2018 Annual Report of the University of Kansas Health System Poison Control Center

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ABSTRACT

Introduction. This is the 2018 Annual Report of the Kansas Poison Control Center at The University of Kansas Health System (KSPCC). The KSPCC serves the state of Kansas 24-hours per day, 365 days a year with certified specialists in poison information and clinical and medical toxicologists.

Methods. All encounters reported to the KSPCC from January 1, 2018 through December 31, 2018 were analyzed. Data recorded for each exposure included caller location, age, weight, gender, exposure substance, nature of exposure, route of exposure, interventions, medical outcome, disposition, and location of care.

Results. There were 21,072 total encounters, including 20,031 human exposure cases. Calls were received from every county and hospital in Kansas. Most of the exposures involved females (51.5%, n = 10,320) and a child less than 19 year of age (64%, n = 12,865). Medical outcomes were 24.5% (n = 4,912) no effect, 17.7% (n = 3,542) minor effect, 9.1% (n = 1,830) moderate effect, and 2.4% (n = 476) major effect. Seven deaths were reported in 2018. The number of exposure calls from healthcare facilities and severity of medical outcomes increased in 2018 compared to 2017.

Conclusion. The 2018 KSPCC annual report demonstrated that the center receives calls from the entire state of Kansas totaling over 20,000 human exposures. While pediatric exposures remain the most common encounter, a trend continued of an increasing number of calls from healthcare facilities and for cases with serious outcomes. This report supported the continued value of the KSPCC to both public and acute health care in the state of Kansas.

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INTRODUCTION

This is the 2018 Annual Report of Kansas Poison Control Center at The University of Kansas Health System (KSPCC). The KSPCC is a 24-hour, 365 day-a-year health care information resource serving the state of Kansas. It was founded in 1982 and is one of the 55 poison control centers certified by the American Association of Poison Control Centers (AAPCC) in the United States. The KSPCC is staffed by nine certified specialists in poison information who are either critical care trained nurses or doctors of pharmacy. There is 24-hour back-up provided by board certified clinical and medical toxicologists.

The KSPCC receives calls from the public, law enforcement, health care professionals, and public health agencies. Encounters may involve an exposed animal or human (Exposure Call) or a request for information with no known exposure (Information Call). The KSPCC follows all cases to make management recommendations, monitor case progress, and document medical outcome. This information is recorded electronically in the ToxICall® data management system and uploaded in near real-time to the National Poison Data System (NPDS).

NPDS is the data warehouse for all the nation’s poison control centers. The average time to upload data for all poison centers is 8,077 [7,32,12.65] (median [25%, 75%]) minutes, creating a near real-time national exposure database and surveillance system. The KSPCC has the ability to share NPDS real time surveillance with state and local health departments and other regulatory agencies. An analysis and summary of all encounters reported to the KSPCC from January 1, 2018 through December 31, 2018 follows.

METHODS

All KSPCC encounters recorded electronically in the ToxICall® data management system from January 1, 2018 to December 31, 2018 were analyzed. Cases were first classified as either an exposure or suspected exposure (Human Exposure, Animal Exposure, Non-Exposure Confirmed Cases) or a request for information with no reported exposure (Information Call). Data extracted included: caller location, age, weight, gender, exposure substance, number of follow up calls, nature of exposure (unintentional, recreational, or intentional), exposure scenario, route of exposure (oral, dermal, parenteral), interventions, medical outcome (no effect, minor, moderate, severe or death), disposition (admitted to noncritical care unit, admitted to critical care unit, admitted to psychiatry unit, lost to follow-up, or treated and released) and location of care (non-health care facility or health care facility).

For this analysis a pediatric case was defined as any patient 19 years of age or less. This is consistent with NPDS methodology. Similarly, NPDS descriptions of the medical outcomes of cases were used. Minor outcomes are defined as minimally bothersome symptoms while moderate outcomes are more pronounced symptoms, usually requiring treatment, and major outcomes are life threatening signs and symptoms. Data was analyzed using Microsoft® Excel (Microsoft Corp, Redmond, WA).

RESULTS

The KSPCC logged 21,072 total calls in 2018, including 20,031 human exposure cases, 74 non-exposure confirmed cases, 92 animal exposure cases, and 875 information calls. This was a decrease of 359 calls (1.7%) compared to 2017. For information calls, drug information (n = 285) was the most common reason for calling. Table 1 further describes the encounter types. The KSPCC made 30,589 follow-up calls in 2018. Follow-up calls were done in 54.5% of human exposure cases. One follow-up call was made in 23.1% of animal exposure cases and multiple follow-up calls (range 2 - 45) were made in 31.4% of cases. In human exposure calls for which follow-up calls were made, an average of 2.8 calls per case were performed, which was a 5% increase over 2017.
The KSPCC received calls from all 105 counties and every hospital in Kansas. The county with the largest number of calls was Sedgwick County with 3,218. In addition, calls were received from 46 states, the District of Columbia, and the U.S. Virgin Islands, while eight calls came from foreign countries including Mexico and Thailand.

