

replay

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SPEAKERS

Daisy Luther, Chuck

D Daisy Luther 00:00

I'm Daisy Luther from self reliance and survival, and I am really excited to be here with my friend Chuck Hudson. Chuck is our guest tonight and he is going to be talking about nuclear survival. Give me just a second to get the webinar up there. So let's introduce you to chuck. Chuck is a retired Army Ranger medic. He specialized in nuclear, chemical and biological warfare during his time in the service. He's been an NBC since 1981 and became a medic in 1983. As he increased in rank, he went from a decon recon specialist to taking part in weather forecasting for fallout and performing offensive NBC planning. And, Chuck, can you tell us a little bit about when you went to Leningrad because I think that really fascinating?

C Chuck 01:01

Well, we, I was stationed in Germany at the time outside of Kitzingen, Germany.

D Daisy Luther 01:06


And this is when Chernobyl.

C Chuck 01:08

Chernobyl exploded.

D Daisy Luther 01:10

Yeah. Oh wow!



C

Chuck 01:11

And this was probably about three or four days afterwards, once we started getting reports out of Finland, that they started getting increased radiation counts. At the time, the Soviet government was still saying nothing was going on, everything was fine. Everything is good, you know, typical Soviet, you know, kind of sweeping under the rug. And so what's called a nest team, we got deployed to the consulate. And I got lucky, I guess, in a way, because the actual nest member that we're supposed to have gone was out, he was, he got really sick. And so they, they started making phone calls, and they called my first sergeant and I got volunteered. We went to the consulate, and we didn't really, we never really got to go to Chernobyl, the Soviets would not allow that. But we were able to since Leningrad is only like 50 or 60 kilometers from the from the border. You know, we set up monitoring stations at the consulate. And were detecting really high levels of alpha and beta radiation with occasional what's called gamma spikes. We'll go into the what the radiation is a little bit later. But we stayed there about two weeks and we were allowed out of the consulate, occasionally. We had we had to go in groups of three or five, no more, no less. And we just got, you know, got to see Leningrad, which was a really beautiful city. But we also got to have a little bit of fun by talking with one of the intelligence operatives at the consulate and he said, you know, if you go out, do us a favor and keep the Soviet agencies busy. So what we do, we take a piece of chalk and we put a mark on a wall. We take a trash can lid and take a trash can lid, look around and move a trash can lid for one trash can to another or reach in somebody's car and flip the visor down. And and I guess what it did it drove- tied up the KGB and the GRU resources, checking out what we were doing. So they were following us around a bunch of, you know, what was a captain to lieutenants and me at the time, I was a staff sergeant, you know it kept and plus we had an embassy official, and you know, that kept them busy. And so the embassy could do their type of dirty work. You're a born troublemaker, and this is why we're friends.

i

03:35

As Ron Wyden says I've never behaved the day in my life.

D

Daisy Luther 03:39

Excellent. All right, so let's jump right in and talk about the different kinds of nuclear attacks that we could potentially be looking at.

C

Chuck 03:50

Well, right now the major one that everybody's talking about is a missile strike. And missile or aircraft are fairly similar and all that, missile strikes now are a lot different than when they were in the 80s, the believe it or not the warheads are actually smaller now. You know, in the 80s and 70s 80s, in that time period, these were multi megaton devices I mean, huge hydrogen bombs. And they were mostly aircraft deployable and, in those in strategic ballistic missiles, they could only fit one, maybe two of these huge bombs into the missiles. Now they've shrunk them down into like one to two mega ton range. For a little background, a megaton is the equivalent explosive power of 1 million tons of dynamite. A kiloton is 1000 tons of dynamite the bomb to hit Hiroshima was 12 kilotons. And you look to history pictures and you see what 12,000 tonnes of dynamite, the equivalent of dynamite did to the city, that for reference was

the size of say Charlotte. Aircraft is their next one aircraft, they can handle the bigger bombs but still the bigger bombs they are a not, I guess it probably won't be cost efficient. Because it takes you know, where if you can load up into say a bare bomber, which is a propeller driven bomber, you can load one to two, maybe three, 30-40 Mega ton devices into it. So it can hit three targets. But that same bare it can be loaded with 30 or 40. You know, high kiloton, low megaton missiles, cruise missiles, and is deployed. And you can get 30 or 40 cities with one aircraft versus two to three with the same aircraft. And submarine would fall in the same category as your strategic missiles, except you have less warning with a submarine because as bad as the Soviet or modern, or even Russian submarines are today, they can still get very close to the coastline and shower a country with hundreds of individual warheads off of 13-14 different missiles. And the final one, though, is the scary one, but you won't probably see this one in a strategic theater like what's happening in the Ukraine is dirty bombs. A dirty bomb is a nuclear device, either an actual nuclear bomb made by a terrorist organization, which that technology isn't that difficult nowadays to make one. But more commonly would be like a bomb that took out the Murrah Building in Oklahoma City, you know, an ammonia nitrate bomb or something like that, but it's filled with nuclear waste. Or they'll break in the hospitals and they'll steal nuclear isotopes that we use for treating cancers or for tracing different tumors. We actually use nuclear isotopes to do a special type of stress test on the heart. But those are the ones that are the scariest because you know, you'll be a U haul truck til something detonates and showers a city with highly radioactive nuclear waste. You know, people have complained about that in New Mexico of the waste Isolation Pilot Plant, and they finally got security in that place up really tight. But still, nuclear waste is easy to get ahold of, but those are the three those are the major type of attacks that can happen. Most any place, but the one I guess we're more worried about is a nuclear exchange between the Ukraine and the Soviet Russia or Russia and us or Pakistan and India, which are North Korea decided they just had enough and we're gonna launch off.

D Daisy Luther 04:44

Wow. Right, right. Okay, now, can you quickly go over the difference between I believe it's an airburst and a groundburst?

C Chuck 08:04

There's three types of bursts of a weapons or two air burst ground bursts, and then there's your water burst. Air burst, are the ideal way to destroy a city is if you drop a nuclear device or launch of a missile and you have it detonate two to 3000 feet above the city. It does two major things to blast instead of being absorbed by the ground. It comes out in a great big ball and it just levels everything. Your fallout is not as heavy with an airburst because it you know you're not actually touching the ground

D Daisy Luther 08:41

I think he froze, give me just a second here. Hey, Chuck, if you can hear me you are frozen you can go out and come back in again. One quick second



C Chuck 09:11
You know, with the actual detonation, but you still get a lot of

D Daisy Luther 09:15
You froze. Can you go back you were just explaining. Oh, hang on. He's coming back in. He just messaged me. Sorry about that, guys. He'll be back in just a moment. I see the spinner. Hello.

C Chuck 09:35
We know what happened here because it showed everything was connected and everything but okay, what do we leave off? Hi.

D Daisy Luther 09:42
Okay, we were just talking about airburst.

C Chuck 09:47
airburst

D Daisy Luther 09:47
You were talking about how it had less, less fallout.

C Chuck 09:53
A little less Fallout than a ground burst because fireball generally doesn't hit the ground. However it causes a vacuum. When a bomb detonates that causes a vacuum by and it pulls in everything and then shoots up that's how you get your mushroom cloud. They caused the most damage. With with with lower radiation counts, and are just, it's a devastating type of attack. The attacks on on Nagasaki and Hiroshima, those are both air bursts. The bombs that were tested in New Mexico in the 1940s, those were surface bursts. And they made huge craters, surface bursts will make a huge crater in the ground, it will literally turn everything within about a mile to two mile radius into glass. And it's just it's super high radiation. In fact, the area in New Mexico at Trinity site is still very radioactive. You can visit it, but you can only visit it for, I think that they let people in for a maximum one hour, you have to wear special boots and and a kind of like almost not quite a hazmat suit. But they make you a kind of a paper heavy paper trouser that comes up to your knees. And you have to take them out. And they take them off for you when you leave the site. And you cannot take anything for the site because it is still highly radioactive. Whereas Hiroshima and Nagasaki are not radioactive anymore. And the bomb detonated just months apart out there. The third burst that is not as well known is a sea or water burst. It's where and these ones are the dirtiest of all of the three bursts is they

detonate a bomb three to 400 feet down in the water. And what that does, it causes a huge cloud of steam, a superheated steam, and whatever materials if it's near the bottom of the sea, that'll pull seafloor up, and it releases it as a superheated steam that travels a lot further than what you would get off a ground bursts. Plus being being wet, it leaves a film of contamination on on everything, it is harder to decontaminate from, and you'll generally have higher radiation counts and all three other types of radiation. But those are the three major types of nuclear attacks other than the Dirty Bomb again. And those were there are just plain filthy you know. Cobalt is one of their favorites or they'll take cesium am or ECM, different nuclear isotopes have used in medicine, or there was a time where people were stealing the radioactive waste from like Oak Ridge and some of the other nuclear power plants.

D Daisy Luther 12:44

Right.

C Chuck 12:44

Because I mean, it's not good for fusion power, fission power, but it's so highly radioactive and makes up a horrible Dirty Bomb.

D Daisy Luther 12:52

Okay. All right. So you were going to talk about the different types of radiation, also. And guys, once we're through this technical stuff, we'll get into the more practical stuff, but this is just the basic stuff you need to know first.

C Chuck 13:08

And yeah, and this is really important to know because types of radiation determine how to defend against it. Three major types of radiation is alpha particles, beta particles, and gamma radiation. Alpha particles are just excited helium atoms, they're very big, they're very heavy. They can be very energetic, they can have a lot of energy to them. But they can be stopped by a sheet of paper, or a few inches of air, they don't have a lot of range on them. Beta particles are stripped electrons. It's you know, an atom is generally composed of what's called a proton, a neutron and electron. The electron orbits the atom. And it's it balances out to charges electrons or negative protons, a positive charge and neutrons or neutral charge. And it's a balanced, like if you take a magnet and put it together. If you have if the magnet is attracting, it'll pull it together. If it's opposed, it pushes apart. Electrons or protons by being balanced, give an atom stability. Radioactive atoms, that's to kind of breaking down it count how the alpha particles work, radioactive atoms are unbalanced. They have either too many electrons, too many protons or something like that. And the third radiation is gamma, gamma and X rays are basically the same type of radiation. People think of them as a ray, but it's not. It's actually a particle. It's a photon is a light particle light is actually particles. It has mass that can be weighed. It has force. You see that in the space stations up in orbit, but those are the three major types of radiation. There's a big misconception saying that alpha is less dangerous than beta, and beta is less dangerous than gamma. And that is totally false. All three of them are

very dangerous to humans, they are just dangerous in different ways gamma radiation, you get that, you'll get a huge burst of gamma for the initial explosion. And that is gone within minutes. Okay, you know, because gamma is traveling pretty close to the speed of light, not quite, but it's very close to the speed of light. And so you'll hear you'll have that big gamma bursts and then that gamma bursts has gone but then you are left with the solid particles, the alpha and the beta. And those ones there are they can be carried by the wind, they can be carried by rain, they can be carried by you know, you know, you walking through a contaminated area and taking it with you and contaminating something else. Because it is a solid particle, it can stick on the skin. Protection from them, I will get into that a little bit more. But like I said, gamma takes anywhere from a few millimeters to a few feet of Lead or water to stop it. Beta can be stopped by from thin from aluminum is heavy aluminum foil to thin sheet steel, or sheet metals. And alpha particles, a few inches of air, millimeters of water or heavy paper will stop alpha particles.

D Daisy Luther 16:27
Okay,

C Chuck 16:28
But those are the three primary types of radiation and X ray likes an x ray gamma are basically the same type of radiation.

D Daisy Luther 16:34
Okay!

C Chuck 16:34
There's no real difference.

D Daisy Luther 16:34
Fascinating. All right. So I guess you kind of covered this about shielding for the different types of radiation, But let's make it more practical,

C Chuck 16:38
Right!

D Daisy Luther 16:41
Let's talk about what we can actually do.

C Chuck 16:49

Well, shielding, like I talked about a minute before is you know, alpha, beta and gamma have different shielding requirements. Alpha particles, your best method of protecting your house from alpha particles, believe it or not, is plastic! Go down to local hardware store get heavy painters plastic this stuff, we use a drape the furniture and floors when we paint, that good quality duct tape will stop the majority of alpha and will slow down beta particles. To shield from beta particles, what a lot of people have done in fact, modern windows that have a mylar film and a reflective film that helps slow down and can actually stop lower energy beta particles.

