3,171	0.20
Potential toxicity of chemicals in the environment	1,599	0.10
Radiation	89	0.01
Safe disposal of chemicals	2,045	0.13
Water purity/contamination	1,079	0.07
Other environmental	6,048	0.38
Subtotal	27,561	1.72
Medical information		
Dental questions	153	0.01
Diagnostic or treatment recommendations for diseases or conditions – nontoxicology	10,845	0.68
Disease prevention	923	0.06
Explanation of disease states	1,830	0.11
General first-aid	2,161	0.13
Interpretation of nontoxicology laboratory reports	170	0.01
Medical terminology questions	176	0.01
Rabies – no known patient(s)	437	0.03
Sunburn management	174	0.01
Other medical	15,469	0.97
Subtotal	32,338	2.02
Occupational information		
Occupational treatment/first-aid guidelines – no known patient(s)	64	0.00
Information on chemicals in the workplace	267	0.02
MSDS interpretation	522	0.03
Occupational MSDS requests	1,370	0.09
Routine toxicity monitoring	74	0.00
Safe handling of workplace chemicals	131	0.01
Other occupational	303	0.02
Subtotal	2,731	0.17
Poison information		
Analytical toxicology	1,104	0.07
Carcinogenicity	121	0.01
Food poisoning – no known patient(s)	5,142	0.32
Food preparation/handling practices	8,253	0.52
General toxicity	41,977	2.62
Mutagenicity	109	0.01
Plant toxicity	6,611	0.41
Recalls of nondrug products (including food)	3,324	0.21
Safe use of household products	4,114	0.26
Toxicology information for legal use/litigation	286	0.02
Other poison	25,403	1.59
Subtotal	96,444	6.02
Prevention/safety/education		
Confirmation of poison center number	16,156	1.01
General (nonpoison) injury prevention requests	1,062	0.07
Media requests	398	0.02
Poison prevention material requests	18,474	1.15
Poison prevention week date inquiries	101	0.01
Professional education presentation requests	554	0.03
Public education presentation requests	803	0.05
Other prevention	1,907	0.12
Subtotal	39,455	2.46
Teratogenicity information		
Teratogenicity	5,505	0.34
Subtotal	5,505	0.34
Other information		
Other	42,398	2.65
Subtotal	42,398	2.65
Substance abuse		
Drug screen information	9,783	0.61
Effects of illicit substances – no known patient(s)	473	0.03
New trend information	309	0.02
Withdrawal from illicit substances – no known patient(s)	267	0.02
Other substance abuse	1,315	0.08
Subtotal	12,147	0.76
Administrative		
Expert witness requests	33	0.00
Faculty activities	69	0.00
Funding	27	0.00
Personnel issues	841	0.05
Poison center record request	180	0.01
Product replacement/malfunction (issues intended for the manufacturer)	1,865	0.12
Scheduling of poison center rotations	182	0.01
Other administration	25,409	1.59
Subtotal	28,606	1.79
Caller Referred		
Immediate referral – animal poison center or veterinarian	17,094	1.07
Immediate referral – drug identification	10,050	0.63
Immediate referral – drug information	434	0.03
Immediate referral – health department	7,756	0.48
Immediate referral – medical advice line	1,396	0.09
Immediate referral – pediatric triage service	71	0.00
Immediate referral – pesticide hotline	370	0.02
Immediate referral – pharmacy	3,640	0.23
Immediate referral – poison center	6,470	0.40
Immediate referral – private physician	3,056	0.19
Immediate referral – psychiatric crisis line	195	0.01
Immediate referral – teratology information program	173	0.01
Other call referral	16,626	1.04
Subtotal	67,331	4.20
Total	1,602,489	100.00

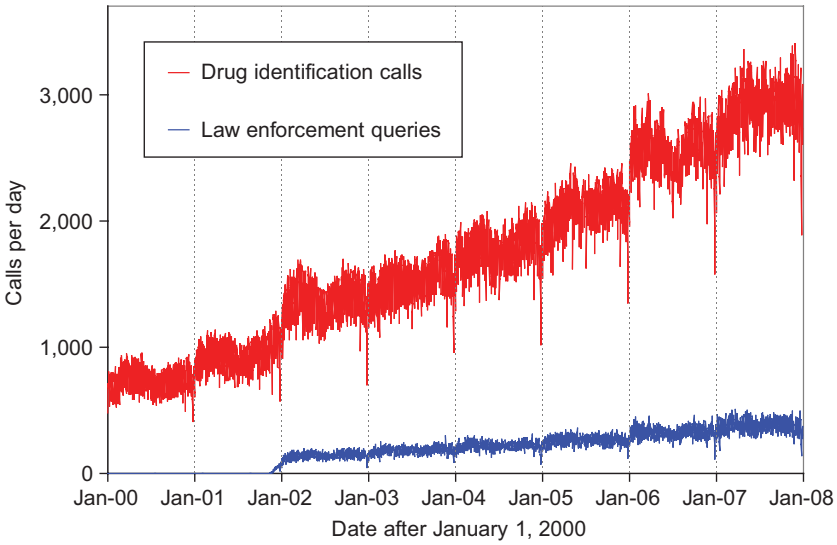

Fig. 1. Drug identification and law enforcement drug identification calls by day since January 1, 2000.

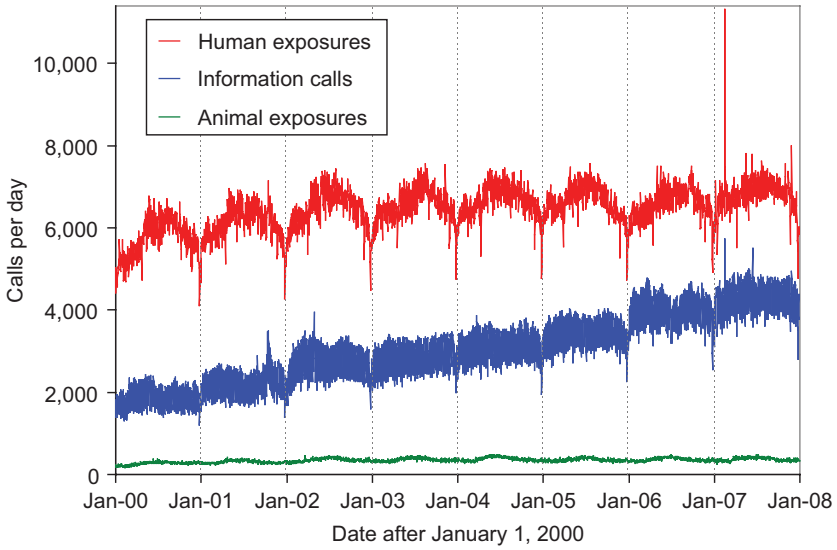

Fig. 2. Human exposure calls, information calls, and animal exposure calls by day since January 1, 2000.

options and historical baseline periods from 1 to 8 years. NPDS surveillance tools include the following:

1. Volume alerts
    a. Total call volume
    b. Human exposure call volume
    c. Clinical effects (signs and symptoms, or laboratory abnormalities) volume
2. Case-based surveillance definitions
    a. Substance
    b. Clinical effects
    c. Various NPDS data fields
    d. Boolean field expressions

Incoming data are monitored continuously and any anomalous signal detected generates an automated e-mail alert to the AAPCC surveillance team or designated public health agency. These anomaly alerts are reviewed by the AAPCC surveillance team and/or the regional PC that created them. When reports of potential public health significance are detected, additional information is obtained via e-mail or phone from reporting PCs. The regional PC then alerts their respective affected state or local health departments. Public health issues are brought to the attention of the National Center for Environmental Health at the Centers for Disease Control and Prevention (CDC).

In 2007, real-time monitoring of cases submitted to the AAPCC national database was expanded to include new case-based definitions and enhanced surveillance at the regional PC level. Surveillance Anomaly 1 was generated at 1400 EDT on September 17, 2006. This event marked the transition of AAPCC surveillance to NPDS. Since then more than 100,000 anomalies have been detected. At the time of this report, 352 surveillance definitions run continuously, monitoring case and clinical effects volume and a variety of case-based definitions from food poisoning to nerve agents. Many individual PCs and CDC have developed surveillance case definitions. Surveillance processes, anomaly definitions, and NPDS software continue to be developed, refined, and evaluated.

GIS functionality was added as a surveillance enhancement along with a variety of surveillance software improvements in 2007.

On February 14, 2007, the Food and Drug Administration (FDA) released an alert to consumers warning about consumption of a certain brand of peanut butter contaminated with *Salmonella* Tennesee (5). A few cases were initially reported in August 2006. By May 22, 2007, a total of 628 cases from 47 states had been documented (5). Beginning on February 14, 2007, NPDS food poisoning cases doubled and cases coded to *Salmonella* increased 15-fold from baseline. In addition, symptomatic cases increased 15-fold from baseline on February 14, 2007 to a peak of 1,364 cases on February 15, 2007, with a final total of 2,366 cases between February 14 and March 14, 2007. In addition to the symptomatic calls unintentional food poisoning calls also increased. The anomalous case volume spike demonstrative of this food recall was dramatic enough to be obvious on the graph of total call volume for 2007 (Fig. 2). Although NPDS did not detect the index case, implementation of refined algorithms and close work with public health agencies show NPDS' promise as part of an early detection system. NPDS case data clearly showed the pattern of exposures and provided situational awareness about the event (Fig. 3).

Database enhancements

Launched on April 12, 2006, NPDS is in its third year as a production system. NPDS is a complex project with critical impact on AAPCC and the regional PCs' public health mission. The system is used every day by AAPCC member centers and a variety of public health agencies including CDC. NPDS continues to be the engine providing all tables in this report including the fatality case listing (Table 21).

The new web-based software for querying, reporting, and surveillance application allows AAPCC and its member centers and public health agencies to use U.S. poisoning exposure data. Users are able to access local and regional data for their own areas and view national aggregate data. The application allows for increased "drill-down" capability and mapping via a GIS. Custom surveillance definitions are available along with ad hoc reporting tools. The new system is designed to serve AAPCC well into the 21st century.

Characterization of participating poison centers

All 61 participating centers submitted data to AAPCC for 2007. Fifty-nine centers (97%) were certified by AAPCC at the end of 2007. The entire population of the 50 states, American Samoa, the District of Columbia, Federated States of Micronesia, Guam, Puerto Rico, and the U.S. Virgin Islands was served by PCs in 2007.

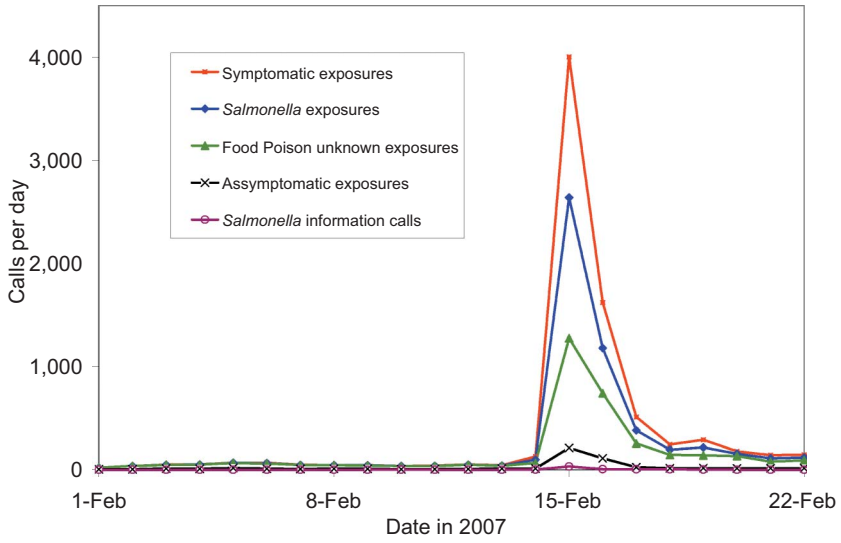

Fig. 3. All exposure and peanut butter exposure calls by Day 1 – February 22, 2007.
Note: The call categories were mutually exclusive. The Symptomatic Calls (topmost line in graph) is a summation of the Salmonella Information Calls plus Food Poison Unknown Exposures plus Salmonella Exposures and Symptomatic Exposures, specifically excluding Asymptomatic Exposures.

The average number of human exposure cases managed per day by all U.S. PCs was 6,800. Similar to other years, higher volumes were observed in the warmer months, with a mean of 7,246 cases per day in June compared with 6,352 per day in January. On average, ignoring the time of day and seasonal fluctuations, U.S. PCs received one call concerning a suspected or actual human exposure every 12.7 s.

Management of calls – specialized poison emergency providers

Calls received at U.S. PCs are managed by health-care professionals who have received additional training in managing exposure emergencies. PC operation as well as clinical education and instruction are directed by Managing Directors [most are PharmDs and RNs with American Board of Applied Toxicology (ABAT) board certification]. Medical direction is provided by Medical Directors who are board-certified physician medical toxicologists. At some PCs, the Managing and Medical Director positions are held by the same person.

Specialists in Poison Information (SPIs) are primarily pharmacists and registered nurses. They work under the supervision of a Certified Specialist in Poison Information (CSPI). SPIs must log a minimum of 2,000 calls over a 12-month period to become eligible to take the certifying examination for SPIs. Poison Information Providers (PIPs) are allied health-care professionals. They manage information-type and nonmedical (nonhospital) calls and work under the supervision of at least one CSPI. These dedicated individuals make NPDS possible.

Review of human exposure data

No changes to the data collection format were implemented in 2007. Prior revisions had 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 change that should be considered when comparing substance data with prior years.

Exposure site

As shown in Table 2, of the 2,482,041 human exposures reported, 92.9% cases of exposures occurred at a residence (Own or Other), 1.9% in the workplace, 1.5% in schools, 0.3% in health-care facilities, and 0.3% in restaurants or food services. PC peak call volumes were from 1700 to 2100, although call frequency remained consistently high between 0900 and 2200, with 82.6% of calls logged during this 13-h period.

Age and gender distribution

The age and gender distribution of human poison exposure victims is outlined in Table 3. Children younger than 3 years were involved in 38.1% of exposures and 51.2% occurred in children younger than 6 years. A male predominance is found among recorded cases involving children younger than 13 years, but this gender distribution is reversed in teenagers and adults, with women comprising the majority of reported poison exposure victims.

Table 2. Site of call and site of exposure, human exposure cases

Site	Site of caller (%)	Site of exposure (%)
Residence		
Own	74.43	90.00
Other	2.02	2.88
Workplace	1.41	1.95
Health-care facility	15.59	0.32
School	0.60	1.52
Restaurant/food service	0.02	0.34
Public area	0.35	1.07
Other	5.29	0.92
Unknown	0.30	1.01

Percentages of caller site and exposure site in calls regarding human exposures made to U.S. Poison Centers in 2007.

Exposures in pregnancy

Exposure during pregnancy occurred in 9,015 (0.36% of all human exposures) women. Of those with known pregnancy duration (N = 8,325), 32.9% occurred in the first trimester, 37.0% in the second trimester, and 30.1% in the third trimester. Most (73.8%) were unintentional and 19.5% were intentional exposures.

Multiple patients

In 2007, 10.8% (267,081) of human exposure cases involved multiple patients. Examples of these calls involve siblings sharing found medication, multiple victims of carbon monoxide exposure such as a family, or multiple patients inhaling vapors at a hazardous material spill.

Chronicity

The overwhelming majority of human exposures, 2,256,991 (90.9%) were acute cases (single, repeated, or continuous exposure occurring over ≤8 h) compared to 867 acute cases of 1,597 fatalities (54.3%). Chronic exposures (continuous or repeated exposures occurring over >8 h) comprised 2.0% (49,512) of all human exposures. Acute-on-chronic exposures (single exposure that was preceded by a continuous, repeated, or intermittent exposure occurring over a period greater than 8 h) numbered 151,044 (6.1%).

Reason for exposure

SPIs coded the reasons for exposure reported by callers to PCs according to the following definitions:

Table 3. Age and gender distribution of human exposures

	Male		Female		Unknown gender		Total		Cumulative total	
Age (years)	**Number**	**% of age group total**	**Number**	**% of age group total**	**Number**	**% of age group total**	**Number**	**% of total exposures**	**Number**	**Col %**
<1 year	67,874	51.87	62,456	47.73	531	0.41	130,861	5.27	130,861	5.27
1 year	206,907	52.05	190,049	47.81	591	0.15	397,547	16.02	528,408	21.29
2 years	219,534	52.55	197,520	47.28	704	0.17	417,758	16.83	946,166	38.12
3 years	101,884	55.18	82,371	44.61	401	0.22	184,656	7.44	1,130,822	45.56
4 years	48,842	56.27	37,713	43.45	249	0.29	86,804	3.50	1,217,626	49.06
5 years	28,521	57.14	21,180	42.43	215	0.43	49,916	2.01	1,267,542	51.07
Unknown ≤5 years	1,838	45.35	1,654	40.81	561	13.84	4,053	0.16	1,271,595	51.23
Child 6–12 years	89,973	57.71	64,434	41.33	1,506	0.97	155,913	6.28	1,427,508	57.51
Teen 13–19 years	79,281	46.42	90,677	53.10	822	0.48	170,780	6.88	1,598,288	64.39
Unknown Child	3,176	40.75	2,942	37.75	1,676	21.50	7,794	0.31	1,606,082	64.71
Total children (<20 years)	847,830	52.79	750,996	46.76	7,256	0.45	1,606,082	64.71	1,606,082	64.71
20–29 years	89,383	45.88	105,201	54.00	246	0.13	194,830	7.85	1,800,912	72.56
30–39 years	66,926	42.68	89,757	57.24	120	0.08	156,803	6.32	1,957,715	78.88
40–49 years	58,829	41.04	84,405	58.88	107	0.07	143,341	5.78	2,101,056	84.65
50–59 years	41,449	38.96	64,877	60.98	56	0.05	106,382	4.29	2,207,438	88.94
60–69 years	23,197	36.95	39,550	63.00	29	0.05	62,776	2.53	2,270,214	91.47
70–79 years	14,264	34.98	26,498	64.97	20	0.05	40,782	1.64	2,310,996	93.11
80–89 years	8,189	31.81	17,534	68.12	17	0.07	25,740	1.04	2,336,736	94.15
≥90 years	1,215	27.58	3,183	72.26	7	0.16	4,405	0.18	2,341,141	94.32
Unknown adult	49,205	39.17	72,706	57.87	3,722	2.96	125,633	5.06	2,466,774	99.38
Total adults	352,657	40.97	503,711	58.52	4,324	0.50	860,692	34.68	2,466,774	99.38
Unknown age	5,266	34.49	6,822	44.68	3,179	20.82	15,267	0.62	2,482,041	100.00
Total	1,205,753	48.58	1,261,529	50.83	14,759	0.59	2,482,041	100.00	2,482,041	100.00

Age and gender distribution of human exposure cases reported to U.S. Poison Centers in 2007.

Unintentional general: All unintentional exposures not otherwise defined below.

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 that 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 substances 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 term "accidental" has been used widely in the past primarily to define children under the age of 6 who may be exposed to a toxic agent. It is not currently used in this context.

The terms "intentional" and "unintentional" are used in this context in the judgment of the PC specialist. Virtually none of the cases are subject to a psychological review in this regard and therefore the use of these terms should be considered on a relative basis without further weight to the term.

Most (83.2%) of poison exposures were unintentional; suicidal intent was suspected in 8.4% of cases (Table 4A). Therapeutic errors accounted for 10.3% of exposures (255,732 cases), with unintentional misuse comprising 4.3% of exposures. Of the 255,732 therapeutic errors, the most common scenarios for all ages included inadvertent double dosing in 80,166 (31.3%) cases, wrong medication taken or given (14.1%), other incorrect doses (14.0%), inadvertent exposure to someone else's medication (9.3%), and doses given/taken too close together (8.6%). The types of therapeutic errors observed are different for each age group and are summarized in Table 4B.

Most (83.2%) exposures were unintentional. Unintentional exposures outnumbered intentional poisonings in all age groups with the exception of age 13–19 years (Table 5). Intentional exposures were reported as frequently as unintentional exposures in patients aged 13–19 years. In contrast, of the 1,239 human poisoning fatalities reported, all of the fatalities in <6-year olds were unintentional while most fatalities in adults (older than 19 years) were intentional (Table 6).

Table 4A. Reason for human exposure cases

Reason	Number	% Exposures
Unintentional		
General	1,487,849	59.9
Therapeutic error	255,732	10.3
Misuse	106,237	4.3
Bite/sting	70,833	2.9
Environmental	62,742	2.5
Food poisoning	43,817	1.8
Occupational	34,303	1.4
Unknown	3,703	0.1
Subtotal	2,065,216	83.2
Intentional		
Suspected suicide	208,442	8.4
Misuse	51,677	2.1
Abuse	45,796	1.8
Unknown	17,452	0.7
Subtotal	323,367	13
Adverse reaction		
Drug	44,368	1.8
Other	12,708	0.5
Food	5,944	0.2
Subtotal	63,020	2.5
Unknown		
Unknown reason	12,867	0.5
Subtotal	12,867	0.5
Other		
Malicious	9,514	0.4
Contamination/tampering	6,782	0.3
Withdrawal	1,275	0.1
Subtotal	17,571	0.7
Total	2,482,041	100

Reason for exposure as reported in cases involving humans. Specialists in Poison Information (SPIs) rely on the history as presented by a caller before making a coding determination.

Deaths and poison-related fatalities

Death as an outcome and poison-related fatality

Death outcomes can be recorded in NPDS as from either a primary (Death) or secondary (Death by Indirect Report) source (e.g., coroner or media). Although PCs may report death as an outcome, the death may not be a direct result of a poisoning exposure. Poison-related fatality is a death that was judged by the Fatality Review Team to be related to the exposure. Of the 1,597 cases referred to the Fatality Review Team where death was the reported outcome, 1,239 were judged as poison-related fatalities [Relative Contribution to Fatality (RCF) category = 1 – Undoubtedly responsible, 2 – Probably responsible, or 3 – Contributory]. The remaining 358 cases were judged as follows: 128 exposures were judged to be not responsible for the death (category = 4 – Probably not responsible or 5 – Clearly not responsible), 216 cases did not contain the pertinent clinical information needed to complete an assessment of causality (category = 6 – Unknown), 4 were miscoded (animal death, not a death, or not primary center), and 10 were not coded.

Summary of fatalities

Table 7 presents the age and gender distribution for these 1,239 poison-related fatalities. Although children younger

Table 4B. Scenarios for therapeutic errors by age

Description of scenario	No. of cases	<6 years (row %)	6–12 years (row %)	13–19 years (row %)	>19 years (row %)	Unknown (row %)
Inadvertently took/given medication twice	80,166	24.1	12.1	5.3	58.1	0.4
Wrong medication taken/given	36,029	17.4	12.1	6.9	63.2	0.4
Other incorrect dose	35,905	36.8	12.2	7.1	43.6	0.3
Inadvertently took/given someone else's medication	23,800	20.8	18.4	7.1	53.3	0.4
Medication doses given/taken too close together	22,040	24.0	10.3	7.4	57.9	0.3
Other/unknown therapeutic error	15,340	23.4	11.0	7.7	57.1	0.8
Incorrect dosing route	14,284	9.5	4.4	3.1	82.0	0.9
Confused units of measure	11,017	58.5	16.5	5.2	19.2	0.5
More than one product containing same ingredient	6,784	27.6	14.6	12.9	44.7	0.2
Incorrect formulation or concentration given	6,736	50.6	16.4	5.0	27.7	0.4
Dispensing cup error	6,248	63.0	17.6	4.8	14.4	0.3
Health professional/iatrogenic error (pharmacist/nurse/physician)	5,832	32.1	9.7	6.4	50.3	1.5
Incorrect formulation or concentration dispensed	1,536	46.1	16.7	6.2	30.5	0.5
Drug interaction	1,512	11.5	7.7	7.9	72.4	0.5
10-fold dosing error	1,386	64.0	5.8	2.7	26.8	0.7
Exposure through breast milk	153	92.8	0.7	0.0	5.2	1.3

423,290 (17.1%) human exposure cases reported to U.S. Poison Centers in 2007 included scenario coding. There are 56 "standard scenarios" covering scenarios ranging from incorrect dosing to use of child-resistant containers to iatrogenic "therapeutic misadventures." Table shows the number of cases where various therapeutic error scenarios were coded. More than one scenario can be coded to describe a case.

Age columns include both actual and estimated ages. >19 years includes "Unknown Adults," "Unknown" includes both "Unknown Child" and Unknown Age.

Table 5. Distribution of reason for exposure by age

	<6 years		6–12 years		13–19 years		>19 years		Unknown		Total	
Reason	**No.**	**Row %**	**No.**	**Row %**	**No.**	**Row %**	**No.**	**Row %**	**No.**	**Row %**	**No.**	**Col %**
Unintentional	1,263,194	61.2	139,848	6.8	80,175	3.9	565,560	27.4	16,439	0.8	2,065,216	83.2
Intentional	1,014	0.3	9,630	3.0	80,864	25.0	227,758	70.4	4,101	1.3	323,367	13.0
Adverse reaction	5,110	8.1	3,492	5.5	5,155	8.2	48,143	76.4	1,120	1.8	63,020	2.5
Other	1,541	8.8	2,191	12.5	2,744	15.6	10,727	61.0	368	2.1	17,571	0.7
Unknown	736	5.7	752	5.8	1,842	14.3	8,504	66.1	1,033	8.0	12,867	0.5
Total	1,271,595	51.2	155,913	6.3	170,780	6.9	860,692	34.7	23,061	0.9	2,482,041	100.0

Age columns include both actual and estimated ages. >19-year column also includes "Unknown Adult." "Unknown" column includes both "Unknown Child" and "Unknown Age."

Table 6. Distribution of reason for exposure and age for fatalities

Reason	**<6 years**	**6–12 years**	**13–19 years**	**>19 years**	**Unknown age**	**Total**
Unintentional						
General	13	2	1	18	0	34
Environmental	10	6	0	39	0	55
Occupational	0	0	0	14	1	15
Therapeutic error	1	1	0	26	0	28
Misuse	0	0	0	16	0	16
Bite/sting	0	0	0	3	0	3
Food poisoning	0	0	0	2	0	2
Unknown	24	9	1	118	1	153
Subtotal	13	2	1	18	0	34
Intentional						
Suspected suicide	0	1	24	617	2	644
Misuse	0	1	3	46	0	50
Abuse	0	0	20	118	0	138
Unknown	0	0	2	55	1	58
Subtotal	0	2	49	836	3	890
Other						
Malicious	6	0	1	0	0	7
Withdrawal	0	0	0	4	0	4
Subtotal	6	0	1	4	0	11
Adverse reaction						
Drug	1	1	1	31	0	34
Subtotal	1	1	1	31	0	34
Unknown						
Unknown reason	3	0	4	141	3	151
Subtotal	3	0	4	141	3	151
Total	34	12	56	1,130	7	1,239

Distribution of coded reason for exposure by age group for the 1,239 fatalities reported to the NPDS in 2007.
Age columns include both actual and estimated ages. >19 years includes "Unknown Adults." "Unknown Age" includes both "Unknown Child" and "Unknown Age."

Table 7. Distribution of age and gender for fatalities

Age (years)	**Male**	**Female**	**Unknown**	**Total (%)**	**Cumulative total (%)**
<1	1	2	1	4 (0.3)	5 (0.4)
1	3	5	2	10 (0.8)	15 (1.2)
2	5	5	0	10 (0.8)	25 (2.0)
3	2	1	0	3 (0.2)	28 (2.3)
4	3	2	0	5 (0.4)	33 (2.7)
5	1	1	0	2 (0.2)	35 (2.8)
6–12	3	9	0	12 (1.0)	47 (3.8)
13–19	30	26	0	56 (4.5)	102 (8.2)
20–29	102	77	0	179 (14.5)	281 (22.7)
30–39	114	107	0	221 (17.8)	502 (40.5)
40–49	136	138	0	274 (22.1)	776 (62.6)
50–59	105	129	0	234 (18.9)	1,010 (81.5)
60–69	50	48	0	98 (7.9)	1,108 (89.4)
70–79	21	31	0	52 (4.2)	1,160 (93.6)
80–89	14	21	0	35 (2.8)	1,195 (96.5)
≥90	4	8	0	12 (1.0)	1,207 (97.4)
Unknown adult	16	7	2	25 (2.0)	1,232 (99.4)
Unknown age	3	1	3	7 (0.6)	1,239 (100.0)
Total	613	618	8	1,239 (100.0%)	1,239 (100%)

Age and gender distribution of human exposure cases reported to result in death; as reported to U.S. Poison Centers in 2007.
Age columns include both actual and estimated ages (e.g., age 20–29 include 20s, age 30–39 includes 30s, …).

Table 8. Number of substances involved in human exposure cases

No. of substances	**No. of cases**	**% of cases**
1	2,248,871	90.6
2	154,480	6.2
3	45,360	1.8
4	17,810	0.7
5	7,638	0.3
6	3,499	0.1
7	1,839	0.1
8	988	0.0
≥9	1,556	0.1
Total	2,482,041	100.0

than 6 years were involved in the majority of exposures, they comprised just 2.8% of the verified fatalities. Most (73.3%) of the poisoning fatalities occurred in 20- to 59-year-old individuals. Table 21 lists each of the 1,239 human fatalities along with all of the substances involved. Note that the Substance listed in column 3 of Table 21 was chosen to be the most specific on the basis of clinical information, including the substances entered for that case. This substance may not agree with the categories used in the summary tables (including Table 22).

Table 21 information includes identification of cases for which an autopsy report was reviewed, inclusion of the relative contribution of fatality, and inclusion of all (rather than only three as in previous years) of the substances identified in each case.

A single substance was implicated in 90.6% of reported human exposures and 9.4% of patients were exposed to two or more drugs or products (Table 8). In contrast, 655 (52.9%) of fatal case reports involved exposure to two or more substances.

Although there is useful information in the fatality experience, one should interpret total numbers with caution.

Route of exposure

Ingestion was the route of exposure in 78.4% of cases (Table 9), followed in frequency by dermal (7.3%), inhalation/nasal

Table 9. Route of exposure for human exposure cases

	In all exposure cases		In fatal exposure cases	
Route	**Number**	**%**	**Number**	**%**
Ingestion	2,045,110	78.4	1,004	75.4
Dermal	191,298	7.3	14	1.1
Inhalation/nasal	145,552	5.6	126	9.5
Ocular	123,281	4.7	2	0.2
Bite/sting	70,853	2.7	3	0.2
Parenteral	14,735	0.6	62	4.7
Unknown	8,824	0.3	103	7.7
Otic	2,604	0.1	0	0.0
Other	2,455	0.1	3	0.2
Aspiration (with ingestion)	1,806	0.1	15	1.1
Vaginal	879	0.0	0	0.0
Rectal	819	0.0	0	0.0
Total	2,608,219	100.0	1,332	100.0

Multiple routes of exposure were observed in many human exposures. Percentage is calculated on the total number of exposure routes (2,608,219 for all cases; 1,332 for outcome of death) rather than the total number of human exposures (2,482,041) or outcomes of death (1,597).

(5.6%), and ocular routes (4.7%). For the 1,239 fatalities, ingestion (75.4%), inhalation/nasal (9.5%), and parenteral (4.7%) were the predominant exposure routes.

Clinical effects

The AAPCC database allows for the coding of up to 131 different clinical effects (signs, symptoms, or laboratory abnormalities) for each case. Each clinical effect can be further defined as related, not related, or unknown if related. Clinical effects were coded in 713,698 (28.8%) cases (15.1% had 1 effect, 7.6% had 2 effects, 3.8% had 3 effects, 1.3% had 4 effects, 0.5% had 5 effects, and 0.4% had >5 effects coded). Of clinical effects coded, 78.7% were deemed related to the exposure(s), 9.2% were considered not related, and 12.1% were coded as unknown if related.

Case management site

The majority of cases reported to PCs were managed in a non-health-care facility (72.7%), usually at the site of exposure, primarily the patient's own residence (Table 10). This includes the 1.8% of cases that were referred to a health-care facility but refused to go. Treatment in a health-care facility was rendered in 23.7% of cases.

Table 10. Management site of human exposures

Site of Management	Number	%
Managed on site, non-health-care facility	1,804,344	72.7
Managed in healthcare facility		
Treated/evaluated and released	293,936	11.8
Patient lost to follow-up/left AMA	106,254	4.3
Admitted to critical care unit	88,417	3.6
Admitted to noncritical care unit	52,476	2.1
Admitted to psychiatric facility	47,173	1.9
Unspecified level of care	6	0.0
Subtotal (managed in HCF)	588,262	23.7
Refused referral	44,819	1.8
Other	28,942	1.2
Unknown	15,674	0.6
Total	2,482,041	100.0

Of the 588,262 cases managed in a health-care facility, 293,936 (50.0%) were treated and released without admission, 88,417 (15.0%) were admitted for critical care, and 52,476 (8.9%) were admitted for noncritical care.

The percentage of patients treated in a health-care facility varied considerably with age. Only 9.7% of children younger than 6 years and only 10.9% of children between 6 and 12 years were managed in a health-care facility compared with 41.4% of teenagers (13–19 years) and 31.2% of adults (age >19 years).

Table 11 displays the medical outcome of the human poison exposure cases distributed by age, showing a greater incidence 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 definitions

NPDS Medical Outcome categories are as follows:

No effect: The patient did not develop any signs or symptoms as a result of the exposure.

Table 11. Medical outcome of human exposure cases by patient age

	<6 years		6–12 years		13–19 years		>19 years		Unknown		Total	
Outcome	**No.**	**% <6 years**	**No.**	**% 6–12 years**	**No.**	**% 13–19 years**	**No.**	**% >19 years**	**No.**	**% Unknown age**	**No.**	**% Total**
No effect	308,117	24.2	25,294	16.2	25,960	15.2	99,153	11.5	2,494	10.8	461,018	18.6
Minor effect	98,743	7.8	23,077	14.8	41,827	24.5	186,435	21.7	2,912	12.6	352,994	14.2
Moderate effect	10,748	0.9	4,108	2.6	20,007	11.7	92,487	10.8	882	3.8	128,232	5.2
Major effect	778	0.1	215	0.1	1,992	1.2	14,627	1.7	73	0.3	17,685	0.7
Death	41	0.0	11	0.0	57	0.0	1,379	0.2	14	0.1	1,502	0.1
No follow-up, nontoxic	265,154	20.9	24,552	15.8	9,556	5.6	57,086	6.6	2,093	9.1	358,441	14.4
No follow-up, minimal toxicity	547,625	43.1	70,629	45.3	49,980	29.3	300,332	34.9	7,561	32.8	976,127	39.3
No follow-up, potentially toxic	22,313	1.8	4,318	2.8	16,826	9.9	73,292	8.5	6,453	28.0	123,202	5.0
Unrelated effect	18,070	1.4	3,706	2.4	4,567	2.7	35,824	4.2	578	2.5	62,745	2.5
Death, indirect report	6	0.0	3	0.0	8	0.0	77	0.0	1	0.0	95	0.0
Total	1,271,595	100.0	155,913	100.0	170,780	100.0	860,692	100.0	23,061	100.0	2,482,041	100.0

Total number of cases where Death was an outcome (1,502+95) is greater than the number of fatalities judged to be exposure-related (1,239).

Age columns include both actual and estimated ages. >19-year column also includes "Unknown Adult." "Unknown" column includes both "Unknown Child" and "Unknown Age."

Table 12. Medical outcome by reason for exposure in human exposures

	Unintentional		Intentional		Other		Adverse reaction		Unknown		Total	
Outcome	**No.**	**Col %**	**No.**	**Col %**	**No.**	**Col %**	**No.**	**Col %**	**No.**	**Col %**	**No.**	**Col %**
No effect	402,427	19.5	54,081	16.7	2,051	11.7	1,457	2.3	1,002	7.8	461,018	18.6
Minor effect	245,683	11.9	87,894	27.2	3,326	18.9	14,146	22.4	1,945	15.1	352,994	14.2
Moderate effect	50,130	2.4	66,556	20.6	1,126	6.4	8,215	13.0	2,205	17.1	128,232	5.2
Major effect	2,906	0.1	13,085	4.0	128	0.7	793	1.3	773	6.0	17,685	0.7
Death	186	0.0	986	0.3	15	0.1	70	0.1	245	1.9	1,502	0.1
No follow-up, nontoxic	350,827	17.0	5,036	1.6	1,101	6.3	1,147	1.8	330	2.6	358,441	14.4
No follow-up, minimal toxicity	908,181	44.0	35,738	11.1	6,638	37.8	23,730	37.7	1,840	14.3	976,127	39.3
No follow-up, potentially toxic	59,401	2.9	54,101	16.7	1,917	10.9	4,565	7.2	3,218	25.0	123,202	5.0
Unrelated effect	45,444	2.2	5,841	1.8	1,265	7.2	8,897	14.1	1,298	10.1	62,745	2.5
Death, indirect report	31	0.0	49	0.0	4	0.0	0	0.0	11	0.1	95	0.0
Total	2,065,216	100	323,367	100.0	17,571	100.0	63,020	100.0	12,867	100.0	2,482,041	100.0

Total number of cases where Death was an outcome (1,502+95) is greater than the number of fatalities judged to be exposure-related (1,239).

Table 13. Duration of clinical effects by medical outcome

	Percent of patients in the category		
Duration of effect	**Minor effect**	**Moderate effect**	**Major effect**
>8 h, ≤24 h	17.7	31.6	24.8
>1 week, ≤1 month	0.5	1.5	6.1
Unknown	12.4	14.8	9.4
>1 month	0.2	0.4	1.0
≤2 hours	36.8	5.9	2.2
>24 h, ≤3 days	5.1	17.9	30.9
>2 h, ≤8 h	25.5	21.4	6.4
>3 days, ≤1 week	1.6	6.2	17.1
Anticipated permanent	0.2	0.2	2.2
Total	100.0	100.0	100.0

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 effect is often limited to the skin or mucous membranes (e.g., 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 (e.g., 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 (e.g., 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.

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 up, 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 (e.g., all missing pills are later located). All cases coded as confirmed nonexposure are excluded from this report.

Death, indirect report: A reported death is coded as "indirect" if no inquiry was placed to the PC. For example, if the case was obtained from a medical examiner who queries the PC about interpretation of postmortem reports.

Description of tables 14–20

Decontamination procedures and specific antidotes

Tables 14 and 15 outline the use of decontamination procedures, specific antidotes, and measures to enhance elimination in the treatment of patients reported in this database. These must be

Table 14. Decontamination and therapeutic interventions

Therapy	**No. of patients**	**%**
Decontamination only	1,108,651	44.7
Therapeutic intervention only	179,435	7.2
Decontamination+other therapy	413,817	16.7
Intervention not coded	780,138	31.4
Total	2,482,041041	100.0

Table 15. Therapy provided in human exposures by age

Therapy	<6 years	6–12 years	13–19 years	>19 years	Unknown	Total
Decontamination						
Cathartic	4,980	500	6,266	20,086	60	31,892
Charcoal, multiple doses	200	24	641	2,242	7	3,114
Charcoal, single dose	22,629	1,637	19,287	59,157	186	102,896
Dilute/irrigate/wash	658,037	70,600	44,187	266,028	5,262	1,044,114
Food/snack	136,557	11,199	5,860	30,393	405	184,414
Fresh air	7,837	5,002	7,229	58,303	2,538	80,909
Ipecac	1,052	93	144	440	11	1,740
Lavage	376	43	1,608	6,819	11	8,857
Other emetic	4,562	474	899	3,936	36	9,907
Whole bowel irrigation	217	23	475	1,984	9	2,708
Other/specific therapies						
Alkalinization	133	51	1,683	7,544	19	9,430
Amyl nitrite	0	0	0	8	0	8
Antiarrhythmic	7	3	52	479	3	544
Antibiotics	2,243	1,124	1,462	12,775	127	17,731
Anticonvulsants[b]	68	19	104	620	0	811
Antiemetics	448	234	2,735	6,893	17	10,327
Antihistamines	2,972	1,940	1,989	12,494	212	19,607
Antihypertensives	14	17	116	1,375	2	1,524
Antivenin (fab fragment)	277	188	149	1,090	6	1,710
Antivenin/antitoxin[c]	61	42	37	258	0	398
Atropine	103	17	63	948	5	1,136
BAL	22	1	16	20	0	59
Benzodiazepines	791	365	3,702	15,958	30	20,846
Bronchodilators	487	236	460	4,269	41	5,493
Calcium	8,677	438	243	1,986	11	11,355
Cardioversion	4	1	13	169	1	188
CPR	35	5	43	534	3	620
Deferoxamine	21	0	28	33	0	82
ECMO	8	0	3	3	0	14
EDTA	50	3	1	10	0	64
Ethanol	9	1	18	228	0	256
Extracorp. procedure (other)	1	0	0	23	0	24
Fab fragments	33	20	16	553	1	623
Fluids, IV	5,607	1,379	17,972	80,544	155	105,657
Flumazenil	100	27	184	1,806	2	2,119
Folate	12	3	32	678	0	725
Fomepizole	156	12	112	1,341	0	1,621
Glucagon	27	2	33	1,122	5	1,189
Glucose, >5%	344	20	201	2,240	7	2,812
Hemodialysis	7	6	120	1,970	3	2,106
Hemoperfusion	0	1	1	14	0	16
Hydroxocobalamin	0	0	3	5	0	8
Hyperbaric oxygen	26	29	50	319	0	424
Insulin	9	4	52	1,099	0	1,164
Intubation	503	102	1,413	15,213	39	17,270
Methylene blue	22	2	11	99	0	134
NAC, IV	202	58	2,784	8,828	23	11,895
NAC, PO	196	51	2,767	8,731	19	11,764
Nalmefene	1	0	4	21	0	26
Naloxone	703	87	1,403	12,826	30	15,049
Neuromuscular blocker	43	8	121	1,033	1	1,206
Octreotide	56	0	19	227	1	303
Oxygen	1,466	605	2,899	30,332	132	35,434
2-PAM	8	2	5	64	1	80
Other	37,447	9,490	14,330	87,456	1,118	149,841
Pacemaker	0	0	2	184	1	187
Penicillamine	1	0	0	4	0	5
Physostigmine	7	8	59	135	0	209
Phytonadione	37	4	71	658	0	770
Pyridoxine	9	7	82	402	0	500
Sedation (other)	234	69	935	8,508	12	9,758
Sodium nitrite	5	1	2	12	1	21
Sodium thiosulfate	11	9	5	40	0	65
Steroids	763	465	553	5,135	78	6,994
Succimer	129	13	28	83	3	256
Transplantation	1	2	4	23	0	30
Vasopressors	89	23	213	3,930	13	4,268
Ventilator	433	88	1,215	13,401	27	15,164

Age columns include both actual and estimated ages. >19 years includes "Unknown Adults." "Unknown" includes both "Unknown Child" and "Unknown Age."
[b]Excludes benzodiazepines.
[c]Excludes Fab fragments.

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 1,052 (<0.01%) pediatric human poison exposures in 2007. A continuous decrease in ipecac syrup use in 2007 was observed, likely as a result of ipecac use guidelines issued in 1997 and updated in 2004 (6, 7) by the American Academy of Clinical Toxicology and European Association of Poisons Centres and Clinical Toxicologists. In a separate report, the American Academy of Pediatrics not only concluded that ipecac should no longer be used routinely as a home treatment strategy but also recommended disposal of ipecac currently in homes (8).

Top 25 substances in human exposures

Table 17A presents the most common 25 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 differences between pediatric and adult poison exposures.

Substance categories associated with fatalities

Table 18 lists the substance categories associated with reported fatalities – sedative/hypnotics/antipsychotics, opioids, and antidepressants lead this list. Although sedative/hypnotics/antipsychotics ranks fourth and antidepressants eighth among the most frequent exposures (Table 17A), there is otherwise little correlation between the frequency of exposures to a substance and the number of fatalities. Note that this table accounts for all substances to which a patient was exposed (i.e., a patient exposed to an opioid may have also been exposed to one or more products).

Distribution of suicides

Table 19 shows the modest variation in the distribution of suicides over the past two decades as reported to the NPDS national database (49–58%). Since 1985, the percentage of fatal cases has increased from 0.037 to 0.050% and the percentage of pediatric cases has decreased from 6.1 to 2.7%.

Plant exposures

Table 20 provides a summary of plant exposures for those species and categories most commonly involved.

Fatality case review – methods

Each fatality case was abstracted by the reporting PC and verified for accuracy. These cases were systematically reviewed by a project Case Review Teams (CRTs). Each CRT consisted of the following members:

Author – the PC medical director or their designee responsible for the case data entered, the abstract, and the initial choices of RCF and Substances;

Lead Reviewer – Medical Director or Managing Director (assigned from a PC other than the center from which the individual case originated using pseudorandom numbers) to provide the primary review of the case;

Peer Reviewer – Managing Director (if the lead reviewer was a Medical Director) or Medical Director (if the lead reviewer was a Managing Director) assigned (using pseudorandom numbers) to provide the second (complementary) review of the case;

Manager – Louis Cantilena (east coast) or Daniel A. Spyker (west coast) assigned by PC zip code.

Table 16. Decontamination trends (1985–2007)

Year	Human exposures reported	Ipecac administered (% of all exposures)	Activated charcoal administered (% of all exposures)	Exposures involving children <6 years (% of all exposures)	Ipecac administered (% of child exposures)	Activated charcoal administered (% of child exposures)
1985	886,389	132,947 (15.0)	41,063 (4.6)	568,691 (64.2)	94,919 (10.7)	14,718 (1.7)
1986	1,095,228	145,516 (13.3)	56,481 (5.2)	690,137 (63.0)	99,688 (9.1)	18,191 (1.7)
1987	1,164,648	117,840 (10.1)	60,310 (5.2)	730,228 (62.7)	83,443 (7.2)	18,507 (1.6)
1988	1,364,113	114,654 (8.4)	88,876 (6.5)	843,106 (61.8)	80,749 (5.9)	26,118 (1.9)
1989	1,578,968	110,545 (7.0)	101,368 (6.4)	963,924 (61.0)	79,192 (5.0)	30,345 (1.9)
1990	1,646,946	98,986 (6.0)	108,341 (6.6)	999,751 (60.7)	73,469 (4.5)	31,579 (1.9)
1991	1,836,364	94,877 (5.2)	129,092 (7.0)	1,099,179 (59.9)	73,069 (4.0)	36,177 (2.0)
1992	1,862,796	79,493 (4.3)	135,625 (7.3)	1,094,256 (58.7)	63,486 (3.4)	38,937 (2.1)
1993	1,747,147	65,078 (3.7)	127,893 (7.3)	978,560 (56.0)	50,834 (2.9)	35,791 (2.0)
1994	1,926,992	51,356 (2.7)	138,247 (7.2)	1,042,651 (54.1)	41,489 (2.2)	35,670 (1.9)
1995	2,023,089	47,359 (2.3)	155,880 (7.7)	1,070,472 (52.9)	38,372 (1.9)	38,095 (1.9)
1996	2,155,952	39,376 (1.8)	157,331 (7.3)	1,137,263 (52.7)	32,622 (1.5)	37,986 (1.8)
1997	2,192,088	32,098 (1.5)	156,213 (7.1)	1,150,931 (52.5)	26,536 (1.2)	35,856 (1.6)
1998	2,241,082	26,653 (1.2)	152,134 (6.8)	1,180,989 (52.7)	22,247 (1.0)	34,302 (1.5)
1999	2,201,156	21,942 (1.0)	145,853 (6.6)	1,154,799 (52.5)	18,326 (0.8)	33,812 (1.5)
2000	2,168,248	18,177 (0.8)	145,911 (6.7)	1,142,796 (52.7)	15,239 (0.7)	31,554 (1.5)
2001	2,267,979	16,058 (0.7)	149,442 (6.6)	1,169,478 (51.6)	13,389 (0.6)	30,367 (1.3)
2002	2,380,028	13,555 (0.6)	149,527 (6.3)	1,227,381 (51.6)	11,163 (0.5)	30,340 (1.3)
2003	2,395,582	9,284 (0.4)	140,412 (5.9)	1,245,584 (52.0)	7,310 (0.3)	28,888 (1.2)
2004	2,438,643	4,701 (0.2)	135,969 (5.6)	1,250,536 (51.3)	3,366 (0.1)	28,335 (1.2)
2005	2,424,180	3,027 (0.1)	123,263 (5.1)	1,233,695 (50.9)	1,999 (0.1)	26,338 (1.1)
2006	2,403,539	2,176 (0.1)	111,351 (4.6)	1,223,815 (50.9)	1,337 (0.1)	23,843 (1.0)
2007	2,482,041	1,740 (0.1)	106,010 (4.3)	1,271,595 (51.2)	1,052 (0.0)	22,829 (0.9)

Table 17A. Substances most frequently involved in human exposures (top 25)

Substance	Number	%[a]
Analgesics	309,431	12.5
Cosmetics/personal care products	225,410	9.1
Cleaning substances (household)	216,228	8.7
Sedative/hypnotics/antipsychotics	154,602	6.2
Foreign bodies/toys/miscellaneous	127,777	5.1
Topical preparations	111,634	4.5
Cold and cough preparations	111,222	4.5
Antidepressants	98,898	4.0
Pesticides	96,307	3.9
Cardiovascular drugs	86,122	3.5
Alcohols	82,432	3.3
Antihistamines	79,157	3.2
Food products/food poisoning	78,102	3.1
Bites and envenomations	77,325	3.1
Antimicrobials	67,445	2.7
Vitamins	66,189	2.7
Plants	60,514	2.4
Hormones and hormone antagonists	54,613	2.2
Gastrointestinal preparations	54,428	2.2
Hydrocarbons	48,497	2.0
Chemicals	48,400	2.0
Stimulants and street drugs	46,143	1.9
Anticonvulsants	43,080	1.7
Arts/crafts/office supplies	40,140	1.6
Fumes/gases/vapors	40,017	1.6

Frequency of exposure may reflect availability of the substance.
[a]Percentages are based on the total number of human exposures (2,482,041) rather than the total number of substances.

Table 17B. Substances most frequently involved in pediatric (≤5 years) exposures (top 25)

Substance	Number	%[b]
Cosmetics/personal care products	172,541	10.7
Cleaning substances (household)	122,832	7.6
Analgesics	115,059	7.2
Foreign bodies/toys/miscellaneous	95,754	6.0
Topical preparations	86,804	5.4
Cold and cough preparations	65,044	4.0
Vitamins	49,440	3.1
Pesticides	44,644	2.8
Plants	41,752	2.6
Antihistamines	39,686	2.5
Gastrointestinal preparations	37,092	2.3
Antimicrobials	34,575	2.2
Arts/crafts/office supplies	29,604	1.8
Hormones and hormone antagonists	25,401	1.6
Cardiovascular drugs	24,371	1.5
Electrolytes and minerals	24,127	1.5
Alcohols	23,574	1.5
Food products/food poisoning	20,121	1.3
Deodorizers	19,919	1.2
Dietary supplements/herbals/homeopathic	17,132	1.1
Asthma therapies	16,250	1.0
Hydrocarbons	15,902	1.0
Other/unknown nondrug substances	15,739	1.0
Sedative/hypnotics/antipsychotics	14,735	0.9
Antidepressants	13,757	0.9

Frequency of exposure may reflect availability of the substance to children.
Includes all children with actual or estimated ages ≤5 years old. Results do not include "Unknown Child" or "Unknown Ages."
[b]Percentages are based on the total number of exposures in children (1,271,595) rather than the total number of substances.

Table 17C. Substances most frequently involved in adult (>19 years) exposures (top 25)

Substance	Number	%[b]
Cosmetics/personal care products	172,541	20.0
Cleaning substances (household)	122,832	14.3
Analgesics	115,059	13.4
Foreign bodies/toys/miscellaneous	95,754	11.1
Topical preparations	86,804	10.1
Cold and cough preparations	65,044	7.6
Vitamins	49,440	5.7
Pesticides	44,644	5.2
Plants	41,752	4.9
Antihistamines	39,686	4.6
Gastrointestinal preparations	37,092	4.3
Antimicrobials	34,575	4.0
Arts/crafts/office supplies	29,604	3.4
Hormones and hormone antagonists	25,401	3.0
Cardiovascular drugs	24,371	2.8
Electrolytes and minerals	24,127	2.8
Alcohols	23,574	2.7
Food products/food poisoning	20,121	2.3
Deodorizers	19,919	2.3
Dietary supplements/herbals/homeopathic	17,132	2.0
Asthma therapies	16,250	1.9
Hydrocarbons	15,902	1.8
Other/unknown nondrug substances	15,739	1.8
Sedative/hypnotics/antipsychotics	14,735	1.7
Antidepressants	13,757	1.6

Frequency of exposure may reflect availability of the substance to adults.
Includes all adults with actual or estimated ages >19 years old. Results also include "Unknown Adult" but do not include "Unknown Ages."
[b]Percentages are based on the total number of human exposures (860,692) rather than the total number of substances.

Table 18. Categories associated with largest number of fatalities (top 25)

Substance	Number	% of all exposures in category
Sedative/hypnotics/antipsychotics	377	0.250
Opioids	331	0.990
Antidepressants	220	0.250
Acetaminophen in combination	208	0.270
Cardiovascular drugs	203	0.240
Stimulants and street drugs	188	0.410
Alcohols	170	0.230
Acetaminophen only	140	0.190
Anticonvulsants	99	0.230
Fumes/gases/vapors	80	0.200
Cyclic antidepressants	80	0.740
Muscle relaxants	70	0.270
Antihistamines	69	0.090
Aspirin alone	63	0.350
Chemicals	45	0.120
Unknown drug	44	0.230
Other nonsteroidal anti-inflammatory drugs	44	0.040
Oral hypoglycemics	36	0.280
Automotive/aircraft/boat products	28	0.200
Miscellaneous drugs	21	0.080
Antihistamine/decongestant, without phenylpropanolamine	21	0.040
Hormones and hormone antagonists	20	0.050
Anticoagulants	20	0.300
Diuretics	16	0.150

Substance categories associated with deaths reported by 61 U.S. Poison Centers. Numbers represent total exposures associated with 1,239 fatalities; each fatality may have had exposure to more than one substance.

The fundamental classification for the NPDS fatalities reporting is whether the toxic exposure caused the death. The review teams assessed the following parameters for each fatality case:

1. Relative contribution of the toxic exposure to the death, RCF (see grading system below);
2. Cause Rank of the substances involved (new for 2007 data) described below;
3. Abstract scoring (see scoring system below);

Table 19. Comparisons of fatality data (1985–2007)

	Total fatalities		Suicides		Pediatric death	
Year	No.	% of cases	No.	% of deaths	No.	% of deaths
1985	328	0.037	174	(53.0)	20	(6.1)
1986	406	0.037	223	(54.9)	15	(3.7)
1987	398	0.034	227	(57.0)	22	(5.5)
1988	544	0.040	296	(54.4)	30	(5.5)
1989	590	0.037	323	(54.7)	24	(4.1)
1990	553	0.034	320	(57.9)	21	(3.8)
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	921	0.042	477	(51.8)	20	(2.2)
2001	1085	0.048	553	(51.0)	27	(2.5)
2002	1169	0.049	635	(54.3)	27	(2.3)
2003	1109	0.046	592	(53.4)	35	(3.2)
2004	1190	0.049	642	(53.9)	27	(2.3)
2005	1,261	0.052	623	(49.4)	24	(1.9)
2006	1,229	0.050	611	(49.7)	29	(2.4)
2007	1,239	0.050	644	(52.0)	34	(2.7)

Table 20. Frequency of plant exposures (top 25)

Botanical name	Generic code name	Number
Plants–general–unknown	Unknown toxic or unknown if toxic	3,182
Spathiphyllum *species (botanic name)*	Oxalate	1,952
Phytolacca americana *(L.) (botanic name)*	Gastrointestinal irritant	1,845
Philodendron *(species unspecified)*	Oxalate	1,363
Euphorbia pulcherrima *(Willd.) (botanic name)*	Gastrointestinal irritant	1,350
Toxicodendron radicans *(L.) (botanic name)*	Dermatitis	1,202
Ilex *species (botanic name)*	Gastrointestinal irritant	943
Botanical terms	Unknown toxic or unknown if toxic	647
Plants – cardiac glycosides	Cardiac glycoside	639
Plants – pokeweed	Other toxic	620
Taraxacum officinale *(botanic name)*	Nontoxic	612
Plants – cyanogenic glycosides	Amygdalin/cyanogenic glycoside	597
Caladium *species (botanic name of all species of the genus* Caladium)	Oxalate	594
Schlumbergera bridgesii *(botanic name)*	Nontoxic	586
Berry	Unknown toxic or unknown if toxic	542
Epipremnum areum *(botanic name)*	Oxalate	536
Mold	Unknown toxic or unknown if toxic	511
Malus *species (botanical name)*	Amygdalin/cyanogenic glycoside	488
Crassula argentea *(Thumb)(botanic name)*	Nontoxic	487
Pepper mace	Dermatitis	443
Nandina domestica *(Thumb) (botanical name)*	Unknown toxic or unknown if toxic	442
Cherry (species unspecified)	Amygdalin/cyanogenic glycoside	439
Quercus *species (botanic name)*	Other toxic	436
Cactus (unknown type or name)	Unknown toxic or unknown if toxic	431
Plants – oxalates	Oxalate	421

4. Degree of agreement between the Abstract and the NPDS database entries for that case;
5. Degree of agreement and if resolution was required between determinations made by members of the CRT;

Cause Rank was a separate field associated with each each substance to address the circumstance where two or more substances were judged causative, but we lack evidence to distinguish among them. Cause Rank defaults to the same number as the Substance Rank 1, 2, 3, . . ., so it does not require additional data entry in the usual single-substance or clear ranking circumstances. Changing Cause Rank permits assignment of equivalence in the event the reviewer cannot distinguish between causative substances, for example, they may rank substances as 1, 1, 3 instead of 1, 2, 3. They may likewise rank 1, 2, 2, 4, and so forth.

Similar to past AAPCC annual reports, a listing of cases (Table 21) and summary of cases (Tables 6, 18, and 19) is provided for fatal cases for which there exists reasonable confidence (RCF 1–3) that the death was a result of that exposure. Therefore, these listings do not include cases in which the exposure was determined to be probably or clearly not responsible for the death (RCF 4–6, 128 cases), cases where the clinical information did not permit an assessment (RCF unknown, 216 cases), miscoded reports (4 cases), or reports not reviewed by the team (10 cases).

The primary basis of the case classification and abstract evaluations were as follows:

Clinical Case Evidence – included all information surrounding the case. It included, but was not limited to, the data entered into the AAPCC case data and, when available, the medical examiner's report.

Medical Examiner's Report – the postmortem examination results, autopsy report or the coroner's report were always sought and, when available, became an important part of fatality case review.

Relative Contribution to Fatality

The definitions used for the RCF classification were as follows:

1. Undoubtedly responsible – In the opinion of the CRT the Clinical Case Evidence established beyond a reasonable doubt that the SUBSTANCES actually caused the death.
2. Probably responsible – In the opinion of the CRT the Clinical Case Evidence suggests that the SUBSTANCES caused the death but some reasonable doubt remained.
3. Contributory – In the opinion of the CRT the Clinical Case Evidence establishes that the SUBSTANCES contributed to the death but did not solely cause the death. That is, the SUBSTANCES alone would not have caused the death, but combined with other factors, were partially responsible for the death.
4. Probably not responsible – In the opinion of the CRT the Clinical Case Evidence, established to a reasonable probability, but not conclusively, that the SUBSTANCES associated with the death did not cause the death.
5. Clearly not responsible – In the opinion of the CRT the Clinical Case Evidence establishes beyond a reasonable doubt that the SUBSTANCES did not cause this death.
6. Unknown – In the opinion of the CRT the Clinical Case Evidence was insufficient to impute or refute a causative relationship for the SUBSTANCES in this death.

Review team procedure

A total of 15 review teams (29 individuals) volunteered to participate in the review. Reviewers were Medical Toxicologists (N = 13) or Clinical Toxicologists (N = 16). Names and affiliations of the reviewers are listed in Appendix A. Training and communication included weekly teleconferences, written guidance documents, spreadsheets (for assignment and reporting), the NPDS-Fatality Module (NPDS-FM), and individual telephone contacts. The initial 1,597 fatalities were randomly assigned such that each of the 29 review teams served as Lead Reviewer on 50–55 cases and peer-reviewed another similar number of cases. For each fatality assigned, the **Lead Reviewer**:

1. Recorded their independent assessment of the RCF;
2. Verified or entered the Alternate substance name for each substance involved;
3. Recorded their assessment of the author's listing and ranking of the SUBSTANCE(S):edited the case abstract (removed all references to names, dates, locations, specific health-care facilities, or other information that would allow identification of the case; replaced trade names with generic product names; assured all lab data reported correct units and times where available and that the abstract and all conclusions were supported by the clinical evidence);
4. Scored the fatality case with regard to quality/completeness and novelty/educational value;
5. Evaluated the degree of agreement between the abstract and the NPDS database entries for that case;
6. Led the resolution of any questions with the CRT and Manager as required.

For each fatality assigned, the **Peer Reviewer**:

1. Recorded the agreement between the abstract and the NPDS database as described above for the Lead Reviewer;
2. Reviewed the decisions of the Lead Reviewer (steps 1–4) and recorded their agreement with the Lead Reviewer.

Final decisions as to the fatality category and involved substances and sequence were derived from the Clinical Case Evidence. In most cases, the three members of the CRT were able to reach consensus. Decisions, which could not be resolved within the CRT, were queried to the responsible Manager for review and discussion.

Selection of abstracts for publication

The 101 abstracts included in Appendix B were selected for publication in a three-stage process consisting of qualifying, ranking, and reading. Qualifying was based on the RCF. Project reviewers recommended qualifying only RCF = 1, 2, or 3 (Undoubtedly responsible, Probably responsible, or Contributory) as eligible for publication. Qualifying cases thus numbered 1,239. Ranking was based on the number of substances (33%) and weighted abstract scores (67%). The weightings were the averages chosen by the review teams (step 4 described above). Each was multiplied by the respective factors to obtain a weighted publication score: Hospital records × 4.4 + Postmortem × 7.6+Blood levels × 6.9 + Quality/Completeness × 6.4 + Novelty/Educational value × 6.0.

The top ranked 200 abstracts were each read by five of the individual reviewers (Bottei, Durback-Morris, Geller, Sangalli, and Spiller) and the two managers (Cantilena and Spyker). Each reader judged each abstract as "publish" or "omit" and all abstracts receiving four or more publish votes were selected, further edited and cross-reviewed by the two managers.

Fatality listing and abstracts

Of 1,597 fatalities reported to U.S. PCs in 2007, 1,239 were judged as poison-related fatalities. Table 21 provides a case listing of these 1,239 poison-related fatal human exposures. Deaths are sorted in this listing according to the category, patient age, and substance deemed most likely responsible for the death. Note that the substance listed in column 3 of Table 21 was chosen to be the most specific on the basis of clinical information, including the substances entered for that case. This substance may not agree with the categories used in the summary tables (including Table 22). Additional agents implicated are listed below the primary agent in the order of their contribution to the fatality. The fatality cases involved a single substance in 584 cases (47.1%), 2 substances in 272 cases (22.0%), 3 in 171 cases (13.8%), and 4 or more in the balance of the cases. The cross-references at the end of each major category section list all cases that identify this substance as other than the primary substance.

The Case number is bold to indicate that the abstract for that case is included in Appendix B.

The letters following the Case number include: i = reported to PC indirectly (by coroner, medical examiner, or other) after the fatality occurred in 68 cases (5.5%), p = prehospital cardiac and/or respiratory arrest in 517 (41.7%), h = hospital records reviewed in 197 cases (15.9%), and a = autopsy report reviewed in 248 cases (20.0%).

RCF: 1 = Undoubtedly responsible in 661 cases (53.3%), 2 = Probably responsible in 428 cases (34.5%), and 3 = Contributory in 150 cases (12.1%).

Chronicity: A = acute exposure in 709 (57.2%), A/C = acute on chronic in 188 (15.2%), C = chronic exposure in 97 (7.8%), and U = unknown in 245 (19.8%).

Route of exposure was as follows: Ingestion in 1,004 cases (75.4%), Inhalation/nasal in 126 cases (9.5%), and Parenteral in 62 cases (4.7%) (Table 9).

Intentional exposure reasons: Suspected suicide in 644 cases (52.0%), Intentional-Abuse in 138 cases (11.1%), and Intentional-Misuse in 50 cases (4.0%) (Table 6).