Overall, a slight majority of human exposure cases (51.5%, n = 10,320) were female. In children younger than 13 years of age, most encounters involved a male, but this gender distribution was reversed in teenagers and adults. Approximately 64% (n = 12,865) of human exposures involved a child (defined as age 19 years or less). Table 2 illustrates distribution of human exposures by age and gender.

Patients one year of age were the most common age group involved in encounters reported to the KSPCC. For adults, the age group of 20-29 years old was most commonly encountered. Seventy-three percent (n = 30,320) of all human exposure cases. Table 4 further details the routes of exposures.

The majority of human exposures, 85.6% (n = 17,150), were acute cases defined as exposures occurring over eight hours or less. Chronic exposures (exposures occurring over eight hours) accounted for 20.7% (n = 4,140) of all human exposures reported. Acute on chronic exposures (single exposure that was preceded by a chronic exposure over eight hours) totaled 2,382 (11.9%). Ingestion was the most common route of exposure documented (81.9%, n = 17,554) in all cases. Table 4 further details the routes of exposures.

Unintentional exposures were the most common reason for exposures (76.7%, n = 15,364), while intentional exposures accounted for 20.7% (n = 4,140) of exposures. Table 8 lists reasons for human exposures. A majority of unintentional exposures, 63.5% (n = 9,759), occurred in the ≤ 5-year-old age group. Up to 12 years of age, 98.2% (n = 10,830) of ingestions were unintentional. However, in the 13-19-year-old group, intentional exposure was most common (69.5%, n = 1,277). In total, suspected suicide attempts accounted for 15.7% (n = 3,138) of human encounters. When a therapeutic error was the reason for exposure, a double dose was the most common scenario, 30% (n = 760). Table 8 demonstrates all reasons for human exposures.

Most encounters (67.4%, n = 13,503) were managed in a non-health care facility (i.e., a residence). Of the 6,321 encounters managed at a health care facility, 46.1% (n = 2,904) were admitted. Table 9 lists the management site of all human encounters.

Among human exposures, 15,132 involved exposures to pharmaceutical agents, while 9,510 involved exposure to non-pharmaceuticals. Because an encounter could include numerous pharmaceutical agents and non-pharmaceutical agents, this total is greater than the total number of encounters. However, 86.8% (n = 17,389) of all human exposures were exposed to only a single substance. Among these single substance exposures, the reason for exposure was intentional in 24.5% (n = 2,188) of pharmaceutical-only cases compared to 3.8% (n = 323) of non-pharmaceutical single substance exposures.
Table 2. Distribution of human exposures by age and gender.

