



## 2017 Fireworks Annual Report

### Fireworks-Related Deaths, Emergency Department-Treated Injuries, and Enforcement Activities During 2017

June 2018

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*This analysis was prepared by CPSC staff. It has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.*

## Executive Summary

This report provides the results of U.S. Consumer Product Safety Commission (CPSC) staff's analysis of data on nonoccupational, fireworks-related deaths and injuries during calendar year 2017. The report also includes a summary of CPSC staff's enforcement activities during fiscal year 2017.<sup>1</sup>

Staff obtained information on fireworks-related deaths from news clippings and other sources in the CPSC's Injury and Potential Injury Incident file (IPII) and the CPSC's Death Certificate File. Staff estimated fireworks-related injuries treated in hospital emergency departments from CPSC's National Electronic Injury Surveillance System (NEISS). CPSC staff conducted a special study of nonoccupational fireworks-related injuries occurring between June 16, 2017 and July 16, 2017. The special study included collection and analysis of more detailed incident information, such as the type of injury, the fireworks involved, and the characteristics of the victim and the incident scenario. About 67 percent of the estimated annual fireworks-related, emergency department-treated injuries for 2017 occurred during that period.

Highlights of the report:

### *Deaths and Injuries*

- CPSC staff received reports of eight nonoccupational fireworks-related deaths during 2017. Of the eight fatalities in 2017, five were related to reloadable aerial devices; one was associated with manufacturing homemade devices; one involved a firecracker; and one was related to sparklers. Seven victims died from direct impacts of fireworks, and one victim died in a house fire caused by misusing a firecracker. Reporting of fireworks-related deaths for 2017 is not complete, and the number of deaths in 2017 should be considered a minimum.
- CPSC staff received an average of 7.25 reports of fireworks-related deaths per year between 2002 and 2017.
- Fireworks were involved in an estimated 12,900 injuries treated in U.S. hospital emergency departments during calendar year 2017 (95 percent confidence interval 9,700–16,100). The estimated rate of emergency department-treated injuries is 4.0 per 100,000 individuals in the United States.
- There is not a statistically significant trend in estimated emergency department-treated, fireworks-related injuries from 2002 to 2017.
- An estimated 8,700 fireworks-related injuries (or 67 percent of the total estimated fireworks-related injuries in 2017) were treated in U.S. hospital emergency

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<sup>1</sup> Fiscal year 2017 refers to the time period between October 1, 2016 and September 30, 2017.

departments during the 1-month special study period between June 16, 2017 and July 16, 2017 (95 percent confidence interval 6,100–11,200).

*Results from the 2017 Special Study<sup>2</sup>*

- Of the fireworks-related injuries sustained, 70 percent were to males, and 30 percent were to females.
- Children younger than 15 years of age accounted for 36 percent of the estimated 2017 injuries. Fifty percent of the estimated emergency department-treated, fireworks-related injuries were to individuals younger than 20 years of age.
- Children 10 to 14 years of age had the highest estimated rate of emergency department-treated, fireworks-related injuries (5.9 injuries per 100,000 people). Young adults 20 to 24 years of age had the second highest estimated rate (5.8 injuries per 100,000 people).
- There were an estimated 1,200 emergency department-treated injuries associated with sparklers and 300 with bottle rockets.
- There were an estimated 800 emergency department-treated injuries associated with firecrackers. Of these, an estimated 51 percent were associated with small firecrackers, an estimated 18 percent with illegal firecrackers, and an estimated 31 percent with firecrackers for which there was no specific information.
- The parts of the body most often injured were hands and fingers (an estimated 31 percent); head, face, and ears (an estimated 22 percent); legs (an estimated 17 percent); eyes (an estimated 14 percent); and arms (an estimated 6 percent).
- Fifty-three percent of the emergency department-treated injuries were burns. Burns were the most common injury to hands, fingers and arms.
- Approximately 82 percent of the victims were treated at the hospital emergency department and then released. An estimated 14 percent of patients were treated and transferred to another hospital or admitted to the hospital.

CPSC staff conducted telephone follow-up investigations of fireworks-related injuries that were reported at NEISS hospital emergency departments during the 2017 special study period and that met certain criteria. Many of these cases were selected for follow-up interviews because they involved potentially serious injuries and/or hospital admissions. Cases were also selected to clarify information in the hospital record about the incident scenario or fireworks type. Thirty telephone interviews were completed and 29 of them were determined to be in scope.

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<sup>2</sup> The percentages are calculated from the actual injury estimates.

A review of data from the 29 completed telephone follow-up investigations showed that most injuries were associated with misuse or malfunctions of fireworks. Misuse included: holding fireworks in hand; setting off fireworks improperly; throwing lit fireworks at someone; dismantling and manufacturing fireworks; igniting fireworks too close to someone; igniting used dud fireworks; and placing fireworks too close to a heat source. Typical malfunctions included: tip-over incidents; debris; errant flight paths; blowouts (*e.g.* exploded in the tube); and back fire (*e.g.* sparks exiting from the rear of the device). According to the injury investigation reports, most victims recovered from their injuries or were expected to recover completely. However, several victims reported that their injuries might be long term.

### *Enforcement Activities*

During fiscal year 2017, CPSC's Office of Compliance and Field Operations continued to work closely with other federal agencies to conduct surveillance on imported fireworks and to enforce the provisions of the Federal Hazardous Substances Act (FHSA) and regulations under the FHSA.

The Compliance and Field Operations staff, in cooperation with U.S. Customs and Border Protection (CBP), continues to conduct surveillance on imported shipments of consumer fireworks. With assistance from CBP, CPSC staff selectively sampled and tested shipments of imported fireworks in fiscal year 2017, for compliance with the FHSA requirements. Approximately 31 percent of the selected and tested shipments were found to contain fireworks that were noncompliant. These violative fireworks devices had an estimated import value of \$124,000. The most frequent violations were due to overloaded report compositions and fuse burn time, comprising approximately 58 and 17 percent of all violations in fiscal year 2017, respectively. CPSC staff requested corrective action on these noncompliant fireworks; and in most cases, firms voluntarily destroyed the noncompliant fireworks.

## 1. Introduction

This report describes injuries and deaths during calendar year 2017, associated with fireworks devices, as well as kits and components used to manufacture illegal fireworks. Reports for earlier years in this series can be found at: <https://www.cpsc.gov/Research--Statistics/Fuel-Lighters-and-Fireworks1>.

This report is organized into seven sections. Section 1 contains a description of the data and statistical methods used in this analysis. Section 2 summarizes the 2017 fireworks-related incidents that resulted in deaths. Section 3 provides an annual estimate of fireworks-related, emergency department-treated injuries in the United States for 2017, and the report compares that estimate with the estimated injuries for previous years. Section 4 analyzes emergency department-treated, fireworks-related injuries occurring during the month around July 4, 2017. Section 5 summarizes the telephone in-depth investigations of a subsample of the injuries during that period. Section 6 describes enforcement activities of CPSC's Office of Compliance and Field Operations during 2017. The report concludes with a summary of the findings in Section 7. Appendix A presents a table on the relationship between fireworks-related injuries and fireworks imports between 2002 and 2017. Appendix B contains more detail on the completed telephone investigations.

### *Sources of Information*

Information on nonoccupational fireworks-related deaths occurring during 2017 was obtained from the CPSC's Injury and Potential Injury Incidents (IPII) file and the CPSC's Death Certificate File. Entries in IPII come from a variety of sources, such as newspaper articles, consumer complaints, lawyer referrals, medical examiners, and other government agencies. CPSC staff from the Office of Compliance and Field Operations conducted in-depth investigations of the deaths to determine the types of fireworks involved in the incidents and the circumstances that led to the fatal injuries.

Because the data in IPII are based on voluntary reports, and because it can take more than 2 years to receive all death certificates from the various states to complete the Death Certificate File, neither data source can be considered complete for the number of 2016 or 2017 fireworks-related deaths at the time this report was prepared. Consequently, the number of deaths should be considered a minimum. Staff updates the number of deaths for previous years when new reports are received. Total deaths for prior years may not coincide with the numbers in reports for earlier years because of these updates.

The source of information on nonoccupational, emergency department-treated fireworks-related injuries is the CPSC's National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U.S. hospitals with emergency departments.<sup>3</sup> Injury information is taken from the emergency department record. This information includes the victim's age and sex, the place where the injury occurred, the emergency department diagnosis, the body part injured, and the consumer product(s) associated with the injury. The information is supplemented by a 160-character narrative that often contains a brief description of how the injury occurred.

To supplement the information available in the NEISS record, every year, during the month around July 4, CPSC staff conducts a special study of fireworks-related injuries. Staff focuses its efforts on fireworks incidents during this period because in most years, about two-thirds to three-quarters of the annual injuries occur then. During this period, hospital emergency department staffs show patients pictures of different types of fireworks to help them identify the type of fireworks device associated with their injuries. The type of fireworks involved in the incident is written into the NEISS narrative. In 2017, the special study period lasted from June 16 to July 16.

After reading the incident case records, including the narrative description of the fireworks device and the incident scenario, CPSC staff may assign a case for telephone investigation. Cases are usually selected because they involve the most serious injuries and/or hospital admissions. Serious injuries include: eye injuries, finger and hand amputations, and head injuries. Cases also may be assigned to obtain more information about the incident than what is reported in the NEISS narrative. In most years, phone interviewers are able to collect information for one-third to one-half of the cases assigned. Information on the final status of the telephone interviews conducted during the 2017 special study is found in Section 5 and Appendix B of this report.

In the telephone investigations, information is requested directly from the victim (or the victim's parent, if the victim is a minor) about the type of fireworks involved, where the fireworks were obtained, how the injury occurred, and the medical treatment and prognosis. When the fireworks device reported in the telephone investigation is different from what is reported in the NEISS emergency department record, the device reported in the telephone investigation is used in the data for this report.