Unintentional exposure reasons: Environmental in 55 cases (4.4%), Therapeutic error in 28 cases (2.3%), Misuse in 16 cases (1.3%) (Table 6).

Tissue Concentrations for 1 or more related analytes were reported in 537 cases (43.3%).

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
NONPHARMACEUTICAL EXPOSURES							
Adhesives/glues							
1	67 y M	Epoxy resin	A	Inhal	Unt-M	3	
Alcohols							
2 pa	16 y F	Ethanol	A	Ingst+Aspir	Oth-M	2	360 mg/dL in blood (unspecified) at autopsy
3 p	18 y M	Ethanol	A/C	Ingst	Int-A	2	426 mg/dL in blood (unspecified) at autopsy
4 p	20 y M	Ethanol Alprazolam	U	Ingst	Int-A	3	
5 p	22 y M	Ethanol Benzodiazepine Fluoxetine Tolterodine	A	Ingst	Int-S	3	
6 ph	23 y F	Ethanol	A	Ingst	Int-A	2	261 mg/dL in blood (unspecified) at autopsy
		Acetaminophen					62 mcg/mL in serum at autopsy
7 ph	25 y M	Ethanol Methadone Cocaine	U	Ingst	Unk	1	
8 pa	26 y F	Ethanol	A/C	Ingst+Unk	Int-S	3	90 mg/dL in whole blood at autopsy 120 mg/dL in vitreous at autopsy
		Venlafaxine					21 mcg/mL in whole blood at autopsy
		Cocaine Bupropion					0.250 mcg/mL in whole blood at autopsy
		Trazodone					1 mcg/mL in whole blood at autopsy
9 a	26 y F	Ethanol Unk drug	U	Ingst	Unk	3	222 mg/dL in serum at autopsy
10	26 y M	Automotive product (methanol)	A	Ingst	Int-S	1	285 mg/dL in blood (unspecified) at autopsy
		Topiramate Lamotrigine Diphenhydramine Pantoprazole					
11	32 y M	Methanol	A	Ingst	Int-S	2	253 mg/dL in blood (unspecified) at autopsy 58 mg/dL in blood (unspecified) at autopsy 8.9 mg/dL in blood (unspecified) at autopsy
12	32 y F	Methanol Cleaner (ammonia)	A	Ingst	Int-S	1	283 mg/dL in blood (unspecified) at autopsy
13	34 y M	Methanol	A	Ingst	Unk	1	480 mg/dL in blood (unspecified) at autopsy
14	37 y M	Methanol	A	Ingst	Int-U	1	435 mg/dL in blood (unspecified) at autopsy
15 p	41 y F	Ethanol Hydroxyzine	A	Ingst	Int-S	1	
16 h	44 y M	Ethanol salicylate	C	Ingst	Int-A	1	82 mg/dL in blood (unspecified) at autopsy
17 p	44 y M	Ethanol Benzodiazepine acetaminophen/hydrocodone	C	Ingst	Int-S	1	400 mg/dL in blood (unspecified) at autopsy
18 a	48 y M	Methanol	A	Unk	Int-A	1	230 mg/dL in serum at autopsy
19	49 y M	Methanol	A	Ingst	Int-A	1	453 mg/dL in blood (unspecified) at autopsy
20	49 y F	Ethanol acetaminophen	C	Ingst	Int-A	1	
21 pi	50 y M	Ethanol Propoxyphene	U	Ingst	Int-A	1	146 mg/dL in blood (unspecified) at autopsy 1,728 ng/mL in blood (unspecified) at autopsy
22 p	50 y M	Methanol	A	Ingst	Int-S	1	222 mg/dL in serum at autopsy
23	52 y F	Automotive product (methanol)	A	Ingst	Int-S	1	209 mg/dL in blood (unspecified) at autopsy
24 p	52 y F	Ethanol	A	Ingst	Int-U	1	
25 a	52 y F	Methanol Acetaminophen/hydrocodone	U	Ingst+ Inhal	Int-S	1	128 mg/dL in serum at autopsy 27 mg/mL in serum at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Alcohols, continued							
		Cocaine					
26 h	53 y M	Methanol	U	Ingst	Int-U	2	
27	54 y F	Automotive product (methanol)	A	Ingst	Unk	1	288 mg/dL in blood (unspecified) at autopsy
28 p	55 y M	Ethanol	A/C	Ingst	Int-A	3	302 mg/dL in blood (unspecified) at autopsy
		Unk opioid					
29	56 y M	Ethanol	A	Ingst	Unk	2	150 mcg/dL in blood (unspecified) at autopsy
		Diazepam					
30	56 y M	Ethanol	C	Ingst	Int-A	3	
		Ibuprofen					
		Unk substance					
31	57 y M	Unk substance	A	Ingst	Int-S	2	
		Trazodone					
		Unk substance					
32 p	57 y M	Ethanol antifreeze (ethylene glycol)	A/C	Ingst	Int-A	2	
33	58 y M	Isopropanol	A	Ingst	Int-A	3	Isopropyl alcohol 130 mg/dL in blood (unspecified) at autopsy
34	60 y F	Ethanol	A	Ingst	Int-A	1	67 mg/dL in whole blood at autopsy
		Acetaminophen					6 mcg/mL in serum at autopsy
35	65 y M	Ethanol	C	Ingst	Int-U	1	
36	68 y M	Ethanol	U	Ingst	Unk	3	
See also cases 46, 85, 92, 110, 114, 116, 132, 162, 165, 166, 169, 176, 213, 262, 263, 268, 270, 276, 278, 282, 288, 317, 318, 331, 342, 344, 348, 353, 361, 368, 384, 389, 395, 397, 404, 411, 414, 417, 418, 423, 431, 436, 437, 442, 443, 453, 454, 455, 456, 457, 466, 472, 482, 509, 512, 513, 529, 531, 542, 547, 565, 567, 579, 590, 611, 612, 613, 617, 661, 674, 698, 719, 723, 745, 749, 773, 778, 779, 780, 783, 790, 808, 813, 817, 819, 820, 821, 823, 827, 830, 839, 843, 845, 846, 847, 857, 858, 865, 867, 886, 900, 908, 912, 913, 917, 923, 924, 951, 952, 1012, 1035, 1048, 1053, 1063, 1065, 1076, 1078, 1082, 1087, 1095, 1102, 1108, 1112, 1119, 1125, 1138, 1156, 1159, 1171, 1176, 1188, 1191, 1210, 1229, 1230							
Automotive/aircraft/boat products							
37 pi	15 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
38	21 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
39 p	22 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	2	
40	33 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
		Cocaine					
41 ph	34 y M	Automotive product (hydrocarbon)	U	Ingst+ Aspir	Int-S	3	
42	43 y M	Antifreeze (ethylene glycol)	A	Ingst	Unk	2	
43	44 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
44	44 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
45	44 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
46 p	45 y M	Antifreeze (ethylene glycol)	U	Ingst	Int-S	2	Methanol 0.0% in blood
		Cocaine					
		Ethanol					38 mg/dL in blood (unspecified) at autopsy
		Aspirin					Salicylates 3.1 mg/dL in blood (unspecified) at autopsy
		Acetaminophen					12 mcg/mL in blood (unspecified) at autopsy
47	46 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	83 mg/dL in blood (unspecified) at autopsy
48 p	46 y M	Methanol	U	Inhal	Int-A	1	
49 p	50 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	Antifreeze (general formulation) 560 mcg/mL in blood (unspecified) at autopsy
50	50 y M	Methanol/glycol	A	Ingst	Int-S	1	
51	51 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	68 mg/dL in blood (unspecified) at autopsy
		Barbiturates (long-acting)					
52	53 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
53	53 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	3	548 mg/dL in serum at autopsy
		Lithium					
54	56 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	2	
55	58 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	41 mg/dL in blood (unspecified) at autopsy
56 p	60 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
		Nifedipine					
		Quetiapine					
57 ph	60 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	109 mg/dL in blood (unspecified)

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Automotive/aircraft/boat products, continued							
58 ph	72 y M	Antifreeze (ethylene glycol)	A	Ingst	Unk	3	
59	81 y M	Automotive product (methanol)	A	Ingst	Int-S	2	
60 p	Unknown adult (≥20 years) F	Antifreeze (ethylene glycol)	A/C	Ingst	Int-A	1	
61	Unknown adult (≥20 years) M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
See also cases 123, 229, 545							
Bites and envenomations							
62 p	23 y M	Hymenoptera	A	B-S	Unt-B	1	
63 phi	48 y M	Crotaline	A	B-S	Unt-B	2	
64	53 y M	*Crotalus adamanteus*	A	B-S	Unt-B	3	
Chemicals							
65 ha	18 y M	Antifreeze (ethylene glycol)	U	Unk	Unk	1	
66 i	19 y M	Cyanide	A	Ingst	Int-S	1	
67	19 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
68 pha	21 y M	Oxalic acid	A	Ingst	Int-S	1	17.5 mg/dL in urine at autopsy
69 pi	23 y M	Cocaine	U	Inhal	Int-A	1	
		Morphine (long-acting)					
70	29 y M	Unk chemical	A/C	Inhal	Int-A	3	
71	30 y M	Cocaine	A	Unk	Int-A	1	
72	33 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	74 mg/dL in serum at autopsy
73 a	35 y F	Cyanide	A	Ingst	Int-S	1	7.302 mg/L in blood (unspecified) at autopsy
74 a	37 y M	Hydrofluoric acid	A	Oc+Derm	Unt-O	1	
75	38 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	298 mg/dL in serum at autopsy
76	38 y M	Cocaine	U	Ingst+Inhal	Int-A	2	
77 a	39 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
78 h	40 y F	Methyl isobutyl ketone	A	Inhal	Unt-O	3	
79	41 y F	Cocaine	A	Ingst	Unt-G	3	
		Methadone					
		Clonazepam	A	Ingst	Int-S	1	289.5 mg/L in blood (unspecified) at autopsy
80 pa	41 y F	Cyanide					
81 pi	42 y M	Cyanide	A	Ingst	Int-S	1	
82 ha	43 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
		Diphenhydramine					
83 p	44 y F	Ammonia	A	Inhal+Derm	Unt-O	1	
84 a	45 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	3	22 mg/dL in blood (unspecified) at autopsy
85	46 y M	Antifreeze (ethylene glycol)	A/C	Ingst	Int-S	1	
		Benzodiazepine					
		Ethanol					
86	47 y M	Hydrofluoric acid	A	Ingst	Int-S	1	
87	48 y M	Cyanide	A	Inhal+Derm	Unt-E	3	
		Carbon monoxide					
88 h	50 y M	Acrolein	A	Inhal+Oc+Derm	Unt-O	1	
89 h	51 y M	Propylene glycol	A/C	Par	AR-D	3	
90	54 y M	Sulfur	A	Derm	Unt-O	1	
91	57 y M	Antifreeze (ethylene glycol)	A	Ingst	Unk	1	
92	57 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-A	1	10 mg/dL in whole blood at autopsy
		Ethanol					3.5 mg/dL in blood (unspecified) at autopsy
		Aspirin					Acetylsalicylic acid 5.9 mg/dL in blood (unspecified) at autopsy
93	57 y M	Sulfuric acid	A	Ingst	Int-S	1	
94 i	59 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	2	146 mg/dL in serum at autopsy
95	59 y M	Hydrochloric acid	A	Ingst	Int-S	1	
96 h	59 y F	Antifreeze (ethylene glycol)	A	Ingst	Int-S	2	85 mg/dL in blood (unspecified) at autopsy
		Acetaminophen					
97 h	64 y M	Hydrochloric acid	A	Ingst	Int-S	1	
98 a	65 y M	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
99	65 y M	Drain opener (alkali)	A	Ingst	Int-S	1	
100 h	65 y M	Antifreeze (ethylene glycol)	A	Unk	Unt-M	2	117 mg/dL in blood (unspecified) at autopsy
101 h	72 y F	Wheel cleaner (hydrofluoric acid)	A	Ingst	Unt-M	1	
102 a	78 y M	Potassium hydroxide	A	Ingst	Int-S	1	
103 a	21 m F	Ammonium bifluoride	A	Ingst	Unt-G	2	
104 p	60+y M	Ammonia	A	Inhal	Unt-E	2	
105 phi	Unknown adult (≥20 years) M	Cyanide	A	Ingst	Int-S	1	
106	Unknown adult (≥20 years) M	Hydrochloric acid	A	Inhal+Derm	Unt-O	1	
107	Unknown adult (≥20 years) M	Cocaine	U	Unk	Int-A	2	
108	Unknown adult (≥20 years) U	Antifreeze (ethylene glycol)	A	Ingst	Int-S	1	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Chemicals, continued							
See also cases 32, 40, 121, 160, 163, 222, 830, 908, 912, 1060							
Cleaning substances (household)							
109	2 y F	Hydrofluoric acid	A	Ingst	Oth-M	2	
110 a	31 y M	Cleaner (acid)	A	Ingst	Int-S	1	
		Cocaine					
		Ethanol					
111	38 y F	Drain opener (sodium hydroxide)	A	Ingst	Int-S	1	
112 a	39 y F	Cleaner (acid)	A	Inhal	Unt-M	2	
		Dietary supplement	A	Ingst	Int-S	2	
113 a	39 y F	Hypochlorite					
		Aripiprazole					
114 a	40 y M	Drain opener (sodium hydroxide)	A	Ingst	Int-S	1	
		Methanol					85 mg/dL in serum at autopsy
		Ibuprofen					
		Doxylamine					
		Diphenhydramine					
		Dextromethorphan					
115	41 y F	Methanol	C	Ingst+Inhal	Int-S	1	370 mg/dL in blood (unspecified) at autopsy
							54 mg/dL in blood (unspecified) at autopsy
		Cleaner (ammonia)					
		Cleaner (basic)					
		Furniture polish					
		Air freshener					
		Isopropanol					
116 h	45 y M	Drain opener (sulfuric acid)	A	Ingst	Int-S	1	
		Ethanol					
117 pha	52 y F	Hypochlorite	A	Inhal	Unt-O	1	
118 p	53 y F	Unk caustic	A	Ingst	Int-S	1	
119	54 y M	Drain opener (sulfuric acid)	A	Ingst	Int-S	1	
120	56 y M	Cleaner (anionic/nonionic)	A	Ingst	Unt-M	1	
121 h	57 y M	Drain opener (sulfuric acid)	A	Ingst	Int-S	1	
		Antifreeze (ethylene glycol)					
		Opioid					
122	59 y F	Hydrofluoric acid	A	Ingst	Unt-G	2	
123	60 y F	Cleaner (basic)	A	Ingst	Int-U	1	
		Automotive product (hydrocarbon)					
124	63 y M	Potassium hydroxide	A	Ingst	Int-S	1	
125	66 y F	Drain opener (sulfuric acid)	A	Ingst	Int-S	1	
		Quetiapine					
		Mirtazapine					
126	67 y F	Cleaner (acid)	A	Inhal	Int-M	2	
		Drain opener (unk)					
127 p	72 y M	Hypochlorite	U	Inhal	Unt-E	3	
128	80 y F	Cleaner (acid)	A	Ingst	Int-S	1	
129	81 y F	Drain opener (alkali)	A	Ingst	Int-S	1	
130	94 y F	Cleaner (anionic/nonionic)	A	Ingst	Unt-G	3	
131 ph	9 m F	Cleaner (anionic/nonionic)	A	Oth	Unt-G	3	
See also cases 12, 927, 950, 1220							
Cosmetics/personal care products							
132	41 y M ethanol	Hair spray	A	Unk	Int-S	3	
133 p	43 y F	Aftershave	A	Ingst	Int-A	1	Ethanol 0.670% (w/v) in blood (unspecified) at autopsy
		Aftershave					Isopropanol 0.130% (w/v) in blood (unspecified) at autopsy
		Aftershave					Acetone 0.011% (w/v) in blood (unspecified) at autopsy
		Unk drug					
		Promethazine					
134	59 y F	Ethanol	A	Ingst	Int-A	3	
135 h	73 y F	Ethanol	A	Ingst+Aspir	Unt-G	1	166 mg/dL in blood (unspecified) at autopsy
136 a	74 y M	Shampoo (anionic/nonionic)	A	Ingst	Int-S	2	
137	80 y M	Bath oil	A	Ingst	Int-A	2	
See also cases 481, 937							
Deodorizers							
138 i	23 y M	Air freshener	U	Inhal	Int-A	1	
See also case 115							

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Fertilizers							
139 p	28 y F	Flower preservative	A	Par	Int-S	2	
Food products/food poisoning							
140 a	57 y F	Botulism	A	Ingst	Unk	1	
Foreign bodies/toys/miscellaneous							
141 pa	34 y M	Foreign body	U	Ingst+Aspir	Int-A	1	
		Methamphetamine					Amphetamine 54 ng/mL in blood (unspecified) at autopsy
		Cocaine					
		Alprazolam					
		Unk drug					
See also case 844							
Fumes/gases/vapors							
142	2 y F	Carbon monoxide	A	Inhal	Unt-E	1	10.1% (w/v) in blood (unspecified) at autopsy
143 pi	2 y F	Smoke	A	Inhal	Unt-E	1	
144 p	3 y F	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 59.6% (w/v) in blood (unspecified) at autopsy
		Smoke					
145 pi	3 y M	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 75% (w/v) in whole blood at autopsy
146 p	4 y F	Carbon monoxide/smoke	A	Inhal	Unt-E	1	
147 pi	4 y M	Carbon monoxide/smoke	A	Inhal	Unt-E	1	
148 p	4 y M	Carbon monoxide	A	Inhal	Unt-E	1	
149 p	4 y M	Carbon monoxide	A	Inhal	Unt-E	3	67% (w/w) in blood (unspecified) at autopsy
150 pi	5 y M	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 75% (w/v) in whole blood at autopsy
151 pi	7 y F	Smoke	A	Inhal	Unt-E	1	Carboxyhemoglobin 75% (w/v) in serum at autopsy
152 pi	9 y F	Hydrogen sulfide	A	Inhal	Unt-E	1	
153 p	10 y F	Carbon monoxide	A	Inhal	Unt-E	2	
		Smoke					
154 pi	11 y F	Hydrogen sulfide	A	Inhal	Unt-E	1	
155 pha	11 y F	Carbon monoxide	A	Inhal	Unt-E	1	20% (w/w) in blood (unspecified) at autopsy
156 ph	18 y M	Carbon monoxide	A	Inhal	Int-S	1	Carboxyhemoglobin 66.7% (w/v) in serum at autopsy
157 ph	24 y M	Carbon monoxide/smoke	A	Inhal	Unt-E	1	Smoke 42.8% (w/w) in whole blood at autopsy
158 pi	24 y M	Hydrogen sulfide	A	Inhal	Unt-O	1	
159 p	25 y F	Carbon monoxide	A	Inhal	Int-S	1	74% (w/v) in blood (unspecified) at autopsy
160	28 y M	Carbon monoxide/smoke	A	Inhal	Unt-E	3	
		Cyanide					
161 p	30 y F	Carbon monoxide	A	Inhal	Unt-E	1	
162 h	31 y F	Carbon monoxide	A	Ingst+ Inhal	Unt-E	1	Carboxyhemoglobin 52.3% (w/v) in serum at autopsy
		Smoke					
		Ethanol					Alcohol 164 mg/dL in serum at autopsy
163 p	31 y F	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 38% (w/v) in blood (unspecified) at autopsy
		Cyanide					
164 pi	34 y M	Hydrogen sulfide	A	Inhal	Unt-E	2	
165 pai	34 y F	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 69% (w/v) in blood (unspecified) at autopsy
		Ethanol					4 mg/dL in blood (unspecified) at autopsy
		Cocaine					Cocaine metabolite 1.4 mg/L in blood (unspecified) at autopsy
166 p	37 y M	Carbon monoxide	A	Inhal	Unt-E	2	64% (w/w) in blood (unspecified) at autopsy
		Ethanol					11% (w/v) in blood (unspecified) at autopsy
							0.1% (w/v) in vitreous at autopsy
167 p	37 y M	Carbon monoxide	A	Inhal	Unt-E	1	
168 p	37 y M	Carbon monoxide	U	Inhal	Unt-E	1	
		Gasoline					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Fumes/gases/vapors, continued							
169 pai	39 y M	Carbon monoxide	A	Inhal	Unt-E	1	53% (w/v) in blood (unspecified) at autopsy
		Ethanol					17 mg/dL in blood (unspecified) at autopsy
		Cocaine					Cocaine metabolite 0.4 mg/L in blood (unspecified) at autopsy
170 p	39 y F	Carbon monoxide	A	Inhal	Int-S	1	
171 p	39 y F	Carbon monoxide/smoke	A	Inhal	Unt-E	1	Carboxyhemoglobin 37% (w/v) in blood (unspecified) at autopsy
172 pha	39 y F	Carbon monoxide	A	Inhal	Int-S	1	Carboxyhemoglobin 15% (w/w) in blood (unspecified) at autopsy
173 pa	40 y F	Carbon monoxide	U	Inhal	Unk	1	66.9% (w/w) in blood (unspecified) at autopsy
		Smoke					
174 pi	40 y M	Hydrogen sulfide	A	Inhal	Unt-E	1	
175 pi	41 y M	Hydrogen sulfide	A	Inhal	Unt-E	1	
176 pai	42 y F	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 53% (w/v) in blood (unspecified) at autopsy
		Ethanol					14 mg/dL in blood (unspecified) at autopsy
		Cocaine					Cocaine metabolite 1 mg/L in blood (unspecified) at autopsy
177 pi	44 y M	Hydrogen sulfide	A	Inhal	Unt-E	1	
178 ph	45 y F	Carbon monoxide	A	Inhal	Unt-E	1	
179 p	47 y M	Hydrogen sulfide	A	Inhal	Unt-O	1	
180 pi	47 y M	Hydrogen sulfide	A	Inhal	Unt-E	1	
181 pai	50 y M	Carbon monoxide	A	Inhal	Unt-E	1	55% (w/v) in blood (unspecified) at autopsy
182 pa	50 y M	Methane	A	Inhal	Unt-O	1	
183	50 y M	Hydrogen sulfide	A	Inhal	Unt-O	1	
184 p	52 y M	Hydrogen sulfide	A	Inhal	Unt-O	1	
185 p	54 y M	Carbon monoxide/smoke	A	Inhal	Unt-E	2	
186 pha	55 y F	Smoke	A	Inhal	Unt-E	1	Carboxyhemoglobin 40% (w/v) in blood (unspecified) at autopsy
		Carbon monoxide					
187 pi	56 y F	Carbon monoxide/smoke	A	Inhal	Unt-E	1	
188 pha	56 y M	Carbon monoxide	A	Inhal+Derm	Unt-E	1	Carbon monoxide 2% (w/w) in blood (unspecified) at autopsy
		Smoke					
189 pa	58 y M	Carbon monoxide	A	Inhal	Unt-E	2	
		Smoke					
190 pi	60 y M	Carbon monoxide	A	Inhal	Int-S	2	
191 p	61 y M	Carbon monoxide	A	Inhal	Unt-E	1	45% (w/w) in blood (unspecified) at autopsy
192 p	62 y F	Carbon monoxide	A	Inhal	Unt-E	1	
193 p	67 y M	Carbon monoxide	A	Inhal	Unt-E	1	
194 p	70 y M	Carbon monoxide	U	Inhal	Unk	1	
195 p	72 y F	Carbon monoxide	A	Inhal	Unt-E	1	35% in other at autopsy
196 p	74 y F	Carbon monoxide	U	Inhal	Unt-E	2	
197 p	74 y M	Carbon monoxide	A	Inhal	Unt-E	1	
198 p	83 y M	Carbon monoxide	A	Inhal	Int-S	1	66 g/dL in blood (unspecified) at autopsy
199 pi	84 y F	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 24% (w/v) in blood (unspecified) at autopsy
200 i	87 y F	Carbon monoxide/smoke	A	Inhal	Unt-E	3	
201 pa	91 y F	Carbon monoxide	A	Inhal	Unt-E	1	Carboxyhemoglobin 74% (w/v) in blood (unspecified) at autopsy
202	93 y M	Carbon monoxide	A	Inhal	Int-S	1	Carboxyhemoglobin 19.6% in blood (unspecified) at autopsy
203 p	6-12 y F	Carbon monoxide/smoke	A	Inhal	Unt-E	1	21% (w/v) in serum at autopsy
204 pi	30+y F	Hydrogen sulfide	A	Inhal	Unt-E	1	
205 p	30+y F	Carbon monoxide	A	Ingst+Inhal	Int-S	1	Carboxyhemoglobin 25% (w/w) in serum at autopsy
		Clonazepam					
206 pi	70+ y M	Carbon monoxide	U	Inhal	Unt-E	2	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Fumes/gases/vapors, continued							
207 i	Unknown adult (≥20 years) M	Carbon monoxide	A	Inhal	Int-S	2	
208 pi	Unknown adult (≥20 years) M	Carbon monoxide	A	Inhal	Unt-E	2	
209 p	Unknown age M	Hydrogen sulfide	A	Inhal	Unt-O	1	
See also cases 87, 548, 860, 976							
Hydrocarbons							
210 pa	2 y M	Hydrocarbons	A	Ingst+Aspir	Unt-G	1	
211 pha	18 y F	Fluorochlorocarbon/propellant	A	Inhal	Unk	1	1,1—difluoroethane 920 mg/kg in lung tissue at autopsy
		Dextromethorphan					9.2 ng/mL in blood (unspecified) at autopsy
212 p	19 y M	Fluorochlorocarbon/propellant	U	Inhal	Int-A	3	
213 p	21 y F	Fluorochlorocarbon/propellant Ethanol Quetiapine Valproic acid	A	Ingst	Int-U	2	
214 p	23 y M	Hydrocarbons	A	Inhal	Int-A	1	
215 ha	28 y M	Toluene	U	Inhal	Int-A	1	Hippuric acid 1.420 g/dL in urine at autopsy *o*-cresol 20 mg/L in urine at autopsy *p*-and/or *m*-cresol 50 mg/L in urine at autopsy
216	32 y M	Motor oil Organophosphate	A	Ingst	Int-S	3	
		Aspirin					124 mg/dL in blood (unspecified) at autopsy
217 p	34 y M	Fluorochlorocarbon/propellant	A	Inhal	Int-A	1	
218 a	54 y M	Motor oil	A/C	Ingst	Int-S	1	
		Fluoxetine					0.48 mg/L in vitreous at autopsy
		Venlafaxine (long-acting)					Effexor XR 9.3 mg/L in vitreous at autopsy
		Trazodone Alprazolam Gabapentin Metformin Potassium Furosemide Glimepiride					
219	20 m M	Lamp oil	A	Ingst+Aspir	Unt-G	1	
220	Unknown adult (≥20 years) M	Lighter fluid (naphtha) phencyclidine	A	Ingst+Inhal	Int-S	2	
221	Unknown adult (≥20 years) M	Gasoline	C	Ingst	Int-U	3	
See also case 168							
Industrial cleaners							
222	40 y M	Cleaner (anionic/nonionic) Hydrofluoric acid	A	Ingst	Unt-M	1	
Mushrooms							
223	67 y F	*Amanita phalloides* *Lycoperdon candidum*	A	Ingst	Unt-M	1	
Other/unknown nondrug substances							
224 p	25 y M	Methadone	A	Unk	Unt-G	2	
225	34 y M	Unk drug Methylenedioxymethamphetamine	U	Unk	Unk	2	
226	39 y F	Unk substance	A	Ingst	Unt-M	3	
227 p	71 y F	Acetic acid/peroxide	A	Par	Unt-T	1	
See also cases 30, 31, 241, 331, 494							
Pesticides							
228 ha	2 y F	Aluminum phosphide	A	Inhal	Unt-E	1	
229	21 y M	Brodifacoum antifreeze (ethylene glycol)	A	Ingst	Int-S	1	
230	27 y M	Diazinon	A/C	Ingst	Int-S	1	
231 p	32 y M	Carbamate	A	Ingst	Int-S	2	
232	35 y M	Acephate	A	Ingst+ Aspir	Int-S	1	
233	40 y M	Brodifacoum	A	Ingst	Int-S	1	
234 pi	41 y F	Unk rodenticide	A	Ingst	Int-S	2	
235 pi	47 y M	Strychnine	A	Ingst	Unk	1	0.930 mg/L in blood (unspecified) at autopsy
236 p	52 y M	Organophosphate	A/C	Ingst	Int-S	1	
237	55 y F	Unk pesticide	C	Ingst	Int-S	1	
238 a	56 y F	Glyphosate Alprazolam	A	Ingst	Int-S	1	
239	57 y M	Organophosphate	A	Ingst	Int-S	3	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Pesticides, continued							
240	57 y M	Glyphosate/diquat	A	Ingst	Int-S	2	
241	59 y M	Paraquat	A	Unk	Unk	3	0.062 mcg/mL in serum at autopsy
		Unk substance					
242 h	71 y M	Glyphosate	A	Ingst	Unt-M	1	
243	75 y F	Carbamate	A	Ingst	Int-S	1	
		Benzodiazepine					
244 h	83 y M	Organophosphate	A	Ingst	Int-S	1	
245 p	90 y F	Organophosphate	A	Ingst	Int-S	1	
246	92 y M	Organophosphate	A	Ingst	Int-S	2	
247 pi	Unknown adult (≥20 years) M	Organophosphate	A	Ingst	Unt-G	1	
See also cases 216, 886, 1230							
Plants							
248 pa	16 y F	*Uragoga ipecacuanha*	U	Ingst	Int-S	2	
		Acetaminophen					
See also case 271							
Polishes and waxes							
249 p	27 y M	Furniture polish	A	Inhal	Int-A	1	
See also case 115							
Sporting equipment							
250	39 y M	Gun bluing	A	Ingst	Int-S	1	
PHARMACEUTICAL EXPOSURES							
Analgesics							
251 p	2 y M	Methadone	U	Ingst	Unk	1	
252 p	2 y M	Methadone	A	Ingst	Unt-G	3	
253 p	2 y M	Methadone	A	Ingst	Unt-G	1	
254 pa	4 y F	Fentanyl patch	A	Ingst	Unt-G	1	
255 h	7 y M	Acetaminophen	U	Ingst	Unt-G	1	
256 pa	12 y F	Methadone	A	Ingst	Int-M	1	1.6 mg/kg in blood (unspecified) at autopsy
							0.810 mg/kg in blood (unspecified) at autopsy
							2.1 mg/kg in liver at autopsy
		Quetiapine					13 mg/L in blood (unspecified) at autopsy
							0.730 mg/L in blood (unspecified) at autopsy
							5.4 mg/kg in liver at autopsy
		Doxylamine					0.3 mg/kg in blood (unspecified) at autopsy
		Paroxetine					66.250 mg/kg in blood (unspecified) at autopsy
		Amantadine					66.250 mg/kg in blood (unspecified) at autopsy
257 pi	14 y F	Methadone	A	Ingst	Int-A	2	
258 ha	15 y F	Acetaminophen	A	Ingst	Int-S	2	62.7 mg/L in serum at autopsy
259 p	15 y M	Oxycodone	A	Ingst	Int-A	1	0.570 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/hydrocodone					
260 pi	15 y F	Methadone	U	Ingst	Int-A	1	0.240 mg/L in blood (unspecified) at autopsy
							0.190 mg/L in blood (unspecified) at autopsy
		Clonazepam					Klonopin 275 ng/mL in blood (unspecified) at autopsy
261	15 y M	Aspirin	A	Ingst	Int-S	1	35.6 mg/dL in serum at autopsy
							56 mg/dL in serum at autopsy
		Bupropion					
262 pa	16 y F	Morphine	A	Ingst	Int-A	1	0.150 mcg/mL in blood (unspecified) at autopsy
		Alprazolam					58 ng/mL in blood (unspecified) at autopsy
		Ethanol					0.050% (w/v) in blood (unspecified) at autopsy
		Ethanol					0.060% (w/v) in vitreous at autopsy
263 ph	16 y F	Methadone	A	Ingst	Unt-G	1	
		Ethanol					
264 pai	16 y F	Morphine	U	Inhal	Int-S	1	Morphine (free) 4,000 ng/mL in blood (unspecified) at autopsy
265 p	16 y M	Oxycodone	A	Ingst	Int-A	1	0.340 mg/L in blood (unspecified) at autopsy
		Cyclobenzaprine					0.210 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
266	17 y F	Acetaminophen/hydrocodone	C	Ingst	Int-M	2	Acetaminophen 11 mcg/mL in serum at autopsy
		Carisoprodol					
		Alprazolam					
267	17 y M	Acetaminophen	C	Ingst	Int-M	1	44 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/oxycodone					
268 pai	17 y M	Methadone	A	Ingst	Int-A	1	0.4 mg/L in whole blood at autopsy
		Ethanol					0.070% (w/v) in whole blood at autopsy
269 p	18 y M	Methadone	A	Ingst	Int-A	2	
		Acetaminophen/oxycodone					
		Ketamine					
270	18 y M	Oxycodone (long-acting)	A	Ingst+Inhal	Int-A	1	
		Diazepam					
		Ethanol					
		Marijuana					
271 p	18 y M	Morphine	A	Ingst	Int-A	1	
		Chlorpheniramine					
		Dextromethorphan					
		Myristica fragrans					
272 ph	18 y M	Acetaminophen/hydrocodone	A	Ingst	Int-A	2	
		Alprazolam					
273 p	18 y M	Methadone	A	Ingst	Int-S	2	
274 ha	19 y F	Acetaminophen	A	Ingst	Int-S	1	52.6 mcg/mL in blood (unspecified) at autopsy
		Unk drug					
		Asian medicine					
275	19 y F	Acetaminophen	A	Ingst	Int-S	1	223 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/ diphenhydramine					
		Fluoxetine					
276 pi	19 y M	Oxycodone	A	Ingst	Int-A	1	0.5 mg/L in blood (unspecified) at autopsy
		Ethanol					
277 p	19 y M	Methadone	A/C	Ingst	Int-A	2	0.230 mg/dL in blood (unspecified) at autopsy
278	20 y M	Acetaminophen/hydrocodone	A/C	Ingst+Unk	Int-S	1	Acetaminophen 127 mcg/mL in blood (unspecified) at autopsy Acetaminophen 76 mcg/mL in blood (unspecified) at autopsy
		Aspirin					
		Ethanol					
		Morphine					
279 p	20 y M	Methadone	A	Ingst	Int-S	1	
		Marijuana					
		Lithium					
280 p	20 y M	Oxycodone	U	Ingst+Aspir	Int-S	2	0.7 mg/L in blood (unspecified) at autopsy
		Alprazolam					0.035 mg/L in blood (unspecified) at autopsy
		Diazepam					
281	20 y F	Opioid	U	Ingst+Par	Int-U	2	
		Acetaminophen					
		Amlodipine/benazepril					
		Heroin					
		Diazepam					
282 pa	20 y F	Acetaminophen	C	Ingst	Int-U	1	40 mcg/mL in blood (unspecified) at autopsy 12.5 mcg/dL in blood (unspecified) at autopsy
		Ethanol					1.8 mg/dL in blood (unspecified) at autopsy
283 p	20 y F	Methadone	A	Ingst	Unk	1	0.340 mg/L in blood (unspecified) at autopsy
284 pa	20 y M	Morphine	U	Ingst	Unt-T	2	3.4 mg/L in blood (unspecified) at autopsy
		Morphine					1.9 mg/L in blood (unspecified) at autopsy
		Methadone					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
285	20 y F	Acetaminophen/propoxyphene	U	Ingst	Int-S	2	Darvocet-N 100 250 mcg/mL in blood (unspecified) at autopsy
		Naproxen					
286 pa	20 y F	Oxycodone	U	Unk	Unk	1	0.2 mg/L in blood (unspecified) at autopsy
		Tramadol					3.4 mg/L in blood (unspecified) at autopsy
		Zolpidem					0.330 mg/L in blood (unspecified) at autopsy
		Ibuprofen					
		Etodolac					
		Phentermine					
287 pha	21 y M	Methadone	A/C	Ingst	Int-A	2	0.150 mg/L in blood (unspecified) at autopsy
							EDDP 0.060 mg/L in blood (unspecified) at autopsy
		Marijuana					
288 a	21 y M	Methadone	A	Ingst	Int-S	1	0.230 mg/L in blood (unspecified) at autopsy
		Ethanol					287 mg/dL in blood (unspecified) at autopsy
							60 mg/dL in blood (unspecified) at autopsy
289 p	21 y M	Methadone	A	Ingst	Int-A	1	
		Cocaine					
290 a	21 y F	Acetaminophen/hydrocodone	A	Ingst	Int-A	2	
		Acetaminophen/oxycodone					
		Clonazepam					
		Amphetamine					
		Pregabalin					
291	21 y F	Acetaminophen/hydrocodone	A	Ingst	Int-M	1	Acetaminophen 51.7 mcg/mL in blood (unspecified) at autopsy
292 p	21 y M	Methadone	U	Ingst	Int-S	2	1.150 mg/L in blood (unspecified) at autopsy
293 h	21 y F	Acetaminophen/ diphenhydramine	A	Ingst	Int-S	1	17.8 mcg/mL in blood (unspecified) at autopsy
294 pha	21 y F	Methadone	A	Ingst	Int-S	2	270 ng/mL in blood (unspecified) at autopsy
		Clonazepam					
295	21 y F	Acetaminophen	A/C	Ingst	Int-S	2	
296	21 y F	Acetaminophen	A	Ingst	Int-S	2	180.4 mcg/mL in serum at autopsy
		Unk drug					
297 a	22 y M	Acetaminophen/ diphenhydramine	A	Ingst	Int-A	1	
298 pa	22 y M	Methadone	U	Ingst	Int-U	2	180 ng/mL in blood (unspecified) at autopsy
		Marijuana					delta-9-carboxy THC 51 ng/mL in blood (unspecified) at autopsy
299 ph	22 y M	Oxycodone	A	Ingst	Int-S	1	
		Benzodiazepine					
300 ph	22 y M	Methadone	U	Ingst	Unk	1	
		Oxycodone (long-acting)					
		Acetaminophen/hydrocodone					
301	22 y F	Acetaminophen	A	Ingst+Inhal	Int-U	2	40 mcg/mL in blood (unspecified) at autopsy
		Opioid					
		Marijuana					
302 ph	23 y M	Methadone	U	Ingst+Aspir	Int-S	2	320 ng/mL in serum at autopsy
303 pa	23 y M	Methadone	A	Ingst	Int-A	1	0.240 mcg/mL in blood (unspecified) at autopsy
304	23 y F	Acetaminophen/tramadol	U	Ingst	Int-S	1	
		Trazodone					
		Carisoprodol					
305 pa	23 y M	Methadone	U	Ingst	Unk	1	0.3 mg/L in blood (unspecified) at autopsy
306 pa	23 y M	Acetaminophen/hydrocodone	A/C	Ingst	Int-M	1	Acetaminophen and hydrocodone 0.459 mcg/mL in serum at autopsy
							36 mcg/mL in serum at autopsy
		Alprazolam					0.071 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Cocaine					
307 p	23 y M	Methadone	U	Ingst	Unk	1	0.340 mg/L in blood (unspecified) at autopsy
		Fentanyl					9.7 ng/mL in blood (unspecified) at autopsy
		Alprazolam					0.030 mg/L in blood (unspecified) at autopsy
308 p	23 y F	Methadone	U	Unk	Int-S	2	
		Unk opioid					
		Benzodiazepine					
309 pa	23 y F	Oxycodone	U	Unk	Unk	2	0.2 mg/L in blood (unspecified) at autopsy
		Hydrocodone					Hydrocodone bitartrate 0.070 mg/L in blood (unspecified) at autopsy
		Tramadol					0.820 mg/L in blood (unspecified) at autopsy
							Desmethytramadol 0.4 mg/L in blood (unspecified) at autopsy
		Antihistamine/decongestant					Promethazine 0.370 mg/L in blood (unspecified) at autopsy
		Promethazine					0.310 mg/L in blood (unspecified) at autopsy
310	23 y M	Fentanyl	A	Ingst	Int-A	2	
311 p	23 y M	Acetaminophen/propoxyphene	A	Ingst	Int-S	3	Acetaminophen 234 mcg/mL in blood (unspecified) at autopsy
312 ha	24 y M	Acetaminophen	A	Ingst	Int-S	2	51 mcg/mL in serum at autopsy
313 p	24 y M	Oxycodone	A/C	Ingst	Int-S	1	Phenobartitone 21(units not specified) in blood (unspecified) at autopsy
		Phenobarbitone					
		Amitriptyline					
314 a	24 y F	Acetaminophen	U	Ingst	Int-S	1	
315 p	24 y M	Acetaminophen	A	Ingst	Int-S	1	161.5 mcg/mL in blood (unspecified) at autopsy
							106.2 mcg/mL in blood (unspecified) at autopsy
							9.3 mcg/mL in blood (unspecified) at autopsy
316 ha	24 y M	Aspirin	A	Ingst	Int-S	1	Salicylate 323 mcg/mL in blood (unspecified) at autopsy
							Salicylate 610 mcg/mL in blood (unspecified) at autopsy
							Salicylate 665 mcg/mL in blood (unspecified) at autopsy
							Salicylate 756 mcg/mL in blood (unspecified) at autopsy
							Salicylate 1230 mcg/mL in blood (unspecified) at autopsy
							Salicylate 677 mcg/mL in blood (unspecified) at autopsy
317 p	24 y M	Methadone	A/C	Ingst	Int-M	2	
		Ethanol					
318 ph	24 y M	Acetaminophen/hydrocodone	A	Ingst	Int-S	1	acetaminophen 12 mcg/mL in serum at autopsy
		Methadone					
		Hydroxyzine					
		Benzodiazepine					
		Buspirone					
		Benzodiazepine					
		Hydrocodone					
		Ethanol					
319	24 y F	Acetaminophen/hydrocodone	C	Ingst	Int-M	1	
320 a	24 y M	Methadone	A/C	Ingst	Int-A	1	0.610 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Alprazolam					58 ng/mL in blood (unspecified) at autopsy
321 pa	25 y M	Methadone	A	Ingst	Unk	1	654 ng/mL in blood (unspecified) at autopsy EDDP 56 ng/mL in blood (unspecified) at autopsy
		Fentanyl					14.5 ng/mL in blood (unspecified) at autopsy
322	25 y F	Acetaminophen/oxycodone	U	Ingst	Int-U	2	Oxycodone 0.070 mg/L in blood (unspecified) at autopsy Dihydrocodone 0.006 mg/L in blood (unspecified) at autopsy
323 ph	25 y F	Fentanyl Cocaine Carisoprodol Alprazolam Marihuana	A	Unk	Int-S	1	
324 pa	25 y M	Methadone	U	Ingst	Unk	1	0.380 mg/L in blood (unspecified) at autopsy
325	25 y M	Acetaminophen	A	Ingst	Int-S	1	
326 p	26 y M	Fentanyl patch	U	Ingst+Par	Unk	1	Fentanyl 4.9 ng/mL in blood (unspecified) at autopsy Norfentanyl 4.2 ng/mL in blood (unspecified) at autopsy
		Tramadol					0.6 mg/L in blood (unspecified) at autopsy
		Trazodone Promethazine					0.060 mg/L in blood (unspecified) at autopsy
		Loperamide					
327	26 y F	Acetaminophen[Cr]	A/C	Ingst	Int-S	2	141 mg/L in blood (unspecified) at autopsy
		Valproic acid[Cr]					Depakote 125 mcg/mL in blood (unspecified) at autopsy
		Vitamins/iron[Cr]					Iron 418 mcg/dL in blood (unspecified) at autopsy
		Duloxetine Fosinopril					
328 p	26 y M	Opioid Cocaine Unk drug Amphetamine Benzodiazepine Marijuana	U	Ingst+Par+Unk	Int-A	2	
329	26 y F	Acetaminophen/hydrocodone Quetiapine Dicyclomine Sulfamethoxazole/trimethoprim Skeletal muscle relaxant	C	Ingst	Int-S	2	
330 p	26 y M	Methadone Acetaminophen/hydrocodone Alprazolam Cocaine	U	Unk	Unk	2	
331 h	26 y M	Unk opioid Ethanol Unk substance	C	Par	Oth-W	3	0.070 g/dL in blood (unspecified) at autopsy
332 pa	26 y F	Morphine	U	Unk	Unk	1	0.460 mg/L in blood (unspecified) at autopsy 30 mg/L in urine at autopsy
333	26 y M	Acetaminophen	C	Ingst	Unt-M	1	
334 p	27 y M	Opioid Benzodiazepine Barbiturates	A	Ingst	Int-A	2	
335 p	27 y F	Methadone	U	Unk	Int-A	1	0.966 mg/L in unknown at autopsy
		Cocaine					0.340 mg/L in unknown at autopsy
		Marijuana					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Ketamine					
336 ph	27 y F	Acetaminophen/propoxyphene	A	Ingst	Int-A	1	Acetaminophen 160 mcg/dL in blood (unspecified) at autopsy Proposyphene 0.850 mcg/mL in blood (unspecified) at autopsy Norpropoxyphene 2 mcg/mL in blod (unspecified) at autopsy
337 pha	27 y M	Methadone	A	Ingst	Int-A	1	184 ng/mL in blood (unspecified) at autopsy
338 h	27 y M	Aspirin	A	Ingst	Int-S	1	Acetylsalicylic acid 131 mg/dL in blood (unspecified) at autopsy
339 pi	27 y M	Methadone Amphetamine	U	Par+Unk	Int-A	2	
340	27 y M	Acetaminophen	A	Ingst	Int-S	2	82 mcg/mL in blood (unspecified) at autopsy
341 pa	28 y M	Methadone	U	Ingst	Int-S	2	0.410 mg/L in whole blood at autopsy 1.1 mg/L in whole blood at autopsy 5.1 mg/kg in liver at autopsy
		Alprazolam					0.2 mg/L in whole blood at autopsy
342	28 y M	Acetaminophen/hydrocodone Ethanol	C	Ingst	Int-M	2	
343 pa	28 y M	Oxycodone	U	Ingst	Unk	2	0.2 mg/L in blood (unspecified) at autopsy
		Acetaminophen/tramadol					
		Zolpidem					0.1 mg/L in blood (unspecified) at autopsy
344 p	28 y F	Methadone	U	Ingst	Unk	2	0.3 mg/L in blood (unspecified) at autopsy
		Ethanol					20 mg/dL in blood (unspecified) at autopsy
		Chlorpheniramine/ phenylephrine/hydrocodone					
		Erythromycin					
		Prednisone					
		Pseudoephedrine/guaifenesin					
345 pa	28 y F	Oxycodone	U	Ingst	Int-S	1	
		Butalbital (unk combination)					Oxycodone 0.220 mg/L in blood (unspecified) at autopsy
		Amitriptyline					Butalbital 12 mg/L in blood (unspecified) at autopsy
		Carisoprodol					Amitriptyline 0.480 mg/L in blood (unspecified) at autopsy
		Tramadol					35 mg/L in blood (unspecified) at autopsy
							Meprobamate 70 mg/L in blood (unspecified) at autopsy
346 pi	28 y F	Hydrocodone	A	Ingst	Unk	1	
347 pa	28 y M	Tramadol	A	Ingst	Int-S	2	
		Amitriptyline					
		Topiramate					
		Citalopram					
348 p	28 y F	Unk substance	A	Ingst	Int-A	2	
		Ketamine					
		Cocaine					
		Ethanol					
		Alprazolam					
349 pa	28 y M	Opioid	A	Ingst	Int-A	1	0.540 mcg/mL in blood (unspecified) at autopsy
		Diazepam					
		Benzodiazepine					
350 a	28 y M	Acetaminophen/ diphenhydramine	U	Ingst	Int-S	1	400 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
351 pha	28 y M	Fentanyl patch	A	Ingst	Int-A	2	Fentanyl 7.3 ng/mL in blood (unspecified) at autopsy
		Diazepam					Nordiazepam 318 ng/mL in blood (unspecified) at autopsy
		Benzodiazepine					Alprazolam 37 ng/mL in blood (unspecified) at autopsy
352	29 y M	Aspirin	A	Ingst	Int-S	1	
353 pa	29 y F	Oxycodone (long-acting)	A	Unk	Int-S	1	1 mg/L in blood (unspecified) at autopsy
							Oxymorphone 0.013 mg/L in blood (unspecified) at autopsy
		Clonazepam					
		Alprazolam					
		Ethanol					
		Diphenhydramine					
354 p	29 y M	Methadone	U	Ingst	Int-A	1	
		Alprazolam					
355	29 y F	Acetaminophen	A	Ingst	Int-S	1	16 mcg/mL in blood (unspecified) at autopsy
		Unk drug					
356 h	29 y F	Acetaminophen	C	Ingst	Int-U	1	66 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/hydrocodone					
357 p	29 y M	Oxycodone	A/C	Ingst	Int-A	2	
		Antihistamine					
358 h	29 y F	Oxycodone	A	Ingst	Int-S	1	
		Acetaminophen/oxycodone					
		Acetaminophen/hydrocodone					
		Alprazolam					
359	29 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	2	Acetaminophen 164 mcg/mL in serum at autopsy
		Carisoprodol					
360	30 y F	Acetaminophen	A/C	Ingst	Unt-M	1	55.6 mcg/mL in serum at autopsy
361 i	30 y M	Methadone	U	Ingst	Unk	2	
362	30 y F	Tramadol	A	Ingst	Int-S	2	
363	30 y F	Oxycodone	A	Ingst+Inhal	Int-S	3	
		Amphetamine					
		Cocaine					
		Benzodiazepine					
364	30 y F	Acetaminophen/ diphenhydramine	A	Ingst	Int-S	1	Acetaminophen 339 mcg/mL in blood (unspecified) at autopsy
365 p	30 y M	Methadone	U	Unk	Unk	1	
		Morphine					
366 a	30 y F	Acetaminophen	A	Ingst	Int-S	1	14 mcg/mL in blood (unspecified) at autopsy
367 a	31 y M	Methadone	A	Ingst+Aspir	Int-U	2	0.1 mg/L in unknown at autopsy
368 a	31 y M	Acetaminophen	A	Ingst	Int-S	1	39 mcg/mL in blood (unspecified) at autopsy
		Hydrocodone					0.120 mcg/mL in blood (unspecified) at autopsy
		Benzodiazepine					0.015 mcg/mL in blood (unspecified) at autopsy
		Clozapine					
		Ethanol					
369 p	31 y F	Acetaminophen	A	Ingst	Int-U	2	
370	31 y F	Acetaminophen/oxycodone	A/C	Ingst	Int-S	1	Acetaminophen 26 mcg/mL in serum at autopsy
		Carisoprodol					
371 pai	31 y M	Morphine	U	Ingst	Unk	1	0.620 mg/L in blood (unspecified) at autopsy
							4.1 mg/L in urine at autopsy
		Gabapentin					
372 p	31 y M	Oxycodone (long-acting)	A	Ingst	Int-S	2	Oxycontin 0.470 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
							Oxymorphone 0.080 mg/L in blood (unspecified) at autopsy
		Oxycodone					
		Pregabalin					
373 pa	31 y M	Methadone	U	Ingst	Unk	1	0.430 mg/L in blood (unspecified) at autopsy
374 p	31 y M	Oxycodone (long-acting)	A	Ingst	Unk	1	Antihistamine/decongestant 0.130 mg/dL in blood (unspecified) at autopsy
		Antihistamine/decongestant					Dextromethorphan 0.030 mg/L in blood (unspecified) at autopsy
		Dextromethorphan					
375 p	31 y M	Methadone	A/C	Ingst	Int-S	1	
		Acetaminophen /oxycodone					
		Hydrocodone					
		Cyclobenzaprine					
		Eszopiclone					
		Duloxetine					
		Risperidone					
376	32 y M	Methadone	A/C	Ingst	Int-S	2	
		Alprazolam					
		Eszopiclone					
377 p	32 y M	Fentanyl	U	Ingst	Int-A	2	
		Clonazepam					
378 a	32 y F	Acetaminophen/ hydrocodone	A	Ingst	Int-S	1	
379	32 y M	Ibuprofen	A	Ingst+Inhal	Int-A	2	
		Cocaine					
380	32 y F	Acetaminophen/hydrocodone	C	Ingst	Int-M	1	Acetaminophen 51 mcg/mL in blood (unspecified) at autopsy
381	32 y F	Acetaminophen	C	Ingst	Unt-T	2	
382	32 y F	Acetaminophen	A	Ingst	Int-S	1	
		Diphenhydramine					
383	32 y M	Aspirin	A	Ingst	Int-S	1	Salicylate 129.6 mcg/dL in serum at autopsy
384 pa	33 y F	Methadone	U	Ingst	Unk	1	
		Oxycodone					
		Diphenhydramine					
		Ethanol					68 mg/dL in unknown at autopsy
385	33 y F	Acetaminophen	A	Ingst	Int-U	2	
		Amphetamine					
		Methadone					
		Zolpidem					
386	33 y F	Acetaminophen/ hydrocodone	A	Ingst	Int-S	2	Acetaminophen 79 mcg/mL in blood (unspecified) at autopsy
387 pa	33 y F	Acetaminophen/propoxyphene	U	Ingst	Int-S	1	Acetaminophen 433.7 mcg/mL in blood (unspecified) at autopsy
							Propoxyphene 1.1 mcg/mL in blood (unspecified) at autopsy
							Norpropoxyphene 2.3 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/ diphenhydramine					
		Temazepam					
388 p	33 y M	Methadone	U	Ingst	Unk	1	0.5 mEq/L in blood (unspecified) at autopsy
		Morphine (long-acting)					0.140 mg/dL in blood (unspecified) at autopsy
389	33 y M	Fentanyl	U	Ingst	Int-S	1	
		Alprazolam					
		Ethanol					
390	33 y F	Acetaminophen	A	Ingst	Int-S	1	600 mcg/mL in serum at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
391	34 y F	Acetaminophen	A	Ingst	Int-S	1	25 mg/L in blood (unspecified) at autopsy
		Ibuprofen					
		Aspirin					acetylsalicylic acid 18.5 mg/dL in blood (unspecified) at autopsy
		Diphenhydramine					
		Loratadine					
392	34 y M	Hydromorphone	A	Par	Int-S	1	
393	34 y M	Colchicine	A	Ingst	Int-S	2	
		Atenolol					
		Phenytoin					
		Fenofibrate					
		Trazodone					
		Oxycodone					
		Gemfibrozil					
		Mirtazapine					
		Haloperidol					
		Indomethacin[Cr]					
		Losartan[Cr]					
394 p	34 y M	Fentanyl patch	A	Ingst	Int-S	1	
395 p	34 y F	Acetaminophen/oxycodone	U	Ingst	Int-S	2	
		Benzodiazepine					
		Ethanol					
396 a	34 y F	Methadone	C	Ingst+Oth	Oth-W	2	550 ng/mL in blood (unspecified) at autopsy
							890 ng/mL in gastric (stomach content) at autopsy
		Benzodiazepine					
397	34 y M	Acetaminophen	A	Ingst	Int-S	1	
		Ethanol					
398 i	34 y M	Acetaminophen	A	Ingst	Int-S	2	534 mg/L in blood (unspecified) at autopsy
399 p	34 y M	Oxycodone	A/C	Ingst	Int-A	2	
400 p	34 y M	Methadone	A	Ingst	Unt-G	1	
401 pha	34 y M	Methadone	A	Ingst	Int-U	1	0.410 mg/L in serum at autopsy
402	34 y F	Acetaminophen	A	Ingst	Int-U	2	32.2 mg/L in blood (unspecified) at autopsy
		Zolpidem					
403	34 y F	Acetaminophen	A/C	Ingst	Int-M	1	41 mcg/mL in serum at autopsy
404 h	34 y F	Acetaminophen	A/C	Ingst	Int-M	2	45 mcg/mL in serum at autopsy
		Hydrocodone					
		Ethanol					
405	34 y M	Acetaminophen/oxycodone	A	Ingst	Int-S	2	110.6 mcg/mL in serum at autopsy
406	35 y F	Acetaminophen/hydrocodone	A/C	Ingst	Int-S	1	199 mcg/mL in blood (unspecified) at autopsy
407 pa	35 y F	Methadone	C	Ingst	AR-D	2	688 ng/mL in blood (unspecified) at autopsy
408	35 y F	Acetaminophen/ diphenhydramine	C	Ingst	Int-U	2	
		Acetaminophen/hydrocodone					
409 p	35 y F	Methadone	U	Ingst	Unk	3	0.3 mg/L in blood (unspecified) at autopsy
410	35 y M	Acetaminophen/ diphenhydrmine	A	Ingst	Int-S	2	463 mcg/mL in blood (unspecified) at autopsy
411	35 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	1	178 mcg/mL in blood (unspecified) at autopsy
		Ethanol					0.030 mg/dL in blood (unspecified) at autopsy
412 p	35 y F	Acetaminophen	A	Ingst	Int-S	2	45 mcg/mL in serum at autopsy
413 p	35 y F	Methadone	A/C	Ingst	Int-A	1	0.580 mcg/mL in blood (unspecified) at autopsy
		Diazepam					
414 ha	36 y M	Acetaminophen/ diphenhydramine	C	Ingst	Int-M	1	171 mcg/mL in plasma at autopsy
		Ethanol					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
415	36 y F	Hydrocodone Oxycodone Aspirin	A	Ingst	Int-S	2	
416 p	36 y F	Acetaminophen/ diphenhydramine	C	Ingst	Int-S	2	
417 p	36 y M	Acetaminophen/hydrocodone Propoxyphene/acetaminophen Ethanol	A	Ingst	Int-S	1	Acetaminophen 134 mcg/mL in serum at autopsy 161 mg/dL in blood (unspecified) at autopsy
418 p	37 y F	Acetaminophen/hydrocodone Sertraline Ethanol Benzodiazepine	C	Ingst	Int-A	1	Acetaminophen 57 mg/L in blood (unspecified) at autopsy
419	37 y M	Acetaminophen	U	Ingst	Unk	2	77.7 mcg/mL in serum at autopsy 60.8 mg/L in blood (unspecified) at autopsy
420 p	37 y M	Methadone	U	Ingst	Int-U	1	
421 h	37 y M	Acetaminophen/hydrocodone	C	Ingst	Int-M	1	Acetaminophen 18 mcg/mL in serum at autopsy
422	37 y M	Acetaminophen/ diphenhydramine	C	Ingst	Int-S	2	Acetaminophen and diphenhydramine 3.5 mcg/ mL in blood (unspecified) at autopsy
423 pha	37 y M	Opioid Ethanol	A/C	Ingst	Unk	1	Ethanol 261 mg/dL in blood (unspecified) at autopsy
424 pa	37 y F	Oxycodone Cocaine Benzodiazepine	U	Ingst	Unk	2	
425 a	37 y M	Aspirin Acetaminophen/aspirin/ caffeine Aspirin	A	Ingst	Int-S	1	Salicylate 31 mg/dL in serum at autopsy Salicylate 48 mg/dL in serum at autopsy Salicylate 58.7 mg/dL in serum at autopsy Salicylate 72.7 mg/dL in serum at autopsy Salicylate 128 mg/dL in serum at autopsy Acetaminophen 107 mcg/mL in serum at autopsy Acetaminophen 128 mcg/mL in serum at autopsy
426 pa	37 y M	Oxycodone Carisoprodol	U	Ingst	Unk	2	0.6 mg/L in blood (unspecified) at autopsy 18 mg/L in blood (unspecified) at autopsy Meprobamate 26 mg/L in blood (unspecified) at autopsy
427 p	37 y M	Morphine Alprazolam Fentanyl	C	Ingst+ Derm	Int-M	2	
428	38 y F	Acetaminophen	A	Ingst	Int-S	1	743 mcg/mL in blood (unspecified) at autopsy
429 ph	38 y M	Fentanyl	A	Ingst	Int-S	1	13.9 ng/mL in blood (unspecified) at autopsy
430	38 y F	Acetaminophen Acetaminophen/hydrocodone	C	Ingst	Unk	1	600 mcg/mL in serum at autopsy
431 pi	38 y M	Propoxyphene Ethanol	U	Ingst	Int-A	1	2,054 ng/mL in blood (unspecified) at autopsy 202 mg/dL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
432 h	38 y M	Acetaminophen	A	Ingst	Int-S	1	202 mcg/mL in blood (unspecified) at autopsy
		Carbamazepine					202 mcg/mL in blood (unspecified) at autopsy
		Cough/cold preparation unknown					
433 pa	38 y F	Oxycodone	A	Ingst	Int-S	1	5.6 mg/L in blood (unspecified) at autopsy
434 p	38 y F	Acetaminophen/hydrocodone	U	Ingst	Unk	1	Hydrocodone bitartrate and acetaminophen 0.220 mg/L in blood (unspecified) at autopsy
		Benzodiazepine					Alprazolam 0.350 mg/L in blood (unspecified) at autopsy
		Promethazine					0.1 mg/L in blood (unspecified) at autopsy
435 pa	38 y M	Fentanyl	U	Ingst+ Derm	Unk	1	12 ng/mL in blood (unspecified) at autopsy
							Norfentanyl 2.6 ng/mL in blood (unspecified) at autopsy
		Carisoprodol					10 mg/L in blood (unspecified) at autopsy
							Meprobamate 30 mg/L in blood (unspecified) at autopsy
		Benzodiazepine					Alprazolam 0.040 mg/L in blood (unspecified) at autopsy
436	38 y M	Acetaminophen/ hydrocodone	C	Ingst	Int-M	1	
		Antihistamine/ decongestant					
		Ethanol					
437 p	38 y F	Acetaminophen/ oxycodone	A/C	Ingst	Int-U	2	Oxycodone 0.1 mg/L in blood (unspecified) at autopsy
							Acetaminophen 58 mg/L in blood (unspecified) at autopsy
		Lorazepam					Nordiazepam 0.1 mg/L in blood (unspecified) at autopsy
		Ethanol					
438 h	38 y M	Aspirin	A	Ingst	Int-S	1	99 mg/dL in serum at autopsy
							109 mg/dL in serum at autopsy
439	38 y F	Acetaminophen/ hydrocodone	C	Ingst	Int-S	1	Acetaminophen 56.9 mcg/mL in serum at autopsy
		Carisoprodol					
440	38 y F	Acetaminophen	A	Ingst	Int-S	1	
441	38 y M	Acetaminophen/ diphenhydramine	U	Ingst	Int-S	3	Acetaminophen 235 mcg/dL in serum at autopsy
442 a	38 y F	Acetaminophen	A	Ingst	Int-S	1	123 mcg/mL in serum at autopsy
		Diphenhydramine					
		Ethanol					
443 p	39 y M	Acetaminophen/ propoxyphene	U	Ingst	Int-U	1	
		Ethanol					
444 p	39 y F	Acetaminophen/ oxycodone	A	Ingst	Int-S	3	
		Clonazepam					
		Methadone					
445	39 y F	Acetaminophen/ diphenhydramine	U	Ingst	Int-S	1	Acetaminophen 116 mcg/mL in blood (unspecified) at autopsy
446	39 y F	Acetaminophen/ diphenhydramine	A	Ingst	Int-S	3	Acetaminophen 7.8 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
							Acetaminophen 11 mg/L in blood (unspecified) at autopsy
447 pa	39 y F	Fentanyl	A/C	Ingst+Derm	Int-S	1	0.010 mg/L in blood (unspecified) at autopsy
		Benzodiazepine					
		Codeine					Morphine 23,722 ng/mL in urine at autopsy
							Morphine 0.410 mg/L in blood (unspecified) at autopsy
		Hydrocodone					Hydromorphone 322.510 ng/mL in urine at autopsy
		Unk antipsychotic					
		Unk drug					
		Unk antipsychotic					
		Methocarbamol					
		Benzodiazepine					
		Antihyperlipidemic					
		Marijuana					Tetrahydrocannabinol 42.150 ng/mL in urine at autopsy
448 h	39 y F	Acetaminophen	A	Ingst	Int-U	2	55 mg/L in blood (unspecified) at autopsy
		Salicylate					Aspirin 13 mg/dL in blood (unspecified) at autopsy
449	39 y F	Methadone	U	Ingst	Int-U	2	
450 pa	39 y F	Oxycodone	C	Unk	Unk	1	Oxycodone 0.190 mg/L in blood (unspecified) at autopsy
		Citalopram					detected but not quantified in blood (unspecified) at autopsy
		Topiramate					detected but not quantified in blood (unspecified) at autopsy
451 p	39 y F	Oxycodone	A	Ingst	Int-U	2	
452	39 y M	Acetaminophen/hydrocodone	A/C	Ingst	Int-A	3	
453 h	39 y F	Acetaminophen/opioid	A	Ingst	Int-S	1	Acetaminophen 86 mcg/mL in plasma at autopsy
		Tramadol					
		Carisoprodol					
		Quetiapine					
		Trazodone					
		Duloxetine					
		Fexofenadine					
		Naproxen					
		Thyroid preparation					
		Clonazepam					
		Ethanol					
454 pa	39 y F	Methadone	A/C	Ingst	Int-S	2	0.3 mg/L in blood (unspecified) at autopsy
							EDDP 0.030 mg/L in blood (unspecified) at autopsy
		Cyclobenzaprine					0.030 mg/L in blood (unspecified) at autopsy
		Buspirone					
		Hydroxyzine					Hydroxyzine pamoate 0.420 mg/L in blood (unspecified) at autopsy
		Quetiapine					
		Ethanol					
455 i	39 y F	Acetaminophen	A	Ingst	Int-S	2	
		Naproxen					
		Ethanol					
456	40 y F	Acetaminophen	A/C	Ingst	Int-M	1	19 mcg/mL in blood (unspecified) at autopsy
		Ethanol					
457 p	40 y F	Fentanyl patch	U	Unk	Unk	2	Fentanyl transdermal system 7.5 ng/mL in blood (unspecified) at autopsy
							Norfentanyl 8.4 ng/mL in blood (unspecified) at autopsy
		Ethanol					0.050 mg/dL in blood (unspecified) at autopsy
		Oxycodone					0.060 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Paroxetine					
		Zolpidem					
458 p	40 y F	Oxycodone	U	Ingst	Int-S	1	0.4 mg/L in blood (unspecified) at autopsy
		Carisoprodol					33 mg/L in blood (unspecified) at autopsy
							Meprobamate 3 mg/L in blood (unspecified) at autopsy
		Propranolol					
		Citalopram					
		Quetiapine					
		Fluoxetine					
459 pa	40 y F	Methadone	U	Ingst	Int-S	1	0.130 mg/L in blood (unspecified) at autopsy
460 pa	40 y M	Morphine	U	Ingst	Unk	1	0.620 mg/L in blood (unspecified) at autopsy
		Carisoprodol					2 mg/L in blood (unspecified) at autopsy
							Meprobamate 8 mg/L in blood (unspecified) at autopsy
461	40 y F	Acetaminophen	A	Ingst	Int-M	1	44 mcg/dL in blood (unspecified) at autopsy
462 p	40 y F	Codeine	U	Unk	Int-S	2	1.5 mg/L in blood (unspecified) at autopsy
		Diphenhydramine					3.7 mg/L in blood (unspecified) at autopsy
		Cyclobenzaprine					0.1 mg/L in blood (unspecified) at autopsy
		Trazodone					0.2 mg/L in blood (unspecified) at autopsy
		Citalopram					
		Olanzapine					
		Dextromethorphan					0.070 mg/L in blood (unspecified) at autopsy
463	40 y F	Aspirin	A	Ingst	Int-S	1	Salicylate 80 mg/dL in serum at autopsy
							Salicylate 470 mg/dL in blood (unspecified) at autopsy
							Salicylate 144.6 mg/dL in serum at autopsy
464	40 y M	Acetaminophen	A	Ingst	Int-S	1	198.5 mcg/mL in blood (unspecified) at autopsy
465	40 y F	Acetaminophen	A	Ingst	Unk	1	91 mg/L in blood (unspecified) at autopsy
466 ph	40 y M	Acetaminophen/diphenhydramine	A	Ingst	Int-S	1	Acetaminophen 122.8 mcg/mL in blood (unspecified) at autopsy
		Ethanol					192 mg/dL in blood (unspecified) at autopsy
467 p	40 y M	Codeine	A	Ingst	Unk	1	
		Tramadol					
		Trazodone					
468 p	40 y M	Methadone	U	Ingst	Int-S	1	1.7 mg/L in other at autopsy
		Acetaminophen/oxycodone					Oxycodone 0.260 mg/L in other at autopsy
		Morphine					60 mg/L in other at autopsy
		Trazodone					
		Benzodiazepine					
469	40 y F	Methadone	A	Ingst	Int-S	2	
		Hydrocodone					
		Carisoprodol					
		Risperidone					
		Venlafaxine					
		Tramadol					
		Benzodiazepine					
470	40 y F	Acetaminophen	U	Ingst	Unk	2	22 mcg/mL in blood (unspecified) at autopsy
471 p	40 y F	Acetaminophen/hydrocodone	A	Ingst	Int-U	1	
		Quetiapine					
		Morphine Patch					
472 a	40 y M	Acetaminophen	C	Ingst	Int-U	1	92 mcg/mL in serum at autopsy
		Ethanol					
473	40 y F	Acetaminophen	U	Unk	Unk	1	36 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
474	41 y M	Acetaminophen/oxycodone	U	Ingst	Int-S	1	
475	41 y F	Acetaminophen	U	Ingst	Int-U	1	
476 p	41 y M	Oxycodone	A/C	Ingst	Int-A	1	0.710 mg/L in blood (unspecified) at autopsy
							Oxymorphone 0.060 mg/L in blood (unspecified) at autopsy
		Alprazolam					0.050 mg/L in blood (unspecified) at autopsy
		Thioridazine					
		Lithium					
477	41 y F	Acetaminophen/butalbital/caffeine/codeine	A/C	Ingst	Int-S	1	Acetaminophen 19 mcg/mL in serum at autopsy
478 p	41 y F	Methadone	U	Ingst	Int-S	2	
		Carisoprodol					
		Opioid					
		Benzodiazepine					
		Amitriptyline					
		Atenolol					
479 p	41 y M	Opioid	U	Ingst	Int-S	2	
		Lisinopril					
480 pa	41 y M	Hydrocodone	U	Ingst	Unk	3	0.070 mg/L in blood (unspecified) at autopsy
		Morphine					0.050 mg/L in blood (unspecified) at autopsy
							Morphine greater than 100 mg/L in urine at autopsy
481 p	41 y M	Methadone	A	Ingst	Unk	1	260 ng/mL in blood (unspecified) at autopsy
							EDDP 57 mcg/mL in blood (unspecified) at autopsy
		Benzodiazepine					
		Nail polish remover					Ethanol 17 mg/dL in blood (unspecified) at autopsy
482 p	41 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	3	
		Alprazolam					
		Ethanol					
483	41 y F	Acetaminophen/diphenhydramine	A	Ingst	Int-M	1	
		Acetaminophen/caffeine/pyrilamine					
484 pa	42 y F	Oxycodone	U	Ingst	Unk	2	Oxycodone 0.9 mg/L in blood (unspecified) at autopsy
		Cyclobenzaprine					0.1 mg/L in blood (unspecified) at autopsy
		Promethazine					0.1 mg/L in blood (unspecified) at autopsy
		Imipramine					Imipramine 0.070 mg/L in blood (unspecified) at autopsy
		Unk drug					
485	42 y F	Acetaminophen	C	Ingst	Unt-M	1	
486	42 y F	Acetaminophen	A	Ingst	Int-S	1	93 mcg/mL in serum at autopsy
		Amitriptyline					
		Sertraline					
		Tramadol					
		Alprazolam					
		Lisinopril					
		Unk substance					
487	42 y F	Acetaminophen	A	Ingst	Unk	2	
		Ibuprofen					
		Aspirin					
488 p	42 y F	Oxycodone	A	Ingst	Int-U	2	
489	43 y M	Acetaminophen	A	Ingst	Unk	1	113 mcg/mL in blood (unspecified) at autopsy
490 p	43 y M	Codeine/acetaminophen	U	Ingst	Unk	2	
		Hydrocodone					
		Diazepam					
491	43 y F	Acetaminophen	A	Ingst	Int-S	2	103.8 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
492	43 y F	Acetaminophen	A	Ingst	Int-S	1	383 mcg/mL in serum at autopsy 340 mcg/mL in serum at autopsy
493	43 y M	Acetaminophen	A/C	Ingst	Int-S	1	
494 p	43 y M	Opioid Benzodiazepine Carbamazepine Unk substance Marijuana	U	Ingst	Int-S	3	
495 p	43 y F	Acetaminophen	A	Ingst	Int-S	1	104 mcg/mL in blood (unspecified) at autopsy 107 mcg/mL in blood (unspecified) at autopsy
496 p	43 y M	Unk opioid Methadone	A	Ingst+Par	Int-S	2	
497	43 y M	Acetaminophen/ diphenhydramine	C	Ingst	Int-M	1	Acetaminophen 98.5 mcg/mL in blood (unspecified) at autopsy
498	43 y F	Acetaminophen	C	Ingst	Int-S	1	
		Acetaminophen/ diphenhydramine	U	Ingst+Unk	Unk	3	3.750 mcg/mL in serum at autopsy
499 p	44 y M	Acetaminophen Unk drug					
500 p	44 y F	Morphine Alprazolam Amitriptyline	A/C	Ingst	Int-S	2	
501	44 y F	Acetaminophen/hydrocodone Carisoprodol Alprazolam	C	Ingst	Int-S	2	
502 ph	44 y F	Propoxyphene Carisoprodol Flurazepam	A	Ingst	Int-S	2	
503 pa	44 y M	Methadone	U	Unk	Unk	1	0.510 mg/L in blood (unspecified) at autopsy
504	44 y F	Oxycodone Acetaminophen/codeine	C	Ingst	Int-M	3	
505	44 y F	Acetaminophen	A	Ingst	Int-S	1	
506	44 y M	Acetaminophen	A	Ingst	Int-S	1	190 mcg/mL in serum at autopsy
507	44 y F	Acetaminophen	U	Ingst	Unk	1	
508	45 y F	Naproxen	A	Ingst	Int-S	3	
509 p	45 y M	Methadone	U	Ingst	Int-S	1	0.550 mg/L in blood (unspecified) at autopsy
		Amitriptyline					0.150 mg/L in blood (unspecified) at autopsy nortriptyline 0.2 mg/L in blood (unspecified) at autopsy
		Cocaine Ethanol					
510	45 y M	Acetaminophen/hydrocodone Carisoprodol Alprazolam	U	Ingst	Unk	2	
511	45 y F	Acetaminophen/hydrocodone	A/C	Ingst	Int-M	1	
512 a	45 y M	Aspirin	A	Ingst+Unk	Int-S	1	Salicylate 978 mg/L in unknown at autopsy Salicylic acid 847 mg/L in blood (unspecified) at autopsy
		Ethanol					0.1 g/dL in blood (unspecified) at autopsy
		Cocaine					315 ng/dL in blood (unspecified) at autopsy
513 pha	45 y F	Acetaminophen/hydrocodone	U	Ingst	Int-S	1	Acetaminophen 42 mcg/mL in blood (unspecified) at autopsy
		Ethanol					Hydrocodone 0.052 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
514 p	45 y F	Fentanyl	A	Ingst	Int-U	2	
515	45 y M	Acetaminophen	A/C	Ingst	Int-M	1	92 mcg/mL in serum at autopsy
516 p	46 y F	Methadone	A/C	Ingst	Int-S	2	
		Ziprasidone					
		Trazodone					
		Clonazepam					
517	46 y F	Acetaminophen	A	Ingst	Int-S	1	819 mcg/mL in plasma at autopsy
		Alprazolam					
518 p	46 y F	Morphine (long-acting)					
			U	Ingst	Int-S	2	
519 p	46 y M	Oxycodone	U	Ingst	Unk	1	0.380 mg/L in blood (unspecified) at autopsy
		Diazepam					Valium 0.4 mg/L in blood (unspecified) at autopsy
							Nordiazepam 4 mg/L in blood (unspecified) at autopsy
		Trazodone					0.150 mg/L in blood (unspecified) at autopsy
		Hydrocodone					Hydrocodone bitartrate 0.040 mg/L in blood (unspecified) at autopsy
520 p	46 y F	Methadone	U	Unk	Unk	1	
521 pa	46 y F	Methadone	A/C	Ingst+ Unk	Int-S	1	229 ng/mL in blood (unspecified) at autopsy
							EDDP 52.2 ng/mL in blood (unspecified) at autopsy
		Venlafaxine					4,362 ng/mL in blood (unspecified) at autopsy
							Norvenlafaxine 579 ng/mL in blood (unspecified) at autopsy
		Methylphenidate					48.6 ng/mL in blood (unspecified) at autopsy
		Bupropion					165 ng/mL in blood (unspecified) at autopsy
		Chlorpheniramine					69.4 ng/mL in blood (unspecified) at autopsy
		Unk drug					
		Trazodone					0.4 mcg/mL in blood (unspecified) at autopsy
522	46 y M	Acetaminophen	A	Ingst	Int-S	1	
523	46 y F	Acetaminophen	C	Ingst	Int-A	1	44 mcg/mL in serum at autopsy
		Acetaminophen/hydrocodone					
524	46 y F	Acetaminophen	U	Ingst	Int-S	2	23 mg/mL in serum at autopsy
525 h	46 y F	Acetaminophen/ diphenhydramine	A	Ingst	Int-S	2	
526 p	46 y M	Fentanyl	A/C	Ingst	Int-A	2	
		Cocaine					
527 h	46 y F	Acetaminophen/oxycodone	C	Ingst	Int-M	1	Acetaminophen 153 mcg/mL in blood (unspecified) at autopsy
528 pa	46 y F	Oxycodone (long-acting)	U	Par+Unk	Unk	1	Oxycontin 0.650 mg/L in blood (unspecified) at autopsy
		Oxycodone					
		Amitriptyline					0.4 mg/L in blood (unspecified) at autopsy
							Nortriptyline 0.450 mg/L in blood (unspecified) at autopsy
529	46 y M	Acetaminophen	A/C	Ingst	Int-S	2	15 mcg/mL in blood (unspecified) at autopsy
		Ethanol					
530	47 y M	Acetaminophen/hydrocodone	A	Ingst	Int-S	1	
531	47 y F	Acetaminophen	U	Ingst	Int-M	1	138 mcg/mL in blood (unspecified) at autopsy
		Ethanol					
532 a	47 y M	Methadone	A	Ingst	Int-S	1	
		Clonazepam					
533 p	47 y M	Acetaminophen/propoxyphene	U	Ingst	Int-S	1	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
534 pa	47 y F	Tramadol	A/C	Ingst	Int-S	1	1,900 ng/mL in blood (unspecified) at autopsy
		Meperidine					*o*-desmethyltramadol 460 ng/mL in blood (unspecified) at autopsy
		Sertraline					0.080 mcg/mL in blood (unspecified) at autopsy
		Zolpidem					60 ng/mL in blood (unspecified) at autopsy
		Antihistamine					
535	47 y F	Methadone	A/C	Ingst	Int-U	1	
		Oxycodone					
		Alprazolam					
		Zolpidem					
536 a	47 y M	Salicylate	A	Ingst	Int-S	1	98.1 mg/dL in blood (unspecified) at autopsy
							1,140 mg/L in blood (unspecified) at autopsy
537	47 y F	Acetaminophen/hydrocodone	C	Ingst	Int-S	2	Acetaminophen 124 mcg/mL in blood (unspecified) at autopsy
538 i	47 y F	Aspirin	A	Ingst	Int-S	2	
		Venlafaxine					
539	47 y M	Acetaminophen/diphenhydramine	A	Ingst	Int-S	2	Acetaminophen 340 mcg/mL in blood (unspecified) at autopsy
							Acetaminophen 630 mg/L in blood (unspecified) at autopsy
							Diphenhydramine 4.4 mg/L in blood (unspecified) at autopsy
540 p	48 y M	Acetaminophen/hydrocodone	A/C	Ingst	Unk	2	Acetaminophen 14 mcg/mL in serum at autopsy
		Carisoprodol					
		Alprazolam					
541 p	48 y M	Hydrocodone	A	Ingst	Int-S	2	7.5 mg/L in blood (unspecified) at autopsy
							Acetaminophen 374 mg/L in blood (unspecified) at autopsy
		Alprazolam					
		Promethazine					
		Copegus					
		Tadalafil					
542	48 y F	Acetaminophen	A	Ingst	Int-S	2	
		Methanol					261 mg/dL in blood (unspecified) at autopsy
543 ha	48 y F	Acetaminophen/diphenhydramine	A	Ingst	Int-S	1	508 mcg/mL in plasma at autopsy
							104 mcg/mL in plasma at autopsy
544 pha	48 y M	Methadone	A	Ingst+ Inhal	Int-S	2	
		Oxycodone					
		Amitriptyline					
		Benzodiazepine					
		Marijuana					
545 h	48 y F	Acetaminophen/diphenhydramine	U	Ingst	Int-S	2	
		Antifreeze (ethylene glycol)					
546 pa	48 y M	Oxycodone	U	Ingst	Unk	1	0.240 mg/L in blood (unspecified) at autopsy
		Alprazolam					0.110 mg/L in blood (unspecified) at autopsy
		Hydrocodone/acetaminophen					Hydrocodone 0.040 mg/L in blood (unspecified) at autopsy
547	49 y F	Morphine	A	Ingst	Int-S	1	0.280 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Benzodiazepine					Desalkylflurazepam 370 ng/mL in blood (unspecified) at autopsy Hydroxyethylflurazepam 380 ng/mL in blood (unspecified) at autopsy Temazepam 0.150 mcg/mL in blood (unspecified) at autopsy
		Temazepam					
		Alprazolam					79 ng/mL in blood (unspecified) at autopsy
		Ethanol					
		Acetaminophen					
		Diazepam					
548	49 y M	Acetaminophen	A/C	Ingst	Int-S	2	9 mg/L in blood (unspecified) at autopsy
		Unk drug					
		Carbon monoxide					
549 pa	49 y F	Oxycodone (long-acting)	C	Ingst	Int-U	1	64 ng/mL in blood (unspecified) at autopsy
550 pa	49 y M	Aspirin	A	Ingst	Int-S	1	79 mg/dL in blood (unspecified) at autopsy Salicylates 591.7 mg/L in blood (unspecified) at autopsy
		Cocaine					0.050 mg/L in blood (unspecified) at autopsy Benzoylecgonine 1.1 mg/L in blood (unspecified) at autopsy 0.049 mg/kg in gastric (stomach content) at autopsy
551 p	49 y F	Acetaminophen/hydrocodone	U	Ingst	Int-U	1	
552 ph	49 y M	Acetaminophen/propoxyphene	A	Ingst	Int-S	2	
		Alprazolam					
		Nabumetone					
553	49 y F	Acetaminophen	C	Ingst	Unt-T	2	
554 ph	49 y F	Acetaminophen/propoxyphene	A	Ingst	Int-S	1	Acetaminophen 257.3 mcg/mL in blood (unspecified) at autopsy
		Escitalopram					
		Benzodiazepine					
		Meloxicam					
		Celecoxib					
555 h	49 y F	Acetaminophen/butalbital/codeine	A	Ingst	Int-S	2	Acetaminophen 12 mcg/mL in serum at autopsy
		Carisoprodol					
556 pa	50 y F	Acetaminophen/hydrocodone	U	Unk	Int-S	1	Hydrocodone 0.3 mg/L in blood (unspecified) at autopsy
		Carisoprodol					6 mg/L in blood (unspecified) at autopsy 10 mg/L in blood (unspecified) at autopsy
		Diazepam					0.4 mg/L in blood (unspecified) at autopsy Nordiazepam 0.3 mg/L in blood (unspecified) at autopsy
557 p	50 y F	Aspirin	A	Ingst	Int-S	2	
558 p	50 y F	Oxycodone	U	Ingst	Unk	2	Oxycodone 0.9 mg/L in blood (unspecified) at autopsy
		Diazepam					0.3 mg/L in blood (unspecified) at autopsy
		Zolpidem					0.1 mg/L in blood (unspecified) at autopsy
		Antihistamine/decongestant					0.06 mg/L in blood (unspecified) at autopsy
		Naproxen					
		Amphetamine					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
559	50 y F	Acetaminophen/hydrocodone	C	Ingst	Int-U	2	52 mcg/mL in blood (unspecified) at autopsy
560 i	50 y M	Salicylate	A	Ingst	Int-S	1	84.2 mg/dL in blood (unspecified) at autopsy
							62 mg/dL in blood (unspecified) at autopsy
561	50 y M	Colchicine	C	Ingst	Unk	2	
		Ibuprofen					
562 h	50 y F	Acetaminophen	A	Ingst	Int-S	1	69 mcg/mL in blood (unspecified) at autopsy
563 p	50 y F	Morphine	U	Ingst	Int-S	1	4.9 mg/L in blood (unspecified) at autopsy
		Diazepam					0.140 mg/L in blood (unspecified) at autopsy
							Nordiazepam 0.170 mg/L in blood (unspecified) at autopsy
		Gabapentin					
		Acetaminophen/oxycodone					
		Hydromorphone					
564 pa	50 y F	Oxycodone	U	Ingst	Unk	1	0.240 mg/L in blood (unspecified) at autopsy
		Amitriptyline					0.110 mg/L in blood (unspecified) at autopsy
		Diphenhydramine					0.190 mg/L in blood (unspecified) at autopsy
		Cyclobenzaprine					0.040 mg/L in blood (unspecified) at autopsy
		Acetaminophen					
		Enalapril					
		Unk substance					
		Unk drug					
565	50 y M	Acetaminophen	A	Ingst	Unk	1	17 mcg/mL in blood (unspecified) at autopsy
		Salicylates					16 mg/dL in blood (unspecified) at autopsy
		Ethanol					
566	50 y M	Morphine	A	Ingst+Unk	Unt-G	1	
567 pha	50 y F	Acetaminophen/ hydrocodone	A	Ingst	Unt-M	1	
		Methadone					
		Methamphetamine					
		Ethanol					
568	50 y F	Acetaminophen	A	Ingst	Int-M	1	
569 p	50 y F	Acetaminophen/hydrocodone	U	Ingst	Int-S	2	Vicodin 246 mcg/mL in blood (unspecified) at autopsy
		Unk drug					
570	50 y M	Colchicine	A/C	Ingst	Int-S	1	
		Amlodipine					
		Metoprolol					
		Lisinopril					
		Glipizide					
		Pioglitazone					
		Clopidogrel					
		Simvastatin					
571 h	50 y F	Acetaminophen/oxycodone	U	Ingst	Int-S	2	
		Carisoprodol					
572	51 y F	Unk substance	U	Unk	Unk	2	
573 pa	51 y M	Hydrocodone	U	Ingst	Unk	2	Hydrocodone bitartrate 0.4 mg/L in blood (unspecified) at autopsy
		Tramadol					1.1 mg/L in blood (unspecified) at autopsy
		Zolpidem					0.1 mg/L in blood (unspecified) at autopsy
		Lisinopril					
		Mirtazapine					
		Meprobamate					
574	51 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	1	Acetaminophen 157 mcg/mL in plasma at autopsy
575	51 y F	Acetaminophen/hydrocodone	C	Ingst	Unk	1	Acetaminophen 104.7 mcg/mL in serum at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
576	51 y F	Acetaminophen	A	Ingst	Int-S	1	
		Alprazolam					
577	51 y F	Acetaminophen	A	Ingst	Int-S	1	255 mcg/mL in blood (unspecified) at autopsy
578 h	51 y M	Acetaminophen/oxycodone	C	Ingst	Int-M	3	
		Acetaminophen					46 mg/L in serum at autopsy (unspecified) at autopsy
		Ethanol					
579 h	51 y F	Acetaminophen	A	Ingst	Int-S	1	58.9 mcg/mL in blood (unspecified) at autopsy
		Ethanol					
580 pa	51 y F	Oxycodone	U	Unk	Unk	2	0.260 mg/L in blood (unspecified) at autopsy
		Promethazine					7.050 mg/L in blood (unspecified) at autopsy
		Chlorpromazine					
		Venlafaxine					
581 h	51 y F	Aspirin	A	Ingst	Int-S	1	Salicylate 91.3 mg/dL in serum at autopsy
582 p	51 y F	Fentanyl patch	A	Ingst	Int-S	2	
583 ha	51 y F	Naproxen	U	Ingst	Int-S	3	
		Sertraline					
		Hydroxyzine					
584	51 y F	Acetaminophen/oxycodone	U	Ingst+ Unk	Unk	2	
		Zolpidem					
585 pa	51 y M	Methadone	U	Ingst	Int-A	1	1.2 mcg/mL in blood (unspecified) at autopsy
							8.4 mcg/G in liver at autopsy
							1.7 mg in gastric (stomach content) at autopsy
		Alprazolam					268 ng/mL in blood (unspecified) at autopsy
586 pa	51 y M	Methadone	U	Unk	Unk	1	0.170 mg/L in blood (unspecified) at autopsy
		Bupropion (long-acting)					
		Sertraline					
		Methamphetamine					
587 h	52 y F	Aspirin	A	Ingst	Int-S	2	Acetylsalicylic acid 65 mg/dL in blood (unspecified)at autopsy
		Acetaminophen					
588	52 y F	Acetaminophen/ hydrocodone	A/C	Ingst	Int-S	1	Acetaminophen 10 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/ diphenhydramine					
		Gabapentin					
		Zolpidem					
		Alprazolam					
589	52 y M	Acetaminophen	A/C	Ingst	Int-S	3	223 mcg/mL in blood (unspecified) at autopsy
590	52 y M	Acetaminophen	C	Ingst	AR-D	3	
		Ethanol					
591 p	52 y F	Fentanyl patch	U	Ingst + Derm	Unk	1	Fentanyl transdermal system 19 ng/mL in blood (unspecified) at autopsy
							Norfentanyl 3.3 ng/mL in blood (unspecified) at autopsy
		Methadone					0.9 mg/L in blood (unspecified) at autopsy
		Oxycodone					0.050 mg/L in blood (unspecified) at autopsy
		Promethazine					0.2 mg/L in blood (unspecified) at autopsy
		Clonidine					
		Metoclopramide					
592 h	52 y F	Acetaminophen	A	Ingst	Unk	2	
593	52 y M	Aspirin	A	Ingst+Inhal	Unk	2	
		Cocaine					
594 pa	52 y M	Oxycodone	U	Derm+Unk	Unk	1	0.680 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Fentanyl					61 ng/mL in blood (unspecified) at autopsy
		Diazepam					0.190 mg/L in blood (unspecified) at autopsy
595 a	52 y F	Acetaminophen	A/C	Ingst	Unk	3	66 mg/L in serum at autopsy
		Aspirin					46 mg/dL in serum at autopsy
596	52 y M	Aspirin	A	Ingst	Int-S	1	96.7 mg/dL in serum at autopsy
597	53 y F	Aspirin	A	Ingst	Int-S	1	
		Acetaminophen					
		Opioid					
598 pa	53 y F	Morphine	U	Unk	Unk	2	0.360 mg/L in blood (unspecified) at autopsy
599 p	53 y F	Fentanyl	A/C	Ingst	Int-S	1	
		Diphenoxylate/atropine					
600 pa	53 y F	Fentanyl	U	Unk	Unk	2	21 mcg/L in blood (unspecified) at autopsy
		Oxycodone					Norfentanyl 7.1 mcg/L in blood (unspecified) at autopsy
		Propoxyphene					0.1 mg/L in blood (unspecified) at autopsy
							0.2 mg/L in blood (unspecified) at autopsy
							Norpropoxyphene 5 mg/L in blood (unspecified) at autopsy
		Trazodone					1.8 mg/L in blood (unspecified) at autopsy
		Unk drug					
601 p	53 y F	Tramadol	U	Ingst	Unk	2	9.5 mg/L in blood (unspecified) at autopsy
		Butalbital (unk combination)					2 mg/L in blood (unspecified) at autopsy
		Meprobamate					4 mg/L in blood (unspecified) at autopsy
602 ph	53 y M	Acetaminophen	A	Ingst	Int-S	2	
		Ibuprofen					
		Unk drug					
603	53 y M	Acetaminophen/hydrocodone	C	Ingst	Int-M	3	
604	53 y M	Tramadol	A/C	Ingst	Int-S	3	
		Acetaminophen/butalbital/ caffeine					
605 p	53 y F	Propoxyphene	A	Ingst	Int-S	2	
606	53 y F	Acetaminophen	U	Ingst	Unk	1	134.6 mcg/mL in blood (unspecified) at autopsy
607 p	53 y M	Morphine	U	Unk	Unk	3	0.140 mg/L in blood (unspecified) at autopsy
		Tramadol					0.290 mg/L in blood (unspecified) at autopsy
608	53 y M	Acetaminophen	A	Ingst	Int-S	2	
		Aspirin					
		Metoprolol					
609 p	53 y F	Meperidine/promethazine	A/C	Ingst	Int-U	3	
		Fluoxetine					
610 ha	53 y F	Aspirin	A	Ingst	Int-S	1	101 mg/dL in serum at autopsy
		Venlafaxine					
		Fluoxetine					
		Prochlorperazine					
		Acetaminophen/ diphenhydramine					
		Acetaminophen/hydrocodone					
		Clindamycin					
		Omeprazole					
611	53 y M	Acetaminophen/hydrocodone	C	Ingst	Unt-M	1	Acetaminophen 33.6 mcg/mL in serum at autopsy
		Ethanol					
612	53 y F	Acetaminophen/ diphenhydramine	A	Ingst	Int-S	1	Acetaminophen 930 mcg/mL in plasma at autopsy
		Ethanol					220 mg/dL in serum at autopsy
613	54 y F	Acetaminophen	U	Ingst	Int-S	1	282 mcg/mL in serum at autopsy
		Ethanol					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
614	54 y F	Acetaminophen	A	Ingst	Int-S	3	
615 h	54 y F	Acetaminophen	A	Ingst	Int-S	1	650 ng/mL in blood (unspecified) at autopsy
616 p	54 y M	Acetaminophen Aspirin	A	Ingst	Int-S	2	
617	54 y M	Aspirin Ethanol	A	Ingst	Int-S	1	93.5 mg/dL in serum at autopsy
618 pa	54 y F	Propoxyphene	U	Ingst	Unk	1	Norpropoxyphene 2.6 mg/L in blood (unspecified) at autopsy 0.7 mg/L in blood (unspecified) at autopsy Norpropoxyphene 6.8 mg/L in blood (unspecified) at autopsy 1.7 mg/L in blood (unspecified) at autopsy Norpropoxyphene 51 mg/kg in liver at autopsy 10 mg/kg in liver at autopsy
		Alprazolam					0.088 mg/L in blood (unspecified) at autopsy
619 p	55 y M	methadone	A	Ingst	Int-S	2	
620 pa	55 y M	Methadone	A	Unk	Int-S	1	0.810 mg/L in blood (unspecified) at autopsy 2-Ethylidene-1,5-dimethyl-3,3-diphenyl pyrrolidine 0.080 mg/L in blood (unspecified) at autopsy Methadone 6.640 mg/kg in liver at autopsy 2-Ethylidene-1,5-dimethyl-3, 3-diphenyl pyrrolidine 0.430 mg/kg in liver at autopsy
		Tramadol					0.780 mg/L in blood (unspecified) at autopsy 1.690 mg/kg in liver at autopsy
		Sertraline					940 ng/mL in blood (unspecified) at autopsy Desmethylsertraline 2,090 ng/mL in blood (unspecified) at autopsy 4000 mg/kg in liver at autopsy Desmethylsertraline 8,990 mg/kg in liver at autopsy
		Diazepam					0.020 mg/L in blood (unspecified) at autopsy Nordiazepam 0.110 mg/L in blood (unspecified) at autopsy
621 pa	55 y M	Methadone	U	Ingst	Unk	2	0.2 mg/L in blood (unspecified) at autopsy
		Amitriptyline					Amitriptyline and nortriptyline 0.4 mg/L in blood (unspecified) at autopsy
		Cocaine					
		Diphenhydramine					0.2 mg/L in blood (unspecified) at autopsy
		Cyclobenzaprine					
622 p	55 y F	Oxycodone (long-acting)	C	Ingst	Int-M	1	Oxycontin 690 ng/mL in blood (unspecified) at autopsy
623 pa	55 y F	Fentanyl patch	U	Derm	Unk	1	Fentanyl 20 ng/mL in blood (unspecified) at autopsy Norfentanyl 11 ng/mL in blood (unspecified) at autopsy
624	55 y M	Aspirin	A	Ingst	Int-S	1	Acetylsalicylic acid 118 mg/dL in serum at autopsy
625 p	55 y F	Aspirin	A	Ingst	Int-S	2	Acetylsalicylic acid 82.5 mg/dL in serum at autopsy Acetylsalicylic acid 95 mg/dL in serum at autopsy
		Acetaminophen/hydrocodone					
		Bupropion					
		Ibuprofen					
		Quetiapine					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
626	56 y F	Acetaminophen/hydrocodone	C	Ingst	Int-M	1	Lortab 10/500 163.8 mcg/mL in blood (unspecified) at autopsy
		Diazepam					
627 p	56 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	2	Acetaminophen 48.4 mcg/mL in blood (unspecified) at autopsy
		Cyclobenzaprine					
		Lorazepam					
		Ibuprofen					
		Eszopiclone					
628 ha	56 y F	Colchicine	C	Par	Unt-T	1	
629	56 y F	Acetaminophen	C	Ingst	Int-M	1	
		Ibuprofen					
		Cyclobenzaprine					
630	56 y F	Methadone	A	Ingst	Int-S	1	
		Acetaminophen/propoxyphene					Propoxyphene 0.380 mcg/mL in serum at autopsy Norpropoxyphene 0.980 mcg/mL in serum at autopsy Acetaminophen 243.4 mcg/mL in blood (unspecified) at autopsy
631 a	56 y F	Acetaminophen	A/C	Ingst	Int-S	1	59.3 mcg/mL in blood (unspecified) at autopsy
632 h	56 y F	Aspirin	A	Ingst	Int-S	1	Salicylate 125.7 mg/dL in serum at autopsy
		Indomethacin					
633	56 y M	Methadone	U	Ingst	Int-M	2	
		Diazepam					
634	56 y M	Aspirin	A	Ingst	Int-S	2	Acetylsalicylic acid 119 mcg/mL in serum at autopsy
635	56 y M	Acetaminophen	C	Ingst	Int-M	3	45.9 mcg/mL in blood (unspecified) at autopsy
636 a	56 y F	Acetaminophen/hydrocodone	C	Ingst	Int-S	2	Acetaminophen 161 mcg/mL in serum at autopsy
		Acetaminophen					
637 p	57 y M	Methadone	A	Ingst	Int-S	1	
		Tramadol					
		Bupropion					
		Propranolol					
		Gabapentin					
		Lisinopril					
		Naproxen					
638 p	57 y F	Fentanyl patch	A	Ingst	Int-S	2	
639 pa	57 y M	Oxycodone	U	Ingst	Unk	1	0.270 mg/L in blood (unspecified) at autopsy
		Carisoprodol					8 mg/L in blood (unspecified) at autopsy Meprobamate 4 mg/L in blood (unspecified) at autopsy
		Acetaminophen					Alprazolam 0.030 mg/L in blood (unspecified) at autopsy
640 h	57 y M	Acetaminophen	C	Ingst	Int-S	1	329 mcg/mL in blood (unspecified) at autopsy
641 p	57 y F	Oxycodone	A/C	Ingst	Int-S	1	
		Nabumetone					
		Zanaflex					
		Gabapentin					
		Olanzapine					
642	57 y F	Acetaminophen/diphenhydramine	A/C	Ingst	Int-S	2	Acetaminophen 500 mcg/mL in blood (unspecified) at autopsy Acetaminophen 356 mcg/mL in blood (unspecified) at autopsy
		Clonazepam					
		Duloxetine					
		Levothyroxine					
643	57 y F	Acetaminophen	A	Ingst	Unk	1	
644	57 y F	Acetaminophen	A	Ingst	Unk	1	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
645	57 y M	Acetaminophen/propoxyphene	A	Ingst	Unt-G	2	
646 p	57 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	1	Acetaminophen 32 mcg/mL in blood (unspecified) at autopsy
		Carisoprodol					
647 a	58 y F	Acetaminophen/ diphenhydramine	A/C	Ingst	Int-S	1	Acetaminophen 257 mcg/mL in serum at autopsy Diphenhydramine 6.1 mg/L in serum at autopsy
		Alprazolam					0.410 mg/L in serum at autopsy
		Zolpidem					8.1 mg/L in serum at autopsy
		Risperidone					36 ng/mL in serum at autopsy
		Fluvoxamine					
648	58 y F	Morphine (long-acting)	A/C	Ingst	Int-S	2	
649 pa	58 y F	Methadone	U	Ingst	Unk	1	0.110 mg/L in blood (unspecified) at autopsy
		Trazodone					0.310 mg/L in blood (unspecified) at autopsy
650	58 y M	Salicylate	A	Ingst	Int-S	3	110 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen					49.3 mcg/mL in blood (unspecified) at autopsy
		Diphenhydramine					
651	58 y F	Acetaminophen/ hydrocodone	U	Ingst	Int-S	2	
		Carisoprodol					
		Quetiapine					
		Zolpidem					
652 p	58 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	2	Acetaminophen 392.6 mcg/mL in serum at autopsy
653 p	58 y F		U	Ingst	Int-S	2	
		Morphine					
		Acetaminophen/oxycodone					
		Pregabalin					
654 p	59 y F	Morphine	A	Ingst	Int-S	2	
		Acetaminophen/hydrocodone					
		Alprazolam					
		Diphenhydramine					
655 a	59 y F	Acetaminophen/oxycodone	A	Ingst	Int-S	2	Acetaminophen 170 mcg/mL in plasma at autopsy
		Diazepam					12.5 mg/L in serum at autopsy Nordiazepam 0.9 mg/L in serum at autopsy
		Citalopram					
656 h	59 y F	Acetaminophen/hydrocodone	A	Ingst	Unk	1	Hydrocodone 78 704 ng/mL in blood (unspecified) at autopsy Hydromorphone 713 ng/mL in blood (unspecified) at autopsy Acetaminophen 692.3 mg/L in blood (unspecified) at autopsy
657 a	59 y F	Hydromorphone	U	Ingst	Unk	3	280 ng/mL in blood (unspecified) at autopsy
		Morphine					Morphine sulfate total 1,900 ng/mL in blood (unspecified) at autopsy Morphine sulfate-free 170 ng/mL in blood (unspecified) at autopsy
		Venlafaxine (long-acting)					410 ng/mL in blood (unspecified) at autopsy *o*-desmethylven lafaxine 1,700 ng/mL in blood (unspecified) at autopsy
		Eszopiclone					Zopiclone 0.0% in serum

