

2007 Annual Report

A message from the Medical Director

The Regional Center for Poison control and Prevention Serving Massachusetts and Rhode Island provides a critical public service – the management and treatment of poisoning exposures. This year we helped over 61,000 individuals and healthcare providers understand and treat poison exposures, ranging from the simple to the life-threatening.

Our services are confidential and we are focused on exceptional patient care and customer service. Highly trained poison specialists are available to help answer questions 24 hours a day, 7 days a week at no charge. Not only do we offer reassurance to parents of children who have gotten into too much toothpaste, or share our knowledge with elderly callers who have concerns about their medications, but we also offer our expertise in clinical consults to medical professionals throughout both states on complicated medical cases.

The Poison Center is an also a cost saving mechanism for the treatment and triage of poison exposures. Over 75% of all cases in Massachusetts are successfully treated at the site of the exposure – thereby eliminating the need for those callers to seek care at their local emergency department.

It is unknown who and when we will help next, but we do know that poisonings happen – and we are always committed and prepared to react appropriately. We are charged to meet the challenges of the year ahead as we grow stronger as an organization in our work to serve the public and healthcare professionals of Massachusetts and Rhode Island.

The Poison Center recognizes that poisonings are a preventable injury. In response, the Poison Center's public education committee continues its work to reduce both unintentional and intentional poisonings through prevention education and public awareness of the Center's services.

I hope you'll find our 2007 annual report useful, as a tool to better understand who we are, and what we are able to do for the people of our region.

Michele Burns Ewald, MD
Medical Director

Executive Report

2007 was an active year for the Regional Center for Poison Control and Prevention Serving Massachusetts and Rhode Island.

- In 2007, the Poison Center managed over 61,255 poison exposure and general information calls, which translates to almost 175 calls every day.
- 9,750 of the exposure calls, often from hospital healthcare professionals, required repeated follow up communication to provide the appropriate care and management of the patient.
- Over 75 physicians, nurses, and pharmacists were trained in the discipline of Toxicology and Pharmacology so that the care of future poisoned patients is ensured.

The Poison Center remains an important element in both the public safety and health systems of Massachusetts and Rhode Island by reducing the number, severity and frequency of both intentional and unintentional poisoning exposures. The Center works closely with the Departments of Health in both states to educate and inform the public with targeted direct education and outreach regarding the preventability of poisonings, with various media campaigns, and other advertising opportunities. Every month between 15,000 and 25,000 educational materials are distributed to the public including such items as phone stickers, magnets, and informational brochures advertising the toll-free emergency hotline phone number, **(800) 222-1222**.

The Center continues to be a resource to federal, state and local officials in the identification and management of biological as well as chemical exposures. In addition, the Center participates in local and nationwide toxicology surveillance systems targeting the early identification of a potential toxic exposure. In tandem with the Massachusetts Department of Public Health and the Rhode Island Department of Health, we are continuously working to define and increase our capabilities and technologies. As such, the MA & RI Regional Center for Poison Control and Prevention is prepared to play a vital role in any potential large or small scale emergency. The Center's staff is committed to continually enhancing their knowledge base with subsequent growth and presence in the emergency preparedness arena.

As national security continues to be of foremost concern, the Center's resources remain a vital part of the public health response to chemical and biological terrorism threats as well as health outbreak management. Accordingly, all segments of the population, including the general public, law enforcement, legislative bodies, first responders, health care providers, and public health specialists have utilized the poison control center as an emergency preparedness resource. The Center participates in Epi-X, and the National Poison Data System, both of which are monitored by the CDC for potential early detection of a mass toxic exposure or bioterrorism response.

Locally, the Center provides its resources for regional exercises that test emergency protocols and identify gaps in preparedness. We remain committed to maintaining a level of excellence in emergency preparedness and continually train our health care professionals in such areas of pandemic medication management and biological warfare issues so that they can function as a knowledge base resource in a time of need.

This report provides information on the demographics and substances involved in poisonings as reported to the Center during 2007, as well as the treatments and outcomes of these cases.

Services:

- Emergency Hotline for Public # **(800) 222-1222**
- Telephone Consult Service for Health Care Facilities
- Children's Hospital Boston In-Patient Toxicology Service
- Beth Israel Deaconess Medical Center Consult Toxicology Service
- Harvard Medical Toxicology Fellowship

- Public Education and Outreach
- Professional Education
- Data Analysis
- Clinical Research

Please visit our website at www.maripoisoncenter.org for additional information.

Mission:

The mission of the Regional Center for Poison Control and Prevention is to provide assistance and expertise in the medical diagnosis, management and prevention of poisonings involving the people of Massachusetts and Rhode Island.

By maintaining its excellent standard of care in both clinical research and professional development, the Center continually strives to improve the quality of medical care given to its patients.

In addition, the Center develops and implements public education and information campaigns to prevent injuries due to intentional and unintentional poisonings.

What is a poisoning?

A poisoning is caused by any substance that has a toxic, or damaging, effect to the tissues and/or systems of the body upon exposure. Exposures can occur through ingestion, inhalation or through dermal and ocular contact.

Any substance may become a poison if used incorrectly, or in the wrong amount, or by a person with a particular sensitivity to the product. Common poisons include household products, industrial and environmental chemicals, medications (prescription, over-the-counter, veterinary, herbal), illicit drugs, and bites and stings.