As a result of this investigative process, three different levels of information may be available about a fireworks-related injury case. For the cases that occur before or after the July 4 special study period, the NEISS record is almost always the only source of information. Many NEISS records collected outside the special study period do not specify the type of fireworks involved in the incident. During the special study period, more information is available for analysis because the NEISS record collected by the

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<sup>3</sup> For a description of NEISS, including the revised sampling frame, see Schroeder and Ault (2001). Procedures used for variance and confidence interval calculations and adjustments for the sampling frame change that occurred in 1997 are found in Marker, Lo, Brick, and Davis (1999). SAS<sup>®</sup> statistical software for trend and confidence interval estimation is documented in Schroeder (2000). SAS<sup>®</sup> is a product of the SAS Institute, Inc., Cary, NC.

emergency department usually contains the type of fireworks and additional details on the incident scenario. Finally, the most information is available for the subset of the special study cases where staff conducted telephone investigations. These different levels of information about injuries correspond to different analyses in the report, as follows:

- Estimated national number of fireworks-related, emergency department-treated injuries. This estimate is made using NEISS cases for the entire year, from records where fireworks were specified as one of the consumer products involved. For cases outside the special study period, as noted above, there is usually no information on the fireworks type, and limited information is available on the incident scenario. Consequently, there is not enough information to determine the role played by the fireworks in the incident. This means that the annual injury estimate may include a small number of cases in which the fireworks device was not lit or no attempt was made to light the device. Calculating the annual estimates without removing these cases makes the estimates comparable to previous years.<sup>4</sup>
- Detailed analyses of injury patterns. The tables in this report, which describe fireworks type, body part injured, diagnosis, age and sex of injured people, and other such information, are based on the special study period only. Fireworks-type information is taken from the telephone investigation or the NEISS comment field when there was no telephone investigation. When computing estimates for the special study period, staff does not include cases in which the fireworks device was not lit or no attempt was made to light the device.
- Information from telephone investigations. Individual case injury descriptions and medical prognosis information from the telephone investigations are listed in Appendix B. These listings also exclude cases in which the fireworks device was not lit or no attempt was made to light the device. These cases represent a sample of some of the most serious fireworks-related injuries and may not represent the typical emergency department-treated, fireworks-related injuries.

### *Statistical Methods*

Injuries reported by hospitals in the NEISS sample were weighted by the NEISS probability-based sampling weights to develop an estimate of total U.S. emergency department-treated, fireworks-related injuries for the year and for the special study month around July 4. Confidence intervals were estimated, and other statistics were calculated using computer programs that were written to take into account the sampling design.<sup>5</sup> Estimated injuries are rounded to the nearest 100 injuries. Estimates of fewer than 50 injuries are shown with an asterisk (\*). Percentages are calculated from the actual

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<sup>4</sup> The only exception to the practice of including all of the cases occurred in 2003, when nine cases representing an estimated 150 emergency department-treated injuries were excluded from the annual injury estimates. These cases resulted from a nightclub fire in West Warwick, RI, which also caused 100 deaths. For details see Greene and Joholske (2004).

<sup>5</sup> See Schroeder (2000).

estimates. Percentages may not add to subtotals or to the total in the tables or figures, due to rounding.

This report also contains a number of detailed tables about fireworks-related injuries during the special study period. National estimates in these tables were also made using the sampling weights. To avoid cluttering the tables, confidence intervals are not included. Because the estimates are based on subsets of the data, they have larger relative sampling errors (*i.e.*, larger coefficients of variation) than the annual injury estimate or the special study injury estimate. Therefore, interpretation and comparison of these estimates with each other or with estimates from prior years should be made with caution. For example, when comparing subsets of the data—such as between injuries associated with two different types of fireworks, or between two different age groups—it is difficult to determine how much of the difference between estimates is associated with sampling variability and how much is attributed to real differences in national injury totals.



## 2. Fireworks-Related Deaths for 2017

CPSC has reports of eight nonoccupational, fireworks-related deaths that occurred during 2017. Reporting of fireworks-related deaths for 2017 is not complete, and the number of deaths in 2017 should be considered a minimum. Brief descriptions of the incidents, using wording taken from the incident reports, follow:

- A 52-year-old male lived in a mobile home with his sister in Florida. The mobile home had developed a rodent problem. According to the medical examiner's report, the victim's sister threw a lit firecracker at a rodent, and the firecracker caught the insulation of the mobile home on fire. The mobile home became engulfed in flames and the victim was unable to escape. The victim was found deceased near the back area of the residence. This incident occurred on April 30, 2017.
- On the New Year's Eve of 2016, a 38-year-old female from Hawaii was at a party to celebrate the New Year with her partner, friends and family members in a private property. It was reported that the victim, her partner and some people had been igniting fireworks on the public street in front of the property. It was believed that the victim was holding a metal mortar tube in her hands with a commercial 1.3G fireworks shell in it. The shell was possibly put into the tube by her partner. For an unknown reason, the fireworks shell exploded while inside the mortar tube, resulting in shrapnel from the tube becoming embedded into both the victim and her partner. The victim died of penetrating injury of the right axilla on the New Year's Day, and her partner was in serious condition and was transported to a hospital. According to the investigating officials, the witnesses were not cooperative with the authorities for the investigation. As a result, minimum information about the incident and the product were obtained.
- On July 4, 2017, a 42-year-old male from Illinois sustained a fatal head injury from a fireworks explosion incident. According to the police and fire department reports, the victim used a lighter to ignite the fuse of a large cylindrical mortar in a PVC tube that was 24-inch long and 4-inch in diameter. The mortar seemed to be a dud and did not launch. The victim approached the tube and looked down the pipe, and suddenly the mortar blew up into the victim's face. The victim died on the scene, and the cause of death was craniocerebral injuries from fireworks.
- An 11-year-old boy from Kansas died of penetrating injury of the left neck on July 21, 2017. According to the official reports, authorities received a 911 call from the victim of an apparent explosion. Multiple fire departments and EMS responded. According to the police, the victim was home alone and had been experimenting with fireworks and other explosive devices. The homemade device blew up and a piece of metal went into the victim's neck cutting his carotid artery. The victim was pronounced deceased at the scene. The death was determined to be accidental.

- A 25-year-old male from Kentucky died of fireworks explosion on July 3, 2017. According to the police report, the victim was holding a consumer artillery tube in his hand when the device was loaded and ignited. The shell exploded in the tube while the victim was holding it. According to a witness who was standing next to the victim, the victim yelled and ran a few steps before collapsing. The victim was taken to a hospital and was pronounced dead. The cause of death was multiple blunt force injuries to the torso.
- A 57-year-old male from Maine died after a fireworks explosion on October 8, 2017. It was reported that the victim placed a firework into a PVC pipe and propped it up in a cinderblock outside his son's home. When the victim lit the firework, it exploded sending pieces flying. The victim was standing 15 feet away and several pieces of cement hit him. The victim was taken to a hospital where he died from his injuries. It was also reported that the fireworks involved were professional grade and the investigating authority did not know how the victim acquired them.
- A 28-year-old male from Missouri was injured by fireworks and died later in a hospital on July 4, 2017. According to the police, the victim was reported setting off fireworks in backyard. An unknown type of mortar shell struck the victim in his face and caused a massive trauma rendering him unconscious. The victim was transported to a hospital where he was pronounced deceased. The officials observed a lot of fireworks were close to where the victim was found. No one actually witnessed the incident. The police officials reported that no other details about the incident could be obtained.
- A 4-year-old girl from Wisconsin was killed in a fireworks incident in July 2017. According to EMS report, the victim and her father were in front of their home where the father was lighting fireworks on July 10, 2017. At some point, the father put numerous individual sparklers into a piece of metal tube and then secured the tube into a planting pot to make it stay upright. The victim's father did this several times without an issue. Just before 10:30pm, the victim's father packed sparklers into the tube again and ignited them. The victim was reportedly about 10 to 12 feet away from the fireworks. Once the sparklers were lit, the force of the sparklers blew apart the tube, creating shrapnel that struck the victim in the neck. The victim's father carried the victim into the home and a 911 call was made. The medical responders treated the victim without success. The coroner declared the victim deceased just after the midnight.

Including the eight deaths described above, CPSC staff has reports of 116 fireworks-related deaths between 2002 and 2017, for an average of 7.25 deaths per year.<sup>6</sup>

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<sup>6</sup> See previous reports in this series (*e.g.*, the report for 2016: Tu (2016)). In the most recent 3 years, the number of deaths included 13 deaths in 2014, 11 deaths in 2015, and four deaths in 2016.

### 3. National Injury Estimates for 2017

Table 1 and Figure 1 present the estimated number of nonoccupational, fireworks-related injuries treated in U.S. hospital emergency departments between 2002 and 2017.

Table 1  
Estimated Fireworks-Related Injuries: 2002–2017

Year	Estimated Injuries	Injuries per 100,000 People
2017	12,900	4.0
2016	11,100	3.4
2015	11,900	3.7
2014	10,500	3.3
2013	11,400	3.6
2012	8,700	2.8
2011	9,600	3.1
2010	8,600	2.8
2009	8,800	2.9
2008	7,000	2.3
2007	9,800	3.3
2006	9,200	3.1
2005	10,800	3.7
2004	9,600	3.3
2003	9,300	3.2
2002	8,800	3.1

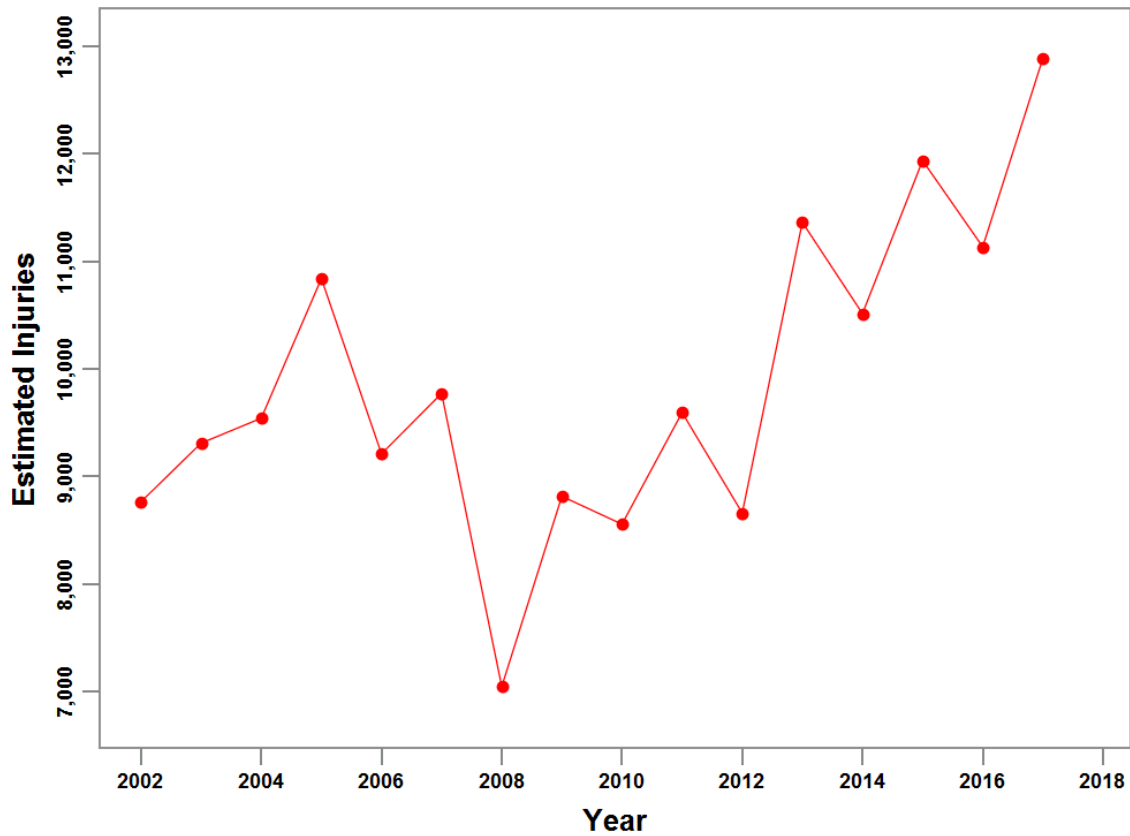
*Source:* NEISS, U.S. Consumer Product Safety Commission. The estimate for 2003 excludes an estimated 150 emergency department-treated injuries following the nightclub fire in West Warwick, RI. Population estimates for 2010 to 2017 are from Table 1. Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2017 (NST-EST2017-01), U.S. Census Bureau, Population Division. Release Date: December 2017. Population estimates for 2002 to 2009 are from Table 1. Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2009 (NST-EST2009-01). Population Division, U.S. Census Bureau.