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Venlafaxine (long-acting)					410 ng/mL in blood (unspecified) at autopsy
		Antihistamine/decongestant					
658	60 y M	Acetaminophen	U	Ingst	Int-U	2	
		Unk drug					
659 h	60 y M	Hydromorphone	A	Ingst	Unt-T	2	
		Fentanyl					
		Diphenhydramine					
660	60 y F	Naproxen	A	Ingst	Int-S	2	
661 pa	60 y M	Tramadol	U	Ingst	Int-S	1	8.8 mg/L in blood (unspecified) at autopsy
							Desmethyltramadol 0.8 mg/L in blood (unspecified) at autopsy
		Propoxyphene					0.5 mg/L in blood (unspecified) at autopsy
							Norpropoxyphene 3.8 mg/L in blood (unspecified) at autopsy
		Bupropion					
		Ethanol					170 mg/dL in blood (unspecified) at autopsy
		Diphenhydramine					0.1 mg/L in blood (unspecified) at autopsy
662	60 y M	Acetaminophen/ diphenhydramine	A	Ingst	Int-S	3	
663	60 y M	Aspirin	A	Ingst	Int-S	1	Acetylsalicylic acid 49.1 mg/dL in blood (unspecified) at autopsy
		Diphenhydramine					
664	60 y M	Aspirin	A	Ingst	Unk	1	
665	60 y M	Acetaminophen	C	Ingst	Unt-M	1	84.9 mcg/mL in blood (unspecified) at autopsy
666 pa	60 y M	Methadone	U	Ingst	Unk	2	
		Acetaminophen/ oxycodone					
667	61 y F	Aspirin	A	Ingst	Int-S	1	72 mg/dL in unknown at autopsy
668	61 y F	Acetaminophen/codeine	A/C	Ingst	Int-S	1	Acetaminophen 222 mcg/mL in blood (unspecified) at autopsy
		Oxycodone					
		Escitalopram					
		Levothyroxine					
		Thiazide					
		Acetaminophen/ diphenhydramine					
		Estradiol					
		Progestin					
669	61 y F	Ibuprofen	U	Ingst	Int-S	2	
		Gabapentin					
		Ramipril					
		Quazepam					
		Acetaminophen					
670 h	61 y F	Aspirin	U	Ingst	Int-S	2	Acetylsalicylic acid 80 mg/dL in serum at autopsy
		Heparin					
671	61 y M	Acetaminophen/hydrocodone	A	Ingst	Int-S	2	Acetaminophen 115 mcg/mL in serum at autopsy
672 a	62 y F	Acetaminophen/hydrocodone	A	Ingst	Int-S	1	Acetaminophen 451 mcg/mL in blood (unspecified) at autopsy
							Hydrocodone 0.4 mg/L in blood (unspecified) at autopsy
		Acetaminophen/oxycodone					Acetaminophen 451 mcg/mL in blood (unspecified) at autopsy
							Oxycodone 0.1 mg/L in blood (unspecified) at autopsy
		Oxycodone (long-acting)					0.1 mg/L in blood (unspecified) at autopsy
		Meperidine					0.7 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
673	63 y F	Acetaminophen Unk opiate Nortriptyline	C	Ingst	Int-A	3	
674 h	63 y M	Acetaminophen/ hydrocodone Acetaminophen/codeine Ethanol	A/C	Ingst	Int-M	2	230 mg/dL in blood (unspecified) at autopsy
675	63 y F	Hydrocodone/ibuprofen	A	Ingst	Int-S	2	
676	63 y M	Salicylate Acetaminophen/ diphenhydramine	U	Ingst	Int-M	2	
677	63 y F	Acetaminophen/propoxyphene	A	Ingst	Int-S	2	Propoxyphene 100 650 mcg/mL in blood (unspecified) at autopsy
678 h	64 y F	Acetaminophen/hydrocodone	C	Ingst	Int-M	2	Acetaminophen 112 mg/L in blood (unspecified) at autopsy Acetaminophen 14.7 mg/L in blood
679 h	64 y F	Tramadol Zolpidem	A/C	Ingst	Int-S	3	
680 pa	64 y F	Propoxyphene Trazodone Benzodiazepine	U	Ingst+Unk	Int-S	1	1 mg/L in blood (unspecified) at autopsy Norpropoxyphene 2.8 mg/L in blood (unspecified) at autopsy
681	64 y F	Aspirin	C	Ingst	Int-M	1	125 mg/dL in blood (unspecified) at autopsy
682 ha	65 y F	Acetaminophen	U	Ingst	Unk	2	12 mcg/mL in serum at autopsy
683	65 y F	Fentanyl Propoxyphene Zolpidem Acetaminophen/codeine	A	Ingst	Int-S	2	
684	65 y F	Acetaminophen/ diphenhydramine Unk drug	A	Ingst	Int-S	2	Acetaminophen 101 mcg/mL in blood (unspecified) at autopsy
685	65 y F	Acetaminophen	A	Ingst	Int-S	1	375 mcg/mL in blood (unspecified) at autopsy
686	65 y F	Acetaminophen Imipramine Ranitidine	A/C	Ingst	Int-S	2	15 mcg/mL in plasma at autopsy
687	66 y M	Aaspirin Diltiazem	A	Ingst	Int-S	1	Acetylsalicylic acid 120 mg/dL in serum at autopsy
688	67 y M	Aspirin	A	Ingst+Aspir	Int-S	3	Acetylsalicylic acid 66.5 mg/dL in serum at autopsy
689 p	68 y F	Oxycodone	A	Ingst	Int-U	2	
690 h	68 y M	Acetaminophen/ hydrocodone	A/C	Ingst	Int-A	2	
691	69 y F	Aspirin	A	Ingst	Int-S	1	Acetylsalicylic acid 70.5 mg/dL in blood (unspecified) at autopsy Acetylsalicylic acid 97.8 mg/dL in blood (unspecified) at autopsy Acetylsalicylic acid 85 mg/dL in blood (unspecified) at autopsy
692 h	69 y M	Colchicine	A	Ingst	Unt-T	2	
693 i	71 y M	Acetaminophen/hydrocodone Acetaminophen/propoxyphene	C	Ingst	Unt-T	2	Acetaminophen 111 mg/L in blood (unspecified) at autopsy
694	74 y F	Aspirin	A/C	Ingst	Int-S	2	Acetylsalicylic acid 58.8 mg/dL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
		Zolpidem					
		Acetaminophen					32 mcg/mL in blood (unspecified) at autopsy
695 p	74 y F	Morphine	A/C	Unk	Unt-U	2	
696	75 y F	Acetaminophen/propoxyphene	A	Ingst	Int-S	3	
697	75 y F	Acetaminophen/propoxyphene	C	Ingst	Int-M	2	
		Acetaminophen					
698	76 y M	Acetaminophen	C	Ingst	Int-M	1	Acetaminophen 107 mcg/mL in serum at autopsy
		Ethanol					
699 pha	76 y F	Acetaminophen	A	Ingst	Unk	1	
700 p	76 y F	Fentanyl	U	Unk	Int-U	2	
701 h	77 y F	Colchicine	C	Par	Unt-T	1	44 ng/mL in blood (unspecified) at autopsy
702	77 y F	Acetaminophen/hydrocodone	A	Ingst	Int-U	1	Acetaminophen 447 mcg/mL in serum at autopsy
703	78 y F	Acetaminophen/ hydrocodone	A	Ingst	Int-S	1	
704	78 y F	Acetaminophen	U	Ingst	Int-S	3	347 mcg/mL in blood (unspecified) at autopsy
		Hydromorphone					
		Fentanyl patch					
705 h	79 y F	Acetaminophen	U	Ingst	Unk	2	95 mcg/mL in serum at autopsy
706 h	79 y F	Acetaminophen/ hydrocodone	U	Ingst	Int-S	1	
		Zolpidem					
707	81 y F	Aspirin	U	Ingst	Int-S	1	Salicylates 91 mg/dL in blood (unspecified)at autopsy
708	81 y M	Acetaminophen/propoxyphene	A	Ingst	Unk	2	Acetaminophen 13 mcg/mL in serum at autopsy
709 h	82 y F	Acetaminophen/hydrocodone	U	Ingst	Int-S	2	Acetaminophen 220 mcg/mL in blood (unspecified) at autopsy
		Trazodone					
		Escitalopram					
710 a	83 y F	Aspirin	A	Unk	Unk	1	Salicylate 48.7 mg/dL in serum at autopsy
711	84 y F	Acetaminophen	A	Ingst	Int-S	1	
712	86 y F	Acetaminophen	A	Ingst	Int-U	2	507 mcg/mL in blood (unspecified) at autopsy 510 mcg/mL in blood (unspecified) at autopsy
713	89 y M	Acetaminophen/hydrocodone	A	Ingst	Unk	2	Acetaminophen 257 mcg/mL in blood (unspecified) at autopsy
714 pa	14 m U	Methadone	U	Ingst	Oth-M	1	366 ng/mL in blood (unspecified) at autopsy EDDP 67 ng/mL in unknown at autopsy 1,440 ng/mL in urine at autopsy
715 p	17 m U	Methadone	U	Ingst	Oth-M	1	
716 ha	20 m F	Ooxycodone	A	Ingst	Unt-G	1	44 mcg/mL in blood (unspecified) at autopsy
		Hydrocodone					
717 ph	21 m F	Oxycodone (long-acting)	A	Unk	Unt-G	1	
718	40 + y F	Acetaminophen	A	Ingst	Int-S	2	52 mcg/mL in serum at autopsy
		Acetaminophen/ hydrocodone					
		Carisoprodol					
		Acetaminophen/butalbital/ caffeine					
719 h	40 + y M	Acetaminophen/ propoxyphene	A	Ingst	Int-S	1	Acetaminophen 185 mcg/mL in serum at autopsy
		Paroxetine					
		Dextromethorphan					
		Diphenhydramine					
		Acetaminophen/hydrocodone					
		Ethanol					11 mg/dL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Analgesics, continued							
720	Unknown adult (≥20 years) F	Acetaminophen	C	Ingst	Int-S	1	
721 pi	Unknown adult (≥20 years) U	Opioid	A	Unk	Int-A	1	
722	Unknown adult (≥20 years) F	Acetaminophen	A/C	Ingst	Int-S	2	
723 h	Unknown adult (≥20 years) M	Acetaminophen/ hydrocodone Ethanol	C	Ingst	Int-M	1	Acetaminophen 36 mcg/mL in serum at autopsy
724 pai	Unknown adult (≥20 years) M	hydrocodone	U	Ingst	Int-S	2	
725 pi	Unknown adult (≥20 years) M	Oxycodone (long-acting) Cyclobenzaprine Zolpidem Gabapentin	A	Ingst	Int-S	2	
726 p	Unknown age M	Unk opioid	A	Unk	Int-S	2	
727	Unknown age U	Hydromorphone Diphenhydramine	U	Unk	Unk	2	
728 pa	Unknown age M	Methadone Zolpidem	U	Ingst	Unk	2	0.8 mg/L in blood (unspecified) at autopsy 0.6 mg/L in blood (unspecified) at autopsy
729 p	Unknown age F	Oxycodone	A	Par	Int-U	3	
See also cases 6, 7, 16, 17, 20, 21, 25, 28, 30, 34, 46, 69, 79, 92, 96, 114, 121, 216, 248, 733, 741, 751, 754, 755, 758, 763, 770, 775, 780, 784, 785, 791, 793, 794, 795, 801, 802, 804, 805, 813, 814, 815, 816, 824, 825, 826, 831, 836, 838, 841, 842, 843, 847, 849, 858, 860, 865, 876, 877, 890, 901, 903, 905, 908, 919, 923, 932, 935, 936, 939, 940, 952, 953, 956, 967, 968, 996, 998, 1013, 1015, 1017, 1018, 1019, 1021, 1027, 1035, 1039, 1041, 1042, 1043, 1047, 1049, 1055, 1058, 1063, 1065, 1070, 1092, 1093, 1094, 1095, 1099, 1105, 1106, 1107, 1110, 1114, 1127, 1131, 1140, 1152, 1155, 1158, 1167, 1171, 1179, 1183, 1186, 1198, 1203, 1210, 1211, 1219, 1224, 1226, 1232							
Anesthetics							
730 p	31 y F	Lidocaine Methamphetamine Amphetamine Mirtazapine	U	Par	Int-A	1	7.6 mcg/mL in blood (unspecified) at autopsy 0.43 mcg/mL in blood (unspecified) at autopsy 0.1 mcg/mL in blood (unspecified) at autopsy 0.160 mcg/mL in blood (unspecified) at autopsy
731	55 y M	Bupivacaine	A	Par	AR-D	2	
732 ha	63 y F	Bupivacaine	A	Par	AR-D	1	
See also cases 269, 335, 348, 1029, 1048							
Anticoagulants							
733 ha	38 y F	Warfarin Amitriptyline Methadone Gabapentin	A/C	Ingst	AR-D	3	
734	58 y F	Warfarin	C	Ingst	AR-D	3	
735	62 y M	Eptifibatide	A	Par	Unt-T	1	
736	66 y M	Tenecteplase	A	Par	Unt-T	1	
737	68 y M	Enoxaparin	C	Par	Unt-T	2	
738	75 y F	Heparin	A/C	Ingst	AR-D	3	
739 h	85 y F	Abciximab	U	Par	AR-D	2	
740 p	86 y F	Warfarin	A/C	Ingst	Unk	3	
741	89 y M	Tenecteplase Salicylate Heparin Clopidogrel	A	Par	AR-D	1	
See also cases 570, 670, 887, 912, 916, 932, 965, 968, 990							
Anticonvulsants							
742 h	3 y M	Phenytoin Alprazolam	A	Par	Unt-T	1	
743 a	22 y F	Valproic acid	A	Ingst	Int-S	3	267 ng/mL in blood (unspecified) at autopsy 6.2 ng/mL in blood (unspecified) at autopsy
744	28 y F	Chlorpromazine[Cr] Valproic acid[Cr] Lamotrigine Baclofen	A/C	Ingst	Int-S	1	472 in blood (unspecified) at autopsy
745 p	30 y F	Oxcabazepine Ethanol Oxcabazepine	U	Unk	Int-S	2	6 g/dL in whole blood at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
746	30 y F	Carbamazepine	A/C	Ingst	Int-S	1	60 mcg/mL in serum at autopsy
747 ph	37 y M	Gabapentin	A	Ingst	Int-S	3	
748 p	39 y M	Valproic acid	A	Ingst	Int-S	1	
749 p	40 y M	Gabapentin Ethanol	A	Ingst	Int-S	3	
750 pha	43 y F	Valproic acid Flurazepam Bupropion Temazepam	A	Ingst	Int-S	1	1,460 mcg/mL in blood (unspecified) at autopsy
751 a	44 y M	Lamotrigine Quetiapine Duloxetine Lorazepam Modafinil Vardenafil Thorazine Tramadol	A	Ingst	Int-S	1	
752 h	44 y M	Lamotrigine Bupropion	A/C	Ingst	Int-U	1	
753	44 y M	Phenytoin	A	Ingst	Int-S	3	
754 ph	46 y F	Pregabalin Sertraline Promethazine Cyclobenzaprine Tramadol Imipramine	A	Ingst	Int-S	1	
755	47 y F	Pregabalin Valsartan Alprazolam Ibuprofen	A/C	Ingst	Int-S	2	
756 a	48 y M	Valproic acid Fluoxetine	A	Ingst	Int-S	1	544 mg/L in whole blood at autopsy 550 ng/mL in blood (unspecified) at autopsy 910 ng/mL in blood (unspecified) at autopsy Norflouxetine 500 ng/mL in blood (unspecified) at autopsy
757	48 y M	Phenytoin	U	Ingst	Unk	3	46.8 mg/dL in serum at autopsy
758 a	50 y M	Carbamazepine Acetaminophen/ diphenhydramine	A	Ingst	Int-S	2	36.4 ng/mL in blood (unspecified) at autopsy Acetaminophen 214 ng/mL in blood (unspecified) at autopsy
759	50 y F	Valproic acid	A	Ingst	Int-S	1	675 mcg/mL in serum at autopsy 715 mcg/mL in serum at autopsy 941 mcg/mL in serum at autopsy 875 mcg/mL in serum at autopsy 228.6 mcg/mL in serum at autopsy
760 p	51 y F	Valproic acid Risperidone Temazepam Alprazolam	U	Ingst	Int-S	1	140 mcg/mL in blood (unspecified) at autopsy
761 p	54 y M	Valproic acid	A/C	Ingst	Int-S	2	Depakote 900 mcg/mL in serum at autopsy
762	57 y F	Phenytoin	A/C	Ingst	AR-D	2	
763	58 y M	Topiramate Valproic acid Carbamazepine Benztropine Risperidone Ibuprofen Cimetidine	A	Ingst	Unt-T	3	
764	58 y M	Lamotrigine	A	Ingst	Int-S	2	
765	86 y F	Phenytoin	A	Par	AR-D	3	Phenytoin sodium 11.3 mg/L in serum at autopsy
766 p	Unknown adult (≥20 years) F	Valproic acid	U	Ingst	Int-S	3	329 mcg/mL in unknown at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
See also cases 10, 213, 218, 290, 327, 347, 371, 372, 393, 432, 447, 450, 494, 563, 588, 637, 641, 653, 669, 725, 733, 768, 776, 785, 795, 801, 803, 813, 822, 830, 838, 840, 860, 874, 876, 902, 904, 935, 939, 960, 968, 988, 1038, 1039, 1047, 1053, 1059, 1068, 1069, 1070, 1079, 1084, 1086, 1097, 1099, 1100, 1107, 1121, 1122, 1136, 1154							
Antidepressants							
767 p	5 y F	Amitriptyline	U	Ingst	Unt-G	2	
		Antihistamine/decongestant					
768 p	14 y M	Bupropion	A	Ingst	Int-S	1	
		Valproic acid					
769	14 y M	Bupropion	A/C	Ingst	Int-S	1	
		Fluoxetine					2,000 ng/mL in blood (unspecified) at autopsy
		Buspirone					
770 p	18 y F	Fluoxetine	A	Ingst	Int-S	2	5 mg/L in blood (unspecified) at autopsy
		Methadone					0.2 mg/L in blood (unspecified) at autopsy
771	18 y M	Bupropion (long-acting)	A/C	Ingst	Int-S	1	Wellbutrin XL 23 mg/L in blood (unspecified) at autopsy
		Atomoxetine					
		Methamphetamine					
772 ph	19 y F	Trazodone	A/C	Ingst	Int-S	1	
		Quetiapine					
		Paroxetine					
773 ha	20 y F	Bupropion (long-acting)	A	Ingst	Int-S	1	37 ng/mL in blood (unspecified) at autopsy
		Ethanol					150 mg/dL in plasma at autopsy
774 a	23 y F	Venlafaxine	A	Ingst	Int-S	1	110 mcg/mL in serum at autopsy
							440 ug in liver at autopsy
		Trazodone					
		Cyclobenzaprine					0.082 mcg/mL in serum at autopsy
							0.660 ug/g in liver at autopsy
		Clozapine					0.013 mcg/mL in serum at autopsy
							0.120 ug/g in liver at autopsy
775 ha	23 y F	Bupropion	A/C	Ingst+Unk	Int-S	2	0.460 mg/L in blood (unspecified) at autopsy
		Cocaine					Benzoylecgonine 0.380 mg/L in blood (unspecified) at autopsy
		Benzodiazepine					Diazepam 0.640 mg/L in blood (unspecified) at autopsy
							Nordiazepam 0.2 mg/L in blood (unspecified) at autopsy
		Morphine					
		Methadone					
		Quetiapine					
		Cyclobenzaprine					
		Marijuana					
776 p	23 y F	Venlafaxine (long-acting)	C	Ingst	AR-D	2	
		Sertraline					
		Topiramate					
777	25 y F	Bupropion	A	Ingst	Int-S	2	
778	25 y M	Amitriptyline	U	Ingst	Int-S	1	
		Ethanol					
		Diazepam					
779 ph	26 y F	Amitriptyline	A	Ingst	Int-S	1	
		Ethanol					197 mg/dL in blood (unspecified) at autopsy
780 p	26 y F	Bupropion (long-acting)	A	Ingst	Unk	3	
		Ethanol					174 mg/dL in blood (unspecified) at autopsy
		Tramadol					
		Escitalopram					
781	27 y F	Amitriptyline	A	Ingst	Int-S	2	
782 a	28 y M	Venlafaxine (long-acting)	A/C	Ingst	Int-S	1	Effexor 20,000 ng/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
783 pa	29 y F	Bupropion	U	Ingst	Int-S	1	
		Ethanol					
784	29 y F	Escitalopram	A	Ingst	Int-S	3	Citalopram 0.090 mg/L in blood (unspecified) at autopsy
		Alprazolam					0.2 mg/L in blood (unspecified) at autopsy
		Lorazepam					
		Acetaminophen					17.4 mg/L in blood (unspecified) at autopsy
		Quetiapine					
785	31 y F	Venlafaxine (long-acting)	A	Ingst	Unk	1	
		Valproic acid					232.4 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/hydrocodone					Acetaminophen 134 mcg/mL in blood (unspecified) at autopsy
		Codeine/promethazine					
		Duloxetine					
		Trazodone					
		Pseudoephedrine					
		Diphenhydramine					
		Acetaminophen					134 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/ diphenhydramine					
		Ethanol					
786	32 y F	Tricyclic antidepressant	A	Ingst	Int-S	1	
787	32 y M	Desipramine	A	Ingst	Int-S	1	
788 p	34 y M	Lithium	A/C	Ingst	Int-S	1	811 ng/mL in serum at autopsy
		Amitriptyline					1.7 mcg/mL in serum at autopsy
							Nortriptyline 0.690 mcg/mL in serum at autopsy
		Diazepam					
789	35 y M	Bupropion	A	Ingst	Int-S	3	
		Clonazepam					
		Trazodone					
		Venlafaxine					
		Zolpidem					
790	35 y F	Amitriptyline	A	Ingst	Int-S	1	
		Ethanol					
791	36 y M	Venlafaxine	A/C	Ingst	Int-S	2	
		Quetiapine					
		Oxycodone (long-acting)					
		Alprazolam					
792	36 y F	Bupropion	A	Ingst	Int-S	1	Bupropion threo-amino metabolite 0.120 mg/L in blood (unspecified) at autopsy
							Bupropion erythro-amino metabolite 0.220 mg/L in blood (unspecified) at autopsy
							Bupropion morpholinol 0.1 mg/L in blood (unspecified) at autopsy 0.260 mg/kg in brain at autopsy
							Bupropion threo-amino metabolite 9 mg/kg in brain at autopsy
							Bupropion erythro-amino metabolite 57.2 mg/kg in brain at autopsy
							Bupropion erythro-amino metabolite 21.5 mg/kg in brain at autopsy
793 p	36 y F	Bupropion	A	Ingst	Int-S	2	
		Cyclobenzaprine					
		Propranolol					
		Clonazepam					
		Acetaminophen/propoxyphene					
794	36 y F	Amitriptyline	A	Ingst	Int-S	1	
		Diltiazem					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
		Alprazolam					
		Hydrocodone/acetaminophen					
		Citalopram					
795 p	37 y M	Bupropion	A	Ingst	Int-S	1	
		Quetiapine					
		Baclofen					
		Promethazine					
		Methadone					
		Duloxetine					
		Clonazepam					
		Zolpidem					
		Lithium					
		Levothyroxine					
		Lamotrigine					
		Efavirenz					
		Emtricitabine/tenofovir					
796 p	38 y F	Tricyclic antidepressant	A	Ingst	Int-S	2	
		Lorazepam					
797 p	38 y F	Doxepin	A	Ingst	Int-S	1	
		Benzodiazepine					
798 p	38 y F	Trazodone	A	Ingst	Int-S	2	
		Alprazolam					
799 p	38 y F	Amitriptyline	A	Ingst	Int-S	2	
800 pa	39 y M	Amitriptyline	A/C	Ingst	Int-S	1	1.040 mg/L in blood (unspecified) at autopsy
							13.150 mg/kg in liver at autopsy
							58.7 mg recovered in gastric (stomach content) at autopsy
							Nortriptyline 0.470 mg/L in blood (unspecified) at autopsy
							Nortriptyline 3.670 mg/kg in liver at autopsy
		Bupropion					1.150 mg/L in blood (unspecified) at autopsy
							2.110 mg/kg in liver at autopsy
							197.450 mg recovered in gastric (stomach content) at autopsy
		Duloxetine					0.690 mg/L in blood (unspecified) at autopsy
							13.680 mg/kg in liver at autopsy
801 p	39 y F	Amitriptyline	A	Ingst	Int-S	2	
		Valproic acid					
		Acetaminophen					
		Aspirin					
		Topiramate					
		Diazepam					
802	40 y M	Bupropion	A/C	Ingst	Int-S	3	
		Escitalopram					
		Acetaminophen/hydrocodone					
803	40 y M	Selegiline	A/C	Ingst	Unk	2	
		Bupropion					
		Lamotrigine					
		Clonazepam					
		Promethazine					
		Aripiprazole					
		Clonazepam					
804 p	40 y M	Amitriptyline	A/C	Ingst	Int-S	2	
		Methadone					
		Clonazepam					
		Propoxyphene					
		Diazepam					
805 pa	40 y F	Mirtazapine	A	Ingst	Int-S	1	0.7 mcg/mL in whole blood at autopsy
		Temazepam					1.4 mcg/mL in whole blood at autopsy
		Acetaminophen/propoxyphene					Propoxyphene 6 mcg/mL in whole blood at autopsy
806 p	41 y F	Bupropion	A	Ingst	Int-S	1	
807	41 y M	Venlafaxine (long-acting)	A/C	Ingst	Int-S	1	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
808	42 y M	Amitriptyline	A	Ingst	Int-S	2	
		Ethanol					429 mg/dL in serum at autopsy
809	42 y M	Lithium	C	Ingst	AR-D	1	3.410 mEq/L in blood (unspecified) at autopsy
810 h	42 y M	Lithium	A/C	Ingst	Int-S	1	Lithium salts 5.5 mmol/L in blood (unspecified) at autopsy
811	42 y F	Duloxetine	A	Ingst	Int-S	2	
		Bupropion					
		Clonazepam					
812 p	42 y F	Nortriptyline	A	Ingst	Int-S	1	
		Diphenhydramine					
		Diazepam					
813 p	43 y M	Amitriptyline	A	Ingst	Int-S	1	
		Morphine					
		Lisinopril					
		Naproxen					
		Baclofen					
		Gabapentin					
		Venlafaxine					
		Ethanol					13 mg/dL in blood (unspecified) at autopsy
814 h	43 y F	Sertraline	A	Ingst	Int-S	3	Acetaminophen 40 mg/L in plasma at autopsy
		Acetaminophen					
815	43 y F	Imipramine	U	Ingst	Int-S	1	1,646 ng/mL in blood (unspecified) at autopsy
		Hydrocodone					726 ng/mL in blood (unspecified) at autopsy
816 p	45 y F	Tricyclic antidepressant	A	Ingst	Int-S	1	
		Methadone					
817	45 y M	Trazodone	A	Ingst	Int-U	2	
		Ethanol					
818	45 y M	Fluoxetine	A	Ingst	Int-S	2	
		Bupropion					
819 p	46 y M	Doxepin	A/C	Ingst	Int-S	2	
		Clonazepam					
		Ethanol					
820 p	46 y F	Amitriptyline	A/C	Ingst	Int-S	1	
		Ethanol					
821	46 y M	Bupropion (long-acting)	A	Ingst	Int-S	1	
		Ethanol					300 mg/dL in blood (unspecified) at autopsy
822	47 y M	Bupropion	A	Ingst	Int-S	2	
		Quetiapine					
		Gabapentin					
823 h	47 y F	Bupropion	A/C	Ingst	Int-S	2	
		Venlafaxine					
		Ziprasidone					
		Ethanol					87 mg/dL in serum at autopsy
824 p	47 y F	Amitriptyline	A	Ingst	Int-S	1	
		Methadone					
		Carisoprodol					
825 a	47 y F	Bupropion (long-acting)	A	Ingst	Int-S	1	6,800 ng/mL in blood (unspecified) at autopsy Hydroxybupropion 11,000 ng/mL in blood (unspecified) at autopsy
		Fluoxetine					41,000 ng/mL in blood (unspecified) at autopsy
		Cyproheptadine					
		Acetaminophen/oxycodone					
		Lorazepam					
826 p	48 y F	Bupropion	U	Ingst	Int-S	2	
		Venlafaxine					
		Acetaminophen/hydrocodone					
		Tramadol					
		Thiazolidinedione					
		Cocaine					
		Irbesartan					
		Hydrochlorothiazide					
		Diphenoxylate/atropine					
		Olanzapine					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
		Quinapril					
		Benzodiazepine					
827	48 y F	Venlafaxine	A	Ingst	Int-S	2	
		Ethanol					248 mg/dL in blood (unspecified) at autopsy
828	48 y F	Tricyclic antidepressant	A	Ingst	Int-S	2	
829 h	48 y M	Lithium	U	Ingst	Unk	1	2 mEq/L in plasma at autopsy
		Metformin					
		Lisinopril					
		Allopurinol					
		Simvastatin					
		Ezetimibe					
830	48 y M	Escitalopram	A	Ingst+Aspir	Int-S	2	Citalopram 0.270 mg/L in blood (unspecified) at autopsy
		Alprazolam					
		Lamotrigine					Lamictal detected but not quantified in blood (unspecified) at autopsy
		Gabapentin					
		Ethanol					
		Carbon black					
831 p	49 y F	Amitriptyline	U	Ingst	Unk	1	1 mg/L in blood (unspecified) at autopsy
							Nortriptyline 0.7 mg/L in blood (unspecified) at autopsy
		Oxycodone					0.1 mg/L in blood (unspecified) at autopsy
		Trazodone					1 mg/L in blood (unspecified) at autopsy
		Acetaminophen/hydrocodone					Hydrocodone bitartrate and acetaminophen 0.030 mg/L in blood (unspecified) at autopsy
832 p	49 y F	Venlafaxine (long-acting)	A	Ingst	Unt-G	2	
833 p	49 y F	Amitriptyline	A	Ingst	Int-S	1	
834	49 y F	Tricyclic antidepressant	A	Ingst	Int-M	3	2,585 ng/mL in serum at autopsy
835	49 y M	Doxepin	A/C	Ingst	Int-S	1	
836 pa	50 y M	Sertraline	C	Ingst	Unt-T	2	3,122 ng/mL in blood (unspecified) at autopsy
		Hydrocodone					Hydrocodone bitartrate 24.8 ng/mL in blood (unspecified) at autopsy
837 p	50 y F	Tricyclic antidepressant	A	Ingst	Int-S	2	
		Diazepam					
838 p	50 y F	Amitriptyline	A/C	Ingst	Int-S	1	
		Propranolol					
		Acetaminophen/hydrocodone					
		Baclofen					
		Benzodiazepine					
		Pregabalin					
839 ph	51 y F	Trazodone	U	Ingst	Int-S	1	
		Fluoxetine					
		Buspirone					
		Quetiapine					
		Ethanol					130 mg/dL in blood (unspecified) at autopsy
840	51 y M	Bupropion	A	Ingst	Int-S	1	
		Lamotrigine					
841 p	52 y F	Amitriptyline	A	Ingst	Int-S	3	
		Acetaminophen/hydrocodone					
		Sertraline					
		Clonazepam					
		Trazodone					
842 p	53 y F	Tricyclic antidepressant	A	Ingst	Int-S	2	
		Acetaminophen/propoxyphene					
		Benzodiazepine					
		Acetaminophen					146 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
843 pa	53 y F	Escitalopram	A/C	Ingst	Int-S	1	Citalopram 2,280 ng/mL in vitreous at autopsy
							Desmethlycitalopram 134 ng/mL in vitreous at autopsy
		Cyclobenzaprine					13 ng/mL in vitreous at autopsy
		Acetaminophen					39.4 mcg/mL in vitreous at autopsy
		Bupropion					275 ng/mL in vitreous at autopsy
		Ethanol					16 mg/dL in vitreous at autopsy
		Nifedipine					
		Piroxicam					
844 a	54 y F	Sertraline	A	Ingst+ Inhal+ Aspir	Int-S	1	
		Activated charcoal					
		Ziprasidone					
		Zolpidem					
845 pai	54 y F	Citalopram	A/C	Ingst	Int-U	1	
		Ethanol					
846	54 y F	Paroxetine	U	Ingst	Int-S	3	
		Ethanol					
847 a	55 y F	Venlafaxine	A	Ingst	Unt-G	1	*o*-desmethylvenlafaxine 6.6 mg/L in blood (unspecified) at autopsy
							41 mg/L in blood (unspecified) at autopsy
		Zolpidem					
		Ethanol					264 mg/dL in blood (unspecified) at autopsy
		Acetaminophen					15 mcg/mL in serum at autopsy
848	55 y F	Lithium	C	Ingst	AR-D	1	5.680 mEq/L in blood (unspecified) at autopsy
849 p	55 y F	Amitriptyline	U	Unk	Unk	2	
		Oxycodone (long-acting)					
850	56 y F	Lithium	C	Ingst	AR-D	1	
851	56 y F	Venlafaxine (long-acting)	A	Ingst	Int-S	3	
		Fluoxetine					
		Lorazepam					
852 p	57 y F	Doxepin	A/C	Ingst	Int-S	1	TCA 753 ng/mL in serum at autopsy
853 a	58 y M	Bupropion (long-acting)	A	Ingst	Int-S	1	9.1 mg/L in blood (unspecified) at autopsy
							381.1 mg/kg in gastric (stomach content) at autopsy
		Diphenhydramine					9.7 mg/L in blood (unspecified) at autopsy
							295.3 mg/kg in gastric (stomach content) at autopsy
		Quetiapine					4.8 mg/L in blood (unspecified) at autopsy
							11123.1 mg/kg in gastric (stomach content) at autopsy
		Benztropine					
		Haloperidol					
854 p	58 y F	Amitriptyline	A	Ingst	Int-S	2	
855 ha	58 y F	Lithium	A	Ingst	Int-S	3	6 mEq/L in blood (unspecified) at autopsy
856 p	60 y F	Bupropion	A/C	Ingst	Int-S	2	
857	61 y F	Amitriptyline	A	Ingst	Int-S	1	
		Ethanol					
858 p	62 y F	Amitriptyline	A	Ingst	Int-S	2	
		Methadone					
		Ethanol					
859	63 y M	Tricyclic antidepressant	A/C	Ingst	Int-S	2	
860	65 y M	Tranylcypromine	A/C	Ingst	Int-S	1	
		Amphetamine					
		Carbon monoxide					18.9% (w/w) in whole blood at autopsy
		Methylphenidate					
		Modafinil					
		Acetaminophen/codeine					
		Zolpidem					
		Tiagabine					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
861 h	66 y F	Amitriptyline	A	Ingst	Int-S	2	
862	67 y F	Lithium	A/C	Ingst	Int-S	2	3.7 mEq/L in serum at autopsy
863 p	68 y M	Amitriptyline	A/C	Ingst	Int-S	1	0.3 mg/L in serum at autopsy 3,100 ng/mL in blood (unspecified) at autopsy Nortriptyline 1,000 ng/mL in blood (unspecified) at autopsy
		Zolpidem					0.580 mg/L in serum at autopsy 16 ng/mL in blood (unspecified) at autopsy
864	68 y M	Amitriptyline	A	Ingst	Int-S	2	
865	69 y F	Nortriptyline	A/C	Ingst	Int-S	2	1,142 ng/mL in blood (unspecified) at autopsy
		Digoxin					1.6 ng/mL in blood (unspecified) at autopsy
		Trazodone Acetaminophen[Cr] Furosemide[Cr]					
		Ethanol					152 mg/dL in blood (unspecified) at autopsy
866	69 y M	Lithium	C	Ingst	AR-D	3	2.910 mEq/L in serum at autopsy
867	70 y F	Trazodone Venlafaxine Risperidone Clonazepam Zolpidem	U	Ingst	Int-S	3	
		Ethanol					248 mg/dL in blood (unspecified) at autopsy
868 p	79 y F	Amitriptyline	A	Ingst	Unk	3	651 ng/mL in blood (unspecified) at autopsy
869 p	80 y F	Amitriptyline	A	Ingst	Int-S	3	
870	85 y M	Paroxetine Terazosin Levothyroxine Unk drug	A/C	Ingst	Int-S	2	
871 a	16 m M	Bupropion (long-acting)	A	Ingst	Unt-G	1	10,000 ng/mL in serum at autopsy
872 a	22 m F	Bupropion (long-acting)	A	Ingst	Unt-G	1	Wellbutrin Sr 45,000 ng/mL in blood (unspecified) at autopsy
873 p	40+ y F	Amitriptyline	A	Ingst	Int-S	1	
874	40+ y M	Bupropion Valproic acid Quetiapine	A/C	Ingst	Int-S	2	
875	40+ y M	Duloxetine	A	Ingst	Int-S	2	380 ng/mL in blood (unspecified) at autopsy
		Hydroxyzine					320 ng/mL in blood (unspecified) at autopsy
		Cetirizine					740 ng/mL in blood (unspecified) at autopsy
876 p	Unknown age U	Amitriptyline Pregabalin Opioid Oxycodone Cyclobenzaprine Paroxetine	U	Unk	Unk	3	
See also cases 5, 8, 31, 53, 125, 218, 256, 261, 275, 279, 304, 313, 326, 327, 345, 347, 375, 393, 418, 450, 453, 457, 458, 462, 467, 468, 469, 476, 478, 484, 486, 500, 509, 516, 519, 521, 528, 534, 538, 544, 554, 564, 573, 580, 583, 586, 600, 609, 610, 620, 621, 625, 637, 642, 647, 649, 655, 657, 661, 666, 668, 673, 680, 686, 709, 719, 730, 733, 750, 751, 752, 754, 756, 880, 902, 904, 906, 907, 910, 913, 916, 930, 931, 934, 935, 936, 937, 938, 945, 946, 949, 952, 954, 1014, 1021, 1025, 1027, 1029, 1041, 1042, 1053, 1054, 1056, 1057, 1070, 1075, 1076, 1083, 1084, 1092, 1099, 1100, 1101, 1102, 1105, 1111, 1145, 1150, 1154, 1167, 1169, 1215, 1225, 1228							
Antihistamines							
877 p	18 y F	Diphenhydramine	A	Ingst	Int-S	2	
		Acetaminophen					300 mg/dL in blood (unspecified) at autopsy
878 h	23 y M	Diphenhydramine	A	Ingst	Int-S	2	
879	23 y M	Diphenhydramine	A	Ingst	Int-S	3	
880 pa	26 y F	Promethazine	U	Unk	Unk	1	0.450 mg/L in blood (unspecified) at autopsy
		Alprazolam					0.140 mg/L in blood (unspecified) at autopsy
		Citalopram					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Anticonvulsants, continued							
881	30 y M	Hydroxyzine	A	Ingst	Int-S	1	
		Benzodiazepine					
882 h	31 y F	Promethazine	A/C	Ingst	Int-S	2	330 ng/mL in serum at autopsy
883 a	36 y F	Promethazine	A	Par	Int-M	1	
884	40 y F	Diphenhydramine	A	Ingst	Int-S	2	
885 p	42 y M	Promethazine	U	Ingst	Int-S	1	4 mg/L in blood (unspecified) at autopsy
		Zolpidem					2.4 mg/L in blood (unspecified) at autopsy
886	56 y M	Diphenhydramine	A	Ingst	Int-S	1	
		Ethanol					
		Glyphosate					
See also cases 10, 15, 82, 114, 133, 271, 309, 318, 326, 357, 382, 391, 434, 442, 453, 454, 462, 484, 521, 534, 541, 564, 580, 583, 591, 621, 650, 654, 659, 661, 663, 686, 719, 727, 754, 763, 785, 795, 803, 812, 825, 853, 875, 903, 916, 920, 954, 968, 988, 1050, 1084, 1100, 1198							
Antimicrobials							
887	15 y M	Hydroxychloroquine	A	Ingst	Int-S	3	
		Diltiazem (long-acting)					
		Warfarin					
888 p	25 y M	Tilmicosin	A	Par	Unt-O	1	
889	33 y M	Tilmicosin	A	Ingst	Int-S	2	
890	40 y F	Didanosine (long-acting)	A/C	Ingst	Int-S	2	
		Ritonavir					
		Atazanavir					
		Emtricitabine/tenofovir					
		Trimethoprim/ sulfamethoxazole					
		Acetaminophen/caffeine/ butalbital					Acetaminophen 22 mcg/mL in blood (unspecified) at autopsy
		Hydromorphone					
891 h	48 y M	Isoniazid	C	Ingst	AR-D	2	
	rifampin						
892	22 m F	Albendazole	C	Ingst	AR-D	2	
893	Unknown adult (≥20 years) M	Tilmicosin	A	Par	Unt-O	2	Micotil 300 2,000 ng/mL in blood (unspecified) at autopsy
See also cases 256, 329, 344, 486, 541, 610, 795, 906, 973, 1008, 1026, 1145, 1151, 1228							
Antineoplastics							
894	58 y F	Methotrexate	A	Ingst	Unt-M	3	
895 ha	68 y F	Methotrexate	C	Ingst	Unt-T	2	
Cardiovascular drugs							
896 ph	6 y M	Clonidine	A/C	Ingst	Unt-T	1	120 ng/mL in unknown at autopsy
897	10 y F	Nitroprusside	C	Par	AR-D	3	
898p	21 y F	Drotaverine	A	Ingst	Int-S	2	
899	23 y F	Verapamil	A	Ingst	Unt-G	1	
900	24 y F	Atenolol	A	Ingst	Int-S	1	1,300 ng/mL in blood (unspecified) at autopsy
		Verapamil					11 mcg/mL in blood (unspecified) at autopsy
		Ethanol					40 mg/dL in vitreous at autopsy
901 p	26 y M	Adenosine	A/C	Par	Int-A	1	
		Opioid					
902 p	27 y F	Diltiazem (long-acting)	A/C	Ingst	Int-S	2	
		Carbamazepine					
		Bupropion					
		Aripiprazole					
		Topiramate					
		Trazodone					
903	29 y M	Propranolol	A	Ingst	Int-S	1	
		Metoprolol					
		Propranolol					
		Lisinopril					
		Meclizine					
		Aspirin					
		Promethazine					
904 a	34 y F	Amlodipine	A	Ingst	Int-S	1	Amlodipine besylate 1.2 mg/L in blood (unspecified) at autopsy
		Amitriptyline					
		Trazodone					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Cardiovascular drugs, continued							
		Fluoxetine					
		Pregabalin					
905	36 y F	Hydralazine	U	Ingst	Int-S	2	
		Tramadol					
906	36 y F	Metoprolol	A	Ingst	Int-S	3	
		Isoniazid					
		Quetiapine					
		Fluoxetine					
		Vitamin D					
907	40 y M	Atenolol	A/C	Ingst	Int-S	1	
		Amlodipine					
		Trazodone					
		Escitalopram					
		Duloxetine					
		Losartan					
908 pha	40 y M	Verapamil	A/C	Ingst+Unk	Int-S	1	4,100 pg/mL in blood (unspecified) at autopsy
		Cocaine					
		Ethanol					
		Potassium					
		Acetaminophen/hydrocodone					
		Diuretics					
		Fentanyl					
909	41 y F	Flecainide	A	Ingst	Int-S	1	
910	41 y F	Beta-blocker	A	Ingst	Int-S	1	Metoprolol 12 mcg/mL in blood (unspecified) at autopsy
		Citalopram					2 mcg/mL in blood (unspecified) at autopsy
		Bupropion					
		Lisinopril					
		Diuretic					
911	41 y F	Labetalol	A	Ingst	Int-S	2	
912 pa	42 y M	Digoxin	A	Ingst	Int-S	2	
		Cocaine					0.080 mg/L in blood (unspecified) at autopsy Cocaethylene 0.022 mg/L in blood (unspecified) at autopsy Benzoylecgonine 1.8 mg/L in blood (unspecified) at autopsy
		Enalapril					
		Hydrochlorothiazide					
		Clopidogrel					
		Ethanol					36 mg/dL in blood (unspecified) at autopsy
913	43 y M	Atenolol	C	Ingst	Int-S	2	
		Bupropion					
		Sertraline					
		Ethanol					Whiskey 184 mg/dL in serum at autopsy
914	44 y M	Lisinopril	A/C	Ingst	Int-S	2	
		Metformin					
		Glipizide					
		Pioglitazone					
915 a	44 y F	Diltiazem (long-acting)	A	Ingst	Int-S	1	2.5 mg/L in blood (unspecified) at autopsy
916 a	44 y M	Propranolol	A/C	Ingst	Int-S	1	5.8 mg/L in blood (unspecified) at autopsy 5.2 mg/L in blood (unspecified) at autopsy
		Venlafaxine (long-acting)					7.3 mg/L in blood (unspecified) at autopsy 7.9 mg/L in blood (unspecified) at autopsy
		Quetiapine					3.4 mg/L in blood (unspecified) at autopsy 3.7 mg/L in blood (unspecified) at autopsy
		Warfarin					
		Benazepril					
		Ranitidine					
917	45 y F	Atenolol	A	Ingst	Int-S	1	
		Amlodipine/benazepril					
		Ethanol					390 mg/dL in serum at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Cardiovascular drugs, continued							
918	45 y M	Amlodipine Clonidine Metoprolol Metformin Rosiglitazone Simvastatin	U	Ingst	Int-S	1	
919	46 y F	Verapamil Codeine/acetaminophen	U	Ingst	Int-S	1	
920 h	46 y M	Amlodipine Diltiazem Labetalol Loratadine	A/C	Ingst	Unt-T	2	
921	46 y F	Trandolapril/verapamil	A	Ingst	Int-S	1	
922 a	46 y M	Diltiazem (long-acting)	U	Ingst	Int-S	1	2.2 mcg/mL in serum at autopsy
923	47 y M	Amlodipine Metoprolol/ hydrochlorothiazide Acetaminophen/hydrocodone Ethanol	A	Ingst	Int-S	1	
924	47 y M	Diltiazem (long-acting) Cocaine Montelukast Ethanol	A	Ingst+ Inhal	Int-S	1	5.6 mg/L in blood (unspecified) at autopsy 48.4 mg/kg in gastric (stomach content) at autopsy 0.150 mg/L in blood (unspecified) at autopsy 0.420 mg/kg in gastric (stomach content) at autopsy Benzoylecgonine 1.7 mg/L in blood (unspecified) at autopsy Benzoylecgonine 3.2 mg/kg in gastric (stomach content) at autopsy
925 h	47 y M	Verapamil Labetalol Clonidine Propranolol	A	Ingst	Int-S	2	
926	48 y F	Diltiazem (long-acting) Alprazolam	A/C A	Ingst Ingst	Int-S Int-S	2 1	
927	48 y M	Beta-blocker Cyclobenzaprine Cleaner (alkali)					
928 h	49 y M	Amlodipine Beta-blocker Alprazolam Cocaine Amphetamine Marijuana	U	Ingst	Int-S	1	
929	49 y F	Verapamil	A	Ingst	Int-S	1	
930 a	50 y F	Verapamil Phenelzine Benzodiazepine	A/C	Ingst	Int-S	1	
931 ph	50 y F	Diltiazem Quetiapine Trazodone	A	Ingst	Int-S	1	
932	50 y M	Metoprolol Lisinopril Fexofenadine/pseudoephedrine Clopidogrel Allopurinol Ibuprofen Naproxen Meloxicam Atorvastatin	A/C	Ingst	Int-S	2	
933	51 y M	Verapamil Diazepam Sotalol	A	Ingst	Int-S	1	
934 p	51 y F	Amlodipine Metoprolol	U	Ingst	Int-S	2	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Cardiovascular drugs, continued							
		Paroxetine					
		Lorazepam					
935	51 y M	Clonidine	A	Ingst	Int-S		
		Aspirin					Acetaminophen 60 mcg/mL in blood (unspecified) at autopsy
							26.1 mg/dL in blood (unspecified) at autopsy
							Acetaminophen 90 mcg/mL in blood (unspecified) at autopsy
							39.1 mg/dL in blood (unspecified) at autopsy
							Acetaminophen 154 mcg/mL in blood (unspecified) at autopsy
							55 mg/dL in blood (unspecified at autopsy
							Acetaminophen 169 mcg/mL in blood (unspecified) at autopsy
							63 mg/dL in blood (unspecified) at autopsy
		Lisinopril					
		Montelukast					
		Fluoxetine					
		Lamotrigine					
		Potassium					
		Tramadol					
		Hydrochlorothiazide					
936	52 y F	Diltiazem (long-acting)	A/C	Ingst	Int-S	3	
		Acetaminophen/tramadol					Acetaminophen 34 mcg/mL in serum at autopsy
		Clonazepam					
		Fluoxetine					
		Furosemide					
937	52 y M	Verapamil (long-acting)	A/C	Ingst	Int-S	2	
		Triamterene/ hydrochlorothiazide					
		Glipizide					
		Lithium					
		Olanzapine					
		Metformin					
		Mevacor					
		Hydrogen peroxide					
938 ha	52 y M	Verapamil (long-acting)	A	Ingst	Int-S	1	
		Sertraline					
		Metoprolol					
939	53 y M	Nifedipine	U	Ingst	Int-S	1	
		Acetaminophen/hydrocodone					
		Acetaminophen/hydrocodone					
		Gabapentin					
940	53 y M	Verapamil	A	Ingst	Int-S	1	
		Valsartan					
		Tramadol					
941 ha	53 y F	Diltiazem (long-acting)	A	Ingst	Int-S	1	22 mcg/mL in blood (unspecified) at autopsy
942	56 y F	Metoprolol	A/C	Ingst	Int-S	3	
943	56 y M	Clonidine	A	Ingst	Int-S	1	
944	57 y F	Verapamil	U	Ingst	Int-S	1	
945 a	57 y F	Digoxin	U	Ingst	Unk	3	2.5 ng/mL in blood (unspecified) at autopsy
		Paroxetine					0.910 mg/L in blood (unspecified) at autopsy
946	57 y M	Verapamil	A	Ingst	Unk	1	
		Propranolol					
		Lithium					
		Quetiapine					
		Glipizide					
		Clonidine					
		Modafinil					
		Paroxetine					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Cardiovascular drugs, continued							
947 p	57 y F	Nifedipine	U	Ingst	Int-S	1	
948	58 y F	Diltiazem	A	Ingst	Int-S	1	
949 pi	58 y F	Atenolol Duloxetine	A/C	Ingst	Int-S	1	
950 p	59 y M	Verapamil Unk chemical	A/C	Ingst	Int-S	1	
951	59 y F	Diltiazem Metoprolol Ethanol	A/C	Ingst	Int-S	1	
952	59 y M	Atenolol Desipramine Salsalate Naltrexone Trazodone Levothyroxine Ethanol	A	Ingst	Int-S	1	222 mg/dL in blood (unspecified) at autopsy
953 p	59 y M	Felodipine Metoprolol Acetaminophen/propoxyphene	A/C	Ingst	Int-S	2	
954 h	60 y F	Amlodipine/benazepril Phenothiazine Diphenhydramine Paroxetine Sucralfate	U	Ingst	Int-S	3	
955 p	60 y F	Diltiazem (long-acting)	A/C	Ingst	Int-S	1	
956	60 y F	Atenolol Morphine Lorazepam	A	Ingst	Int-S	2	
957 p	60 y M	Verapamil	A/C	Ingst	Int-S	1	
958 p	60 y F	Diltiazem (long-acting) Clonazepam Clonidine	U	Ingst	Int-S	1	
959	61 y F	Verapamil Glipizide Metformin Quetiapine Diazepam Antihyperlipidemic	A/C	Ingst	Int-S	1	
960	61 y M	Diltiazem Carbamazepine	A	Ingst	Int-S	1	43 mcg/mL in blood (unspecified) at autopsy
961	61 y M	Amlodipine Atenolol Amlodipine/benazepril	A/C	Ingst	Int-S	1	
962	61 y F	Verapamil	A	Ingst	Int-S	1	
963	64 y F	Cardiac glycoside	C	Ingst	AR-D	2	Digoxin 3.6 ng/mL in blood (unspecified) at autopsy
964	64 y F	Beta-blocker Diltiazem	A/C	Ingst	Int-S	3	
965	64 y F	Verapamil (long-acting) Warfarin Pantoprazole	A/C	Ingst	Int-S	3	
966	66 y M	Digoxin	U	Ingst	Unt-U	3	4.1 ng/mL in blood (unspecified) at autopsy
967	66 y M	Amlodipine Clozapine Acetaminophen	A/C	Ingst	Int-S	2	
968	69 y M	Amlodipine Metoprolol Clonidine Salicylate Albuterol Ranitidine Tiagabine Diuretic Clopidogrel Lisinopril Ezetimibe Lorazepam Atorvastatin Phenytoin	A/C	Ingst	Int-S	3	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Cardiovascular drugs, continued							
969	70 y F	Nifedipine Losartan Gemfibrozil	A	Ingst	Int-S	1	
970	70 y F	Metoprolol	A	Ingst	Int-S	1	
971	70 y M	Verapamil Atenolol Lisinopril	A/C	Ingst	Int-S	1	3.2 mg/L in whole blood at autopsy
972	70 y M	Verapamil	A	Ingst	Int-S	1	
973 i	71 y M	Beta-blocker Quinine Glibenclamide Rosiglitazone Vitamins/iron Furosemide Hydrochlorothiazide	A	Ingst	Int-S	3	
974	71 y M	Cardiac glycoside	C	Ingst	AR-D	2	2.3 ng/mL in blood (unspecified) at autopsy
975	71 y M	Digoxin	C	Ingst	AR-D	3	
976	73 y M	Beta-blocker Amlodipine ACE inhibitor Carbon monoxide	U	Ingst+Inhal	Int-S	1	Carboxyhemoglobin 7% (w/v) in blood (unspecified) at autopsy
977	74 y M	Verapamil	A	Ingst	Unt-T	3	
978	74 y F	Digoxin	C	Ingst	Unt-G	3	
979	78 y F	Diltiazem (long-acting)	C	Ingst	Unt-T	2	
980	78 y F	Diltiazem Beta-blocker	A/C	Ingst	Int-S	2	
981	79 y F	Diltiazem	A/C	Ingst	Unt-T	3	
982	84 y M	Cardiac glycoside	A	Ingst	AR-D	1	Digoxin 3.2 ng/mL in blood (unspecified) at autopsy
983 h	84 y M	Diltiazem	A/C	Ingst	Int-S	1	1,400 ng/mL in blood (unspecified) at autopsy
984	84 y F	Digoxin	C	Ingst	AR-D	3	2.6 mcg/mL in serum at autopsy
985 p	84 y M	Digoxin	U	Ingst	Unk	2	
986	87 y M	Amlodipine Metoprolol	A/C	Ingst	Int-S	2	
987	88 y M	Diltiazem (long-acting)	A/C	Ingst	Int-S	2	
988	89 y F	Amlodipine/benazepril Isosorbide Phenytoin Fexofenadine Fluvastin	A/C	Ingst	Unt-T	2	6.7 mcg/mL in blood (unspecified) at autopsy
989 p	90 y M	Metoprolol Diuretic	A/C	Ingst	Int-S	1	
990	92 y F	Digoxin Metoprolol/ hydrochlorothiazide Furosemide Warfarin Valsartan Donepezil	A	Ingst	Int-M	2	
991	96 y M	Digoxin	C	Ingst	AR-D	3	3.1 ng/mL in blood (unspecified) at autopsy 4 ng/mL in blood (unspecified) at autopsy 3.3 ng/mL in blood (unspecified) at autopsy
992	98 y F	Digoxin	A	Ingst	Unt-G	3	Cardiac glycosides 4.3 ng/mL in blood (unspecified) at autopsy
See also cases 56, 281, 327, 393, 447, 458, 478, 479, 486, 564, 570, 573, 591, 608, 637, 669, 687, 755, 793, 794, 813, 826, 829, 838, 843, 865, 870, 887, 1006, 1013, 1014, 1017, 1018, 1020, 1023, 1053, 1080, 1084, 1100, 1107, 1198							
Cold and cough preparations							
993 p	2 y F	Hydrocodone Cocaine	A	Ingst	Oth-M	1	
994 pha	17 y M	Chlorpheniramine/ dextromethorphan	A	Ingst	Int-A	1	Chlorpheniramine 1,820 ng/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Cold and cough preparations, continued							
							Dextromethorphan 7,250 ng/mL in blood (unspecified) at autopsy Acetaminophen 2.9 mcg/mL in blood (unspecified) at autopsy Chlorpheniramine 235 ng/mL in blood (unspecified) at autopsy Dextromethorphan 1,160 ng/mL in blood (unspecified) at autopsy Acetaminophen 3 mcg/mL in blood (unspecified) at autopsy
995 p	19 y M	Chlorpheniramine/ dextromethorphan	A	Ingst	Int-A	3	
996 pa	20 y M	Promethazine/codeine	A	Ingst+ Unk	Int-U	1	Promethazine with codeine 0.120 mg/L in blood (unspecified) at autopsy
		Zolpidem Cocaine					
		Opioid					Codeine 2.230 mg/L in blood (unspecified) at autopsy Free codeine 0.990 mg/L in blood (unspecified) at autopsy Morphine 0.120 mg/L in blood (unspecified) at autopsy
		Alprazolam					44 mg/L in blood (unspecified) at autopsy
		Marijuana					
997 pai	20 y M	Dextromethorphan	A	Ingst	Int-A	1	10 mcg/mL in blood (unspecified) at autopsy
998 pa	22 y M	Acetaminophen/ extromethorphan/ doxylamine	A/C	Ingst	Int-S	2	Dextromethorphan 0.3 mg/L in blood (unspecified) at autopsy Doxylamine 0.4 mg/L in blood (unspecified) at autopsy Acetaminophen 20 mg/L in blood (unspecified) at autopsy
		Morphine					
999	24 y F	Acetaminophen	C	Ingst	Unt-T	2	51 mcg/mL in serum at autopsy
1000 p	25 y M	Benzonatate	A/C	Ingst	Int-S	1	
1001 pa	2 m U	Diphenhydramine/ibuprofen/ pseudoephedrine/ doxylamine	U	Unk	Oth-M	1	Diphenhydramine 7,730 ng/mL in unknown at autopsy
1002	61 y M	Diphenhydramine	A	Ingst	Int-S	2	
1003 pi	3 m M	Dextromethorphan	U	Unk	Unk	1	
1004 pai	4 m F	Dextromethorphan	A	Ingst	Oth-M	3	0.070 mg/L in blood (unspecified) at autopsy
See also cases 114, 211, 256, 271, 309, 344, 353, 374, 384, 432, 436, 462, 558, 657, 719, 767, 785, 932, 1054, 1108, 1167, 1176							
Dietary supplements/herbals/homeopathic							
1005 h	16 y F	Ma huang	A	Ingst	AR-D	3	
See also cases 274, 1138							
Diuretics							
1006	42 y F	Furosemide Isosorbide/hydralazine	A	Ingst	Int-S	2	
See also cases 218, 668, 826, 865, 908, 910, 912, 935, 936, 937, 968, 973, 989, 990							
Electrolytes and minerals							
1007	68 y F	Magnesium hydroxide	C	Ingst	Int-M	3	6.2 mEq/L in serum at autopsy
See also cases 112, 218, 327, 935, 973, 1008							
Gastrointestinal preparations							
1008 h	58 y F	*Saccharomyces boulardii* Calcium acetate	A	Par	Unt-T	3	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Gastrointestinal preparations, continued							
		Unk drug					
		Vancomycin					
See also cases 5, 10, 326, 329, 591, 599, 610, 826, 954, 965, 1014, 1047, 1080, 1147							
Hormones and hormone antagonists							
1009 a	13 y F	Insulin	A	Par	Int-S	1	
1010 h	24 y M	Insulin	A	Par	Int-S	2	
		Unk drug					
1011 h	26 y F	Insulin	A	Ingst+Par	Unk	1	
1012 a	29 y M	Metformin	A	Ingst	Int-S	1	
		Ethanol					214 mg/dL in blood (unspecified) at autopsy
1013 ph	35 y F	Insulin	U	Ingst+Par	Int-S	2	
		Acetaminophen/hydrocodone					
		Lisinopril					
1014	37 y M	Metformin	A/C	Ingst	Int-S	1	
		Glipizide					
		Benzodiazepine					
		Beta-blocker					
		Sertraline					
		Omeprazole					
		Olanzapine					
		Zolpidem					
		Unk substance					
1015	38 y M	Metformin	U	Ingst	Int-S	1	
		Acetaminophen/codeine					
1016 p	42 y M	Insulin	A	Par	Int-S	1	
1017	43 y F	Insulin	A/C	Ingst+ Par	Int-S	1	
		Metoprolol					
		Acetaminophen					
1018	43 y M	Metformin	U	Ingst	Int-S	2	
		Thiazolidinedione					
		Ketorolac					
		Carvedilol					
1019 p	43 y M	Metformin	U	Ingst	Unk	2	
		Acetaminophen					
		Glipizide					
1020 h	49 y F	Metformin	A	Ingst	Int-S	1	380 mcg/mL in blood (unspecified) at autopsy
		Lisinopril/hydrochlorothiazide					
1021 a	51 y F	Metformin	A/C	Ingst	Int-S	1	
		Venlafaxine					5400 ng/mL in blood (unspecified) at autopsy
							o-desmethyl-venlafaxine 2,100 ng/mL in blood (unspecified) at autopsy
		Doxepin					970 ng/mL in blood (unspecified) at autopsy
							Desmethyldoxepin 470 ng/mL in blood (unspecified) at autopsy
		Tramadol					400 ng/mL in blood (unspecified) at autopsy
							o-desmethyltramadol 40 ng/mL in blood (unspecified)at autopsy
		Nortriptyline					12 ng/mL in blood (unspecified) at autopsy
		Zolpidem					
		Ziprasidone					
1022	52 y M	Metformin	A/C	Ingst	Int-S	2	
1023	52 y M	Glyburide/metformin	A/C	Ingst	Int-S	1	
		Diltiazem (long-acting)					
		Ramipril					
1024	55 y M	Metformin	A/C	Ingst	Int-S	1	
1025	60 y F	Insulin	A/C	Ingst	Int-S	1	
		Zolpidem					
		Citalopram					
1026	64 y M	Metformin	A	Ingst	Int-S	2	
		Fluconazole					
1027	76 y M	Metformin	A/C	Ingst	Int-S	2	
		Glyburide					
		Sertraline					
		Tramadol					
		L-dopa					
1028	77 y M	Metformin	C	Ingst	AR-D	2	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Hormones and hormone antagonists, continued							
See Also case 218, 344, 453, 570, 642, 668, 795, 826, 829, 870, 914, 918, 937, 946, 952, 959, 973, 1069, 1084, 1158, 1169, 1238							
Miscellaneous drugs							
1029 pa	41 y M	Succinylcholine Cisatracurium Midazolam Propofol Venlafaxine (long-acting) Neostigmine	A	Ingst+Par	Int-S	1	
1030	53 y F	Vasopressin	A	Par	Unt-T	2	
1031	57 y M	Succinylcholine	A	Par	AR-D	3	
1032 p	62 y M	Ramelteon Alprazolam	A	Ingst	Int-S	2	
1033 h	84 y F	Hydroxyurea	C	Ingst	AR-D	1	
1034	Unknown adult (≥20 years) F	*n*-acetylcysteine	A	Par	AR-D	2	
See also cases 541, 578, 751, 771, 785, 829, 860, 932, 946, 990, 1008, 1027							
Muscle relaxants							
1035 p	17 y M	Carisoprodol Phencyclidine Alprazolam Methadone Ethanol	A/C	Ingst	Int-S	2	
1036 p	22 y F	Baclofen	A	Ingst	Int-S	2	
1037	29 y M	Cyclobenzaprine	A	Ingst	Unk	3	
1038	35 y F	Cyclobenzaprine Alprazolam Gabapentin Phenytoin	A	Ingst	Int-S	2	
1039 p	40 y F	Carisoprodol Acetaminophen/propoxyphene Gabapentin	A/C	Ingst	Int-A	1	
1040	40 y F	Metaxolone	A	Ingst	Int-S	2	
1041 pa	41 y F	Carisoprodol Oxycodone Acetaminophen/hydrocodone Methadone Alprazolam	U	Ingst+Unk	Unk	2	8 mg/L in blood (unspecified) at autopsy Meprobamate 19 mg/L in blood (unspecified) at autopsy 0.1 mg/L in blood (unspecified) at autopsy
1042 a	41 y F	Carisoprodol Methadone Barbiturates Cocaine Amphetamine Marijuana Citalopram	A	Ingst	Int-S	1	89 mg/L in blood (unspecified) at autopsy Meprobamate 150 mg/L in blood (unspecified) at autopsy 0.5 mg/L in blood (unspecified) at autopsy 0.5 mg/L in blood (unspecified) at autopsy
1043	42 y M	Carisoprodol Hydromorphone	A	Ingst	Int-S	1	
1044	45 y M	Baclofen	A	Par	Unt-T	3	
1045 p	48 y M	Methocarbamol Cyclobenzaprine	A	Ingst	Int-S	2	
1046 h	49 y M	Carisoprodol	A	Ingst	Int-S	1	
1047 a	57 y M	Baclofen Oxycodone/aspirin Aspirin Diazepam Gabapentin Oxybutynin Unk laxative	A/C	Ingst	Int-S	1	1,239 ng/mL in blood (unspecified) at autopsy
1048	61 y M	Baclofen Desflurane Ethanol	C	Ingst+Inhal+Par	Oth-W	2	
1049	75 y F	Baclofen Diazepam Acetaminophen/hydrocodone	A/C	Ingst	Unk	2	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Muscle relaxants, continued							
See also cases 265, 266, 304, 323, 329, 345, 359, 370, 375, 426, 435, 439, 447, 453, 454, 458, 460, 462, 469, 478, 484, 501, 502, 510, 540, 555, 556, 564, 571, 621, 627, 629, 639, 641, 646, 651, 718, 725, 744, 754, 774, 775, 793, 795, 813, 824, 838, 843, 876, 927, 1070, 1092, 1127, 1231							
Sedative/hypnotics/antipsychotics							
1050 p	8 y F	Chloral hydrate	A	Ingst	Unt-G	2	
		Hydroxyzine					
1051	11 y M	Quetiapine	A	Ingst	Int-S	1	
1052 pa	17 y M	Chloral hydrate	A	Ingst	Int-S	1	Trichloroethanol 26.5 mcg/mL in blood (unspecified) at autopsy
1053 ha	18 y F	Alprazolam	A	Ingst	Int-S	1	0.150 mg/L in blood (unspecified) at autopsy
		Quetiapine					20 mg/L in blood (unspecified) at autopsy
		Prazosin					
		Ethanol					0.050 g/dL in blood (unspecified) at autopsy
							104 mg/dL in blood (unspecified) at autopsy
		Valproic acid					18.6 mg/L in blood (unspecified)
		Lamotrigine					
		Sertraline					3.860 mg/L in blood (unspecified) at autopsy
							Desmethylsertraline 0.570 mg/L in blood (unspecified) at autopsy
1054	19 y M	Quetiapine	U	Ingst	Unk	2	
		Sertraline					
		Fluoxetine					
		Dextromethorphan					
		Unk substance					
1055 ha	20 y F	Doxylamine	A	Ingst	Int-S	1	
		Acetaminophen					128 mg/L in serum at autopsy
1056 a	21 y M	Quetiapine	A	Ingst	Int-S	2	14.780 mg/L in whole blood at autopsy
		Escitalopram					
1057	22 y F	Quetiapine	A	Ingst	Int-S	2	
		Fluoxetine					
1058 pa	23 y M	Temazepam	U	Ingst	Unk	1	2,100 ng/mL in blood (unspecified) at autopsy
		Alprazolam					0.1 mg/L in blood (unspecified) at autopsy
		Oxycodone					0.1 mg/L in blood (unspecified) at autopsy
1059	29 y M	Quetiapine	A/C	Ingst	Int-S	1	
		Valproic acid					
1060 p	30 y M	Benzodiazepine	U	Unk	Unk	2	
		Cocaine					
		Formaldehyde/methanol					
1061 p	30 y F	Quetiapine	A	Ingst	Int-U	1	
1062 a	31 y F	Quetiapine	A/C	Ingst	Int-S	2	
		Cocaine					Benzoylecgonine 500 ng/mL in blood (unspecified) at autopsy
1063 ha	32 y M	Benzodiazepine	A	Ingst	Int-A	3	
		Ethanol					
		Methadone					0.670 mg/L in blood (unspecified) at autopsy
1064 p	32 y F	Quetiapine	U	Ingst	Int-S	2	
		Benzodiazepine					
1065 p	34 y F	Alprazolam	A	Ingst	Int-S	2	
		Ethanol					
		Opioid					
1066 ha	35 y M	Haloperidol	U	Par	AR-D	1	
		Cocaine					0.042 mg/L in blood (unspecified) at autopsy
		Alprazolam					
1067 p	36 y F	Quetiapine	A	Ingst	Int-S	2	
1068	36 y M	Quetiapine	A	Ingst+Aspir	Int-S	3	
		Valproic acid					144 mcg/mL in blood (unspecified) at autopsy
		Alprazolam					
1069 i	36 y F	Risperidone	A	Ingst	Int-S	2	
		Insulin					
		Topiramate					
		Lorazepam					

