

SB 283 Legislative Report Answers to Frequently Asked Questions
Oregon Health Authority
January 19, 2021

1. What is the scope of the Oregon Health Authority (OHA) SB 283 Legislative Report?

Senate Bill (SB) 283 directed OHA to review independently funded scientific studies of the health effects of exposure to microwave radiation, particularly exposure from the use of wireless network technologies in schools or similar environments. OHA reviewed epidemiology studies (studies on humans) that examined an association between exposure to radiofrequency radiation (RFR) and cancer and noncancer health effects. OHA considered independent studies to include all epidemiology primary research. OHA also included the funding source for each study it reviewed. OHA identified relevant RFR emissions to be in the frequency range of cell phones and Wi-Fi, or approximately between 1.6 gigahertz (GHz) and 30 GHz.

2. Why did OHA not include animal studies in its review?

OHA prioritized the review of the numerous available human (epidemiological) studies as the most relevant for school settings and did not include studies on animals due to limited resources and a lack of funding for the bill. OHA utilized limited existing resources to complete the review.

Animal studies typically support the findings of epidemiology studies, although they do not always give definite answers on the relevance to humans. There is at least one review of the RFR-health effects in animal studies (see Food and Drug Administration under “additional resources” below). In addition, the National Toxicology Program (NTP) conducted a large-scale animal study of long-term exposure to RFR. The NTP found that one specific group of animals (male rats) showed an exposure-related increase of tumor formation but other groups (female rats, male mice, female mice) did not. OHA provides

a brief summary of the results of this study under “additional resources” National Toxicology Program below.

3. What is radiofrequency radiation or RFR?

Radiation is on the electromagnetic spectrum which is split into two main categories of radiation:

1. Ionizing, a form of high energy particles and waves that can interact with atoms and molecules by removing electrons (ionizing) or breaking chemical bonds. This includes X-rays, ultraviolet rays, gamma rays, and others.
2. Non-ionizing, low energy waves that do not have enough energy to remove electrons from atoms or break chemical bonds and RFR is on that side of the spectrum. This can come from sources like power lines, computers, radios, mobile phones, microwaves, daylight, and others.

4. What are some of the report findings on RFR and cancer effects?

OHA found insufficient evidence for a causal relationship between microwave exposures similar to those in school settings and cancer endpoints. Some studies found an association between long-term cell phone use (as one example of microwave exposure) and various brain cancers. However, other studies found no association between long-term use and cancers and there was no consistency among studies. It is not clear if the findings were related to cell phone use or not, particularly when most studies were not able to measure actual RFR for any one person and relied on personal recollection of habits, translated into exposure measures. Moreover, studies by the National Cancer Institute could not detect an increase in brain cancers that corresponded to an increase in cell phone use in the U.S. If a relationship exists between RFR and cancer in exposures similar to those in a school setting, it is not clear yet.

5. What were some of the report findings on RFR and noncancer effects?

Overall, OHA found insufficient evidence to conclude that RFR exposures similar to those in school settings are associated with adverse noncancer health effects. There is some indication of an effect of RFR on specific brain wave signals when a cell phone was held next to the head for some time. There were also reported effects on reproductive endpoints. However, these studies were not consistent in their findings and were unable to account for many potential confounders. For example, longer use of phones associated with increased sperm abnormalities in men might be a result of long periods

of sitting down or running a laptop in contact with the body, rather than RFR from the phone or a Wi-Fi router.

6. Does OHA find that new research can change the status of the science?

OHA finds that more research is needed to continue exploring this association to account for evolving technologies, modes of use, and confounding factors. For example, there is evidence to suggest that screen and phone time are associated with poorer mental health indicators and sleep. The exact attributes associated with the use of these devices (RFR exposure, media content, some with conditions are more likely to use these devices more, etc.) need to be explored further. Also, there is a need for better studies that assess actual exposures to RFR rather than rely on proxy exposure indicators that could be unreliable.

7. Is there evidence to suggest that radio and cell phone towers are associated with increased COVID-19 incidence?

OHA does not find a reasonable explanation for how this could happen.

8. What recommendations does OHA have for the Oregon Department of Education?

Because OHA's review of the epidemiological literature did not determine these technologies cause specific adverse health effects associated with exposures that are specific to school settings, it would not be appropriate to make specific recommendations that are not based on the evidence.