In calendar year 2017, there were an estimated 12,900 fireworks-related, emergency department-treated injuries (95 percent confidence interval 9,700–16,100). There were an estimated 11,100 injuries in 2016. The difference between the injury estimates for 2017 and 2016 is not statistically significant.

Figure 1 shows that the highest estimated number of annual fireworks-related injuries was 12,900 in 2017, followed by 11,900 estimated injuries in 2015; 11,400 estimated injuries in 2013; 11,100 estimated injuries in 2016; 10,800 estimated injuries in 2005; and 10,500 estimated injuries in 2014. For the other years, the estimated number of injuries fluctuated between 7,000 and 9,800. In 2008, the estimated number of fireworks-related injuries was 7,000, which was the lowest between 2002 and 2017. There is not a

statistically significant trend detected in the fireworks-related injury estimates from 2002 to 2017.<sup>7</sup>

**Figure 1**  
**Estimated Fireworks-Related, Emergency Department-Treated Injuries**  
**2002–2017**



Source: NEISS, U.S. Consumer Product Safety Commission.

Appendix A contains a table showing estimated fireworks-related injuries and fireworks imports between 2002 and 2017.

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<sup>7</sup> For details on the method to test a trend that incorporates the sampling design, see Schroeder (2000) and Marker et al. (1999).

#### **4. Injury Estimates for the 2017 Special Study: Detailed Analysis of Injury Patterns**

The injury analysis in this section presents the results of the 2017 special study of fireworks-related injuries treated in hospital emergency departments between June 16, 2017 and July 16, 2017. During this period, there were an estimated 8,700 fireworks-related injuries (95 percent confidence interval 6,100–11,200), accounting for 67 percent of the total estimated fireworks-related injuries for the year, which is not statistically different from the estimated 7,600 fireworks-related injuries in the 2016 special study period.

The remainder of this section provides the estimated fireworks-related injuries from this period, broken down by fireworks device type, victims' demographics, injury diagnosis, and body parts injured.

##### *Fireworks Device Types and Estimated Injuries*

Table 2 shows the estimated number and percent of emergency department-treated injuries by type of fireworks device during the special study period of June 16, 2017 to July 16, 2017.

Table 2  
 Estimated Fireworks-Related Injuries  
 By Type of Fireworks Device  
 June 16–July 16, 2017

Fireworks Device Type	Estimated Injuries	Percent
Total	8,700	100
All Firecrackers	800	10
Small	400	5
Illegal	200	2
Unspecified	300	3
All Rockets	600	7
Bottle Rockets	300	3
Other Rockets	300	4
All Other Devices	3,500	41
Sparklers	1,200	14
Fountains	200	2
Novelties	700	8
Multiple Tube	200	2
Reloadable Shells	1,000	12
Roman Candles	400	4
Homemade/Altered	200	3
Public Display	*	*
Unspecified	3,400	39

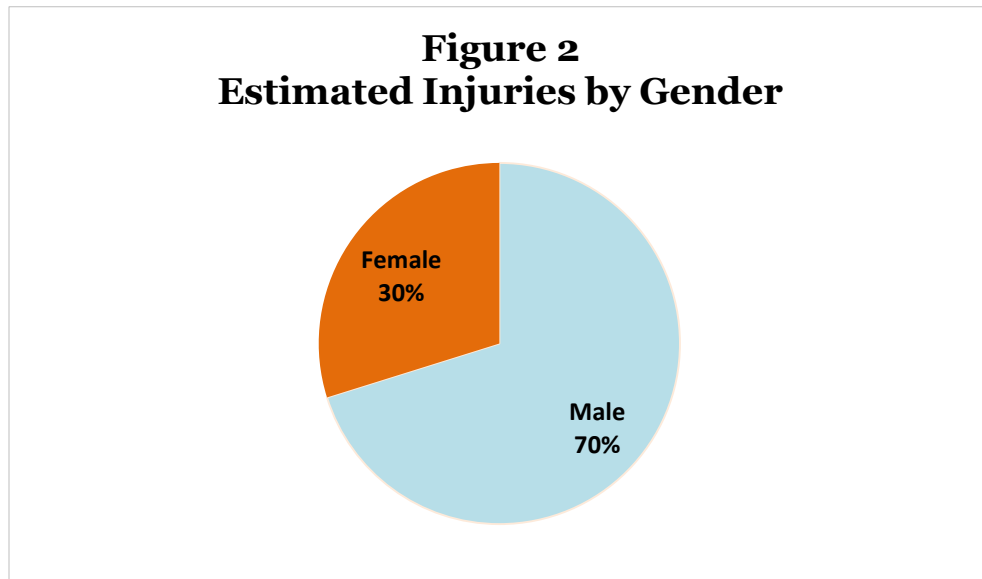
*Source:* NEISS, U.S. Consumer Product Safety Commission. Based on 224 NEISS emergency department-reported injuries between June 16, 2017 and July 16, 2017, and supplemented by 29 completed In-Depth Investigations (IDIs). Fireworks types are obtained from the IDI, when available; otherwise, fireworks types are identified from information in victims' reports to emergency department staff that were contained in the NEISS narrative. Illegal firecrackers include M-80s, M-1000s, Quarter Sticks, and other firecrackers that are banned under the Federal Hazardous Substances Act (FHSA) (16 C.F.R. § 1500.17). Fireworks that may be illegal under state and local regulations are not listed as illegal, unless they violate the FHSA. Subtotal estimates are presented below the estimates for firework type. Estimates are rounded to the nearest 100 injuries. Estimates may not sum to subtotal or total due to rounding. Percentages are calculated from the actual estimates, and they may not add to subtotals or the total due to rounding.

As shown in Table 2, sparklers were involved in 1,200 estimated emergency department-treated injuries, which represents 14 percent of the total fireworks-related injuries during the 2017 special study period. Reloadable shells were associated with 1,000 estimated injuries, 12 percent of the total fireworks-related injuries. Firecrackers accounted for an estimated 800 injuries, 10 percent of the total fireworks-related injuries during the special study period. Small firecrackers were involved in 400 injuries. The estimate for illegal firecracker-related injuries was 200. However, some of the estimated 300 unspecified firecracker-related injuries, and some of the estimated 3,400 unspecified fireworks-related injuries also may have involved illegal firecrackers. Novelty devices

were related to 700 estimated injuries, 8 percent of the total estimated injuries. Rockets were associated with 600 estimated injuries, 7 percent of the total estimated injuries, of which 300 injuries were involved in bottle rockets. Roman candles accounted for 400 estimated injuries, 4 percent of the total. Homemade/altered devices were involved in 200 estimated injuries, 3 percent of the total. Multiple tube devices and fountains each were associated with 200 estimated injuries, 2 percent of the total estimated injuries. Public display of fireworks were related to less than 1 percent of the total estimated injuries during the 2016 special study period. Although public display fireworks are not associated with a large number of injuries, the larger load in these devices makes them involved disproportionately in serious injuries.

### *Gender and Age of Injured Persons*

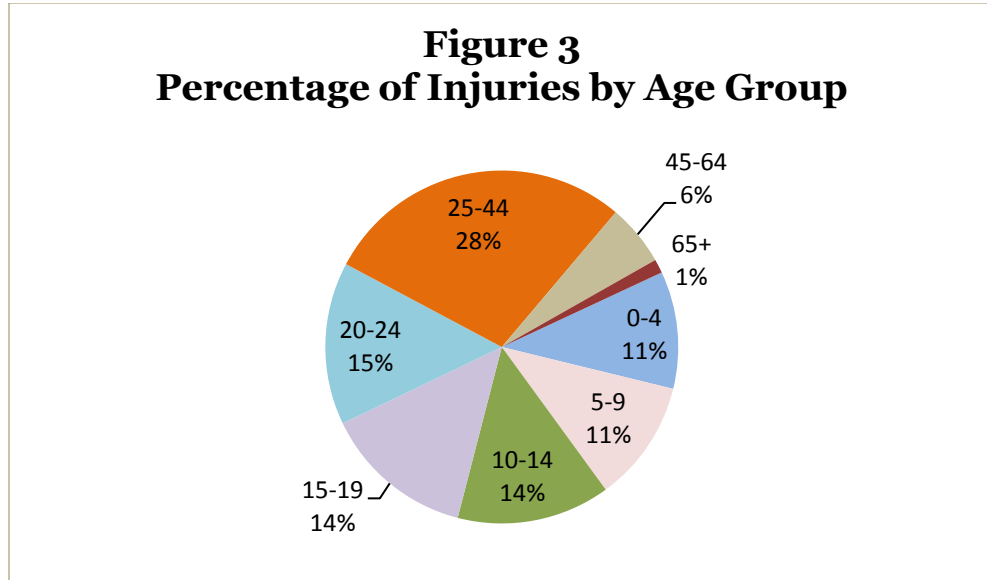
Some 6,100 of the estimated fireworks-related injuries were to males, representing 70 percent of the total injuries. Males experienced an estimated 3.8 fireworks-related, emergency department-treated injuries per 100,000 individuals during the special study period. Females, with an estimated 2,600 emergency department-treated injuries, had 1.6 injuries per 100,000 people. Figure 2 shows the distribution of estimated fireworks-related injuries by gender.



Source: NEISS, U.S. Consumer Product Safety Commission.

Children and young adults under age 20 constituted 50 percent of the fireworks-related injuries. Children under 5 years of age experienced an estimated 900 injuries (11 percent of all fireworks-related injuries during the special study period), as shown in Figure 3 and Table 3. Children in the 5- to 14-year-old age group experienced an estimated 2,200 injuries (25 percent of all fireworks-related injuries). Breaking down that age group further, children 5 to 9 years of age had an estimated 1,000 injuries and

children 10 to 14 years of age accounted for 1,200 injuries. In the aggregate, children under 15 years of age accounted for 36 percent of the estimated fireworks-related injuries.<sup>8</sup>



Source: NEISS, U.S. Consumer Product Safety Commission.

The detailed breakdown by age and gender is shown in Table 3. The concentration of injuries among males and people under 25 has been typical of fireworks-related injuries for many years.

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<sup>8</sup> The percentages are calculated from actual injury estimates, and age subcategory percentages may not sum to the category percentage due to rounding.