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Sedative/hypnotics/antipsychotics, continued							
1070	38 y F	Quetiapine Clonazepam Sertraline Pregabalin Acetaminophen/hydrocodone Carisoprodol	A	Ingst	Int-S	2	
1071 p	38 y M	Clonazepam	U	Ingst	Int-A	1	
1072	39 y M	Phenobarbital	A/C	Ingst	Unt-T	2	
1073	41 y M	Quetiapine	A	Ingst	Unt-G	3	
1074	41 y M	Quetiapine	A	Ingst	Int-S	1	
1075 p	42 y M	Quetiapine Paroxetine	U	Unk	Int-S	2	2,000 ng/mL in blood (unspecified) at autopsy 560 ng/mL in blood (unspecified) at autopsy
1076	42 y F	Quetiapine Venlafaxine Ethanol	A	Ingst	Int-S	2	
1077	42 y F	Clozapine	A/C	Ingst	Int-S	2	
1078 p	42 y F	Phenobarbital Ethanol Cocaine	U	Ingst	Int-S	2	122 mcg/mL in unknown at autopsy 86 mcg/mL in unknown at autopsy 26 mcg/mL in unknown at autopsy
1079	43 y F	Olanzapine Valproic acid	A	Ingst	Int-S	2	 15.3 mcg/mL in serum at autopsy
1080	43 y M	Clozapine Haloperidol Benztropine Gemfibrozil Senna Vitamins–multiple	A/C	Ingst	Int-S	2	
1081	44 y F	Clonazepam	A	Ingst	Int-S	2	
1082 a	46 y F	Quetiapine Zolpidem Ethanol	A	Ingst	Int-S	2	1 mg/L in blood (unspecified) at autopsy 0.021 mg/L in blood (unspecified) at autopsy 0.240 g/dL in blood (unspecified) at autopsy
1083 h	46 y F	Quetiapine Venlafaxine	A/C	Ingst	Int-S	2	
1084	47 y F	Quetiapine Mirtazapine Trazodone Gabapentin Topiramate Hydroxyzine Levothyroxine Ezetimibe	A/C	Ingst	Int-S	3	
1085	47 y F	Quetiapine Clonazepam	A/C	Ingst	Int-S	2	
1086 ph	48 y M	Quetiapine Valproic acid	A	Ingst	Int-S	2	
1087	48 y F	Quetiapine Ethanol Cocaine	A/C	Ingst	Int-S	2	 108 mg/dL in blood (unspecified) at autopsy
1088	48 y M	Quetiapine	A	Ingst	Unk	2	
1089	49 y M	Quetiapine	A	Ingst	Int-S	2	
1090 p	49 y M	Fluphenazine	A	Ingst	Int-S	1	
1091	50 y M	Quetiapine	A	Ingst	Int-S	3	
1092 pa	50 y F	Quetiapine Benzodiazepine Maprotiline Methocarbamol Hydrocodone Tramadol	U	Ingst	Int-S	1	
1093	50 y F	Lorazepam Acetaminophen	U	Ingst+ Unk	Int-S	2	 155 mcg/mL in serum at autopsy
1094 ha	51 y M	Haloperidol Salicylate	U	Ingst	Unk	2	 28.6 mg/dL in serum at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Sedative/hypnotics/antipsychotics, continued							
1095 pa	52 y F	Diazepam	U	Ingst	Int-S	1	0.390 mg/L in blood (unspecified) at autopsy
							Nordiazepam 0.340 mg/L in blood (unspecified) at autopsy
		Ethanol					144 mg/dL in blood (unspecified) at autopsy
		Acetaminophen/butalbital/caffeine/codeine					Codeine 2.080 mg/L in blood (unspecified) at autopsy
							Codeine >1 mg/L in vitreous at autopsy
							Acetaminophen 28 mg/L in blood (unspecified) at autopsy
1096	52 y M	Phenobarbital	A	Ingst	Int-S	1	
1097 pa	53 y M	Olanzapine	U	Ingst	Unk	2	0.820 mg/L in blood (unspecified) at autopsy
		Tiagabine					
1098 h	55 y M	Olanzapine	U	Ingst	Unk	2	
		Risperidone					
		Benztropine					
1099	56 y F	Quetiapine	A/C	Ingst	Int-S	2	
		Carbamazepine					
		Duloxetine					
		Lamotrigine					
		Lorazepam					
		Ibuprofen					
1100	57 y F	Buspirone	A	Ingst	Int-S	3	
		Sertraline					
		Zolpidem					
		Valproic acid					
		Diphenhydramine					
		Amlodipine					
1101 p	58 y M	Clonazepam	A	Ingst	Int-S	2	
		Zolpidem					
		Eszopiclone					
		Lithium					
1102 ph	58 y F	Diazepam	U	Ingst	Unk	1	
		Nortriptyline					130 ng/mL in blood (unspecified) at autopsy
		Ethanol					24 mg/dL in blood (unspecified) at autopsy
1103 p	60 y M	Flurazepam	A	Ingst	Int-S	2	
1104 h	60 y F	Haloperidol	A	Ingst	Int-U	3	
1105 pha	61 y F	Quetiapine	U	Ingst+Derm	Int-S	1	
		Lithium					0.970 mEq/L in blood (unspecified) at autopsy
		Diazepam					
		Methadone					
		Fentanyl					
1106	62 y M	Alprazolam	A/C	Ingst	Int-A	2	
		Methadone					
1107	66 y F	Quetiapine	U	Ingst	Int-S	3	0.010 mcg/mL in blood (unspecified) at autopsy
		Aspirin					
		Ibuprofen					
		Gabapentin					
		Verapamil					
1108 pa	67 y M	Alprazolam	U	Ingst	Int-S	3	0.090 mg/L in blood (unspecified) at autopsy
		Ethanol					70 mg/dL in blood (unspecified) at autopsy
		Diphenhydramine					0.210 mg/L in blood (unspecified) at autopsy
1109	70 y F	Clonazepam	A/C	Ingst	Int-S	1	
1110	73 y M	Zolpidem	A	Ingst	Int-S	3	1.9 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen/hydrocodone					Acetaminophen 25 mg/L in blood (unspecified) at autopsy
		Acetaminophen/hydrocodone					Hydrocodone 0.420 mcg/mL in blood (unspecified) at autopsy
		Propoxyphene					1.6 mcg/mL in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Sedative/hypnotics/antipsychotics, continued							
		Codeine					0.720 mcg/mL in blood (unspecified) at autopsy
1111	76 y F	Buspirone Venlafaxine	A/C	Ingst	Int-S	3	
1112 ph	80 y M	Lorazepam Ethanol	U	Ingst	Int-S	1	
1113 p	83 y F	Diazepam	A	Ingst	Int-S	2	
1114 h	83 y F	Diazepam Acetaminophen	A	Ingst	Int-S	2	 110 mcg/mL in blood (unspecified) at autopsy
1115	85 y F	Meprobamate	A	Ingst	Int-S	1	
1116 h	85 y F	Diazepam	A/C	Ingst	Int-S	1	
1117	85 y F	Alprazolam	C	Ingst	Int-S	1	130 ng/mL in blood (unspecified) at autopsy
1118 pa	90 y F	Phenobarbital	U	Ingst	Int-S	1	31.4 mcg/mL in blood (unspecified) at autopsy
1119	94 y F	Phenobarbital Ethanol	A/C	Ingst	Int-S	1	193 mg/L in plasma at autopsy
1120 p	100 y F	Risperidone	A	Par	AR-D	3	
1121 p	20 + y M	Quetiapine Valproic acid	A	Ingst+ Unk	Int-U	2	
1122 p	Unknown adult (≥20 years) F	Quetiapine Gabapentin	A	Ingst	Unk	1	
1123	Unknown age U	Quetiapine	A	Ingst	Int-S	3	41,000 ng/mL in unknown at autopsy
		Clozapine					Ziprasidone 5,600 ng/mL in unknown at autopsy
See also cases 4, 5, 17, 29, 51, 56, 79, 85, 113, 114, 125, 141, 205, 213, 218, 238, 243, 256, 260, 262, 266, 270, 272, 280, 281, 286, 290, 294, 299, 306, 307, 308, 313, 318, 320, 323, 328, 329, 330, 334, 341, 343, 345, 348, 349, 351, 353, 354, 358, 363, 368, 375, 376, 377, 385, 387, 389, 393, 395, 396, 402, 413, 418, 424, 427, 434, 435, 437, 444, 447, 453, 454, 457, 458, 462, 468, 469, 471, 476, 478, 481, 482, 486, 490, 494, 500, 501, 502, 510, 516, 517, 519, 532, 534, 535, 540, 541, 544, 546, 547, 552, 554, 556, 558, 563, 573, 576, 580, 584, 585, 588, 594, 601, 610, 618, 620, 625, 626, 627, 633, 639, 641, 642, 647, 651, 654, 655, 657, 669, 679, 680, 683, 694, 706, 725, 728, 742, 744, 750, 751, 755, 760, 763, 769, 772, 774, 775, 778, 784, 785, 788, 789, 791, 793, 794, 795, 796, 797, 798, 801, 803, 804, 805, 811, 812, 819, 822, 823, 825, 826, 830, 837, 838, 839, 841, 842, 844, 847, 851, 853, 860, 863, 867, 874, 880, 881, 885, 902, 906, 916, 926, 928, 930, 931, 933, 934, 936, 937, 946, 954, 956, 958, 959, 967, 968, 996, 1014, 1021, 1025, 1029, 1032, 1035, 1038, 1041, 1042, 1047, 1049, 1131, 1136, 1140, 1145, 1150, 1156, 1167, 1169, 1173, 1177, 1183, 1186, 1190, 1223, 1225, 1228							
Stimulants and street drugs							
1124	16 y F	Methylenedioxymethamphetamine	A	Unk	Int-U	2	
1125 ph	17 y F	Cocaine Ethanol	A	Ingst	Int-A	2	
1126 p	17 y F	Heroin	A	Inhal	Int-A	1	
1127 p	18 y F	Cocaine Oxycodone Carisoprodol	U	Ingst	Unk	1	
1128 h	18 y F	Methylenedioxymethamphetamine	A	Ingst	Int-U	1	5,724 ng/mL in urine at autopsy 29 ng/mL in blood (unspecified) at autopsy
1129 i	18 y F	Amphetamine	A	Inhal	Int-A	3	Methamphetamine 0.280 mcg/mL in blood (unspecified) at autopsy 0.070 mcg/mL in blood (unspecified) at autopsy
1130 p	18 y M	Cocaine	A	Ingst	Int-M	2	
1131 p	19 y M	Cocaine Unk opioid Benzodiazepine Unk drug	A/C	Ingst+Unk	Int-A	2	
1132 h	20 y F	Methamphetamine	A	Ingst+Inhal	Int-M	1	
1133 ai	20 y F	Amphetamine	A	Ingst	Int-A	2	
1134 ph	21 y M	Methamphetamine Cocaine	A	Ingst+Inhal	Int-S	2	
1135 pha	21 y M	Cocaine Marijuana	A	Ingst+ Inhal	Int-M	1	
1136 p	21 y F	Cocaine Zolpidem Levetiracetam	A	Ingst+Inhal	Unt-G	2	
1137	22 y M	Cocaine	A	Ingst	Int-M	1	
1138	22 y F	Methylphenidate Ephedra Ethanol Valerian	A	Ingst	Int-S	1	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Stimulants and street drugs, continued							
1139 p	22 y F	Methylenedioxymethamphetamine	A	Unk	Int-A	2	0.280 mg/L in blood (unspecified) at autopsy
1140 p	22 y M	Heroin Methadone Quetiapine Alprazolam	U	Ingst+Aspir+Oth	Int-S	2	
1141 ph	23 y M	Heroin	A	Par	Int-A	2	
1142 h	23 y M	Cocaine	A	Ingst	Int-S	1	
1143 ha	24 y M	Cocaine	A	Ingst	Int-A	1	
1144 h	24 y F	Amphetamine	A	Ingst	Int-A	3	
1145 pa	24 y M	Heroin Clonazepam Benzodiazepine Doxepin Cefadroxil	A/C	Ingst+Par	Int-A	2	
1146 p	24 y F	Methamphetamine	A/C	Ingst+Par	Int-A	2	
1147 p	25 y M	Amphetamine Laxative–stimulant Frangula bark Glucomannan	U	Unk	Unk	2	
1148 ph	26 y F	Cocaine	U	Inhal+Par	Int-A	2	
1149	27 y F	Methylenedioxymethamphetamine	A	Ingst	Int-A	1	
1150 p	27 y M	Heroin Clonazepam Paroxetine Zolpidem	U	Unk	Int-A	2	
1151 p	27 y F	Cocaine Antimalarial	A	Ingst	Int-S	2	
1152 ha	28 y M	Cocaine Methamphetamine Heroin	A/C	Unk	Int-A	1	
1153 pi	28 y M	Heroin	C	Unk	Int-A	2	
1154 p	28 y M	Methamphetamine Trihexyphenidyl Paroxetine Valproic acid	A	Unk	Int-U	3	
1155 p	29 y M	Cocaine Unk opiate	A	Unk	Int-S	3	
1156 pa	29 y F	Heroin Ethanol Acepromazine	U	Ingst+Par	Unk	1	Morphine 0.440 mg/L in blood (unspecified) at autopsy 140 mg/dL in blood (unspecified) at autopsy
1157	29 y F	Phencyclidine	A	Unk	Int-A	1	
1158 pai	30 y M	Methylenedioxymethamphetamine Cocaine Methadone Androgen Unk drug	U	Unk	Unk	1	3,4-MDMA 0.540 mg/L in blood (unspecified) at autopsy 3,4-MDA 0.270 mg/L in blood (unspecified) at autopsy 0.047 mg/L in blood (unspecified) at autopsy Benzoylecgonine 2 mg/L in blood (unspecified) at autopsy 0.450 mg/L in blood (unspecified) at autopsy 4.4 mg/kg in liver at autopsy
1159 p	30 y M	Cocaine Ethanol	A	Ingst	Int-S	2	
1160 i	30 y M	Methamphetamine	A	Ingst	Int-A	1	
1161	30 y M	Phencyclidine	A	Inhal	Int-A	1	
1162	30 y M	Heroin	C	Inhal	Int-A	3	
1163	31 y M	Caffeine	A	Ingst	Int-S	1	
1164 pa	31 y M	Heroin	A/C	Unk	Int-A	1	Morphine 57 mg/L in urine (quantitative only) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Stimulants and street drugs, continued							
							Morphine 0.120 mg/L in blood (unspecified) at autopsy
		Cocaine					Benzoylecgonine 10 mg/L in urine (quantitative only) at autopsy
							1.5 mg/L in urine at autopsy
1165 p	31 y M	Heroin	A	Par	Int-A	1	
1166	32 y F	Methamphetamine	A	Inhal	Int-M	2	
1167 p	32 y M	Marijuana	A/C	Ingst	Int-S	1	
		Lithium					
		Sertraline					
		Quetiapine					
		Diphenhydramine					
		Methadone					
		Acetaminophen/hydrocodone					
		Clonazepam					
1168 h	33 y M	Cocaine	A/C	Unk	Int-A	1	
1169 ha	34 y M	Cocaine	A	Ingst	Unk	2	
		Rosiglitazone					
		Lithium					
		Clonazepam					
1170 pa	35 y M	MethylenedioxymEthamphetamine	A	Unk	Int-A	1	MDA 0.032 mg/L in blood (unspecified) at autopsy
							MDMA 0.857 mg/L in blood (unspecified) at autopsy
		Methamphetamine					3.365 mg/L in blood (unspecified) at autopsy
1171 p	35 y M	Cocaine	U	Ingst	Int-A	1	
		Oxycodone					
		Ethanol					
1172 ha	35 y M	Cocaine	A	Ingst	Unk	2	Cocaine metabolite 1.2 mcg/dL in blood (unspecified) at autopsy
1173 p	35 y M	Heroin	U	Par+Unk	Int-A	1	
		Cocaine					
		Alprazolam					
1174 pa	35 y F	Heroin	A	Unk	Int-A	1	
1175 p	35 y M	Heroin	A	Par	Int-S	1	
		Cocaine					
1176 pha	35 y M	Cocaine	U	Ingst+Inhal+Unk	Int-A		
						1	5,100 ng/mL in blood (unspecified) at autopsy
							Cocaethylene 23 ng/mL in blood (unspecified) at autopsy
							Benzoylecgonine 10,000 ng/mL in blood (unspecified) at autopsy
		Marijuana					3.6 ng/mL in blood (unspecified) at autopsy
		Pseudoephedrine					45 ng/mL in blood (unspecified) at autopsy
		Ethanol					
1177 p	35 y F	Cocaine	U	Unk	Int-U	1	Benzoylecgonine 1,288 mcg/L in blood (unspecified) at autopsy
		Benzodiazepine					
1178	36 y M	Cocaine	A	Unk	Int-A	1	
1179	36 y M	Cocaine	A	Unk	Int-A	2	
		Heroin					
1180	36 y M	Amphetamine	U	Unk	Int-U	2	
		Unk drug					
1181 a	36 y M	Cocaine	A	Unk	Int-A	1	150 ng/mL in blood (unspecified) at autopsy
							Benzoylecgonine 6,100 ng/mL in blood (unspecified) at autopsy
1182 a	36 y M	Cocaine	A	Ingst	Int-A	1	*Erythroxylon coca* 1.6 mcg/mL in blood (unspecified) at autopsy
1183 pa	37 y M	Cocaine	A	Ingst	Unk	1	Benzoylecgonine 1.2 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Stimulants and street drugs, continued							
							0.059 mg/L in blood (unspecified) at autopsy
		Oxycodone					0.8 mg/L in blood (unspecified) at autopsy
							Oxycodone (vena cava) 0.550 mg/L in blood (unspecified) at autopsy
		Methadone					0.085 mg/L in blood (unspecified) at autopsy
							0.350 mg/kg in liver at autopsy
		Alprazolam					
1184 pa	37 y F	Cocaine	A/C	Par	Int-A	1	173 ng/mL in blood (unspecified) at autopsy
							Benzoylecgonine 5,496 ng/mL in blood (unspecified) at autopsy
1185 p	37 y M	Cocaine	A	Ingst	Int-A	1	
1186 ph	37 y M	Cocaine	U	Ingst	Int-S	1	
		Acetaminophen/hydrocodone					
		Oxycodone					
		Diazepam					
1187 p	37 y F	Cocaine	A	Par	Int-A	1	
		Heroin					
1188 pa	38 y F	Amphetamine	A/C	Ingst+Inhal	Int-S	1	Methamphetamine 41 ng/mL in blood (unspecified) at autopsy
		Ethanol					260 mg/dL in blood (unspecified) at autopsy
1189 ph	38 y M	Cocaine	A	Unk	Int-A	1	
1190 p	39 y F	Cocaine	A	Ingst	Int-A	2	
		Aripiprazole					
		Olanzapine					
		Quetiapine					
1191	41 y M	Cocaine	A	Ingst	Int-A	3	
		Ethanol					200 mg/dL in blood (unspecified) at autopsy
		Marijuana					
1192 pa	41 y F	Cocaine	A	Unk	Unk	2	0.850 mcg/mL in blood (unspecified) at autopsy
							Benzoylecgonine 14 mcg/mL in blood (unspecified) at autopsy
1193 p	42 y M	Heroin	A	Inhal	Int-A	2	
		Cocaine					
1194	42 y M	Cocaine	A	Inhal	Int-A	2	
1195 p	43 y M	Cocaine	A	Ingst+Inhal	Int-A	2	
		Amphetamine					
1196 pa	43 y F	Methamphetamine	A	Unk	Int-A	1	Amphetamine 1.4 mg/L in urine at autopsy
							2 mg/L in urine (quantitative only) at autopsy
1197 h	43 y M	Amphetamine	A	Ingst+Inhal	Int-A	2	
		Cocaine					
1198 a	44 y F	Cocaine	A	Ingst+Inhal	Int-S	1	3,000 ng/mL in blood (unspecified) at autopsy
							Benzoylecgonine 73,000 ng/mL in blood (unspecified) at autopsy
		Diltiazem					28 ng/mL in blood (unspecified)
		Hydroxyzine					
		Ibuprofen					
		Acetaminophen					4.7 mcg/mL in blood (unspecified) at autopsy
1199	45 y F	Amphetamine	A	Unk	Int-S	2	
1200 p	45 y F	Cocaine	A/C	Par	Int-A	1	3,212 ng/mL in blood (unspecified) at autopsy
							Benzoylecgonine 6,064 ng/mL in blood (unspecified) at autopsy
1201 h	46 y F	Cocaine	A	Ingst	Oth-W	2	
1202 p	46 y M	Cocaine	A/C	Ingst	Unk	1	0.260 mg/L in blood (unspecified) at autopsy
							Benzoylecgonine 2.070 mg/L in blood (unspecified) at autopsy

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Stimulants and street drugs, continued							
							Ecgonine methyl ester 2.490 mg/L in blood (unspecified) at autopsy
1203 h	46 y F	Cocaine	A/C	Inhal	Int-A	1	Benzoylecgonidine 3.7 mcg/mL in blood (unspecified) at autopsy
		Opioid					Codeine 0.160 mcg/mL in blood (unspecified) at autopsy
1204	46 y M	Heroin	A	Par	Unt-G	3	Codeine 0.140 mcg/mL in vitreous at autopsy
							Morphine 0.090 mcg/mL in vitreous at autopsy
1205 ph	47 y M	Heroin	A	Par	Int-A	1	Morphine 0.230 mcg/mL in blood (unspecified) at autopsy
1206	47 y F	Cocaine	A	Unk	Int-A	1	
1207	48 y F	Methylenedioxymethamphetamine	A	Ingst	Int-A	1	MDMA 2 mcg/mL in blood (unspecified) at autopsy
							MDA 0.070 mcg/mL in blood (unspecified) at autopsy
							Methamphetamine 0.250 mcg/mL in blood (unspecified) at autopsy
1208 pa	48 y M	Heroin	U	Par+ Unk	Int-S	1	Morphine 0.110 mg/L in blood (unspecified) at autopsy
							Codeine 0.2 mg/L in blood (unspecified) at autopsy
1209 p	48 y M	Methamphetamine	A	Unk	Int-U	3	
		Cocaine					
1210	49 y F	Cocaine	A	Unk	Int-A	1	
		Unk opioid					
		Ethanol					
1211 ha	49 y M	Cocaine	A	Ingst	Int-S	1	Benzoylecgonine 0.070 mcg/mL in blood (unspecified) at autopsy
		Acetaminophen					97 mcg/mL in serum at autopsy
							71 mcg/mL in blood (unspecified) at autopsy
1212 ha	52 y M	Methamphetamine	C	Inhal	Int-A	3	0.921 mg/L in blood (unspecified) at autopsy
							0.066 mg/L in blood (unspecified) at autopsy
1213 pa	55 y M	Heroin	A/C	Inhal+Par	Int-A	1	Morphine 0.038 mg/L in blood (unspecified) at autopsy
		Cocaine					Benzoylecgonine 0.143 mg/L in blood (unspecified) at autopsy
1214	Unknown adult (≥20 years) M	Phentermine	U	Ingst	Int-U	2	
1215 pa	Unknown adult (≥20 years) F	Heroin	A	Ingst+Par	Int-S	1	0.310 mg/L in blood (unspecified) at autopsy
		Citalopram					
1216 p	Unknown adult (≥20 years) M	Cocaine	A	Inhal	Int-A	2	
1217 i	Unknown adult (≥20 years) M	Methamphetamine	A	Ingst	Unt-G	2	
See also cases 7, 8, 25, 46, 110, 141, 165, 169, 176, 220, 225, 270, 279, 281, 286, 287, 289, 290, 298, 301, 306, 323, 328, 330, 335, 339, 348, 363, 379, 385, 424, 447, 494, 509, 512, 521, 526, 544, 550, 558, 567, 586, 593, 621, 730, 771, 775, 826, 860, 908, 924, 928, 993, 996, 1035, 1042, 1060, 1062, 1066, 1078, 1087, 1225							
Unknown drug							
1218 p	2 y M	Unk drug	A	Unk	Unk	1	
1219	16 y F	Unk drug	A	Ingst	Int-S	2	
		Aspirin					Acetylsalicylic acid 170 mg/dL in blood (unspecified) at autopsy
1220 p	19 y F	Unk drug	A	Ingst	Int-S	1	
		Drain opener (alkali)					
1221	20 y F	Unk drug	U	Unk	Int-A	2	
1222	20 y F	Glimepiride	U	Unk	Unk	2	
1223 p	26 y F	Unk drug	A	Ingst	Int-S	2	
		Alprazolam					
1224 p	27 y F	Unk drug	A	Ingst+Unk	Int-U	2	
		Unk opiate					
1225 ph	29 y M	Unk drug	U	Unk	Int-A	2	

(*Continued*)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures

Case	Age	Substances	Chronicity	Routes	Reason	RCF	Blood concentration at time
Unknown drug, continued							
		Cocaine					
		Marijuana					
		Alprazolam					
		Tricyclic antidepressant					
1226	31 y F	Unk drug	U	Ingst	Int-U	2	Acetaminophen 50.6 mcg/dL in blood (unspecified) at autopsy
		Acetaminophen					
1227	31 y F	Unk drug	A	Unk	Int-S	3	
1228 ph	31 y F	Unk drug	A/C	Ingst	Unt-T	2	
		Duloxetine					
		Fluoxetine					
		Benzodiazepine					
		Ciprofloxacin					
1229 h	32 y M	Unk drug	U	Ingst	Int-S	3	
		Ethanol					37 mg/dL in unknown at autopsy
1230 h	33 y M	Glimepiride	A	Ingst	Unk	1	
		Aldicarb					
		Ethanol					
1231	38 y M	Glimepiride	U	Ingst+ Unk	Int-S	2	
		Tizanidine					
1232 p	41 y F	Glimepiride	A	Ingst	Int-S	2	
		Acetaminophen					
1233 p	42 y M	Unk drug	A	Unk	Unk	2	
1234 p	45 y F	Unk drug	A/C	Ingst	Int-U	2	
1235 p	51 y F	Unk drug	A	Ingst	Int-S	2	
1236	71 y F	Unk drug	A	Ingst	Unk	2	
1237	16 m M	Unk drug	A	Ingst	Unt-G	2	
See also cases 9, 133, 225, 274, 296, 328, 355, 484, 499, 521, 548, 564, 569, 600, 602, 658, 684, 870, 1010, 1131, 1155, 1158, 1180							
Veterinary drugs							
1238	41 y M	Unk drug	C	Par	Int-M	3	
		Androgen					
Vitamins							
1239h	71 y M	Vitamin K	A	Par	AR-D	3	
See also cases 906, 1014, 1080							

Listing of 1,229 human exposures where the medical outcome was coded as "death" or "death, indirect report." Of 1,514 fatalities reported to U.S. Poison Centers in 2006, for 212 cases the clinical information did not permit an assessment (unknown), 31 were judged to be definitely unrelated to the exposures, 26 were not coded, and 16 were miscoded (not a human death).