Budget

In fiscal year 2007, the annual operating budget for the Regional Center for Poison Control and Prevention was over \$2 million. Most of the funding for Center operations is provided by the Massachusetts Department of Public Health and Rhode Island Department of Health, with additional funding streams from federal grants, hospital partners and pharmacy training programs. The Center continues to receive federal funds appropriated from the HRSA Poison Control Center Enhancement and Awareness Act of 2000. The following table highlights revenue and expenditures for fiscal year 2007.

Fiscal Year 2007 (7/1/06-6/30/07)

Operating Revenue

Department of Public Health, Massachusetts (7/1/06-6/30/07)	\$	577,618
Department of Health, Rhode Island (8/1/06-7/31/07)	\$	200,000
Federal Stabilization Grant (9/1/06-8/31/07)	\$	516,020
Funding Partners (7/1/06-6/30/07)	\$	157,912
Member Hospitals	\$	100,110
Pharmacy Training Programs	\$	3,900
Other Contracts	\$	53,902

Subtotal	\$	1,451,550
Children's Hospital In-Kind	\$	754,806
TOTAL	\$	2,206,356

Direct Expenses

Salaries and Benefits	\$	1,319,146.92
Telephone	\$	16,953.21
Printing and Postage	\$	37,331.55
Software Licensing Fee	\$	12,415.97
Travel	\$	20,654.73
Educational Materials	\$	3,232.06
Supplies	\$	22,658.56
Dues/Memberships	\$	11,280.87
Other	\$	10,729.67
Subtotal	\$	1,454,403.54

Children's Hospital In-Kind	\$	754,806.00
TOTAL	\$	2,209,209.54

BALANCE:	\$	(2,853.54)
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Public Education

The Poison Control Center has an active public education program whose goal is to reduce both unintentional and intentional poisonings through prevention education and public awareness of the Center's services.

To conduct effective poison prevention outreach, the Center works with injury prevention professionals from the Massachusetts Department of Public Health, Children's Hospital Boston, Councils on Aging, and community organizations from the Center's service area. By examining both current poisoning data at the state level and also statistics from poison center calls, high risk populations can be targeted for education.

In 2007, education efforts targeted medication management and carbon monoxide poisoning. In March, the Center sponsored a successful Poison Prevention Week. Strategies to educate the community included a public transit poster campaign addressing medication management, press releases in Massachusetts and Rhode Island, and poison prevention displays at various hospitals across the region.

In the fall of 2007 the public education program partnered with the Massachusetts Fire Marshall's office to issue a joint press release regarding carbon monoxide poisoning. As a result of this announcement, there was a feature on WUMB public radio and Boston Neighborhood Network News highlighting the dangers of carbon monoxide.

The education program at the poison center continues to devote time to increase consumer awareness around poisonings. Presentations were delivered at hospital safety fairs, corporate wellness events, councils on aging and other community events. The public education program disseminates seasonally appropriate press releases throughout the year. In 2007, school health nurses across the state received materials to help

integrate poison prevention into their programs. The center distributed over 300,000 education materials to the public through outreach activities and the recently redesigned website (www.maripoisoncenter.org).

The center remains committed to training health care professionals on poisoning issues. In 2007, presentations were delivered to colleagues at the Massachusetts Suicide Prevention Conference, the State WIC Directors meeting, and the School Health Summer Institute.

In recent years, the region served by the center has seen an increase in poisoning deaths. It is critical that the center's public education program continue to partner with key agencies and organizations to provide effective poison prevention education. With the support and guidance of the Health Education Subcommittee, the public education program looks forward to developing additional partnerships and programming in 2008.

Prevention:

Why and how are poisonings preventable?

Any substance may become a poison if it is used incorrectly, in the wrong amount, or by a person with a particular sensitivity to the product. However, the public can prevent many poison exposures by adopting techniques and methods to avoid poisonings and by gaining a general awareness of how poisonings occur. The Regional Poison Center develops public education resources and implements information campaigns that highlight the dangers of poisonings in order to ensure the safety of the local community. In order to maximize awareness and outreach, the Center remains proactive in encouraging the public to utilize our medical expertise and educational resources to prevent injuries due to unintentional and intentional poisonings.

Current Educational Materials:
Poison Center Brochures (English & Spanish)
Telephone Stickers (English & Spanish)
Refrigerator Magnets
Posters (Inhalant Abuse, Poison Prevention Week, Candy vs. Medicine)
Medicine Passports for Seniors
Clinical Toxicology Reviews
Adult Education Program Videos
Education Presentations (Look a-likes, Candy vs. Medicine)
Fact Sheets:
Candy or Medicine (English & Spanish)
Carbon Monoxide
Children Act Fast (English & Spanish)
Fall Poison Safety Tips
Halloween Safety
Ipecac Syrup Alert (English & Spanish)
Poison Prevention Tips
Poisonous Plants (English & Spanish)
Preventing Poisoning in Your Home (English & Spanish)
Safe Plants (English & Spanish)
Safer Alternatives
Top Ten Poison Exposures in Children
Winter Holiday Safety
For Children:
SPIKE Temporary Tattoos for Children
Poison Prevention Coloring Book

Poison Word Search

Pills and Poisons Quiz (English & Spanish)

Additional articles covering a wide array of poisoning concerns are available in both English and Spanish at www.maripoisoncenter.org

Professional Education

The professional education program at the Regional Center for Poison Control and Prevention is comprised of three components: continuing education for center staff, education at Children's Hospital Boston for healthcare professionals, and education presented off-site for healthcare professionals. The Center has continued to provide the highest quality professional development to its staff, as well as to the professional community outside the Center.

