

Low EMF television viewing



Watching television or movies on a home screen can be difficult for people with electrical sensitivities. We provide a catalog of options to choose from.

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Watching broadcast television, streaming video or film recorded on DVDs or USB flash drives (thumb drives) is a pleasure. But for people with electrical sensitivities it can cause a range of neurological symptoms. For some it causes a flushing of the skin. For others it can cause tingling sensations, restlessness or even pain.

Fortunately, there are several options for reducing the radiation exposure. Some cost little or nothing.

We do not have the budget to test the different brands of televisions and the different underlying technologies on the market today to find the lowest radiating screen – or which current technology is best. Things change so fast that information would be obsolete within twelve months anyway.

Instead we list common-sense measures that have worked for some people. Be aware that people's level of sensitivity vary. Some of the options are too extreme for most people.

The screen technologies

The technology has changed dramatically over the past two decades and it will continue to change. Today's televisions and computer screens radiate less than the old CRT (cathode ray tube) and plasma screens, but they also radiate different frequencies.

It appears that some people are more sensitive to certain frequencies than others.

We cannot recommend any specific screen technology as the "best" among what is available today.

Non-wireless TV

Most of today's televisions have built-in wireless Wi-Fi, so they can receive streaming video via the home's wireless internet router instead of using a cable.

A Wi-Fi device constantly transmits, whether it has any data to transmit and receive, or not. If you want low-radiation TV, no wireless is a must.

It *may* be possible to turn off the transmitter inside the TV, but such a feature cannot be trusted. The transmitter will be on by default so any system reset, software update or other changes will turn on the transmitter. It could be a booby trap.

Look for a television that does not have a transmitter at all. You may have to search online to find one, but they do exist from lesser known brands.

Use a laptop/desktop computer or a dedicated television?

Today's televisions are specialized computers. Inside they have a processor, memory and other electronics similar to a computer. But a computer tends to have

many more components inside, radiating a wider range of frequencies. And some also have electric fans.

The screen on a laptop computer is rather small, so you have to sit close to it. A larger screen allows more distance to limit the radiation exposure.

In general, we think a dedicated television is better than a computer.

Screen size

If you have a large screen, you can sit further away. Distance lowers the radiation. But large screens also radiate much more than small screens, and because it is a radiating surface (instead of a point source) the radiation reaches further.

Using a large screen requires a large room to be able to sit further away.

In our experiments, we found televisions with a screen of around 20 to 24 inches to be more tolerable than laptop computers with 15 inch screens.

We also tried a television with a 40 inch screen. Even though we could sit further away, the television radiated so much more that it wasn't any better. (We only tested one 40 inch TV. It had no wireless.)

Testing to compare the radiation

Today's television screens (without wireless) radiate mostly frequencies in the kilohertz band. That means a simple portable AM radio is a good tool to test the radiation with.

Set the channel selector to the low end of the scale (around 530 kHz), where there is little static and no station can be heard. If you are in a high-EMF area, it may not be possible to find a static-free AM radio band (FM cannot be used for this test).

Testing a television inside a store is probably not possible. There will be many televisions which all radiate. It will be impossible to tell them apart. The owner of a small store may be willing to turn them all off, except for one at a time. A large store is unlikely to be helpful.

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An AM radio is a crude instrument, but it can be helpful to compare a few televisions. You could compare how loud the squawking is when the AM radio is held 3 feet (1 meter) from the front of each television.

Using binoculars

If you use binoculars, you can sit much further back from the screen. This is the method used by the author.



Binoculars used for viewing screens.

You'd want small lightweight binoculars that won't get tiresome to hold. For this use you won't need the big heavy lenses used for low-light binoculars. This author uses 8 X 21 binoculars, which are a good compromise and allows a viewer to sit 20 ft (7 meters) from a 24 inch screen and have a comfortable picture size (subtitles can even be read).