| Age (yrs.) | Male                  | Female                | Unknown Gender | Total                  | Cumulative Total |
|------------|-----------------------|-----------------------|----------------|------------------------|------------------|
|            | N                     | % of age group total  | N              | % of age group total   | N                | % of total exposure | N | %          |
| < 1 year   | 595                   | 54.09                 | 503            | 45.73                  | 2                | 0.18                | 1,100 | 5.49       | 1,100 | 5.49     |
| 1 year     | 1,674                 | 52.81                 | 1,494          | 47.13                  | 2                | 0.06                | 3,170 | 15.83      | 4,270 | 21.32    |
| 2 years    | 1,548                 | 51.48                 | 1,457          | 48.45                  | 2                | 0.07                | 3,007 | 15.01      | 7,277 | 36.33    |
| 3 years    | 798                   | 56.80                 | 607            | 43.20                  | 0                | 0.00                | 1,405 | 7.01       | 8,682 | 43.34    |
| 4 years    | 400                   | 55.56                 | 317            | 44.03                  | 3                | 0.42                | 720   | 3.59       | 9,402 | 46.94    |
| 5 years    | 238                   | 60.41                 | 156            | 39.59                  | 0                | 0.00                | 394   | 1.97       | 9,796 | 48.90    |
| Unknown ≤ 5 years | 0     | 0.00                  | 1              | 100.00                 | 0                | 0.00                | 1     | 0.00       | 9,797 | 48.91    |
| Child 6-12 years | 689   | 56.34                 | 531            | 43.62                  | 3                | 0.25                | 1,223 | 6.11       | 11,020 | 55.01    |
| Teen 13-19 years | 660 | 35.91                 | 1,177          | 64.04                  | 1                | 0.05                | 1,838 | 9.18       | 12,858 | 64.19    |
| Unknown Child | 1     | 14.29                 | 3              | 42.86                  | 3                | 0.42                | 7     | 0.03       | 12,865 | 64.23    |
| Subtotal   | 6,603                 | 51.33                 | 6,246          | 48.55                  | 16               | 0.12                | 12,865 | 64.23     | 12,865 | 64.23    |
| 20-29 years | 862                 | 46.15                 | 1,006          | 53.85                  | 0                | 0.00                | 1,868 | 9.33       | 14,733 | 73.55    |
| 30-39 years | 678                 | 43.80                 | 867            | 56.01                  | 3                | 0.19                | 1,548 | 7.73       | 16,281 | 81.28    |
| 40-49 years | 415                 | 39.79                 | 626            | 60.02                  | 2                | 0.19                | 1,043 | 5.21       | 17,324 | 86.49    |
| 50-59 years | 387                 | 40.40                 | 570            | 59.50                  | 1                | 0.10                | 958   | 4.78       | 18,282 | 91.27    |
| 60-69 years | 343                 | 42.77                 | 458            | 57.11                  | 1                | 0.12                | 802   | 4.00       | 19,084 | 95.27    |
| 70-79 years | 221                 | 42.75                 | 296            | 57.25                  | 0                | 0.00                | 517   | 2.58       | 19,601 | 97.85    |
| 80-89 years | 88                  | 36.97                 | 150            | 63.03                  | 0                | 0.00                | 238   | 1.19       | 19,839 | 99.04    |
| ≥90 years  | 18                   | 40.91                 | 26             | 59.09                  | 0                | 0.00                | 44    | 0.22       | 19,883 | 99.26    |
| Unknown adult | 48              | 41.74                 | 67             | 58.26                  | 0                | 0.00                | 115   | 0.57       | 19,998 | 99.84    |
| Subtotal   | 3,060                | 42.90                 | 4,066          | 57.00                  | 7                | 0.10                | 7,133 | 35.61      | 19,998 | 99.84    |
| Unknown age | 12                  | 36.36                 | 8              | 24.24                  | 13               | 39.39               | 33    | 0.16       | 20,031 | 100.00   |
| Total*     | 9,675                | 48.30                 | 10,320         | 51.52                  | 36               | 0.18                | 20,031 | 100.00     | 20,031 | 100.00   |

*Total includes 33 unknown age cases.

Table 3. Origin of call and site of exposure for human exposure cases.

| Site                  | Origin of Call | N | % | Site of Exposure | N | % |
|-----------------------|----------------|----|---|------------------|----|---|
| Residence             |                |    |   |                  |    |   |
| Own                   | 13,110         | 65.45 | | 18,064         | 90.18       |
| Other                 | 345            | 1.72  | | 667            | 3.33        |
| Workplace             | 307            | 1.53  | | 443            | 2.21        |
| Health care facility  | 5,168          | 25.80 | | 75             | 0.37        |
| School                | 38             | 0.19  | | 271            | 1.35        |
| Restaurant/food service | 4          | 0.02  | | 36             | 0.18        |
| Public area           | 75             | 0.37  | | 161            | 0.80        |
| Other                 | 963            | 4.81  | | 222            | 1.11        |
| Unknown               | 21             | 0.10  | | 92             | 0.46        |
Table 4. Route of human exposures.

| Route                | N       | % of All Routes | % of All Cases |
|----------------------|---------|-----------------|----------------|
| Ingestion            | 17,554  | 81.94           | 87.63          |
| Dermal               | 1,577   | 7.36            | 7.87           |
| Inhalation/nasal     | 1,014   | 4.73            | 5.06           |
| Ocular               | 709     | 3.31            | 3.54           |
| Bite/sting           | 190     | 0.89            | 0.95           |
| Unknown              | 172     | 0.80            | 0.86           |
| Parenteral           | 156     | 0.73            | 0.78           |
| Other                | 17      | 0.08            | 0.08           |
| Otic                 | 13      | 0.06            | 0.06           |
| Rectal               | 10      | 0.05            | 0.05           |
| Aspiration (with ingestion) | 5  | 0.02            | 0.02           |
| Vaginal              | 5       | 0.02            | 0.02           |
| **Total Number of Routes** | **21,422*** | 100.00            | 106.94*        |

*Some cases may have multiple routes of exposure documented.