D Daisy Luther 17:37

Oh wow.

C Chuck 17:37

Gamma, on the other hand, you know, and I'll go back into more detail on them. But gamma is not really, it's a worry, and I'll expand on that later, when we go deeper into the types, into some isotopes of radiation. But gamma is something that is not as easily shielded, by your basic, like our house here is made out of brick. And for the most part, that brick will slow down most low energy gamma. And now say if Charleston was hit by a nuclear device, and we are 21 air miles from Charleston, the bricks in our house will cut down about 80% of the radiation. The glass on the other hand, it won't slow it down very much and what you can do on that, if you know there's attack, which we never know, is you can put heavy foil. Foil in conjunction with the glass. Or a better idea, a better thing that I have seen from my friend of mine that is in Ukraine, and we'd learned us in the military is water bottles. Put your water storage in front of you windows.

D Daisy Luther 18:48

Now wont that contaminate the water storage?

C Chuck 18:51

Not by gamma radiation because gamma is such a small particle. And by the time it makes it through the through the glass, or through the bricks, into the through the container of the water is already lost a lot of energy. And gamma doesn't hold energy like alpha and beta being a wave a light wave it, it loses energy quite quickly. That's why your gamma burst is there and gone, it doesn't linger. Now if you had a really high energy, say if you take that same water and you put an alpha emitter to say, take your smoke detector break apart your smoke detector and put the sensor inside your water. You can contaminate your water with alpha radiation.

D Daisy Luther 19:38

Oh wow! Okay.

C Chuck 19:38

Gamma is so it's very fast. And it's also fairly low energy the further it gets from the device that was detonated. It's not as big of a worry. Now if you were saying that's here in Summerville, say you are in Ladson which is 10 miles further in. You might have a minor chance of contamination but really what water contamination isn't that high from gamma. A good example of that is when Fukushima melted down. The water in it was heavily contaminated, but it was heavily contaminated with alpha and beta radiation. The gamma at either already either gone through it, or had already dissipated. But the beta emitters and the alpha emitters that were in the reactor that were released when it exploded and melted, those are what contaminated the water with high, huge doses of radiation. But a lot of times, you know, if you people have I've seen people in, I'll find some pictures of it, but my friend sent me some pictures of people making water curtains. And putting them in in the windows, so and that's one thing I want to try out, I'm gonna try it out at work, make it make it take, because you see those little tomato cages or for cold weather, the water tubes, I'm gonna take one of those, and I'm going to put a Kerney meter in it. And I'm gonna set up and operate our X ray system and actually see if it'll work.

D Daisy Luther 21:12

That will be really interesting. I'd like a follow up.

C Chuck 21:15

I'll give you my results in that.

D Daisy Luther 21:16

Yeah, maybe you can write a follow up for OP on that!

C Chuck 21:19

But you're shielding. The biggest thing on alpha and beta radiation is alpha. Generally, unless you have open sores, open cuts or whatever, which is possible after a nuclear attack, alpha will be stopped by the first few layers of your skin.

D Daisy Luther 21:35

Okay.

C

Chuck 21:36

Beta will go in a little bit deeper, but unless, it's more of a hazard, but if you weren't heavy clothing, you know, you got more protection. But shielding of them, if you're going to shield your house, I would use heavy plastic to seal your doors and windows. The problem sealing your doors and windows that you can't really truly make a house airtight, but you can really get the air in the house really bad. One of the things that we were experimenting with in the 80s, and it's been perfected in the late 90s, early 2000s is the modern furnace filters. Those HEPA furnace filters, there's been some studies on them that if you take a double layer, two furnace filters, those HEPA, it has to be the HEPA- what are they, 3m filters. It's one of the main brands, no association, no money from them on that. But it's just a recognizable name. You duct tape two of those flat sides together, it will stop about 95 to 90 to 95% of alpha particles coming through and about 40 to 50% of beta particles coming through, but still allow you ventilation. Because these filters are designed to stop viruses. You know they have times they'll stop certain viruses, you know in your air conditioning system and all that. And they seem to be a very good alternative for people for helping insulate your house from radiation. A person involved in a radioactive event... Tyvek, they're called Tyvek suits. Sure, Daisy can pop a link up on her webpage later on. But Tyvek suits are actually quite good against alpha, defeating alpha radiation. It's those funny suits you see people that are working with chemicals with, and they're kind of a plastic-plasticized cloth suit. They work very well in protecting you from alpha particles. In fact, our military protective gear, the old one was a layer of foam, a layer of thin rubber, then charcoal, and it was horrible. The mob suits a lot more than modern protective suits for radiation now are just a very thin, mylar coated suit that works very, very well at defeating alpha and some beta radiations. Do you want to camp out in the area in a beta environment? No, but it will allow you to get through it with minimal hazards. And radiation, all three of them unless you are at very you know within three to four miles of the blast is not fatal, instantly fatal. Radiation is called cumulative. In my job, I work in a cardiac cath lab. And so I'm dealing with X rays every day. But I have a dosimeter that I wear and it tells how much radiation I get. And if I go over a certain amount, I can't work for 90 days in my job, I have to do something else. But also to it keeps track of the radiation I've had since day one. I started in the cardiac cath lab. So there's 30 years of radiation history on me and I can watch over the years my counts go up over the years, but radiation itself is not instantly fatal. Unless like I said, you are exposed directly to a super high energy source or a nuclear device going off and basically if you can see the flash, you're in trouble from one of those things.

D

Daisy Luther 25:05

Right? Okay, so got a couple of questions here. You talked about it being absorbed through your skin, the first one's my question. You talked about it being absorbed through your skin. What about inhalation? Are you going to inhale

C

Chuck 25:21

Inhalation, inhalation and ingestion are the two main ways that alpha and beta particles can hurt you. Part radiation and when a nuclear device goes off, it releases for three times the radiation. But it also leaves us four major types of isotopes. One is cesium. One is Iodine. And we'll talk about iodine a little bit later in the program, strontium and Americium. What happens with those ones there, if your exposure to skin you got no skin cuts, whatever, they're pretty,

they're fairly harmless in the short term, if you get them off in a goodly amount of time, however you inhale, those, your inner organs do not have the thick epidermal layer to protect them. And then you can start getting high doses of inhaled Americium or Cesium or Strontium, then you'll start getting into different problems with it. The good thing about it is majority of them don't work immediately, three of the four don't work immediately. And they are all excreted by sweat, urine, or feces.

D Daisy Luther 26:32
Okay!

C Chuck 26:32
One, one of the things that we used to use for decontamination from people exposed to alpha, especially alpha particles, we used to have them drink as much cheap beer as they could. Water Works, but it doesn't work as well as low alcohol beer, it causes a kidneys to go into overdrive, and it basically flushes your system out.

D Daisy Luther 26:57
Okay, that makes sense.

C Chuck 26:58
Also add a chemical, it's a dye, it's called prussian blue. And you buy the stuff and we'd add a dye to it. And what happens is the prussian blue has a field on it that will attract the alpha particles, hold them in suspension while the kidneys flush them out and help prevent them from being redeposited in the fatty tissues of the kidneys. I'm sorry, ma'am.

D Daisy Luther 27:25
I'm sorry, is this something anyone can buy or is that?

C Chuck 27:28
Anyone, you go to Amazon and buy it. It's just a few drops, it's just a few drops of Prussian blue in there. And it's more than enough to actually help bind with, with with radioactive particles. And it seems kind of, in a way, almost goofy because it's the 21st century. You know, we're half a step away from Star Trek, but we're using a die that was invented in the 1600s to protect from radiation. But it's still one of the best things massive fluid almost to the point of fluid overload of getting the water out of your body. And adding that prussian blue to it was one of those things that is it will bind with your particles and they will take them out. It only works on americium, cesium and strontium. It does not work with iodine. But we have other methods to protect ourselves from iodine.

D Daisy Luther 28:23

Okay, and the next question is from Pam. And this is a great question. How do we know the difference between the three types of radiation?

C Chuck 28:33

Unless you have a radiation detection meter, you can't.

D Daisy Luther 28:37

Okay,

C Chuck 28:38

You cannot tell the difference between any of the radiation. Correct. Now, by using a little bit of deductive reasoning, though, you can tell you can kind of deduce that I'm 50 miles away from a nuclear blast. Okay, the wind is blowing from west to east a device was eased to me. I'm probably not going to get very much of anything but a little bit of gamma that's going to be there and gone instantly. Fall out though. I think we got a slide on Fallout that's going to be coming up though. Fallout though, is where you'll start getting your other particles but without a detection meter. You cannot tell the difference. It's just physically impossible.

D Daisy Luther 29:20

Okay, not a problem. So this will probably be our longest slide here. Oh, and one more question. Prussian blue works on alpha and beta. Is that right?

C Chuck 29:33

Primarily alpha and it works on low energy beta. The thing about beta radiation it doesn't have without getting too technical. This thing's called HalfLife. And beta as a general rule, doesn't last very long. But it will it will be excreted eventually by the body. And generally though, unless you are in a Super high beta environments so your body will flush itself out prior to any short term damage and more than likely before any long term damage.

D Daisy Luther 30:11

Great.

C Chuck 30:12

C Chuck 30:12

But that's the key in radiation exposures. Hydration, it's the old Army medic things. drink a bottle of water, take some Motrin change your socks.

D Daisy Luther 30:21

Awesome. Okay, so now let's talk about protecting people, pets, livestock and property from Fallout.

C Chuck 30:30

This is where things can get

D Daisy Luther 30:32

Let's talk about fallout itself, first, let's talk about fallout.

C Chuck 30:36

Fallout. Remember, we talked about the nuclear explosion, when a device explodes, it causes a vacuum, whether its surface, air burst, or even a water burst, it causes a vacuum and it sucks and everything around it shoots it up into the atmosphere. The initial burst of radiation that you'll get from a bomb is gamma, your alpha and beta radiation, though, they're solid particles. They are sucked up into the stratosphere. And they are caught by a jetstream, and by upper level winds. And they are blown around the planet. Fukushima we'll use that as an example again. Fukushima and Chernobyl, also Chernobyl is a better example because there was no water involved in Chernobyl. So there's Chernobyl. Prevailing winds in Russia are kind of weird. There's a lot of east to west winds in Russia. And when they're worse, a lot of it wasn't an actual nuclear explosion at Chernobyl, but there were steam explosions from superheated water inside the reactor vessels that exploded. They shot superheated steam at us, and if you've ever seen a movie, anytime when they find oilfield fires, what they'll do, they'll set a huge charge of dynamite off, and it sucks away the oxygen and it causes the fire to go out. So same principle with this thing here. It's sucked away the oxygen and something had to come in and fill it. And that was contaminated water, and concrete and pieces of plutonium and all that they're shot up in the atmosphere, they're caught by the upper level winds and blown around the planet. Eventually, the heavier particles will start to drop out, that's your first thing of fall out. But when it rains, the rain will gather all those particles into the water droplets. And they'll cause it to fall from the sky. And that's what it termed fallout. I want to use a TV show as an example. And it's a very good one. It was called Jericho.

D Daisy Luther 32:34

I love that show.

C

Chuck 32:35

It was on CBS, the first oh five or six episodes, you could almost use that as a training class of what to do and what not to do from Fallout. They were in Kansas, a little town in Kansas, Denver was a couple 100 miles away. They could see the mushroom clouds, whatever. And everything went on as normal until somebody got smart. And they saw I saw thunderstorms coming in from the west. And then they panicked, because those thunderstorms are now full of radiation that's ready to fall out of the sky. But as we got to term fallout from it's this radiation falling out of the sky. Protecting people, pets, property. People and pets are the easiest. Get them indoors, get them indoors, seal your house best you can. If you're in an active attack, I recommend and I mean he was not active attack, let me back up. I recommend everybody buy a quality protective mask, not a gas mask. A gas mask is supplies you oxygen. And a painter's HEPA filter isn't the same thing. Get a quality protective masks, because all of these masks will protect your lungs from alpha and beta particles. However, if you don't have that, a good, not an n95, I'm talking a good respirator. Like the real, real expensive ones that are used by people working in chemical environments, people that are used in that are painting in an automotive paint. That's the using metal flake or the or what was called Diamond dust, or pearls.

D

Daisy Luther 34:25

Right.