Table 3  
Estimated Fireworks-Related Injuries  
By Age and Gender  
June 16–July 16, 2017

Age Group	Total	Per 100,000 People	Male	Female
Total	8,700	2.7	6,100	2,600
0–4	900	4.7	500	400
5–14	2,200	5.3	1,600	600
5–9	1,000	4.7	700	300
10–14	1,200	5.9	900	300
15–24	2,500	5.7	2,000	500
15–19	1,200	5.7	1,100	100
20–24	1,300	5.8	900	400
25–44	2,500	2.9	1,500	1,000
45–64	500	0.6	300	200
65+	100	0.2	100	*

*Sources:* NEISS, U.S. Consumer Product Safety Commission. NC-EST2016-AGESEX-RES: Annual Estimates of the Resident Population by Single Year of Age and Sex for the United States: April 1, 2010 to July 1, 2016. File: 7/1/2016 National Population Estimates. Source: U.S. Census Bureau, Population Division. Release Date: April 2017. The oldest victim was 77 years of age. Estimates are rounded to the nearest 100 injuries. Age subcategory estimates may not sum to the category total due to rounding.

When considering per capita injury rates, children and young adults had higher estimated rates of injury than the other age groups during the 2017 special study period. Children 10 to 14 years of age had the highest estimated per capita injury rate at 5.9 per 100,000 population. This was followed by 5.8 injuries per 100,000 people from young adults 20 to 24 years of age, and 5.7 injuries per 100,000 people from older teens 15 to 19 years of age.

#### *Age and Gender of the Injured Persons by Type of Fireworks Device*

Table 4 shows the ages of those injured by the type of fireworks device associated with the injury. For children under 5 years of age, sparklers accounted for nearly half of the total estimated injuries for that specific age group.<sup>9</sup>

<sup>9</sup> The percentages are calculated from the actual injury estimates.

No clear relationship between age and fireworks type is suggested by the data in Table 4. It is worth noting that the number of estimated injuries does not completely represent the usage pattern because victims are often injured by fireworks used by other people. This is especially true for rockets and aerial shells (*e.g.*, fountains, multiple tube, and reloadable devices), which can injure people located some distance away from where the fireworks are launched.

Table 4  
Estimated Fireworks-Related Injuries  
By Device Type and Age Group  
June 16–July 16, 2017

Fireworks Type	Total	Age Group					
		0–4	5–14	15–24	25–44	45–64	65+
Total	8,700	900	2,200	2,500	2,500	500	100
All Firecrackers	800	*	400	200	100	100	*
Small	400	*	400	*	*	*	*
Illegal	200	*	*	100	*	100	*
Unspecified	300	*	*	100	100	*	*
All Rockets	600	100	200	200	*	100	*
Bottle Rockets	300	*	100	200	*	*	*
Other Rockets	300	100	200	*	*	100	*
Other Devices	3,500	500	800	1,000	1,000	100	100
Sparklers	1,200	400	200	200	400	*	*
Fountains	200	100	100	*	*	*	*
Novelties	700	*	400	300	100	*	*
Multiple Tube	200	*	*	100	100	*	*
Reloadable	1,000	*	100	400	300	*	100
Roman Candles	400	*	100	100	100	100	*
Homemade/Altered	200	*	100	*	100	100	*
Public Display	*	*	*	*	*	*	*
Unspecified	3,400	300	600	1,100	1,300	100	*

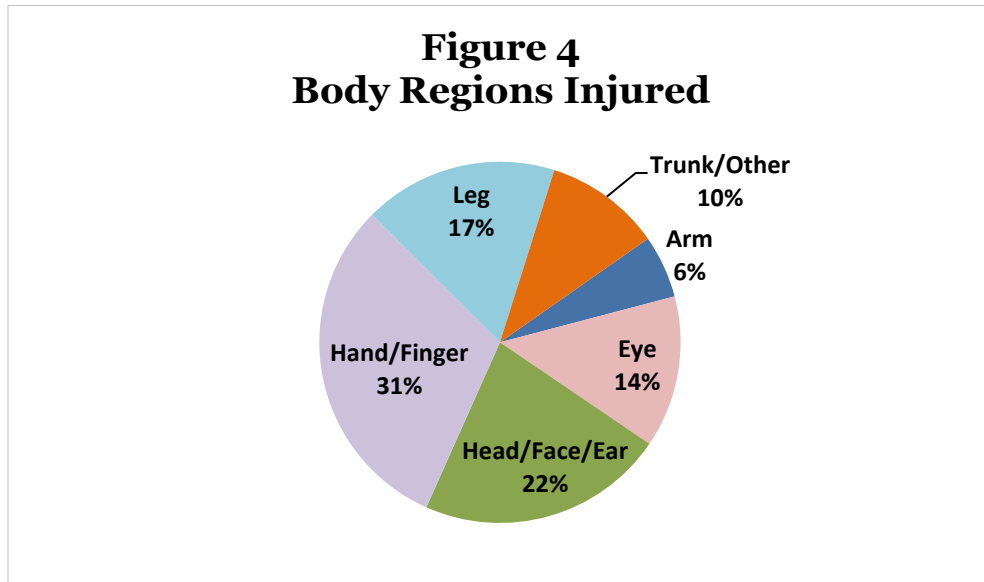
Source: NEISS, U.S. Consumer Product Safety Commission. Estimates are rounded to the nearest 100 injuries. Estimates of fewer than 50 injuries are denoted with an asterisk (\*). Estimated injuries may not sum to subtotals or totals due to rounding.

As shown previously in Figure 2, males accounted for 70 percent of the estimated fireworks-related injuries, and females comprised 30 percent. Males accounted for a

majority of the estimated injuries from firecrackers; bottle rockets; other rockets; sparklers; reloadable devices; Roman candles; as well as unspecified devices. In addition, males were associated with all the estimated injuries from fountains and homemade/altered devices. Females accounted for all the estimated injuries from public display of fireworks.

*Body Region Injured and Injury Diagnosis*

Figure 4 presents the distribution of estimated emergency department-treated injuries by the specific parts of the body to which the injury occurred. Hands and fingers, with an estimated 2,700 injuries, accounted for 31 percent of the total injuries. These were followed by an estimated 1,900 injuries to the head/face/ear region (22 percent); 1,500 leg injuries (17 percent); 1,200 eye injuries (14 percent); 900 injuries to trunk/other category (10 percent); and 500 arm injuries (6 percent).

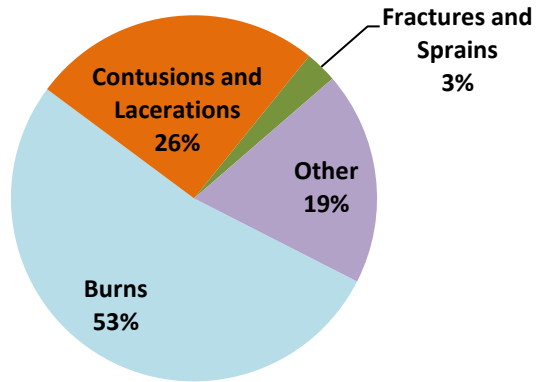


Source: NEISS, U.S. Consumer Product Safety Commission.

Figure 5 shows the diagnoses of the estimated injuries associated with fireworks devices. Burns, with 4,600 estimated injuries (53 percent), were the most frequent injury diagnosis. Contusions and lacerations were associated with 2,200 estimated injuries (26 percent), and fractures and sprains were associated with 200 estimated injuries (3 percent). The remaining 1,600 estimated injuries (19 percent) were attributed to other diagnoses.<sup>10</sup>

<sup>10</sup> Percentages are calculated from the actual injury estimates and do not sum to 100 due to rounding.

**Figure 5**  
**Type of Injuries**



*Source:* NEISS, U.S. Consumer Product Safety Commission. Percentages may not sum to 100 due to rounding.

As shown in Table 5, burns were the most frequent injuries to hands and fingers, arms, as well as the trunk and other regions. Contusions and lacerations were the most frequent injuries to eyes, which included foreign bodies in the eye.

Table 5  
 Estimated Fireworks-Related Injuries  
 By Body Region and Diagnosis  
 June 16–July 16, 2017

Body Region	Total	Burns	Diagnosis		
			Contusions Lacerations	Fractures Sprains	Other Diagnoses
Total	8,700	4,600	2,200	200	1,600
Arm	500	400	*	100	*
Eye	1,200	100	700	*	300
Head/Face/Ear	1,900	800	600	*	500
Hand/Finger	2,700	2,100	100	*	400
Leg	1,500	500	700	100	200
Trunk/Other	900	600	200	*	100

*Source:* NEISS, U.S. Consumer Product Safety Commission. Fractures and sprains also include dislocations. Other diagnoses include all other injury categories. Arm includes NEISS codes for upper arm, elbow, lower arm, shoulder, and wrist. Head/Face/Ear regions include eyelid, eye area, nose, neck, and mouth but not the eyeball. Leg includes upper leg, knee, lower leg, ankle, foot, and toe. Trunk/other regions include chest, abdomen, pubic region, “all parts of body”, internal, and “25–50 percent of body”. Estimates are rounded to the nearest 100 injuries. Estimates of fewer than 50 injuries are denoted with an asterisk (\*). Estimated injuries may not sum to subtotals or totals due to rounding.

*Type of Fireworks Device and Body Region Injured*

Table 6 presents estimated injuries by the type of fireworks device and body region injured.

Table 6  
 Estimated Fireworks-Related Injuries  
 By Type of Fireworks Device and Body Region Injured  
 June 16–July 16, 2017

Fireworks Type	Total	Arm	Eye	Region of the Body Injured			
				Head/Face/Ear	Hand/Finger	Leg	Trunk/Other
Total	8,700	500	1,200	1,900	2,700	1,500	900
All Firecrackers	800	100	100	100	400	100	100
Small	400	100	100	100	100	*	100
Illegal	200	*	*	*	100	100	*
Unspecified	300	*	*	*	200	*	*
All Rockets	600	*	*	100	200	100	100
Bottle Rockets	300	*	*	100	100	*	*
Other Rockets	300	*	*	*	100	100	100
Other Devices	3,500	200	500	900	1,200	700	100
Sparklers	1,200	100	*	100	700	300	*
Fountains	200	100	*	*	100	*	*
Novelties	700	*	100	400	100	100	*
Multiple Tube	200	*	100	*	*	100	*
Reloadable	1,000	*	300	200	200	200	100
Roman Candles	400	*	100	200	100	100	*
Homemade/Altered	200		*	100	100	*	*
Public Display	*	*	*	*	*	*	*
Unspecified	3,400	200	500	700	800	600	600

*Source:* NEISS, U.S. Consumer Product Safety Commission. Estimates are rounded to the nearest 100 injuries. Estimates of fewer than 50 injuries are denoted with an asterisk (\*). Estimated injuries may not sum to subtotals or totals due to rounding.