Table 5. Substance categories most frequently involved in exposure for age ≤ 5 years old.

| Substance Category                        | All Substance | %  | Single Substance Exposures | %  |
|-------------------------------------------|---------------|----|----------------------------|----|
| Cosmetics/Personal Care Products          | 1,134         | 11.04 | 1,110                      | 11.69 |
| Cleaning substances (Household)           | 1,125         | 10.96 | 1,080                      | 11.37 |
| Analgesics                                | 925           | 9.01  | 853                        | 8.98  |
| Foreign bodies/toys/miscellaneous         | 587           | 5.72  | 575                        | 6.05  |
| Antihistamines                            | 578           | 5.63  | 512                        | 5.39  |
| Dietary supplements/herbals/homeopathic   | 472           | 4.60  | 437                        | 4.60  |
| Vitamins                                  | 451           | 4.39  | 404                        | 4.25  |
| Topical preparations                      | 441           | 4.29  | 434                        | 4.57  |
| Pesticides                                | 386           | 3.76  | 377                        | 3.97  |
| Gastrointestinal preparations             | 281           | 2.74  | 254                        | 2.67  |
| Cold and cough preparations               | 226           | 2.20  | 209                        | 2.20  |
| Cardiovascular drugs                      | 222           | 2.16  | 151                        | 1.59  |
| Essential oils                            | 215           | 2.09  | 208                        | 2.19  |
| Antimicrobials                            | 204           | 1.99  | 189                        | 1.99  |
| Plants                                    | 201           | 1.96  | 196                        | 2.06  |
Table 6. Substance categories most frequently involved in exposures of adults (≥ 20 years).

| Substance Category              | All Substance | %  | Single Substance Exposures | %  |
|---------------------------------|---------------|----|-----------------------------|----|
| Analgesics                      | 1,210         | 11.50 | 559                        | 10.45 |
| Sedative/hypnotics/antipsychotics| 1,147         | 10.91 | 315                        | 5.89  |
| Antidepressants                 | 955           | 9.08  | 311                        | 5.81  |
| Cardiovascular drugs            | 761           | 7.24  | 249                        | 4.65  |
| Alcohols                        | 535           | 5.09  | 67                         | 1.25  |
| Antihistamines                  | 471           | 4.48  | 202                        | 3.77  |
| Anticonvulsants                 | 463           | 4.40  | 142                        | 2.65  |
| Cleaning substances (Household) | 445           | 4.23  | 348                        | 6.50  |
| Pesticides                      | 366           | 3.48  | 327                        | 6.11  |
| Hormones and hormone antagonists| 328           | 3.12  | 175                        | 3.27  |
| Stimulants and street drugs     | 303           | 2.88  | 131                        | 2.45  |
| Chemicals                       | 244           | 2.32  | 206                        | 3.85  |
| Cosmetics/personal care products| 224           | 2.13  | 198                        | 3.70  |
| Fumes/gases/vapors              | 212           | 2.02  | 190                        | 3.55  |
| Muscle relaxants                | 210           | 2.00  | 68                         | 1.27  |

Table 7. Top 5 most frequent plant exposures.

| Botanical Name or Category       | N  |
|----------------------------------|----|
| Phytolacca americana (L.) (Botanic name) | 44 |
| Cherry (Species unspecified)     | 18 |
| Plants -Toxicodendrol            | 16 |
| Philodendron (Species unspecified) | 13 |
| Spathiphyllum species (Botanic name) | 10 |
| Plants-general-unknown           | 22 |
### Table 8. Reason for human exposure cases.

| Reason for Exposure          | N     | %    |
|------------------------------|-------|------|
| **Unintentional**            |       |      |
| Unintentional - general      | 10,383| 51.8 |
| Unintentional - therapeutic error | 2,446 | 12.2 |
| Unintentional - misuse       | 1,381 | 6.9  |
| Unintentional - environmental| 485   | 2.4  |
| Unintentional - occupational | 325   | 1.6  |
| Unintentional - bite/sting   | 191   | 1.0  |
| Unintentional - food poisoning| 139  | 0.7  |
| Unintentional - unknown      | 14    | 0.1  |
| **Subtotal**                 | 15,364| 76.7 |
| **Intentional**              |       |      |
| Intentional - suspected suicide | 3,138 | 15.7 |
| Intentional - misuse         | 533   | 2.7  |
| Intentional - abuse          | 382   | 1.9  |
| Intentional - unknown        | 87    | 0.4  |
| **Subtotal**                 | 4,140 | 20.7 |
| **Adverse reaction**         |       |      |
| Adverse reaction - drug      | 249   | 1.2  |
| Adverse reaction - other     | 56    | 0.3  |
| Adverse reaction - food      | 49    | 0.2  |
| **Subtotal**                 | 354   | 1.8  |
| **Unknown**                  |       |      |
| Unknown reason               | 90    | 0.4  |
| **Subtotal**                 | 90    | 0.4  |
| **Other**                    |       |      |
| Other - malicious            | 52    | 0.3  |
| Other - withdrawal           | 19    | 0.1  |
| Other - contamination, tampering | 12  | 0.1  |
| **Subtotal**                 | 83    | 0.4  |
| **Total**                    | 20,031| 100.0|