Continuing Education for Center Staff

- Presented in-service programs to the staff on such topics as Drugs of Abuse, Cardiac Medication Toxicity, Anticonvulsants, Plants, Cyanide and Weapons of Mass Destruction
- Instituted a monthly staff required reading list of current medical toxicology literature
- Participated in New England Regional Toxicology Conferences seminars
- Administered weekly trivia quizzes.

Education for Healthcare Professionals

- Fellowship Program in Medical Toxicology: The Center maintains an active two-year postgraduate fellowship in medical toxicology. In recognition of its unique service within the Harvard-affiliated hospital system, the program is designated as the Harvard Medical Toxicology Fellowship.
- Emergency Medicine Resident Rotation: Residents from Boston Medical Center, Brigham and Women's Hospital, Massachusetts General Hospital, and Beth Israel Deaconess Medical Center, as well as the pediatric emergency medicine fellows from Children's Hospital Boston, participate in one-month rotations through the Center. The Center also intermittently has rotators from Hasbro Children's/Rhode Island Hospital, as well as Harvard Medical students.
- Doctor of Pharmacy Clerkship: Students from the Massachusetts College of Pharmacy and Health Science and the University Of Rhode Island College Of Pharmacy participate in five to six week rotations through the Regional Poison Center.

Education for Healthcare Professionals—Off Site

- The Center conducted lectures on clinical toxicology at various teaching and community hospitals, as well as continuing education courses for healthcare professionals, including an Agents of Opportunity Chemical Terrorism Course at Rhode Island Hospital.
- Center staff authored books/chapters and contributed articles to various professional journals.
- Center staff conducted lectures on clinical toxicology at the Massachusetts College of Pharmacy and Health Science as well as the University of Rhode Island College of Pharmacy.

Whom do we serve and why do they call?

In 2007, the Center managed a total of 61,255 incoming calls, including 50,839 exposure calls and 10,416 information calls.

Type of Call	2001	2002	2003	2004	2005	2006	2007
Information	15,785	25,209	15,859	12,705	12,179	11,096	10,416
Exposure to Poison	45,193	52,181	52,739	53,880	53,031	51,693	50,839
Total	60,978	77,390	68,598	66,585	65,210	62,789	61,255

The total population for the region served by the Center is 7,397,416 residents, according to the 2000 Census data. The population of Massachusetts is 6,349,097 (86%) and Rhode Island is 1,048,319 (14%).

Type of Call - Massachusetts							
	2001	2002	2003	2004	2005	2006	2007
Information	13,724	22,020	12,653	10,301	10,238	9,397	8,777
Exposure to Poison	38,387	42,340	43,874	45,106	44,687	43,292	42,231
Total	52,111	64,360	56,526	55,407	54,925	52,689	51,008

Type of Call - Rhode Island							
	2001	2002	2003	2004	2005	2006	2007
Information	1,713	2,768	2,954	2,159	1,774	1,455	1,252
Exposure to Poison	6,093	8,335	7,415	7,703	7,790	7,585	7,481
Total	7,806	11,103	10,369	9,862	9,564	9,040	8,733

Where do poisonings happen?

Of the 50,839 exposure calls managed in 2007 by the Poison Center, 46,885 calls (92%) were exposures that took place in a home residence; the remaining 3,454 calls (8%) occurred in other locations including schools, workplaces and other public areas.

Where do our calls come from?

Of the 50,839 exposure calls managed in 2007 by the Poison Center, 38,583 (76%) of the total exposure calls came from a home residence, 8,425 (17%) came from health care facilities or medical professionals, and the remaining 3,831 (7%) come from various other sources such as public area schools or workplaces.

Residence Calls	76%
HCF Calls	17%
Other Calls	7%

Where are these poisonings managed?

In 2007, the majority of the poison exposure calls 38,466 (76%) were managed on-site and did not require treatment at a healthcare facility.

Management Site	2007
Onsite	38,466
HCF	11,377
Unknown	583
Refused	428

Of interest are those calls that were managed at a health care facility but resulted in the patient being treated and released. While it is unclear whether a pre-hospital call could have prevented the trip to the emergency room, there is a clear potential cost savings that exists if the Poison Center is involved prior to the hospital.

Treated and released	4,637	41%
Admitted: Critical	1,890	17%
Admitted: Non-critical	1,372	12%
Admitted: Psychiatric	802	7%
Lost to follow-up	2,676	23%

Who are the poisoned?

In 2007, as in previous years, calls were split equally between males and females. Of the exposure calls received, gender was recorded for 50,551 (99.4%) of calls in 2007.

Gender	2007	MA	RI	Other
Male Exposure	25,515	21,304	3,668	543
Female Exposure	25,036	20,671	3,785	580
Unknown	288	256	28	4
TOTAL	50,839	42,231	7,481	1,127

The general age of the caller was captured for 50,527 (99.4%) of cases. Over 52% (26,893) of the exposure calls involved children 5 years of age and younger. Specifically, the greatest number of exposure calls in any single age category involved two-year-olds; 9,461 calls for this age group were received, representing over 18% of the exposure calls. Overall, the distribution of the age or gender has not changed in recent years.