Sixty percent of the estimated sparkler injuries and 52 percent of the estimated bottle rocket injuries involved the hands and fingers. All of the estimated injuries from fountains involved the arms, hands and fingers. A majority of the estimated injuries associated with novelty devices affected the heads, faces and ears.

### *Hospital Treatment*

An estimated 82 percent of the victims of fireworks-related injuries were treated at the emergency department and then released; about 4 percent were admitted to the hospital; approximately 10 percent of the victims were treated and transferred to another hospital; and 4 percent of the victims had other dispositions (i.e. left hospital without being seen or held for observation). The treat-and-release percentage was slightly lower compared to that for all consumer products in 2017, and the percentages of the treated and transferred and the admitted were a bit higher for the fireworks-related injuries in the special study period than those for all consumer products.<sup>11</sup>

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<sup>11</sup>For all injuries associated with consumer products in 2017, 89 percent of patients were treated and released; 8 percent were admitted to the hospital; 1 percent of patients were transferred to other hospitals; and 2 percent had other dispositions, including left hospital without being seen, held for observation, or dead on arrival.

## 5. Telephone Investigations of Fireworks-Related Injuries

CPSC staff conducted telephone in-depth investigations of a sample of fireworks incidents that occurred during the 1-month special study period surrounding the 4<sup>th</sup> of July holiday (June 16, 2017 to July 16, 2017). Completed telephone investigations provided more detail about incidents and injuries than the emergency department information summarized in the narrative in the NEISS record. During the telephone interview, respondents were asked how the injury occurred (hazard pattern); what medical care they received following the emergency-department treatment; and what long-term effects, if any, resulted from their injury. Respondents were also asked detailed questions about the fireworks involved in the incident, including their type, markings, and where they were obtained.

Cases were selected for telephone investigations based on the information provided in the NEISS narrative and coded information in the NEISS records. The selection criteria included: (1) unusual hazard patterns, (2) severity of the injury, and (3) lack of clear information in the narrative about the type of fireworks associated with the injury. For these reasons, and because many victims did not respond, the telephone investigation cases cannot be considered typical of fireworks-related injuries.

From the 224 emergency department-treated, fireworks-related injuries during the special study period, staff selected 116 cases for telephone investigations, of which 29 were completed and determined to be in scope; one was completed and found to be out of scope; and 86 were incomplete. Table 7 shows the final status of these investigations, including the reasons why some investigations were incomplete.

Table 7  
Final Status of Telephone Investigations

Final Case Status	Number of Cases	Percent
Total Assigned	116	100
Completed Investigation	30	26
In Scope	29	25
Out of Scope	1	1
Incomplete Investigations	86	74
Failed to Reach Patient	61	53
Victim Name Not Provided by Hospital	8	7
Victim Refused to Cooperate	17	15

*Note:* Percentages may not add to subtotals or the total due to rounding.



One case was found to be out of scope after receiving information in the telephone investigation. The victim in the case twisted his ankle when his foot went into a hole in the ground, and he was not injured by fireworks. Short descriptions of the 29 completed in-scope cases are found in Appendix B. The cases are organized in order of emergency department disposition, with Admitted (to the hospital) first, followed by Treated and Transferred, and Treated and Released. Within dispositions, cases are in order of increasing age of the victim.

### *Summary Statistics<sup>12</sup>*

Of the 29 completed in scope cases, 15 (52 percent) involved males, and 14 (48 percent) involved females. There were three victims (10 percent) younger than 5 years of age; 13 victims (45 percent) ages 5 to 14 years of age; five victims (17 percent) ages 15 to 24 years of age; five victims (17 percent) ages 25 to 44 years of age; and three victims (10 percent) ages 45 to 64 years of age. As for emergency department dispositions, four victims (14 percent) were admitted to the hospital; three victims (10 percent) were treated at the emergency department and transferred to another hospital; 22 victims (76 percent) were treated and released.

The most frequently involved fireworks devices in these incidents were aerial shells,<sup>13</sup> which were associated with 11 incidents (38 percent). Firecrackers accounted for five incidents (17 percent)—three incidents involved small firecracker and two involved illegal firecrackers. Unspecified device were related to four incidents (14 percent). Bottle rockets were associated with three incidents (10 percent). Fountains and public display of fireworks each were involved in two incidents (7 percent). Roman candles and homemade/altered devices each accounted for one incident (3 percent).

Note that the distribution of the types of fireworks and the emergency department dispositions differ from the special study data in Section 4. These differences reflect the focus in the telephone investigation on more serious injuries and incompletely specified NEISS records. Note also that only 26 percent of the victims selected for the telephone investigations responded.

### *Hazard Patterns*

The hazard patterns described below are based on the incident descriptions obtained during the telephone investigations and summarized in Appendix B. When an incident has two or more hazard patterns, the hazard pattern most likely to have caused the injury was selected. Hazard patterns are presented in Table 8, below, and a detailed description of the incidents follows Table 8. Case numbers refer to the case numbers shown in Appendix B.

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<sup>12</sup> Percentages may not add to 100 due to rounding.

<sup>13</sup> The category “aerial shells” includes multiple tube, reloadable mortars and rockets, but excludes bottle rockets.

Table 8  
Hazard Patterns, as Described in Telephone Investigations of Fireworks-Related Injuries

Hazard Pattern	Number of Cases	Percent
All	29	100
Misuse	14	48
Holding Fireworks in Hand	5	17
Setting Fireworks Improperly	3	10
Throwing Lit Fireworks at Someone	2	7
Dismantling and Manufacturing Fireworks	1	3
Igniting Fireworks too Close to Someone	1	3
Igniting Used Dud Fireworks	1	3
Placing Fireworks too Close to Heat Source	1	3
Malfunction	13	45
Tip-over	5	17
Debris	4	14
Errant Flight Path	2	7
Blowout	1	3
Back Fire	1	3
Other	2	7
Unknown	2	7

*Note:* Percentages may not add to subtotals or the total due to rounding.

Misuse (14 victims injured, 48 percent).

Fourteen victims were injured when fireworks were used in ways that departed from proper usage.

Holding Fireworks in Hand.

- In Case 2, it was reported that a 12-year-old male found an M-80 in a street. The victim lit the firecracker in his hand, and the firecracker blew up before he could throw it. The victim sustained burns on his hand and fractures in two fingers.
- In Case 3, a 19-year-old male found a cherry bomb in an open field. The victim picked the firework up and lit it in his right hand. The firework exploded in his hand. The victim suffered amputation of four fingers of his right hand except for the thumb.
- In Case 7, a 16-year-old male and his cousins were shooting small bottle rockets in the yard. The victim found a damaged bottle rocket on the floor of a fireworks stand where his cousins purchased the fireworks and took it. The victim lit that bottle rocket in his hand and did not realize that the part of the fuse was missing. The bottle rocket went off in the victim's hand immediately. The victim sustained amputations of four fingers of his right hand.

- In Case 14, a 10-year-old male found a small firecracker in the backyard area of an apartment complex. The victim ignited the fuse of the firecracker and it exploded in his hand. The victim suffered burns on his hand.
- In Case 21, it was reported that a 17-year-old male lit a small firecracker and it blew up in his hand. The victim sustained second-degree burns on the palm and several fingers of his right hand.

#### Setting Fireworks Improperly.

- In Case 8, a 2-year-old girl was injured by fireworks. The victim's cousins were shooting off little bottle rockets out of a can, and the victim was standing 100 feet away from them. The can fell over and the bottle rocket shot out and hit the victim on the right side of her upper rib area. The victim's sundress caught fire. The victim suffered second-degree burns as a result.
- In Case 26, a 33-year-old female was injured by an unspecified firework. According to the victim, she was at a party for the 4<sup>th</sup> of July. Her back was turned to the people who set off fireworks and she was about 10 to 15 feet away from the fireworks. The victim believed that people put a firework in an empty soda can and it was top-heavy. The firework fell over, and it caught the victim's shorts and exploded three to four times. The victim sustained first- and second-degree burns on both her thighs.
- In Case 29, a 58-year-old female was at a barbecue with her husband and his cousins. They were shooting off fireworks. A person lit a mortar and accidentally knocked it over. The mortar fell over and shot at the victim who sat 3 to 5 feet away from it. The firework traveled up the victim's dress and went off. The victim suffered burns on both her legs and a bruise on the calf.

#### Throwing Lit Fireworks at Someone.

- In Case 19, a 14-year-old female sat on the front porch steps of her house. Two young males were in the street about 100 to 150 feet away from her. One of the males ignited a small firecracker and threw it to the other male. The second male then hit the firecracker with a baseball bat and propelled it to a distance. The firecracker hit the victim and exploded on her stomach. The victim suffered a second-degree burn the size of 3" by 3" on her stomach area. There were also specks of debris that lodged in her right thigh.
- In Case 28, a 50-year-old female sat in her truck with the windows open. A group of teenagers were throwing fireworks at each other about 3 feet away. One Roman candle came through the back window of the truck and hit the victim on her neck. The victim sustained nerve damage in her left ear and first-degree burns on her neck.

#### Dismantling and Manufacturing Fireworks.

- In Case 6, an 11-year-old male dismantled several bottle rockets and packed the explosive powder into an empty mortar shell and made a fuse for it. The victim lit the fuse and waited for the firework to go off. When the fuse appeared to stop burning, the victim went to see why it would not continue burning. The firework

exploded in the general vicinity of the victim's face. The victim suffered second-degree burns on his face and traumatic iritis.

#### Igniting Fireworks too Close to Someone.

- In Case 12, an 8-year-old boy and his mother went to a friend's house for the holiday, and they parked their car on the street. They did not realize that people were setting off fireworks across the street. As soon as they got to the curb of sidewalk, someone lit an unspecified firework and it went off. Embers from the firework hit the victim in eyes. The victim suffered corneal abrasions.

#### Igniting Used Dud Fireworks.

- In Case 15, a 10-year-old girl was injured by an artillery shell type firework at a family gathering for the 4<sup>th</sup> of July celebration. It was reported that the firework looked like a cracker ball, and it had been used and its fuse had burned off. The victim's brother found it in the neighborhood and took it home. The brother put this used mortar shell on the table with the other fireworks purchased by the family. The victim got her mother's permission to light a firework, and she accidentally picked this used mortar shell. As soon as the victim lit the shell, it exploded on her. The victim sustained ruptures of ear drums, abrasions in her eyes, and burns on her arms and legs. She also had shrapnel embedded in her from face to feet.

#### Placing Fireworks too Close to Heating Source.

- In Case 17, a 12-year-old male was injured by a bottle rocket. The victim's mother stated that the victim was playing with a gaming system in his bedroom. The heat from the gaming system ignited one of the bottle rockets on the bedroom floor beside him. The victim picked up the lit bottle rocket and carried it into the bathroom to put it out with water. The firework went off in his hand before he could discharge it. The victim suffered burns on the palm and pinky of his left hand.