### Table 9. Management site of human exposures.

| Site of Management                          | N     | %   |
|---------------------------------------------|-------|-----|
| Managed in healthcare facility              |       |     |
| Treated/evaluated and released              | 3,211 | 16.0|
| Admitted to critical care unit              | 1,520 | 7.6 |
| Admitted to noncritical care unit           | 826   | 4.1 |
| Admitted to psychiatric facility            | 558   | 2.8 |
| Patient lost to follow-up/ left AMA         | 206   | 1.0 |
| **Subtotal (managed in Healthcare facility)**| 6,321 | 31.6|
| Managed on site, non-health care facility   | 13,503| 67.4|
| Other                                        | 15    | 0.1 |
| Refused referral                             | 177   | 0.9 |
| Unknown                                      | 15    | 0.1 |
| **Total**                                    | 20,031| 100.0|
When medical outcomes were analyzed, 24.5% (n = 4,912) of human exposures had no effect, 17.7% (n = 3,542) had minor effect, 9.1% (n = 1,830) had moderate effect, and 2.4% (n = 476) major effect. Moderate effects were more common in the 13 - 19-year-old group, while major effects were more common in those over 20 years of age. Moderate and major effects were most common in those with intentional encounters. More serious outcomes were related to single-substance pharmaceutical exposures, accounting for 42.9% (n = 3) of the fatalities. Table 10 lists all medical outcomes by age and Table 11 lists outcomes by reason for exposure.

Table 10. Medical outcome of human exposure cases by patient age.

| Outcome | ≤ 5 Years | 6-12 Years | 13-19 Years | ≥ 20 Years | Unknown Child | Unknown Adult | Unknown Age | Total |
|---------|-----------|------------|-------------|-----------|---------------|---------------|-------------|-------|
| No effect | 2,962 | 254 | 478 | 1,203 | 3 | 42.86 | 8 | 12.1 | 4,912 | 24.52 |
| Minor effect | 1,008 | 238 | 530 | 1,736 | 1 | 14.29 | 25 | 21.74 | 1,754 | 17.68 |
| Moderate effect | 112 | 52 | 360 | 1,298 | 0 | 0.00 | 3 | 15.2 | 1,830 | 9.14 |
| Major effect | 14 | 3 | 82 | 375 | 0 | 0.00 | 1 | 3.0 | 476 | 2.38 |
| Death | 0 | 0 | 0 | 0 | 0 | 0.00 | 0 | 0.0 | 7 | 0.03 |
| No follow-up, nontoxic | 341 | 44 | 5 | 39 | 0 | 0.00 | 1 | 0.87 | 430 | 2.15 |
| No follow-up, minimal toxicity | 5,032 | 580 | 288 | 1,766 | 3 | 42.86 | 39 | 33.91 | 7,718 | 38.53 |
| No follow-up, potentially toxic | 230 | 15 | 55 | 282 | 0 | 0.00 | 29 | 25.22 | 362 | 1.8 |
| Unrelated effect | 98 | 37 | 40 | 312 | 0 | 0.00 | 9 | 7.83 | 496 | 2.48 |
| Death, indirect report | 0 | 0 | 0 | 0 | 0 | 0.00 | 0 | 0.0 | 0 | 0.0 |
| Total | 9,797 | 1,223 | 1,838 | 7,018 | 7 | 100.00 | 115 | 100.00 | 33 | 100.00 | 20,031 | 100.00 |

Table 11. Medical outcome by reason for exposure in human exposures.