Case: Bolded case number=Narrative provided for this case in Appendix B, i=case was reported to poison center indirectly (by coroner, medical examiner, or other) after the fatality occurred, p = prehospital cardiac and/or respiratory arrest, h=hospital records reviewed, a=autopsy report reviewed.

Chronicity: C = chronic exposure, A = acute exposure, A/C = acute on chronic, U=unknown.

Route: Aspir=Aspiration, Derm=Dermal, Oc=Ocular, Ot=Otic, Inhal=Inhalation, Ingst=Ingestion, Par=Parenteral.

Most Reason Codes are formatted with a major and minor category. Reason codes: AR-D=Adverse Reaction Drug, Int-A=Intentional Abuse, Int-M=Intentional Misuse, Int-S=Intentional Suspected Suicidal, Int-U=Intentional Unknown, Unt-B=Unintentional Bite/sting, Unt-E=Unintentional Environmental, Unt-G= Unintentional General, Unt-M=Unintentional Misuse, Unt-O=Unintentional Occupational, Unt-T=Unintentional Therapeutic Error, Unt-U=Unintentional Unknown, Oth-M=Other Malicious, Oth-W=Other Withdrawal, Unk-Unknown.

RCF (Relative Contribution to Fatality): 1 = Undoubtedly responsible, 2 = Probably responsible, 3 = Contributory, 4 = Probably not responsible.

Blood concentrations: concentrations are from blood serum or plasma unless otherwise specified.

Cr: Cause rank of substances was indeterminate for this multisubstance case.

Pediatric fatalities – age less than 6 years

There were 34 fatalities reported in children younger than 6 years, similar to numbers reported over the past decade (Table 19). These pediatric cases represented 2.7% of total reported fatalities, similar to percentages reported over most of the last 10 years. The percentage of pediatric fatalities related to total pediatric exposures was 34/1,271,595 = 0.0027%. By comparison, 1,130/860,692 = 0.13% of all adult exposures involved a fatality. Of the reported deaths in children younger than 6 years, 13 (38%) were reported as unintentional (Table 6). In 2006, 21 of 29 (72.4%) fatalities in children younger than 6 years were unintentional exposures. Six (18%) deaths in children younger than 6 years were coded as resulting from malicious intent. These 34 cases included 19 pharmaceuticals and 15 nonpharmaceuticals. The substances associated with these fatalities included carbon monoxide/smoke inhalation (four cases), hydrogen sulfide (two cases), and six other substances (one each).

Of the 19 pharmaceutical-associated fatalities, 8 involved a primary substance of analgesics, 4 involved cough and cold preparations, 3 involved antidepressants, 1 involved an anticonvulsant, 1 involved an antimicrobial, and 2 involved unknown substances. The primary substance reported in the 15 nonpharmaceuticals included 9 carbon monoxide, 2 hydrocarbons, 2 household cleaning substances, and 1 each of pesticide and ammonium bifluoride.

Pediatric fatalities – ages 6–12 years

In the age range 6–12 years, there were 12 reported fatalities of which 2 were unintentional exposures and 2 intentional exposures (Table 6). These 12 cases included 6 pharmaceuticals and 6 nonpharmaceuticals. The primary pharmaceutical substances associated with these fatalities included analgesics (two cases), cardiovascular drugs (two cases), and sedatives/hypnotics/antipsychotics (two cases). The primay nonpharmaceutical substances included carbon monoxide (four cases) and hydrogen sulfide (two cases).

Adolescent fatalities – ages 13–19 years

In the age range 13–19 years, there were 56 reported fatalities of which 20 (36%) were intentional abuse exposures (Table 6). These 56 cases included 46 pharmaceuticals and 10 nonpharmaceuticals, similar to the numbers reported in this age group, reported annually since 1999. The pharmaceuticals associated with these fatalities included analgesics (21 cases), stimulants and street drugs (8 each), antidepressants (5 cases) sedatives/hypnotics/antipsychotics (3 cases), cough and cold preparations (2 cases), unknown substance (2 cases), and 1 case each of antihistamines, antimicrobials, dietary supplements, hormone/hormone antagonist, and muscle relaxants.

In fatalities for the age range 13–19 years, 24 (42.9%) were presumed suicides and 20 (35.7%) were attributed to intentional abuse (Table 6). The suspected suicide percentage is similar to recent years. The percentage of intentional abuse cases increased from 25.8% in 2006 to 35.7% in 2007. As in the past years, only a small number (1 of 56) of adolescent fatalities were coded as being unintentional.

All fatalities – all ages

The age distribution of reported fatalities is similar to that in past years, with 91.2% (1,130 of 1,239) of fatal cases occurring in adults (age > 19 years) (Table 7).

The most common classes of substances involved across all fatalities were sedative/hypnotics/antipsychotics followed by opioids, antidepressants, acetaminophen in combination, cardiovascular drugs, and stimulants/street drugs (Table 18). Of these top six classes most frequently involved in fatalities in Table 18 only four appear in Table 17A: sedative/hypnotics/antipsychotics ranked 4th, antidepressants 8th, cardiovascular drugs 10th, and stimulants/street drugs 22nd among exposure frequency. Thus there was little correlation between frequency of exposure and frequency of fatality.

There were 584 fatalities associated with single-substance exposures (Table 21). The 407 pharmacueticals included 198 analgesics (61 acetaminophen, 27 methadone, 24 acetaminophen/hydrocodone, 18 aspirin, 15 acetaminophen/diphenhydramine, 7 acetaminophen/propoxyphene, 6 oxycodone, and 5 fentanyl patch), 49 stimulants/street drugs (20 cocaine, 9 heroine, 7 methamphetamine, and 5 MDMA), 36 cardiovascular drugs (10 cardiac glycoside, 9 diltiazem, and 7 verapamil), 32 antidepressants (9 amitriptyline, 7 lithium, and 7 bupropion), and 24 sedative hyphotics/antipsychotic (8 quetiapine).

Two poison-related fatalities of pregnant women were reported in 2007. The first case was a 24-year-old woman with a reported intentional misuse (chronic ingestion) of an opioid/acetaminophen combination product (Table 21, Case 319). The exposure was judged as undoubtedly responsible for the death. The second case was a suspected suicide of a 21-year old with an acute acetaminophen overdose as well as an unknown drug (Table 21, Case 296). This exposure was judged as probably responsible for the death.

Demographic summary of exposure data

Tables 22A and 22B provide summary demographic data on patient age and gender, reason for exposure, medical outcome, and use of a health-care facility for all 2,482,041 exposure cases, presented by substance categories. This table and the one published in 2006 differ from the version of previous years.

Table 22A. Demographic profile of SINGLE-SUBSTANCE nonpharmaceuticals exposure cases by generic category

Major category			Age			Reason					Outcome				
Minor category Generic substance	No. of case mention	No. of single exposures	<6	6–19	>19	Unintentional	Intentional	Other	Adverse reaction	Treated in health-care facility	None	Minor	Moderate	Major	Death
Adhesives/glues															
Cyanoacrylate	9,516	9,422	3,882	1,748	2,866	9,099	191	61	56	2,107	1,046	1,882	307	5	0
Epoxy	626	572	232	48	224	547	8	5	11	166	114	108	43	1	1
Nontoxic	1,751	1,649	1,154	369	91	1,576	51	13	8	60	186	81	8	0	0
Toluene/xylene	677	659	419	54	151	633	16	2	6	117	185	119	10	1	0
Unknown	4,238	4,017	1,926	556	1,188	3,804	116	25	50	810	753	658	182	9	0
Category Total:	16,808	16,319	7,613	2,775	4,520	15,659	382	106	131	3,260	2,284	2,848	550	16	1
Alcohols															
Ethanol: beverage	47,202	8,668	1,326	2,072	4,375	2,428	5,668	204	220	3,950	1,010	1,280	915	185	5
Ethanol: other	16,683	15,518	11,974	1,615	1,586	14,701	575	174	43	872	3,874	1,166	110	4	0
Higher alcohol	188	135	75	17	29	132	1	0	2	25	37	30	3	0	0
Isopropanol	7,447	6,836	4,055	546	1,877	5,942	798	40	19	1,334	1,711	1,132	265	36	1
Methanol	825	683	180	71	360	578	85	6	4	346	210	101	52	16	9
Other	492	473	355	40	63	453	12	2	5	40	139	46	8	2	0
Unknown	653	278	92	48	97	179	76	8	5	100	40	49	30	5	0
Rubbing alcohols															
Ethanol with methyl salicylate	11	11	6	2	3	10	1	0	0	3	3	2	0	0	0
Ethanol without methyl salicylate	245	237	163	11	56	222	12	1	1	32	81	26	5	0	0
Isopropanol with methyl salicylate	300	290	223	14	43	272	14	2	1	58	105	36	4	0	0
Isopropanol without methyl salicylate	7,788	7,309	4,635	584	1,751	6,553	676	39	8	1,154	1,783	1,059	214	25	0
Unknown rubbing alcohol	89	79	44	7	19	70	7	0	0	18	15	16	3	0	0
Category Total:	81,923	40,517	23,128	5,027	10,259	31,540	7,925	476	308	7,932	9,008	4,943	1,609	273	15
Arts/crafts/office supplies															
Artist paint, nonwater color	3,157	3,057	2,266	365	340	2,974	59	11	10	106	445	137	18	3	0
Chalk	1,753	1,726	1,593	96	25	1,697	21	3	3	41	222	45	3	0	0
Clay	2,682	2,646	2,311	227	77	2,596	31	6	13	80	240	67	10	0	0
Crayon	2,442	2,389	2,071	213	80	2,361	25	2	1	50	221	29	3	0	0
Glaze	140	134	43	55	26	122	10	1	1	15	18	21	1	0	0
Office supplies: miscellaneous	195	190	91	23	50	187	1	0	2	25	39	18	1	0	0
Pen/ink	17,286	16,971	11,831	4,319	533	16,299	545	47	70	398	2,016	401	28	1	0
Pencil	2,812	2,775	1,432	1,104	162	2,629	92	40	1	102	226	206	13	0	0
Typewriter correction fluid	1,906	1,872	1,402	301	125	1,783	64	16	3	120	468	125	9	1	0
Water color	1,228	1,205	1,049	101	38	1,182	16	3	4	19	150	20	0	0	0
Other	6,297	5,964	4,722	642	460	5,828	106	13	13	227	793	227	28	2	0
Unknown	152	145	98	31	13	142	2	0	1	6	43	8	1	0	0
Category Total:	40,050	39,074	28,909	7,477	1,929	37,800	972	142	122	1,189	4,881	1,304	115	7	0
Automotive/aircraft/boat products															
Brake fluid	1,187	1,126	321	100	590	1,072	40	9	3	409	221	304	60	2	0
Ethylene glycol	5,395	4,966	511	636	3,132	4,203	630	68	19	1,875	970	878	365	135	16
Glycol and methanol	229	224	58	32	108	205	9	5	1	71	50	51	5	3	1
Glycol: other	231	218	106	28	66	207	9	2	0	59	41	48	4	1	0
Hydrocarbon	2,786	2,646	1,059	321	1,017	2,476	128	18	11	749	599	714	136	5	1
Methanol	1,427	1,350	321	220	689	1,224	102	14	7	565	381	307	80	10	2
Nontoxic	8	8	5	0	2	8	0	0	0	0	0	1	0	0	0
Other	2,516	2,414	840	361	954	2,296	46	39	27	680	464	864	168	6	0
Unknown	236	214	44	26	90	193	4	12	2	95	25	55	19	1	0
Category Total:	14,015	13,166	3,265	1,724	6,648	11,884	968	167	70	4,503	2,751	3,222	837	163	20
Batteries															
Automotive battery	860	842	63	95	542	825	7	2	6	249	90	254	61	1	0
Dry cell battery	5,203	5,134	2,791	1,035	961	4,767	307	24	16	853	1,253	755	134	2	0
Other	152	146	54	20	50	139	6	0	1	35	30	22	4	0	0
Unknown	88	87	32	17	25	83	3	1	0	6	22	18	5	0	0
Disc batteries															
Alkaline (MnO_2)	280	275	187	46	31	264	10	0	0	192	141	18	10	3	0
Lithium	187	126	45	25	50	80	28	0	16	100	39	20	26	6	0
Mercuric oxide	2	2	1	0	1	2	0	0	0	1	1	0	0	0	0
Nickel cadmium	7	7	5	1	0	7	0	0	0	2	4	0	0	0	0

(*Continued*)

Table 22A. Demographic profile of SINGLE-SUBSTANCE nonpharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mention	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Adverse reaction		None	Minor	Moderate	Major	Death
Silver oxide	41	40	17	1	19	40	0	0	0	29	28	1	0	0	0
Zinc–air	82	81	33	10	38	81	0	0	0	53	58	6	1	0	0
Other	9	9	5	1	1	9	0	0	0	4	4	2	1	0	0
Unknown	3,299	3,263	2,188	711	293	3,158	85	8	2	2,333	1,559	138	39	6	0
Category Total:	10,213	10,012	5,421	1,962	2,011	9,455	446	35	41	3,857	3,229	1,234	281	18	0
Bites and envenomations															
Nonpoisonous snake	1,496	1,487	147	521	697	1,482	3	1	1	545	70	645	61	1	0
Other/unknown bite/envenomation	339	336	45	60	168	335	0	1	0	106	4	93	26	1	0
Reptile: other/unknown	780	772	232	274	205	738	15	2	15	130	46	220	35	1	0
Unknown insect or spider	4,848	4,809	802	824	2,779	4,794	7	8	0	651	49	532	159	3	0
Unknown snake	1,634	1,617	116	439	944	1,612	1	4	0	1,147	66	665	278	18	0
Aquatic															
Coelenterate	788	785	87	366	272	782	1	1	1	116	8	231	55	2	0
Fish	1,085	1,076	27	199	750	1,070	0	0	6	386	11	321	136	2	0
Other/unknown	332	323	159	65	73	307	10	3	3	47	40	53	10	1	0
Exotic snakes															
Nonpoisonous	88	87	9	28	45	87	0	0	0	39	0	24	8	0	0
Poisonous	58	57	4	8	40	55	2	0	0	50	0	8	23	3	0
Unknown if poisonous	7	7	0	4	3	7	0	0	0	6	1	3	1	1	0
Insects															
Ant/fire ant	1,737	1,670	600	250	665	1,652	6	9	2	176	28	376	95	3	0
Bee/wasp/hornet	8,138	8,027	1,554	1,462	4,100	8,023	1	1	2	863	73	2,390	434	16	1
Caterpillar	1,449	1,442	327	369	617	1,410	18	4	10	143	38	396	77	4	0
Centipede/millipede	1,509	1,499	229	241	880	1,496	2	0	1	118	48	462	44	1	0
Mosquito	289	281	98	38	119	281	0	0	0	50	1	62	12	0	0
Scorpion	16,937	16,920	1,588	3,254	11,050	16,914	3	1	0	1,323	77	2,323	655	30	0
Tick	1,830	1,794	401	334	839	1,787	5	0	1	325	51	244	42	1	0
Other	11,138	10,987	2,170	1,633	5,476	10,818	38	99	12	1,884	292	2,230	629	9	0
Mammals															
Bat	763	747	103	166	359	738	2	1	2	460	122	83	3	0	0
Cat	760	754	62	131	420	751	0	0	3	413	7	168	40	1	0
Dog	1,684	1,670	286	542	615	1,667	1	1	0	1,189	14	443	143	7	0
Fox	22	22	2	4	13	22	0	0	0	18	2	7	1	0	0
Human	47	46	9	10	21	41	0	5	0	15	1	11	0	1	0
Raccoon	153	152	11	27	85	151	1	0	0	79	12	31	6	0	0
Rodent/lagomorph	1,491	1,472	318	447	504	1,451	7	9	2	422	56	318	26	0	0
Skunk	231	231	29	49	90	214	2	10	2	25	14	56	5	0	0
Other	917	910	139	238	383	899	5	0	1	436	59	174	26	1	0
Snakes															
Copperhead	1,166	1,144	53	206	822	1,138	4	0	1	1,041	19	346	598	28	0
Coral	90	89	6	13	66	88	0	0	1	83	13	38	20	2	0
Cottonmouth	198	195	5	40	143	194	0	0	1	166	4	67	68	7	0
Rattlesnake	1,334	1,315	78	172	1,003	1,306	3	2	3	1,209	30	286	655	86	1
Crotaline: unknown	479	470	35	122	292	466	2	0	1	416	10	155	200	22	1
Spiders															
Black widow	2,514	2,501	224	347	1,743	2,498	2	0	0	932	98	714	389	16	0
Brown recluse	1,783	1,767	113	230	1,141	1,763	2	0	2	635	36	386	333	15	0
Tarantula	123	121	12	32	61	120	1	0	0	27	3	36	2	0	0
Necrotizing spider:other	213	213	23	41	123	212	1	0	0	47	6	67	14	0	0
Other spider	8,846	8,781	1,011	1,512	5,175	8,752	15	6	1	1,600	127	2,061	571	10	0
Category Total:	77,296	76,576	11,114	14,698	42,781	76,121	160	168	74	17,318	1,536	16,725	5,880	293	3
Building and construction products															
Caulking compound and putty	2,194	2,132	1,601	116	312	2,094	22	4	9	197	404	144	23	1	0
Cement, concrete	1,679	1,600	463	118	819	1,556	13	3	21	603	182	317	305	14	0
Soldering flux	266	256	87	33	111	247	3	1	3	73	42	66	21	1	0
Other	2,779	2,590	1,368	209	783	2,519	41	6	19	494	409	394	153	7	0
Unknown	121	111	20	10	53	107	2	1	0	43	10	30	8	0	0

Insulation															
Asbestos	589	527	57	67	268	509	6	3	4	87	42	45	9	0	0
Fiberglass	1,140	1,114	428	181	389	1,071	6	10	24	154	102	253	30	1	0
Urea/formaldehyde	32	32	16	2	10	32	0	0	0	6	8	3	2	0	0
Other	107	103	44	4	41	100	2	0	1	23	7	14	5	0	0
Unknown	386	370	221	38	86	361	6	0	3	38	42	36	9	0	0
Category Total:	9,315	8,835	4,305	778	2,872	8,596	101	28	84	1,718	1,248	1,302	565	24	0
Chemicals															
Acetone	1,169	967	317	107	433	886	43	19	12	284	184	208	45	2	0
Alkali	4,356	3,747	643	573	2,030	3,564	64	58	41	1,876	376	1,101	671	48	2
Ammonia	3,917	2,984	751	339	1,406	2,808	92	35	31	998	341	900	285	25	2
Borate/boric acid	2,655	2,431	1,201	248	778	2,265	97	36	22	431	530	209	35	2	0
Chlorate	24	15	3	4	5	14	1	0	0	7	2	3	2	0	0
Cyanide	242	197	6	7	148	148	18	16	5	138	44	44	25	3	5
Dioxin	11	9	0	0	7	7	0	1	0	5	2	0	0	0	0
Ethylene glycol	922	765	72	80	422	513	184	22	3	404	124	83	77	92	11
Formaldehyde/formalin	1,007	915	118	166	474	843	43	11	11	317	184	227	41	1	0
Ketone	594	477	138	33	250	459	9	2	4	204	77	155	52	4	1
Methylene chloride	289	248	61	30	126	240	4	1	2	90	28	78	20	1	0
Nitrate and nitrite	1,484	1,391	425	500	363	1,215	150	11	8	266	265	235	30	6	0
Phenol/creosote	420	393	26	51	237	382	4	1	5	156	32	145	39	1	0
Strychnine	53	40	15	2	17	24	5	6	3	22	13	6	2	0	0
Toluene diisocyanate	597	563	135	79	246	533	11	0	19	145	54	140	35	3	0
Glycol: other	1,070	845	386	97	297	756	30	31	21	267	202	160	42	6	1
Other	15,114	11,978	4,456	1,930	4,250	10,884	574	161	293	2,883	2,018	2,075	681	50	6
Other: unknown if toxic	61	55	42	4	5	54	0	1	0	5	4	4	0	0	0
Unknown	4,523	4,159	905	486	1,809	3,494	96	289	156	1,327	458	840	337	36	1
Acids															
Hydrochloric	2,673	2,251	144	380	1,400	2,162	52	16	16	851	183	773	271	10	3
Hydrofluoric	881	738	28	48	572	708	18	3	6	586	52	291	196	13	4
Other	5,718	4,937	620	816	2,771	4,741	90	42	39	1,754	512	1,481	590	28	1
Unknown	192	172	9	22	98	158	0	5	5	89	12	42	27	3	0
Category Total:	47,972	40,277	10,501	6,002	18,144	36,858	1,585	767	702	13,105	5,697	9,200	3,503	334	37
Cleaning substances (household)															
Ammonia cleaner	1,510	1,147	386	145	522	1,074	42	23	7	241	184	266	61	2	0
Carpet/upholstery cleaner	5,246	4,922	3,747	241	732	4,784	41	30	62	535	987	840	74	2	0
Starch/fabric finish/sizing	455	440	378	24	28	424	15	1	0	22	90	40	1	0	0
Wheel cleaner: HF/bifluoride	72	63	22	3	32	60	2	0	1	47	7	24	10	0	0
Automatic dishwasher															
Granular	4,013	3,962	3,330	113	416	3,919	17	19	5	143	1,126	460	20	0	0
Liquid or gel	3,465	3,419	2,981	75	297	3,394	13	10	2	145	1,058	403	19	2	0
Rinse agent	976	953	830	19	84	939	9	3	1	93	183	172	16	0	0
Tablet	1,826	1,816	1,717	22	62	1,812	2	2	0	63	525	252	5	0	0
Other/unknown	5,592	5,540	5,176	84	211	5,517	5	14	4	187	1,450	829	15	2	0
Bleaches															
Borate	304	267	144	16	83	250	9	1	5	31	41	55	4	0	0
Hypochlorite	40,020	34,176	14,395	3,417	13,319	31,875	1,411	408	283	6,292	5,343	9,326	1,106	20	1
Nonhypochlorite	581	506	197	45	183	458	23	4	18	82	75	142	26	1	0
Other/unknown	461	374	151	47	138	349	17	5	2	111	39	95	16	0	0
Cleansers															
Anionic/nonionic	2,715	2,503	1,921	123	312	2,442	28	8	17	166	581	289	55	1	0
Other/unknown	1,912	1,690	920	162	462	1,603	52	22	8	367	343	330	52	3	0
Disinfectants															
Hypochlorite	13,867	11,520	4,403	1,285	4,572	10,710	502	161	115	2,419	1,689	2,845	461	14	1
Phenol	1,440	1,394	899	202	235	1,314	50	24	6	160	294	216	30	1	0
Pine oil	4,271	3,895	2,235	280	1,092	3,597	170	60	29	666	1,120	928	69	6	0
Other/unknown	8,121	7,712	5,114	834	1,297	7,358	192	71	67	712	1,594	1,539	150	4	0
Drain cleaners															
Acid: hydrochloric	592	249	30	22	160	218	16	1	13	56	66	111	20	2	0
Acid: sulfuric	404	325	29	16	225	311	7	2	4	119	34	99	70	2	0
Alkali	3,792	3,099	553	242	1,822	2,873	164	21	30	895	412	818	337	34	4
Acid: other/unknown	55	43	8	3	27	40	3	0	0	19	11	5	10	0	0
Other/unknown	874	647	100	63	358	604	28	4	8	192	71	148	70	3	0

(*Continued*)

Table 22A. Demographic profile of SINGLE-SUBSTANCE nonpharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mention	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Adverse reaction		None	Minor	Moderate	Major	Death
Fabric softeners/antistatic agents															
Aerosol/spray	198	191	157	13	15	180	4	6	1	7	30	19	2	0	0
Dry/powder	7	7	6	1	0	6	1	0	0	0	5	1	0	0	0
Liquid	1,069	1,007	780	56	148	968	14	4	19	79	199	112	8	1	0
Solid/sheet	552	542	467	23	40	527	4	2	7	20	95	29	2	0	0
Other/unknown	10	9	7	0	2	9	0	0	0	1	1	1	0	0	0
Glass cleaners															
Ammonia	4,960	4,527	3,751	307	376	4,349	121	42	11	312	1,038	550	31	0	0
Anionic/nonionic	159	147	105	8	24	142	4	1	0	15	30	24	1	0	0
Isopropanol	2,955	2,706	2,140	190	290	2,599	71	21	10	188	581	301	21	2	0
Other/unknown	1,352	1,232	939	106	155	1,165	36	19	6	133	271	162	14	0	0
Hand dishwashing															
Anionic/nonionic	5,659	5,187	3,382	377	1,184	4,942	83	103	50	338	576	942	67	2	1
Other/unknown	3,207	2,967	1,922	214	701	2,841	50	50	23	152	308	488	19	1	0
Laundry additives															
Bluing/brightening agent	57	51	28	2	18	50	0	0	1	1	7	3	1	0	0
Detergent booster	48	46	34	1	11	46	0	0	0	5	6	9	0	0	0
Enzyme/microbiological additive	108	85	50	5	20	82	2	1	0	18	13	16	2	0	0
Water softener	78	72	36	6	17	65	1	2	4	8	11	12	1	0	0
Other/unknown	2,672	2,561	2,169	172	168	2,483	42	23	11	181	538	336	15	1	0
Laundry detergents															
Granular	3,975	3,800	3,044	181	476	3,679	79	13	26	461	712	781	49	1	0
Liquid	4,616	4,403	3,144	262	826	4,237	104	30	20	544	723	883	87	5	0
Soap	86	82	50	11	17	78	3	1	0	11	13	15	2	0	0
Other/unknown	130	119	67	11	33	106	4	2	6	32	29	23	5	0	0
Laundry prewash/stain removers															
Dry solvent-based	1	1	0	0	0	1	0	0	0	1	0	1	0	0	0
Dry surfactant-based	124	119	102	7	9	119	0	0	0	7	23	9	0	0	0
Liquid solvent-based	842	815	612	46	128	797	8	1	9	123	226	131	17	0	0
Liquid surfactant-based	2,708	2,602	2,295	74	173	2,564	17	13	5	348	475	469	76	2	0
Spray solvent-based	468	456	417	14	16	453	1	0	1	79	90	97	13	0	0
Spray surfactant-based	271	265	243	8	13	262	1	1	1	70	49	55	21	0	0
Other/unknown solvent-based	107	104	86	5	10	102	0	0	2	20	22	26	2	0	0
Other/unknown surfactant-based	111	109	96	5	7	109	0	0	0	10	17	11	1	0	0
Other/unknown	2,620	2,510	1,907	111	376	2,470	12	8	16	289	537	561	34	1	0
Miscellaneous cleaners															
Acid	1,968	1,713	970	95	519	1,652	31	8	17	327	392	420	56	6	0
Alkali	10,042	9,114	5,848	543	2,278	8,794	180	75	49	1,493	1,850	1,618	294	13	0
Anionic/nonionic	7,037	6,397	4,611	401	1,093	6,185	117	42	43	820	1,242	1,093	125	3	0
Cationic	2,799	2,624	1,415	241	782	2,490	94	9	24	530	529	539	99	3	0
Ethanol	713	695	504	96	68	684	5	3	2	42	149	102	3	0	0
Glycols	1,041	963	571	116	193	912	30	6	12	146	210	200	23	0	0
Isopropanol	1,936	1,888	1,202	425	192	1,793	42	38	8	160	403	311	13	2	0
Methanol	25	25	9	1	12	25	0	0	0	6	5	6	1	0	0
Phenol	8	7	2	0	5	7	0	0	0	2	3	2	1	0	0
Other/unknown	5,324	4,855	3,112	469	965	4,608	116	69	39	785	1,059	999	120	6	0
Oven cleaners															
Acid	6	4	2	0	2	4	0	0	0	1	2	1	1	0	0
Alkali	2,111	2,041	497	258	992	1,962	27	24	21	775	264	539	298	14	1
Detergent	19	18	7	3	7	18	0	0	0	3	5	2	2	0	0
Other/unknown	364	342	65	47	185	323	5	9	5	115	35	87	25	3	0
Rust removers															
Alkali	12	6	3	0	2	6	0	0	0	4	3	0	1	0	0
Anionic/nonionic	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrofluoric acid	327	312	50	12	222	295	8	1	7	141	68	142	41	0	2
Other acid	787	680	312	37	248	637	12	21	10	145	202	181	29	1	0
Other/unknown	237	207	41	11	131	196	6	3	2	48	26	67	22	0	0

Spot removers/dry cleaning agents															
Anionic/nonionic	216	207	178	8	17	204	1	1	1	14	44	29	4	0	0
Carbon tetrachloride	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Glycol	358	339	255	18	54	330	5	2	2	50	87	55	6	0	0
Isopropanol	49	45	32	4	7	43	0	2	0	8	8	11	0	0	0
Perchloroethylene	23	22	16	0	6	22	0	0	0	4	10	4	0	0	0
Other halogenated hydrocarbon	40	35	18	0	15	34	1	0	0	9	6	11	1	1	0
Other nonhalogenated hydrocarbon	695	654	297	65	246	625	14	3	12	172	134	180	34	0	0
Other/unknown	178	168	127	11	23	166	1	0	1	17	46	19	7	0	0
Toilet bowl cleaners															
Acid	5,862	3,764	1,279	414	1,739	3,596	131	7	23	778	819	1,534	220	11	1
Alkali	2,751	2,419	1,576	108	585	2,365	39	2	11	373	678	475	61	1	0
Other/unknown	2,374	2,084	1,500	103	361	2,035	26	6	10	238	501	279	37	0	0
Wall/floor/tile cleaners															
Acid	3,108	2,639	1,699	146	649	2,557	42	11	25	474	642	693	88	4	0
Alkali	8,144	7,184	4,736	449	1,597	6,862	192	48	55	1,207	1,606	1,497	258	8	0
Anionic/nonionic	8,158	7,327	4,728	497	1,717	6,987	227	62	33	1,178	1,675	1,134	113	3	2
Cationic	2,674	2,380	1,535	202	506	2,273	72	18	12	324	437	500	43	0	0
Ethanol	110	105	84	8	11	103	1	0	1	4	20	8	0	0	0
Glycol	2,143	1,917	1,488	98	268	1,862	36	12	7	176	435	310	28	0	0
Isopropanol	884	842	701	30	77	819	14	4	2	54	222	115	3	0	0
Methanol	2	1	0	1	0	0	1	0	0	1	0	0	0	0	0
Other/unknown	1,535	1,386	896	82	316	1,330	35	11	7	253	328	285	45	3	0
Category Total:	215,780	192,794	118,068	14,698	48,012	184,161	4,991	1,734	1,357	28,093	38,093	39,747	5,290	197	13
Cosmetics/personal care products															
Baby oil	2,261	2,192	1,988	64	106	2,152	30	3	5	164	523	181	10	3	0
Bath oil/bubble bath	4,177	4,087	3,709	214	128	4,011	44	3	29	139	704	379	18	0	1
Cream/lotion/make-up	27,377	26,434	22,746	1,206	1,977	25,789	232	48	357	852	3,860	1,181	99	0	0
Deodorant	25,364	25,099	22,753	1,164	979	24,412	251	84	344	597	3,365	1,522	66	1	0
Depilatory	1,557	1,524	376	315	658	994	86	11	433	315	130	387	125	3	0
Douche	115	112	86	7	16	105	2	1	4	9	30	6	0	0	0
Eye product	1,403	1,334	1,168	42	78	1,297	11	4	21	64	219	52	11	0	0
Lipstick/balm: with camphor	1,036	1,017	924	55	27	1,000	10	3	3	30	200	54	4	0	0
Lipstick/balm: without camphor	4,346	4,206	3,914	172	86	4,119	40	3	44	75	505	135	13	1	0
Perfume/cologne/aftershave	15,004	14,586	12,313	1,252	851	14,075	337	108	51	1,039	3,189	2,838	106	7	0
Peroxide	9,958	9,597	3,995	800	3,936	9,121	172	45	241	808	1,454	1,641	154	9	0
Powder: talc	2,804	2,724	2,362	155	166	2,656	42	13	12	295	498	585	35	2	0
Powder: without talc	2,020	1,970	1,818	62	60	1,939	20	3	5	93	304	360	14	1	0
Soap	20,035	19,333	14,824	1,497	2,435	18,491	382	152	294	828	2,663	2,119	129	2	0
Suntan/sunscreen	13,363	13,147	11,873	709	435	12,915	51	24	154	435	1,718	1,688	59	1	0
Dental care products															
Denture cleaner	1,646	1,630	266	81	1,144	1,578	36	2	5	95	308	148	4	0	0
Toothpaste with fluoride	24,237	23,683	20,558	1,111	1,543	22,324	250	568	524	526	4,389	1,200	50	0	0
Toothpaste without fluoride	1,972	1,890	1,603	68	164	1,783	16	39	52	22	281	80	5	0	0
Other	6,178	6,081	2,947	1,190	1,544	5,672	82	180	143	284	977	481	26	2	0
Hair care products															
Coloring agent	2,350	2,263	854	225	971	1,835	34	7	385	447	315	527	159	4	0
Curl activator	45	43	32	1	10	41	1	0	1	5	6	5	0	0	0
Oil	344	337	289	16	28	330	6	1	0	55	80	39	10	1	0
Permanent wave solution	352	343	176	16	116	310	6	1	26	134	52	110	28	0	0
Relaxer: sodium hydroxide	676	668	483	31	131	647	3	0	17	316	134	241	75	0	0
Rinse/conditioner/relaxer	2,316	2,218	1,869	128	172	2,153	31	5	25	163	429	236	21	1	0
Shampoo	6,791	6,493	5,112	474	727	6,265	157	11	56	431	871	953	66	2	1
Spray	1,998	1,817	1,265	171	317	1,613	174	16	13	268	397	293	37	2	0
Relaxer: other alkaline	646	633	481	39	91	613	2	0	18	286	127	186	75	2	0
Relaxer: other nonalkaline	75	75	60	2	10	71	2	0	2	23	24	11	3	0	0
Other	3,114	2,959	2,178	211	455	2,797	44	5	111	402	528	446	66	3	0
Mouthwash															
Ethanol	11,726	11,184	3,649	2,476	4,166	9,874	1,149	85	44	1,118	1,879	1,383	218	21	2
Fluoride	4,490	4,451	3,240	904	250	4,397	29	2	21	45	794	123	3	0	0
Nonethanol	1,051	999	466	203	275	940	47	2	10	54	189	60	7	0	0
Unknown	167	157	44	28	65	140	14	0	2	15	25	23	1	0	0

(*Continued*)

Table 22A. Demographic profile of SINGLE-SUBSTANCE nonpharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mention	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Adverse reaction		None	Minor	Moderate	Major	Death
Nail products															
Acrylic nail adhesive	1,397	1,387	567	405	329	1,354	16	4	10	543	150	424	98	3	0
Acrylic nail primer	247	239	190	17	25	233	4	0	2	73	59	58	15	1	0
Acrylic nail remover	47	46	27	3	12	42	0	1	3	8	13	13	2	0	0
Polish	10,265	10,052	9,223	403	311	9,958	68	11	11	500	1,801	1,202	47	2	0
Polish remover: acetone	2,200	2,153	1,650	166	286	2,086	44	11	9	205	629	332	18	1	0
Polish remover: other	1,410	1,370	1,049	114	179	1,302	30	4	33	143	395	223	9	1	0
Polish remover: unknown	7,114	6,867	4,962	649	1,022	6,658	146	38	16	701	1,566	928	46	1	0
Other	1,255	1,226	786	61	309	1,198	13	4	11	226	240	253	34	0	0
Category total:	224,929	218,626	168,875	16,907	26,590	209,290	4,114	1,502	3,547	12,831	36,020	23,106	1,966	77	4
Deodorizers															
Diaper pail deodorizer	12	12	10	1	0	12	0	0	0	0	1	0	0	0	0
Toilet bowl deodorizer	562	545	473	22	40	537	4	2	2	64	157	45	0	0	0
Other	4,529	4,359	3,320	282	607	4,218	79	28	28	460	960	678	59	2	0
Unknown	74	71	46	8	13	69	1	1	0	14	14	18	0	0	0
Air fresheners															
Aerosol	2,849	2,760	2,048	346	282	2,634	84	30	10	256	520	444	32	0	1
Liquid	8,086	8,012	7,256	333	337	7,920	37	38	14	593	1,856	1,349	60	2	0
Solid	5,053	5,021	4,627	153	198	4,993	15	7	5	243	1,050	498	19	0	0
Other/unknown	2,382	2,355	1,927	186	190	2,292	37	7	16	177	608	359	16	2	0
Category Total:	23,547	23,135	19,707	1,331	1,667	22,675	257	113	75	1,807	5,166	3,391	186	6	1
Dyes															
Fabric	418	399	291	55	41	387	5	1	6	38	79	15	2	0	0
Food	1,202	1,156	987	106	43	1,122	18	3	13	19	170	28	1	0	0
Leather	110	106	82	8	11	103	0	0	3	7	21	4	1	1	0
Other	474	430	206	151	57	401	10	1	18	42	89	30	4	2	0
Unknown	81	74	55	5	11	68	2	0	3	11	20	4	1	0	0
Category Total:	2,285	2,165	1,621	325	163	2,081	35	5	43	117	379	81	9	3	0
Essential oils															
Cinnamon oil	552	517	327	112	60	427	63	2	24	74	53	214	9	0	0
Clove oil	401	375	251	17	81	347	10	1	16	71	70	102	8	1	0
Eucalyptus oil	494	445	278	30	116	425	16	0	3	105	127	104	8	0	0
Pennyroyal oil	26	23	2	4	15	14	5	3	1	9	5	5	0	0	0
Tea tree oil	1,047	997	646	66	222	932	29	0	35	131	279	153	19	1	0
Other/unknown	5,946	5,758	4,901	245	473	5,645	45	11	51	493	1,300	934	75	1	0
Category Total:	8,466	8,115	6,405	474	967	7,790	168	17	130	883	1,834	1,512	119	3	0
Fertilizers															
Household plant food	2,487	2,404	1,488	271	526	2,361	21	13	8	88	447	90	5	1	0
Outdoor fertilizer	3,292	3,140	2,095	311	598	3,063	24	20	31	176	697	190	16	0	0
Plant hormone	37	29	12	5	9	27	1	1	0	3	9	2	0	0	0
Other	2,107	1,909	1,240	186	373	1,861	17	11	19	131	413	132	17	1	1
Unknown	166	147	85	17	37	138	0	2	6	16	35	9	2	0	0
Category Total:	8,089	7,629	4,920	790	1,543	7,450	63	47	64	414	1,601	423	40	2	1
Fire extinguishers															
Fire extinguisher	3,573	3,493	327	1,013	1,444	3,093	151	213	25	754	640	845	165	1	0
Category Total:	3,573	3,493	327	1,013	1,444	3,093	151	213	25	754	640	845	165	1	0
Food products/food poisoning															
Capsicum/peppers	4,988	4,893	858	982	2,290	4,027	123	26	708	279	71	2,045	126	2	0
Monosodium glutamate	124	112	14	10	68	47	0	0	65	10	5	37	12	1	0
Question: food/additive	12,957	11,476	6,888	1,529	2,303	9,833	508	264	829	984	1,354	1,143	204	10	0
Question: spoiled food	22,294	20,325	5,710	3,444	8,494	19,217	58	422	588	985	2,474	1,306	234	2	0
Suspected food poisoning	14,138	12,790	1,651	1,908	7,606	12,398	6	147	219	1,702	404	2,518	799	14	0
Other adverse reaction to food	2,760	2,622	633	400	1,130	1,065	58	110	1,363	505	107	676	236	6	0
Bacterial food poisoning (documented)															
Botulism	366	350	52	39	204	310	6	15	12	92	85	23	7	17	1
Other	3,386	2,808	553	532	1,394	2,738	4	22	42	455	229	387	129	6	0
Unknown	15,568	13,448	2,078	2,117	7,142	12,787	32	126	482	1,495	809	2,420	695	8	0

Ichthyosarcotoxins															
Ciguatera	187	175	9	14	130	143	4	0	28	81	6	32	48	4	0
Clupeotoxic	18	18	0	0	13	14	0	0	4	5	1	3	1	0	0
Paralytic shellfish	762	752	36	62	612	723	0	0	29	120	9	214	45	4	0
Scombroid	203	190	8	15	135	145	0	0	44	61	11	48	37	2	0
Tetrodotoxin	116	113	16	38	51	107	1	2	3	32	8	24	8	1	0
Other	90	85	7	5	59	67	0	0	18	29	2	18	14	1	0
Category Total:	77,957	70,157	18,513	11,095	31,631	63,621	800	1,134	4,434	6,835	5,575	10,894	2,595	78	1
Foreign bodies/toys/miscellaneous															
Ash	415	378	312	16	31	370	2	4	2	13	52	26	5	0	0
Bubble blowing solution	4,948	4,912	4,576	246	58	4,862	35	7	5	126	563	777	25	0	0
Charcoal	566	512	394	27	41	498	3	3	4	23	79	45	8	0	0
Christmas ornament	792	783	652	42	64	774	6	2	1	65	141	46	2	0	0
Coin	3,908	3,847	3,129	596	83	3,767	66	8	2	1,222	1,038	333	48	0	0
Desiccant	43,695	43,478	39,159	2,423	1,248	43,057	283	96	27	1,318	5,267	235	10	0	0
Feces/urine	6,535	5,835	4,811	307	500	5,659	42	113	7	151	703	119	7	1	0
Glass	3,164	3,081	938	359	1,184	2,956	26	80	10	269	473	176	23	1	0
Glow product	19,279	19,254	12,431	6,296	290	18,941	263	18	29	737	2,010	3,704	81	0	0
Incense, punk	295	290	261	9	15	284	4	1	1	20	49	28	2	0	0
Soil	2,341	1,999	1,694	126	138	1,972	15	5	6	57	247	97	11	0	0
Toy	10,161	10,091	7,603	2,197	194	9,923	104	25	34	704	1,578	705	37	0	0
Other	23,991	22,899	15,052	3,741	2,853	22,035	376	228	190	2,269	3,715	1,123	169	3	0
Unknown	859	849	625	120	69	792	16	24	12	80	146	44	6	0	0
Thermometers															
Mercury	4,156	4,144	1,250	1,262	1,010	4,082	34	15	9	279	803	41	5	0	0
Other	1,723	1,707	672	514	307	1,671	15	12	9	76	324	77	6	0	0
Unknown	806	803	271	223	237	801	1	1	0	54	58	2	0	0	0
Category Total:	127,634	124,862	93,830	18,504	8,322	122,444	1,291	642	348	7,463	17,246	7,578	445	5	0
Fumes/gases/vapors															
Carbon dioxide	511	503	44	193	179	411	73	11	5	102	56	78	31	1	0
Carbon monoxide	15,769	14,550	1,773	2,240	7,161	14,178	261	10	53	5,486	2,813	3,576	1,091	152	39
Chloramine	853	831	38	86	622	806	25	0	0	201	97	276	115	0	0
Chlorine: acid mixed with hypochlorite	1,309	1,266	57	136	938	1,224	40	1	1	391	102	530	258	1	0
Hydrogen sulfide	1,229	1,134	108	110	585	1,125	4	0	4	317	118	295	68	9	13
Methane and natural gas	5,311	4,998	1,040	769	2,274	4,935	18	8	20	939	1,376	909	134	2	0
Polymer fume fever	9	9	1	1	5	9	0	0	0	0	3	5	0	0	0
Propane/simple asphyxiant	4,281	2,967	302	612	1,384	2,719	213	8	18	869	436	684	201	14	1
Chlorine: other	5,375	5,029	405	777	3,119	4,814	138	16	57	1,537	267	1,781	794	14	0
Other	1,817	1,681	159	212	877	1,617	35	7	19	383	270	329	117	3	0
Unknown	3,466	3,406	123	426	1,005	3,296	45	38	15	560	412	451	213	1	0
Category Total:	39,930	36,374	4,050	5,562	18,149	35,134	852	99	192	10,785	5,950	8,914	3,022	197	53
Heavy metals															
Aluminum	1,163	1,035	565	116	270	1,001	9	11	12	77	141	40	12	2	0
Arsenic (excluding pesticide)	1,165	1,049	134	97	645	658	14	179	13	565	165	82	77	10	0
Barium	27	16	2	5	7	14	0	1	1	3	2	3	1	0	0
Cadmium	73	39	1	3	30	32	1	2	0	20	5	3	2	0	0
Copper	892	737	104	242	302	673	22	10	25	197	75	189	35	1	0
Fireplace flame colors	30	26	20	2	2	26	0	0	0	1	5	4	0	0	0
Gold	3	3	0	0	2	3	0	0	0	0	0	0	0	0	0
Lead	3,557	3,360	1,901	455	750	3,115	51	105	21	1,259	731	175	67	9	0
Manganese	52	43	2	5	26	35	0	1	1	29	3	2	7	0	0
Mercury: elemental	2,446	2,319	275	509	915	2,120	70	28	51	614	576	55	38	3	0
Mercury: other/unknown	153	136	30	11	68	119	4	2	8	49	23	10	7	0	0
Metal fume fever	747	703	38	82	488	657	26	6	13	212	22	195	82	4	0
Thallium	38	32	1	3	22	22	0	6	3	10	2	1	2	0	0
Other	2,596	1,849	707	233	690	1,599	89	56	90	366	314	167	56	5	0
Unknown	60	58	7	5	40	37	1	8	2	34	6	3	3	0	0
Category Total:	13,002	11,405	3,787	1,768	4,257	10,111	287	415	240	3,436	2,070	929	389	34	0
Hydrocarbons															
Benzene	183	143	11	6	45	137	3	2	0	102	62	33	4	0	0
Carbon tetrachloride	31	25	2	2	16	25	0	0	0	7	7	2	5	0	0

(*Continued*)

Table 22A. Demographic profile of SINGLE-SUBSTANCE nonpharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mention	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Adverse reaction		None	Minor	Moderate	Major	Death
Diesel fuel	1,305	1,241	194	124	688	1,171	55	6	3	300	150	374	67	0	0
Fluorochlorocarbon/propellant	7,518	7,241	632	1,733	3,738	6,005	1,059	97	45	2,046	1,199	1,623	648	43	2
Gasoline	17,174	16,702	3,976	2,894	8,022	15,490	1,028	103	44	2,760	2,355	5,733	535	15	1
Halogenated hydrocarbon: other	500	450	109	49	233	424	18	3	3	171	49	131	43	2	0
Kerosene	1,451	1,350	660	140	422	1,270	45	23	6	425	243	371	109	5	0
Lamp oil	1,956	1,932	1,516	92	264	1,890	30	7	3	608	567	470	163	22	1
Lighter fluid/naphtha	2,782	2,614	1,361	270	788	2,461	79	54	15	823	516	679	178	12	0
Lubricating oil/motor oil	5,042	4,696	2,969	331	1,074	4,553	64	50	19	747	1,395	752	105	4	0
Mineral seal oil	33	30	19	3	7	29	1	0	0	5	10	3	0	0	0
Mineral spirits/varsol	2,444	2,211	761	238	984	2,061	95	33	18	679	381	654	127	10	1
Other	5,586	5,136	2,617	518	1,576	4,853	124	67	83	1,350	1,171	1,153	262	13	1
Toluene/xylene	1,077	914	138	87	568	828	60	10	9	430	89	320	98	5	1
Turpentine	561	510	142	80	233	431	60	10	5	151	97	117	27	2	0
Unknown	779	711	283	102	264	620	71	7	10	230	156	167	60	4	0
Category Total:	48,422	45,906	15,390	6,669	18,922	42,248	2,792	472	263	10,834	8,447	12,582	2,431	137	7
Industrial cleaners															
Acid	1,669	1,445	438	91	764	1,386	31	15	10	461	230	402	121	6	0
Alkali	3,106	2,845	791	335	1,404	2,715	75	33	13	1,351	347	918	418	23	0
Anionic/nonionic	1,048	926	459	89	300	860	40	8	10	208	163	228	26	1	0
Cationic	898	845	201	122	412	786	42	10	3	318	132	295	70	1	0
Disinfectant	2,969	2,812	262	290	1,835	2,624	156	13	14	972	273	844	331	10	0
Other/unknown	1,636	1,451	352	207	702	1,354	43	28	17	645	191	501	155	6	0
Category Total:	11,326	10,324	2,503	1,134	5,417	9,725	387	107	67	3,955	1,336	3,188	1,121	47	0
Information calls															
Administrative information	1	1	1	0	0	1	0	0	0	1	0	0	0	0	0
Medical information	3	3	0	0	2	1	0	0	2	1	0	0	0	0	0
Poison information	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0
Category Total:	5	5	2	0	2	3	0	0	2	2	0	0	0	0	0
Lacrimators															
Capsicum defense spray	4,356	4,321	610	1,837	1,289	2,993	151	999	69	635	112	1,786	223	0	0
Lacrimator: CN	1,129	1,114	156	332	440	761	54	232	23	177	42	440	44	2	0
Lacrimator: CS	34	31	6	4	12	27	1	1	1	9	0	9	4	0	0
Other	15	12	2	5	5	11	1	0	0	3	0	2	1	1	0
Unknown	279	266	30	62	125	213	2	41	8	50	3	100	17	0	0
Category Total:	5,813	5,744	804	2,240	1,871,	4,005	209	1,273	101	874	157	2,337	289	3	0
Matches/fireworks/explosives															
Explosive	272	261	130	64	51	230	17	11	1	78	64	47	11	1	0
Firework	648	641	546	57	26	628	7	3	3	63	206	40	12	0	0
Match	765	754	679	19	42	730	19	5	0	31	147	12	4	0	0
Other	58	57	36	16	4	55	1	1	0	8	11	17	1	0	0
Unknown	7	7	5	1	1	7	0	0	0	1	1	1	1	0	0
Category Total:	1,750	1,720	1,396	157	124	1,650	44	20	4	181	429	117	29	1	0
Mushrooms															
Coprine	16	16	8	2	5	13	2	0	1	7	6	4	2	0	0
Cyclopeptide	38	33	0	6	24	16	14	0	3	26	1	5	10	6	0
Gastrointestinal irritant	133	130	56	32	35	91	36	0	3	56	38	32	21	1	0
Hallucinogenic	773	609	30	302	235	83	511	5	5	458	40	112	257	9	0
Ibotenic acid	51	43	10	11	18	14	29	0	0	33	9	6	12	6	0
Miscellaneous, nontoxic	151	132	70	12	38	113	3	1	14	29	33	19	7	0	0
Monomethylhydrazine	30	28	0	3	22	19	3	0	6	17	1	13	6	1	0
Muscarine	31	27	4	1	21	20	4	0	3	19	2	15	2	1	0
Other potentially toxic	17	15	6	2	7	12	2	0	1	7	3	8	0	0	0
Unknown	6,493	6,318	4,359	981	784	5,576	614	6	107	1,982	2,754	616	260	11	0
Category Total:	7,733	7,351	4,543	1,352	1,189	5,957	1,218	12	143	2,634	2,887	830	577	35	0
Other/unknown nondrug substances															
Other	28,819	22,617	12,558	3,398	4,575	20,646	629	637	563	2,641	4,076	2,973	624	27	1
Unknown	6,519	6,210	1,757	813	2,677	4,285	184	958	334	1,957	653	873	326	59	2
Category Total:	35,338	28,827	14,315	4,211	7,252	24,931	813	1,595	897	4,598	4,729	3,846	950	86	3

Paints and stripping agents															
Varnish, lacquer	1,338	1,248	336	127	593	1,198	20	6	24	265	139	313	62	2	0
Other paint/varnish/lacquer	549	507	204	45	186	488	11	0	8	119	73	101	24	4	0
Unknown paint/varnish/lacquer	7,694	7,276	4,853	529	1,397	7,047	102	26	88	942	1,071	634	108	6	0
Paints															
Antialgae	26	25	2	0	17	24	0	0	1	5	2	5	0	0	0
Anticorrosion	63	61	6	6	22	59	1	0	1	15	4	17	2	1	0
Oilbase	2,666	2,497	716	487	985	2,321	135	5	32	501	333	581	111	5	0
Stains	849	796	335	58	295	766	10	2	17	98	132	157	24	2	0
Waterbase	4,606	4,490	3,448	313	597	4,396	38	23	33	309	790	324	30	0	0
Stripping agents															
Methylene chloride	588	567	115	48	330	545	10	1	9	199	42	230	57	0	0
Other	642	585	163	35	318	551	15	7	11	199	62	179	61	7	0
Unknown	84	76	9	5	43	73	0	1	2	27	6	25	12	1	0
Category Total:	19,105	18,128	10,187	1,653	4,783	17,468	342	71	226	2,679	2,654	2,566	491	28	0
Pesticides															
Fumigants															
Aluminum phosphide	72	64	5	3	38	61	2	0	1	40	4	20	5	1	1
Metam sodium	1	1	0	0	1	1	0	0	0	1	0	1	0	0	0
Methyl bromide	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfuryl fluoride	195	174	30	26	100	170	0	3	1	32	19	22	3	1	0
Other	44	43	5	6	29	43	0	0	0	19	3	10	5	0	0
Unknown	75	72	13	6	38	67	0	1	1	14	4	12	5	1	0
Fungicides (nonmedicinal)															
Carbamate	157	126	40	12	58	120	5	0	0	28	32	20	7	1	0
Copper compound	38	37	4	5	19	36	1	0	0	3	1	5	2	0	0
Mercurial	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Nonmercurial	2	2	0	0	2	2	0	0	0	0	0	0	0	0	0
Phthalimide	83	54	33	3	12	53	0	0	1	5	7	5	1	0	0
Wood preservative	229	210	37	14	133	201	1	2	5	43	37	33	3	1	0
Other	838	721	132	35	377	692	8	3	18	143	162	149	19	0	0
Other/unknown	2	2	1	1	0	2	0	0	0	0	0	0	0	0	0
Unknown	30	25	9	6	7	23	0	1	1	6	5	3	2	0	0
Herbicides (includes algicides, defoliants, dessicants, plant growth regulators)															
2,4-D or 2,4,5-T	56	49	14	6	22	48	1	0	0	8	9	8	2	0	0
Carbamate	22	20	3	2	15	15	5	0	0	11	4	6	5	0	0
Chlorophenoxy	2,456	2,101	598	165	1,102	1,997	35	7	61	362	432	444	67	3	0
Diquat	250	218	40	20	136	206	4	2	6	51	59	57	8	0	0
Glyphosate	4,593	4,183	1,157	277	2,350	3,919	50	23	183	701	930	1,061	103	3	2
Paraquat	97	63	0	5	51	59	2	0	1	35	8	14	8	1	0
Triazine	470	343	81	20	190	327	1	2	12	75	58	78	18	1	0
Urea	99	62	33	3	23	60	0	2	0	10	9	6	2	0	0
Other	1,741	1,342	353	111	702	1,271	15	7	45	284	268	278	57	5	0
Unknown	433	375	95	54	169	344	12	7	9	72	39	57	29	0	0
Insecticides (includes insect growth regulators, molluscicides, nematicides)															
Arsenic pesticide	379	373	274	9	76	364	6	0	3	50	118	19	3	1	0
Borate/boric acid	4,367	4,291	3,588	179	419	4,230	31	11	16	268	1,120	155	18	1	0
Carbamate only	2,474	2,327	930	240	922	2,190	73	20	38	475	488	311	71	8	1
Carbamate with other insecticide	344	318	77	24	174	297	11	2	5	56	53	66	15	0	0
Chlorinated hydrocarbon only	547	498	194	65	184	437	15	4	39	138	114	61	19	2	0
Chlorinated hydrocarbon with other insecticide	245	235	100	28	75	217	5	4	9	26	42	56	7	0	0
Insect growth regulator	18	82	41	7	28	80	0	1	1	10	10	3	3	0	0
Metaldehyde	254	246	83	13	127	238	5	1	2	36	59	34	1	0	0
Nicotine	14	12	4	1	7	11	1	0	0	4	4	2	0	0	0
Organophosphate	3,974	3,659	1,009	391	1,841	3,377	124	55	83	974	825	742	165	32	8
Organophosphate/carbamate	89	83	24	9	43	75	5	1	2	13	19	13	8	0	0
Organophosphate/carbamate/ chlorinated hydrocarbon	16	16	0	2	13	15	1	0	0	0	0	1	1	0	0
Organophosphate/chlorinated hydrocarbon	2	2	1	1	0	2	0	0	0	0	0	0	0	0	0

(*Continued*)

Table 22A. Demographic profile of SINGLE-SUBSTANCE nonpharmaceuticals exposure cases by generic category

Major category			Age			Reason					Outcome				
Minor category Generic substance	No. of case mention	No. of single exposures	<6	6–19	>19	Unintentional	Intentional	Other	Adverse reaction	Treated in health-care facility	None	Minor	Moderate	Major	Death
Organophosphate/other insecticide	847	794	150	70	476	756	18	5	14	154	120	202	28	1	0
Piperonyl butoxide/pyrethrin	290	280	90	54	118	261	6	2	10	56	39	69	9	1	0
Pyrethrin	5,309	4,937	1,884	604	1,939	4,580	124	22	205	753	824	914	177	2	0
Pyrethrins only	96	91	26	11	49	88	1	0	2	10	11	7	1	0	0
Pyrethroid	21,721	20,653	5,857	2,036	10,452	19,247	492	129	744	3,317	3,171	4,999	669	20	0
Rotenone	90	74	21	9	38	73	0	0	1	13	10	19	1	0	0
Veterinary insecticid	164	156	43	22	78	150	1	1	4	24	29	31	3	0	0
Other	9,412	8,979	4,554	676	2,967	8,687	80	31	168	812	1,717	1,160	110	6	0
Unknown	4,264	3,926	1,023	419	1,815	3,573	95	89	125	1,031	506	698	174	11	1
Repellents															
Bird, dog, deer, or other mammal repellent	320	307	94	42	138	290	3	7	7	35	36	86	8	0	0
Insect repellent with DEET	7,179	7,044	4,563	1,224	965	6,596	87	58	297	608	1,072	2,177	123	4	0
Insect repellent without DEET	1,848	1,812	1,373	199	187	1,741	11	4	55	107	323	370	14	0	0
Insect repellent: unknown	69	68	31	7	24	61	0	2	5	14	15	20	5	0	0
Naphthalene	1,504	1,479	1,007	69	290	1,427	40	3	6	282	500	85	15	1	0
Paradichlorobenzene	168	164	110	8	32	144	19	0	1	13	37	10	1	0	0
Other moth repellent	9	8	5	1	2	7	0	0	1	5	5	0	1	0	0
Unknown moth repellent	2,153	2,115	1,208	150	542	2,011	70	6	19	355	575	161	28	0	0
Rodenticides															
Anticoagulant: long-acting, superwarfarin	11,926	11,683	10,220	350	874	11,180	387	76	26	3,287	3,520	118	54	10	1
Anticoagulant: warfarin-type	380	363	294	13	47	342	18	1	1	155	174	5	0	0	0
ANTU	5	4	1	3	0	2	1	0	1	1	2	0	1	0	0
Bromethalin	533	507	393	21	72	469	25	8	2	146	170	19	3	1	0
Cholecalciferol	12	10	6	0	4	7	2	0	1	5	2	0	0	1	0
Cyanide	4	1	0	0	0	1	0	0	0	1	0	0	1	0	0
Monofluoroacetate	5	4	3	0	1	4	0	0	0	1	4	0	0	0	0
Strychnine	89	78	8	5	48	51	5	10	1	36	12	5	5	1	1
Vacor	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0
Zinc phosphide	123	112	25	9	50	99	11	1	1	45	24	19	26	0	0
Other	720	698	495	64	109	668	15	7	7	70	169	28	9	2	0
Unknown	1,607	1,483	977	81	287	1,250	122	85	4	636	383	58	24	7	1
Category Total:	95,657	90,261	43,469	7,896	31,088	85,017	2,052	706	2,251	15,965	18,392	15,012	2,152	130	16
Photographic products															
Developer/fixing/stop bath	247	224	28	107	69	218	1	1	4	81	30	95	7	0	0
Photographic coating fluid	4	2	1	0	1	2	0	0	0	0	2	0	0	0	0
Other	375	347	261	26	45	342	1	1	2	28	58	30	4	1	0
Unknown	7	7	2	2	2	6	1	0	0	2	2	0	0	0	0
Category Total:	633	580	292	135	117	568	3	2	6	111	92	125	11	1	0
Plants															
Amygdalin/cyanogenic glycoside	2,896	2,812	1,753	536	385	2,614	102	5	87	151	597	97	28	0	0
Anticholinergic	1,037	938	345	392	176	512	400	3	17	490	183	93	272	28	0
Cardiac glycoside	1,402	1,371	788	229	277	1,279	68	3	20	194	374	81	25	7	0
Colchicine	17	15	14	0	0	15	0	0	0	1	3	1	0	0	0
Depressant	282	242	161	36	29	207	24	1	9	17	45	16	4	0	0
Dermatitis	7,744	7,253	3,695	1,107	1,852	6,702	148	88	303	649	851	902	267	3	0
Gastrointestinal irritant	9,913	9,494	7,075	1,057	1,092	8,980	291	15	190	678	1,880	764	136	6	0
Hallucinogenic	451	396	115	180	77	192	174	21	6	153	47	58	66	8	0
Nicotine	171	155	57	47	36	122	28	0	3	50	47	30	18	0	0
Nontoxic	9,836	9,244	7,248	991	725	8,715	163	20	331	337	1,132	445	57	5	0
Oxalate	7,529	7,368	6,020	762	455	7,114	204	8	38	340	1,558	1,145	81	3	0
Solanine	1,127	1,092	785	116	135	1,023	25	8	35	112	331	73	12	0	0
Stimulant	110	95	28	20	41	78	11	1	3	25	18	16	4	0	0
Toxalbumin	215	196	77	61	51	169	19	4	4	61	51	27	11	1	0
Other toxic	5,086	4,815	3,405	808	458	4,533	146	14	115	437	1,231	324	67	9	0
Unknown toxic or unknown if toxic	12,398	11,796	8,445	1,678	1,281	11,239	324	21	195	903	2,258	915	133	2	0
Category Total:	60,214	57,282	40,011	8,020	7,070	53,494	2,127	212	1,356	4,598	10,606	4,987	1,181	72	0