C

Chuck 34:25

Those are designed to catch those microscopic particles and they'll hold them in suspension. It's like the thing with a, and I don't want to get into a discussion I but I'm going to use it an example. People wearing masks during the pandemic. A mask will not stop a virus, a virus is in a range of one to three microns and HEPA n95 can only stop down to seven to eight microns. However, it will stop that glob of spit that that virus is attached to, okay? Same thing with that with that with that good quality be filtered, it won't stop the actual alpha particle. However, alpha particles, we used to say the military and beta particles are lazy. They whether it's hanging on to something and be carried along. So dust from a windstorm, dust from a car going down the road, stuff like that, they'll they'll hang on to that, that mask will stop those microscopic dust particles and afford you a good amount of protection from a device. If you folks got Daisy's email the other day of those PSAs on the Cold War, and it showed the one like you described as the John Wayne. One, it had soldiers just taking their handkerchief over their face. It won't stop high energy Alpha high energy beta particles, but it will stop the dirt and dust that's attached to them. It will slow it down, it'll cut down the amount going into your lungs and give your body a better chance of fighting it out. Pets are harder because you can't stick an N95 Or a respirator on your dog or cat. However, though, you can do it by limiting their exposure by making and it's going to it might be smelly or whatever, making an area indoors for them to relieve themselves in until the radiation counts go down. If they must, if or livestock. Livestock is a little bit more difficult because you can't bring in you know your herd of cattle sheep whatever into your house. By having a barn and, and insulating that barn with paper, with hay, with piling dirt up against it will give the animals more of a chance. Also too, by keeping the animals on the lowest floor of it and having more insulation on an upper floor. Most barns are double layered. You got your livestock in the lower side, and then on the upper side is all storage of feed and hay, and all that. That hay is actually a fairly good protectant from alpha and beta particles. Not you know, I mean, you said you'd take a pocket knife and

stab to a bale of hay. However, those fibers and those twist and turn to the air channels inside of bale of hay, slow down those particles and they capture them. Now you will have to deal with that contaminated hay afterwards. But you know for that, those are the things that you can do. Another thing also too is after the after the Fallout has ended and it takes like when Fukushima exploded, it was probably about eight days for the radiation to reach the United States and is about to same in Europe, with Chernobyl let go it was about 10 to 12 days, because the wind currents was so jumbled because it was in a winter. It took about four the radiation to reach say Germany. What they were doing after the after they finally all the governments of the planet that is I'm not just going to hammer on the Soviet Union it was the European government and the American government were really slow in getting people protected from that. Because they kind of like well, it's I don't know if we really want to release that type thing. So a lot of contaminated milk was gathered from Europe and was fed to people until finally somebody said no, we can't do that that milk has to be destroyed because the cows are eating the grass that's contaminated from Fallout. Protection of the animals back to your prepper mindset have food stored for them also.

D Daisy Luther 38:54

Right, right.

C Chuck 38:57

You know you have to you have to have it because you can't just turn your animals out after a nuclear fallout attack and expect them to be okay. More than likely they will be but if you're relying on that animal for food, whether milk or meat, or even a leather or whatever, it will be contaminated and it will take time for that contamination to go down. So you need to have your part of protection for your livestock is to have a supply of food least two weeks. And growing up on a cattle ranch. I can tell you two weeks of alfalfa for a cow that is a

D Daisy Luther 39:33

It's a lot

C Chuck 39:34

A lot food so you just have to make do the best you can on that there's no real way to actually shield livestock from it like you can your indoor pets and all. All you can do is try to reduce the amount of contamination they get.

D Daisy Luther 39:50

Now what about your property like your gardens and your orchards and stuff like that? Is that something you can cover up?

C

Chuck 39:58

If it's not Very big. Yes, you can, you can definitely cover it up. However, you still got to deal with, with Fallout that's in the ground up to protect. You know if you got, say you got 100 by 100 foot garden. Sure you can get a few tarps and you can put put like a little tent over your garden, that's going to be fine. How you gonna get that tarp off that contaminate yourself? Right so it takes a little bit of skill and it's a basically basic protective equipment, heavy rubber gloves, respirator, a heavy hoodie, and over your mask to protect your face boots, heavy clothing that you can throw away. And water. All of this water is the key to this. But you got to remember you got to deal with the wastewater because that water will be contaminated the land. That's the hardest part of all. What was done in Europe when Chernobyl blew up and hundreds and hundreds of square miles of farmland is they scraped the first couple of inches of topsoil and they buried it. Most people will not have most, most farmers will have equipment that they can go with a blade and they can blade that down. Can you do that though you have to you don't want it soaking wet so that the fallout leeches deeper into the soil. But you want it wet enough to be able to to keep the dust down. And then you have to take all this contaminated dirt and figure out what to do with it. Some of the isotopes that will come from Fallout There's four main ones cesium, strontium, iodine, and americium have half life's between eight days to 400 years. So you gotta have a plan what to do for this contaminated stuff for a couple of centuries.

D

Daisy Luther 42:02

Wow.

C

Chuck 42:03

Right. Best thing to do dig a hole away from a water source and a way and hot like in South Carolina, we're screwed. water tables two to three feet down in some places. Other places, it might be 100 feet, but so that it won't, heavy rains won't leach contamination into the water. In the military, we used to line up pits with a heavy duty plastic. And, then we were, you know, I only did one actual contamination cleanup. Most of the time was training. But we were very strict in how we train. So we trained exactly what we do in a real environment. We lined pits with heavy, really heavy plastic, or you can use don't use a cheap Harbor Freight tarps. A good alternative, if you don't know if you got a huge, huge pit you want to cover is you can buy these vinyl billboards, they are very impervious to water they last forever and they don't decompose like plastic will eventually. Line a pit with that put your dirt in there and have at least two to three feet of dirt of clean dirt on top of it to protect escaping radiation because it will escape radiation is sneaky, you will figure out a way to get out. If you have a small area, you can just do a similar but just on a smaller scale lawn tractor is not a good idea some people have talked about we'll just kill it under. But all you're doing is just putting it right back to where you're going to be working at. There's no, there's no easy thing. There are simple things you know just is getting rid of it's a simple thing. But it's brutal work. It's something that we'll have to you'll have to figure out how to do. Luckily for us if and if a nuclear exchange takes place and it does not spread, which is a decent chance talking to some buddies of mine at Fort Leonard where to chemical school is not a really high chance of it spreading here, unless things go really sideways. By the time fall out radiation from a say and let's say let's use Pakistan, or even to Ukraine. Even though Ukraine is only a couple of 1000 miles over the ocean from us, prevailing winds will push it the opposite way around the planet prevailing winds from west to east that

suffer hit the jet stream Jetstream is still moving at two to 400 miles an hour. It's still going to take time for the radiation to come over to us. If from an attack in Europe. During that time period that radiation is going to be decreasing intensity is going to be starting to be dropping out almost immediately. Sort of by the time it hits us. You It won't be a very high dose. However, say somebody gets froggy and they drop a nuke in Minneapolis, or Omaha, or Houston, or Los Angeles, now we got bigger problems. And then now you have to have your plans of what you're going to do with your dirt, most of us preppers, we do have a garden area, even if you got a small garden area, you need to have plans of what to do, and you need to have a place to dispose of it. And the same thing with your wastewater, you know, we talked about hosing off your tarp before you take it off of there, you got to have a plan that wastewater needs to be channeled into an area that it can naturally decay on its own. So is that?

D Daisy Luther 45:42

Yeah that's awesome. Now, few questions here. What about like sitting water, like your lakes and your streams and your ponds and things like that? Is that all gonna be contaminated?

C Chuck 45:57

Yes, and no, water is very, I know we talked about how water can be contaminated by radiation by us washing it down. But we're using really small amounts of water to wash with I mean, a garden hose might be three to five gallons a minute. Whereas your your even your smallest stream is 50 to 62 on up gallons per minute is going to be moving it's going to be dissipated is going to be going away slowly. If you do take water from a stream. Ideally you want it this is from old RV FM, you want to find the deepest portion of it and sites and from the bottom never from the top.

D Daisy Luther 46:42

Okay.

C Chuck 46:43

Reason why even though oh wait particles are going to settle down to the bottom. But they're going to be more and more insulated. So you want to you want to take you know you want to have your deeper water because it'll be have been naturally filtered. And then you still want to filter it your even your Big Berkey and your other type of filters like that not your cheapy Brittas. And all these other ones are good quality filters. You'll still want to filter that water because any radiation will not attach to the water molecules itself. They attach to the dirt to sediment contamination, the bacteria in the water. Right? Right. Okay, so you wonder itself, it's not going to be contaminated. That's why in nuclear reactors, they use distilled water in them, you know, you'll have 50,000 gallons of distilled water. But there's no solids in it to attract radiation. So it acts like an insulating blanket. So your deeper your stream and then hyper filtered be vigilant. Don't, don't be rushing it even and this is where you do need to use a good filter. You know, even your sand, your sand straw, and our charcoal filter may not be enough

unless you run it through that a new filter three or four times. And also after you filter a batch of contaminated water, you don't want use to filter again, that filter is now contaminated because those solid radiography particulates are part of the filter medium. So it's not like your 3000 gallon Berkey. You know, I'm gonna go ahead and just filter one, one round of water through it. And then once it's empty all this, we fill it in that stream. It doesn't work that way. If you're going to filter it, filter as much as you possibly can. And then so the filters away. Because once those once that water dries in those filters because those Berkey sometimes do get dry, that radiation is released. And it can be attracted to you it can be released backwards, out through the filter back into the water that's waiting to be filtered. You'll have contamination now inside of your house.

D Daisy Luther 48:52

Right? No, that makes lots of sense. A couple of questions. Can you take Prussian Blue and potassium iodide at the same time?

C Chuck 49:02

Yes, you can. They they're perfectly compatible. They don't interact with each other in any way. And I go I'm going to expand on potassium iodide because I saw there's a slide on that on no do's and don'ts of it. But yes, they're perfectly safe to take together.

D Daisy Luther 49:19

Awesome. What about air purifiers? Like you know, you know the kind that you run in your home?

C Chuck 49:28

Right!

D Daisy Luther 49:28

Or what about your HVAC?

C Chuck 49:33

Okay, your your standard air purifier. Theoretically, and this is you know this, theoretically it will work. However, it does not pull enough airflow in to completely clean everything in the house. So all you're going to do on a HEPA filter, air purifier is you're going to have a little bit of clean air coming out of it, but it's going to be pulling contaminants from around into it,

D Daisy Luther 50:00

D Daisy Luther 50:03
Right, so it's not really..

C Chuck 50:04
I would not depend on one of those to filter your air better,

D Daisy Luther 50:10
Okay, alright.

C Chuck 50:10
I like that because it's affordable, it's practical, any of us can do it. That's a really good suggestion. Your better bet like I said is, is a good one window, a small window, a bathroom window in your house, a couple of layers of HEPA furnace filters those filtrings, sealed tightly in the window, and then seal every other place you can with heavy plastic. And that will be your best chance of keeping majority of the contamination out of your house. And it's something that when I was getting ready to retire 95 is something that that chemical school was was experimenting with at Fort McClellan before fort McClung chain. They were doing it more so for chemicals, but some smart guys had put some americium emitters on the other side of one of those filters, and they did radiation counts on the clean side of it. And they were very, very low counts. And these are fairly active emitters. So I mean, it does work. But the key to it though, is you need two, a minimum of two. Two to three is better. They need to be sealed, real tight together, stacking together and then seal them. And don't be cheap on your duct tape. You can use your \$3.99, 1000 foot roll Walmart tape for sticking up signs and all that, but for prepping and all that you get the best stuff you can afford because it will hold up. I can't stress that enough.

D Daisy Luther 51:08
That's amazing. Yeah, that is not the place to cheap out Definitely not. Another question we have if you're 1000 miles from a nuclear attack, do you still need to protect from the radiation?

C Chuck 51:48
Yes. But you don't need to protect in the same amount as attack 100 miles away, in radiology, in my job because I you do I have to be radiation certified to do X rays, we go by a formula called time plus distance, the less time the more distance, the less radiation you get. So you know, 1000 miles away, it's going to take more time for that radiation to travel, that radiation is going to dissipate. And so you're going to get a lower dose versus a exposure 10 miles away. But yes, you still need to protect radiation because you will still have the solid alpha and beta particles.