| Outcome | Unintentional | Intentional | Other | Adverse Reaction | Unknown | Total |
|---------|---------------|-------------|-------|------------------|---------|-------|
| Death | 1 | 0.01 | 5 | 0.12 | 0 | 0.00 | 1 | 0.28 | 0 | 0.00 | 7 | 0.03 |
| Death, indirect report | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Major effect | 46 | 0.30 | 405 | 9.78 | 7 | 8.43 | 8 | 2.26 | 0 | 0.00 | 476 | 2.38 |
| Minor effect | 2,280 | 14.84 | 1,138 | 27.49 | 16 | 19.28 | 96 | 27.12 | 12 | 13.33 | 3,542 | 17.68 |
| Moderate effect | 540 | 3.51 | 1,194 | 28.84 | 19 | 22.89 | 55 | 15.54 | 22 | 24.44 | 1,830 | 9.14 |
| No effect | 3,900 | 25.38 | 983 | 23.74 | 5 | 6.02 | 13 | 3.67 | 11 | 12.22 | 4,912 | 24.52 |
| No follow-up, nontoxic | 420 | 2.73 | 7 | 0.17 | 0 | 0.00 | 1 | 0.28 | 2 | 2.22 | 430 | 2.15 |
| No follow-up, minimal toxicity | 7,422 | 48.31 | 45 | 9.32 | 17 | 20.48 | 94 | 26.55 | 6 | 6.67 | 7,718 | 38.53 |
| No follow-up, potentially toxic | 424 | 2.76 | 158 | 3.82 | 13 | 15.66 | 12 | 3.39 | 13 | 14.44 | 620 | 3.10 |
| Unrelated effect | 331 | 2.15 | 71 | 1.71 | 6 | 7.23 | 74 | 20.90 | 14 | 15.56 | 496 | 2.48 |
| Total | 15,364 | 100.00 | 4,140 | 100.00 | 83 | 100.00 | 354 | 100.00 | 90 | 100.00 | 20,031 | 100.00 |
### Table 12a. Decontamination provided in human exposures by age.

| Decontamination            | ≤ 5 Years | 6-12 Years | 13-19 Years | ≥ 20 Years | Unknown Child | Unknown Adult | Unknown Age | Total |
|----------------------------|-----------|------------|-------------|------------|---------------|---------------|-------------|-------|
| Cathartic                  | 2         | 0          | 2           | 1          | 0             | 0             | 0           | 5     |
| Charcoal, multiple doses   | 3         | 0          | 8           | 8          | 0             | 0             | 0           | 19    |
| Charcoal, single dose      | 62        | 11         | 132         | 197        | 0             | 0             | 0           | 402   |
| Dilute/irrigate/wash       | 7,404     | 727        | 402         | 2,531      | 2             | 47            | 10          | 11,123|
| Food/snack                 | 1,436     | 132        | 85          | 422        | 2             | 5             | 1           | 2,083 |
| Fresh air                  | 68        | 52         | 32          | 419        | 0             | 19            | 9           | 599   |
| Lavage                     | 0         | 0          | 0           | 0          | 0             | 0             | 0           | 0     |
| Other emetic               | 67        | 6          | 7           | 49         | 0             | 0             | 0           | 129   |
| Whole bowel irrigation     | 0         | 0          | 1           | 13         | 0             | 0             | 0           | 14    |

### Table 12b. Therapy provided in human exposures by age.

| Therapy                          | ≤ 5 Years | 6-12 Years | 13-19 Years | ≥ 20 Years | Unknown Child | Unknown Adult | Unknown Age | Total |
|----------------------------------|-----------|------------|-------------|------------|---------------|---------------|-------------|-------|
| Decontamination                  |           |            |             |            |               |               |             |       |
| Cathartic                        | 2         | 0          | 2           | 1          | 0             | 0             | 0           | 5     |
| Charcoal, multiple doses         | 3         | 0          | 8           | 8          | 0             | 0             | 0           | 19    |
| Charcoal, single dose            | 62        | 11         | 132         | 197        | 0             | 0             | 0           | 402   |
| Dilute/irrigate/wash             | 7,404     | 727        | 402         | 2,531      | 2             | 47            | 10          | 11,123|
| Food/snack                       | 1,436     | 132        | 85          | 422        | 2             | 5             | 1           | 2,083 |
| Fresh air                        | 68        | 52         | 32          | 419        | 0             | 19            | 9           | 599   |
| Ipecac                           | 0         | 0          | 0           | 2          | 0             | 0             | 0           | 2     |
| Other therapies                  |           |            |             |            |               |               |             |       |
| Alkalinization                   | 2         | 0          | 47          | 162        | 0             | 0             | 0           | 211   |
| Antiarrhythmic                   | 0         | 0          | 0           | 3          | 0             | 0             | 0           | 3     |
| Antibiotics                      | 17        | 9          | 15          | 171        | 0             | 0             | 0           | 212   |
| Anticonvulsants                  | 0         | 0          | 3           | 2          | 0             | 0             | 0           | 5     |
| Antiemetics                      | 13        | 11         | 121         | 255        | 0             | 0             | 0           | 400   |
| Antihistamines                   | 14        | 6          | 15          | 79         | 0             | 1             | 1           | 116   |
| Antihypertensives                | 0         | 0          | 0           | 18         | 0             | 0             | 0           | 18    |
| Antivenom (Immune Fab fragment)  | 1         | 3          | 2           | 22         | 0             | 0             | 0           | 28    |
| Antivenom/antitoxin (Non-Fab)    | 0         | 2          | 0           | 8          | 0             | 0             | 0           | 10    |
| Atropine                         | 4         | 2          | 3           | 9          | 0             | 1             | 0           | 19    |
| Benzodiazepines                  | 12        | 7          | 109         | 345        | 0             | 0             | 1           | 474   |
| Bronchodilators                  | 5         | 6          | 7           | 67         | 0             | 1             | 0           | 86    |
| Calcium                          | 126       | 8          | 10          | 35         | 0             | 0             | 0           | 179   |
| Cardiopression                   | 0         | 0          | 0           | 1          | 0             | 0             | 0           | 1     |
| Deferoxamine                     | 0         | 0          | 0           | 1          | 0             | 0             | 0           | 1     |
| Digoxin Immune Fab               | 0         | 0          | 0           | 12         | 0             | 0             | 0           | 12    |
| EDTA                             | 1         | 0          | 0           | 1          | 0             | 0             | 0           | 1     |
| Ethanol                          | 0         | 0          | 0           | 1          | 0             | 0             | 0           | 1     |
| Extracorp. procedure (other)     | 0         | 0          | 0           | 1          | 0             | 0             | 0           | 1     |
Table 12b. Therapy provided in human exposures by age. cont.