Polishes and waxes															
Floor wax/polish/sealer	617	587	359	40	140	569	7	1	8	129	147	89	18	0	0
Furniture polish	2,152	2,069	1,790	88	145	2,010	40	8	10	225	751	273	23	6	1
Polish/wax: other	3,555	3,404	2,641	199	416	3,304	51	16	25	365	917	463	50	1	0
Category Total:	6,324	6,060	4,790	327	701	5,883	98	25	43	719	1,815	825	91	7	1
Radioisotopes															
Radioisotope (nonmedicinal)	314	256	24	15	135	219	10	6	18	61	30	18	7	0	0
Category Total:	314	256	24	15	135	219	10	6	18	61	30	18	7	0	0
Sporting equipment															
Fishing bait	68	67	49	13	4	61	4	1	1	3	13	3	0	0	0
Golf ball	20	20	2	6	10	17	3	0	0	5	2	4	3	0	0
Gun bluing	32	31	8	1	19	27	4	0	0	14	4	8	2	0	1
Fishing product: other	30	28	20	3	5	25	2	0	1	6	6	5	2	0	0
Golf product: other	2	2	2	0	0	2	0	0	0	2	0	2	0	0	0
Hunting product: other	387	373	226	52	71	336	16	10	6	115	131	27	4	3	0
Other	28	27	21	4	1	27	0	0	0	3	5	3	2	0	0
Unknown	2	2	0	2	0	2	0	0	0	0	1	0	0	0	0
Category Total:	569	550	328	81	110	497	29	11	8	148	162	52	13	3	1
Swimming pool/aquarium															
Algicide	1,977	1,884	607	329	805	1,839	22	0	23	324	249	573	146	3	0
Aquarium product	2,156	2,036	1,718	123	157	2,014	11	10	1	154	524	126	6	0	0
Bromine water/shock treatment	138	113	43	19	44	105	3	0	5	16	19	36	5	0	0
Chlorine water/shock treatment	3,521	3,319	663	777	1,642	3,212	44	2	60	823	255	1,369	398	8	0
Pool/aquarium test kit	262	233	172	17	35	233	0	0	0	33	77	25	12	0	0
Other	2,197	1,988	572	374	889	1,884	16	5	75	431	247	712	143	6	0
Category Total:	10,251	9,573	3,775	1,639	3,572	9,287	96	17	164	1,781	1,371	2,841	710	17	0
Tobacco products															
Chewing tobacco	808	784	701	46	32	760	12	7	5	209	258	248	22	0	0
Cigar	88	77	67	1	5	73	0	0	4	19	28	16	1	0	0
Cigarette	5,445	5,285	4,929	86	214	5,178	48	25	26	935	1,858	1,019	74	1	0
Filter tip	126	121	111	3	5	116	2	1	2	15	40	21	1	0	0
Snuff	407	397	334	26	33	374	14	3	5	113	127	118	11	0	0
Other	74	67	34	3	23	58	3	0	6	14	10	16	4	0	0
Unknown	787	722	548	31	101	648	30	4	31	170	174	156	21	2	0
Category Total:	7,735	7,453	6,724	196	413	7,207	109	40	79	1,475	2,495	1,594	134	3	0
Weapons of mass destruction															
Anthrax	15	14	0	2	9	0	0	12	2	7	4	1	2	0	0
Nerve gas	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Suspicious powder in envelope/ package	32	32	0	4	19	11	0	20	0	16	16	4	0	0	0
Other biological weapon	81	74	10	10	43	68	0	1	4	25	2	7	6	1	0
Other chemical weapon	83	71	3	6	50	66	1	1	1	47	16	13	14	1	0
Other suspicious powder	25	25	0	1	10	17	1	6	0	13	2	8	0	1	0
Other suspicious substance	3	3	0	0	2	1	0	2	0	1	0	0	1	0	0
Category Total:	240	219	13	23	133	163	2	42	7	109	40	33	23	3	0
Total nonpharmaceuticals	1,354,188	1,233,770	682,925	148,658	314,808	1,164,085	35,879	12,421	17,622	177,024	200,850	189,151	37,776	2,304	177
% of single exposures		100.0%	55.4%	12.0%	25.5%	94.4%	2.9%	1.0%	1.4%	14.3%	16.3%	15.3%	3.1%	0.2%	0.0%

Table 22B. Demographic profile of SINGLE-SUBSTANCE Pharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mentions	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Advense reaction		None	Minor	Moderate	Major	Death
Analgesics															
Nonaspirin salicylate	471	371	228	41	94	306	45	0	20	103	116	32	21	3	0
Other	567	512	321	31	124	463	20	0	27	68	106	79	9	0	0
Phenacetin	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phenazopyridine	1,555	1,298	1,013	86	155	1,214	38	1	43	258	457	130	23	4	0
Salicylamide	6	4	3	0	1	4	0	0	0	3	2	0	0	0	0
Unknown	217	111	21	41	34	42	60	1	7	69	20	20	6	0	0
Acetaminophen in combination with:															
Aspirin with other ingredient	7,602	5,286	2,537	1,138	1,416	3,402	1,701	1	163	2,198	1,433	762	272	11	0
Aspirin without other ingredient	405	258	108	44	96	176	72	0	8	83	46	25	13	2	0
Codeine	4,857	2,639	805	526	1,107	1,488	834	3	290	1,189	677	447	141	19	1
Hydrocodone	24,472	10,943	1,976	1,699	6,139	5,075	4,849	73	750	5,332	2,299	1,925	692	164	23
Oxycodone	8,493	4,153	879	521	2,348	2,048	1,629	34	381	1,869	850	757	265	42	4
Propoxyphene	5,175	2,428	478	323	1,428	1,203	1,054	5	123	1,306	574	417	217	39	7
Other drug: adult formulation	22,680	13,712	2,985	3,152	6,760	5,333	7,867	16	376	8,349	2,989	2,773	1,663	217	18
Other drug: pediatric formulation	180	152	141	9	2	148	1	0	3	21	43	9	1	0	0
Other opioid	1,950	926	126	133	599	417	436	4	66	512	153	130	59	3	1
Acetaminophen only															
Adult formulation	7,013	4,148	1,670	1,101	1,222	2,318	1,697	5	98	2,075	1,088	513	493	48	9
Pediatric formulation	884	606	467	95	42	539	54	1	11	135	206	21	18	1	0
Unknown formulation	10,211	5,507	1,563	1,495	2,161	2,403	2,889	8	124	3,391	1,122	920	997	98	11
Asprin in combination with:															
Carisoprodol	163	69	6	9	46	16	50	0	3	50	6	18	15	2	0
Codeine	145	75	19	9	44	34	38	1	2	42	11	16	12	2	0
Oxycodone	61	35	8	3	22	15	10	2	7	14	8	7	2	1	0
Propoxyphene	6	3	1	1	0	2	1	0	0	2	1	0	1	0	0
Other drug: adult formulation	1,609	956	292	163	446	551	313	3	71	393	192	174	80	10	0
Other drug: pediatric formulation	277	249	228	20	1	245	1	1	2	28	79	19	0	0	0
Other opioid	37	11	1	1	9	7	1	1	2	5	3	1	2	0	0
Opioids															
Codeine	974	629	280	134	176	499	90	4	35	160	158	84	13	1	0
Meperidine	527	285	43	33	176	128	110	0	44	141	42	45	36	10	0
Methadone	5,025	2,364	318	244	1,511	858	1,169	93	153	1,529	292	414	439	211	27
Morphine	3,321	1,813	264	179	1,128	933	640	23	179	949	317	296	207	51	7
Oxycodone	6,515	3,340	525	493	1,889	1,667	1,271	67	267	1,545	488	560	260	78	9
Pentazocine	139	101	8	11	59	33	33	0	31	45	12	17	7	3	0
Propoxyphene	356	132	27	13	75	66	52	0	11	66	24	21	11	4	1
Tramadol	7,500	4,053	709	528	2,466	1,746	1,847	39	364	2,385	915	790	558	112	1
Other/unknown	8,835	4,927	1,126	472	2,811	2,402	1,733	121	596	2,615	815	999	582	219	15
Other nonsteroidal anti-inflammatory drugs															
Colchicine	377	219	51	12	144	148	25	2	41	112	46	41	31	4	3
Cox-2 inhibitor	1,498	824	387	47	316	697	64	0	60	140	220	40	5	1	0
Ibuprofen	79,130	62,829	45,058	9,067	7,267	53,186	8,717	39	729	10,557	14,538	2,736	537	35	0
Ibuprofen with hydrocodone	86	58	17	10	27	33	13	0	10	20	14	7	2	0	0
Indomethacin	580	320	127	30	139	211	66	0	40	110	76	41	11	0	0
Ketoprofen	169	110	55	17	36	79	20	0	9	24	37	7	1	0	0
Naproxen	12,620	7,866	2,873	1,768	2,778	5,113	2,189	5	509	2,379	1,905	805	175	6	2
Other	6,062	3,588	1,480	399	1,438	2,932	469	6	151	769	946	291	57	7	0
Unknown	17	10	4	2	4	7	2	0	1	3	3	2	2	0	0
Category Total:	307,590	205,245	104,267	33,709	57,782	142,311	54,472	607	6,323	69,897	47,585	19,606	9,672	2,004	198
Anesthetics															
Ketamine and analogs	134	72	8	15	42	29	33	2	5	58	5	16	22	7	0
Other	24	15	6	1	6	13	0	0	2	7	4	2	1	2	0
Unknown	7	3	0	0	2	0	0	0	3	1	0	0	0	0	0

Inhalation anesthetics															
Nitrous oxide	178	144	15	41	57	74	49	1	17	76	11	37	21	4	0
Other	154	114	3	16	78	97	8	3	3	63	9	41	10	0	0
Unknown	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Local/topical anesthetics															
Dibucaine	37	36	26	1	9	36	0	0	0	4	10	2	0	0	0
Lidocaine	1,694	1,529	670	198	550	1,286	77	6	152	349	342	229	83	16	0
Other/unknown	6,073	5,789	3,987	508	1,018	5,329	134	25	292	745	1,907	602	105	10	2
Category Total:	8,303	7,703	4,715	780	1,762	6,865	301	37	474	1,303	2,288	929	242	39	2
Anticholinergic drugs															
Anticholinergic drug	10,650	8,582	442	207	6,701	8,109	297	18	141	738	1,285	278	186	13	0
Category Total:	10,650	8,582	442	207	6,701	8,109	297	18	141	738	1,285	278	186	13	0
Anticoagulants															
Glycoprotein IIA/IIB inhibitor	19	17	1	1	13	14	0	0	3	17	6	2	1	0	2
Heparin	253	211	23	8	144	152	25	0	32	107	34	19	29	10	2
Warfarin (excluding rodenticide)	3,846	2,353	1,058	82	1,073	2,080	163	10	84	716	644	48	128	20	2
Other	39	34	14	2	16	20	2	1	10	21	8	5	5	1	1
Other antiplatelet	2,330	862	274	24	490	805	28	1	28	112	174	21	11	0	0
Unknown	51	46	33	4	6	40	5	1	0	25	7	2	1	0	0
Category Total:	6,538	3,523	1,403	121	1,742	3,111	223	13	157	998	873	97	175	31	7
Anticonvulsants															
Carbamazepine	4,255	2,352	660	380	1,190	1,357	753	4	197	1,482	471	604	418	78	1
Phenytoin	3,889	2,395	289	121	1,811	1,216	600	3	485	1,710	391	590	528	45	4
Primidone	249	129	24	12	85	100	18	0	8	56	31	35	11	0	0
Succinimide	106	78	36	31	8	69	6	0	2	21	24	13	1	0	0
Valproic acid	8,461	3,232	540	736	1,746	1,620	1,263	6	276	1,835	865	591	309	60	5
Other	24,609	11,182	3,116	2,274	5,058	7,060	3,320	20	707	5,018	2,898	2,094	866	100	2
Unknown	12	5	1	1	2	2	1	1	1	3	1	0	2	0	0
Category Total:	41,581	19,373	4,666	3,555	9,900	11,424	5,961	34	1,676	10,125	4,681	3,927	2,135	283	12
Antidepressants															
Lithium	6,104	3,131	199	441	2,270	1,100	1,122	13	767	2,477	530	593	933	135	7
MAO inhibitor	302	134	19	5	93	81	22	1	28	71	32	18	28	5	0
SSRI	42,613	19,407	5,795	4,624	7,782	10,916	7,619	63	703	9,396	6,132	2,933	1,099	84	0
Trazodone	12,338	4,796	479	923	3,014	1,565	3,043	13	119	3,252	962	1,393	590	32	0
Other	24,935	11,391	3,050	1,893	5,688	6,808	3,958	58	491	6,230	3,396	1,734	1,233	305	9
Unknown	91	30	5	8	12	7	18	0	2	21	4	1	7	1	0
Cyclic antidepressants															
Amitriptyline	5,854	2,648	525	355	1,604	1,100	1,414	8	63	1,903	483	564	569	230	8
Amoxapine	27	8	1	0	6	2	2	0	3	7	3	0	4	0	0
Cyclic antidepressant formulated with a benzodiazepine	36	17	5	2	9	7	10	0	0	11	7	6	0	0	0
Cyclic antidepressant formulated with a phenothiazine	89	44	12	5	24	25	18	0	0	27	9	8	10	1	0
Desipramine	111	50	16	3	28	32	14	0	4	30	13	6	8	1	1
Doxepin	919	412	48	40	295	157	234	0	19	290	77	84	102	24	2
Imipramine	509	284	90	69	115	175	83	0	19	161	77	48	43	13	0
Maprotiline	11	2	1	0	1	1	1	0	0	2	1	1	0	0	0
Nortriptyline	933	410	65	56	258	198	179	0	30	251	79	71	75	19	0
Protriptyline	21	11	3	2	5	9	1	0	1	3	5	1	0	0	0
Other cyclic antidepressant	2,265	910	162	133	553	431	403	2	43	577	188	177	161	68	5
Unknown cyclic antidepressant	28	11	1	2	8	2	7	0	0	10	1	2	3	4	0
Category Total:	97,186	43,696	10,476	8,561	21,765	22,616	18,148	158	2,292	24,719	11,999	7,640	4,865	922	32
Antihistamines															
Diphenhydramine	27,657	19,680	10,867	3,239	4,914	14,393	4,832	11	357	6,312	4,362	2,790	1,600	151	2
Diphenhydramine: OTC	5,463	4,351	3,095	573	577	3,641	622	2	73	1,070	987	588	197	15	1
Diphenhydramine: Rx	23	13	4	2	6	8	5	0	0	6	2	4	1	0	0
H2 receptor antagonist	8,887	6,816	5,613	382	678	6,457	232	1	111	675	1,845	225	29	0	0
Other	36,100	25,160	14,971	5,158	4,318	21,748	2,811	13	498	5,235	6,834	2,045	779	45	2
Category Total:	78,130	56,020	34,550	9,354	10,493	46,247	8,502	27	1,039	13,298	14,030	5,652	2,606	211	5
Antimicrobials															
Other	91	82	57	6	16	79	2	0	1	13	32	7	1	0	0
Unknown	19	14	4	2	7	9	2	0	3	3	2	1	1	0	0

(*Continued*)

Table 22B. Demographic profile of SINGLE-SUBSTANCE Pharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mentions	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Advense reaction		None	Minor	Moderate	Major	Death
Anthelmintics															
Diethylcarbamazine	47	43	14	2	19	42	0	0	0	3	6	0	0	0	0
Piperazine	391	381	294	23	52	366	8	4	3	54	136	21	1	0	0
Other	1,635	1,548	957	148	377	1,498	17	1	32	136	379	99	8	1	1
Unknown	14	13	7	1	5	13	0	0	0	1	2	0	0	0	0
Antibiotics															
Systemic	39,635	32,515	16,985	4,513	8,866	26,973	1,308	27	4,144	4,024	5,238	2,398	648	49	3
Topical	7,610	7,325	5,395	506	1,087	7,088	74	7	152	217	1,111	337	28	3	0
Unknown	485	330	145	53	98	237	19	0	73	55	40	43	8	1	0
Antifungals															
Systemic	1,688	1,419	828	149	351	1,253	30	0	135	202	307	78	23	3	0
Topical	8,936	8,589	6,528	329	1,387	8,308	50	11	218	531	1,392	569	49	0	0
Unknown	13	13	5	2	5	13	0	0	0	5	3	4	1	0	0
Antiparasitics															
Antimalarial	885	583	137	116	279	464	48	3	65	218	168	60	39	7	0
Metronidazole	1,401	925	316	89	425	714	57	0	152	132	147	85	14	0	0
Other	47	41	24	8	8	37	1	0	3	7	14	5	0	1	0
Antituberculars															
Isoniazid	330	228	51	86	76	113	78	1	30	142	48	16	31	45	0
Rifampin	109	62	19	8	26	53	1	0	8	11	11	9	2	0	0
Other	30	11	4	0	7	11	0	0	0	3	3	1	1	0	0
Unknown	1	1	0	0	1	0	1	0	0	1	0	1	0	0	0
Antivirals															
Amantadine	211	84	30	15	34	66	12	0	5	26	20	10	4	1	0
Anti-influenza agent: other	164	134	42	42	44	111	3	0	19	13	31	11	3	0	0
Antiretroviral	522	279	60	14	156	203	60	0	16	105	68	32	10	2	0
Systemic	1,485	1,168	486	149	442	1,015	69	1	78	185	250	63	24	1	0
Topical	219	210	98	20	71	200	0	0	10	8	30	18	2	0	0
Unknown	311	223	90	17	94	183	13	0	27	42	60	13	5	2	0
Category Total:	66,279	56,221	32,576	6,298	13,933	49,049	1,853	55	5,174	6,137	9,498	3,881	903	116	4
Antineoplastics															
Antineoplastic	1,718	1,330	309	85	773	1,154	35	0	138	403	303	127	74	6	2
Category Total:	1,718	1,330	309	85	773	1,154	35	0	138	403	303	127	74	6	2
Asthma therapies															
Albuterol	6,217	5,532	4,121	853	461	5,052	256	29	177	733	1,319	590	244	2	0
Aminophylline/theophylline	369	230	39	17	163	158	39	0	30	118	35	35	51	8	0
Leukotriene antagonist/inhibitor	13,342	11,356	9,199	1,665	401	11,128	170	4	40	871	2,498	137	6	0	0
Terbutaline and other beta-2 agonist	3,095	2,704	1,075	401	997	2,521	84	2	90	246	501	142	72	1	0
Other beta agonist	1,022	992	197	332	399	956	22	4	8	366	65	447	138	1	0
Other	415	284	89	34	140	210	40	2	29	124	85	43	26	6	0
Unknown	10	7	3	3	1	5	1	0	1	1	2	0	1	0	0
Category Total:	24,470	21,105	14,723	3,305	2,562	20,030	612	41	375	2,459	4,505	1,394	538	18	0
Cardiovascular drugs															
ACE inhibitor	14,029	6,626	2,943	527	2,817	5,940	495	2	178	1,691	2,470	223	163	14	0
Alpha blocker	2,070	1,020	293	38	636	890	71	0	56	294	310	92	77	2	0
Angiotensin receptor blocker	6,893	3,594	1,275	210	1,886	3,343	168	1	73	826	1,301	146	77	0	0
Antihyperlipidemic	11,994	5,815	2,771	333	2,310	5,428	147	6	228	553	1,171	142	43	3	0
Antihypertensive	2,874	1,692	647	427	555	1,445	180	4	52	793	634	200	186	8	1
Beta blocker	19,926	9,291	2,867	729	5,170	8,008	1,007	9	226	3,641	3,569	413	631	61	3
Calcium antagonist	10,084	4,759	1,349	240	2,872	4,176	405	1	160	2,232	1,904	288	361	74	17
Cardiac glycoside	2,565	1,544	300	46	1,160	1,012	60	2	428	987	309	85	474	121	10
Clonidine	6,162	3,499	1,480	1,147	782	2,742	637	17	68	2,235	763	740	841	76	2
Hydralazine	427	178	55	13	101	152	17	0	8	71	58	17	13	0	0
Long-acting nitrate	879	325	101	11	197	288	29	1	5	99	112	28	11	2	0
Nitroglycerin	1,531	1,193	794	77	271	1,065	98	4	20	363	565	76	27	0	0
Nitroprusside	34	30	1	3	23	10	0	0	20	26	6	1	3	1	1
Vasopressor	2,866	2,445	625	685	945	2,362	59	0	22	968	238	907	273	6	0
Antiarrhythmic: other	1,304	797	157	23	548	738	21	0	33	291	274	57	46	11	1
Vasodilator: other	936	658	253	84	261	475	109	10	61	215	195	62	25	3	1

Other	474	249	111	12	113	226	9	2	12	44	65	6	6	2	0
Vasodilator: unknown	61	39	19	3	13	33	3	0	3	17	14	1	4	1	0
Unknown	65	29	10	1	13	19	5	0	3	11	1	0	1	0	0
Category Total:	85,174	43,783	16,051	4,609	20,673	38,352	3,520	59	1,656	15,357	13,959	3,484	3,262	385	36
Cold and cough preparations															
APAP/dextromethorphan	314	242	194	31	13	229	11	0	2	49	68	17	6	0	0
ASA/dextromethorphan	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0
Expectorant/antitussive	3,684	2,755	1,627	419	590	2,463	168	6	114	423	626	202	45	6	1
Non-ASA salicylate/dextromethorphan	21	16	11	2	1	13	2	0	1	2	6	1	1	0	0
Other dextromethorphan	16,602	13,393	8,191	3,020	1,901	11,267	1,819	10	252	2,748	2,764	1,617	709	21	3
Other phenylpropanolamine	315	266	137	14	108	260	3	0	3	26	72	6	3	0	0
Other	3,106	2,494	1,892	292	252	2,319	99	0	66	319	669	213	40	1	0
Unknown	1,377	865	444	260	125	553	268	2	22	370	156	122	81	2	0
Antihistamine/decongestant, with phenylpropanolamine															
Codeine	30	21	16	2	3	18	2	0	1	8	8	4	1	0	0
Dextromethorphan	1,670	1,402	1,168	164	62	1,324	52	0	25	197	411	141	26	1	0
Without opioid	4,936	4,234	3,843	301	67	4,146	48	3	35	600	1,243	393	43	3	0
Other opioid	45	37	19	12	5	35	1	0	1	9	15	5	1	0	0
Antihistamine/decongestant, without phenylpropanolamine															
Codeine	1,125	951	582	195	148	855	61	1	31	183	259	140	18	1	0
Dextromethorphan	22,064	18,745	12,940	4,476	1,180	14,685	3,744	21	245	5,189	4,369	2,638	1,601	67	1
Without opioid	24,808	18,902	12,779	2,681	2,981	17,152	1,245	24	424	3,176	5,125	1,601	442	25	2
Other opioid	2,955	2,440	1,453	446	480	2,176	158	2	93	636	698	484	64	4	0
APAP with decongestant/antihistamine, with phenylpropanolamine															
Codeine	5	4	3	0	1	4	0	0	0	2	1	1	0	0	0
Dextromethorphan	405	305	224	51	26	272	26	0	6	57	81	34	4	0	0
Other opioid	2	2	1	1	0	2	0	0	0	0	0	0	0	0	0
Without opioid	375	289	168	85	30	196	84	0	8	112	81	45	28	3	0
APAP with decongestant/antihistamine, without phenylpropanolamine															
Codeine	39	33	20	6	6	28	3	0	2	12	13	3	2	0	0
Dextromethorphan	17,987	12,118	8,090	2,032	1,715	10,098	1,647	17	306	2,744	3,086	1,299	303	16	2
Other opioid	54	44	35	2	6	41	2	0	1	9	10	3	1	0	0
Without opioid	7,125	5,085	3,399	964	618	4,085	810	9	154	1,241	1,265	458	247	13	0
APAP/ASA with decongestant/antihistamine, with phenylpropanolamine															
Dextromethorphan	142	114	96	7	8	106	4	0	4	17	33	11	4	0	0
Other opioid	12	11	6	3	2	11	0	0	0	2	5	1	0	0	0
Without opioid	30	22	10	8	4	15	7	0	0	9	3	5	4	0	0
APAP/ASA with decongestant/antihistamine, without phenylpropanolamine															
Dextromethorphan	179	132	85	22	22	116	13	0	3	24	33	13	0	0	0
Other opioid	15	11	8	2	1	10	0	0	1	3	1	2	1	0	0
Without opioid	83	67	43	7	17	58	7	0	2	17	12	11	1	1	0
ASA with decongestant/antihistamine, with phenylpropanolamine															
Dextromethorphan	14	11	7	0	4	9	0	1	1	1	2	1	0	0	0
Without opioid	40	29	12	9	6	17	8	0	3	11	10	5	0	0	0
ASA with decongestant/antihistamine, without phenylpropanolamine															
Dextromethorphan	45	37	26	7	3	31	1	0	5	6	11	2	1	0	0
Other opioid	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0
Without opioid	61	39	13	14	12	19	19	0	1	20	6	9	8	0	0
Non-ASA salicylates with antihistamine/decongestant, with PPA															
Dextromethorphan	13	8	6	1	0	7	1	0	0	1	4	1	0	0	0
Other opioid	4	4	2	1	1	2	2	0	0	2	0	1	1	0	0
Without opioid	2	2	1	0	1	1	0	0	1	1	1	1	0	0	0
Non-ASA salicylates with antihistamine/decongestant, without PPA															
Dextromethorphan	17	12	12	0	0	12	0	0	0	3	6	2	0	0	0
Other opioid	4	3	2	1	0	3	0	0	0	1	0	0	1	0	0
Without opioid	12	12	6	1	4	9	3	0	0	4	3	3	0	0	0
Category Total:	109,719	85,159	57,572	15,539	10,404	72,649	10,318	96	1,813	18,234	21,156	9,495	3,687	164	9
Diagnostic agents															
Clinitest/acetest	1	1	0	0	1	1	0	0	0	1	0	0	1	0	0
Other	591	544	138	34	283	439	8	0	96	197	88	81	39	3	0
Unknown	26	24	4	3	11	13	0	1	10	8	1	6	1	0	0
Category Total:	618	569	142	37	295	453	8	1	106	206	89	87	41	3	0

(*Continued*)

Table 22B. Demographic profile of SINGLE-SUBSTANCE Pharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mentions	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Advense reaction		None	Minor	Moderate	Major	Death
Dietary supplements/herbals/homeopathic															
Homeopathic	10,149	9,643	8,831	240	466	9,309	129	10	189	530	2,070	215	41	6	0
Dietary supplement/homeopathic: unknown	2,884	2,384	1,482	326	479	1,828	231	4	302	548	461	210	126	4	0
Amino acids															
Creatine	226	177	62	57	52	113	22	0	41	64	37	26	17	2	0
Other amino acid dietary supplement	466	331	191	47	79	251	34	0	45	71	59	24	16	1	0
Botanical products															
Citrus aurantium (single ingredient)	4	1	0	0	1	0	0	0	1	1	0	0	1	0	0
Echinacea	338	262	193	46	18	234	8	2	18	20	59	17	5	0	0
Ginkgo biloba	134	76	45	8	20	63	5	0	8	12	16	3	3	0	0
Ginseng	196	120	56	18	40	88	14	0	17	30	22	19	4	0	0
Kava kava	61	41	12	9	18	22	10	0	6	20	12	3	4	1	0
Ma huang/ephedra (single ingredient)	149	107	32	16	56	45	48	0	13	62	23	24	15	1	0
Multibotanical with *Citrus aurantium*	184	145	77	22	39	96	25	0	23	57	52	28	9	0	0
Multibotanical with ma huang	681	500	241	96	144	292	133	2	72	225	129	85	61	3	1
Multibotanical without ma huang or *Citrus aurantium*	2,440	1,956	1,023	324	532	1,308	328	2	299	641	443	313	145	6	0
St. John's wort	175	104	61	10	25	75	17	0	11	24	22	10	1	0	0
Valerian	231	125	39	22	51	68	38	2	16	52	20	13	9	1	0
Yohimbe	277	213	43	26	134	87	35	1	88	123	19	58	58	2	0
Other single ingredient botanical	2,259	1,687	952	184	432	1,375	103	3	201	267	306	156	45	4	0
Cultural medicines															
Asian	128	110	50	16	29	81	11	0	18	39	19	21	7	1	0
Ayurvedic	8	5	3	0	2	4	0	0	1	1	1	0	0	0	0
Hispanic	11	10	5	2	3	5	0	0	5	8	5	1	1	0	0
Other	43	42	17	5	16	23	7	0	11	21	9	13	2	0	0
Hormonal products															
Androgen/precursor (dietary supplement)	121	81	39	10	26	57	7	0	16	16	14	11	2	0	0
Glandular	41	31	20	0	9	24	1	0	6	5	6	3	0	0	0
Melatonin	3,082	2,452	1,606	518	258	2,046	349	5	40	347	581	228	12	0	0
Phytoestrogen	71	48	32	2	12	43	2	0	3	8	9	1	1	0	0
Other dietary supplements															
Blue-green algae	123	111	38	28	36	99	1	2	9	24	8	12	3	0	0
Glucosamine (with or without chondroitin)	738	501	365	16	97	461	8	2	30	35	85	21	3	0	0
Other single ingredient nonbotanical	634	424	268	45	95	340	27	1	53	70	92	30	9	2	0
Category Total:	25,854	21,687	15,783	2,093	3,169	18,437	1,593	36	1,542	3,321	4,579	1,545	600	34	1
Diuretics															
Furosemide	2,865	1,088	514	81	452	987	60	3	35	246	268	125	27	1	0
Thiazide	4,513	1,837	836	177	747	1,663	140	1	29	353	446	87	39	2	0
Other	1,847	822	395	77	303	715	68	1	34	175	239	47	19	1	0
Unknown	1,317	476	224	39	187	429	27	0	19	87	116	25	12	0	0
Category Total:	10,542	4,223	1,969	374	1,689	3,794	295	5	117	861	1,069	284	97	4	0
Electrolytes and minerals															
Calcium	16,779	15,170	13,962	633	438	14,958	147	8	48	364	2,410	202	34	2	0
Chromium, trivalent	504	434	201	53	139	413	11	0	8	75	95	39	8	0	0
Colloidal silver	82	73	25	10	33	47	10	1	13	28	12	10	2	1	0
Fluoride	3,091	2,926	2,568	252	80	2,860	30	1	34	116	611	179	4	0	0
Iron	4,115	3,196	1,917	321	809	2,684	305	13	180	879	891	314	90	8	0
Magnesium	1,012	825	329	87	350	665	79	7	68	125	150	107	22	3	1
Multimineral dietary supplement	243	198	137	9	37	175	6	0	16	20	38	14	0	1	0
Multimineral, multiherbal dietary supplement	1,437	1,110	627	145	305	767	196	0	141	438	335	154	94	4	0
Potassium	1,524	645	247	32	314	547	59	0	34	131	155	26	11	1	0
Selenium	102	73	31	7	25	62	4	1	4	22	11	13	4	0	0
Sodium	3,176	2,659	1,550	490	474	2,380	198	31	46	384	505	384	38	4	0
Zinc	1,083	901	556	67	227	824	29	1	43	89	129	78	18	1	0
Unknown	9	7	2	1	3	6	1	0	0	1	0	0	0	0	0
Other	64	59	17	7	26	46	3	0	8	18	11	13	3	0	0
Category Total:	33,221	28,276	22,169	2,114	3,260	26,434	1,078	63	643	2,690	5,353	1,533	328	25	1

Eye/ear/nose/throat preparations															
Steroid, topical for eye/nose/throat	2,412	1,861	1,050	336	353	1,756	38	3	62	77	278	147	18	0	0
Nasal preparations															
Tetrahydrozoline	42	41	29	3	7	40	0	0	1	11	11	6	2	0	0
Other decongestant	2,579	2,442	1,227	256	763	2,246	44	9	140	275	696	280	36	3	0
Other	739	710	441	42	176	683	6	2	19	30	108	96	3	0	0
Unknown	11	9	2	0	2	8	0	0	1	2	0	3	0	0	0
Ophthalmic preparations															
Contact lens product	3,467	3,373	1,790	294	1,028	3,273	22	22	55	521	386	636	136	2	0
Glaucoma therapy	260	228	70	12	120	203	3	0	22	37	56	28	5	0	0
Tetrahydrozoline	2,221	2,153	1,283	327	423	1,753	111	262	19	485	867	159	42	1	0
Other sympathomimetic	1,145	1,079	559	197	250	848	58	119	44	217	363	97	24	1	0
Other	1,531	1,447	763	150	410	1,318	30	18	74	124	209	107	37	3	0
Unknown	73	64	21	15	16	42	5	12	4	18	10	6	3	0	0
Otic preparations															
Combination product	2,590	2,541	1,228	354	790	2,498	8	1	33	241	443	797	33	0	0
Other	2,161	2,138	869	200	866	2,105	9	0	22	252	248	626	62	0	0
Unknown	85	83	34	11	24	81	0	1	1	8	8	23	5	0	0
Throat preparations															
Lozenge with local anesthetic	314	273	148	60	51	252	11	0	9	26	91	15	3	1	0
Lozenge without local anesthetic	1,264	1,165	979	98	66	1,111	29	1	24	33	221	30	2	0	0
Other	505	474	202	99	149	430	29	1	14	59	111	51	6	1	0
Unknown	3	2	2	0	0	2	0	0	0	0	1	0	0	0	0
Category Total:	21,402	20,083	10,697	2,454	5,494	18,649	403	451	544	2,416	4,107	3,107	417	12	0
Gastrointestinal preparations															
Laxative	15,541	14,007	10,114	1,169	2,266	12,893	530	153	407	1,114	1,983	1,413	152	3	0
Other	10,809	9,367	8,013	345	813	8,895	180	4	277	761	1,605	280	116	8	0
Unknown	34	24	17	0	6	19	1	0	4	5	5	2	0	0	0
Antacids															
Proton pump inhibitor	10,020	6,007	3,737	351	1,599	5,593	194	7	203	502	1,345	184	20	2	0
Salicylate-containing	2,841	2,573	2,107	210	210	2,385	80	3	97	226	618	76	22	1	0
Other	9,405	8,878	8,239	324	244	8,748	76	10	43	155	1,263	93	7	0	0
Antidiarrheals															
Diphenoxylate/atropine	408	231	109	23	84	182	32	2	14	145	88	29	16	3	0
Loperamide	1,568	1,256	809	98	297	1,086	84	2	80	297	457	93	19	2	0
Nonopioid	63	47	33	4	6	41	2	0	4	7	14	1	2	0	0
Paregoric	12	8	1	0	6	3	1	0	3	2	0	3	0	0	0
Antispasmodics															
Anticholinergic	3,294	1,926	1,014	237	603	1,613	199	1	96	655	641	226	120	9	0
Other	87	55	30	5	18	43	7	0	4	20	18	8	2	2	0
Category Total:	54,082	44,379	34,223	2,766	6,152	41,501	1,386	182	1,232	3,889	8,037	2,408	476	30	0
Hormones and hormone antagonists															
Androgen	384	291	89	28	136	181	67	4	37	97	41	45	16	1	0
Corticosteroid	9,622	7,817	4,195	862	2,275	7,137	128	9	527	556	1,140	290	88	4	0
Estrogen	1,744	1,046	712	70	216	980	26	1	39	75	200	28	5	0	0
Insulin	4,323	3,719	144	131	3,036	3,350	260	13	82	1,327	1,428	184	554	31	3
Oral contraceptive	9,010	7,827	6,441	656	557	7,250	418	11	135	71	1,258	215	13	0	0
Progestin	1,481	1,263	796	109	283	1,146	37	0	75	110	222	39	5	1	0
Selective estrogen receptor modulator	427	247	76	21	133	236	3	0	7	37	73	8	1	0	0
Thyroid preparation	12,291	8,525	4,823	537	2,715	8,235	178	4	96	978	1,730	106	39	0	0
Other hormone	809	634	251	120	211	553	28	2	47	161	172	47	22	4	0
Other hormone antagonist	526	404	159	35	175	366	22	0	16	57	90	16	4	0	0
Unknown hormone or antagonist	21	14	5	2	7	11	3	0	0	4	1	4	0	0	0
Oral hypoglycemics															
Biguanide	5,758	2,789	726	284	1,596	2,346	345	4	82	733	839	192	87	18	3
Sulfonylurea	4,384	1,975	991	110	780	1,666	183	2	99	1,421	802	68	491	34	0
Thiazolidinedione	1,873	696	344	40	276	629	40	0	26	209	336	16	20	1	0
Other/unknown	731	422	126	40	229	332	28	1	60	187	172	12	41	3	0
Category Total:	53,384	37,669	19,878	3,045	12,625	34,418	1,766	51	1,328	6,523	8,504	1,270	1,386	97	6
Miscellaneous drugs															
Allopurinol	671	287	154	25	90	261	15	0	11	50	87	8	3	0	0
Disulfiram	293	79	5	3	54	33	21	1	23	36	12	14	5	2	0
Ergot alkaloid	241	179	108	16	41	150	10	1	18	104	67	21	13	0	0

(*Continued*)

Table 22B. Demographic profile of SINGLE-SUBSTANCE Pharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mentions	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Adverse reaction		None	Minor	Moderate	Major	Death
L-dopa and related drug	1,010	510	170	14	304	460	25	2	20	141	138	60	24	2	0
Neuromuscular blocking agent	30	21	4	0	13	15	3	0	3	16	5	2	2	4	1
Nicotine pharmaceutical	1,115	1,040	539	113	314	821	79	5	131	233	328	160	47	1	0
Other	20,962	14,314	5,879	1,698	5,713	12,162	985	43	1,053	3,156	3,292	1,687	545	29	3
Category Total:	24,322	16,430	6,859	1,869	6,529	13,902	1,138	52	1,259	3,736	3,929	1,952	639	38	4
Muscle relaxants															
Carisoprodol (formulated alone)	8,658	3,536	272	422	2,571	776	2,608	6	69	2,771	454	1,167	705	120	1
Cyclobenzaprine	8,667	3,949	1,302	598	1,817	2,243	1,585	1	83	2,277	1,020	828	487	65	1
Methocarbamol	1,518	765	163	133	396	406	323	1	26	360	168	142	38	5	0
Other	6,963	3,220	733	410	1,823	1,620	1,383	11	158	1,925	648	653	521	115	3
Unknown	174	46	13	9	14	18	24	0	3	31	5	12	2	1	0
Category Total:	25,980	11,516	2,483	1,572	6,621	5,063	5,923	19	339	7,364	2,295	2,802	1,753	306	5
Narcotic antagonists															
Opioid antagonist	341	151	4	9	116	48	44	10	45	96	11	36	38	1	0
Category Total:	341	151	4	9	116	48	44	10	45	96	11	36	38	1	0
Radiopharmaceuticals															
Radiopharmaceutical	36	31	2	3	16	11	1	0	19	10	1	9	3	0	0
Category Total:	36	31	2	3	16	11	1	0	19	10	1	9	3	0	0
Sedative/hypnotics/antipsychotics															
Atypical antipsychotic	41,607	18,273	2,673	4,526	9,961	7,183	9,930	50	872	12,927	3,398	4,897	3,544	466	10
Benzodiazepine	72,978	29,262	6,234	3,915	16,578	10,995	17,021	300	523	19,043	5,816	8,490	2,751	269	7
Buspirone	2,209	764	153	114	430	391	310	1	50	374	186	137	45	2	0
Chloral hydrate	190	109	29	20	54	53	45	2	8	76	12	31	24	7	1
Ethchlorvynol	2	1	0	0	0	1	0	0	0	0	0	1	0	0	0
Meprobamate	64	29	6	4	15	15	12	0	2	18	9	3	2	3	1
Methaqualone	10	1	0	0	1	0	1	0	0	1	0	0	1	0	0
Phenothiazine	4,632	2,209	470	318	1,234	1,186	738	11	247	1,305	449	391	450	35	2
Sleep aid (OTC)	1,144	706	114	95	433	223	472	0	8	476	140	151	135	14	0
Other	22,425	10,811	1,561	1,770	6,588	4,627	5,587	30	399	6,436	1,792	3,290	1,088	91	0
Unknown	251	112	9	22	58	23	73	8	4	84	10	25	17	2	0
Barbiturates															
Long-acting	2,342	1,298	333	118	766	928	301	5	32	520	250	218	122	46	3
Short/intermediate-acting	295	132	11	14	88	77	44	2	5	79	20	45	9	5	0
Unknown type	77	22	1	4	9	4	16	1	0	16	1	3	0	0	0
Category Total:	148,226	63,729	11,594	10,920	36,215	25,706	34,550	410	2,150	41,355	12,083	17,682	8,188	940	24
Serums, toxoids, vaccines															
Serum, toxoid, vaccine	2,552	2,319	456	365	1,105	1,738	7	4	557	747	192	413	109	4	0
Category Total:	2,552	2,319	456	365	1,105	1,738	7	4	557	747	192	413	109	4	0
Stimulants and street drugs															
Amphetamine	11,681	7,931	2,714	2,808	2,025	5,315	2,149	52	335	3,990	1,914	1,245	1,098	95	8
Amyl/butyl nitrite	63	49	3	3	33	25	21	1	0	29	2	8	13	0	0
Caffeine	5,448	4,183	1,176	1,328	1,404	2,104	1,573	20	446	1,561	616	922	544	16	1
Cocaine	7,634	2,748	97	346	1,940	281	2,323	61	19	2,351	488	301	649	140	20
Ephedrine	526	396	224	42	109	284	82	4	18	133	105	53	32	0	0
GHB and analog/precursor	518	340	31	32	232	89	146	72	11	231	35	49	85	40	0
Hallucinogenic amphetamine	1,785	1,020	17	399	475	98	824	69	15	750	69	189	253	21	5
Heroin	1,688	849	14	110	602	91	699	40	10	721	82	118	221	89	9
LSD	318	192	3	98	67	28	147	5	4	143	6	37	71	5	0
Marijuana	4,050	985	111	363	381	257	631	40	42	599	144	160	145	6	0
Mescaline/peyote	116	103	20	21	42	64	31	4	3	32	3	19	15	0	0
Methamphetamine	1,119	671	71	95	394	212	405	27	14	486	79	92	151	23	4
Methylphenidate	8,994	6,355	1,522	3,741	939	5,134	995	14	174	2,051	1,638	897	531	24	0
Phencyclidine	662	305	14	53	200	60	215	6	5	252	25	58	113	13	2
Phenylpropanolamine look-alike drug	3	3	2	0	1	2	0	0	1	1	1	0	1	0	0
Other hallucinogen	33	24	0	12	10	6	17	1	0	19	0	5	9	3	0
Other stimulant	70	36	7	10	15	16	7	0	13	17	7	3	6	0	0
Other stimulant/street drug	22	15	4	5	6	5	8	0	2	8	3	2	5	0	0

Unknown hallucinogen	11	9	0	3	5	1	5	2	0	6	0	0	4	1	0
Unknown stimulant/street drug	191	124	8	49	46	17	82	19	2	95	13	20	29	4	0
Diet aids															
Phenylpropanolamine	67	47	17	7	18	33	6	0	8	17	12	6	6	0	0
Phenylpropanolamine and caffeine	15	10	2	4	4	5	3	0	2	5	2	1	3	0	0
Other: OTC	303	243	130	39	65	156	42	0	44	100	56	36	23	1	0
Other: Rx	114	83	45	7	23	61	8	0	11	38	23	11	9	0	0
Unknown	114	71	33	14	22	46	17	0	7	30	16	11	6	0	0
Category Total:	45,545	26,792	6,265	9,589	9,058	14,390	10,436	437	1,186	13,665	5,339	4,243	4,022	481	49
Topical preparations															
Acne preparation	3,336	3,197	1,915	551	567	2,983	54	4	150	221	596	335	34	1	0
Boric acid/borate	83	80	38	4	29	74	3	0	2	11	17	9	0	0	0
Calamine	3,691	3,595	2,785	138	595	3,560	16	3	15	162	541	165	10	0	0
Camphor	9,819	9,639	7,797	459	1,135	9,460	113	10	48	925	2,828	1,208	94	14	0
Camphor/methyl salicylate	2,256	2,224	1,969	86	142	2,187	16	2	17	205	763	279	17	0	0
Diaper care/rash product	44,415	43,860	42,058	632	893	43,784	31	8	31	545	5,434	767	21	1	0
Hexachlorophene antiseptic	54	52	20	10	17	46	3	1	2	10	12	11	0	0	0
Hydrogen peroxide	14,077	13,807	5,496	1,154	5,998	13,488	214	44	50	617	1,622	1,707	47	3	0
Iodine or iodide antiseptic	1,300	1,182	384	203	486	1,006	120	6	42	255	251	204	43	0	0
Mercury antiseptic	122	113	85	10	13	106	3	0	3	13	30	5	0	0	0
Methyl salicylate	9,005	8,901	6,917	616	1,091	8,718	65	35	76	745	1,933	1,491	75	2	0
Minoxidil	131	126	55	5	57	112	4	1	9	30	34	26	6	0	0
Podophyllin	40	39	7	3	19	29	3	0	7	12	7	11	1	0	0
Silver nitrate	175	151	16	76	38	126	8	3	14	34	10	40	7	1	0
Topical steroid	9,849	9,588	7,157	502	1,541	9,441	33	8	102	169	1,249	297	21	0	0
Topical steroid with antibiotic	1,431	1,388	787	129	384	1,342	12	0	34	82	187	223	10	3	0
Wart preparation	1,647	1,623	1,046	178	306	1,544	21	3	54	182	350	279	37	1	0
Other liniment	3,035	2,977	1,857	163	781	2,671	20	5	278	193	469	543	36	2	0
Other topical antiseptic	7,027	6,882	5,086	938	698	6,485	213	129	44	387	1,632	623	46	1	0
Category Total:	111,493	109,424	85,475	5,857	14,790	107,162	952	262	978	4,798	17,965	8,223	505	29	0
Unknown drug															
Unknown drug	19,117	14,632	4,954	2,799	5,156	7,569	4,164	833	920	8,620	2,684	1,718	1,570	486	9
Category Total:	19,117	14,632	4,954	2,799	5,156	7,569	4,164	833	920	8,620	2,684	1,718	1,570	486	9
Veterinary drugs															
Veterinary drug	2,924	2,765	994	210	1,272	2,649	49	15	50	364	530	442	79	8	0
Category Total:	2,924	2,765	994	210	1,272	2,649	49	15	50	364	530	442	79	8	0
Vitamins															
Other	995	801	457	67	215	602	59	3	132	137	135	119	19	2	1
Unknown	843	629	478	66	58	575	36	2	14	73	164	34	3	0	0
Multiple vitamin liquids: adult formulations															
No iron, no fluoride	192	123	89	11	18	113	5	0	5	11	13	7	3	0	0
With iron, no fluoride	143	118	65	13	37	108	3	0	7	16	16	6	1	0	0
With iron, with fluoride	8	8	4	1	3	6	0	0	2	0	1	1	0	0	0
Multiple vitamin liquids: pediatric formulations															
No iron, no fluoride	314	291	269	16	5	283	2	0	6	10	43	12	1	0	0
No iron, with fluoride	366	333	328	4	0	333	0	0	0	13	53	7	0	0	0
With iron, no fluoride	568	528	506	15	1	520	1	0	7	47	106	25	0	0	0
With iron, with fluoride	24	21	21	0	0	21	0	0	0	6	8	1	0	0	0
Multiple vitamin tablets: adult formulations															
No iron, no fluoride	3,830	2,836	1,867	298	549	2,467	203	2	156	368	567	164	59	3	0
No iron, with fluoride	48	36	29	3	3	32	2	1	1	5	7	1	1	0	0
With iron carbonyl (no fluoride)	100	82	61	7	12	81	1	0	0	4	24	5	0	0	0
With iron, no fluoride	7,373	6,083	4,566	353	969	5,743	244	3	88	592	1,419	195	20	2	0
With iron, with fluoride	53	41	30	3	6	36	3	0	2	6	8	4	0	0	0
Multiple vitamin tablets: pediatric formulations															
No iron, no fluoride	20,668	20,154	15,541	4,451	98	19,344	767	5	25	668	3,718	306	4	0	0
No iron, with fluoride	1,077	1,000	959	38	3	992	7	0	0	21	146	8	1	0	0
With iron carbonyl (no fluoride)	34	31	29	2	0	31	0	0	0	4	10	2	0	0	0
With iron, no fluoride	15,224	14,669	13,185	1,358	92	14,417	194	18	28	1,069	3,373	534	14	0	0
With iron, with fluoride	129	122	115	5	1	122	0	0	0	7	22	3	0	0	0
Multiple vitamins, unspecified adult formulations															
No iron, no fluoride	56	41	26	6	8	35	4	1	1	5	9	1	0	0	0
No iron, with fluoride	7	6	5	1	0	6	0	0	0	0	0	0	0	0	0

(*Continued*)

Table 22B. Demographic profile of SINGLE-SUBSTANCE Pharmaceuticals exposure cases by generic category

Major category / Minor category / Generic substance	No. of case mentions	No. of single exposures	Age			Reason				Treated in health-care facility	Outcome				
			<6	6–19	>19	Unintentional	Intentional	Other	Advense reaction		None	Minor	Moderate	Major	Death
With iron, no fluoride	2,070	1,597	1,187	127	234	1,521	61	1	13	159	386	51	3	0	0
With iron, with fluoride	7	6	5	0	1	6	0	0	0	0	2	0	0	0	0
Multiple vitamins, unspecified pediatric formulations															
No iron, no fluoride	342	329	259	68	1	320	8	0	1	15	52	5	0	0	0
No iron, with fluoride	31	30	29	1	0	29	0	0	1	0	2	0	0	0	0
With iron, no fluoride	226	210	191	18	1	207	2	1	0	13	38	5	0	0	0
With iron, with fluoride	19	19	17	2	0	18	1	0	0	1	1	2	0	0	0
Other vitamins															
Niacin (B_3)	2,713	2,303	540	369	1,164	1,046	336	5	899	420	122	699	98	4	0
Other B complex vitamins	3,525	2,546	2,070	97	296	2,409	58	1	73	147	428	51	14	3	0
Pyridoxine (B_6)	332	212	164	15	29	191	11	1	9	24	33	11	4	0	0
Vitamin A	661	550	430	42	58	514	17	1	17	36	91	13	6	0	0
Vitamin C	2,084	1,531	1,201	168	120	1,429	73	1	22	71	236	77	2	2	0
Vitamin D	787	596	169	24	336	541	10	0	45	89	109	31	13	1	0
Vitamin E	1,072	740	606	44	71	697	17	1	21	32	154	20	1	0	0
Category Total:	65,921	58,622	45,498	7,693	4,389	54,795	2,125	47	1,575	4,069	11,496	2,400	267	17	1
Waterproofer/sealants															
Waterproofers/sealants: aerosols	59	57	14	14	26	51	4	0	2	31	5	18	15	1	0
Waterproofers/sealants: solids	7	7	3	0	3	6	1	0	0	4	1	2	1	0	0
Categ ory Total:	66	64	17	14	29	57	5	0	2	35	6	20	16	1	0
Total pharmaceuticals	1,482,964	1,015,101	551,212	139,906	276,470	798,693	170,165	4,023	35,850	268,433	220,431	106,684	48,879	6,708	407
% of single exposures		100.0%	54.3%	13.8%	27.2%	78.7%	16.8%	0.4%	3.5%	26.4%	21.7%	10.5%	4.8%	0.7%	0.0%
Total–nonpharmaceuticals+pharmaceuticals	2,837,152	2,248,871	1,234,137	288,564	591,278	1,962,778	206,044	16,444	53,472	445,457	421,281	295,835	86,655	9,012	584
% of single exposures		100.0%	54.9%	12.8%	26.3%	87.3%	9.2%	0.7%	2.4%	19.8%	18.7%	13.2%	3.9%	0.4%	0.0%

Column 1 (gray shading) lists the number of exposures to the substance in the total number of cases including multiple exposures (as in previous years) and is sorted in the table under the name of the substance listed first by the regional PC. The first column counts all exposures to that substance.

Column 2 (and the breakdowns by Age, Treatment Site, Reason, and Outcome) report single-substance exposures only, that is, excludes cases with multiple substance exposure. Subtracting column 2 from column 1 provides the number of cases where there were multiple exposures.

This table restricts the breakdown columns to single-substance cases to improve precision (avoid misrepresentation). In past years when multisubstance exposures were included, a relatively innocuous substance was mentioned in a death column when, for example, the death was attributed to an antidepressant, opioid, or cyanide. This subtlety was not always appreciated by the casual user of the information. The restriction of the breakdowns to single-substance exposures should increase precision and reduce misrepresentation of the results in this unique by-substance table. Single-substance cases reflect most (90.6%) of all exposures (Table 8).

Tables 22A and 22B tabulate 2,861,568 substance exposures of which 2,248,871 were single-substance exposures including 1,233,828 (54.9%) nonpharmaceuticals and 1,015,036 (45.1%) pharmaceuticals.

In 16.8% of exposures that involved pharmaceutical substances the reason for exposure was intentional, compared to only 2.9% when the exposure involved a nonpharmaceutical substance. Correspondingly, treatment in a health-care facility was provided in a higher percentage of exposures that involved pharmaceutical substances (26.4%) compared with nonpharmaceutical substances (14.4%). Exposures to pharmaceuticals also had more severe outcomes. Of single-substance-implicated fatal cases, 406 were pharmaceuticals compared with 176 nonpharmaceuticals.

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Disclaimer

The AAPCC (http://www.aapcc.org) maintains the national database of information logged by the country's 61 PCs serving all 50 U.S. states, Puerto Rico, and the District of Columbia. Case records in this database are from self-reported calls: they reflect only information provided when the public or health-care professionals report an actual or potential exposure to a substance (e.g., an ingestion, inhalation, or topical exposure), or request information/educational materials. Exposures do not necessarily represent a poisoning or overdose. The AAPCC is not able to completely verify the accuracy of every report made to member centers. Additional exposures may go unreported to PCs and data referenced from the AAPCC should not be construed to represent the complete incidence of national exposures to any substance(s). Revised March 2007.

Appendix A – acknowledgments

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Poison Centers

We gratefully acknowledge the extensive contributions of each participating PC and the assistance of the many health-care providers who provided comprehensive data to the PCs for inclusion in this database. We especially acknowledge the dedicated efforts of the SPIs who meticulously coded 4,224,157 calls made to U.S. PCs in 2007.

The initial review of reported fatalities and development of the abstracts was the responsibility of the staff of the participating PCs. These PCs and individuals are listed at the beginning of this report.

Many individuals at each center participate in the review of their centers fatality cases. The following toxicology professionals summarized and prepared their center's fatality data for NPDS:

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The Lead and Peer review of the 2007 fatalities was carried out by the 29 individuals listed here. The authors and the AAPCC wish to express our appreciation for their volunteerism, dedication, hard work, and good will in completing this task in a very limited time.

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**These five reviewers further volunteered to read the top ranked 200 abstracts and judged to publish or omit.*

Surveillance

Surveillance was carried out by a team of four medical and clinical toxicologists working across the country who provided daily monitoring of surveillance anomalies throughout 2007: Blaine (Jess) E. Benson, PharmD; Douglas J. Borys, PharmD; Alvin C. Bronstein, MD; and Richard Thomas, PharmD.

Appendix B – abstracts of select cases

Abstracts of the 101 cases selected (see Selection of Abstracts for Publication) from 1,239 human fatalities judged related to a poisoning exposure as reported to U.S. PCs in 2007. A structured format for abstracts was optional in the preparation of the abstracts and was used in the abstracts presented. Abbreviations, units, and normal ranges omitted from the abstracts are given at the end of this appendix.

Abstracts

Case 14. Acute methanol ingestion: undoubtedly responsible.
Scenario/Substances: A 37-y/o male drank hair spray of an unknown type and complained of "snowfield blindness" sometime later.
Physical Exam: Conscious, but became unresponsive. Pupils were dilated and poorly responsive to light, BP 60/30.
Past Medical History: The patient had recently presented to the ED with metabolic acidosis but left against medical advice without a diagnosis.
Laboratory Data: ABG-pH 6.9/pCO_2 26/pO_2 78/HCO_3 5, anion gap 29. Salicylate, acetaminophen, ethylene glycol, isopropanol, and ethanol were BLQ, methanol 435 mg/dL.
Clinical Course: The patient was intubated and administered vasopressors (vasopressin and norepinephrine) at high doses, with BP 88/57. Fomepizole and a bicarbonate infusion were administered. CVVHD was started instead of hemodialysis because of hypotension. Fomepizole was given every 4 h during CVVHD. Over the first 6 h K decreased to 3.4, with resolving metabolic acidosis (anion gap 16), and the methanol declined to 68 mg/dL. The patient remained hypotensive with fixed, dilated pupils, and no corneal or gag reflexes. He developed a gastrointestinal bleed and expired 18 h after arrival. An autopsy was not performed.

Case 19. Acute methanol ingestion: undoubtedly responsible.
Scenario/Substances: A 49-y/o male patient presented to the ED after drinking an unknown amount of denatured alcohol (containing methanol). The patient called the ED earlier complaining of "blindness." Prior to arrival in the ED, he had a seizure and was intubated by EMS.
Physical Exam: Intubated patient, BP 80/60.
Laboratory Data: ABG-pH 6.5/pCO_2 63/pO_2 383, HCO_3 5, Cr 2.5, methanol 453 mg/dL, ethanol BLQ. Head CT found "abnormalities associated with damage to the optic nerve."
Clinical Course: The patient was given fomepizole, folinic acid, and IV bicarbonate. He was transferred to tertiary care facility where he was immediately started on dialysis. Vasopressors were required for hypotension. Five hours later pH 6.9, and dialysis, fomepizole, folic and folinic acids were continued. On Day 2 the patient was still on pressors, methanol 32 mg/dL, pH 7.36, HCO_3 29. Late Day 2, methanol not detected, fomepizole discontinued. Owing to lack of neurologic recovery, life support was withdrawn on Day 4 and the patient expired.
Autopsy Findings: Not available.

Case 38. Acute antifreeze (ethylene glycol) ingestion: undoubtedly responsible.
Scenario/Substances: A 21-y/o male was found unresponsive in his dorm room. A green liquid was noted next to him. He had recent girlfriend issues and was acting "moody" recently. The patient was seen at 0200 and was noted to be "intoxicated," then at 0630 vomiting and at 1430 unresponsive. EMS arrived and intubated the patient.
Physical Exam: BP 180/100, HR 42, respirations described as shallow.
Physical Exam: Ventilated, unresponsive patient. Pupils midrange and sluggish, abrasion over right maxilla and petechiae noted around the eyes. Eyes deviated more to left and conjunctival erythema noted.
Laboratory Data: ABG-pH 6.8, HCO_3 6, anion gap 35, osmolar gap 72, Cr 2.2, UA moderate crystals, acetaminophen and salicylates BLQ, ethanol 10.5 mg/dL, ethylene glycol 174 mg/dL, methanol and isopropyl BLQ, ECG rate 93, QRS 97 ms, QTc 450 ms, ST depression in inferior leads.
Clinical Course: Hemodialysis was initiated. CXR and head CT were unremarkable. Seizures occurred in the ICU, treated with lorazepam. Follow-up ethylene glycol during the day was 134 mg/dL and the next day 48.4 mg/dL. Fomepizole was initiated prior to dialysis. A repeat CT head revealed no shift but minimal edema. His pupils remained fixed and dilated and was declared brain dead on Day 2, comfort measures were instituted, and he expired. Autopsy was not preformed.

Case 65. Unknown chronicity antifreeze (ethylene glycol) by an unknown route: undoubtedly responsible.
Scenario/Substances: An 18-y/o male seen the night prior to admission was diagnosed with pharyngitis and prescribed amoxicillin/clavulantate potassium. The next day he presented hyperventilating with bizarre effect and was intubated. A suicide note was later found stating he had ingested ethylene glycol.
Physical Examination: BP 87/25, HR 120.
Laboratory Data: ABG-pH 6.76/pCO_2 23.4/pO_2 579. HCO_3 3.4. K 8 (nonhemolyzed), Cr 2.8, ammonia 500, glu 223, calculated osmolar gap 60, and negative urine drug screen. Ethylene glycol 84 mg/dL.
Clinical Course: Acid–base status did not respond to bicarbonate therapy. Fomepizole was initiated, but the patient expired before hemodialysis could be started.
Autopsy Findings: Cause of Death: ethylene glycol ingestion. Postmortem urine ethylene glycol level 2.44 mg/L. Premortem blood levels, drawn at various times, ranged from 3.4 mg/L to 13.4 mg/L.

Case 68. Acute oxalic acid ingestion: undoubtedly responsible.
Scenario/Substances: A 21-y/o male was found down by a family member who stated the patient was awake and alert ~11 h earlier. An open container of gem stone cleaner/polish containing oxalic acid was found near the patient. EMS found the patient unconscious and asystolic, with emesis containing a white material. He received CPR, intubation, epinephrine × 3, atropine, sodium bicarbonate, and midazolam and achieved a HR of 40.
Past Medical History: Drug abuse, depression.
Physical Exam: Hypotension, signs of gastrointestinal bleeding, and cerebral anoxia.
Laboratory Data: ABG-pH 7.17, K 4.7, glucose 129, troponin 0.29, CK 264, CK-MB 10.2 ng/mL, AST 118, ALT 115,

acetaminophen and salicylates were BLQ, urine screen positive only for THC.
Clinical Course: In the ED the patient became pulseless, received epinephrine, atropine, sodium bicarbonate, succinylcholine, and dopamine infusion. He was placed on a ventilator and given activated charcoal. BP was 130/70 and admitted to ICU, with hypothermia and suspicion of severe anoxic brain injury. After consultation with family members, the patient was placed on comfort measures and expired the following day.
Autopsy Findings: Death from acute oxalic intoxication, manner of death was suicide. Urine oxalate 17.5 mg/L, urine positive for THC, blood ethanol was BLQ, midazolam 0.03 mg/L.