D Daisy Luther 52:26
Okay.

C Chuck 52:27
That will come through but you don't have to go to the extent of wearing a full respirator suit and full MOPP gear and all that. You just need to be a little smart. Don't pick your feet up when you walk. Don't drag your feet and set up a cloud of dust type of thing.

D Daisy Luther 52:41
Right. All right. Move to the next slide here.

C Chuck 52:46
I've got one more question here. It says How long can you use a full respirator filter in an event?

D Daisy Luther 52:50
I missed that one sorry, Laura.

C Chuck 52:52
No worries. Laura, minimum, okay. Depending on the environment. As an NBC NCO, this I was of the era of the M 17. And then the m nine mask I forgot to new mask is out today. The M 17 protective mask would protect you in a area of a rat count of less than 30 Ranktins or langtons and rats. It sieverts. Now 30 rads an hour, okay, 30 miles an hour is a pretty intense dose, it's about equivalent to standing in front of a chest X ray machine for one hour. Okay, now, it will, it will protect you from alpha particles for about two to three hours before the filter medium starts getting clogged from it. So if you have a good you need when you have a protective mask, you need to have a supply of filters. Now that is for a high radiation environment. Okay? Say you're in a low radiation environment say you. I'm in say I'm in Charleston here and say Louisville, Kentucky. But 350 400 miles away was hit. I could view I could keep my filter in my mask and wear it every day outside for probably a week. Because of the lower radiation counts. The closer you are, the less time if you're in a fairly if you're at a high radiation count. I'm gonna give a piece of advice get out of it. Okay, it sounds silly, but you do not need to try to survive an area with a high radiation count. So say if you are in Charlotte, and Rock Hill, South Carolina was hit about about 60 miles apart. Get out of Charlotte. Okay, for a while. You don't gotta leave permanently. We don't you know, you don't have to worry about your houses being blown up from a blast like that. But you will have about a week or so a fairly high radiation and then it will drop immediately. Nagasaki, Hiroshima when those bombs detonated We see Nagasaki was what, about three or four days after Hiroshima. And then a week later, the war it ended a week or so later, the war ended about three to four weeks after that, people, American

military teams were in those two cities that were hit. And for the most part, radiation was already very, very low, except at the center of the blasts. Both of those air and both of those were air bursts. Sorry about that. Somebody was launching fireworks. Both of those air bursts were fairly low. So they were kind of dirty, they were and one of them was 1200 feet, and I think Nagasaki was about 2200 feet. So Hiroshima was a more dirty type environment. But a month later, radiation counts, were only about 40% higher than background background radiation, which really isn't a lot of rads. Today, it's almost undetectable. I mean, it sure is 70 years later. But you know, there's, there's no radiation and, and that is at ground zero of an attack, you go to Chernobyl. And being a Chernobyl would be a prime example of a dirty bomb. You dig down a few inches into the soil, and you're still in a super high radiation environment. Because it was a dirty bomb, the radiation was contaminated plutonium, it was it was actual solid from the reactor that were scattered over the area. So those things stayed, those highly radioactive materials stay, they weren't blown up into the atmosphere and dissipated over the entire planet. So you have to, that's why so yes, you can wear your filter for a while quite a while, unless you're very close to it. And if you're very close to the emitter, get away. It'll go down in time.

D Daisy Luther 56:01
Okay.

C Chuck 56:01
I hope I wasn't confusing on that.

D Daisy Luther 56:01
Okay.

C Chuck 56:10
No, I think it was really clear. Okay, so let's talk about creating a filter in your home. Now I'm not talking about you know, a fancy bunker spending a million dollars, I'm talking about things that are practical that we can do sort of like that that air filter for the window that you talked about. Ideally, your best room in your house to protect yourself from nuclear fallout if you have a basement that's the best. Your next believe it or not is your garage. Most people like older garages I don't know about modern ones don't have a lot of windows in them. Windows equivalent contamination is coming in to harder to seal but you'll still need one for ventilation. But realistically, you know for Fallout, seal it. Heavy duty plastic, heavy duty duct tape. Get those you want to use, you don't want to use tightly compacted cloth like sheets sheets are not very good. Because it's so tight. There's no air in them to help slow things down. comforters, quilts, rock wool, fiberglass insulation, those things like that packed into air gaps and then sealed with tape are really good for that. But create a defensible space in your home you can turn your whole house into a fallout shelter as long as you're not in the blast area. If in the blast area I'm going to be kind of not...

D Daisy Luther 58:35

So we're not all gonna be huddled in our bathtub.

C Chuck 58:37

No, you 're not going to be huddled in the bathtub and if you're in the blast area, you got bigger things to worry about them fall out right right at the moment. If you watch like say you watch those PSAs even though those things are 50 and 60 years old, 70 years old, they give good information that is just as valid today, technology is different. But the basic information is good. Seal your house. However you can. The heavier plastic can get vinyl billboard materials good at this point in time, do not care about appearances. Also have a good supply of heavy duty aluminum foil. It won't stop gamma radiation, but it will slow down and it will stop most beta radiation and it will definitely stop alpha. So if you live in a brick house or even a frame house that has vinyl siding and you got you got what's called Celotex then you got insulation and you got sheetrock and then you got paint and plaster on the other side of it. You got a good layer of protection. Okay.

D Daisy Luther 59:41

What about sandbags in window sills? I've seen that before too.

C Chuck 59:46

Sandbags in window sills they give you a really heavy barrier against gamma. They give you a good barrier against gamma radiation. Sorry, earphone here. They give you good protection against gamma radiation and they also give you a good protection against certain alphas and betas. Now, the thing about those though is, you gotta say, okay, I can seal the window with sandbags, and then you have, then you put a sheet of plastic over it and you have an impervious layer, that's nothing is gonna get through your house, you still got to worry about ventilation.

D Daisy Luther 1:00:24

Right.

C Chuck 1:00:24

And another part of ventilation that people forget about when they're going out and they're sitting in a Windows a cylinder doors, you have vents on top of your house. You have heater vents, you have Stove Vents, you have sewer vents, you have all these other vents on top your house that need to be covered.



D Daisy Luther 1:00:42
What about chimneys?

C Chuck 1:00:44
Chimneys too. Now the chimney and your furnace. Those ones are dangerous to seal because if you get an attack in the wintertime, carbon monoxide poisoning from your furnace or you're going to get smoke from your house from your chimney. The thing about those are if you keep a positive airflow going, it'll keep it'll push the radiation up.

D Daisy Luther 1:01:09
Okay.

C Chuck 1:01:10
But your vent stacks for, you know, you don't, you want to have not capped tightly, but you want to have a cap on it a modern. If you look at an older house compared to a modern house, you'll see that all the vents on top of the house it'd be just a straight pipe sticking up, we'll have a cap on it looks like a four sided hat on top of it. And it points at a point down. Those are designed to keep water from entering into your appliances or entering into your vents for your sewer. But in the same fashion too. They keep radiation from coming upward from being sucked into the house that way too. So you just want to make sure that you have good shielding on those that will protect direct wind from hitting them and allowing particles to be pushed into them.

D Daisy Luther 1:02:02
Okay, that's great.

C Chuck 1:02:03
So then here comes your aluminum foil, a couple of dowel rods or something like that, form a cage around it wrap aluminum foil, leave it like a three to four inch gap. I would not do this with your water heater, your furnace or your or your chimney, but your vents for your other things, your low pressure vents and your attic vents. You can use that to keep contamination from being pulled into your house. It won't stop it but it will slow it down. And again time and distance. If you move it causes it to move slower, the less you the less contamination you're going to receive.

D Daisy Luther 1:02:40
Awesome. All right.

C Chuck 1:02:42
All right,

D Daisy Luther 1:02:43
Let's move forward here. Okay, so what if you're away from home and a strike occurs?

C Chuck 1:02:50
Okay. This is dependent on where you are in relation to the blast. Okay. If you are in an area, say you're in Charleston. Charleston's a pretty good sized city, the whole metro about a million people say you're in Charleston, and they drop a bomb on Mount Pleasant which is on the other side of the harbor. It's the old if you're in your 50s and older, you'll remember the duck and cover drills of elementary school and junior high school of that era. Duck cover your head face away from the blast. The problem with that though, is they show those PSAs that Daisy had posted on her website. Okay so, you see the flash duck and cover. The problem is, is that flash depending on how close you are to device is going to blind you anywhere from a temporary flash blind to looking at an arc welder too long to total complete destruction of the optic nerve. So there's really if you're in the blast area you know there is not a whole bunch of do other than duck and cover and hope for the best. Now, say you're in Charlotte and Columbia, South Carolina gets hit couple, 150 miles away. Okay, now you got things you can do you still see the flash, you know when they detonated the bomb in New Mexico in 1945. The area is almost 100 miles from Albuquerque about 100 about 80 miles from Las Cruces about 130 miles from El Paso. All those cities saw the flash of that bomb because it's done late at night and they saw that flash. Well you have anywhere from 30 to 40 minutes to a few hours depending on the strength of the wind to get to shelter. Get yourself in shelter. But again, we talked about it before, time and distance. If you see that flash and take cover immediately, just in case, there is something else, there is another attack, there is another bomb or debris, debris can be thrown hundreds of kilometers from a nuclear attack.

D Daisy Luther 1:05:13
Okay.

C Chuck 1:05:14
It's gonna get sucked up in the air and it's going to drop. However, though, it's not one of those things where you need to dig a hole in the ground, get into a culvert seal yourself in, you do need to get back to your home or get to a place where you can do a more permanent type of shelter is not something that you have to worry about. In the military, we used to do nuclear drill attack drills, you know, while we're on out in the field, and somebody would go out there and they'd launch, they drop a magnesium bomb, you know, which is like 10 to 15 pounds of magnesium. And they'd ignite it out in the middle of the desert somewhere and you see that flash, you duck and cover, you'd wait five to 10 minutes, and then you'd go about your ward

and making business. We wouldn't change anything. Because if you're far enough away not to feel the blast, you're safe. Because that initial like I said that initial burst again, by the time that flashes gone, that burst of gamma radiation has already passed you by.

D Daisy Luther 1:06:15
Okay.

C Chuck 1:06:16
And if you're if you're outside of the blast radius, the intensity of that gamma Spike has already dropped immensely. If anybody here works in radiology, like you go to like, you go to the cardiac cath lab where I work at, you can go into the cath lab with the X ray on high dose low oil with a Geiger counter, you can walk in the door of the room and it will read zero until you get to about six feet from the, from the X ray tube, and then the counts start going up. It's that time and distance thing, gamma is actually quite low energy. It dissipates very quick and it's very, very fast. So I mean, unless you you think what you should do if you're away from home and a nuclear strike, get home.

D Daisy Luther 1:07:04
Perfect.

C Chuck 1:07:04
I mean, that's just a simple advice. Now you should still have in your Bug Out Bag. And you know now you know we up last year, two years ago, we would have never thought about adding nuclear protection stuff into our bug out bag.

D Daisy Luther 1:07:20
Yeah.

C Chuck 1:07:21
You know, it wasn't a big thing. We were more worried about chemical, biological, or civil unrest, Civil War, asteroid strike, EMP type of thing. Okay, well, two years makes a big change. Now, I would recommend that you have a roll of foil with you, a roll of duct tape, and a good you know, a roll of plastic, you know, one of those rolls of plastic is like they fold down fairly small, but they are kind of heavy, but a roll of Painter's plastic.

D Daisy Luther 1:07:31

Right. Right.

C Chuck 1:07:54

I wouldn't carry it in my bug out bag, but I'd have it in my vehicle. You can turn your vehicle into a temporary shelter if you're close enough to an area or if you're caught in a rainstorm. After an attack, you can seal up your vehicle well enough and unless you got a vehicle like mine is 20 some odd years old, you already have a HEPA cabin filter in it.

D Daisy Luther 1:08:18

Right

C Chuck 1:08:19

Now if you're in a jeep like like daisies, it's a soft top or mine is a little bit more difficult. But you can make a quick shelter doing the same things that you did in your home, you could do the same thing in your vehicle and ride out a rainstorm. You don't want to drive through that rainstorm, unless, you know situations dictated by that mean, somebody's attacking you you are in a super dangerous area, then you'd risk it. Your best bet is to ride it out, let the water drain down and then get out. It doesn't take long. It's only a few hours. You got to lose a few hours of time but your chances of escaping with a lower dose of radiation your car is steel. Unless you had a Corvette, but not so seriously. Your car is steel. It's going to stop all the Alpha it's going to stop 99% of the beta emitters. The gamma is already long gone. Now there are and we'll get to a point here and I'll talked about that. Some of your Fallout isotopes do have gamma in them. But basically though, during your Fallout period, all that your car is really really good protection.