| Therapy            | ≤ 5 Years | 6-12 Years | 13-19 Years | ≥ 20 Years | Unknown Child | Unknown Adult | Unknown Age | Total |
|--------------------|-----------|------------|-------------|------------|---------------|---------------|-------------|-------|
| Fluids, IV         | 53        | 31         | 525         | 1,535      | 0             | 3             | 0           | 2,147 |
| Flumazenil         | 2         | 3          | 2           | 35         | 0             | 0             | 0           | 42    |
| Folate             | 0         | 0          | 0           | 5          | 0             | 0             | 0           | 5     |
| Fomepizole         | 0         | 1          | 1           | 24         | 0             | 0             | 0           | 26    |
| Glucagon           | 1         | 0          | 3           | 25         | 0             | 1             | 0           | 30    |
| Glucose, > 5%      | 3         | 0          | 5           | 48         | 0             | 1             | 0           | 57    |
| Hemodialysis       | 0         | 0          | 1           | 24         | 0             | 0             | 0           | 25    |
| Hyperbaric oxygen  | 0         | 0          | 0           | 4          | 0             | 0             | 0           | 4     |
| Insulin            | 0         | 0          | 6           | 22         | 0             | 1             | 0           | 29    |
| Intubation         | 3         | 0          | 30          | 205        | 0             | 1             | 0           | 239   |
| Methylene blue     | 0         | 0          | 0           | 4          | 0             | 0             | 0           | 4     |
| NAC, IV            | 3         | 4          | 76          | 177        | 0             | 0             | 0           | 260   |
| NAC, PO            | 0         | 0          | 14          | 24         | 0             | 0             | 0           | 38    |
| Nalmefene          | 0         | 0          | 0           | 1          | 0             | 0             | 0           | 1     |
| Naloxone           | 10        | 3          | 28          | 139        | 0             | 1             | 0           | 181   |
| Neuromuscular blocker | 0     | 0          | 2           | 13         | 0             | 0             | 0           | 15    |
| Octreotide         | 2         | 0          | 0           | 2          | 0             | 0             | 0           | 4     |
| Other              | 42        | 27         | 98          | 534        | 0             | 2             | 0           | 703   |
| Oxygen             | 9         | 4          | 52          | 435        | 0             | 1             | 4           | 505   |
| Physostigmine      | 0         | 0          | 4           | 5          | 0             | 0             | 0           | 9     |
| Phytonadione       | 1         | 0          | 7           | 21         | 0             | 0             | 0           | 29    |
| Sedation (other)   | 7         | 1          | 33          | 233        | 0             | 0             | 0           | 254   |
| Steroids           | 9         | 7          | 8           | 66         | 0             | 1             | 0           | 91    |
| Succimer           | 7         | 0          | 0           | 7          | 0             | 0             | 0           | 14    |
| Transplantation    | 0         | 0          | 0           | 1          | 0             | 0             | 0           | 1     |
| Vasopressors       | 2         | 0          | 8           | 53         | 0             | 1             | 0           | 64    |
| Ventilator         | 2         | 0          | 32          | 197        | 0             | 1             | 0           | 232   |