Insert Bar Chart and Table from Data:

AGE	TOTAL	MA	RI	Other
<1	2,530	2,152	313	65
1	7,649	6,414	1,060	175
2	9,461	7,957	1,304	200
3	4,160	3,495	562	103
4	1,929	1,604	287	38
5	1,164	963	179	22
6-12	3,564	3,049	449	66
13-19	3,714	3,112	530	72
20-29	3,235	2,528	597	110
30-39	2,727	2,185	478	64
40-49	3,000	2,385	572	43
50-59	1,918	1,570	319	29
60-70	1,147	937	186	24
70+	1,462	1,209	237	16
Unknown	312	280	27	5
Unknown Adult over 20	2,867	2,391	381	95

What are the most common agents of poisonings?

Products involved in poisonings are regularly divided into drug and non-drug categories. The percentage of calls and products in each category has remained consistent over the past several years.

Insert Pie Chart:

Category: Non Drug	Exposure Calls	%
Cosmetics/personal care products	5,801	21%
Cleaning substances (household)	4,137	15%
Foreign bodies/toys/miscellaneous	3,137	11%
Alcohols	1,860	7%
Plants	1,571	6%
Other	11,232	40%
Total	27,738	

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Top Five Substances Most Frequently in Non-Drug Related Poison Exposures - 2007

Substance	Most Common Products
Cosmetics/personal care products	Creams, lotions, make-up, toothpaste, deodorant, mouthwash, nail products, hair care products, perfume, soap
Cleaning substances (household)	Bleach, household cleaners, dishwasher/laundry detergents, disinfectants, ammonia
Foreign bodies/toys	Silica gel, bubbles, thermometers, glow products, toys
Alcohols	Alcoholic beverages, rubbing alcohol
Plants	Gastrointestinal irritants, Toxic/Non-toxic Species

In 2007, exposure calls involving non-drug agents accounted for 27,738 of all substance calls. The top five non-drug agents most commonly involved in poisonings are detailed below. Other common agents include alcohol, arts/crafts/office supplies, chemicals, food products, and hydrocarbons.

Category: Drug	Exposure Calls	%
Analgesics	6,241	20%
Sedative/hypnotics/antipsychotics	3,416	11%
Topical preparations	2,520	8%
Antidepressants	2,246	7%
Cold and cough preparations	2,042	7%
Other	14,006	46%
Total	30,471	

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Top Five Substances Most Frequently in Drug Related Poison Exposures - 2007

Substances	Most Common Products
Analgesics	Ibuprofen, Acetaminophen, Opioids, Aspirin, Naproxen
Sedative/hypnotics/antipsychotics	Benzodiazepines, Atypical Antipsychotics, Lithium
Topical preparations	Diaper Rash Products, Topical Steroids, Hydrogen Peroxide
Antidepressants	Serotonin ReUptake Inhibitors, Trazodone, Amitriptyline
Cold and cough preparations	Dextromethorphan, Non-Opioid Preparations

In 2007, drug substances were a reported agent in 30,471 exposure calls. Analgesics, such as acetaminophen, continue to be the most commonly reported drug agent involved in poison exposures. Appendix C provides a more detailed analysis of the most common substances reported in exposure calls for both drug and non-drug categories.

What was the intent related to the poisoning?

The majority of poison exposures in 2007 were recorded as unintentional. Of the 50,839 exposure calls, 6,919 (14%) that were classified as intentional poisonings; of those 4,658 (9%) were recorded as suspected suicides managed by the Center.

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Intentional	6,919	14%
Unintentional	42,582	84%
Other	1,338	2%
Total Exposures	50,839	

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Suspected suicide	4,658	9%
Misuse	753	1.5%
Abuse	1,072	2%
Unknown	436	1%

What was the result of the poisoning?

Of the 50,839 exposure calls recoded in 2007, 38,356 (75.4%) cases did not require follow-up by the Poison Center staff because the exposure was judged to cause only minimal effect or to be a non-toxic event. 2,733 (5.4%) cases could not be followed.

Cases Not Followed	N = 41,089
Minimal Effect	33,333
Judged Nontoxic	5,023
Unable to follow	2,733

In 2007, 9,750 (19%) poison exposures were followed to determine the medical outcome of the poisoning. Below are the results for those cases by category of medical outcome.

Definition of Medical Outcomes		2007
Minor Effect:	The patient exhibited some symptoms as a result of the exposure, but they were minimally bothersome to the patient. The patient has returned to a pre-exposure state of well being and has no residual disability or disfigurement.	2,955
Moderate Effect:	The patient exhibited symptoms as a result of the exposure that were more pronounced, more prolonged or more of a systemic nature than minor symptoms.	2,485
Major Effect	The patient exhibited symptoms as a result of the exposure. The symptoms were life-threatening or resulted in significant residual disability or disfigurement.	794
Death	The patient died as a result of the exposure or as a direct complication of the exposure which was unlikely to have occurred had the toxic exposure not preceded the complication. Only included are those deaths that are probably or undoubtedly related to the exposure.	36
Unrelated Effect	Based upon all information available, the exposure was probably not responsible for the effect(s).	491
No effect	The patient developed no symptoms as a result of the exposure.	2,989

Summary of death cases

The deaths listed below are those cases reported to the Poison Center by health care facilities for the management of a suspected poisoning that resulted in a fatal outcome. In those cases where several substances were ingested, the cause of death was determined by the substance deemed to have had the most toxic effect.