Case 73. Acute cyanide ingestion: undoubtedly responsible.
Scenario/Substances: A 35-y/o female intentionally ingested a cyanide-containing jewelry cleaner purchased in an Asian market.
Physical Exam: Unresponsive, pupils nonreactive, BP 40/20, HR 30–60 beats/min. Hyperemia of oral mucosa.
Clinical Course: The patient suffered brady-asystolic cardiopulmonary arrest and was intubated and ventilated. Dopamine infusion was started with CPR. Resuscitation efforts were unsuccessful and she expired.
Autopsy Findings: Blood cyanide 7.30 mg/L. Death ruled suicide secondary to ingestion of cyanide.

Case 74. Acute hydrofluoric acid eye and skin exposure: undoubtedly responsible.
Scenario/Substances: A 37-y/o male was splashed with 100% hydrofluoric acid gel at work. The gel landed on his face, hands, and eyes.
Physical Exam: The patient was alert and oriented. Skin of his nose, cheeks, mouth, chin, and right eyelid erythema were dark and ashy. Gel had dried and hardened on his fingers and hands, BP 164/106, HR 141, RR 20.
Laboratory Data: All the patient's blood samples hemolyzed, therefore no labs were obtained.
Clinical Course: The patient arrived at the ED ~1 h postexposure and was decontaminated with calcium gluconate wash to face and eyes. His hands were decontaminated with simethicone drops. Calcium gluconate was given IV and applied as gel to burn areas on skin. The patient received bronchodilators for breathing difficulty and developed diffuse intravascular coagulation treated with fresh frozen plasma prior to transfer to a tertiary HCF. At the second HCF, the patient had cardiac arrest 40 min after arrival and could not be resuscitated. The patient expired ~3 h after exposure.
Autopsy Findings: The cause of death was cardiac arrest as a result of chemical hydrogen fluoride inhalation and chemical hydrogen fluoride burns to the skin and face.

Case 80. Acute cocaine ingestion and inhalation: undoubtedly responsible.
Scenario/Substances: A 41-y/o female collapsed minutes after drinking jewelry cleaner mixed with water. Her son heard her call out from the bathroom that it was time for her to die.
Past Medical History: Depression related to compulsive gambling and debts.
Laboratory Data: Na 144, K 5.8, HCO_3 13, glu 400, Ca 8.2, WBC 12.2, AST 334, Hgb normal, troponin 0.07, and acidotic.
Clinical Course: Arrived in ED apneic, pulseless, in bradya-systolic arrest with CPR ongoing. Intubated, central venous catheter placed, transcutaneous and transvenous pacing attempted. Given epinephrine, bicarbonate, atropine, calcium, and insulin. No response to resuscitation efforts and she was pronounced dead in ED.
Autopsy Findings: Pulmonary congestion and edema, hyperemic gastric and duodenal mucosa, gallstones. Blood cyanide 290 mg/L. Remainder of toxicological screen negative except for urine ethanol of 0.01 g/dL. Death ruled suicide secondary to cyanide ingestion.

Case 88. Acute acrolein inhalation and eye and skin exposure: undoubtedly responsible.
Scenario/Substances: A 50-y/o male was spraying for algae with acrolein. He was attempting to tighten a pressure line connection when he was sprayed in the face, resulting in a dermal, ocular, and inhalational exposure. It is unknown if he was decontaminated at the scene.
Past Medical History: Hyperlipidemia.
Physical Exam: Upon arrival to the ED the patient was coughing and dyspneic with chest pain, dermal irritation and redness, edema and redness to the eyes, and facial skin pain. He was tachycardic with normal BP.
Laboratory Data: Four hours postexposure ABG-pH 7.37/pCO_2 44/pO_2 66/HCO_3 21, CXR unremarkable.
Clinical Course: The patient was decontaminated in the ED, with a shower and irrigation of both eyes. Bilateral wheezing with desaturation to 85% on room air was observed and albuterol and O_2 were given. Respiratory status worsened with continued wheezing. Levalbuteral and methylprednisolone were given and repeat CXR showed signs of pulmonary edema. At 4 h he developed yellow sputum, with evidence of ARDS with hypotension. At 24 h, repeat ABG-pH 7.1/pCO_2 65 indicative of respiratory failure. Renal insufficiency was noted with K 6.2, Cr 1.4, which progressed to renal failure requiring dialysis 48 h postexposure. Pressor support was needed and rhabdomyolysis with CK 573, 680 developed. The patient expired on Day 6 from respiratory failure and septic shock. Autopsy was not done.

Case 90. Acute sulfur skin exposure: undoubtedly responsible.
Scenario/Substances: A 54-y/o male was exposed to molten sulfur from an explosion and fire when he cut into an industrial pipeline. He was decontaminated at the scene, intubated, and then transported to the ED.
Physical Exam: BP 132/85, HR 80, O_2 sat 97% on ventilator with 100% O_2. The patient suffered thermal airway injury and 68% body surface area burns with 48% third-degree full thickness burns on the abdomen, trunk, groin, and thighs.

Clinical Course: In the ED he was again decontaminated with copious amounts of water. After admission to the Burn ICU, fasciotomies of chest, abdomen, thighs, and hand were performed along with eschar removal for compartment syndrome. During the night patient suffered a cardiopulmonary arrest and expired.
Autopsy Findings: Cause of death was thermal injury.

Case 99. Acute drain opener (alkali) ingestion: undoubtedly responsible.
Scenario/Substances: A 65-y/o male was brought to the ED after intentionally ingesting about one-half cup of an alkaline corrosive drain cleaner with a pH of 13 on the material safety data sheet. The patient reported vomiting at least once prior to ED arrival.
Physical Exam: Significant burns in and around the mouth were observed.
Laboratory Data: K 6.1; HCO3 17, Cr 1.4. Acetaminophen and salicylates were BLQ. An X-ray visualized edema of the epiglottis and proximal trachea.
Clinical Course: Six hours after presenting to the ED, the patient was taken to the OR where a tracheotomy was performed and the surgeon noted severe epiglottitis and severe laryngeal edema. In the ICU the patient had abdominal pain and an abdominal CT scan showed air in the mediastinum, whereas no air was noted in the peritoneum. Over the course of the next 31 hospital days, the patient had surgical removal of his esophagus, stomach, duodenum, and part of the jejunum, and bilateral chest tubes placed. He had persistent metabolic acidosis and nosocomial infections. GI bleeding required another surgery, parenteral feedings, and antibiotics prior to his death on Day 56.
Autopsy Findings: Not performed.

Case 101. Acute wheel cleaner (hydrofluoric acid) ingestion: undoubtedly responsible.
Scenario/Ingestants: A 72-y/o female ingested one to two swallows of a purple liquid from a Gatorade® bottle while working in the garden. She was immediately suspicious, tried to make herself vomit at the time and she thought she would be OK. The patient's husband had brought the Gatorade® bottle from work containing a wheel cleaner consisting of sulfuric acid and hydrofluoric acid.
Past Medical History: Hypertension, medications included amlodipine 5 mg, Diovan Hct 320 mg, and Nexium 40 mg.
Laboratory Data:

Na 140	Cl 107		Glu 153
K 4.1	HCO_3 21	Cr 1.5	

Calcium 4.4; magnesium 1.0 mEq/L; phosphorus 0.9 mg/dL, Hct 31.9%; AST 175, ALT 216, Alk phos 148, total bilirubin 1.7, albumin 3.3 g/dL.
Clinical Course: She was brought into the ED by ambulance about 6 h after the ingestion with dyspnea, hematemesis, hypocalcemia, and hypotension. The patient had ventricular fibrillation ~8 h after ingestion and was resuscitated, intubated, received calcium chloride for calcium correction, and sedated with propofol. The QRS widened and dopamine, amiodarone × 1, calcium gluconate × 1, and norepinephrine were given. Two hours later, wide complex bradycardia was seen which progressed to ventricular fibrillation and asystole that was fatal ~5 h after presentation to the ED.
Autopsy Findings: Severe acute esophagogastritis consistent with strong acid and fluoride ingestion; shock lungs and congestion of the liver, spleen, and kidneys; mild-to-moderate nephrosclerosis, bilateral. Urine fluoride level 120 mg/L (normal 0.2–3.2 mg/L), fluoride (Cr-corrected) 240 mg/g Cr, gastric fluid 32 mg/L. Cause of death was fluoride toxicity owing to ingestion of hydrofluoric acid in automotive wheel cleaner.

Case 103. Acute ammonium bifluoride ingestion: probably responsible.
Scenario/Substances: A 21-month-old female accidentally ingested a mouthful of toilet bowl cleaner later found to contain ammonium bifluoride.
Physical Exam: Altered mental status, BP 64/33, HR 124.
Laboratory Data: pH 7.07, no other lab values available. No urine toxicology screen was obtained.
Clinical Course: Brought to ED by EMS, the child had vomited, acidosis was treated with sodium bicarbonate, and presumed hypocalcemia with IV calcium. The patient had a fatal cardiac arrest 1.5 h after presentation to the ED and could not be resuscitated.
Autopsy Findings: Mucosal edema to the esophagus and stomach and a small amount of blood in the stomach.

Case 114. Acute drain opener (sodium hydroxide) ingestion: undoubtedly responsible.
Scenario/Ingestants: A 40-y/o male ingested an unknown quantity of drain cleaner and methanol at home. Also found were empty bottles of acetaminophen, diphenhydramine, ibuprofen, and a cold and flu preparation.
Past Medical History: Severe depression, worsening over last 3 months.
Physical Exam: Male with respiratory distress and strider. BP 120/70, HR 110, O_2 sat 97% on ventilator. Pupils were dilated, oral mucosa was black with necrotic discoloration, and edema.
Laboratory Data: ABG-pH 7.22/pCO_2 31/pO_2 364. HCO_3 12, methanol 85 mg/dL. Acetaminophen, salicylate, ethanol, isopropanol, and ethylene glycol were all BLQ. Urine drug screen was positive for benzodiazepines.
Clinical Course: The patient was intubated and subsequently had a tracheotomy placed secondary to airway edema. IV fluids and methylprednisolone were given as well as fomepizole loading and maintenance dosages. Hemodialysis was run for 3 h. Endoscopy showed Grade II and III burns of entire esophagus with caustic gastritis of >95% of the stomach. The patient's condition rapidly declined with multisystem organ failure, ARDS, disseminated intravascular clotting, and

shock. The patient's family requested comfort measures only and the patient expired ~18 h after presentation. Autopsy not available.

Case 117. Acute hypochlorite inhalation: undoubtedly responsible.
Scenario/Substances: A 52-y/o female was one of five victims who became symptomatic after a 10–15 min exposure to fumes from undiluted cleaning solution poured down a drain in a nursing home laundry room. The product was an undiluted sodium hypochlorite solution with a pH of 11.2. The solution was left open in the laundry room and also poured down the drain. The patient developed wheezing and lost consciousness at the scene after having respiratory difficulty. EMS found in cardiorespiratory arrest and began resuscitation.
Past Medical History: Asthma, alcohol abuse, and obsessive compulsive disorder.
Physical Examination: The patient arrived in the ED in ventricular fibrillation and resuscitation efforts continued. After a successful resuscitation, BP 97/62, HR 116, RR 12 by ventilator, *T* 36.2°C.
Laboratory Data: WBC 16,900, CT head with extensive diffuse brain swelling and loss of gray–white matter possibly due to hypoxia. CXR showed bilateral patchy infiltrates.
Clinical Course: Bilateral chest tubes were placed for suspicion of a pneumothorax and the patient was admitted to the ICU. Hypotension initially required vasopressors. Neurologic function did not improve. The patient was determined to be brain dead on Day 4 and expired when supportive care was withdrawn.
Autopsy Findings: Postmortem examination revealed histological evidence of acute inflammation in the lungs. Postmortem blood: norsertraline 0.62 mcg/mL, sertraline 0.066 mg/mL, heart blood clomipramine/desmethylclomiparime/total 277/897/1,174 ng/mL, morphine 0.48 mcg/mL.

Case 139. Acute flower preservative parenteral: probably responsible.
Scenario/Substances: A 28-y/o female dissolved fresh flower preservative in water and injected the solution into her central line. She was found unresponsive at home but was awake by the time of admission.
Past Medical History: Munchausen's syndrome and bipolar disorder. She also had Hodgkin's disease, in remission.
Physical Exam: She was initially awake, oriented, and talking. BP 100 (systolic), HR 110.
Laboratory Data: ABG-pH 7.43/pCO_2 20, HCO_3 11, lactate 9, anion gap 15. Repeat HCO_3 14, lactate 7, anion gap 8.
Clinical Course: The patient's condition deteriorated and she was intubated and placed on a bicarbonate infusion along with vasopressin and epinephrine. The patient expired on Day 2.
Autopsy Findings: Massive edema (weight increase ~23 kg), facial edema with a protruding tongue, and edema of the hands. The lungs were congested, filled with pigmented histiocytes. Areas of the spleen showed congestion with red cells. The liver was markedly congested. There were no drugs of abuse noted. Cause of death was injection of floral preservative into patient's intravenous line, leading to lactic acid acidosis and diffuse intravascular coagulopathy. Manner of death was suicide.

Case 155. Acute carbon monoxide inhalation: undoubtedly responsible.
Scenario/Substances: An 11-y/o girl was found apneic and asystolic at the scene of a house fire and required 40–45 min of CPR before a spontaneous perfusing rhythm returned. Prior to transport to the ED, the patient was intubated, noted to have fixed and dilated pupils, and to be unresponsive to stimulation of any kind.
Physical Exam: She was unresponsive to noise, visual, or noxious stimuli, pupils fixed and dilated, no apparent burn injuries, *T* 34.5°C.
Laboratory Data: ABG-pH 6.95/pCO_2 37/pO_2 402. Arterial carboxyhemoglobin 20%, Na 137, K 5.5, BUN 18, Cr 0.8, troponin 3.2.
Clinical Course: The patient was transferred by fixed wing aircraft to a trauma center, arrived with fixed and dilated pupils and then transferred to another HCF for hyperbaric oxygen therapy. After HBO therapy and transfer to a pediatric ICU at the fourth HCF, the patient showed persistent signs of anoxic brain injury including diabetes insipidus requiring continuous infusion vasopressin. The patient's family requested comfort measures and she expired.
Autopsy Findings: Cause of death was anoxic brain injury due to carbon monoxide and products of combustion. Death was classified as an accident.

Case 156. Acute carbon monoxide inhalation: undoubtedly responsible.
Scenario/Substances: An 18-y/o male was found unresponsive in a car with the engine running in his garage. He was noted by EMS to be in PEA and later was asystolic.
Physical Exam: On ED arrival there was no evidence of trauma, pupils were initially fixed and dilated, muscle tone was flaccid without clonus, had no response to pain, systolic BP 60 and respirations agonal, and he was intubated.
Laboratory Data: ABG-pH 6.74/pCO_2 42/pO_2 248, Hgb 15.9, platelets 185.

Na 145	Cl 105	BUN 9	Glu 91
K 4.2	HCO_3 6	Cr 1.8	

Acetaminophen and salicylate were BLQ. Carboxyhemoglobin 66.7%. EKG: Diffuse ST–T wave inversions and ST depression, consistent with global ischemia. Head CT showed severe cerebral edema with loss of gray–white interface and pseudo subarachnoid findings.
Clinical Course: Initial resuscitation included 3–5 L normal saline, norepinephrine, and 250 mEq sodium bicarbonate, with restoration of BP to 130/76 and HR of 140. ABG-pH 7.18/pCO_2 32. He underwent hyperbaric oxygen therapy for

90 min (3 atm for 30 min and then 2.5 atm for 60 min). After treatment, the patient had no evidence of brain stem or higher cortical function with a GCS 3 and pupils 6 mm and fixed. An initial brain flow study demonstrated some level of flow and no flow on repeat scan 24 h later. The patient was diagnosed brain dead and his organs were harvested for transplant. Autopsy was not performed.

Case 165. Acute carbon monoxide inhalation: undoubtedly responsible.
Scenario/Substances: A 34-y/o female was found dead in the cabin cruiser of a leisure boat anchored at a marina. Air sampling inside the cabin revealed carbon monoxide 30 p.p.m. Two other victims were also found dead. A faulty generator was suspected.
Autopsy Findings: Cause of death: Carbon Monoxide. Postmortem carboxyhemoglobin 69%. Heart blood contained 0.04% ethanol and benzoylecgonine 1.4 mg/L.

Case 172. Acute carbon monoxide inhalation: undoubtedly responsible.
Scenario/Substances: A 39-y/o female was found unresponsive, with a vehicle running in a closed garage. She was found in PEA, intubated and resuscitated following ACLS protocols, and started on dopamine by EMS.
Past Medical History: Depression.
Physical Exam: Unresponsive, pupils fixed and dilated.
Laboratory Data: ABG-pH 7.18/pCO_2 26, carboxyhemoglobin 15%.
Clinical Course: Head CT after arrival in ED showed diffuse cerebral edema with tonsillar herniation. Dopamine and vasopressin were given for BP support and mannitol for the cerebral edema. She was treated with hyperbaric oxygen without change in her condition. Brain death was formally diagnosed on Day 2.
Autopsy Findings: Cause of death listed as inhalation of combustion products. Findings included diffuse cerebral edema with cerebellar tonsillar herniation and necrosis. Blood carboxyhemoglobin level 15%. Citalopram level 71 ng/mL and desmethyl citalopram 49.4 ng/mL.

Case 174. Acute hydrogen sulfide inhalation: undoubtedly responsible.
Scenario/Substances: A 40-y/o male was one of four landfill workers who died while attempting to replace the pump in a large landfill runoff collection tank. Police reported the four victims likely died well before rescue crews arrived.
Laboratory Data: First responders found readings of hydrogen sulfide of 200 p.p.m. on their gas detection meter. Autopsy findings are not available.

Case 176. Acute carbon monoxide inhalation: undoubtedly responsible.
Scenario/Substances: A 42-y/o female was found dead in the cabin cruiser of a leisure boat anchored at a marina. Air sampling: 30 p.p.m. carbon monoxide inside the cabin. Two other victims were found dead as well. A faulty generator was suspected. See case 165.
Autopsy Findings: Cause of death: Carbon Monoxide. Postmortem carboxyhemoglobin 53%. Heart blood contained 0.14% ethanol and benzylecognine 1.0 mg/L. Cherry red lividity was present.

Case 183. Acute hydrogen sulfide inhalation: undoubtedly responsible.
Scenario/Substances: A 50-y/o male worker on an offshore drilling rig was found down and unresponsive after exposure to hydrogen sulfide gas.
Clinical Course: The patient was transported by air and arrived at the ED with agonal respirations, tachycardia, and hypertension. He was intubated and placed on 100% O_2, bloody pulmonary secretions were noted. The patient was placed on a propofol drip and received hyperbaric oxygen therapy. In the ICU, course lung sounds and yellowish tinged sputum were noted. The patient received three hyperbaric treatments but developed acute renal failure and oliguria, myocardial infarction, and cardiogenic shock. AST was 1,770 and ALT 877. The patient expired on Day 3. No autopsy was performed.

Case 210. Acute hydrocarbons ingestion and aspiration: undoubtedly responsible.
Scenario/Substances: A 2-y/o male was with his father who was working on his car when he apparently ingested mineral spirits. He initially screamed and cried and after initial decontamination with water he began to have seizures and became cyanotic within 10 min. Rescue breathing resulted in the patient coughing and choking. EMS transported the patient to the ED where he arrived in cardiac arrest.
Laboratory data: CXR obtained during the resuscitation showed pulmonary edema.
Clinical Course: Resuscitation was attempted with intubation and ACLS protocols without success. The patient expired 60 min after the witnessed exposure.
Autopsy Findings: Hypoxic ischemic brain injury, early acute lung injury, and an oily–watery fluid in the stomach lumen. Aortic blood contained trace levels of hydrocarbons including decane, uodecane, tetradecane, and hexadecane as well as substituted alkanes and cyclohexanes.

Case 211. Acute fluorochlorocarbon/propellant inhalation: undoubtedly responsible.
Scenario/Substances: An 18-y/o female found unresponsive in her mother's swimming pool. Upon EMS arrival, she was asystolic and a can of fluorocarbon-based duster spray was found next to where she had been sitting by the pool.
Physical Examination: Unresponsive and asystolic.
Clinical Course: She was intubated by EMS and given standard ACLS treatments. In the ED, the patient remained unresponsive and asystolic and expired 20 min after ED arrival.
Autopsy Findings: Severe atherosclerotic stenosis (90–95%) right coronary and first diagonal; moderate atherosclerosis

(40–50%) – LAD. Pulmonary congestion and edema. Blood: dextromethorphan 9.2 (therapeutic 2.0–6.0 ng/mL), trazodone 764 ng/mL (therapeutic 800–1,600 ng/mL), fluoxetine 3,890 ng/mL, norfluoxetine 3,870 ng/mL, liver: trazodone 2,384 ng/mL, dextromethorphan 88.6 ng/g. Lung: 1,1-difluoroethane 0.92 mcg/g. Negative analysis for carbon tetrachloride, chloroform, Freon 11, 12, and 113, perchloroethylene/trichloroethylene.

Case 215. Unknown chronicity toluene inhalation: undoubtedly responsible.
Scenario/Substances: A 28-y/o male was found down outside of his workplace (rubber processing plant) with "soot" on his clothes. He told a bystander that he had been locked in the building for 3 days. Unopened canisters of toluene were found containing a similar residue to that noted covering the patient who previously told a coworker about "getting high" by breathing vapors from a solvent used in the plant.
Physical Exam: (prehospital) Young male, alert and covered with a "carbon-like" material. BP 128/56 P 94, RR 22. Skin: Pale, cool, and dry with delayed capillary refill, pressure sores present on back and buttocks. Peripheral O_2 sat unobtainable at multiple sites. Pupils reactive (4 mm). Clear frothy sputum. Lungs: Clear to auscultation bilaterally. Abdomen: Soft, nondistended, and nontender with positive bowel sounds. He was incontinent at the scene and had seizure-like activity; the patient was partially decontaminated with removal of clothing prior to transport and intubated. On ED admission the patient was not moving extremities. Vital Signs: *T* 31°C by Foley catheter BP 86/57, HR 105, on ventilator.
Laboratory Data: WBC 21.8, Hgb 15.3, Hct 44.6, platelets 198,

Na 137	Cl 105	BUN 50	Glu 93
K 7.3	HCO_3 17	Cr 4.1	

INR 1.32, lactate 3.9, Alk phos 67, AST 4,655, ALT 1,092, CK 181,008, troponin 0.05, calcium 0.75 mEq/L, phosphorus 11.1 mg/dL, Mg 2.9. Urine screen only was positive for benzodiazepines. Urine hippuric acid 14.2 g/L, *o*-cresol 20 mg/L, and *p*- and/or *m*-cresol 50 mg/L. The following day:

Na 134	Cl 102	BUN 69	Glu 149
K 5.2	HCO_3 21	Cr 5.2	

On Day 6, a CXR showed a new left lower lobe consolidation with stable right lung base opacity.
Clinical Course: Seizures were treated in the field with midazolam and fentanyl. Hemodialysis was initiated on Day 2; right gluteal fasciotomy was performed for elevated compartment pressures during which he received 11 U of blood; nosocomial pneumonia and urinary tract infections occurred prior to change in patient status to comfort measures only and death due to multiorgan failure on Day 10.
Autopsy Findings: Cause of death was complications of toluene exposure with rhabdomyolysis, skin ulcers, and acute tubular necrosis. Microscopic examination of the brain did not demonstrate evidence of hypoxic encephalopathy or significant edema.

Case 228. Acute aluminum phosphide inhalation: undoubtedly responsible.
Scenario/Substances: A 2-y/o female was exposed to phostoxin pellets after her mother sprinkled the industrial-strength tablets (55% aluminum phosphide) on the ground. Prior to EMS arrival the patient had vomited. EMS found a lethargic child with an irregular HR of 74–135. She was crying out occasionally as if in pain. The mother and another adult female were also not feeling well. It was believed that the exposure was inhalational.
Physical Exam: Unresponsive with decorticate posturing, without signs of trauma. BP 57/43, HR 40, RR 26, *T* 36°C, O_2 sat 91% with assisted ventilation, GCS 3.
Laboratory Data: ABG-pH 6.61/pCO_2 75/pO_2 30, carboxyhemoglobin BLQ.
Clinical Course: EMS initiated IV fluids, gave naloxone, and assisted ventilation. With assisted ventilation, the patient had normal sinus rhythm. On arrival in the ED the patient was intubated and required CPR. Fluid bolus was administered, urinary catheter placed with no urine output. Cardiac rhythms in ER: ventricular fibrillation, ventricular tachycardia, wide complex bradycardia, and asystole. Resuscitation was unsuccessful and the patient expired.
Autopsy Findings: Cause of death was complications of acute phosphine gas exposure. Postmortem analyses were BLQ for amphetamines, barbiturates, cannabinoids, cocaine, fentanyl, methadone, opiates, phencyclidine, propoxyphene, salicylates, alcohols, stimulants, narcotics, sedatives/hypnotics, antidepressants, analgesics, anesthetics, cardiovascular agents, antihistamines, anticonvulsants, and antipsychotics.
Phosphine was detected in the blood, brain, and liver.

Case 252. Acute methadone ingestion: contributory.
Scenario/Substances: A 2-y/o male was found with an open bottle of methadone 5 mg. Unknown how many doses were missing.
Physical Examination: Vital signs reported as "stable" in the ED.
Clinical Course: Activated charcoal and cathartic were given. The patient was asleep in the ED and discharged in the early morning hours. Later that morning the patient was found at home apneic in asystole, with perioral emesis. EMS transported patient back to ED. He was subsequently transferred to a tertiary care facility where resuscitation efforts were eventually halted. Autopsy was not available.

Case 254. Acute fentanyl patch ingestion: undoubtedly responsible.
Scenario/Substances: A 4-y/o 13.6 kg female was found apneic by her grandparents.
Past Medical History: Not contributory.
Clinical Course: Extensive efforts at resuscitation were unsuccessful.

Autopsy Findings: A fentanyl patch was found in the GI tract. The patient had apparently found and ingested a used fentanyl patch that had been discarded in the trash.
Editor's Note: Package inserts for all transdermal fentanyl products stipulate "fold and flush" for disposal of used patches.

Case 255. Unknown chronicity acetaminophen ingestion: undoubtedly responsible.
Scenario/Substance: A 7-y/o male presented to the ED with nausea, vomiting, and jaundice. Although the patient denied ingestion, additional history discovered that 4 days prior to presentation, the child had been at a friend's house, where they had taken an unknown amount of acetaminophen.
Past Medical History: No known medical problems or family history of disease.
Physical Examination: BP 125/63, HR 121, *T* 36.5 C; RR 24, saturation 100% on room air. Awake, alert, and oriented × 3, with icteric sclera and jaundiced skin.
Laboratory Data:

Na 137	Cl 102	BUN 6	Glu 186
K 4.1	HCO_3 25	Cr < 1.0	

Ca 9.2 mg/dL, Mg 2.2 mg/dL, WBC 7.3, Hgb 13.1, Hct 40.2, platelets 610, acetaminophen 12.6 mcg/mL, ALT 2,083 IU/L, AST 1,923 IU/L, total bilirubin 16.2 mg/dL, direct bilirubin 11.6 mg/dL, Alk phos 448 U/L, amylase 145 U/L, albumin 3.6 g/dL, total protein 6.1 g/dL, prothrombin time 46.7 s, partial thromboplastin time 48.7 s, INR of 4.79.
Clinical Course: The patient was started on 140 mg/kg of IV *N*-acetylcysteine, followed by 70 mg/kg Q4 hours, given IV ondansetron and was transferred to a liver transplant center, missing the second dose of *N*-acetylcysteine due to the transfer. AST and ALT trended downward on Day 2 to 1,700 U/L and 1,900 U/L, whereas the INR increased to 7.0. BUN/Cr increased to 29/0.5 on Day 6. The patient was stable for several days; however, maintaining his INR at a normal level required IV infusions of fresh frozen plasma. On Day 6 the patient received a liver transplant but developed persistent hypotension requiring colloids and vasopressors. The patient became anuric and removal of the transplanted liver was attempted for homeostasis. The patient expired after a prolonged resuscitative effort on Day 7.
Autopsy Findings: An autopsy was performed, but the results were not available.

Case 256. Acute methadone ingestion: undoubtedly responsible.
Scenario/Substances: A 12-y/o female had fever, vomiting, stomachache, and cold-like symptoms for several days. Her parents had been giving her over-the-counter cold medicines, ibuprofen, and oral fluids. Her mother found her unresponsive ~12 h after her last observed dose.
Physical Exam: The patient died on arrival to the ED and in rigor mortis with pooling of blood to the posterior.
Autopsy Findings: Cause of death was determined to be multiple drug toxicity, primarily methadone. A death investigation revealed the mother and stepfather had multiple medications in the home and the patient had self-medicated in an attempt to treat her symptoms. Findings included mild cerebral edema, with evidence of aspiration of gastric contents in the upper airway. Heart blood concentrations: amantadine less than 0.25 mg/kg, doxylamine 0.30 mg/kg, paroxetine less than 0.25 mg/kg, methadone 1.6 mg/kg, quetiapine 13 mg/L. Femoral blood concentrations: methadone 0.81 mg/kg, quetiapine 0.73 mg/L. Liver concentrations: methadone 2.1 mg/kg, quetiapine 5.4 mg/kg.

Case 258. Acute acetaminophen ingestion: probably responsible.
Scenario/Substances: A 15-y/o female had been on a week-long water fast and may have been taking excess amounts of acetaminophen.
Past Medical History: Depression, urinary tract infection (1 day prior) treated with ciprofloxacin, hypokalemia treated with KCl supplements, street drug use including heroin.
Physical Exam: Oriented and awake, anxious, slurred speech, pale, tachypneic and with moderate respiratory distress, tongue noted to be dry and black, carpal–pedal spasm present, BP 115/60, HR 120, *T* 33°C, O_2 sat 100% (room air).
Laboratory Data: ABG-pH 6.84/pCO_2 62/pO_2 151,

Na 138	Cl 105	BUN 6	Glu 57
K 2.6	HCO_3 13	Cr 0.6	

bilirubin 3.5, Hgb 12.6, platelets 97, WBC 14.9 (1 day prior) and 52.3 on admission. Neutrophils 64%, bands 19%, and lymphocytes 14%. Initial acetaminophen 62.7 mg/L, ethanol 11 mg/dL, osmolar gap 37 (including contribution of ethanol), salicylates and acetone BLQ, urine drugs of abuse screen negative.
Clinical Course: The patient was intubated in the ED for respiratory deterioration, placed on vasopressors/inotropic support, and transferred to an HCF with a pediatric ICU where treatment with insulin, bicarbonate, and potassium for possible diabetic ketoacidosis and ceftriaxone for possible sepsis was given. *N*-Acetylcysteine initially given via NG tube was continued IV and fomepizole was given for a possible toxic alcohol ingestion. Based on fulminant hepatic failure with an elevated acetaminophen level, the patient was being prepared for cadaveric transplant until she became hemodynamically unstable, arrested, could not be resuscitated, and she expired on Day 2.
Autopsy Results: Lungs noted to be severely edematous and congested without suppuration; consolidation, hemorrhage or other lesions, pericardial, and pleural and peritoneal effusions were also noted. Cardiac exam was remarkable for focal soft tissue hemorrhage of the fibroadipose connective tissue within the membranous interventricular septum. Liver had diffuse hemorrhagic hepatocyte necrosis with nuclear karyorrhexis of zones 2 and 3 with minimal residual zone 1 hepatocytes. Remaining zone 1 hepatocytes have diffuse microvesicular steatosis and intracellular cholestasis associated with acute neutrophilic inflammatory infiltrates. Pathology findings included 1) fulminant hepatic necrosis, 2) Alzheimer Type II astrocytes in the putamen consistent with hepatic encephalopathy,

and 3) renal intravascular microthrombi consistent with disseminated intravascular coagulation. No pathognomonic characteristics were present for a definitive etiology. Toxicologic analysis of hospital admission blood revealed metformin, strychnine, cyanide, or ibuprofen all BLQ, lidocaine and metabolite present, and trace atropine.

Case 288. Acute methadone ingestion: undoubtedly responsible.
Scenario/Substances: A 21-y/o male reportedly ingested 140 mg of methadone tablets and an unknown amount of ethanol.
Past Medical History: Polysubstance abuse and alcoholism.
Physical Exam: Lethargic male, vital signs not provided.
Laboratory Data: ABG-pH 7.03/pCO_2 72/pO_2 92,

Na 159	Cl 105 HCO_3 29	BUN 17 Cr 1.3	Glu 344

ethanol 287 mg/dL, urine screen positive for methadone.
Clinical Course: Ninety minutes after arrival in ED, the patient had an asystolic arrest and was resuscitated with ACLS protocols plus naloxone, Mg, and Ca but expired after a second, fatal asystolic arrest <24 h later.
Autopsy Findings: Cause of death was intentional ingestion of methadone and alcohol with complications of acute methadone and alcohol intoxication. Blood ethanol 60 mg/dL, methadone 0.23 mg/L, and methadone metabolite of <0.1 mg/L.

Case 316. Acute aspirin ingestion: undoubtedly responsible.
Scenario/Substances: A 24-y/o male ingested between 100 and 300 aspirin tablets in a suicide attempt. He was taken to hospital by his mother.
Past Medical History: Previous suicide attempt.
Physical Exam: In the ED, he was sleepy, disoriented to time and place, tachypneic, diaphoretic. BP 124/66, HR 125, RR 27, *T* 37°C, O_2 sat 100% (room air), GCS: M-6, V-5, E-3.
Laboratory Data: ABG-pH 7.466/pCO_2 23.7/pO_2 107.6 (11 h post-ingestion)

Na 144 K 4.1	Cl 108 HCO_3 20	BUN 15 Cr 1.3	Glu 127

Acetaminophen BLQ, salicylate 32.3 mg/mL. Repeated salicylate 61.0 mg/dL ~9 h, 66.5 mg/dL ~11 h and 75.6 mg/dL ~14 h post-ingestion.
Clinical Course: He was started on a sodium bicarbonate infusion and transferred to a tertiary HCF for hemodialysis. There the salicylate level was 123 mg/dL ~22 h, HCO_3 19, BUN 18, Cr 1.5, glu 159, and INR 1.54. Upon arrival in the ICU, the patient was belligerent and agitated and was sedated with IM diazepam and haloperidol. He was intubated and a central line was placed. He had a brief episode of ventricular tachycardia followed by bradycardia with wide complexes; he turned blue and went into asystole. Decreased breath sounds were noted on the left side and the endotracheal tube was pulled back with improvement in breath sounds. CPR and ACLS measures were started but were not successful. Resuscitative measures were stopped with consent of the patient's mother and he was declared dead. Just prior to the arrest Na 148, K 3.7, Cl 105, HCO_3 25, BUN 26, Cr 2.0, glu 156, and salicylate 1,130 μg/mL. During resuscitation pH 7.11, K 8.7, and glu 194 were recorded.
Autopsy Findings: Mild atherosclerosis (left descending and right coronary arteries), mild left ventricular hypertrophy, marked pulmonary edema and congestion, mottled appearance of liver and lungs, and hepatosplenomegaly. Postmortem blood salicylate 677 μg/mL. Cause of death was listed as complications of salicylate poisoning. Manner of death was suicide.

Case 407. Chronic methadone ingestion: probably responsible.
Scenario/Substances: A 35-y/o female was found dead. History available to the coroner was that she had been started on methadone in escalating doses – she was given 30 mg on Day 1, 40 mg on Days 2 and 3, 50 mg on Day 4, and 60 mg on Day 5. She was found dead on the evening of Day 5.
Past Medical History: Addison's disease.
Autopsy Findings: Tunneling of the left anterior descending artery, myxomatous changes of mitral valve. Heart blood methadone was 688 ng/mL.

Case 425. Acute aspirin ingestion: undoubtedly responsible.
Scenario/Substances: A 37-y/o male ingested aspirin (300 × 325 mg + 180 × 81 mg) and 250 tablets containing acetaminophen, aspirin, and caffeine.
Past Medical History: Schizophrenia and personality/developmental disorders.
Physical Exam: Uncooperative and combative, vital signs stable.
Laboratory Data: Initial salicylate was 31 mg/dL, acetaminophen 107 mcg/mL. At ~2 h at the second HCF, salicylate was 48 mg/dL, acetaminophen was 128 mcg/mL, and K 2.9. ABG-pH 7.29/pCO_2 30/HCO_3 16.2. Salicylate continued to rise to 58.7 mg/dL, 72.7 mg/dL, and finally 128 mg/dL.
Clinical Course: Patient was intubated, gastric lavage performed prior to transfer to a second HCF. Sodium bicarbonate IV infusion containing potassium was given and he was started on IV *N*-acetylcysteine. BP 155/84, HR 55. One dose of activated charcoal was given when salicylate levels were increasing. On Day 2, he became diaphoretic, flushed, tachycardic with a HR into the 100s, and hypertensive with a systolic pressure of 140. Potassium replacement was provided, but he expired due to cardiac arrest later that day.
Autopsy Findings: Cause of death was aspirin overdose. Superficial esophageal erosions and pulmonary congestion were present. Blood tests for drugs of abuse, opioids, and toxic alcohols were negative.

Case 428. Acute acetaminophen ingestion: undoubtedly responsible.
Scenario/Substances: A 38-y/o female last seen in normal health 2 days prior was found unresponsive by friends beside two empty acetaminophen bottles. EMS transported her to the ED.

Physical Exam: BP 119/73, HR 113, *T* 36°C, ventilator rate 15. Unresponsive, pupils fixed and dilated, occasional grunting, and purposeless movements.
Laboratory Data: Initial ABG-pH 6.88/pCO_2 18 base excess –29.5.

Na 148	Cl 110	BUN 15	Glu 315
K 2.9	HCO_3 <10	Cr 1.0	

Acetaminophen >400 mcg/mL on arrival, 743 mcg/mL at 24 h, 501 mcg/mL at 36 h, 397 mcg/mL at 42 h, 387 mcg/mL at 49 h, 12 h later 281 mcg/mL at 61 h, and final level the same day was 125 mcg/mL (day of death). AST 914, ALT 835, INR 5.18. On Day 2 AST 7,969, ALT 6,730, bilirubin 3.1, INR 10.7, Cr 1.7. Highest CK 24,034.
Clinical Course: The patient was intubated on arrival and given several vasopressors and IV *N*-acetylcysteine. Head CT was reported as negative. Patient was transferred from initial ED to a liver transplant center. Multiple vasopressors were required to treat hypotension. A heating blanket was used for "hypothermia," low-dose insulin drip for hyperglycemia, bicarbonate drip for acidosis. Patient underwent hemodialysis but suffered a cardiac arrest on Day 2 and died. Autopsy was not preformed.

Case 429. Acute fentanyl ingestion: undoubtedly responsible.
Scenario/Substances: A 38-y/o male found at home by EMS in asystole, with syringes nearby.
Physical Examination: No spontaneous breaths, CPR in progress.
Laboratory Data: pH 7.0, pCO_2 56, HCO_3 15, K 5.2 mEq/L, BUN 22, Cr 2.3, AST 5,262 IU/L, and ALT 5,000 IU/L.
Clinical Course: The patient was intubated and resuscitated for ~1.5 h. Because of a poor response to treatment, the treating physician was concerned about the potential for a toxic alcohol exposure, so fomepizole treatment was initiated. The patient expired in the ED after resuscitation efforts were unsuccessful.
Autopsy Findings: Cause of death acute fentanyl intoxication occurring in an accidental fashion. A postmortem blood fentanyl level: 13.90 mcg/L. No morphine or metabolites of morphine were found in the urine. The drug in the syringes was fentanyl.

Case 512. Acute aspirin ingestion and unknown route: undoubtedly responsible.
Scenario/Substances: A 45-y/o male took 400 tablets of 325 mg aspirin after a confrontation. He was found in his home ~5 h later "cold, blind, and unable to hear." He had a seizure en route to the ED.
Past Medical History: HIV, insulin-dependent diabetes mellitus.
Physical Exam: Combative and confused, afebrile, BP 140/76, HR sinus tachycardia 155, RR 36, O_2 sat 97%.
Laboratory Data: Salicylate 97.8 mg/dL, acetaminophen BLQ, coagulation studies normal, AST 97, ALT 107, glu 300, Cr 1.5.
Clinical Course: In the ED, he became unresponsive and suffered a cardiopulmonary arrest. Resuscitation was unsuccessful and he was pronounced dead within 1 h of arrival.
Autopsy Findings: Hepatosplenomegaly with steatosis, moderate coronary artery disease and cardiomegaly, arteriolar nephrosclerosis, and congestion of the leptomeninges. Blood salicylic acid 847 mg/L, ethanol 0.10 g/dL benzoylecgonine 315 ng/dL. Cause of death was intoxication with aspirin, ethanol, and cocaine; manner of death was suicide.

Case 543. Acute acetaminophen/diphenhydramine ingestion: undoubtedly responsible.
Scenario/Substances: A 48-y/o female ingested 75 g of acetaminophen and 3,750 mg of diphenhydramine from a combination product (acetaminophen 500 mg and diphenhydramine 25 mg) and was brought to the ED by EMS ~4 h after the ingestion.
Past Medical History: Depression and multiple suicide attempts. Patient was discharged from a psychiatric facility the day prior to ingestion.
Physical Exam: Patient was responsive to painful stimuli only. BP 120 systolic, HR 110. Her skin was warm and dry, pupils dilated, and no bowel sounds.
Laboratory Data: Acetaminophen 104 mcg/mL (4 h post-ingestion); AST 19, ALT 17, Cr 0.8, INR 1.04.
Clinical Course: Patient did not receive activated charcoal and was started on standard 21 h NAC IV. End-of-21-h-NAC infusion labs: acetaminophen 181 mcg/mL, AST/ALT normal. She received continuous NAC IV at 6.25 mg/kg/h and IV sodium bicarbonate. EKG showed QRS widening (140 ms). Urine was positive for PCP and barbiturates. At 36-h post-ingestion, a seizure occurred. At 48-h post-ingestion, the patient had persistent anticholinergic signs. Repeat serum acetaminophen was 196 mcg/mL and was transferred to a tertiary HCF. She was intubated and paralyzed upon arrival. Forty-nine hours post-ingestion acetaminophen 256 mcg/mL, AST 182, ALT 220, INR 2.9, lactate 3.4, and Cr 0.9. NAC IV was increased to 12.5 mg/kg/h. Abdominal CT did not show bezoar; activated charcoal was administered and whole bowel irrigation was begun at 1 L/h until the effluent was clear (13 h). No pill fragments were noted. At 72-h post-ingestion, acetaminophen 508 mcg/mL; 3.5 days post-ingestion, acetaminophen 354 mcg/mL, AST 5,071, and ALT 7,608. The patient developed sepsis and was treated with IV antibiotics. Peak AST was 5,943, ALT was 7,608 U/L. Encephalopathy developed and the patient was determined not to be a transplant candidate. On Day 6, the family decided to withdraw care, the patient expired on Day 7. A total dose of 1,662 mg/kg of NAC IV had been administered over 144 h.
Autopsy Findings: Centrilobular necrosis with relative preservation of zone 1 hepatocytes, acute bronchopneumonia, diffuse alveolar damage, and hypoxic–ischemic encephalopathy. Patient died of complications of acetaminophen intoxication and the manner of death was undetermined.

Case 581. Acute aspirin ingestion: undoubtedly responsible.
Scenario/Substances: A 51-y/o female presented to the ED 8 h after ingestion of 80 tablets of regular strength aspirin.
Physical Exam: Awake and alert female, BP 156/93, HR 154, RR 25, *T* 100°F. The patient had decreased bowel sounds, tachypnea, tachycardia and hyperpnoea, and flushed beet red skin.
Laboratory Data: ABG-pH of 7.58/pCO_2 18/pO_2 111.

Na 127	Cl 82		Glu 201
K 2.6	HCO_3 18	Cr 1.47	

Aspirin 64 mg/dL, acetaminophen <10 mcg/mL, ethanol <5 mg/dL, urine pH was 5.5.
Clinical Course: The patient was given several liters of normal saline, oral activated charcoal, and oral KCl 80 mEq. No bicarbonate was given. She was transferred to a tertiary care HCF. Five hours later she was confused and flushed. BP 114/37, HR 136, RR 30, *T* 38.4°C. She was started on a bicarbonate drip. Her aspirin level rose to 91.3 mg/dL. Urine pH 5.5. Six hours after original presentation, HCO_3 was 22, anion gap increased to 18, and urine pH 6.2. Seven hours after presentation, ABG-pH 7.40/pCO_2 44 mmHg/pO_2 207. Ten hours after original presentation, the patient had a seizure and received lorazepam and became hypotensive to 60 (by palpation) and was started on four pressors, intubated and placed on the ventilator. The PT increased to 18.3 s, PTT 41.1 s, and an INR of 1.9. Despite hemodialysis and decreasing salicylate level to 8.6 mg/dL, the patient continued to require extensive hemodynamic support and expired 19 h after original presentation.
Autopsy Findings: A postmortem was performed but the results were not available.

Case 615. Acute acetaminophen ingestion: undoubtedly responsible.
Scenario/Substances A 54-y/o female was presented to the ED following an acetaminophen overdose.
Past Medical History: Chronic renal disease requiring dialysis.
Laboratory Data: Day 1: Acetaminophen 659 mcg/mL, INR 1.48, APTT (activated PTT) >200 s, BUN 34, Cl 86, Cr 5.88, AST 103, Alk phos 124, anion gap 31.1, methanol, isopropanol, and acetone all BLQ. **Day 2:** acetaminophen 111 mcg/mL, activated PTT 42.4, BUN 27, Cl 92, Cr 4.53, AST 103, Ca 3.97.
Clinical Course: *N*-Acetylcysteine was administered for ~16 h IV followed by oral administration. Fresh frozen plasma and vitamin K were given for the coagulation abnormalities. Dialysis was performed as scheduled for the patient's renal failure. On the morning of Day 2, the patient experienced VF and could not be resuscitated.
Autopsy Findings: Antemortem acetaminophen (blood) 740 mcg/mL, (liver) 828 mcg/g.

Case 620. Acute methadone by an unknown route: undoubtedly responsible.
Scenario/Substances: A 55-y/o male was found unresponsive at home. Upon EMS arrival, the patient was asystolic. Naloxone 2 mg was given without effect. CPR per ACLS protocols was employed. The patient was found to have methadone and tramadol pills in his pocket as well as IV track marks on his arms bilaterally. He was transported to the ED where he was pronounced dead. Subsequent history was that the patient was given two white pills by an acquaintance prior to this event.
Past Medical History: Alcoholism, cardiac bypass grafting, and status postmitral valve replacement.
Physical Exam: Not provided.
Laboratory Data: Postmortem only.
Clinical Course: He remained asystolic throughout the resuscitation attempt and transport.
Autopsy Findings: Cause of death was multiple drug intoxication. Manner of death was suicide. Findings: Multiple drug intoxication, coronary artery atherosclerosis (severe), cardiomegaly with left ventricular hypertrophy, severe pulmonary congestion, and edema. Heart blood: methadone 0.81 mg/L, methadone metabolite, 2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP) 0.08 mg/L, tramadol 0.78 mg/L, *N*-desmethyl tramadol-positive (not quantified) sertraline 940 ng/mL, desmethylsertraline 2,090 ng/mL, citalopram/escitalopram-positive (not quantified), diazepam 0.02 mg/L, nordiazepam 0.11 mg/L. Liver: citalopram/escitalopram: positive–positive (not quantified), diazepam 0.08 mg/kg, methadone 6.64 mg/kg, methadone metabolite (EDDP) 0.43 mg/kg, tramadol 1.69 mg/kg, *N*-desmethyl tramadol-positive (not quantified), sertraline 40,000 ng/g, and desmethylsertraline 89,900 ng/g.

Case 623. Unknown chronicity fentanyl patch skin exposure: undoubtedly responsible.
Scenario/Substances: A 55-y/o female was found dead and was taken to the medical examiner. Two fentanyl 75 μg/h patches were found on her body.
Past Medical History: Chronic back pain.
Autopsy Findings: Cause of death determined to be fentanyl toxicity. Postmortem blood showed fentanyl 20 ng/mL and norfentanyl 11 ng/mL.

Case 628. Chronic colchicine parenteral: undoubtedly responsible.
Scenario/Substances: A 56-y/o female received IV colchicine (2 mg) weekly × 6 from licensed practitioners at an alternative medicine clinic as part of a naturopathic treatment protocol for neck pain. Within 1 h after the sixth dose she experienced vomiting and diarrhea. A clinic staff member instructed her to go to the ED.
Past Medical History: Neck pain from fibromyalgia and had received IV colchicine for this for 10 years.
Physical Exam: Dehydrated, lungs with crackles at bases.
Laboratory Data: Initial BUN, Cr, electrolytes, complete blood count, and troponin were unremarkable except for WBC 14.1.
Clinical Course: The patient was admitted for rehydration and observation. Her WBC increased to 18.4, with a 40%

bands and myelocytes, metamyelocytes, and echinocytes. Over the next 72 h her WBC fell to 1.4 and platelets decreased to 74, BUN 38, Cr 2.4, rhabdomyolysis with CK 1,485, lactate 6.9, AST 626, ALT 290, troponin I >50. Her serum colchicine level 3 days after the last injection was 11 ng/mL (therapeutic = 0.2 ng/mL). On Day 3, she was intubated for ARDS and became hypotensive, requiring vasopressors. Later became anuric and increasingly hypoxic, then experienced bradycardia and cardiac arrest, and expired.

Autopsy Findings: Her postmortem colchicine blood level was 32 ng/mL. Follow-up investigation revealed two other deaths from colchicine toxicity in patients treated at the same clinic who received IV colchicine. The FDA and the State Board of Pharmacy issued a recall for all colchicine that had been sold or produced within the last year by the pharmacy that had produced the lot of colchicine used in this case.

Case 632. Acute aspirin ingestion: undoubtedly responsible.

Scenario/Substance: A 56-y/o female presented awake and alert to the ED at an unknown time after reportedly taking 40 aspirin tablets and 20 indomethacin tablets.

Physical Examination: Twelve hours after arrival, she was reported to be restless, diaphoretic, and complaining of shortness of breath. Vital signs 15 h after arrival were HR 102, BP 137/66, RR 17, and *T* 98.7°F.

Laboratory Data: One hour after arrival in the ED, salicylate 49.3, acetaminophen BLQ. ABG-pH 7.4/pCO_2 32/pO_2 81 (room air). Hct 47.9, WBC 12.6,

Na 140	Cl 101	BUN 24	Glu 166
K 4.0	HCO_3 22	Cr 1.3	

Ca, 9.4, anion gap 17, PT 10.8, INR 1.1. Drug screen positive for benzodiazepines.

Clinical Course: On arrival, she received two ampoules of sodium bicarbonate, placed on a bicarbonate drip, and given activated charcoal. Serial salicylate concentrations (hour post-admission) were 49.3 (1), 55.1 (5), 73.2 (7) 112.3 (12), 122.6 (14), and 125.7 (16). Fifteen hours after admission she was noted to be restless and diaphoretic and vomited her activated charcoal. Sixteen hours after arrival, she complained of shortness of breath and was put on oxygen. ABG-pH 7.52/pCO_2 23 mmHg/pO_2 91 mmHg. BP 121/61 mmHg, RR 19, and EKG showed rapid atrial tachycardia at 160. She was intubated and post-intubation ABG-pH 7.18/pCO_2 68 mmHg/pO_2 77 mmHg. Electrolytes drawn at the same time showed an anion gap of 20 up from 11 at 7-h post-admission. Eighteen hours post-admission salicylate level 116 mg/dL and her anion gap had dropped to 14. ABG-pH 7.35/pCO_2 41 mmHg/pO_2 87 mmHg. The patient expired during placement of dialysis catheters. No autopsy was done.

Case 647. Acute-on-chronic acetaminophen/diphenhydramine ingestion: undoubtedly responsible.

Scenario/Substances: A 58-y/o female took acetaminophen/diphenhydramine tablets × 385, alprazolam (0.25 mg × 480), zolpidem (10 mg × 90), risperidone (0.5 mg × 9), and fluvoxamine (100 mg × 134) ~12 h prior to presentation. The patient's husband found the patient unconscious at home. EMS gave naloxone 2 mg without response and activated charcoal 60 g via NG.

Past Medical History: Depression and obsessive–compulsive disorder.

Physical Exam: The patient was comatose on arrival, intubated and unresponsive to painful stimuli. BP 58/30, HR 50s. Pupils were slightly dilated and nonreactive to light.

Laboratory Data:

Na 129	Cl 92	BUN 15
K 3.7	HCO_3 20	Cr 0.7

ABG-pH 7.24/pCO_2 16/pO_2 207/HCO_3 7, AST 39; ALT 21, acetaminophen >200 mcg/mL (~12 h), CK 332, lactate 9.9, ECG sinus bradycardia, QRS 112 ms, QTc 526 ms, left anterior fascicular block, right bundle branch block. Acetaminophen 257 mg/L (unknown time), risperidone 36 ng/mL, diphenhydramine 6.1 mg/L, zolpidem 8.1 mg/L, alprazolam 0.41 mg/L.

Clinical Course: The patient was intubated and given five ampoules of HCO_3 2 L of normal saline and placed on norepinephrine, dopamine, and vasopressin, with BP 63/61 and HR 38. A metabolic acidosis developed and worsened over the next 3 h until the patient expired 7 h after arrival.

Autopsy Findings: Antemortem blood was positive for fluvoxamine, showed elevated levels of risperidone, risperidone metabolite, and diphenhydramine, and potentially fatal levels of acetaminophen, zolpidem, and alprazolam. The cause of death was suicide secondary to acute polysubstance overdose.

Case 656. Acute acetaminophen/hydrocodone ingestion: undoubtedly responsible.

Scenario/Substances: A 59-y/o female presented to the ED after being found unresponsive on her floor. EMS found the patient with agonal respirations and was administered naloxone with positive effect prior to transport. In ED, the patient was lethargic but maintained her airway.

Past Medical History: History of prior drug overdose, anxiety, depression, and chronic back pain. Current medications: risperadol, trazodone, clonazepam, atenolol, ziprasidone, sertraline, and hydrocodone/acetaminophen 5/500 mg.

Physical Exam: Awake, lethargic, oriented to person only. Afebrile, BP 148/76, HR 99, RR 14, 94% O_2 sat with face mask. Pupils 1–2 mm and reactive, moist mucous membranes, hypoactive bowel sounds.

Laboratory Data: Acetaminophen 692.3 mg/L, ALT 22 IU/L, AST 28 IU/L, Alk phos 55. Salicylate and ethanol negative.

Clinical Course: In the ED, three additional doses of naloxone 2 mg and a naloxone infusion was initiated at 3.6 mg/h. The patient remained lethargic and had a period of apnea that required intubation. IV *N*-acetylcysteine was started and continued until Day 5. After a prolonged ICU course, which included hypotension, fluid overload, and reintubation for desaturation on supplemental oxygen, the patient developed

DIC with microvascular thromboses and severe ARDS. The patient expired on Day 10.
Autopsy Findings: Cause of Death: Multiple complications due to hydrocodone and acetaminophen overdose. Manner of Death: Suicide. Antemortem blood: hydrocodone 78,704 ng/mL (78.7 mg/L), acetaminophen 692.3 mg/L, hydromorphone 713 ng/mL (0.0713 mg/L). Findings: Acute hydrocodone and acetaminophen toxicity with liver failure, coagulopathy, and sepsis.

Case 701. Chronic colchicine parenteral: undoubtedly responsible.
Scenario/Substances: A 77-y/o female presented to the ED with complaints of numbness, mild abdominal pain, severe nausea, vomiting, and diarrhea. The patient had received colchicine for back pain 2 mg IV on alternating days for 3 days.
Past Medical History: Chronic lower back pain.
Physical Exam: Alert and oriented, BP 100/60, HR 80-90, RR 16, O_2 sat 99% (room air).
Laboratory Data: ABG-pH 7.07/pCO_2 33, bicarbonate 9, Cr 2.6, BUN 3, Alk phos 225, CK 740, bilirubin 1 (total), AST 1,933, ALT 2,295. Colchicine 44 ng/mL (therapeutic = 0.2 ng/mL).
Clinical Course: The patient was admitted to ICU and given IV fluids, ondansetron, and hydromorphone. Her condition evolved through sinus tachycardia, hypotension, bradycardia, severe respiratory distress, and renal failure. She expired <24 h from ED presentation. No autopsy was done. An investigation found the concentration of colchicine in the product used was more concentrated than stated on the label.

Case 714. Unknown chronicity methadone ingestion: undoubtedly responsible.
Scenario/Substances: Coroner called for interpretation of methadone levels found in a 14-month-old child.
Laboratory Data: Blood methadone 366 ng/mL; EDDP 67 ng/mL, urine methadone 1,440 ng/mL.
Autopsy Findings: Coroner advised that levels were within the range found in victims of fatal methadone overdoses. Cause of death was listed as methadone overdose.

Case 716. Acute oxycodone ingestion: undoubtedly responsible.
Scenario/Substances: A 20-month-old 13 kg female was discovered unresponsive. She was last known alive 3 h prior. EMS initiated CPR.
Laboratory Data: Initial urine drug screen positive for both hydrocodone and oxycodone. Second urine drug screen was positive for oxycodone.
Clinical Course: She arrived at the ED unresponsive and required mechanical ventilation. Pill fragments aspirated from her stomach via an NG tube. The patient was transferred, developed cardiopulmonary arrest during transport, received CPR for 30 min prior to arrival to the level I trauma center with fixed/dilated pupils and GCS 3. Cough and gag reflex were absent. Naloxone was administered and the child was intubated and ventilated. Death by neurologic criteria was established, comfort measures were instituted and the patient expired on Day 2.
Autopsy Findings: Ischemic changes in the brain, brain herniation, focal acute bronchopneumonia, the heart showed acute ischemic changes. Premortem blood (Day 1) ethanol BLQ, hydrocodone positive (<0.05 mcg/mL), oxycodone 0.44 mcg/mL, liver and bile BLQ. Postmortem blood oxycodone 0.44 mcg/mL and positive for hydrocodone. No drugs were detected in samples of liver or bile. A postmortem acylcarnitine profile showed an elevation of propionylcarnitine. DNA analysis showed no mutations in the common propionic acidemia alleles or methylmalonic acidemia alleles. There was no historical evidence of these inborn errors in metabolism in the decedent. At autopsy, the decedent showed no evidence of failure to thrive or underlying natural disease. This elevation was likely an artifact of the decedent's perimortem clinical condition. The cause of death was acute combined oxycodone and hydrocodone toxicity. The manner of death was accidental.

Case 717. Acute oxycodone (long-acting) by an unknown route: undoubtedly responsible.
Scenario/Substances: A 17-month-old male was found unresponsive in cardiac arrest by EMS inside a private car. Transported to hospital, he was intubated and resuscitated and then transferred to a tertiary care facility. The family stated that the child took a family member's oxycodone.
Physical Examination: BP 101/50, HR 113, RR 1, O_2 sat 100% on mechanical ventilation. The patient was unresponsive without spontaneous respirations or reflexes.
Laboratory Data: ABG-pH 7.30/pCO_2 41.1/pO_2 257 100% oxygen.

Na 145	Cl 101	BUN 17
K 3.4	HCO_3 21	Cr 0.5

Ca 9.4, anion gap 17, PT 10.8, INR 1.1. Drug screen positive for benzodiazepines.
AST 180, ALT 70, troponin 0.25 ng/mL, lactate 3.2 mmol/L, high-performance liquid chromatography (HPLC) urine showed presumptive presence of oxycodone and metabolites.
Clinical Course: The patient remained intubated, ventilator dependent, and unresponsive throughout his hospital stay. Attempts to wean from the ventilator were unsuccessful. Serial EEGs showed diffuse neuronal dysfunction and encephalopathy and no evoked potentials. MRI showed extensive gliosis with enlargement of the ventricles. The family elected to withdraw supportive care and he was withdrawn from the ventilator on Day 77. The patient expired from respiratory failure. Autopsy was not available.

Case 732. Acute bupivacaine parenteral: undoubtedly responsible.
Scenario/Substances: A 63-y/o surgical patient was reported to have been in the process of receiving an axillary block with 30 mL of bupivacaine (0.5%) with epinephrine (0.0091 mg/mL).

The patient sneezed, with about 5 mL left to be administered, had a seizure, and suffered from cardiopulmonary arrest.
Clinical Course: The patient received two ampoules of sodium bicarbonate and CPR was performed. Resuscitation was not successful.
Autopsy Findings: Autopsy showed extensive arteriolosclerosis and cardiomegaly. Cause of death was sudden cardiac arrest because of arteriosclerotic disease; contributing factors were bupivacaine administration and cardiomegaly.
Editor's Note: See black box warning of "CARDIAC ARREST WITH DIFFICULT RESUSCITATION OR DEATH DURING USE OF BUPIVACAINE HYDROCHLORIDE."

Case 736. Acute tenecteplase parenteral: undoubtedly responsible.
Scenario/Substances: A 66-y/o male diagnosed with embolic CVA accidentally given tenecteplase 70 mg instead of the ordered tissue plasminogen activator 70 mg and developed a cerebral bleed.
Physical Exam: Vital signs were stable.
Clinical Course: Patient intubated and transferred to a tertiary hospital where cryoprecipitate, fresh frozen plasma, and platelets were administered. Patient remained intubated, developed cerebral edema, with signs of marked posturing. After patient's family requested comfort measures only, the patient died on Day 5. Autopsy was not available.

Case 743. Acute valproic acid (VPA) ingestion: contributory.
Scenario/Substances: A 22-y/o female presented to the ED comatose after ingestion of an unknown amount of VPA in a suspected suicide attempt.
Laboratory Data:

Na 143	Cl 108	BUN 12	Glu 127
K 4.3	HCO_3 17.3	Cr 1.2	

VPA 267 mcg/mL, salicylate 5.2 mg/dL, AST 14, ALT 24, Alk phos 106, total bilirubin 0.32, ammonia 79, EKG QRS 80 ms, QT/QTc 368/475 ms.
Clinical Course: The patient was comatose on arrival in the ED. She was intubated, admitted to the ICU, and placed on a ventilator. VPA 177 mcg/mL ~6 h after admission and HCO_3 remained <17, over the first 12 h. Three doses of carnitine 500 mg were given. She developed bradycardia (HR 30s) starting ~18 h after admission with transient response to atropine, VPA 117 μg/mL, ammonia of 55. Her HR then rebounded to 170 beats/min. Her lung function declined to 1.0, requiring 100% O_2. She was transferred to a tertiary HCF on dopamine and norepinephrine, VPA 66 μg/mL, but she remained unresponsive, MRI and EEG indicated a brain stem infarct. She met the criteria for brain death and was pronounced brain dead on Day 2.
Autopsy Findings: Acute brainstem infarct, cerebral edema, swelling and hernia, and respirator lung. Postmortem blood VPA 6.2 μg/mL, THC 1.7 ng/mL, THC-COOH 13.4 ng/mL. Urine postmortem THC was 101 ng/mL. Cause of death was listed as acute brainstem infarct, with a contributing factor of VPA toxicity. Manner of death was accidental.

Case 750. Acute VPA ingestion: undoubtedly responsible.
Scenario/Substances: A 43-y/o female was found down at her residence by EMS. Empty pill bottles could have contained VPA (500 mg × 810), flurazepam (30 mg × 180), bupropion (250 mg × 90), and temazepam (30 mg × 30). Naloxone was administered. Cardiac arrest developed en route to the ED, CPR and transcutaneous pacing were started.
Past Medical History: Depression, chronic pain, opioid and benzodiazepine dependence, bipolar disorder, and borderline personality disorder.
Physical Exam: Unresponsive, pupils fixed and dilated (8 mm). BP 73/54, HR 68, RR 18, *T* 31°C, O_2 sat 100% (nasal O_2).
Laboratory Data: WBC 11, Hct 46.5, Hgb 15.9, platelets 185,

Na 144	Cl 103	BUN 33	Glu 132
K 3.7	HCO3 16	Cr 1.2	

ABG-pH 7.25/pCO_2 35/pO_2 203/HCO_3 18.2, AST 42, ALT 39, CK 1,015, acetaminophen and salicylate levels were BLQ. Initial VPA > 1,460 mcg/mL.
Clinical Course: Patient was intubated, but lavage tube could not be passed due to tablet-packed esophagus. She received IV fluids, atropine, epinephrine, and L-carnitine 50 mg/kg/day to prevent hyperammonemia. Chest CT negative and head CT was consistent with ischemic injury. The patient was admitted to ICU and given dopamine and norepinephrine. Day 2 troponin 2.6 ng/mL, CK 2,692, CK-MB 37.1 U/L, ECG showed anterior T-wave inversions. VPA 229 mcg/mL posthemodialysis, upper endoscopy showed lacerated and friable esophagus but no further obstruction. On Day 3 AST 9,152, ALT 2,369, CK 9,614, troponin 3.37 ng/mL, VPA 385 mcg/mL, INR 1.8, PTT 72.7, systolic BP 60 mmHg on three vasopressors while receiving levofloxacin and vancomycin, pantoprazole, and sodium bicarbonate infusion. Despite 40 U of fresh frozen plasma, cryoprecipitate pack, vitamin K, and continued hemodialysis, she expired on Day 3.
Autopsy Findings: Cause of death was combined VPA and benzodiazepine toxicity and multisystem organ failure. Manner of death was suicide.