DISCUSSION

The 2018 Kansas Poison Control Center at The University of Kansas Health System’s statistics are mirroring those seen nationally by the other 54 accredited poison control centers nationwide. In 2018, 2,530,238 encounters were logged by poison control, including 2,099,751 human exposures. Overall encounters showed a 2.96% (n = 77,175) decline from 2017 to 2018, though healthcare facility human exposure cases decreased by only 0.261% from 2017. More serious outcomes (moderate, major or death) continue to increase. Nationwide, the five substance classes most frequently involved in adult exposures were analgesics, cleaning substances (household), cosmetics/personal care products, sedative/hypnotics/antipsychotics, and antidepressants, while the top five most common exposures in children age five years or less were cosmetics/personal care products, household cleaning substances, analgesics, foreign bodies/toys/miscellaneous, and topical preparations. There were 3,111 exposure related fatalities reported nationwide in 2018.

The KSPCC has served the state of Kansas continually 24 hours a day, 365 days a year for 37 years. By receiving over 20,000 calls per year, the KSPCC continues to be an important resource for emergency medical services, public health agencies, and health care facilities in Kansas. Childhood poisonings, both unintentional and intentional, remain a major focus since calls for patients under 19 years of age account for approximately 2/3 of all exposures. However, more serious hospitalized adult cases are becoming an increasing trend.
Table 13. Details on deaths and exposure related fatalities.

| Age; Sex | Substances | Substance Rank | Cause Rank | Chronicity | Route | Reason | AAPCC RCF* |
|----------|------------|----------------|------------|------------|-------|--------|------------|
| 53;F     | Acetaminophen/ Diphendydramine | 1              | 1          | A/C        | Ingestion | Intentional- unknown | 3          |
|          | Melaxaline | 2              | 2          |            |        |        |            |
| 60;F     | Theophylline | 1              | 1          | C          | Ingestion | Adverse reaction - drug | 3          |
| 34;M     | Acetaminophen/ Dextromethorphan/ Doxylamine | 1              | 1          | A          | Ingestion | Intentional - suicide | 3          |
|          | Tramadol   | 2              | 2          |            |        |        |            |
| 39;F     | Quetiapine | 1              | 1          | A          | Ingestion | Unknown | 4          |
|          | Trazodone  | 2              | 2          |            |        |        |            |
|          | Duloxetine | 3              | 3          |            |        |        |            |
|          | Potassium Chloride | 4              | 4          |            |        |        |            |
|          | Drug, unknown | 5              | 5          |            |        |        |            |
| 65;M     | Methamphetamine | 1              | 1          | A          | Inhalation | Intentional - Abuse | 3          |
| 59;M     | Drug, unknown | 1              | 1          | A/C        | Ingestion | Intentional - Suicide | 6          |
| 69;F     | Drug, unknown | 1              | 1          | A          | Unknown  | Intentional - Suicide | 6          |
|          | Citalopram  | 2              | 2          |            |        |        |            |
|          | Baclofen    | 3              | 3          |            |        |        |            |

*American Association of Poison Control Centers Relative Contribution to Fatality

Table 14. 2015 to 2018 comparison of select statistics.

|                     | 2015  | 2016  | 2017  | 2018  |
|---------------------|-------|-------|-------|-------|
| Total cases         | 20,109| 21,965| 21,431| 21,072|
| Calls from healthcare facility | 4,267 | 4,514 | 4,892 | 5,224 |
| Moderate or major outcomes | 1,688 | 1,971 | 2,170 | 2,340 |
| Deaths              | 13    | 15    | 16    | 7     |

The ongoing importance of the KSPCC is reflected in trends that have seen rates of poisonings and overdoses increase at an alarming rate over the last decade. According to the most current available data, drug poisoning-related hospitalizations in the United States have increased 26%.23 The National Center for Health Statistics noted over 67,000 overdose related deaths in 2018.4 Similarly, the KSPCC consistently has seen an increase in the number of calls from healthcare facilities and cases with moderate or major medical outcomes. Over the last four years, calls from healthcare facilities have increased by 21%. At the same time, calls involving moderate or major outcomes increased by 37%.

Several limitations must be noted when interpreting poison center data. Reporting exposures to the KSPCC is voluntary and the KSPCC is not contacted regarding all poisonings in the state of Kansas. Furthermore, in a majority of cases, there is no objective confirmation of exposure.

CONCLUSIONS

The 2018 KSPCC annual report demonstrated that the center received over 20,000 human exposures called from the entire state of Kansas. While pediatric exposures remain the most common, there continued to be an increasing trend in the number of calls from healthcare facilities and for cases with serious outcomes. In this regard, the experience of the KSPCC is similar to national data. This report supported the continued value of the KSPCC to both the public and healthcare professionals in the state of Kansas.

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