

The Impact of Fireworks on Health

The 4th of July has come and gone, with families and friends celebrating the holiday with fireworks. In the next year, there is some information about fireworks to consider – the harmful toll fireworks can take on the world. While fireworks can be used and cause problems no matter the time of year, 4th of July fireworks specifically are an issue to our society, the human mind and body, and the environment. However, there are ways to combat these problems.

DANGERS & EFFECTS OF FIREWORKS ON THE BODY

The most common issue with fireworks are external bodily injuries, particularly from individual fireworks – also called consumer fireworks. In 2021, an estimated [11 500 people suffered injuries from incidents involving fireworks](#). Of the injuries, 32% were burns. Deaths have also been recorded from firework usage – at least 9 people in 2021, and 26 in 2020.

While these statistics do not mention the context behind the incidents, it is important to know that fireworks can be used as weapons. In England, specifically, the use of fireworks as weapons was such a problem that a taskforce was created to combat their use – [Operation Hercules](#). This past 4th of July, Minneapolis had a chaotic holiday: [an article at the StarTribune notes](#), “Gunfire and fireworks launched as weapons overnight Monday created chaos and peril ... where seven people were wounded.”

While fireworks can cause injuries like burns, they also produce potentially damaging noise. Firework shows can get up to 150 decibels or louder, which is an unsafe level for children. A Washington University pediatric physician noted these firework shows can actually [rupture a child’s eardrum and cause permanent damage](#).

DANGERS & EFFECTS OF FIREWORKS ON THE MIND

While external injuries are usually more obvious, the use of fireworks can be harmful to a person’s mental health as well. Part of the idea of celebrating 4th of July is to celebrate the country’s freedom and acknowledge our veterans. However, veterans are often the ones most impacted by the holiday festivities.

For veterans – or anyone – with PTSD, these fireworks may cause traumatic memories to surface. The explosions of the fireworks can easily sound like gunshots and trigger a panic attack. Other sensory input can also bring up traumatic memories, such as the smell of the smoke or the feeling of giant crowds. The surprise and unpredictability of fireworks can be detrimental – people never know when their neighbors are going to shoot off fireworks in the weeks before and after the holiday. [Dr. Moe Gelbert, a behavioral specialist](#), says “All of a sudden — out of

nowhere — come a few explosions, and that becomes much more startling because we haven't mentally or physically prepared ourselves for what's to come.” For those with PTSD, the holiday is often filled with anxiety and a sense of dread rather than the joy and camaraderie it was intended to invoke.

People with PTSD are not the only ones adversely affected by fireworks: people with auditory/sensory processing disorders and mental health problems are also impacted. One [audiologist explained that people](#) with auditory/sensory processing disorders hear differently. They “don’t hear a bang ... they hear an explosion that is much louder and more intense.” Auditory/sensory processing disorder also tends to be common in those with autism who may “[experience certain auditory stimuli as more intense subjectively](#).” Anxiety disorders often come with the symptom of hypersensitivity to sound, and [loud noises can cause a person’s anxiety to spike](#), resulting in stress and manifesting in physical symptoms.

Those who do not suffer from PTSD or other mental health issues are not excluded from the adverse effects of fireworks, either. Since fireworks are shot off at night, they can disrupt the ability to fall or stay asleep, especially if “[the fireworks cause a startle-response](#).” When people associate fireworks with nighttime, it can cause people to be on high alert or unable to fall asleep. From there, lack of sleep affects every part of a person’s life – ability to focus, short-term memory, cognitive function, and even mood. [Poor sleep can be linked to fatigue, tension, headaches, irritability, and more](#). This stress and lack of sleep weaken the body’s immune system, increasing risks of certain disorders and general sicknesses. As mental health, stress, and lack of sleep can take a toll on the body, the effects of fireworks can be detrimental to anyone.

DANGERS & EFFECTS ON THE ENVIRONMENT

Humans are not the only ones affected by fireworks. The burning and use of fireworks [releases a large amount of air pollutants](#). On 4th of July, certain areas will have their pollution levels spike dramatically, and remain elevated for several days. This poses a serious health problem to people with pre-existing conditions, and can cause respiratory diseases. Additionally, fireworks also pollute the water and soil. [General firework debris often ends up in the water](#), as well as the fine particulate matter produced by fireworks. Some communities have banned firework displays over the lakes used for drinking water.

Animals are affected, too. As most animals have better hearing than humans, the explosions from the fireworks are even louder to them. In research studying the responses of birds to fireworks, it was found that fireworks “[incite flight responses and disorientation](#).” Other wildlife, such as deer, have been documented to run out into streets or abandon their young. As for pets, half of dogs show fear responses to loud noises. Other effects are fires, elevated risk of wildfires, animals eating firework debris, and smoke irritants to wildlife.

SOCIETAL ISSUES

Fireworks affect those using them and bystanders alike if the firework is misaimed or fails to light properly. This includes children and pets. Because of this, firefighters and police officers are negatively impacted by fireworks. The 4th of July is the [single busiest day for calls reporting fires](#), and [fireworks start an average of 18,500 fires every year](#).

Individual fireworks – also called consumer fireworks – are heavily regulated throughout the country, with each state (and even county or municipalities) having different regulations and requirements. If an individual is caught using fireworks that their state has deemed illegal, they can be [fined or even sentenced to time in prison](#).

These regulations are often linked to the 4th of July as many municipalities only allow the use of fireworks on the actual 4th of July. While professional fireworks are used for public shows, people often use consumer fireworks throughout the weeks before and after the holiday. There are obvious fire and injury risks associated with fireworks, but if the fireworks are not used on the holiday itself, explosions have been mistaken for gunfire. This leads to false calls to 911 and even more fines.

The issues and dangers of fireworks do not affect everyone equally. Pollution, particularly from fireworks, is elevated in “[communities characterized by high proportions of minority group populations, children and elderly residents, and asthma rates](#).” While population density is a huge factor in firework pollution, it is important to note who is affected.

HOW TO HELP

The 4th of July is a holiday for family and friends to get together, share food, and have a good time. That does not have to change! Here are some helpful alternatives in order to help lessen the negative effects of fireworks:

- Only use legal, consumer fireworks on a specific schedule – refrain from using them on the days before and after the holiday. Instead, the best time to shoot fireworks is after the sun sets on the 4th of July, as that time is the most “predictable.”
- Those susceptible to air pollution can watch the firework displays indoors and/or wear a mask, and headphones or ear plugs can help cut down on the intensity of the sound.
- Silent fireworks for individual gatherings can also be bought. Fireworks can also be made using compressed air, not gunpowder. They are beneficial not only to humans but there is little to no pollution as well.

- Consider changing public and municipal city fireworks to other types of displays, like the drone light shows, which have the same visual effects without the sound or pollution issues.
- City & local governments could more aggressively crack down on illegal fireworks, minimizing the harm from individual fireworks by leaving their use to professionals.
- Or, consider skipping them altogether, and only attend a public display.