Case 773. Acute bupropion (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 20-y/o female was found unresponsive on the bathroom floor with an empty bottle of extended-release bupropion. She reportedly had been drinking ethanol. Emesis was noted at the scene and a seizure occurred prehospital. She was transported to the ED about 3 h after she was last known to be awake at the scene.
Past Medical History: Depression.
Physical Exam: Somnolent, normotensive, and HR 95
Laboratory Data: Ethanol 150 mg/dL, pH 7.1, HCO_3 17. Initial ECG was sinus rhythm with normal QRS and normal QTc. Subsequent QRS was 154.

Clinical Course: After intubation in the ED, the patient was hemodynamically stable. She was then transferred to the ICU, where systolic BP dropped to 78, HR 110. She received lorazepam for twitching and sodium bicarbonate boluses for widened QRS with hypotension that worsened despite high doses of vasopressors. Cardiac ejection fraction was 40% by echocardiogram ~17 h after ingestion. Intra-aortic balloon pump and pacemaker were placed but hypotension and bradycardia worsened. The patient expired owing to cardiovascular collapse on Day 2.
Autopsy Findings: Bilateral pulmonary edema, cerebellar tonsillar herniation, and 29 pills in the stomach. Serum and urine drug screens were negative except for the pentobarbital and phenytoin she received in the hospital. Blood bupropion 37 ng/mL. Cause of death was medication overdose.

Case 775. Acute-on-chronic bupropion ingestion and unknown route: probably responsible.
Scenario/Substances: A 23-year-old female was admitted to an ICU, with suspected multiple drug overdose after presenting to the ED the evening before with delirium.
Past Medical History: History of opioid, benzodiazepine, cocaine, marijuana abuse since age 18 and a history of depression, intentional IV water injections, and prior suicide attempts via drug ingestions.
Physical Exam: Awake young female with obvious delirium. BP, RR, and O_2 sat reported as "normal," HR 137, *T* 38.8°C. Skin: track marks noted, warm, flushed, and diaphoretic. HEENT: no signs of trauma. Neuro: markedly hypertonic throughout with episodes of opisthotonos.
Laboratory Data: Urine screen positive for amphetamines, benzodiazepines, cannabinoids, cocaine, and opiates. AST 61, ALT 89, CK 322, CK-MB 9.2 ng/mL, serum osmolality 307 mOsm/kg.
Clinical Course: The patient initially improved after treatment with 10 mg lorazepam IV and was admitted to a medical ward where she suffered a respiratory arrest, requiring intubation during which a piece of chewing gum was retrieved. Subsequent CXR and bronchoscopy in the ICU revealed left lung aspiration of stomach contents including pill fragments. Approximately 5 h after transfer to the ICU the patient's temperature increased with hypotension and possible seizure. Hypotension developed which progressed to PEA for which resuscitation was unsuccessful. The patient expired 13 h after arrival in the ED.
Autopsy Findings: The cause of death was multiple drug intoxication. Multiple pill fragments were found in the stomach and duodenum. Blood bupropion 0.46 mg/L, benzoylecgonine 0.38 mg/L, diazepam 0.64 mg/L, nordiazepam 0.20 mg/L, methadone 0.008 mg/L, morphine 0.03 mg/L, and temazepam 0.07 mg/L.

Case 782. Acute-on-chronic venlafaxine (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 28-y/o male drove himself to the hospital seeking assistance but had seizure in the hospital hallway before reaching the ED.
Clinical Course: In the ED, the seizure resolved with lorazepam 2 mg. ECG showed QRS 112 ms and he received sodium bicarbonate. After a second seizure, he was treated with lorazepam 4 mg, intubated, and admitted to the ICU where the *T* rose to 42°C, and he developed complete heart block leading to ventricular fibrillation from which he could not be resuscitated.
Autopsy Findings: Postmortem exam found white granules in small intestine but no fragments or intact pills. Cause of death was multiple drug overdose. Antemortem and postmortem blood levels were as follows:

Fluoxetine: ante = 100 ng/mL; post = 199 ng/mL
Norfluoxetine: ante = 100 ng/mL; post = 196 ng/mL
Venlafaxine: ante = 5,898 ng/mL; post = >20,000 ng/mL
Norvenlafaxine: ante = 398 ng/mL; post = 5,484 ng/mL

Case 792. Acute bupropion ingestion: undoubtedly responsible.
Scenario/Substances: A 36-y/o female presented to the ED after taking 60 bupropion 10.5 h prior to arrival.
Past Medical History: Recently prescribed bupropion for smoking cessation. Unknown psychiatric history.
Physical Exam: Lethargic and intermittently combative, BP 130/60, RR 24, HR 115.
Laboratory Data: Salicylate and acetaminophen were both BLQ.
Clinical Course: Eleven hours after arrival, while admitted to a telemetry ward, the patient experienced a seizure lasting 1–3 min. She was treated with lorazepam and fosphenytoin. During treatment, the heart rhythm transitioned from sinus bradycardia to junctional, QRS widening, and asystole. Post-resuscitation, the patient was transferred to the ICU, without spontaneous respirations. On Day 3, EEG indicated brain death and life support was withdrawn.
Autopsy Findings: The cause of death was intentional ingestion of bupropion. Blood bupropion 0.02 mg/L, bupropion threo-amino metabolite 0.12 mg/L, a bupropion erythro-amino metabolite 0.22 mg/L, and a bupropion morpholinol metabolite 0.10 mg/L. Brain bupropion level 0.26 mg/kg, bupropion threo-amino metabolite 9.0 mg/kg, bupropion erythro-amino metabolite 57.2 mg/kg, and bupropion morpholinol metabolite 21.5 mg/kg. The manner of death was suicide.

Case 807. Acute-on-chronic venlafaxine (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 41-y/o male presented to the ED with a history of taking 180 tablets of his venlafaxine 150 mg SR 2 h prior to arrival.
Physical Exam: Drowsy and afebrile male, BP 135/75, HR 140, RR 16.
Laboratory Data: Serum acetaminophen and salicylate were both BLQ and the metabolic profile was reported as "normal."
Clinical Course: The patient seized within a hour of presentation and was intubated then given activated charcoal via oral gastric tube. The patient developed clonus and remained

tachycardic with HR ~ 150. Serotonin syndrome was considered and he was given benzodiazepines. ECG revealed a prolonged QRS interval of 110 ms, with a QTc interval of 440 ms, and a sodium bicarbonate infusion was initiated. VT occurred after the bicarbonate infusion was started. Cardioversion was attempted for VT and a trial of 10% IV fat emulsion was started, resulting in a transient narrowing of the QRS interval. The patient remained hypotensive on pressors, with fixed and dilated pupils and expired from cardiac dysrhythmias 18 h after ingestion. Autopsy was not performed.

Case 810. Acute-on-chronic lithium ingestion: undoubtedly responsible.
Scenario/Substances: A 42-y/o male presented to the ED nauseated and shaky, but otherwise stable ~14 h post-ingestion of lithium carbonate extended release (300 mg × 20) and fluphenazine (20 tabs). He denied suicidal thoughts and reported that he was feeling stressed and made an impulsive mistake.
Past Medical History: Depression, schizophrenia, and bipolar disorder with prior hospitalization.
Physical Exam: Alert, oriented, conversing appropriately, BP 134/81, HR 99, *T* 38°C, RR 16, O_2 sat 98% (room air).
Laboratory Data: Hgb 13.8, WBC 11.6, platelets 202, Na 133, K 3.9, BUN 24, Cr 1.8, acetaminophen and salicylate BLQ. Lithium 5.9 mmol/L. ECG showed sinus rhythm with QT prolongation. Urine drug screen was negative.
Clinical Course: Patient admitted and received IV NS at 150 mL/h. Day 2, lithium 3.8 mmol/dL, but patient's behavior became erratic and sedated. Day 3 Cr 1.9, Na 152, patient became increasingly agitated, oral fluid intake decreased despite 20 L of urine output. Patient customarily drank 10 plus liters per day to correct for his lithium-induced nephrogenic diabetes insipidus. Day 4 Na 172 mEq/L patient was lethargic and agitated and unable to take oral fluids, K 3.3, Ca 11.5, Cr 2.4, and lithium 1.6 mmol/dL. Desmopressin started with aggressive potassium repletion and rehydration with D5W. Day 5 Na 177, head CT unremarkable. Day 8, encephalopathy confirmed via EEG. Day 9 feeding tube placed. Day 17 family elected comfort measures; patient expired on Day 19. Autopsy results not available.

Case 825. Acute bupropion (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 47-y/o female vomited at home and was brought to the ED ~15 h after suspected ingestion of bupropion and cyproheptadine.
Past Medical History: Medications available to patient included bupropion, cyproheptadine, and oxycodone with acetaminophen.
Physical Exam: Lethargic and combative ~4 h after arrival in ED.
Laboratory Data: Acetaminophen 10.6 mcg/mL ~1 h after arrival in ED. Urine drug screen positive for opiates, acetaminophen, and benzodiazepines.
Clinical Course: Naloxone 0.8 mg was given without response. The patient vomited with return of pill fragments and experienced a single self-limited seizure. After transfer to the ICU she was restless, agitated, and hallucinating. She was treated with lorazepam and ziprasidone and later developed multiple seizures hypotension, requiring multiple vasopressors. She experienced a cardiac arrest and died ~12 h after arrival in the ED.
Autopsy Findings: Focal, acute, centrilobular hepatocellular necrosis, and a small focus of acute lobar pneumonia. Cause of death was prescription medication overdose with lethal blood levels of bupropion and fluoxetine, 68 tablets of bupropion extended release were present in stomach contents. Blood bupropion 6,800 ng/mL, hydroxybupropion 11,000 ng/mL, fluoxetine 4,100 ng/mL, and therapeutic, nontoxic levels of lorazepam and hydrocodone. The bupropion level reported was felt to be less than the peak, given the manner of handling blood sample and the duration of time passed before the blood was obtained from the patient.

Case 847. Acute venlafaxine ingestion: undoubtedly responsible.
Scenario/Substances: A 55-y/o female was discovered unconscious with a suicide note by family. Empty bottles of venlafaxine and zolpidem were found.
Past Medical History: Depression.
Physical Exam: Female responsive to painful stimuli. BP 136/73, HR 69, RR 14.
Laboratory Data: Ethanol 264 mg/dL, acetaminophen 15 mcg/mL, AST 29, ALT 22. EKG 12 h after presentation showed a normal QRS and QTc.
Clinical Course: Within a few hours after presentation episodic hypotension responsive to fluid boluses occurred. Twelve hours after presentation four brief (10 s) seizures were noted and emesis containing pill fragments was produced. Sedation with propofol and pressor support with norepinepherine was initiated for persistent hypotension. Further seizures occurred prior to death ~30 h after presentation.
Autopsy Findings: Cause of death was cardiac arrest and manner of death was suicide. Subclavian blood contained venlafaxine 41 mg/L and *O*-desmethylvenlafaxine 6.6 mg/L.

Case 863. Acute-on-chronic amitriptyline ingestion: undoubtedly responsible.
Scenario/Substances: A 68-y/o male was found unconscious and unresponsive ~4 h after ingesting zolpidem extended release (<375 mg) and other unknown medications. He had cardiac arrests × 2 and was resuscitated and intubated by EMS.
Physical Exam: Unresponsive, pupils dilated and slightly reactive to light. BP 125/74, HR 109.
Laboratory Data: Initial labs AST/ALT 300–400.

Na 141	Cl 111	BUN 30	Glu 266
K 3.5	HCO_3 15	Cr 2.4	

ABG-pH 6.80/pCO_2 19.6/pO_2 277/HCO_3 20.78, salicylate, acetaminophen, and ethanol BLQ; urine drug screen positive for tricyclic antidepressants. Follow-up lab 5 h post-admission AST 580 and ALT 464. ECG rate 109; QRS 60 ms; QTc 445 ms.

Clinical Course: The patient had a third cardiopulmonary arrest shortly after arrival in the ED. Widened QRS complexes progressed to ventricular fibrillation for which bicarbonate boluses and then a bicarbonate drip were given. The patient remained hypotensive on vasopressors, acidosis resolved. Head CT showed diffuse cerebral edema. The patient remained on the ventilator and vasopressors for 2 days but had progressive deterioration and expired on Day 3.
Autopsy Findings: The autopsy revealed cardiomegaly owing to hypertension, arteriosclerotic cardiovascular disease, and bronchopneumonia. Antemortem serum at hospital admission showed zolpidem 0.58 mg/L and amitriptyline 0.30 mg/L. Postmortem femoral blood showed amitriptyline 3,100 ng/mL, nortriptyline 1,000 ng/mL, and zolpidem 16 ng/mL. Death was due to multiple drug toxicity with bronchopneumonia as a significant contributing condition.

Case 871. Acute bupropion (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 16-month-old male ingested up to 12, 150 mg bupropion extended release tablets.
Past Medical History: No prior medical problems.
Physical Exam: Initially unremarkable.
Laboratory Data: Ethanol BLQ.
Clinical Course: In the ED the patient received activated charcoal and remained asymptomatic until having a generalized 30-s seizure ~3 h post-ingestion followed by multiple seizures that initially responded to IV benzodiazepines but eventually were unresponsive preceding cardiopulmonary arrest. The patient expired 7 h after ingestion.
Autopsy Findings: Twelve chewed bupropion extended release, 150 mg tablets were found in the small intestine. Cause of death was acute bupropion toxicity. Blood bupropion 10,000 ng/mL.

Case 872. Acute bupropion (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 22-month-old female found in family car with her 5-y/o sibling feeding her 150 mg tablets of extended release bupropion.
Past Medical History: Previously healthy.
Physical Exam: Alert, BP 101/69, HR 116, RR 24.
Clinical Course: The patient developed seizures, initially self-limited lasting ~40 s, treated with lorazepam, phenytoin, and phenobarbital. She was intubated using propofol and transferred to a tertiary HCF. En route, the patient became hypotensive and was treated with IV epinephrine boluses. On arrival the patient was persistently hypotensive with bradycardia and a widened QRS only initially responsive to sodium bicarbonate boluses. Despite IV crystalloid, multiple vasopressors, atropine and hypertonic saline, the patient expired 9 h after the ingestion.
Autopsy Findings: Blood bupropion level was 45,000 ng/mL; cause of death was bupropion overdose.

Case 883. Acute promethazine parenteral: undoubtedly responsible.
Scenario/Substances: A 36-y/o female injected herself with 25 mg of oral formula promethazine after not getting relief from taking the oral formulation for nausea. The patient crushed one 25 mg tablet of promethazine and mixed it with saline prior to injecting the mixture via her central catheter line. She was found conscious on the floor of the bathroom and EMS was called. The patient began to have difficulty in breathing and then stopped breathing. The family initiated CPR. EMS continued resuscitation attempts during transport to the ED.
Past Medical History: Crohn's disease.
Physical Examination: No spontaneous breaths, CPR in progress.
Laboratory Data: None available.
Clinical Course: The patient was pronounced dead in the ED after resuscitation efforts were unsuccessful.
Autopsy Findings: The autopsy report revealed edematous bronchi and red parenchyma with edema, congestion, and white, punctate lesions throughout the lung.

Case 892. Chronic albendazole ingestion: probably responsible.
Scenario/Substances: A 22-month-old female presented to the clinic with jaundice. Her family initially denied giving her any medications but later admitted that the grandmother sent a bottle of albendazole from Central America to treat worms they believed the child would get from drinking milk. The dose was supposed to be one-half teaspoon, but the mother had given the entire bottle (unknown quantity) over 24 h. The last dosage occurred ~10 days prior to presentation.
Past Medical History: No significant past medical history.
Physical Exam: Jaundice female toddler, awake and alert, responding appropriately.
Laboratory Data: Initial AST and ALT were both >10,000, INR >8.0.
Clinical Course: The patient was treated with fresh frozen plasma, phytonadione, lactulose, and IV fluids. Two days later, she was placed on the liver transplant list. During the next 2 days the patient became encephalopathic with an ammonia level of 98. For ~30 days the patient continued to have elevated ammonia concentration, respiratory failure, hypothermia, renal failure, and rectal bleeding. The patient expired 1 month after presentation. Autopsy was not available.

Case 895. Chronic methotrexate ingestion: probably responsible.
Scenario/Substances: A 67-y/o female underwent left hip hemiarthroplasty and was transferred to a rehabilitation hospital where she was given methotrexate 12. A dose of 5 mg/day for 9 days instead of the intended 12.5 mg/week was given.
Past Medical History: Chronic renal insufficiency, stroke, rheumatoid arthritis, bipolar affective disorder. Medications included protonix, cefeprine, trazodone, amiodarone,

guaifenesin, clonidine, lamictil, chlorpheniramine, folic acid metoprolol, digoxin, morphine, midazolam, and dactinomycin.
Physical Exam: Flushed peeling skin, intraoral burns, ileus, shock, respiratory distress.
Laboratory Data: Pancytopenia, methotrexate level drawn several days after the last dose was "normal."
Clinical Course: The patient developed Steven Johnson's Syndrome with desquamation of skin involving 13% of total body surface area and was transferred to a burn unit where she developed sepsis with pancytopenia and expired 3 days after arrival to the burn unit.
Autopsy Findings: Multiple skin ulcers of the chest, back, extremities, and oral surfaces. Petechial hemorrhages and ecchymosis of the trunk, abdomen, and upper extremities. Pulmonary edema; small vessel thrombus, lung; small bowel infarction; acute tubular necrosis.

Case 898. Acute drotaverine ingestion: probably responsible.
Scenario/Substances: A 21-y/o female intentionally ingested ~10 tablets of drotaverine 80 mg sent from Russia. The patient was intubated in the field and received epinephrine and atropine for asystole. On arrival to the ED the patient had a seizure and showed posturing. Initial pH was 6.5 on arrival and activated charcoal was administered.
Physical Exam: (One day after admission) BP 90–100 systolic while receiving norepinephrine infusion, intubated, and ventilated. The patient showed decerebrate posturing movements without sedation. Pupils described as minimally reactive with slight corneal reflex present.
Laboratory Data: Initial pH 6.5. CBC reported as "normal,"

Na 152	Cl 132	BUN 13	Glu 75
K 2.1	HCO_3 16	Cr 1.0	

CT head negative, Urine drug screen (UDS) negative. CK 14,291, CK-MB 68.5, EEG reported "brain activity." On Day 2, ABG-pH 7.4/*p*CO2 33/O_2 145, AST 185, ALT 55 U/L, total bilirubin 0.3, Ca 4.6. CK peaked at 18,615, with troponin 0.39.
Clinical Course: The patient remained unresponsive and ventilator dependent. EEG showed slow wave activity; MRI showed diffuse ischemia. No improvement was noted and on Day 15, the patient was taken to surgery for organ procurement.
Autopsy Findings: The cause of death was determined to be anoxic encephalopathy due to or as a consequence of drug ingestion. Note that reported drug ingestion by clinical history was a Russian muscle relaxant Cipla (drotaverine); no drug quantitation was determined.

Case 904. Acute amlodipine ingestion: undoubtedly responsible.
Scenario/Substances: A 34-y/o female presented to the ED with abdominal pain, nausea, and vomiting. Four hours into the ED visit, the patient provided additional history of ingestion of all her medications that included amitriptyline, trazodone, fluoxetine, and pregabalin.
Past Medical History: Not provided.
Physical Exam: No acute distress. BP 79/58, HR 98, RR 16, 95% O_2 sat (room air) *T* 37°C. Pupils normal size and reactive, normal heart and lungs, GCS 15.
Laboratory Data: Initial hospital: Lactate 18 mmol/L, anion gap metabolic acidosis, bicarbonate 17, BUN 27, Cr 1.8, ionized calcium <2.5 mEq/L. Initial ECG showed accelerated junctional rhythm at 70, with no QRS or QTc prolongation. CXR was normal.
Clinical Course: The patient developed PEA and cardiac arrest 4.5 h after ED arrival and was given CPR per ACLS protocols with return of spontaneous circulation and initiation of bicarbonate infusion. PEA returned and lipid rescue therapy with lipid emulsion bolus (20% emulsion, 1 cc/kg) for potential tricyclic antidepressant toxicity was administered × 3. Resuscitation attempts were unsuccessful and the patient expired ~6 h after presentation.
Autopsy Findings: Postmortem revealed profound edema. There was no abdominal pathology, and heart and lungs were otherwise normal. The toxicology results showed an elevated amlodipine level (1.2 mg/L) and amlodipine was judged the causative agent.

Case 908. Acute-on-chronic verapamil ingestion and unknown route: undoubtedly responsible.
Scenario/Substances: A 40-y/o male was initially awake and oriented when EMS arrived. Multiple empty pill bottles were found at the scene. During transport, he experienced a cardiopulmonary arrest.
Past Medical History: Medications included verapamil, potassium, hydrocodone, furosemide, levofloxacin, spironolactone, and amoxicillin.
Laboratory Data: Hct 42.8, Hgb 14.6, WBC 31.5, platelets 246, ABG-pH 7.25/pCO_2 35/pO_2 203/HCO_3 18.2.

Na 137	Cl 97	BUN 21	Glu 541
K 4.5	HCO_3 11.2	Cr 3.1	

Acetaminophen and salicylate levels were BLQ. Ca 10.9, calculated osmolality 301 mOsm/L, AST 42, ALT 39, Alk phos 51, total bilirubin 0.6, anion gap 29, CK 1,015, INR 1.2, PTT 35.2. Initial VPA >1,460 mcg/mL.
Clinical Course: Patient was unresponsive and in asystole on arrival to the ED. ACLS was started and the patient was intubated. He was treated with epinephrine, atropine, calcium chloride, naloxone, dopamine, amiodarone, bicarbonate, glucagon, normal saline, and insulin. The patient was given activated charcoal by orogastric tube. External pacing was unsuccessful. The patient expired within 30 min of ED arrival.
Autopsy Findings: Toxicologic testing showed ethanol 0.015 g/dL, verapamil 4,100 ng/mL, cocaine 11 ng/mL, cocaethylene 17 ng/mL, benzoylecgonine 209 ng/mL in heart blood. Verapamil was identified in gastric contents and serum. There were no significant findings on gross examination. Cause of death was verapamil overdose. Manner of death was suicide.

Case 909. Acute flecainide ingestion: undoubtedly responsible.
Scenario/Substances: A 41-y/o female took flecainide tablets (100 mg × 12) for unknown reason.
Past Medical History: Supraventricular tachycardia.
Physical Exam: Awake and alert, atraumatic. BP 47/35, HR 58. ECG sinus bradycardia with first-degree AV block and right bundle branch, glu 139.
Clinical Course: In the ED the patient had two seizures that responded to lorazepam. She was intubated, received 10 ampoules of sodium bicarbonate and 2 g magnesium, started on bicarbonate drip, and given neosynepherine and dopamine prior to transfer to the ICU. The QRS remained prolonged (184 ms) and an echocardiogram showed an ejection fraction of 45%. After a second seizure, propofol and diazepam were given for sedation. Shortly after amiodarone was given because of the lack of response to sodium bicarbonate to narrow the QRS, the patient's bradycardia worsened and progressed to cardiac arrest from which she could not be resuscitated. Autopsy was not performed.

Case 920. Acute-on-chronic amlodipine ingestion: probably responsible.
Scenario/Substances: A 46-y/o male presented to the ED with abdominal pain, nausea, and sudden hypotension after taking an extra dose of his BP medication that included amlodipine 10 mg, diltiazem 240 mg, and labetalol 400 mg earlier today. Patient had also missed his past two dialysis sessions because of severe abdominal pain.
Past Medical History: End-stage renal disease on hemodialysis and hypertension.
Physical Exam: In the ED: BP 58/44, HR 40, RR 26, *T* 36°C. Abdomen revealed tenderness with voluntarily guarding.
Laboratory Data: K 5.0, HCO_3 19, Cr 14.8, lactate 1.9 mmol/L, glucose 135 mg/dL. CXR showed cardiomegaly.
Clinical Course: Hypotension and worsened abdominal pain resulted in fluid resuscitation in the ED and administration of calcium gluconate. Shortly after receiving the calcium, the patient's bradycardia worsened and eventually became asystole. Resuscitation was ultimately unsuccessful and the patient expired 4 h after ED presentation.
Autopsy Findings: Severe coronary artery disease.

Case 922. Unknown chronicity diltiazem (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 46-y/o 100 kg male took 15–20 tablets of diltiazem extended release.
Past Medical History: Patient medications included lithium and ziprasidone. Unknown if the diltiazem was prescribed for this patient.
Laboratory Data: Glu 253, Ca 7, Cr 6.
Clinical Course: The patient became bradycardic and hypotensive, HR 20, BP 79/36, was admitted to the ICU ~2 h after ED arrival. Dopamine and IV fluids and atropine were given with no effect. The patient developed a wide QRS complex that progressed to asystole. The patient was cardioverted, intubated, and ventilated. Asystole recurred that could not be treated and the patient expired from multiorgan system failure ~10 h after hospitalization.
Autopsy Findings: Cause of death was anoxic brain injury due to drug overdose. Manner of death was suicide. Premortem urine nordiazepam (positive) serum diltiazem 2.2 mcg/mL.

Case 938. Acute verapamil (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 52-y/o male presented to the ED unresponsive, hypotensive, and bradycardic after reportedly ingesting SR verapamil, metoprolol, and sertraline as a suicide attempt.
Past Medical History: Hypertension, depression, previous suicide attempt.
Physical Examination: Unresponsive male, BP 40/P, HR 49, with decreased bowel sounds and cool extremities.
Laboratory Data: Initial blood glucose >500. On Day 2: pH 7.15.

Na 130	Cl 106	BUN 13	Glu 93
K 2.6	HCO_3 13	Cr 1.93	

Clinical Course: The patient was intubated, given 2 g IV calcium chloride without improvement. Whole bowel irrigation was initiated but not tolerated. Dopamine was started and a transvenous pacemaker was placed. High-dose insulin was initiated. After no improvement over 3-h period, 20% IV fat emulsion was given and the BP improved to 90 (by palpation). Insulin was temporarily halted owing to hypoglycemia but restarted with a greater concentration of glucose given concurrently. BP improved to 109/60 and the patient regained consciousness. Eight hours after admission, hypotension returned, fat emulsion and high-dose insulin were again given and later glucagon, epinephrine, and vasopressin as well. Hypotension continued over 2 days. The patient's family requested comfort measures only and the patient died on Day 3.
Autopsy Findings: Elevated verapamil and sertraline metabolites and the presence of propranolol but was otherwise "normal."

Case 941. Acute diltiazem (long-acting) ingestion: undoubtedly responsible.
Scenario/Substances: A 53-y/o female ingested diltiazem SR (60 mg × 10).
Past Medical History: Hypertension.
Physical Examination: Upon ED arrival 1-h post-ingestion, the patient was initially awake and cooperative but became uncooperative and combative. BP 84/47, HR 66, RR 24, *T* 36°C.
Laboratory Data: EKG AV dissociation with a ventricular rate of 64, QRS duration 84. QTc 453 with right axis deviation and low voltage.
Clinical Course: Because of progressively declining BP and, HR, she was intubated. The patient experienced a cardiovascular arrest within 45 min of ED presentation, Resuscitation including 3 L of normal saline, calcium gluconate 6 g, glucagon 1 mg, atropine 1 mg, insulin 10 U regular insulin, and dextrose 25 g IV. A norepinephrine infusion and transvenous pacemaker failed to restore function.

Autopsy Findings: Cause of death was diltiazem ingestion; manner of death was suicide. There were no injuries or diseases present that contributed to death. Blood diltiazem levels were 22 and 16 mg/mL in separate blood draws. Brompheniramine was also detected at a concentration of 0.099 mg/mL. Blood ethanol level was 0.06 mg/mL. Nicotine was detected at a concentration of 0.055 mg/mL. Caffeine was detected qualitatively.

Case 994. Acute chlorpheniramine/dextromethorphan ingestion: undoubtedly responsible.
Scenario/Substances: A 17-y/o male ingested an unknown quantity of a cough and cold preparation containing dextromethorphan and chlorpheniramine. He became unresponsive. EMS was called and they found the patient unresponsive and pulseless. The patient was pulseless for ~20 min and transported to the ED where asystole continued. He was resuscitated to sinus rhythm with a QRS duration of 120 ms. The patient was transferred to a tertiary care hospital shortly after resuscitation.
Past Medical History: Over-the-counter drug abuse.
Physical Exam: Unresponsive and intubated. Pupils fixed and dilated. BP 125/54, HR 142.
Laboratory Data: Initial hospital: ABG-pH 6.95/pCO$_2$ 64/pO$_2$ 100. Urine screen positive for THC. Tox screen negative for acetaminophen, aspirin, and ethanol. At tertiary care hospital: ABG-pH 7.19/pCO$_2$ 59/pO$_2$ 127. CK 9,152, ALT 80, AST 184. Acetaminophen 2.9 mcg/mL, chlorpheniramine 1,820 ng/mL (reference range 10–40 ng/mL), dextromethorphan 7,250 ng/mL (reference range 2–6 ng/mL). ECG: Sinus tachycardia; QRS complex duration 100 ms. CT angiogram showed diffuse bilateral cerebral infarcts and edema with normal perfusion.
Clinical Course: The patient was transferred to the tertiary care hospital, admitted to the pediatric ICU where he remained hemodynamically stable but without improvement in neurologic function. The patient expired on Day 4 after organ recovery for donation.
Autopsy Findings: The cause of death was multiple drug intoxication and the manner of death was accidental. Findings included pulmonary edema and congestion, mild cerebral edema, pale internal organs, and status post-tissue donation and aborted organ donation. Femoral blood: acetaminophen 3 mcg/mL, chlorpheniramine 235 ng/mL.

Case 997. Acute dextromethorphan ingestion: undoubtedly responsible.
Scenario/Substances: A 20-y/o male and his two friends intentionally ingested dextromethorphan cough spray to get high. The patient ingested five bottles (2,700 mg dextromethorphan) and his two friends ingested two bottles each. All three fell asleep. The friends found the patient dead the next morning. History obtained from friends.
Autopsy Findings: The medical examiner reported a postmortem dextromethorphan level of 10 mg/L (previously reported levels resulting in death 3.3–9.2 mg/L). Cause of death was determined to be dextromethorphan intoxication. Manner of death was accidental.

Case 1001. Unknown chronicity diphenhydramine/ibuprofen/pseudoephedrine/doxylamine by an unknown route: undoubtedly responsible.
Scenario/Substances: A 2-month-old presented to the ED in full cardiac arrest.
Past Medical History: Not contributory, on no medications.
Clinical Course: On arrival at the ED the child's pupils were fixed and dilated, corneal edema was noted, there were no signs of aspiration, T 38°C (rectal), and no seizure activity reported. Resuscitation was not successful.
Autopsy Findings: Tox screen (unknown source) positive for ibuprofen, pseudoephedrine, doxylamine, and ethanol. Postmortem diphenhydramine 7,730 ng/mL (unknown source). Ruled homicide by the coroner.

Case 1005. Acute ma huang ingestion: contributory.
Scenario/Substances: A 16-y/o female ingested up to six tablets of a dietary supplement containing ma huang. The patient complained of nausea, vomiting, weakness and numbness in her arms and legs, and experienced what may have been a seizure.
Past Medical History: Preeclampsia, migraine headaches, 9-month postpartum.
Physical Exam: In the ED the patient presented with weakness, numbness in arms/legs, followed by a loss of consciousness that may have been a syncopal episode or a seizure. Initial vital signs were BP 150/90, HR 128.
Laboratory Data:

Na 137	Cl 109	BUN 8	Glu 1,193
K 4.1	HCO_3 20	Cr 0.7	

ABG-pH <7.4/pCO$_2$ 31.5/pO$_2$ 152/HCO_3 16.3, Ca 8.9; liver function tests unremarkable, lactate 2.7, INR 1.0, PTT 25, acetaminophen, salicylate, and ethanol BLQ.
Clinical Course: The patient developed nonconvulsive status epilepticus, was intubated and given anti-epileptic medications. An MRI of the brain showed a superior sagittal sinus thrombosis with bilateral frontal ischemia and edema. Head CT showed parenchymal hemorrhage owing to the sagittal sinus thrombosis and associated hemorrhagic venous infarction, small posterior aspect of sagittal sinus, and small transverse sinuses suggest chronic sequelae of previous thrombosis and recanalization. Intracranial pressure monitoring was initiated and showed intracranial pressure in the 30s and 40s. The patient underwent hemicraniectomy and decompression, where it was noted that the sagittal sinus was completely thrombosed. A brain perfusion study on Day 2 showed no cerebral perfusion, confirming brain death. No autopsy was performed.

Case 1009. Acute insulin parenteral: undoubtedly responsible.
Scenario/Substances: A 13-y/o female patient presented to the ED and was believed to have injected her grandmother's insulin and possibly have ingested other unknown medications.

Physical Exam: The patient was unresponsive, HR 200, other vital signs not provided.
Laboratory Data: ABG-pH 7.1, K, 3.5, BUN 10, Cr 0.2, glu 4, AST 44, ALT 31. Acetaminophen and salicylate were both BLQ. CT head showed diffuse cerebral edema.
Clinical Course: In the ED, the patient was intubated, ventilated, and given sodium bicarbonate, which improved her pH. Serum bicarbonate 22, glu 150 after correction with bicarbonate and glucose, respectively. The glucose decreased to <20. The patient had an irregular SVT that was treated with amiodarone and did not convert to a sinus rhythm with cardioversion. After admission to the pediatric ICU, the patient experienced several cardiac arrests that recovered to SVT. The pupils were 5–6 mm and sluggishly reactive. A second CT scan was performed which revealed brain stem herniation, and her pupils became fixed and dilated. The patient displayed diabetes insipidus and the blood glucose remained difficult to control with frequent hypoglycemia while receiving a dextrose infusion. Life support was withdrawn 24 h after presentation to the emergency room and the patient expired from a cardiac and respiratory arrest thought secondary to brain stem herniation and severe hypoglycemia.
Autopsy Findings: The only remarkable findings were on microscopic examination of the brain, which revealed changes consistent with prolonged hypoglycemia. Toxicology results were negative.

Case 1011. Acute insulin ingestion and parenteral: undoubtedly responsible.
Scenario/Substances: A 26-y/o female with an insulin pump for diabetes mellitus found unresponsive by her husband at home. Her husband reported her blood glucose was "unreadable." EMS administered glucagon and glucose, intubated, and ventilated the patient. Repeat glucose was 40 mg/dL. She was transported to the ED.
Past Medical History: Insulin-dependent diabetes, hypothyroidism, seizure disorder, systemic lupus erythematosus, bipolar disorder. Medications were insulin and buspirone.
Physical Exam: Patient was unresponsive, BP 84/42, HR 144.
Laboratory Data: Glu 512. Opiates, ethanol, acetaminophen, barbiturates, stimulant amines, and benzodiazepines BLQ.
Clinical Course: The patient was admitted to the ICU and started on vasopressors for hypotension. Brain MRI revealed diffuse cerebral edema treated with mannitol. She remained unresponsive to pain, developed generalized seizures, and expired on Day 4. Autopsy was not performed.

Case 1015. Unknown chronicity metformin ingestion: undoubtedly responsible.
Scenario/Substances: A 38-y/o male presented to the ED after having ingested metformin and acetaminophen 300 mg/codeine 30 mg tablets (amounts unknown) 3–4 h prior to presentation.
Past Medical History: Diabetes, unknown psychiatric disorder, previous suicide attempts.
Physical Exam: Patient was awake but unable to answer questions, HR 89, BP was initially within normal limits but dropped while in the ED (values not known).
Laboratory Data: ABG-pH 6.8, glu 40, Cr 2.2, HCO_3 4, lactate 30, acetaminophen 18 mcg/mL (~5 h post-ingestion). Ethylene glycol, alcohol, methanol, isopropyl alcohol, and aspirin all BLQ.
Clinical Course: In the ED the patient received D_{50} for hypoglycemia, bicarbonate, and a loading dose of fomepizole. He rapidly deteriorated requiring intubation and multiple vasopressors. *N*-Acetylcysteine was started. Despite IV bicarbonate supplementation he remained persistently academic (pH 6.5). He was started on continuous veno-venous hemodialysis but ECG deteriorated into PEA and resuscitation was unsuccessful. No autopsy was done.

Case 1016. Acute insulin parenteral: undoubtedly responsible.
Scenario/Substances: A 42-y/o male, was discovered unconscious at his home along with a suicide note and multiple empty bottles of regular insulin and used syringes.
Past Medical History: Diabetes mellitus, alcohol abuse.
Physical Examination: Comatose, limited withdrawal of extremities from pain. No areas of subcutaneous swelling from insulin injection were identified.
Laboratory Data: After initial glucose administration

Na 134	Cl 105	BUN 11	Glu 344
K 3.3	HCO_3 21	Cr 1.0	

ABG-pH 7.3/pCO_2 29/pCO_2 186/HCO_3 17, O_2 sat 99% (room air) Hct 41.3, Hgb 13.5, WBC 11, platelets 250, lactate 4.3, CK 393, AST 39, ALT 24, acetaminophen and salicylate both BLQ.
Clinical Course: Upon arrival in the ED the patient was profoundly hypoglycemic (<40 mg/dL) and given four ampoules of Dextrose50 and Dextrose10 IV dextrose continuous infusion. The patient was tachycardic and hypertensive, but normalized with glucose administration. The patient did not regain consciousness. CT head noted gross evidence of cerebral edema, initial EEG showed diffuse slowing, but no focal seizure activity. The patient was given prophylactic phenytoin. On Day 2, the glucose level was in the range 150–200 and the dextrose infusion was reduced over the next 2 days. No improvement in neurological function was observed and after neurology consultation and based on the patient's long-term prognosis, the family elected supportive care only. The patient expired 2 days later. Autopsy was not available.

Case 1033. Chronic hydroxyurea ingestion: undoubtedly responsible.
Scenario/Substances: An 84-y/o female presented to the ED complaining of weakness and bilateral lower leg numbness.
Past Medical History: The diagnosis of essential thrombocytosis was made 1 month before presentation (platelets 2.2 million/cu mm, WBC 30,000). Treatment with hydroxyurea 500 mg PO BID and aspirin 325 mg PO QD was started which reduced platelets to 1.3 million/cu mm and WBC to

10,000. Cr clearance 60 mg/mL. Hydroxyurea was increased to 1 g PO BID.
Physical Examination: Awake, alert female with mild tachypnea, with a normal physical and neurologic exam.
Laboratory Data: WBC 100 cells/cu mm, Hgb 3.4 g/dL, Hct 9.6%, platelets 1 K/cu, Cr 2.8, lactate 10.9.
Clinical Course: The diagnosis of pancytopenia, with life-threatening thrombocytopenia was made. Fluid boluses were given and 6 U of platelets and 2 U of packed RBCs transfused. At the beginning of the transfusion the patient became more obtunded, hypoxic, and tachypneic and required endotracheal intubation. Hypotension improved with the RBC infusion. Over 5 days in the ICU the patient received several platelets, fresh frozen plasma, and red cell transfusions as well as continuous IV vasopressors for refractory hypotension. With continued hemodynamic instability, the patient's family and medical team withdrew therapy. The patient expired on Day 5.
Autopsy Findings: Pending.

Case 1056. Acute quetiapine ingestion: probably responsible.
Scenario/Substances: A 21-y/o male, last seen 12 h before, had a seizure when his family tried to awaken him. Near him were an empty bottle of quetiapine and a bottle of escitalopram with some medication still in it. EMS gave naloxone, glucose, and a benzodiazepine and transported him to the ED.
Past Medical History: Depression, current medication quetiapine.
Physical Exam: Unresponsive, BP 111/47, HR 142, RR 16.
Laboratory Data: ABG-pH 7.070/pCO_2 44/pO_2 130 / HCO_3 12.4, O_2 sat 97% (on O_2), base deficit 17.5, glu 205, INR 1.3, ammonia 146, CP 874, WBC 14.8. A urine toxicology screen was positive only for benzodiazepines.
Clinical Course: Shortly after arrival at the ED the patient had cardiac arrest with PEA. Resuscitation was unsuccessful and he expired.
Autopsy Findings: Subclavian blood postmortem quetiapine 14.78 mg/L, no other drugs or ethanol was detected. Cause of death was "suicide."

Case 1066. Unknown chronicity haloperidol parenteral: undoubtedly responsible.
Scenario/Substances: An agitated 35-y/o male complained of delusions and hallucinations and was admitted to psychiatric ED.
Laboratory Data: Urine was positive for cocaine. CK post-cardiac arrest 943 and 86,100 on Day 2, troponin I was 0.01 postarrest and 11 on Day 2.
Clinical Course: In the ED the patient received lorazepam 2 mg PO and haloperidol 10 mg IM. Approximately 2 min after haloperidol, the patient experienced a cardiac arrest. ACLS protocols resulted in successful resuscitation and transfer to the ICU, with cooling measures initiated for *T* 41.8°C and continued vasopressors. Despite all measures the patient expired on Day 2.
Autopsy Findings: Sarcoidosis with granulomas in the lung and left atrioventricular node. Blood cocaine 0.042 mg/L, ecgonine methyl ester 4.5 mg/L, benzoylecgonine 0.027 mg/L. Cause of death was cocaine-induced excited delirium in combination with mechanical compression during attempted restraint.

Case 1128. Acute methylenedioxymethamphetamine ingestion: undoubtedly responsible.
Scenario/Substances: An 18-y/o female ingested an unknown quantity of 3,4-methylenedioxy-*N*-methamphetamine (MDMA). The patient presented to the ED complaining of headache for 2 h and difficulty in walking. The patient desaturated, became unresponsive, bradycardic, and required intubation.
Past Medical History: Prior use of MDMA.
Physical Exam: BP 110 systolic, HR 60, *T* 36°C. Pupils initially reactive to light and then became dilated and nonreactive.
Laboratory Data: WBC 11.4, Hgb 16.3, Hct 48, platelets 234

Na 124	Cl 91	BUN 9	Glu 134
K 3.0		Cr 0.5	

ABG-pH 7.39/pCO_2 33/pO_2 242/HCO_3 20, O_2 sat 100%. Ionized calcium 1.09 mmol/L, phosphorous 0.9 mg/dL, Mg 1.4, lactate 2.6, and CK 560. Spot urine test for MDMA was 5, 724 ng/mL; serum test for MDMA 12 h after arrival 29 ng/mL. CT head revealed cerebral edema, loss of gray–white differentiation, and herniation.
Clinical Course: Patient was admitted to the ICU and required maximum doses of dopamine and epinephrine to maintain BP. Initial treatment with hypertonic saline for hyponatremia was discontinued when the Na was in excess of 170. Diabetes insipidus developed prior to determination of brain death. Apnea test failed and the patient expired 53 h after arrival in the ED.
Autopsy Findings: Cerebral edema (brain weight 1,250 g in 48 kg patient) particularly involving the midbrain and medulla. Postmortem toxicology testing was negative for acidic/neutral and basic drugs by gas chromatography/mass spectrometry and opiates by radio immune assay, as well as alcohols, whereas an antemortem specimen was confirmed positive for MDMA (negative for methylenedioxyamphetamine, MDA).

Case 1132. Acute methamphetamine ingestion and inhalation: undoubtedly responsible.
Scenario/Substances: A 20-y/o female was stopped for a traffic violation, admitted to smoking methamphetamine, and became agitated while in custody causing police to suspect she had ingested methamphetamine to conceal possession. EMS arrived at the jail and found the patient awake and alert, extremely agitated, diaphoretic, unable to sit still, and was tensing both arms and extending them out straight. She was able to obey requests to relax, but would then quickly go back to the rigid state. She was alert and oriented × 3 with dilated pupils, extremely agitated, fidgeting, with rigidity and diaphoresis. BP was 252/110; HR 202; RR 30; O_2 sat 88%; An ECG en route to the ED revealed SVT with a HR of 200.

Laboratory Data: ABG-pH 7.08/pCO_2 60/pO_2 40.9, urine drug screen, positive for amphetamines and cannabinoids. In the second HCF: INR 1.7, APTT 35, CK > 24,000, Cr 2.1, CO_2 16, AST 466, ALT 72, Alk phos 113, pH 7.13, lactate 3.7, K 5.7, CK-MB > 300 ng/mL, troponin I > 100, free methamphetamine (urine), 0.94 nmol/L; normethamphetamine (urine), 6.23 nmol/L.
Clinical Course: In the ED, the patient was nonverbal, diaphoretic, with pinpoint pupils, myotonic in all extremities and opisthotonic. BP was 252/110, HR 202, *T* 42°C. She confirmed she had swallowed and smoked methamphetamine. Oxygen was provided and large doses of midazolam and diazepam administered with a lorazepam infusion. The patient was intubated for worsening respiratory function, a cooling blanket and ice lavage was initiated and the patient was paralyzed with rocuronium and vecuronium, a lidocaine infusion was started, and the patient was transferred to a second HCF for ICU care. In the ICU neuromuscular paralysis and ventilation was continued, seizures continued despite benzodiazepines and phenobarbital and *T* 42°C despite cooling measures. By midday of Day 1, seizures had subsided but the acidosis and hyperthermia were refractory to all measures. The patient expired early evening of Day 1. Autopsy was not available.

Case 1135. Acute cocaine ingestion and inhalation: undoubtedly responsible.
Scenario/Substances: A 21-y/o male had a seizure followed by a cardiac arrest after ingesting 14 g of rock cocaine.
Past Medical History: "Spell" 2 years ago diagnosed as syncope versus seizure, without follow-up.
Laboratory Data: ABG-pH 6.7/pCO_2 81/pO_2 120/HCO_3 14, O_2 sat 91%. Urine drug screen was positive for cocaine metabolites and negative for THC.
Clinical Course: The patient initially reported that he ingested marijuana. He was alert and eager for discharge, with BP 167/112 and HR 133, prior to signing out AMA. Following departure from the ED, he was seen running through a restaurant requesting water before having a witnessed seizure. En route to the ED he had a cardiac arrest and was intubated and resuscitated, glu 129. On second ED presentation, he was initially unresponsive, pupils fixed and dilated. He quickly developed PEA, followed by hypotension, and later hypertension. T 37.8°C (rectal). Treatment included epinephrine boluses, atropine, sodium bicarbonate, and IV crystalloid. He appeared to make some ventilatory effort before being transferred to the ICU where he was sedated with fentanyl and lorazepam. After epinephrine was discontinued, he continued to be hypertensive for about 3 days with minimally reactive pupils and frequent myoclonic jerks. Hydralazine and labetalol were administered and hypertension eventually improved with HR ~50. On Day 3, brain CT showed cerebral edema, Day 4 pupils were fixed and dilated and he was only intermittently breathing over the ventilator. Brain death formally diagnosed on Day 9, comfort measures instituted on Day 13.
Autopsy Findings: Anoxic encephalopathy secondary to cocaine toxicity. Findings included cerebral edema and clear plastic baggie found in stomach. Urine drug test positive for cocaine and cocaine metabolites.

Case 1139. Acute methylenedioxymethamphetamine by an unknown route: probably responsible.
Scenario/Substances: A 22-y/o female was observed using Ecstasy (MDMA) and shortly thereafter had a witnessed syncopal episode. EMS found the patient in cardiac and respiratory arrest. She also had oxycodone/acetaminophen pills with her.
Past Medical History: Status post-cardiac transplant 2 years ago for cardiomyopathy and receiving tacrolimus therapeutically.
Physical Exam: She had significant periorbital edema. After return of spontaneous circulation, she was comatose and flaccid with intermittent lower extremity twitching. HR, 136; BP, 120/76, RR 20, *T* 37.2°C (r).
Laboratory Data: Total CK 117; troponin 0.43; myoglobin 403 ng/mL.
Clinical Course: Paramedics found the patient in ventricular fibrillation, followed by asystole. The patient was resuscitated and given atropine, lidocaine, and started on a dopamine drip. She had frequent PVCs and torsades (treated with magnesium) and her urine output steadily decreased during hospitalization. She was intubated, placed on a ventilator. Later the same day, she experienced seizures and her blood pressure and heart rate decreased. Prior to cardiac arrest, the patient developed a wide complex QRS and then asystole. Efforts to resuscitate her were unsuccessful. The head CT demonstrated diffuse cerebral edema with signs of herniation.
Autopsy Findings: Methylene dioxyamphetamine 0.28 mg/L (>1 is "toxic"), this was not the likely cause of death, but was likely contributory to her death. Lidocaine was also reported (likely from iatrogenic use). No other drugs of abuse or ethanol was found. No methylene dioxymethamphetamine was found (methylene dioxymethamphetamine is MDMA or Ecstasy).

Case 1143. Acute cocaine ingestion: undoubtedly responsible.
Scenario/Substances: A 24-y/o male presented to the ED and reported he had swallowed 4 g of cocaine.
Past Medical History: Substance abuse.
Physical Exam: BP 116/105, HR 110 to 113.
Laboratory Data: ABG-pH 6.74, Na 157, CO_2 14, Ca 13.2, Glu 156, protein 9.5 g/dL, albumin 6.1 g/dL. Urine screen was positive for THC and cocaine. Serum acetaminophen, salicylate, and ethanol were all BLQ.
Clinical Course: The patient arrested shortly after arrival in the ED and began to seize. IV fluids, lorazepam 6 mg and sodium bicarbonate (three ampoules) were given. Rapid sequence intubation followed etomidate 30 mg and succinylcholine 100 mg IV. He was placed on a ventilator, given epinephrine 6 mg and atropine 3 mg and a dose of activated charcoal. During CPR, ECG changed from ventricular tachycardia to asystole to PEA and back to asystole. The patient had no spontaneous respirations and expired in the ED.

Autopsy Findings: Cause of death was cocaine toxicity. Blood cocaine 5.64 mg/L, ecgoninemethylester 30.5 mg/L, and benzoylecgonine 14.0 mg/L.

Case 1158. Unknown chronicity methylenedioxymethamphetamine by an unknown route: undoubtedly responsible.
Scenario/Substances: A 30-y/o male was found dead in his home 5 days after last being seen alive. Found with the body were multiple unknown tablets, buprenorphine/naloxone, alprazolam, zolpidem, cyclobenzaprine, bupropion, as well as oral and injectable anabolic steroids apparently purchased over the Internet.
Past Medical History: He had a history of polysubstance abuse (cocaine, Ecstasy, marijuana), depression, and a cardiac dysrhythmia due to prolonged Ecstasy use. His prescribed medications included paroxetine, alprazolam, and acetaminophen/hydrocodone. Over-the-counter medications used by the patient included "energy boosters" and dietary supplements.
Physical Exam: The patient was found dead and the body was in moderate decomposition.
Autopsy Findings: The cause of death was determined to be cocaine, methadone, and MDMA toxicity. Additional finding was severe coronary atherosclerosis. Analysis of bloody fluid found 3,4-methylenedioxymethamphetamine 0.54 mg/L, 3,4-methylenedioxyamphetamine 0.27 mg/L, cocaine 0.047 mg/L, benzoylecgonine 2.0 mg/L, cocaethylene <0.02 mg/L, and methadone 0.45 mg/L. Liver tissue contained methadone 4.4 mg/kg and ethanol 80 mg/dL (possibly from decomposition).

Case 1168. Acute-on-chronic cocaine by an unknown route: undoubtedly responsible.
Scenario/Substances: A 33-y/o female with a history of cocaine abuse was found running aimlessly and barefoot, midazolam 10 mg was given when EMS arrived on the scene.
Past Medical: Cocaine abuse.
Physical Examination: On EMS arrival, the patient was delirious, diaphoretic, and agitated. She received midazolam 10 mg. In the ED, BP 70 systolic, RR 39, and *T* 105.9°F. EKG showed a wide complex tachycardia with HR 118 and a QRS interval 148.
Laboratory Data: ABG-pH 6.8/pCO_2 76. His pH subsequently increased to 7.37 and pCO_2 increased to 7.37 and pCO_2 decreased to 46 after administration of sodium bicarbonate. Na 149, K 6.1, Cr 1.9, and troponin 0.2. Repeat labs several hours later demonstrated a pH of 7.39, pCO_2 33, anion gap 18, K 2.2 mEq/L, Cr 3.2, CK 27,000, fibrinogen 150 mg/dL, and d-dimer >20 mcg/mL.
Clinical Course: In the ED the patient was intubated and was sedated with lorazepam. The patient received 13 ampoules of sodium bicarbonate and was started on a sodium bicarbonate infusion and cooling with mist and fans. His QRS narrowed and HR decreased to 88. CT of the head/abdomen/pelvis was unremarkable and he was transferred to the ICU. Several hours later, the patient became hypotensive with a systolic BP in the 60s despite fluids and vasopressors. His ECG at that time demonstrated narrow complex tachycardia with a HR in the 110s. He began to develop disseminated intravascular clotting and rhabdomyolysis with worsening renal function and a CPK of 27,000. The patient was also noted to have grossly bloody stools, urine, and NG tube suction. He developed PEA and was initially resuscitated, but several hours later, he became pulseless again and resuscitation was not successful. Autopsy was not available.

Case 1170. Acute methylenedioxymethamphetamine by an unknown route: undoubtedly responsible.
Scenario/Substances: A 35-y/o male was driving with his wife when he slammed on brakes and slumped over the steering wheel.
Past Medical History: Methamphetamine and Ecstasy abuse.
Clinical Course: Upon arrival in ED the patient went into cardiopulmonary arrest. CPR per ACLS protocols was carried out but he could not be resuscitated and was pronounced dead.
Autopsy Findings: Brain revealed 60 mL of subarachnoid hemorrhage extending to the lateral surfaces of both hemispheres and at the base of the brain. On dissection, a cerebral artery aneurism was encountered in the anterior communicating artery. Blood and tissue were positive for cocaine, MDMA, and methamphetamine. Cardiac tissue MDA 0.032 mg/L, MDMA 0.857 mg/L, methamphetamine 3.365 mg/L, and benzoylecgonine 0.457 mg/L.

Case 1178. Acute cocaine by an unknown route: undoubtedly responsible.
Scenario/Substances: A 36-y/o male was brought to ED by police because of agitation and disorientation after he had assaulted the officer with a lead pipe.
Physical Exam: Patient became unresponsive in the ED. BP 120/60, HR 155, *T* 108°F. He was noted to have some white powder around the nose.
Laboratory Data: CK 2,000 U/L, ABG-pH 7.14/pCO_2 53/HCO_3 13. INR 1.0. Urine drugs of abuse screen: positive for cocaine. Ethylene glycol and methanol negative.
Clinical Course: Patient underwent rapid sequence intubation with etomidate, succinylcholine, midazolam, and fentanyl on presentation. He immediately was cooled using external cooling measures. Repeat *T* was 105°F a few hours later. He became hypotensive and required vasopressors. He continued to suffer from persistent lactic acidemia (lactate peak 9 mmol/L). He developed disseminated intravascular clotting with bleeding from IV sites and peak INR 14 and received multiple transfusions. He developed anuria and renal failure with a serum Cr 4. He was treated with continuous veno-venous hemodialysis (CVVHD). By Day 4, the patient was off all sedatives but made no neurological recovery and remained comatose with no central reflexes or pupillary reaction. Head CT scan was negative. He developed hypoglycemia that required D50W boluses. He died on Day 8. Autopsy was not performed.

Case 1183. Acute cocaine ingestion: undoubtedly responsible.
Scenario/Substances: A 37-y/o male was arrested for shoplifting and possession of controlled substances. He was noted to be "intoxicated" at the time of his arrest and was kept in a holding cell where he was found unresponsive 27 h after his arrest. He was taken to the local ED where resuscitation attempts were unsuccessful. There were smudged, unidentifiable tablets in his pockets.
Autopsy Findings: Death was attributed to bronchopneumonia complicating oxycodone, methadone, and cocaine toxicity. The pulmonary findings were more likely secondary to hypoxia and aspiration injury with inflammation as evidenced by the talc noted on microscopic exam. Crumpled cellophane with small areas of possibly white powder in the creases was found in the stomach. The larger airways showed acute inflammation with focal ulceration of the epithelium. There was polarizable material seen in areas adjacent to the airways (possibly talc). Postmortem aorta blood analysis revealed: ethanol negative, alprazolam 0.1 mg/L, cocaine 0.059 mg/L, benzoylecgonine 1.2 mg/L, methadone 0.085 mg/L, oxycodone 0.80 mg/L, 0.55 mg/L (vena cava). Liver tissue methadone 0.35 mg/kg.

Case 1212. Chronic methamphetamine inhalation: contributory.
Scenario/Substances: A 52-y/o male was spraying for roaches in his garage when he developed acute severe shortness of breath and chest pain. There was no vomiting, diarrhea, or seizure. No container was available. EMS transported him to the ED.
Past Medical History: Cigarette smoker, methamphetamine abuse, and was trying to quit.
Physical Exam: Appeared acutely ill, cyanotic with air hunger. BP 92/81, HR 146, RR 30. Pulses initially symmetric but on reexamination pulses were decreased in the left upper extremity.
Laboratory Data:

Na 137	Cl 112	BUN 10	Glu 225
K 3.1	HCO_3 19	Cr 1.2	

Urine toxicology screen was positive for methamphetamine. CXR showed a wide mediastinum, CT chest revealed a Type B aortic dissection.
Clinical Course: The patient was transported urgently to a tertiary care hospital for management of the aortic dissection, where he became unresponsive and hypotensive. He expired shortly after arrival.
Autopsy Findings: The medical examiner submitted a specimen to the crime laboratory that showed methamphetamine 0.921 mg/L and amphetamine 0.066 mg/L (source and timing not specified).

Case 1239. Acute vitamin K parenteral: contributory.
Scenario/Substances: A 71-year-old male presented to the ED with a 1-week history of weakness, dyspnea on exertion, and black stools.
Past Medical History: GI bleeding, coronary artery disease, hypertension, atrial fibrillation, and congestive heart failure. Medications: coumadin, spironolactone, glyburide, iron, and erythromycin.
Physical Exam: Pale, BP 98/52, HR 74, RR 20. Nontender abdomen, no gross blood on rectal exam.
Laboratory Data: Hgb 5.8, Hct 17, INR 3.5, Na 134, K 5.0, BUN 89, and Cr 3.4. Abdominal ultrasound showed ascites.
Clinical Course: Patient was placed on monitor and blood products were ordered. During an infusion of 0.5 mg of IV vitamin K the patient developed bradycardia and then became pulseless and apneic. Resuscitation was initiated with epinephrine and atropine that increased HR but widened the QRS. Sodium bicarbonate and calcium were given but ventricular fibrillation developed and then asystole from which resuscitation was not successful. Autopsy was not performed.

Abbreviations and normal ranges for abstracts

Disclaimer – all laboratories are different; units and normal ranges are provided for general guidance only. These values were taken from Harrison (9), Goldfrank (10), or Dart (11).

Serum electrolyte summary table

Sodium (136–146)	Chloride (102–109)	BUN (7–20 mg/dL)	Glucose (75–110 mg/dL)
Potassium (3.5–5)	Bicarbonate (22–26)	Creatinine (0.5–1.2 mg/dL)	

serum electrolytes have units of mEq/L = mmol/L.

ABG = arterial blood gases
ABG-pCO_2 = partial pressure of carbon dioxide (38–42 mmHg)
ABG-*p*H = hydrogen ion concentration (7.38–7.42 mmHg)
ABG-pO_2 = partial pressure of oxygen (90–100 mmHg)
ACLS = advanced cardiac life support, protocol for the provision of cardiac resuscitation
Alk phos = alkaline phosphatase (13–100 U/L)
ALT = alanine aminotransferase (7–41 U/L) = SGPT
AMA = against medical advice
Ammonia = 250–80 mcg/dL = 15–47 mcmol/L
ARDS = acute respiratory distress syndrome
AST = aspartate aminotransferase (12–38 U/L) = SGOT
Bicarbonate = 22–26 mEq/L
Bilirubin = total 0.3–1.3 mg/dL, direct 0.1, 0.4 mg/dL, indirect 0.2, 0.9 mg/dL
BLQ = below the limit of quantitation
BP = blood pressure, systolic/diastolic, mmHg (Torr)
BUN = see urea nitrogen
°C = degrees centigrade
Ca = calcium 8.7–10.2 mg/dL)
CK = creatinine kinase (CPK), total: 39–238 U/L females and 51–294 U/L males
Cl = chloride (102–109 mEq/L)
CPR = cardiopulmonary resuscitation
Cr = creatinine (0.5–0.9 mg/dL females and 0.6–1.2 mg/dL males)
CT = computed tomography

CVA = cerebrovascular accident
CVVHD = continuous veno-venous hemodialysis
CXR = chest radiograph, chest X-ray
Day = when capitalized, Day = hospital day, i.e., days since admission
ECG = electrocardiogram, leads = I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6
ED = emergency department, in these abstracts refers to the initial health-care facility
EEG = electroencephalogram
EMS = emergency medical services, the first responders
g/dL = grams per deciliter
GCS = Glasgow Coma Score
Glu = glucose, fasting (75–110 mg/dL)
HCF = health-care facility
HCO_3 = bicarbonate
HCP = health-care provider
Hct = hematocrit (35.4–44.4% females and 38.8–46.4% males)
Hgb = hemoglobin (12.0–15.8 g/dL females and 13.3–16.2 g/dL males)
HIV = human immunodeficiency virus
HR = heart rate, beats/min
h = hour(s)
ICU = intensive care unit
IM = intramuscular
INR = international normalized ratio (0.8–1.2)
IU/L = international units per liter
IV = intravenous
K = potassium
L = liter
Lactate = lactic acid (4.5–14.4 mg/dL arterial and 4.5–19.8 mg/dL venous)
Leukocyte count = white blood count (3.54–9.06 $10^3/mm^3$)
mcg/dL = micrograms per deciliter
mcg/L = micrograms per liter
mcg/min = micrograms per minute
mcg/mL = micrograms per milliliter
mcmol/L = micromoles per liter
MDA = 3,4-methylenedioxyamphetamine
MDMA = methylenedioxymethamphetamine (Ecstasy)
mEq = milliequivalents
mEq/L = milliequivalents per liter
Mg = magnesium (1.5–2.3 mg/dL)
mg = milligrams
mg/dL = milligrams per deciliter
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
min = minutes
mmol/L = millmoles per liter
mOsm/kg = milliosmoles per kilogram
mOsm/L = milliosmoles per liter
MRI = magnetic resonance imaging
ms = milliseconds
NG = nasogastric
ng/mL = nanograms per milliliter
NS = normal saline
O_2 sat = oxygen percent saturation (94–100% at sea level)
OR = operating room
Osm = osmole
PC = poison center (PCC or Poison Control Center)
PEA = pulseless electrical activity
PEEP = positive end expiratory pressure
Platelets = platelet count 150–400 $\times$ 10^9/L
PO = per os ("by mouth" in Latin)
Potassium = 3.5–5 mEq/L
PT = prothrombin time, INR is preferred, but PT may be used if INR is not available
PTT = partial thromboplastin time (26.3–39.4 s)
QRS = ECG QRS complex duration (60–100 ms)
QT = Q to T interval on the ECG waveform, varies with heart rate
QTc = QT interval corrected for heart rate, usually QTcB = $QT/RR^{1/2}$ (Bazett correction) 1- to 15-y/o <440 ms, adult male <430 ms, and adult female <450 ms
RBC = red blood cell(s)
RR = respiratory rate, breaths per minute
s = seconds
SR = sustained release
SVT = supraventricular tachycardia
T (oral) = temperature (oral; 36.4 and 37.2°C)
T (rectal) = temperature (rectal; 36.4 and 37.2°C)
T (tympanic) = temperature (tympanic; 36.4 and 37.2°C)
THC = tetrahydrocannabinol
Troponin I = normal range (0–0.08 ng/mL), cutoff for MI > 0.04 ng/mL
U/L = units per liter
UA = urinalysis
Urea nitrogen (BUN) = 6–17 mg/dL
VT = ventricular tachycardia
WBC = white blood count, see leukocyte count
y/o = years old