D Daisy Luther 1:09:33

Right, Don is asking where you would put the foil on your car.

C Chuck 1:09:38

The foil is not so much for the car. It's more to protect you.

D Daisy Luther 1:09:42

Finally a use for all my tinfoil hats? Is that what your telling me?

C Chuck 1:09:48

You've finally got a use for that tinfoil hat. The foil for the car, you can, your best bet for the foil

is your glass. Is the glass of your car, it's because most beta will pass through glass, a few millimeters of glass and your windows on your car are less than a quarter inch thick, high energy beta can pass through that alpha will be stopped by it. But so there's foil inside of the glass, tape it, it'll stick it up there, little tape and all that to hold it in place, it will stop the, between the thickness of the glass, especially your front windshield, because it's got a layer of plastic in it also, it will slow down enough for the beta radiation to give you a safe environment that you can hang out in a really contaminated area for quite a while. I would have your filter, I would wear your protective mask in your vehicle, though. You can't, there's no way to seal a vehicle totally. I mean, you can seal your house better in your vehicle even. But you can't you still have ventilation that's always come in your car.

D Daisy Luther 1:10:53

Okay. Right.

C Chuck 1:10:53

I would wear your protective mask in there. And then once and I would only wear it in, I need to clarify this I started a little bit ago. You only need to really worry about this is if you're caught in a rainstorm immediately after the burst. Or you're in the south, in the southwest, or you in a windstorm with a lot of dirt and dust blowing around. Remember we just talked about it earlier. Those are solid particles, they're going to attach to other solid particles, whether it's other pieces of dust, pollen, or water. Ride it out instead of driving through it, unless situation the tactical, I hate using that term because it's overused. But the situation is not safe for you to stay in an area. It's better to ride it out.

D Daisy Luther 1:11:41

Great information. All right. Now potassium iodide pills. Let's talk about that. And there's a handout, hang on real quick. There's a handout that I put in the chat. And we'll also be emailing it to you on Monday. And it has a potassium iodide instruction suite. And there's also a book that is all of the organic preppers nuclear articles.

C Chuck 1:12:15

Potassium iodide, one of the greatest things ever invented and one of the most misunderstood, abused and totally screwed up things there is potassium iodide. It only does one, it's not an anti radiation pill. You go on to Amazon, you go on eBay, you go on all these other websites and it advertises "potassium iodide, the anti radiation pill," but I'm being a little dramatic on that. But that's the way the sites advertise it to get you to buy it and right now, try try trying to buy potassium iodide, lot's of luck. Only think potassium iodide protects is your thyroid. Your thyroid is an iodine magnet and only what it does is potassium iodide loads up your thyroid so that it rejects iodine. So, and iodine 131 That is the most common isotope, well, it is the most common isotope released by nuclear devices. It only has a half life of eight days. Let me talk about HalfLife half life is a term used in radiation being the amount of radiation the amount of activity A emitter has decreases by 50% is called its half life. And so you think okay, so past my

diet, the half life is 8 days so 16 days, it's gone. No, it's only gone down by another 50% It gets a longer minute. It takes about 400 days for all the radiation from iodine 131 to completely decay. So potassium iodide, all it does it protects your thyroid, from iodine uptake. And it what it does it sell it overloads the thyroid with good iodine and blocks the bad iodine. Also potassium iodide only last 24 hours. That's how long it takes the thyroid basically to use up the iodine, recycle it and you urinate out the rest of it the excess and then you got to do it again the next day. But it is not an anti radiation pill. You cannot take a potassium iodide tablet and go walk through a contaminated nuclear reactor. You will die just as quickly without it. There is a couple of other I saw there's a few new quote unquote anti radiation pills. But I am not qualified to talk about them. I just started reading about them and I don't know how or what they protect on the body. Now, this is prepper medicine. This is not something that you can prescribe as a doctor you cannot you know Daisy and I take no responsibility, but it is something that was taught in the military during the NBC courses. potassium iodide has limited shelf life, especially if it's exposed to air or light. So you take that bottle of potassium. Now these new ones, they companies, blister packs, that's the best way to buy it. Because they are good for years that way. You buy potassium iodide, that little glass bottle. Soon as you open it up, you're exposed to oxygen, it starts breaking down. Iodine is a very, very reactive substance is called a halide or halogen. And what it does, it wants to find something it's going to find some is going to attach to and when it does, it loses potency. So if you use potassium iodide, keep it in a dark, preferably black container and have oxygen absorbers in it to pull the oxygen out of it. If you don't have potassium iodide, and this was a thing that we use in the army, you can use medical iodine, the iodine you'd paint on your mom used to paint on you when you hurt yourself, or beta dine. And you can soak a gauze pad and you can put it over your thyroid. Your thyroid is just below your Adam's apple and behind it, it looks like a butterfly. It looks like hell but you soak a heavy iodine. Soaked pad and you put it on that your body will absorb that iodine up to the point and it won't overdose you're not going to overdose on it that way. potassium iodide pills, you can overdose on that. But when you do in topical iodine, it won't, you won't overdose of it. Two problems with this self, one, potassium iodide people are well known say well, for little is good, more is better. Iodine is 130 milligrams for an adult and half of that for a kid up to like 30, about 30 kilograms or so. Or 64 pounds. When you overdose of potassium iodide, the effects you get are not from the iodine. The side effects you get are from the potassium. It can cause heart arrhythmias, it can cause very fast heart or heart rhythms that can be potentially be fatal. So that's why I tell people when they buy us potassium iodide, follow the directions exactly don't just oh, there's a Fukushima blew up. I knew people that were just eating the crap like skin, like like chickens was kidneys. And you can't do that. And a lot more than a few people got quite sick and ended up in the hospital, either with electrolyte imbalance or with a an arrhythmia of the heart. Other problem you have an iodine? What if you're allergic to it? And there's no good answer. Because iodine is a new vital nutrient in our diet. And most people that are allergic to iodine are allergic to it via shellfish. However, you do have that one group of people that are allergic to topical iodine. And unfortunately, though, I don't have a good answer for that, you know, I could blow smoke up everybody's skirts, but I don't have a good answer for it.

D

Daisy Luther 1:18:34

Right. Now, isn't there a point at which age wise you really don't even need to bother?

C

Chuck 1:18:41

The older you get you get up into your you know, we're not quite there, Daisy, but you get up into your 70s and 80s and all that your thyroid takes less of an active role in regulating your hormones. If you've ever known anybody with thyroid issues, one thing that you notice about them, they are moody. You think PMS is bad. I have a I have a very dear friend of mine that she went early menopause and then also she had her thyroid removed. She was impossible to deal with for a couple years. But he noticed though, but as you age, your thyroid takes a less active role in regulating your hormones because as we age, testosterone, estrogen and other hormones that control our bodies drop off. So your thyroid takes a less active role. And after a certain point, you know, it's really a, I won't say a non issue, but it's less of an issue. And I'm gonna be kind of blunt about this because at 75, 80, 85 years old, you're more than likely going to pass away from something else other than thyroid cancer.

D Daisy Luther 1:19:15

Wow. Right, right. So, you know, you mentioned your friend who doesn't have a thyroid gland if you Don't have your thyroid anymore, you don't need to take

C Chuck 1:20:03

need to take it. But you do need it. But yeah, there's still other medications that they need to take. But yet for radiation poisoning for that type of specific radiation, no, if you don't have a thyroid, you have not to protect, all you're doing is wasting it and you're urinating out all that iodine, and you're caught, you're setting yourself up for a risk of electrolyte imbalance and causing yourself a heart arrhythmia. Other than that, but you know, you can't use iodine, beta nine to 10% Beta diet, not to really cheap three to 5%, a 10%, beta nine hour you can use actually, you can still buy real iodine and drugstores and gauze pads soaked in that placed over your thyroid, do it once a day. You know, it will produce enough iodine and it has been tested in the military and a few other places by doing it certain levels. And you can see that the levels are high enough. And your body is cool about that. Like I said it won't overdose on the iodine, it will just excrete out what we don't need.

D Daisy Luther 1:21:11

And how long do you leave it on? 24


C Chuck 1:21:13

hours, 24 hours. Now see what a potassium iodide tablets are cool, is it's one tablet every 24 hours. However, if you're using an iodine patch, and iodine, so patch, it's a much slower transmission. transdermal transmissions are very slow. It's like, you know, you see people that were nicotine patches, it takes a while for that to build up. After three or four days, you can you know, you probably won't have to wear it every 24 hours. But it would be a good idea. That's great. Anything, I don't see anything in our chat room so far, and that we're good there. Yep.

D Daisy Luther 1:21:54

 Daisy Luther 1:22:07


All right. So and I know that you're gonna say time and distance here, how long? Like what is our rule of thumb for how long we need to stay sheltered after a nuclear event?

 Chuck 1:22:08

The old Civil Defense videos, they recommended 14 days or when a radiation survey team said it was safe. However, this is a 21st century, we don't have radiation survey teams anymore. Right? Those went away at the when the wall fell in Berlin, and the Soviet Union collapsed in 1993. You know, we don't have those teams anymore. So this is what I think the next slide is on a dosimeters isn't it if I remember correctly, so this is these two are going to kind of go together now. You can, if you have a method for measuring radiation in the area, you can you know, you can it will have a safe zone on these things. Generally, background radiation in the United States at sea level is less than point five grams per hour. And the higher you go and altitude, the higher the radiation. It ties into this it but it's a little funny anecdote. About six years ago, one of the pacemaker companies put out a technical service bulletin, warning, people that flew extensively in jets above 30,000 feet were at risk for solar radiation damage to their pacemakers.

 Daisy Luther 1:23:36

Wow.

 Chuck 1:23:37

Background radiation, if you don't have a 60% 70% of the atmosphere, you're already above it. You don't have that big insulated envelope, protecting us from the radiation from the sun. And one of the pacemaker companies, they put out a technical service bulletin to watch for pacemaker damage from pilots, people who are pilots, business people who flew continually, you know, six, seven days a week that had a pacemaker there was a thing to worry about that. So that ties in here. The higher altitude you are, the less background radiation you have so we're like 0.2 to 0.5 milligrams per hour. At sea level. At we lived in New Mexico at 7000 feet, we were about 0.7 to one milligram an hour and that was at 7000 feet. Say you are in what's a good high place in say you're living on a 14,000 foot mountain in Colorado, you might see as high as 1.1 to 1.5 milligrams an hour, less atmosphere protecting you from background radiation. So if you have a Geiger counter that's actually not determining whether if you have a Geiger counter once the radiation drops below two to three milligram, milligram, not rads, or millirad, or milligram, not rams or rads an hour, its safe to do everything you want to do outside. What do you have from one to five rads per hour, you want to limit your outdoor activity to no more than 30 to 40 minutes, every three to five hours. But the rule of thumb is once it drops below one rad per hour, it's safe to, to start doing everything outside again. Even though one rat per hour is 1000 times the background radiation at 14,000 feet its still at a level that's low enough that the body will switch off expecially if you decontaminate your area, like we talked about a little bit earlier, get rid of that layer of topsoil, wash it down. Clean up your trash. And one of those Civil Defense things that Daisy posted brought up a term that I mean an item that I wanted to talk about here is trash attracts much more than vermin. You got a

bunch of the tip beer cans, you got plastic, you got paper, you got all this junk, littering your property and all that. Those folds, creases, crevices, buckets, and all that is is places for radiation to collect. Keep that stuff clean.

D Daisy Luther 1:26:28
Make sense,

C Chuck 1:26:29
Oh, it's Oh, wow. I just saw it that requires a prescription.

D Daisy Luther 1:26:39
How about that.

C Chuck 1:26:40
Okay, I know because he used to be able to get it for free because we used to use it in microbiology for staining slides. I will have to look that up and see if we can, if that can, if there is other methods it gets it. Thank you so much for finding that 710 rule to calculate shelter time. Wow. Okay, it shows you how far out of NBC business I've been on that part's there. The 710 rule? Yes, you can use that. I'm sorry. My wife. and I are going to answer her.