Age	Male	Female	Substances
0-5	0	0	-
6-12	0	0	-

13-19	0	1	Acetaminophen and Diphenhydramine
20-29	4	1	Unknown Drug, Cocaine, Unknown Opioid, Unknown Barbiturate, Unknown Benzodiazepine
30-39	4	3	Carbamazepine, Methanol, Acetaminophen, Unknown, Cocaine, Glipizide, Olanzapine, Atenolol Clonazepam, Quetiapim
40-49	7	3	Amlodipine, Atenolol, Trazodone, Escitaloprem, Duloxetine, Acetaminophen and Diphenhydramine, Venlofoxine, Verapamil, Phenytoin, Methocarbamol, Cyclobenzaprine, Amitriptyline, Doxepin, Unknown, Methanol
50-59	1	4	Fluoxetine, Atenolol, Propoxyphene, Acetaminophen, Nabumetone, Tizanidine, Olanzapine, Gabapentin Diltiazem, Metoprolol
60-69	2	3	Diltiazem, Clonazepam, Clonidine, Verapamil, Carbamazepine, Drain Cleaner, Mirtazepine
70-79	1	2	Verapamil, Unknown, Hydrocodone, Acetaminophen
80-89	0	0	-
Total	19	17	

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Category	%
Acetaminophen	13%
Antidepressant	22%
Toxic alcohol	4%
Cardiovascular	20%
Drugs of abuse	11%
Misc/Unknown	29%

The relatively small number of deaths reported to the Poison Center does not accurately represent the true significance of poisonings as a cause of acute injury and death in the region. In fact, poisonings are the leading cause of injury death in Massachusetts, surpassing motor vehicle occupant deaths by a factor of 2 to 3. In 2006, there were over 900 poisoning deaths among Massachusetts residents.

Many cases of poison fatalities are never reported to the poison center. Law enforcement, first responders, medical examiners, or other health care professionals who have initial contact with poisoned patients, may not call the center to report the poisoning when treatment advice is not required or when the patient is determined to be dead on arrival.

A look into the future.....

The majority of poisonings are preventable.

The Regional Center for Poison Control and Prevention works to reduce the number of poisonings that occur through direct outreach programs and the dissemination of targeted educational materials to the public. These programs are a vital component of our multifaceted and comprehensive prevention system and public awareness campaign. Continued efforts in primary prevention are needed in the areas of environmental modification (e.g. locks on cabinets, safety caps, manufacturing of pills), policy (e.g. monitoring prescription

drug dispensing, and drug enforcement by public safety), and educational initiatives performed by other public health professionals, such as pharmacists and clinicians.

The Poison Center will continue to be unique in the region for its combined participation in the medical management of actual poisonings and national real-time surveillance of potential poisonings, as well as for its professional training and public education programs. As such, the Center is a valuable resource that seeks to address such critical issues as potential bioterrorism events, environmental exposures, and trends in substance abuse.

Appendix A

Current Staff - Regional Center for Poison Control and Prevention

Insert PPT Page

Appendix B

Current Advisory Committee Members

Angela Anderson, MD

Pediatric Emergency Medicine Physician
Hasbro Children's Hospital

Lana Dvorkin-Camiel, PharmD *

Associate Professor of Pharmacy Practice
Natural Products Division Coordinator
Mass. College of Pharmacy and Health Sciences

Anara Guard, MS*

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Maria Kostka-Rokosz, BS, PharmD, RPh *

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William J. Lewander, MD

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Quality Partners of Rhode Island

Kathleen Siemionko, MSW, LCSW *

Director of Community Planning and Development
Springwell

Kristina E. Ward, BS, PharmD, BCPS

Clinical Assistant Professor/Director, Drug Information Services

University of Rhode Island College of Pharmacy

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Mary Schneider, MBA

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Colleen Longfellow, MPH

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Massachusetts Department of Public Health

Cynthia Rodgers*

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Occupational Health Surveillance Program

Meg Blanchet, MS, REHS

Assistant Director of the Environmental Toxicology Program, Bureau of Environmental Health

Rhode Island Department of Health

Dhitinut Ratnapradipa, PhD

Environmental Health Program Manager

Robert Vanderslice, PhD

Team Leader, Healthy Homes and Environment

L. Anthony Cirillo, MD, FACEP

Chief, Center for Emergency Preparedness & Response

** Member of Health Education Subcommittee*

Appendix C

Most Common Substances by Category 2007

The following tables describe the incidence of the most common exposures reported to the Center, divided by pharmaceutical (drug) and non-pharmaceutical (non-drug) substances and by frequency of the most common substances within each category. For each substance listed, both the number of cases in which it was involved and the percentage of all substance exposures are listed.

Some poisoning cases involve multiple exposures. As a result, in 2007 there were 58,209 exposures to individual substances among the 50,839 exposure calls the Center received.

% of Calls for All Substances, Non Drug, Top 5	Total	Percentage
Cosmetics/personal care products		
Dental care products	857	3.09%
Hair care products	415	1.50%
Mouthwash	509	1.84%
Nail products	501	1.81%
Cleansing/Lotions/Deodorant	2,067	7.45%
Category TOTAL	5,801	20.91%
Cleaning substances (household)		
Dishwasher detergents	499	1.80%
Bleaches	541	1.95%
Household Cleansers	2,416	8.71%
Laundry	507	1.83%
Miscellaneous cleaners	174	0.63%
Category TOTAL	4,137	14.91%
Foreign bodies/toys/miscellaneous		
Desiccant	762	2.75%
Glow product	659	2.38%
Toy	230	0.83%
Thermometers/Mercury	131	0.47%
Other	1355	4.88%
Category TOTAL	3,137	11.31%
Alcohols		
Ethanol: beverage	1,040	3.75%
Ethanol: other	477	1.72%
Isopropanol	201	0.72%
Other	142	0.51%
Category TOTAL	1,860	6.71%
Plants		
Gastrointestinal irritant	262	0.94%
Non-toxic	272	0.98%
Toxic	508	1.83%
Other	529	1.91%
Category TOTAL	1,571	5.66%
Other	11,232	40.49%
Total Drug	27,738	100.00%