#### Malfunction (13 victims injured, 45 percent).

Thirteen victims were injured when fireworks reportedly malfunctioned. These injuries resulted from tip-overs, debris, errant flight paths, blowouts, and backfire. Note that some of the errant flight path injuries may have involved tip-overs, but victims may have been unable to observe the tip-over if they were far from the fireworks.

#### Tip-Over Incidents.

- In Case 5, a 9-month-old baby girl was injured by a malfunctioned firework. According to the victim's mother, fireworks were set off in the neighborhood and they got up in the air and exploded. An unspecified firework flipped over and landed on the victim's lap. The victim suffered burns to her face, chest and leg.
- In Case 11, a 7-year-old boy, his family and other people were setting off fireworks on the street in their neighborhood. Someone lit a mortar type firework

- and the tube fell over just before the shell going off. The victim was on the sidewalk about 50 feet away. The victim's mother stated that the shell either went directly to the victim or ricocheted off a nearby house and hit the victim on the right ankle. The victim suffered a burn on his right ankle.
- In Case 22, an 18-year-old male was injured by a malfunctioned firework. It was reported that the victim and his friend were shooting off fireworks in the yard. The victim's friend lit a multiple tube device type firework and one tube fell over. The shell shot back and hit the victim around his right eye. The victim sustained cheekbone laceration and traumatic iritis.
  - In Case 23, a 28-year-old female was shooting fireworks in the yard, and she was about 150 feet away from her house. The victim lit a 16-shot cake firework, and the first two to three shots went into air before the tube fell over. The remaining shots started firing off into the yard in all directions. One shell shot through a window of the house and filled the house with smoke. The victim started running toward the house because her children were in the house. A shell hit the victim on the outside of her foot while she was running. The victim suffered second- and third-degree burns from her toes to ankle.
  - In Case 27, a 48-year-old female sat in a chair watching fireworks at an open field. The victim stated that she was not very close to the fireworks. The victim reported that the launching tube fell over and the shell shot sideways and exploded under her chair. The victim sustained second-degree burns on her right arm, right calf and thigh. She also suffered burns on the right side of her stomach.

#### Debris.

- In Case 18, a 13-year-old male and his mother were at a friend's house for the 4<sup>th</sup> of July. They were out in the driveway watching fireworks. The victim looked up the sky and some ash/debris from a mortar type firework fell into his eye. The victim suffered a burn mark inside his eyelid.
- In Case 20, a 16-year-old female and her mother went to a soccer game and sat high up in the bleachers inside a stadium. After the game, there was a professional display of fireworks in the middle of the stadium. There was a lot of debris floating around. When they got home, the victim took out her contact lenses and started complaining that her eyes hurt. The victim suffered a corneal abrasion.
- In Case 24, a 29-year-old female was watching a public display of fireworks at an open field. The victim stated that she did not know how far away she was from where the fireworks were ignited due to the vendors and the crowds. The victim and other spectators were pelted by the fireworks debris, and a piece got into the victim's right eye. The victim suffered a corneal abrasion.
- In Case 25, a 31-year-old female was in her yard watching fireworks being set off by her neighbors. A neighbor launched an artillery shell firework, and the packing agent inside the firework did not disintegrate and hit the victim on the head. The victim sustained a concussion as a result.

#### Errant Flight Path.

- In Case 1, a 10-year-old boy and an older neighbor were setting off fireworks on the sidewalk. The neighbor lit an unspecified firework and it shot sideways

- instead of going up. The firework landed in the large side pocket of the victim's short cargo pants. The victim's cloth ignited and burned the side of the victim's leg.
- In Case 16, an 11-year-old female was at a family reunion, and there were some fireworks that were left over from the 4<sup>th</sup> of July. The victim went down into a little trench area, and she put a multiple tube device on the ground and ignited it. When the victim climbed up out the trench and turned around, the firework exploded on her face. According to the victim's mother who witnessed the incident, the firework blew up like a bomb instead of going up into the air. The victim suffered several facial burns that extended from the tip of her nose to the area just above her eyebrow. The particles from the firework also scratched the victim's eyes.

#### Blowout.

- In Case 10, a 5-year-old girl was injured by a malfunctioned firework. The victim and her family were outside, and her father was setting off fireworks. The victim's father lit a multiple tube device type firework. The last shell got stuck in the chamber and exploded on the ground. The victim suffered the most severe injuries because she was the closest to the ground. The victim sustained second- and third-degree burns on the left side of her face and neck. She also suffered burns on her chest, left arm, eyebrows, and eyelashes.

#### Back Fire.

- In Case 9, a 4-year-old boy was injured by a fountain type firework when it malfunctioned. The victim and his family were shooting off fireworks in their backyard. The victim's mother lit a fountain firework that looked like a machine gun and was helping the victim to hold it. The firework blew out from the back into the victim's right underarm area instead of shooting out from the front. The victim's shirt caught fire and melted on his arm. The victim suffered a second-degree burn 4-inch long and the size of a pen in diameter. The victim also had first-degree burns splattered under his arm and around his neck.

#### Other (Two victim injured, 7 percent).

There were two victims whose injuries were related to fireworks, based on the NEISS incident narrative and telephone IDI. However, the telephone IDI did not yield enough information to pinpoint definitively the hazard associated with the incident.

#### Unknown.

- In Case 4, a 35-year-old male was severely injured by a mortar shell. The victim and his friends were at an Indian Reservation. There were a lot of people setting off fireworks. The victim did not see the actual firework that hit him. He just saw a bright flash and heard a big boom and felt a pinch in his abdomen. A mortar shell hit the victim in his abdomen and exploded. That caused immediate

evisceration of the abdomen. The victim sustained serious injuries to his abdomen and the internal organs.

- In Case 13, a 9-year-old boy was injured by a fountain firework. It was reported that the victim suffered a small second-degree burn on his right index finger while lighting a fountain. The victim's mother who responded to the telephone interview did not witness the incident. No information about the incident scenario was available.

### *Long-Term Consequences of Fireworks-Related Injuries*

Victims were asked whether there were any long-term consequences of their injuries. Most victims (23 of 29, or 79 percent) have experienced or expected complete recoveries with no long-term effects. Six victims reported that they have experienced or might suffer long-term effects of the injuries, as follows:

- In Case 3, a cherry bomb exploded in the victim's right hand. The victim sustained amputations of four fingers of his hand. The victim might not regain full function of his right hand.
- In Case 4, a mortar shell hit the victim in his abdomen and exploded. That caused immediate evisceration of the abdomen. The victim suffered serious injuries to his abdomen and the internal organs. The victim reported that he had lingering incontinence and his overall immune system might be less as a result of the injuries.
- In Case 7, a damaged bottle rocket blew up in the victim's hand, and the victim sustained amputations of four fingers of his right hand. The victim might not regain full function of his right hand.
- In Case 12, hot sparks from fireworks hit the victim in his eyes, and the victim suffered corneal abrasions as a result. The victim's mother stated that she did not know if the victim's vision will return fully.
- In Case 27, a mortar shell exploded under a chair while the victim was sitting on it. The victim sustained second-degree burns on her right arm, right calf and thigh. The victim reported getting a shooting pain that goes through her right leg because of the blunt force trauma she suffered from the incident.
- In Case 28, the victim was hit in the neck by a Roman candle while sitting in her truck. The victim sustained nerve damage in her left ear as a result. The victim stated that she still could not hear out of her left ear.

### *Where Fireworks Were Obtained*

Of the 29 telephone survey respondents, 15 (52 percent) knew where the fireworks were obtained. Eight respondents reported that the fireworks were purchased from a stand; three stated that fireworks were acquired from a friend or a relative; another three respondents said that they found the fireworks somewhere (e.g. backyard, open field, or street); and one reported that the fireworks were obtained from an Indian reservation.

Ten victims (34 percent) reported that they did not know the source of the fireworks. This is typically the situation when the victim did not purchase or light the fireworks device that caused the injury. Two victims (7 percent) declared that they were injured at a public display of fireworks. One victim terminated the telephone interview before the question regarding where the fireworks were obtained being asked. In the remaining case, administrative errors prevented information collection for the question.

## **6. Enforcement Activities**

During fiscal year 2017, CPSC's Office of Compliance and Field Operations continued to work closely with other federal agencies to conduct surveillance on imported fireworks and to enforce the provisions of FHSA and FHSA regulations.

The Compliance and Field Operations staff, in cooperation with CBP, continues to conduct surveillance on imported shipments of consumer fireworks. With assistance from CBP, CPSC staff selectively sampled and tested shipments of imported fireworks in fiscal year 2017, for compliance with the FHSA requirements. Approximately 31 percent of the selected and tested shipments were found to contain fireworks that were noncompliant. These violative fireworks devices had an estimated import value of \$124,000. The most frequent violations were due to overloaded report compositions and fuse burn time, comprising approximately 58 and 17 percent of all violations in fiscal year 2017, respectively. CPSC staff requested corrective action on these noncompliant fireworks; and in most cases, firms voluntarily destroyed the noncompliant fireworks. Because CPSC's fireworks program stops noncompliant fireworks at import, fewer violative and dangerous imported fireworks are reaching retail stores and roadside stands.

CPSC staff's enforcement effort remains to focus on reducing the number of fireworks-related deaths and injuries, by stopping the sale and distribution of consumer fireworks that violate mandatory regulations.



## 7. Summary

In calendar year 2017, there were eight reported fireworks-related deaths. However, reporting for 2017 may not be complete at this time. Emergency department-treated injuries are estimated at 12,900 for calendar year 2017.

During the 1-month special study period from June 16, 2017 to July 16, 2017, there were an estimated 8,700 emergency department-treated fireworks-related injuries. Children under 15 years of age experienced about 36 percent of the estimated injuries, and males of all ages experienced 70 percent of the estimated injuries.

Additionally, similar to previous years, 53 percent of the estimated injuries during the special study period in 2017 involved burns. Burns were the most frequent injury to fingers, hands and arms. The parts of the body most often injured were hands and fingers (an estimated 31 percent of the injuries); followed by the head, face, and ears (22 percent); legs (17 percent); eyes (14 percent); trunk (10 percent); and arms (6 percent). Most of the estimated injuries (82 percent) involved treat-and-release dispositions. An estimated 14 percent were treated and transferred to another hospital or admitted to the hospital where the emergency department was located.

Among the different types of fireworks, sparklers accounted for 14 percent of the estimated injuries during the special study period; reloadable shells were involved in 12 percent of the estimated injuries; and firecrackers were associated with 10 percent of the estimated injuries. Novelty devices were related to 8 percent of the estimated injuries. Roman candles and other rockets each accounted for 4 percent of the estimated injuries. Bottle rockets and homemade/altered devices were involved in 3 percent of the injuries each. Multiple-tube devices and fountains each were associated with 2 percent of the estimated injuries. Public display of fireworks were involved in less than 1 percent of the estimated injuries.