D Daisy Luther 1:27:17
Yeah, I'm not familiar with the 710 rule.

C Chuck 1:27:24
I'm sorry about that. Let's take care of some over there. No worries for Okay, 710 rule. For, there is a seven fold increase in time after detonation of a device the radiation is going to go up seven fold. Okay. Now, after it peaks, it's going to drop any tenfold decrease. It drops 10 times faster. 710 Oh, gosh, I'm sorry. Let me go. I mean, I'm going to pull it up here on the screen. And that way, I can just read it out instead of going off a memory on it. The 710 in particular pocket future exposure rates is called a 710 rule. This will based on exposure rates determined by survey it's been states that for every seven fold increase in time, I hate bifocals. After the detination of a nuclear device, there is a 10 fold decrease in radiation exposure rate. For example, if a you've taken dose at one hour after the explosion is taken as your reference point, the dose rate will have decreased to one tents at seven times seven or 40 hours. That makes sense. So

D Daisy Luther 1:28:42

D Daisy Luther 1:28:43

I'm not mathy it doesn't make sense. Is there an easier way to calculate this?

C Chuck 1:28:51

I will put the formula here into the chat room here.

D Daisy Luther 1:28:54

Okay, good. I'm not a numbers person.

C Chuck 1:29:02

I'm neither am I That's why I have I use slide rules believe I still use slides at work. Instead we don't have calculators and all that.

D Daisy Luther 1:29:14

At seven days, your radiation in a heavily contaminated area will go down 1/10 of a percent. Okay. Okay. So, and now that will increase in a tenfold fashion every seven days. Okay? If that kind of makes sense. That helps Thank you.

C Chuck 1:29:37

But like that now, that first 300 days, or seven times seven times seven is your highest radiation, but then it starts to drop. But see that's not taken account environmental factors. The 710 rule doesn't take into account environmental factors of wind, rain, dust, physical movement of the contamination. Also, it also doesn't take into account your types of isotopes that you contaminated with. However, though, it is a good thing to keep a track of now, measuring radiation.

D Daisy Luther 1:30:20

Are we going to talk about dosimeters?

C Chuck 1:30:22

You're dosimeters it to have your dosimeters. First I want to talk about dosimetry. And we're going to go back to to determine when it's safe to go out of your building. If you go on Amazon, if you go on eBay, you will see a influx now of every Chinese, every foreign company, even a lot of American companies selling dosimeters read the the description very carefully because over I started just looking at this the other day just to see what was happening out there. Over 90% of these so called dosimeters only detect electromagnetic radiation. Okay, magnets, they only

check magnetism. It is pretty useless. Also, there are very very few dose radiation detectors dosimeters that will work with alpha radiation. Reason why is because alpha detection devices are exceedingly fragile. Because again, alpha doesn't have a lot of power to penetrate solid materials. So on the vacuum tube on the end of a Geiger counter, the ones that can detect Alpha have a very, very thin what's called mica, it's a type of stone window on it that allows the radiation in and they are super layer so easy to damage. But dosimetry though, you can buy it fairly decent dosimeters on the market. But please, oh my gosh, please. You see the one that they see on Amazon? It's like 3995 or 5995 it's not a real dosimeter it's not a real radiation detector. Oh my gosh,

D Daisy Luther 1:32:17

What should your dosimeter like when you're reading the description? What are we looking for? You're looking for one that will measure in milligram, millirad or millisievert. Those three terms you want to receive, RAM or rads, you want to see those terms in it somewhere. They all mean fairly the same thing like you know, in the old days, we use Rankin. And then 1960s, late 60s 70s, rad came out. And then 90s, early 2000s, RAM, it came out now we use a term called Severs, they all mean similar things. And they use a very similar scale. But if you're looking at a radiation detector, please please please make sure it says though one of those three terms on it. If it says anything else, if it has what's called a micro fairr ad, which will be a funny shape you with an F behind it. It's just detected radiation and electrical leakage. Electromagnetic leakage is not a real radiation detector. So please, please, please. And also, you'll see a lot of eBay sites now they will be selling his 1950s 60s and even 70s Geiger counters that were part of civil defense. And they're green or yellow box, they got a wand on him. Yeah, they probably still work, but they have not been calibrated in 50 years. So it might read zero radiation, but there's enough radiation that might be enough radiation area to cook an egg. A good radiation. A real radiation detector is not cheap. It's going to be starting in the \$300 to \$400 range and it will only detect alpha, excuse me beta and gamma radiation. You'll see now a lot a lot of people and they are fairly accurate. You'll see these radiation cards looks like a little card sticking in your wallet. Unfortunately, you put in your wallet, it's not gonna work very good for detecting radiation, especially beta radiation because they will not detect Alpha. Most of these will not detect alpha radiation. But you have this wallet, this little card you got the wallet you got in your purse, your purse, and especially nowadays if you've got a modern wallet or purse, it's shielded to prevent people walking by you would have won and scanning your credit cards. It's going to block that type of radiation. You need to carry it in a shirt pocket so that it can be exposed. Those things are fairly accurate and they are All they work by as a color change, higher radiation, it causes a change on a on a strip of film, it's basically just film on those things. Can you use them more than once? Those cards?

C Chuck 1:35:11

Well, you can use them until it's completely used up. Okay? I'm saying I mean, so if you if you expose if the court wants to card gets exposed, you need a new card. And if you buy a box of these cards, please keep them in like an ammo can. Or if you got LED led foil or something like that in something like that to protect it from just being exposed sitting in your kitchen cabinet by your microwave. Another type of dosimeter if your ex military, you've seen these ones, it looks like an ink pen, about three to four inches long, about three eighths of an inch diameter and I got a little window on him. And these are a offshoot of what's called the Kearny radiation

detector. And I'm going to pop a link in the chat room on the current radiation detector. The Kearney radiation detector is a device you can make at home it was developed at Oak Ridge laboratories in Tennessee. And it was a device for people to be able to afford their own method of detecting radiation. Like other most radiation devices, the currency will not detect alpha and is not very good at detecting beta radiation however, it will detect gamma. And let me get a link here on that thing here.

D Daisy Luther 1:36:36

People have been asking those units of measurement. What was fever? Yeah, if you can also supply a link,

C Chuck 1:36:50

let's see the There we go. There's a link to the information on the Kearney and that will get you can look it up. They are super easy to make. However, anybody can make one but the caveat to make it a Kearney radiation detector is you have to use the measurements Exactly. But this is the epitome of MacGyver. You need you need a soup can a metal rod, some foil, a piece of paper and some drywall and a nail. And you can make your own radiation detector that has an accuracy. Now it's not horribly accurate, but it is accurate to within 20 25%. So is it good enough to say well, I'm going to go lay out nude sunbathing on this contaminated Beach, no, but it will give you an idea of what the radiation is doing. And like I said, the the Kearny radiation detector does not detect alpha is not good on beta. And but it only detects gamma. However, some of these big alpha emitters, like we talked about earlier, cesium, iodine, strontium and Amory cesium, even though they're primarily alpha and beta emitters, they all have them they do emit gamma radiation also. So in your Fallout, even though we talked about your mate, your bid, what we call the gamma spike happens seconds to minutes after the burst, you will still have gamma radiation in your area on these alpha and beta particles, because they do emit as they decay during the decay process of the radiation. It releases gamma radiation. It's I try to keep it a nuclear physicist, that was not my best subject. I know I can whistle the tune and dance a couple of steps do it.

D Daisy Luther 1:38:51

Okay so let me ask a question to maybe. So does that mean if more measuring the gamma that you're getting at least a general idea of alpha and beta?

C Chuck 1:39:03

You're not yes or no. Yes, yes, I will say yes, you'll get an idea that you there will be alpha and beta particles in the area because most of the beta emitters as they decay, they do release gamma radiation. So yes, you will know that you will be able to tell that yes, that type of radiation is more likely present. In fact, I would just say yes, it would be present because they're heavy particles and they are going to hang around a little bit longer than than the gamma spike. But the Kearney meter is super simple. Some plastic sheeting, soup cans and it has to be a Campbell's style soup cans. two and five eighths inches in diameter, five and a

quarter inches tall. You know you can't use a can of peas. Well you can but you got to have enough math background and recalculate the measurements to make it with heavy duty aluminum foil, piece of copper You know, and you can make a meter and some paper. And you know if they are, and they were, like I said it developed in the 1960s, at Oak Ridge laboratory, and they were part of every civil defense shelter. You know, because yeah, you had your Geiger counters and all that, but you took your Kearney meter. And you set these things around in different parts of the area. And then you went back and you looked at it, and you saw how it had to foil leaves, it looked like like leaves, and they hung down at an angle like this. When you charge the device, and you charged it, believe it or not, with a plastic comb, and comb your hair or balloon, and you put a static charge on it. And what happens a very high energy, the energy for the gamma radiation causes a discharge of the static in on the device, and causes the leaves to droop like this. And it has a scale on the bottom of candidate you stick in the bottom of the can and has to be exact, but that scale will point to those leaves and will tell you a guesstimate of how much radiation is in the area. Under \$1, you have yourself your homemade MacGyver Geiger counter and Too bad the guy's name wasn't MacGyver, who made instead of Kearney, but still the link in the chat room there, it'll give you the basic information on it. And then you can just Google up the actual plans,

D Daisy Luther 1:41:20

theres YouTube videos on it,

C Chuck 1:41:23

it's a fantastic tool to have. And you can never have too many of them. Ideally, you know, you want you'll want a Kearney device every say you live out in the country, right? You know, you want to turn the device about every 20 to 30 yards surrounding your property. And that way you get an idea what radiation is doing on your property. You know, because you'll be able to see, if you have your things have you set them out on a compass on a map, if anybody here was in military, and you'll know what a range card is, a range card is a thing that shows a gun in placement. And you draw on all the trees and rocks and bushes and stumps and ditches with distances to them? Well, we did the same thing with radiation detectors in the military. And what that does, it gives you an idea of which direction of Fallout is moving. You know, and it's very useful because what that information can tell you is like, Okay, I know Fallout is coming from distraction, and going this way across my land. So we're going to put a warning barrier saying no, hey, watch out, don't go here. And you can monitor you can have those currently devices in that area and monitor as radiation goes down. And that lets you know when it's safer to go out. And in state, you know, it's not accurate. They're only to within 20 25% of what a Geiger counter will say, but they will give you a good idea of what is going on. It's one of the and it's I hate to say government approve, but this is from a portion of the government that was actually semi at the very best trustworthy and learn those things. Make them I mean, I can't emphasize it enough because not everybody, I can't go out and buy a \$500 or \$600 Geiger counter. Most people I know can't you know, there's other things that have higher priorities. If I were to spend \$500 on Prep supplies, was going to be is going to be canning equipment is going to be salt its going to be stuff like that that's not replaceable. I know I can figure out a way around a Geiger counter. And Kearny is your work around a Geiger counter if you have one. Cool, however, get it calibrated. Please get it calibrated. Because a Kearney has a built in error already. And you know what the error is in a currently radiation meter. It's

guaranteed it doesn't change. It's mathematically fixed. A broken Geiger counter, you don't know where the air is. It can be saying, oh, man, this area is so hot. We got to leave when realistically, it's less radiation than a glowing a dark rate, watch dial. Right? Or you can say you know, there's no radiation here, but it's hot enough, you know, in a year, you know, you're gonna hit die of a bone cancer.

D Daisy Luther 1:44:23

Right. So when we first started talking about when it was safe to go outside, you said that the recommendation previously was about 14 days. Is that somewhat accurate?

C Chuck 1:44:36

That was it. It was accurate for the 1950s and 1980s when they were still Civil Defense radiation teams around. So they wanted you to have 14 days and supplies in your house to be able to survive that long. And generally after 14 days, with normal wind patterns, weather patterns, rain and whatever it will be safe enough to venture out shortly like we talked about Hiroshima and Nagasaki, you know, a week afterwards, you know, radiation levels have aren't had already dropped immensely in the area. Right. And you know, a month later or so once we once the war was over, and we actually had survey teams, except in certain areas of both cities, radiation counts were not that much higher than background. And so you figured 14 to 30 days is probably safe enough to start doing extended outdoor activities now, but have livestock and have all that? Well, you don't have the luxury to sit in your house for 14 days. So protect yourself and we talked a little bit about that. I'll reiterate it again. Tyvek suit, great thing to have, especially if you can afford it, get a little bit more heavier protection on it. heavy boots, heavy boots, you know that you can wash Wellington's rubber boots and all that those they are our medical are really a heavy medical footwear that you can just dispose of. You have other things that you can be washed now. We need to go back a bit because we left out a part of it during the protection on decontamination

D Daisy Luther 1:46:25

that's covered up on the next slide. Okay, well, cool.