% of Calls for All Substances, Drug, Top 5

Analgesics

Acetaminophen	2,914	9.56%
Aspirin	427	1.40%

Opioids	715	2.35%
Ibuprofen	1,789	5.87%
Naproxen	227	0.74%
Other	169	0.55%
Category TOTAL	6,241	20.48%
Sedative/hypnotics/antipsychotics		
Atypical antipsychotic	1,071	3.51%
Benzodiazepine	1,693	5.56%
Other	652	2.14%
Category TOTAL	3,416	11.21%
Topical preparations		
Diaper care/rash product	1,147	3.76%
Topical steroid	266	0.87%
Hydrogen Peroxide	318	1.04%
Other	789	2.59%
Category TOTAL	,2520	8.27%
Antidepressants		
Amitriptyline	106	0.35%
Lithium	154	0.51%
Serotonin ReUptake Inhibitor	915	3.00%
Trazodone	368	1.21%
Other	703	2.31%
Category TOTAL	2,246	7.37%
Cold and cough preparations		
Dextromethorphan	1,139	3.74%
Without opioid	665	2.18%
Other	238	0.78%
Category TOTAL	2,042	6.70%
Other	14,006	45.97%
Total Drug	30,471	100.00%

Appendix D

The highlighted healthcare facilities are those that financially contributed to the Poison Center in 2007 as Member Hospitals for their 2006 Call Volume.

MASSACHUSETTS HOSPITALS	2007 CALL VOLUME
Addison Gilbert Hospital	53
Anna Jaques Hospital	88
Athol Memorial Hospital	38
Bay State Medical Center	271
Berkshire Medical Center	69

Beth Israel Deaconess Medical Center	73
Beverly Hospital	163
Boston Medical Center	306
Brigham & Women's Hospital	92
Brockton Hospital	216
Burbank Hospital	1
Cambridge Health Alliance	166
Cape Cod Hospital	74
Caritas Holy Family Hospital	129
Caritas Norwood Hospital	141
Carney Hospital	111
Charlton Memorial Hospital	56
Children's Hospital	240
Clinton Hospital	2
Cooley Dickinson Hospital	91
Emerson Hospital	26
Fairview Hospital	15
Falmouth Hospital	50
Faulkner Hospital	26
Franklin (Baystate) Medical Center	31
Franciscan Hospital	2
Good Samaritan Medical Center	92
Hallmark Health System/Lawrence	110
Harrington Memorial Hospital	89
Heywood Hospital	163
Holyoke Hospital	41
Hubbard Regional Hospital	38
Jordan Hospital	117
Lahey Clinic Hospital	95
Lowell General Hospital	53
Marlborough Hospital	1
Martha's Vineyard Hospital	42
Mary Lane Hospital	0
Mass Eye and Ear Infirmary	0
Massachusetts General Hospital	188
McLean Hospital	0
Melrose Wakefield Hospital	89
Mercy Hospital	60
Merrimac Valley Hospital	81
Metrowest Medical Center	230
Milford Regional Medical Center	34
Milton Hospital	58
MIT Medical Center	0
Morton Hospital & Medical Center	124
MT Auburn Hospital	154
Nantucket Cottage Hospital	32
New England Baptist	2
New England Medical Center (NEMC)	109
Newton Wellesley Hospital	99
Noble Hospital	156
North Adams Regional Hospital	36
North Shore Medical Center	158

Quincy Medical Center	76
Saint Anne's Hospital	103
Saint Elizabeth's Medical Center	47
Saint Luke's Hospital (Southcoast)	188
Saints Memorial Medical Center	37
Somerville Hospital	38
South Shore Hospital	181
Southern New Hampshire	23
Stillman Infirmary-Harvard University	0
Sturdy Memorial Hospital	110
Tobey Hospital (Southcoast)	33
Union Hospital	113
University of Massachusetts Medical Center	50
VA Bedford	5
VA Brockton	8
VA Jamaica Plain	2
VA West Roxbury	13
Whidden Memorial Hospital	168
Winchester Hospital	149
Wing Memorial	34
Worcester Medical Center	62

	2007 CALL VOLUME
RHODE ISLAND HOSPITALS	
Butler Hospital	3
Emma Pendleton Bradley Hospital	1
Kent County Memorial Hospital	278
Landmark Medical Center	81
Memorial Hospital of RI	149
The Miriam Hospital	86
Newport Hospital	72
RI Hospital/HASBRO	488
Rodger Williams Hospital	56
South County Hospital	87
St Joseph (Fatima)	57
The Westerly Hospital	61
VA RI Hospital (Providence VA Medical Center)	8
Woman & Infants Hospital	6

Appendix E

Faculty Publications 2007

Mannix R, Burns Ewald M. Over-the Counter and Diabetic Agents. In: Zaoutis LB, Chiang VW, editors. Comprehensive Pediatric Hospital Medicine. Philadelphia: Elsevier; 2007. p. 1110-20.

