

## How many fireworks injuries do we see yearly in the U.S.?

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So if we if we think of the, the fireworks injuries in general, there's about 9000 fireworks injuries that occur yearly and about, oh, let's say, 20% of those affect the eye. And so if we, if we think of those numbers, that's a little bit more than 1000 eye injuries and those can be significant. because of the type of injury that a firework causes significant vision loss, you can have the eyeball the surface of the eyeball burned, that can result in significant vision loss and sometimes our best surgical techniques won't repair. Also you can have the eye actually so so forcefully hit by the explosion of a firework that can be ruptured open, and that usually results in a very significant loss of vision so it's not just the number of eye injuries if you think of our population in America, you know, 300 million plus you may not saying that oh, maybe 1000 or so eye injuries are that significant but every one of those people, children and actually it is true that that roughly 30% of those are children that they will have significant weakness of their vision and in fact sometimes a loss of complete vision or even loss of the eye.

## How do you avoid eye injuries with fireworks?

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So, I think, prevention if we think about what fireworks means I mean it's such. It's such so weaved into our American experience, whether it's the fourth of July, or Labor Day or Memorial Day or even New Year's, it's it's usually celebration. And so when we're celebrating we're adding fireworks on to, usually in an other event. If you're doing it around your home if you're going to a professional firework shows and that's, that's where you're going, but if you're doing it around the house, doing it at a family picnic. I think at that moment what we have to do is we have to plan, I think we do things more safely when we plan. And so we should say okay, we're going to do fireworks at this time of the evening, we're going to do it in this area, we're going to make sure that it's adults or as high or as low I'd like to say, if we're going to have our children do the fireworks they should be of the driving age, they should be mature enough and organized and safe enough that if they're that they have a driver's license, they can probably light fireworks safely as long as it's in a safe area. We don't have other small children that are usually very curious kind of sneaking next to big brother or big sister. We need and we probably need to think about how we're going to do we have water that's close by, we're not lighting the fireworks next to a pile of the other fireworks. We don't have flammable liquids, we're not doing it, you know, next to a part of the house if it catches on fire or let's say somebody's expensive car. So I think we have to plan when we're going to do the fireworks during our family event.

## Why are goggles important?

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So if we're going to if we're going to do the fireworks safe safely as, as far as planning, there's several things one I think, as an ophthalmologist goggles certainly are so important. In fact, the, the data I think in our preventative medicine studies clearly show us that goggles prevent the vast majority of most of the eye injuries that occur across most of the activities that we do for fun, sports woodworking and fireworks celebration. And so really it's about having the goggles

on. There are a myriad different types of goggles, and I would like to save to starve the goggles aren't expensive, you can get a very good quality pair of goggles and we're going to protect your eyes for really less than \$10. And, and you can get them actually a great source of protective goggles, in, in most communities is actually your community home improvement store. I've been very impressed by the local home improvement stores always have a good selection of goggles that will serve Well, in addition to the goggles I think also wearing gloves, wearing something that's going to protect your hands from the burns, that, that are they're going to do it and that means having goggles probably the one thing if you're going to have small children. You have to think again plan ahead that sometimes small children may need a smaller pair of goggles because adult size goggles tend not to fit well on children, and that's when they lean over on the goggles will fall off or slip down so I think you have to have them appropriately sized, but they're readily available in the community and they're not that expensive.

## Is there a firework for that is safe for kids?

5:26

So I think when we look at the range of fireworks and speaking as more of somebody who enjoys them I've always enjoyed going to firework shows and as a young boy I would, I would freely admit that I had my, my fair share of lighting the firecrackers and and having sparklers in my hands I would say there's there's probably not a safe firework, but there are many ways to use fireworks safely, but probably the one that most people think about is the sparkler is probably safer for young children because if I in my mind's eye when I go to different if I've gone to different events in my life. It seems like the young children are given the sparklers I would remind folks of sparklers burn at about 2000 degrees, and two things that burning about the same temperature as an auto flare if we remember the old style auto flares, but more but also it burns at about the temperature of of 10 times that of boiling water. And so I think there really isn't a safe firework that you can give a child that they can run around the family picnic safely that even a sparkler needs to have close supervision. If it's put in the precious hand of a toddler or a four or five year old.

## Goggles comparison

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So, what I have in my left hand is an example of a pair of safety goggles that would work great for a celebration with fireworks. These I just use an example because I purchased these on an online site for less than \$10 and they're red white and blue very patriotic, and I will show in this hand this is a pair of goggles that actually protected, a young person who was lighting fireworks I think safely, they had a defined time period. They had the area cordoned off safely so that the people that were at the fireworks were not affected but when they were lighting the fireworks one of the fireworks is sometimes can happens prematurely exploded. And this pair of goggles. As you can see, absorbed the thermal injury quite well this patient or this this person who ended up becoming a patient of mine because I treated him because I was the physician there just experienced really some singed eyebrow hair and and some minor skin burns of his cheek, but his eyelids and eyes were completely protected, so I keep these goggles as a ready

reminder of what the value of prevention because the you know the only thing more expensive than being safe is being not safe. Because at the eye the eye injury that would have occurred. Without these goggles would have been likely 10s of thousands of dollars of health care, be emergency room visits going to surgery and all the follow up care, versus a \$10 pair of these goggles.

## How should someone handle an eye injury from fireworks?

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Despite our best planning best intentions of planning a safe time period in place during our celebration and wearing wearing goggles. People can have eye injuries, really to fireworks. It can be as I described with holding the two set of goggles that can be the person lighting the fireworks, or it can actually be bystanders because of the fireworks trajectory landing into the crowd. I think at that time I think the best thing to do is to calmly help that person get to an emergency room where they can be evaluated. I think things to not do after the event is to try to forcefully or vigorously. Pick material that may be from the firework out of the eyelid or even out of the eye surface as much as that is a desire Oh, we tend to want to take a splinter out of our finger at home before we go to the emergency room, taking something off of the eye surface, because the eye is so delicate is best left to the, to the eye surgeons or the physicians in the emergency room so what I would do is just commonly get that person to an emergency room, and not worry about trying to clean that clean that injured area.

## Can smoke cause eye injuries?

10:07

So smoke certainly it all, I think it depends on what type and the intensity. Certainly if the smoke is from a proximal let's say explosion of one of the fireworks, it can have sooty material or residual parts of the firework itself, and you can have actually little parts of debris that land on your ocular surface and sometimes those can be irritating enough and persistent enough that you may need those removed from the emerge at an emergency room, typically patients notice that, having persistent irritation over a day or so, but I would say in most of the time just like smoke from a barbecue or smoke from a fireplace or a campfire, if you're at a safe distance from where the fireworks are being left the occasional exposure to smoke although mildly irritating for maybe patients or individuals with dry eyes. it should be okay.