C Chuck 1:46:28

I didn't miss it to know you didn't. Mr. Basketball correctly.

D Daisy Luther 1:46:34

One question. What did you say was normal for background radiation?

C Chuck 1:46:38

Okay, normal background radiation. Believe it or not, I can say there's an altitude dependent, but I'm gonna get you the exact figures now. So going off top of my head,

D Daisy Luther 1:46:48

awesome. Look this stuff up on the fly. It's pretty awesome.

C Chuck 1:46:56

Okay, well. So, normal background radiation depends on altitude and location on a planet. And now it can range between point five to 3.5 milligrams or millisieverts per year. Okay. That's the normal background radiation. You know, in most parts of this country now, certain parts of the planet, Mount Everest top of Mount Everest flying in a jet aircraft that can run up to 50 or 80 million milligrams millisieverts a year. But your general background radiation in the majority of the United States is between 0.7 to point 3.5 millisieverts or milligrams a year.

D Daisy Luther 1:47:40

Okay. Awesome. All right, so decontamination picture.

C Chuck 1:47:50

Oh, that's pretty accurate. It's fairly accurate and all that. So decontamination, this is the easiest part of radiation safety, but it has some of the most dangerous piece of to it what to do with that contaminated water, soap and water. There is no magic, you know, there's no magic formula, there's no magic light, you can walk underneath it, it just takes good old fashioned soap and water. But there's a couple of caveats that you do not want to use hot hot water. Reason why hot water causes your pores and your skin to open. You got open into the skin, you can allow radiation to enter your skin, your skin is an actual very good barrier. Unbroken skin is a very good barrier for short term, low to moderate energy, radiation exposure. So you don't want to be doing a camp out in a radiation environment. But just getting through an area is pretty good. However, let's go to Chernobyl where they were sending Russian peasants and Russian soldiers into Chernobyl was nothing more than a than a coveral. And these people were dying hours after leaving that reactor, and they were only in the reactor an hour or two and these people were dying because of radiation level was so high there was pictures of Chernobyl taken at night that had the typical blue glow of radiation. That glow is caused by caesium you know it's a cesium that's really active and all that. But that's at one extreme. The other extreme is the people at the other end of it would be the people around Fukushima Japan. They were back to normal two to three weeks after the thing exploded. And they sealed it I should say after they got it sealed. Right, you know, but decontamination soap and water. Warm water cool water is best Cold water is not quite as good too because it causes constriction and contraction of the muscles, which can cause open pores in the skin to close and open. But tepid water you know, room temperature water and soap you seen on I know who's seen one of the doctor No, James Bond movie 1963 And they're on Dr. Knows Island and they're contaminated by radiation because he is dealing with a lot of radioactive materials on it, and they run them through an actual 1960s and still use today appearing decontamination process. Everything

was accurate and everything except for one thing when they take the scrub brushes, and they started scrubbing down Ursula Andrews and Sean Connery. You don't want to do that because a scrub brush will cause micro punctures micro scratches in the skin, or it can cause actual scratches that will drop blood. And that will allow that radiation and especially if a wound is bleeding and you get contaminated particles into it. They're in the body. And you got to wait for them to come out on their own or by the body's own normal expiratory processes.

D Daisy Luther 1:51:17

You're gonna host someone off.

C Chuck 1:51:22

Similar it's like you take a shower, you start at your head, you soap down, all the way down before rinsing, then you bench top to bottom. You want to be able to you want during that time period though you got to do it fairly quickly. You want to hold your breath or have a method of breathing what we used to use when we do these decontamination was like a snorkel. You know for people snorkeled. You put those those clips on, and they put that in and it ran to a hose outside of the shower area to clean area. So you could breathe, because when you're doing all this stuff up, you're still going to be scared and a little bit of radiation about you don't want to inhale that. You want your eyes closed. You don't want to put goggles on though, because that area around your eyes is contaminated. You know, so you close your eyes lightly. Don't squeeze him tight. Because we've ever gone swimming, or you've gone through a really nasty area to squeeze your eyes super tight, you can still you still get water into them. Close your eyes. Normally, wash, have a way to be able to breathe or do it quick enough that so you can hold your breath and do it and move to a second area that's clean before you start breathing again. We do it in stages. When we decontaminate people like that, we'll do a hose down area where we hose them top to bottom, low pressure water, you don't want to take the garden hose with a jet attachment on it. You want to shower attachment, gentle washing, because once you wet that radiation, it's going to kind of hang out more man, it's St. quintuple Fallout is going to collect is going to start running down. Then you'll move him to another area because you've already left a pile of radiation, you'll move to another area, we used to walk them on pallets to the to the next area, it's like three or four steps. And then you'd soak them. And you do a quick you do a quick rinse, you walk them to another area three or four steps. And then you'd rinse them once again. And then you check in with a Geiger counter. However, if you don't have a Geiger counter, you just like a shampoo bottle says Wash, rinse and repeat. I would do it two to three times if you don't have a Geiger counter. And that will probably get I would say eight 90% or more of any contaminants off for you. And what's left is going to be low energy. And just by being clean, is going to protect you from from contamination is same thing but washing property.

D Daisy Luther 1:53:51

Collect that water too, right? I remember when you need to be collecting that water,

C Chuck 1:53:55

Yes, water and funneling it off to an area where it can. We don't we don't have as a preppers the method of decontaminate it. However, we have to, to contain it and seal it so that is not going to be a problem. Because it likes it. The four primary elements are strontium, cesium, iodine, and americium. Americium has a longest half life and is probably it. And it's very high. In nuclear devices, especially a plutonium based device. It has a half life of 430 years. So it's going to take 430 years for the radiation level on that emitter to drop by 50%. And another 430 years for to drop a another 50% and so on and so on. strontium and cesium, they have half lives of about 30 years. So you know, you need to have a plan for this thing for For centuries, or, and, you know, you know, I hate to sound like a like ecological hippie tree hugger type thing. But you don't want to run that contaminated water into your water sources you don't want to run into the stream.

D Daisy Luther 1:55:16

Right? Right. Absolutely.

C Chuck 1:55:21

And I see thinking thinking of how you dispose of water in a neighborhood, there was a space in the road where the plumbing lines run, can you channel it there? Yes, you can't, but that water has to go somewhere like here in Charleston and ends up in the Atlantic Ocean. Waters got to go somewhere. Ideally, the only thing you have really is back to your pit. Unless you have more construction equipment at hand, you can build concrete tanks,

D Daisy Luther 1:55:53

sewer lines. So what about city sewer lines, they usually go back to like a plant

C Chuck 1:56:02

plant. And the water will probably eventually come out clean but then all the effluent that solid masses that they that they truck off to the dumps and all that out of those plants, these the old plants I'm not familiar with how our sewage plant works, and modernly. I know the older ones, they they treated the water so that it was clean, and then that was pumped into the rivers and lakes and all that. And then the solid effluent a solid feces and junk and trash that was dried and trucked off somewhere, all that radiation is going to collect and that solids and you'll still end at water unless it's been completely filtered down, it's still probably going to have a little contamination in it. But I see a point. I mean, it's one way to get rid of it. And it's not going to be in the area and it's going to be contained in a local area. So that's an option that I

D Daisy Luther 1:56:57

know ideally answer if you're getting nuked, there is not ideal.

C Chuck 1:57:02

The best of the best solution is to keep it away from you and from other people. Yeah, and you drink some water and you drink especially you know don't run it by your wells and don't you know, if water tables low, we got more problems and all that and then you just then you gotta take it's like politics, you got to vote you got to find the lesser of the evils.

D Daisy Luther 1:57:23

Right, right.

C Chuck 1:57:24

How would you clean rainwater for watering the garden and post radiation? Good question. Rainwater you, I would probably run it through a sand and gravel filter. And then you know, you have plants are going to have contain radiation, it's going to contain radiation for a long while to come. There is you'll look up from Fukushima and Chernobyl. There are still pockets of in Germany, Finland, Norway, have high radiation areas from the fallout from from Chernobyl. And basically, the human body is fairly good at adapted from it. Ideally though, if you have another source of water, I would not use rainwater unless you are able to filter it out pretty good with sand and gravel filters and multiple filtrations. And even then you're not going to get it all because you're feeling down almost to the molecular levels be able to get all these particles that have radiation on them. Or if you have the method of doing a very high efficiency water filter system, your better bet would be to use groundwater to garden. Now for some people, especially like, you know, Southwest and all that to do use rainwater for stuff like that. You gotta choose the lesser of two evils.

D Daisy Luther 1:59:04

Right. You can also if you've got rain barrels and you collect your rainwater, that way, you can actually put a filtration kind of device, I don't know if I'd even call it a device. But you can put a filtration thing on the end of your downspout to at least get some particles out.

C Chuck 1:59:28

Now, one thing I will do during this time, too, if people send in questions, I will just say something. I'm actually copying, copying and these questions in the chat room.

D Daisy Luther 1:59:37

Right? Well, we're gonna actually give an email address where they can send them in because we're gonna be recording for those

C Chuck 1:59:43

C Chuck 1:59:43

because I know a lot of people a lot smarter than me on this subject here that still out in the field at Fort Leonard Wood at the chemical School at Fort Leonard Wood, and US airmen at Fort Dietrich and a few other places. You know, and mine is a more of a practical way And now knowledge but some of these questions here deserve a good answer from somebody much smarter than me.

D Daisy Luther 2:00:05

Well, we are going to do another recording, it may take us a week, if Chuck's gonna do a little research, I don't think anyone will mind. That'd be awesome. All right.

C Chuck 2:00:16

Health effects from radiation poisoning. Okay, this I got my little note here on this stuff here. We talked, I've mentioned a few times, the four main isotopes that come out of a nuclear event event, cesium, cesium 137, iodine 131, strontium 90, and americium 241. Cesium is primarily a beta emitter. And as it decays, it releases gamma radiation. Cesium, though it is, it is very easy to get rid of it binds with water. And it also binds with salts. And it's one of the more even though it's a it's a very active emitter, it collects in the tissues uniformly. So there's not one part of the body that's going to have more radiation than another it's going to be even scattered. And cesium is the one we use primarily use for drinking lots of beer to flush it out of you, but it works with all of them. Its health effects are the least of the other three isotopes. There's very few evidences in humans of cancers, or tumors or birth defects from cesium. Unlike the other ones and all that because it is so soluble in water. It's like dissolving sugar and water. It's how fast it it's soluble in water. And so the sooner you start drinking either large amounts of water, large amounts of iced tea, diuretics, you know type of things to flush your body and keep it up on people that can't drink. You know, invalids people in hospitals, what we do on them, we've got an IV in military, we went IVs at them just short of what we call fluid overload. And then we had Foley catheters in them to kind of keep a continuous circle going to get it out of them. Iodine is easiest one, it's a it's a blocking you block it by, you know, by adding extra iodine, Iodine is the most dangerous space of most radioactive of the four isotopes, even though it's the one everybody talks about. A lot of folks don't realize it is the most active in a very high energy, a medium energy gamma emitter, and a medium energy beta emitter, because it's short half life. And radiate. You know, it's, it's an isotope radiation, the longer takes one item decayed. Generally, the lower radiation it has, the faster it takes a faster an item decays, the higher energy than hazard is trying to get rid of. Iodine is, is another one, it's fairly white water soluble, it's more soluble in alcohol. There have been talks at different conferences that I went to in the military of well, it's iodine is alcohol soluble, but it's going to start getting people hammered. It doesn't quite work that way. Because if you can't put pure out you can't put alcohol directly into the bloodstream. It's not conducive to life. But iodine is water soluble and it's another one is just high high hydration and urination. Its primary thing that but however, don't think it really damages though is a thyroid of high presence of thyroid cancer hypo and hyperthyroidism means the thyroid either getting super active or the thyroid is not working correctly at all. As we talked about earlier as you age, thyroid is not important. So iodine protection is not quite as important. It really doesn't. Unless you inhale it or or it enters into your mouth through your or through a broken skin. Iodine doesn't really penetrate too deep into the skin. You know, we talked about painting your thyroid with heavy