There are binoculars available that are worn as glasses (see picture). The best we've found have only a magnification of 3 (3 X 25). Then you'll need a 40 inch screen for a comfortable picture at 20 ft (7 meters) distance. But that may be too close to such a large radiating surface.

Limiting watching time

Some of us simply cannot watch a full-length film and have to watch it in segments of 30, 45 or 60 minutes at a time.

With some models the television can easily continue where it last was turned off, whether you are streaming or watching a DVD.

12 volt DC television

Almost all televisions have a built-in electronic transformer that steps down the higher voltage coming from the electrical outlet (120 or 230 volts). This device works by chopping up the current tens of thousands of times every second and can affect severely sensitive people.

A few brands of televisions have a separate power transformer that is outside the box. It is plugged directly into the wall outlet and then a cord carries the low-voltage DC electricity to the TV. This allows the transformer to be placed further away, especially if an extension cord is used.

Some people feel better if the transformer is eliminated entirely. If the transformer delivers 12 volt electricity, the television can be powered by a large battery (this is what we do).

The battery can be charged elsewhere with a car battery charger, or with a small solar system. A small solar system is not difficult to set up, but it is not for everyone. For details, see the "offgrid" section of this website.

Twelve volt DC televisions can be found on the internet, especially from vendors that cater to truckers and RV/caravan campers. We have seen four different brands, and tested three of them. The brand we prefer is Skyworth, based on our overall opinion, though we won't say the others are bad.

Shielding

Shielding a television is difficult. There are two problems: the radiation is mostly in hard-to-shield frequencies (kilohertz bands). And the best shielding materials do not allow light to pass through it, so you can see the screen.

A somewhat effective method is to hang a sheet of copper mesh in front of the screen (or even drape it over the top). It is best to watch in a dark room so there is

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no light reflecting from the copper wire. A larger screen gives a better picture, as the wires will appear smaller.



Television shielded with copper mesh in front of the screen. It can be seen as a reddish tint. It is less visible in a darkened room and on a larger screen.

The screen works by reflecting the electromagnetic waves back towards the screen.

A more effective method is to build a box around the screen, with metal on all six sides. It is probably easier to use metal plates of aluminum or steel for the sides that do not need to be transparent. Enclosed in such a box, the television would probably need to get its signal through a cable. If it gets too hot inside, you'll need to have more sides with mesh for ventilation.

Shielding can help, but don't expect miracles.

Rear projection devices

A few people have set up rather elaborate rear-projection systems, where a projector generates the picture on a special rear-projection screen. A computer sits further away and sends the picture to the projector through a cable. This way all electronics are away from the viewer.

This type of setup requires a lot of room. In the three cases we've seen, they all had a separate projector room with the screen mounted in a hole in the wall.

The projector has to be rather powerful to provide a bright picture through a rear-projection screen.

It can be helpful to install a longer lens on the projector, so it can be further away from the projection screen.



Projection system used to watch movies and for computer use.

Measures that do NOT work

Lowering the brightness of the picture does not make a difference to the radiation level.

There are a lot of pendants, "dots," "diodes" and other things sold with claims that they somehow protect against EMF radiation or modify EMF. We consider them all placebo devices, i.e. some people report they feel better, but that is solely because of a strong belief that it works.

Some advertisers use fancy words or refer to obscure scientific articles. It is easy to get misled by these claims. Conveniently, they often say their product doesn't

lower the EMF levels shown on any instrument – yes, that one is correct, for good reasons.

Some of these sellers say they use patented technology to give the impression of legitimacy. Having a patent just means the design is novel, not that it works. There are lots of patents for perpetual motion machines and other impossible gadgets.

Broadcast, cable, satellite and streaming

With broadcasting, the TV uses a wireless receiver which doesn't transmit. The electronics still radiates a little, like all electronics does. The TV receiver uses an antenna inside the box or it needs an antenna that either sits next to the TV or is further away with a cable. In rural areas your choice of channels will be very small, or there may be none available.