A review of data from telephone follow-up investigations showed that the typical causes of injuries were as follows: misuse of fireworks; tip-overs; debris associated with eye irritations; errant flight paths; blowouts; and back fire. At the time of the telephone investigation, which was conducted typically 1 to 2 months after the injury, most victims had recovered from their injuries. Six of the 29 victims interviewed reported that the effect of their injuries might be long term.

Finally, in fiscal year 2017, CPSC staff continued to actively monitor import shipments of fireworks and products in the marketplace. CPSC staff worked with CBP to sample imported fireworks and to seize illegal shipments. Compliance staff conducted inspections at fireworks retailers to collect samples for analysis and testing for compliance with mandatory requirements.

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## **Appendix A**

### **Fireworks-Related Injuries and Fireworks Imported**

Table A-1 shows that fireworks imports have generally risen over the period 2002–2007, peaking in 2005 at 275.1 million pounds. From 2008 to 2014, fireworks imports have been relatively steady with modest changes for some years. In 2015, the fireworks imports soared to 279.5 millions of pounds, which was the highest since 2002. It decreased to 262.3 and 247.0 million pounds in 2016 and 2017, respectively. As for the number of estimated emergency department-treated fireworks-related injuries, year 2017 with 12,900 estimated injuries was the highest since 2002. The other three highest estimated fireworks-related injuries were 11,900 in 2015, 11,400 in 2013, and 11,100 in 2016. As shown in Table A-1 below, the highest number of injuries per 100,000 pounds of fireworks was 6.3 injuries per 100,000 pounds in 2013, and the lowest number of injuries per 100 pounds of fireworks was 3.4 injuries in 2006 and 2008. From 2009 to 2016, the number of injuries per 100,000 pounds of fireworks was noticeably stable at about 4.3 injuries per 100,000 pounds except for 2013 and 2014. In 2014, that number was 4.8. In 2017, the number of injuries per 100,000 pounds of fireworks imported was 5.2 injuries.

Table A-1  
 Estimated Fireworks-Related Injuries and  
 Estimated Fireworks Imported into the U.S. 2002–2017

Year	Estimated Injuries	Estimated Fireworks Imports (millions of pounds) <sup>¥</sup>	Injuries Per 100,000 Pounds
2017	12,900	247.0	5.2
2016	11,100	262.3	4.2
2015	11,900	279.5	4.3
2014	10,500	219.6	4.8
2013	11,400	180.2	6.3
2012	8,700	201.0	4.3
2011	9,600	228.1	4.2
2010	8,600	199.6	4.3
2009	8,800	200.2	4.4
2008	7,000	208.3	3.4
2007	9,800	260.1	3.8
2006	9,200	272.1	3.4
2005	10,800	275.1	3.9
2004	9,600	230.0	4.2
2003	9,300	214.6	4.3
2002	8,800	175.3	5.0

Source: Injuries from NEISS, U.S. Consumer Product Safety Commission. See Table 1 for further details. Estimated fireworks imports data from the U.S. International Trade Commission (ITC), using Harmonized Tariff Schedule (HTS code 3604.10). Imports include consumer fireworks (1.4G HTS code 3604.10.90.10 and 3604.10.90.50) and display fireworks (1.3G HTS code 3604.10.10.00). Display fireworks were about 6.8 percent of the total imports in 2017. In addition to imported fireworks used in the United States, there is also a small amount of fireworks manufactured in the United States for domestic consumption; the data for these fireworks is not available from the International Trade Commission and is not shown in this table. Fireworks imports data were downloaded from ITC website in March 2018.

<sup>¥</sup>Fireworks imports data subject to change by ITC. These changes have typically been minor.

Although the table suggests a relationship between weight and the number of injuries, it should be interpreted with caution. First, the logical unit of exposure is the number of fireworks devices used, instead of the collective weight of the devices because a person is exposed to injury when a device is consumed (*i.e.*, lit). Injuries per 100,000 fireworks devices imported might be more meaningful, but the number of devices imported is not available. Moreover, using weight overrepresents heavy devices and underrepresents light devices. There is no reason to assume that a heavy device is inherently more dangerous than a light device because the weight of the device includes things other than just the amount of explosive material.

In addition, international trade statistics do not provide weight by fireworks device types. Thus, it is not possible to associate injuries with the weight of different types of fireworks imported. As shown in Table 2 earlier in this report, different fireworks devices have different numbers of injuries. Thus, the decrease in injuries per 100,000 pounds between 2002 and 2008 may be due to different mixtures of types of fireworks imported over time, or an overall decrease in injuries among all types of fireworks. Similarly, the increase in injuries per 100,000 pounds in 2013 may have

resulted from different fireworks mixtures, a decrease in importation of fireworks, or just statistical variation. The data do not provide enough information to determine the relative contribution of these factors.

**Appendix B**  
**Completed Telephone Investigations**

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
1	10	Male	Thermal Burns	Upper Leg	Admit	Unspecified	The victim and an older neighbor were setting off fireworks on the sidewalk. The neighbor lit an unspecified firework and it shot sideways instead of going up in the air. The firework landed in the large side pocket of the victim's short cargo pants. The victim's cloth ignited and burned the side of the victim's leg.	The victim was taken to the emergency department (ED) by an ambulance. The victim was admitted into the hospital for 1 day. After being released from the hospital, the victim had additional medical visits to change the bandage/dressing every two weeks. At the time of the telephone interview, the victim was still recovering and was expected to recover fully in a few weeks.
2	12	Male	Thermal Burns	Hand	Admit	Large Firecracker	It was reported that the victim found an M-80 in a street. He lit the firecracker and it blew up in his hand before he could throw it. The victim sustained burns to one hand and fractures in two of his fingers.	The victim was admitted to the hospital for 1 day. After he was discharged from the hospital, the victim had a follow-up visit with X-rays to check if his broken fingers healed. The victim was still recovering at the time of the telephone interview. He was expected to recover fully in a few days.
3	19	Male	Amputation	Finger	Admit	Large Firecracker	The victim found a firework in the shape of a ball with a small stem—a cherry bomb—at an open field. He picked the firework up and ignited it in his hand. The victim tried to throw the firework and it exploded in his right hand. The victim sustained amputations of four fingers on his right hand except for the thumb.	The victim was admitted to the hospital for 2 days. He had additional medical visits to treat his injuries after he was discharged from the hospital. The victim was still under treatment when he was interviewed for this report. The victim stated that he did not know when he would recover fully.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
4	35	Male	Other	Lower Trunk	Admit	Aerial Shell	The victim and his friends were at an Indian reservation. There were a lot of people setting off fireworks. The victim did not see the actual firework that hit him. He saw a bright flash and heard a big boom and felt a pinch in his abdomen. A mortar firework hit the victim in his abdomen and exploded. That caused immediate evisceration of the abdomen. The victim was taken to the emergency department (ED) by an ambulance. The victim sustained serious injuries to his abdomen and the internal organs.	The victim was hospitalized for a month. He was in a chemical induced coma for the first 8 days. He had six surgeries to repair his severely injured bladder and colon and to remove the spleen and three abdomen muscles. The doctors recovered fragments of the firework and confirmed it was a mortar. In addition, he had three blood and plasma transfusions. After he was discharged from the hospital and returned to his home state, the victim had been to at least four hospitals to see multiple specialists and had homecare nurses come to change the bandages. At the time of the telephone interview, the victim reported that there is still a hole in his stomach that will require additional surgeries to close and he will need to have skin grafts. The victim stated that he will never recover fully from his injuries.
5	9 months	Female	Thermal Burns	Upper Trunk	Treat and Transfer	Unspecified	Fireworks were set off in the neighborhood and they got up in the air and exploded. According to the victim's mother, an unspecified firework flipped over and landed on the victim's lap. Although the victim's cloth did not catch fire, the victim did suffer burns to her face, chest and leg.	The victim was treated at the ED and transferred to another hospital. No further information was collected due to an administrative error.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
6	11	Male	Thermal Burns	Face	Treat and Transfer	Homemade	The victim dismantled several bottle rockets and packed the explosive powder into an empty mortar shell that he found on the beach and made a fuse for it. The victim lit the fuse and waited for the firework to go off. When the fuse appeared to stop burning, the victim went to see why it would not continue burning. The firework exploded in the general vicinity of the victim's face. The victim suffered second-degree burns on his face and traumatic iritis.	The victim was triaged at the ED and was then transferred to a burn unit at another hospital. After the treatment at the ED, the victim had follow-up visits with pediatric ophthalmologists to remove debris from his eyes and for additional treatments. The victim recovered fully in 3 weeks.
7	16	Male	Amputation	Finger	Treat and Transfer	Bottle Rocket	The victim and his cousins were shooting small bottle rockets in the yard. The victim found a damaged bottle rocket on the floor of the stand where his cousins purchased the fireworks and took it. The victim lit that bottle rocket in his right hand and did not realize that the part of the fuse was missing. The bottle rocket blew up in his hand immediately. The victim sustained amputations of four fingers of his right hand.	The victim was treated at the ED, and was then transferred to another hospital and admitted for 7 days. After being discharged from the hospital, the victim had additional medical visits to remove stitches and to change bandages. At the time of the telephone interview, the victim was still recovering and was expected to recover fully in 6 months.
8	2	Female	Thermal Burns	Upper Trunk	Treat and Release	Bottle Rocket	The victim's cousins were shooting off little bottle rockets out of a can, and the victim was standing 100 feet away from them. The can fell over and the firework shot out and hit the victim on the right side of her upper rib area. The victim's sundress caught fire. The victim's older brother was nearby and ripped the dress off her. The victim sustained second-degree burns about the size of an adult hand.	After the treatment at the ED, the victim had follow-up visits at a different burn unit to check, clean and remove bandages for her wound. The victim recovered fully in 4 weeks.



Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
9	4	Male	Thermal Burns	Upper Arm	Treat and Release	Fountain	The victim and his family were in their backyard shooting off fireworks. The victim's mother bought fountain type fireworks that were shaped like a machine gun. The mother lit a fountain and was helping the victim to hold it. The firework blew out from the back into the victim's right underarm area instead of shooting out of the front. The victim's shirt caught fire and melted to his arm. The mother dropped the firework and ripped the victim's shirt off and rushed him to ED. The victim suffered a second-degree burn about 4 inches long and a pen in diameter. In addition, he also had first-degree burns splattered under his arm and around his neck.	At the time of the telephone interview, the victim was still healing from his injuries. The victim's mother who answered the telephone survey stated that she did not know when the victim will recover fully.
10	5	Female	Thermal Burns	Face	Treat and Release	Multiple Tube Device	The victim and her family were outside, and her father was setting off fireworks. The victim's father lit a multiple tube device type firework. The last shell got stuck in the chamber and exploded on the ground. The victim suffered the most severe injuries because she was the closest to the ground. The victim sustained second-to third-degree burns on the left side of her face and neck. She also suffered burns on her chest, left arm, eyebrows and eyelashes.	After the treatment at the ED, the victim had follow-up medical visits to change the bandage/dressing for her wounds. At the time of the telephone interview, the victim has recovered but still needs to use cream on her face according to the victim's mother who responded to the telephone survey.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
11	7	Male	Thermal Burns	Ankle	Treat and Release	Aerial Shell	The victim, his family and 30 to 40 people were setting fireworks on the street in the neighborhood. Someone lit a mortar type firework, and the tube fell over just before the shell went off. The victim was on the sidewalk about 50 feet away. According to the victim's mother who witnessed the incident, the firework either went directly to the victim or ricocheted off a nearby house and hit the victim. The victim was hit in the ankle and suffered a burn on his right ankle.	The victim had recovered fully in about 16 days.
12	8	Male	Contusions Abrasions	Eye	Treat and Release	Unspecified	The victim and his mother went to a friend's house for the holiday, and they parked their car on the street. They did not realize that people were setting off fireworks across the street. As soon as they got to the curb of the sidewalk, someone lit an unspecified firework and it went off. Hot sparks from that firework hit the victim in both eyes. The victim suffered corneal abrasions.	The victim was taken to the ED immediately by his mother. After the treatment at the ED, the victim had follow-up visits with his physician to check his vision and to make sure that his eyes are healing properly. At the time of the telephone interview, the victim's vision had not returned fully. The victim will see his doctor again to check his vision.
13	9	Male	Thermal Burns	Finger	Treat and Release	Fountain	It was reported that the victim suffered a small second-degree burn on his right index finger while lighting a fountain type firework. The victim's mother who answered the telephone interview did not witness the incident and was told by the victim's father.	The victim recovered fully in a few days.
14	10	Male	Thermal Burns	Finger	Treat and Release	Small Firecracker	It was reported that the victim was with his friends in the backyard area of an apartment complex, and the victim found a small firecracker on the ground. The victim lit the fuse of the firecracker and it blew up in his hand. The victim suffered a burn between his thumb and finger as well as some little burns on the back of his hand.	The victim recovered fully in 2 to 3 days.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
15	10	Female	Contusions Abrasions	Eye	Treat and Release	Aerial Shell	The victim was injured by an artillery shell type firework at a family gathering for the 4 <sup>th</sup> of July celebration. Prior to the incident, the victim's brother found a used mortar shell in the neighborhood. It was reported that the mortar shell looked like a small cracker ball and its fuse had burned off. The victim's brother took this used firework home with his grandparents' permission. The victim's brother put this firework on the table with other fireworks purchased by the family. The victim got her mother's permission to light a firework, and she accidentally picked this used mortar shell instead of the ones bought by the family. As soon as the victim ignited the mortar shell, it exploded on her. The victim sustained ruptures of ear drums, abrasions in her eyes, and burns on her arms and legs. She also had shrapnel embedded in her from face to feet.	After being treated at the ED, the victim had additional medical visits to pick out shrapnel pieces and to change the bandage/dressing for her wounds. She also had a follow-up visit to check her ear drums to see if she would need a surgery. The victim had recovered fully in 5 to 6 weeks.
16	11	Female	Thermal Burns	Face	Treat and Release	Multiple Tube Device	The victim was at a family reunion, and there were some fireworks that were left over from the 4 <sup>th</sup> of July. The victim went down into a little trench area, and she put a multiple tube device type of firework on the ground and ignited it. The victim climbed up out of the trench and turned around, and the firework exploded on her face. According to the victim's mother who witnessed the incident, the firework blew up like a bomb instead of going up in the air. The victim suffered severe facial burns that extended from the tip of her nose to the area just above her eyebrow. The particles from the firework also scratched the victim's eyes.	After the treatment at the ED, the victim had additional medical visits to change the bandage/dressing for her wounds. At the time of the telephone interview, the victim was still recovering from her injuries. The victim's mother who answered the telephone survey stated that it would take 6 to 12 months for the victim's skin to grow back.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
17	12	Male	Thermal Burns	Hand	Treat and Release	Bottle Rocket	The victim was in his bedroom playing a game. The heat from the gaming system ignited one of the bottle rockets on the bedroom floor beside him. The victim picked up the lit bottle rocket and carried it into the bathroom to put it out with water. The firework went off in his hand before he could discharge it. The victim suffered burns on the palm and pinky of his left hand.	After being treated at the ED, the victim had a follow-up visit to change the bandage/dressing for his wounds. The victim had recovered fully in a few weeks.
18	13	Male	Thermal Burns	Eye	Treat and Release	Aerial Shell	The victim and his mother were at a friend's house for the 4 <sup>th</sup> of July. They were out in the driveway watching fireworks. The victim looked up to the sky and some ash/debris from a mortar type firework fell into his eye. The victim suffered a burn mark inside his eyelid.	After the treatment at the ED, the victim had a follow-up visit with a pediatrician to check his wound and to change his medication. The victim was put on an antibiotic for 10 days. The victim recuperated fully in 10 days.
19	14	Female	Thermal Burns	Lower Trunk	Treat and Release	Small Firecracker	The victim sat on the front porch steps of her house. Two young males were in the street about 100 to 150 feet away from her. One of the males ignited a small firecracker and threw it to the other male. The second male then hit the firecracker with a baseball bat and propelled it very far. The firecracker hit the victim and exploded on her stomach. The victim suffered a second-degree burn 3" by 3" in size above her belly button on the right side. There were also specks of debris that lodged in her right thigh about 6" by 5" in size.	After the treatment at the ED, the victim had a follow-up visit with her regular physician to change the bandage/dressing. The victim used cream on her wounds and recovered fully in 3 weeks.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
20	16	Female	Contusions Abrasions	Eye	Treat and Release	Public Display	The victim and her mother went to a soccer game and sat high up in the bleachers inside a stadium. There was a professional display of fireworks in the middle of the stadium after the game. There was a lot of debris floating around. The victim had contact lenses at the time. When they got home, the victim took out her contact lenses and started complaining that her eyes hurt. The victim suffered a corneal abrasion.	The victim recovered fully in a few days.
21	17	Male	Thermal Burns	Hand	Treat and Release	Small Firecracker	It was reported that the victim lit a firecracker and it exploded in his hand. The victim suffered second-degree burns on the palm and several fingers of his right hand. The victim's father who responded to the telephone interview did not witness the incident, and he received a phone call from the victim and was told what happened.	The victim fully recovered in 10 days.
22	18	Male	Other	Eye	Treat and Release	Multiple Tube Device	It was reported that the victim and his friend were shooting fireworks in the yard. The victim's friend lit a multiple tube device type firework and one tube fell over. The shell shot back and hit the victim around his right eye. The victim suffered cheekbone laceration and traumatic iritis.	After the treatment at the ED, the victim had follow-up visits with an optometrist to monitor the pressure in his eye and to administer eye drops. The victim recovered fully in 6 weeks.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
23	28	Female	Thermal Burns	Toe	Treat and Release	Multiple Tube Device	The victim was shooting fireworks in her yard, and it was about 150 feet away from the house. The victim lit a 16-shot cake firework, and the first 2 to 3 shots went into air before the tube fell over. The remaining shots started firing off into the yard in all directions. One shell shot through a window of the house and filled the house with smoke. The victim started running towards the house because her children were in the house. A shell hit the victim on the outside of her foot while she was running. The victim sustained second- and third-degree burns from her toes to ankle.	After the treatment at the ED, the victim followed up with a different doctor to treat her injuries. She saw this doctor 2 to 3 times a week for 2 to 3 weeks to change the dressings and to check the progress of the healing. At the time of the telephone interview, the victim still had a spot of 3-inch long to heal. The victim stated that she will recover fully in probably 2 to 3 weeks.
24	29	Female	Contusions Abrasions	Eye	Treat and Release	Public Display	The victim was watching a public display of fireworks at an open field. The victim reported that she did not know how far away she was from where the fireworks were ignited due to all the vendors and the crowds. The victim and other spectators were pelted by the fireworks debris, and a piece got into her right eye. The paramedics rinsed out the victim's eye, and she went to the ED for further treatment. The victim suffered a corneal abrasion.	The victim fully recovered in a few days.
25	31	Female	Concussions	Head	Treat and Release	Aerial Shell	The victim was in her yard watching fireworks set off by her neighbors. A neighbor launched an artillery shell firework—the victim did not know how far away where the firework came from, but she estimated that might be a football field away. The packing agent inside the firework, which looked like pumice stones, did not disintegrate and hit the victim on the head. The victim sustained a concussion.	The victim recovered fully from the concussion in 1 month.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
26	33	Female	Thermal Burns	Upper Leg	Treat and Release	Unspecified	The victim was at a block party for the 4 <sup>th</sup> of July. Her back was turned to the people who set off fireworks. The victim was about 10 to 15 feet away from the fireworks. The victim believed that the people put a firework in an empty soda can and it was top-heavy. The firework fell over, and it caught the victim's shorts and exploded three to four times. The victim suffered first- and second-degree burns from her panty line to mid thighs on both her legs.	The victim reported that it took over 3 weeks for her to walk around normally. The victim was still healing from her injuries at the time of the telephone interview. The victim was not sure how long it will take for her to recover fully.
27	48	Female	Thermal Burns	Lower Arm	Treat and Release	Aerial Shell	The victim sat in a chair watching fireworks at an open field. The victim stated that she was not very close to the fireworks. The victim reported that the tube fell over and the shell shot out sideways and exploded under her chair. The victim sustained second-degree burns on her right arm, right calf and thigh. The victim also suffered burns on the right side of her stomach.	After the treatment at the ED, the victim had follow-up visits to change the bandage/dressing for her wounds. The victim recovered fully in 6 weeks.
28	50	Female	Thermal Burns	Neck	Treat and Release	Roman Candle	The victim sat in her truck with the windows open. A group of teenagers were throwing fireworks at each other about 3 feet away. One of the fireworks came through the back window of the truck and hit the victim on the neck. The victim sustained nerve damage in her left ear and first-degree burns on her neck.	After the treatment at the ED, the victim had additional medical visits to change the bandage/dressing for her wounds. At the time of the telephone interview, the victim reported that the burns on her neck had healed but she still could not hear out of her left ear. The victim stated that she did not know when she will recover fully.

Case	Age	Sex	Diagnosis	Body Part	Disposition	Fireworks Type	Incident Description	Medical Treatment and Prognosis
29	58	Female	Thermal Burns	Lower Leg	Treat and Release	Aerial Shell	The victim was at a barbecue with her husband and his cousins, and they were setting off fireworks. A person lit a mortar fuse and accidentally knocked it over. The mortar fell and shot at the victim, who sat 3 to 5 feet away from it. The firework traveled up the victim's dress and went off. The victim suffered burns on both of her legs and a bruise on the calf.	After the treatment at the ED, the victim had follow-up visits to treat the infections in the burned areas on her legs and other health issues. The victim was still healing from her injuries when she was interviewed for this report. The victim reported that the bruise on her calf got bigger and she had no idea how long it will take for her to recover fully.