doses of iodine. We're talking a soaked gauze pad with it, which is a lot different than particles in the atmosphere. Strontium. Strontium is one of the ones that's in the mid level danger. Strontium has a life of about 29-30 years, but it mimics calcium, so strontium poisoning enters into the bones and the soft tissues that surround the bones. Its most common health hazard is bone cancers. A few years after heavy exposure is not an overly active emitter, primarily alpha and low energy beta. And it again, it's another one it's it's excreted, believe it or not more in the feces than in urine. But still, it goes out that way. Now one thing about strontium, though, its primary method of absorption is through the digestive tract, It's due to digestive track. And after the body is pretty good on extracting minerals out of the digestive tract, and so about 20 to 30% of the count of strontium is absorbed through the digestive tract and the rest is just passed through in a feces. So that helps us out because we've already cut our dosage to it between 70 to 80%. And then again, back to normal body health high fiber diet, it helps push it out even faster through the digestive track. And then our final one is americium. Americium is primary at alpha emitter emits alpha particles that degenerate into gamma or gamma rays. But americium though, if you have a house, an RV, or something like that, you have americium in your home. I see a question and I'm going to I see I think Jerry and I want to answer it because that's a very good question on that. Americium is in smoke detectors. Every smoke detector has americium. Americium is in a lot of other household appliances in your home. Now, microwave ovens have a small americium emitter in them that that controls the sensors for cooking. Americium is a very good sensor, they use it to you know, for sensitive, our old chemical detectors had an americium in them. So it's one of the most common one. It's the longest lasting one though. That's the one it's 432 years long. The thing about americium though, it takes really, really high doses of it to do anything. And being a primary Alpha emitter, it's the easiest one to get rid of you what excuse me, you wash it off, and you're done with it. Americium attacks the bones and the liver, liver cancer, cirrhosis, bone cancers. It's also been known to leach calcium out of the bones, gamma radiation and high doses high dose gamma radiation effects reproductive systems, and it affects nervous tissues. But gamma, and all of these here are gamma. And you know, what we call secondary gamma emitters, primary alpha beta emitters all the way.

D Daisy Luther 2:08:13

These are long term issues, right?

C Chuck 2:08:18

Short term issues only occur in super hot I mean, we're talking you're walking through ground 0 after an attack or you walk into like Chernobyl, right? There's not too much of an in between. Using Chernobyl, for example, over the last 38 years, there was a short spike in leukemias, bone cancer, liver cancer in the area of Ukraine surrounding Chernobyl in a cone that funnels fall into preventing winds from it. After about five years or so, five to 10 years, those numbers have plummeted back down. In fact, you go to the protected area around Chernobyl until the Russian started digging up the dirt over there doing emplacement animals had moved back in it is one of the biggest nature preserves on the planet. And there are no ill effects except for one change in one specific animal in Chernobyl. And it was a certain type of tree frog prior to the explosion at Chernobyl, and for about 5-10 years afterward, the tree frogs were green. Okay, now you look up and you see those same frogs are now black to dark dark brown in color, because melatonin blocks radiation. So these frogs adapted and since amphibians have

Have a very short lifecycle. They went through mutation in generations a lot faster than mammals would. And so the mammals just outlived it. But the frogs and other amphibians in the areas, they just developed a new protection for it. But now 40 years after Chernobyl, they're seen a shift in the frogs starting to go back to the normal green because of the radiation counts have have dropped, and 40 years in evolution is a blink of the eye. So but in amphibians, though, that is, you know, it's equivalent to 10,000 years of evolution for us, right. But yeah, so there are the short term effects are only really felt in really high radiation environments. Or sloppy decontamination, or sloppy, where I just don't give a damn I'm gonna go out there anyway. type of attitude. proper protection, proper education. Just being smart. Learning how to read the weather is a big part of nuclear defense, like in my intro there when he's talking about me, senior NCOs in in, in the old nuclear, biological, chemical part of the military. We spent most of our times doing two things, plotting weather patterns for potential nuclear sites, we always had a weather pattern set up for every day of the week, our long that's what we call the Fulda gap in Germany, and every major American city that was a nuclear target, to be able to determine which direction to fall that was our other part. It was an offensive technique by using the same weather patterns that caused the most damage to the enemy. Okay, so, back to the question here food grade bentonite. Yes, bentonite is one of the ones I got a little note on there bentonite or Kailyn clay those two things are very similar aluminum silicates. They are very useful for binding with cesium and strontium and the digestive track and pushing them out especially strontium. You just got to watch it. You don't want to it's one of those things too much is bad for you because it can cause what's called a torsional colic which are a blockage of the intestine basically you seem that you get shut. There are directions out there which I should have been smart and I will put in for our follow up on this on how to dose for that. pectin. pectin is effective. pectin for people who don't can it's it's an additive we use in canning to help jellies gel. It is not as effective as bentonite or kaolin. But it does work and it is tolerated by young people, babies and toddlers and elementary school aged children. Better than bentonite is and it's easier for them to take because it doesn't taste like eating dirt, or eating muddy water. But yeah, those two are effective bentonite and kaolin are higher up on the scale of working they were issued in great quantities in the Soviet Union after Chernobyl and almost all nuclear accidents around the country Oak Ridge had a couple Three Mile Island Fukushima and other nuclear accidents around the country around the planet. bentonite was recommended for you know, to help bind with the strontium and push it out of the body before it causes any damage or more damage. Okay, but a lot of there's a lot of health effects but most of them are preventable by just time distance and lack of exposure. The outlook after a nuclear attack, yes. Here remembers in 1980.

D

Daisy Luther 2:13:53

Not the not the burst

C

Chuck 2:13:59

ABC I believe as ABC had the mini series called The Day After it scared the crap out of the planet because it showed the nuclear devastation after a full on nuclear exchange between the Soviet Union and the United States in the 1970s, early 1980s Because there's a bunch of time I was going into military outlook after a nuclear attack. Gosh, that is such an open ended question because it depends on the type of attack and attack of EMP device can be just as bad as a full scale onslaught of round burst or air burst nuclear weapons over every major city in

the United States. Your biggest outlook though is majority of it. This is my personal thinking and just going off a lot, a little bit of experience and a little bit of what we call wishful thinking. I truly don't see a full on nuclear exchange between Russia and us today. Now, not dragging politics into it. But depending on how bat poop crazy, somebody is on a given day, that can change in a heartbeat. My biggest worry, though, is satellite nations say Russia does launch a tactical nuke. And a tactical nuke is a very low yield nuclear weapon generally between one to five kilotons in yield, most of the time fired out of an artillery shell, the mythical nuclear suitcase, technically does exist because there's a weapon called W54. And it was about the size of a standard suitcase weighed about 60 pounds, had a yield of one kiloton 1000 tons of dynamite tearing the hell out of a city. And since it would be a ground burst device, it would be exceedingly dirty. And one of the favorite tricks of the old Soviet Union because they had a very similar device is they would pack it with cobalt and make a very, very dirty small bomb that would kill a city for 1000s of years. Nuclear Terrorism I see as a bigger threat, but the outlook after nuclear, nuclear exchange, I kind of look at it as similar to the TV show Jericho. You know, a lot of smart people did that first season of Jericho. Second season at Jericho, I think it was taken over by days of our lives. The first season of Jericho was a very, very good start, middle and finish of a nuclear attack on the United States. Because what Jericho was was a limited nuclear attack. It wasn't a full on blanket the entire United States it was selective cities around the around the United States that were targeted. And I see that happening more than full on nuclear exchange. Now, if Russia decides to do that, it's going to be a full on nuclear takedown. Soon as a launch, we're launching given fact we call it mad, mutually assured destruction. And as the only thing that really kept us from nuclear warfare until the Soviet Union fall because you kill our innocent civilians Im killing your innocent civilians with nuclear devices. But you have a terrorist group that is able to detonate a nuclear device in selected cities like that. I see that I see Jericho as a very valid thing. Yeah, the EMP problem because as soon as the bombs went off, everything electronic died except mechanically ejected diesel engines, old school points ignited car engines early what's called capacity to discharge ignitions your modern computer vehicles two schools of thought and that some say that there'll be fine other says it's going to be just turned into half of waste metal. High end electronics I think that are not shielded, either by Faraday cage or built to specification to handle EMP are going to be so much plastic, plastic and you know, melted metal bits. EMP is a huge is a is one of the biggest parts of the of the of a nuclear exchange. But unless it's a full on nuclear strike, I think it's totally survivable with proper preparation, I think that the health hazards are going to be high. But not that much higher than what we're doing now with what we do to our bodies hell me with just this pipe alone. I don't inhale it, but it might cause as much damage as a cigarette. You know, I think it's gonna be higher than what we do to ourselves now, but not that much higher. I think cancers will go up like they did in in the Ukraine after Chernobyl blew up, but then they dropped very rapidly. But, you know, gosh, I don't have a crystal ball. And I know there's people, a lot people smarter than me, but that's just going off my military train because that's what we planned for in the military. We plan for survivable nuclear exchange. And we had timetables, we know this type of cancer leukemias and and other soft tissue cancers is going to peak one to four years post and then do your heart tissue, your bone cancers are going to peak five to eight years post, and then you're going to have a drop off. And we had, there was contingencies for stuff like that.

D

Daisy Luther 2:20:10

Right. And of course, there are other players besides Russia, who have nuclear weapons. So I mean, you know, it's impossible to guess who might be the attacker today it's Russia tomorrow, it might be China.

C Chuck 2:20:27

Maybe the other day, we're having a little conversation with some of our friends. I've how many what's the monitor, old term was called Broken arrows, but lost nuclear devices, right? We have dozens of missing nuclear devices from the United States Arsenal from 1949 to last Thursday, the former Soviet Union has hundreds of nuclear devices that are missing. When the Soviet Union broke up into into the two the states now that are fighting each other. Hundreds of nuclear devices have been lost. Israel has lost a few nuclear devices, Pakistan has lost more than their share. India has lost devices, France, England, all of the nuclear powers have lost devices. Where are they? And what's going to happen if say, some knucklehead in the Kremlin decides to take the nuclear football and so it? What are these people that found or bought or stole these devices going to do? And that's why I think the Jericho type of scenario is a more is a fairly accurate scenario. Because,

D Daisy Luther 2:21:36

yeah, I think you're right, I see that more than I see, you know, 600, missiles hitting strategic targets around the US.

C Chuck 2:21:45

It can change with political climate with who's having a bad day in Washington or Moscow. But, yeah, but I think, I think the real the best scenario is somebody does drop a device in Eastern Europe. And it's a small device. I'm only talking one to five kilotons. It's more these things are designed more to move a battle than they are to destroy cities and civilians. But that's going to give somebody else the excuse of oh, well, I'm going to you know, I got this thing over here has been sitting in my basement in BFS stand for 35 years. Well, we're gonna go out and do this with it. I see that more happening than I do. Exchange.

D Daisy Luther 2:22:33

I agree with you, Chuck. This has been so incredibly informative. And I can't tell you how much I appreciate it.

C Chuck 2:22:41

I thank you for having me on. I appreciate it.

D Daisy Luther 2:22:42

All right, guys. I've got my email address up here. Hello@theorganicprepper.com. Send your questions for the next 24 to 48. Let's say 48 hours, give people time to mull this over. For the next 48 hours, send your questions we're going to do Chuck and I are going to do a private

recording. And we're going to send it to you guys. And we're also going to send the handouts. Now, if you don't get those emails by the end of next week, please check your spam folders and your promotions folders because my stuff goes to spam quite a lot. And Google doesn't like me. So check all of your folders. And if you don't have it, just drop us a line and we will get back to you with whatever you happen to be missing. And please send us questions because this was great information, but I'm sure once you mull it over, there's going to be more stuff that you want to get some specifics on and Chuck promised to do a little research for us to awesome.

C Chuck 2:23:51

Before we close out I just need to go up here and copy of the chat room. So I can paste it into a file and because some of these questions here, I want to specifically want to follow up on

D Daisy Luther 2:24:03

Okay, did you get those? Yep, I got it already. Okay, awesome, guys. Thank you. And thank you, Chuck.

C Chuck 2:24:09

Thank you again, Daisy.

D Daisy Luther 2:24:12

Y'all take care bye.