To use cable television or satellite TV there should be a separate set top/converter box provided by the service. You'd want all this extra equipment well away from you. This includes any satellite antenna and the cable going to it.

With streaming, the video signal comes through the internet. You will need fast internet service, which can be done in several ways, all of which can cause problems for very sensitive people. In general, DSL/ADSL is the safest, but discussing internet options is beyond this article.

Watching film on DVD or memory stick

The simplest and most hassle-free setup is to watch recorded files and programs from DVDs or memory sticks (flash drives/thumb drives/USB drives).

There is little wasted time, few or no commercials and simple setup. Most players will remember where you stopped and automatically continue from there when turned on again (not all do this, though).

Some televisions have built-in DVD or memory stick slots, making this easy. Otherwise a separate player can be connected.

Be aware that some DVD drives are rather noisy.

Many televisions have USB connectors, but some of them only allows viewing pictures and not movies.

"Off" is not really off

When you use the remote control to turn off the television, it is not fully off. There are still some parts that are on, so it can receive a signal from your remote control and power up the rest of the system.

The radiation is a lot less than when the TV is fully on, but there is still some radiation (you can verify this using an AM radio, as mentioned earlier).

The simple solution is to use a switch that turns off all power to the television. Or you can pull the plug or use a switch on a power strip.

The remote control

All the remote controls we've seen use infrared signals. They are "wireless," but use light humans cannot see, and they only transmit when you press a button.

The electronics in the remote control device does radiate itself when a button is pressed. It is rather strong, but it is only for a couple of seconds. (You can test with an AM radio.)

To our surprise, about half of the remote controls we tested also radiated when they were *not* used. In all cases it was very light, so if you keep it about 2 ft (1/2 meter) away that should be plenty good. Just don't keep the remote in you pocket, unless you've tested it.

Chemical sensitivities

Many people with electrical sensitivities are also sensitized to chemicals. A new television will give off toxic gases for several months, especially when it is on and therefore warm. The chemical fumes come from the plastic cabinets and the electronics inside.

Buying a television with a metal cabinet can help, but those are rare or not available.

Some people burn in their electronics by running them in a garage or unused room for several months. Some have built a glass box around it to contain the fumes (it may need a ventilation fan).

Sound sensitivity

Many people with severe electrical sensitivity also have sound sensitivity. Some are not aware of it.

The problem varies with the person, but loud sounds, rhythmic sound (music), electronic sounds (recordings) and whining sounds (fans, DVD drives) seem to be common triggers. Natural sound, such as people talking and live acoustic instruments are usually fine.

For people with this problem it can help to turn the sound way down or totally off. Turn on the subtitles instead. If you have trouble keeping up, try running the movie at half speed (it doesn't look weird).

If using a DVD player, the noise can be a problem. Ear protectors work better than ear plugs.

If the measures to lower EMF listed in this article do not help, try turning off the sound. You may be sound sensitive without knowing it.

Flicker sensitivity

Sensitivity to flickering light is common among people with electrical sensitivities and those with epilepsy.

All normal types of screens flicker – usually 60 times a second. It is a lot less noticeable in today's technologies than the old CRT screens.

Higher flicker speeds are believed to be better, but few screens go faster than the 60 times a second.

Small spaces

If you have little space available, such as in a small room or the inside of a van, your options are more limited.

Consider if it is possible to watch the television through a window or an open door. This could be a setup you have to roll away when not in use and may only be usable when it doesn't rain. Think creatively.



Another option is to use a small portable screen, and then possible binoculars. These small device will radiate much less than a full-sized screen.

We once used the device in the picture. It runs on a battery, has a small eight-inch screen and a built-in DVD player. With 8 X binoculars it has a good picture at 9 ft (3 meters) distance. With 3 X binoculars the picture is good a 6 ft (2 meters), which may be too close.

More information

More articles about reducing EMF exposures and living with electrical sensitivities are available on www.eiwellspring.org.