Nigrovic L, Burns Ewald M. Heat Disorders. In: Zaoutis LB, Chiang VW, editors. Comprehensive Pediatric Hospital Medicine. Philadelphia: Elsevier; 2007. p. 1148-52.

Saidinejad M, Law T, Burns Ewald M. Interference by carbamazepine and oxcarbazepine with serum and urine screening assays for tricyclic antidepressants. Pediatrics 2007 120 (3): e504-9.

- Lai MW and Burns Ewald M. Anticoagulants. In: Haddad LM, Shannon MW and Winchester JF, editors. *Clinical Management of Poisoning and Drug Overdose*, 4th ed. W. B. Saunders; 2007. pp: 1051-1064.
- Nikkanen HE. Endocrine Toxicity. In: Shannon M, Borron S, and Burns M (Eds). *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. Saunders, 2007.
- Levine M, Nikkanen H, Pallin DJ. Intravenous Calcium Administration in Digoxin Toxic Patients. *Annals of Emergency Medicine*, Volume 50, Issue 3, Supplement 1, September 2007, Page S27
- Quail MT, Shannon MW. Pralidoxime Safety and Toxicity in Children. *Prehospital Emergency Care* 2007; 11: 36-41
- Ban KM, Mannelli F, Messineo A, Frassinetti M, Barkin R, Mooney DP, Shannon M, Gensini GF. Building a Trauma Center and System in Tuscany, Italy. *Intern Emerg Med* 2007; 2: 13-16
- Bourgeois F, Shannon M. Emergency Care for Children in Pediatric and General Emergency Departments. *Ped Emerg Care* 2007; 2: 94-102
- Counter SA, Buchanan LH, Ortega F, Rifai N, Shannon MW. Comparative Analysis of Zinc Protoporphyrin and Blood Lead Levels in Lead-Exposed Andean Children. *Clin Biochem* 2007; 40: 787-792
- Chung S, Shannon M. Reuniting Children with Their Families During Disasters: A Proposed Plan for Greater Success. *Am J Disaster Medicine* 2007; 2: 113-117
- Hussain J, Woolf AD, Sandel M, Shannon MW. Environmental Evaluation of a Child with Developmental Disability. *Ped Clin N Am* 2007;54: 47-62
- Shannon M. The History of Toxicology in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007
- Shannon M. A General Approach to Poisoning in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007
- Shannon M. Drug Interactions in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007
- Shannon M. Acid-Base, Fluid, and Electrolyte Balance in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007
- Shannon M. Chronic Renal Toxicity in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007
- Nikkanen H, Shannon M. Endocrine Toxicology in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007
- Mannix RC, Shannon M. Poisoning in Children with Unique Metabolism in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007
- Salhanick S, Shannon M. Acetaminophen in *Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Press, 2007

Geib A-J, Shannon M. Isoniazid in Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Edition, Elsevier Press, 2007

Shannon M. Thalidomide, in Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Edition, Elsevier Press, 2007

Shannon M. Theophylline and Caffeine in Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Edition, Elsevier Press, 2007

Shannon M. Lead in Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Edition, Elsevier Press, 2007

Hall A, Shannon M. Other Heavy Metals in Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Edition, Elsevier Press, 2007

Shannon MW. Methylxanthines. Intensive Care Medicine. Irwin RS, Rippe JM. 6th Ed., Lippincott Williams & Wilkins, 2007

Harper AA, Shannon MW. Lead, Other Metals, and Chelation Therapy. Comprehensive Pediatric Hospital Medicine. Zaoutis LB, Chiang VW, Eds. Mosby Elsevier 2007

Shannon, MD. Eye Patching and Eye Guards. Textbook of Pediatric Emergency Procedures. King C, Henretig FM, King BR, et al, Editors. 2nd Edition. Lippincott Williams and Wilkins, 2007

Shannon, MD. Activated Charcoal Administration. Textbook of Pediatric Emergency Procedures. King C, Henretig FM, King BR, et al, Editors. 2nd Edition. Lippincott Williams and Wilkins, 2007

Foltin G, Shannon M, Schonfeld D. Pediatric Terrorism and Disaster Preparedness Resource. Agency for Healthcare Quality and Research and American Academy of Pediatrics Press 2007

American Academy of Pediatrics Committee on Environmental Health. Global Climate Change and Children's Health. *Pediatr* 2007;120:1149-1152 (Technical Report - *Pediatr* 2007; 120: e1359-e1367)

Weisskopf MG, Hu H, Lenkinski, R, Sparrow D., Wright RO Magnetic Resonance Spectroscopy and Lead Exposure in a cohort of Elderly men. *Environmental Health Perspectives* 115(4):519-23, 2007

Peters JL, Kubzansky L, McNeely E, Schwartz J, Spiro A, Sparrow D, Wright RO, Nie H, Hu H. Stress as a Potential Modifier of the Impact of Lead Levels on Blood Pressure: The Normative Aging Study *Environ Health Perspect* 115(8):1154-9, 2007

Wang, F.T.; Schwartz, J.; Weuve, J. ; Spiro, A. III ; Sparrow, D.; Hu, H. Wright RO. Modifying effects of the hemochromatosis polymorphisms on the association between lead burden and cognitive decline. *Environ Health Perspectives*. 115(8):1210-5, 2007

Jain NB, Potula V, Schwartz J, Vokonas PS, Sparrow D, Wright RO, Nie H, Hu H. Lead Levels and Ischemic Heart Disease in a Prospective Study of Middle-Aged and Elderly Men: the VA Normative Aging Study. *Environmental Health Perspectives* 115(6):871-5, 2007

Park SK, O'Neill MS, Vokonas PS, Sparrow D, Wright RO, Coull B, Nie H, Hu H, Schwartz J. Chronic lead exposure increases susceptibility to cardiac autonomic impacts of air pollution: The VA Normative Aging Study. *Epidemiology* 17:18-24, 2006

Rajan P, Kelsey KT, Schwartz JD, Bellinger DC, Weuve J, Sparrow D, Spiro A, Smith TJ, Nie H, Hu H, Wright RO. Lead and Psychiatric Symptoms and the Modifying Influence of the Aminolevulinic Acid Dehydratase (ALAD) Polymorphism: the VA Normative Aging Study. *Am J Epidemiology* 166(12):1400-8, 2007

Perlstein T, Weuve J, Schwartz J, Sparrow D, Wright RO, Litonjua AA, Nie H, Hu H. Cumulative Community-Level Lead Exposure and Pulse Pressure: The Normative Aging Study. *Environmental Health Perspectives* (in press)

Lamadrid-Figueroa H, Tellez-Rojo MM, Hernandez-Avila M, Trejo-Valdivia B, Solano-Gonzalez M, Mercado-Garcia A, Smith D, Hu H, Wright RO Association between the plasma/whole blood lead ratio and history of spontaneous abortion: a nested cross-sectional study. *BMC Pregnancy and Childbirth*; 7:22, 2007

Franco S., Gryparis A, Wright RO, Schwartz J, Wright RJ. Black carbon associated with cognition among children in a prospective birth cohort study *Am J Epidemiology* (in press)

Franco S., Wright RO, Schwartz J, Wright RJ. Association between lung function and cognition in a prospective birth cohort study. *Psychosomatic Medicine* (in press)

Chahine T, Litonjua A, Wright RO, Baccarelli A, Suh H, Gold DR, Sparrow D, Vokonas P, Schwartz J. PM_{2.5}, genes related to oxidative stress, and Heart Rate Variability in an elderly cohort. *Env. Health Perspect* 115(11):1617-22, 2007

Arora M, Ettinger AS, Peterson KE, Schwartz J, Hu H, Hernández-Avila M, Tellez-Rojo MM, Wright RO Maternal Dietary Intake of Polyunsaturated Fatty Acids Modifies the Relationship between Lead Levels in Bone and Breast Milk. *Journal of Nutrition*. 138(1):73-9, 2008

Surkan, PJ, Schnaas L, Wright, RJ, Tellez-Rojo, MM, Lamadrid-Figueroa H, Hu H, Hernández-Avila M, Bellinger DC, Schwartz J, Perroni E, Wright RO. Maternal Coopersmith Self-Esteem, Lead, And Child Neurodevelopment. *Neurotoxicology* (in press)

Arora M, Weuve J, Schwartz J, Wright RO. Association of Environmental Cadmium Exposure with Pediatric Dental Caries. *Environmental Health Perspectives* (in press)

Weisskopf M, Wright RO, Hu H. Are Early Life Exposures to Neurotoxicants Risk Factors for Alzheimer's Disease?. In *Human Developmental Neurotoxicology*, Editor David Bellinger Taylor and Francis Publishing,

Hu H, Shine J, Wright RO The challenge posed to children's health by mixtures of toxic waste: the Tar Creek Superfund Site as a case-study. *Pediatric Clinics of North America*. 54(1):155-75; 2007

Wright RO, Baccarelli A, Metals and Neurotoxicology. *J. Nutrition*. 137(12):2809-13, 2007

Wright RO. Neurotoxicology: What can Context Teach us? Invited Commentary. *J. Pediatr.* (in press)

Wright RO, Fields N. Neurotoxicology and Children's Environmental Health. Invited Commentary, *Current Opinion in Pediatrics*. (in press)

Levine MD, Boyer EW, Geib AJ, Mick N, Pozner A, Thomas SD. Assessment of hyperglycemia following calcium channel blocker overdoses involving diltiazem or verapamil. *Critical Care Medicine* 2007; 35(9): 2071-75 (see editorial: *Critical Care Medicine* 2007; 35(9) 2216-17)

Boyer EW, Babu KM, Macalino G. Self-treatment of opioid withdrawal with a dietary supplement, Kratom. *American Journal of Addictions*, 2007; 16(5):352-56

Boyer EW, Lapen PT, Macalino G, Hibberd PL. Dissemination of Internet information on psychoactive substances. *Cyberpsychology and Behavior*, 2007; 10(1): 1-6

Babu KM, McCurdy CR, Boyer EW. Opioid receptors and legal highs: Salvia divinorum and Kratom. *Clinical Toxicology*, 2007; 42:146-152

Brush D.E., Aaron C.K., TCAs and other Cyclic Antidepressants. *Clinical Management of Poisoning and Drug Overdose*. 4th Edition, Elsevier Publishing 2007.

Brush D.E., Solari PB, Boyer EW. Emerging Patterns of Adolescent Prescription Drug Abuse. *Clinical Toxicology*, 45(6): 631. 2007 North American Congress of Clinical Toxicology, New Orleans, LA. 2007

Miller MA, Navarro M, Bird SB, Donovan JL. Antiemetic use in acetaminophen poisoning: how does the route of N-acetylcysteine administration affect utilization? *J Med Toxicol*. 2007 Dec; 3(4):152-6.