9. If people want to reduce their exposure to radiofrequency radiation from wireless devices, what can they do?

Following are some steps that people can take to reduce their exposure:

- Reduce the amount of time spent using the wireless device.
- Increase the distance between personal wireless devices and the body. One way to do this for some devices is by using a speakerphone, earpiece, or headset. While wired earpieces may conduct some energy to the head and wireless earpieces also emit a small amount of radiofrequency radiation, both wired and wireless earpieces remove the greatest source of radiation (the wireless device) from proximity to the body.

- Check the wireless device for the recommended distance to keep away from the body.
- Increase the distance from wireless devices. The radiofrequency energy is inversely proportional to the square of the distance from a device. In other words, if one doubles the distance from a source, the exposure will potentially be reduced four times.
- Switch from wireless to wired devices.
- If applicable, turn off the device or put it in “flight mode” when not needed.
- Beware of scams <https://www.consumer.ftc.gov/articles/0109-cell-phone-radiation-scams>

10. What additional recommendations does OHA have for the public on the use of wireless devices?

OHA highly recommends the following tips for use of wireless devices:

- Avoid operating wireless devices while driving.
- Avoid staring at your wireless device while on the street and be conscious of people, poles, holes, and vehicles around you.
- Take frequent breaks from social media and enjoy people, nature, and urban landscapes.
- Do not use wireless devices at least an hour before bedtime and keep devices away from your bed so that you are not tempted to use them if you wake up during the night.
- Download an app or use the respective function on your wireless device to eliminate blue light at night.
- Maintain good neck and back position and look for practices to prevent hand injuries from using these devices. <https://lib.msu.edu/ergo/research/mobile/>
- Avoid placing a laptop on your lap during use. This can generate a lot of heat that can be harmful to the tissue in its vicinity.

Additional resources

Centers for Disease Control and Prevention

A brief introduction to non-ionizing radiation

https://www.cdc.gov/nceh/radiation/nonionizing_radiation.html

Federal Communications Commission

On wireless devices and health

<https://www.fcc.gov/consumers/guides/wireless-devices-and-health-concerns>

Food and Drug Administration

Fact sheet on cell phones and health

https://www.cdc.gov/nceh/radiation/cell_phones_faq.html

Weight of evidence evaluation of studies on radiofrequency radiation and cancer

<https://www.fda.gov/media/135043/download>

Cell phones and health

<https://www.fda.gov/radiation-emitting-products/cell-phones/scientific-evidence-cell-phone-safety#5G>

Health Physics Society

On cell phones, nonionizing radiation, and 5G technology

[http://hps.org/documents/Mobile Telephone Fact Sheet update May 2010.pdf](http://hps.org/documents/Mobile_Telephone_Fact_Sheet_update_May_2010.pdf)

National Cancer Institute

Fact sheet on cell phones and cancer risk

<https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/cell-phones-fact-sheet#r14>

National Toxicology Program

Radiofrequency radiation research activities

<https://ntp.niehs.nih.gov/whatwestudy/topics/cellphones/index.html>

Summary of a long-term study of rats and mice exposed to radiofrequency radiation

https://www.niehs.nih.gov/health/materials/cell_phone_radiofrequency_radiation_studies_508.pdf. Briefly,

- a. Following a request from the Food and Drug Administration, the National Toxicology Program (NTP) conducted a study to assess the health effects of exposure to RFR in rats (male and female) and mice (male and female). The

lowest exposure level for rats (1.5 W/kg) was similar to the maximum allowed for humans (1.6 W/kg) by the Federal Communications Commission. The lowest exposure level for mice was 2.5 W/kg.

- b. The animals were exposed for a total of 9 hours and 10 minutes a day (in 10 minutes on, 10 minutes off cycles during a period of 18 hours and 20 minutes each day) daily for up to a period of two years (most of the life of rats and mice). The exposure was to the whole body. The animals were examined for tumor formation and other toxicity endpoints.
- c. NTP concluded that there was clear evidence of RFR association with tumors in the hearts of male rats and some evidence of RFR association with brain and adrenal gland tumors, also in male rats. However, NTP found it was unclear that tumors observed in female rats, male mice, and female mice in the study were associated with the exposure. NTP also found that the exposed male rats at every exposure level lived longer than control rats, possibly due to a decrease in chronic kidney problems.
- d. There were no RFR-related exposure-dependent effects on reproductive parameters examined in this study in mice and rats after 14 weeks of exposure.
- e. NTP stated that the findings in their \$30M study on animals cannot be directly applied to humans because the exposure levels and durations were greater than what people may receive from cellphones.

The strengths and weaknesses of the tumor findings of this study have been discussed by the U.S. Food and Drug Administration (FDA)¹ and the *International Commission on Non-Ionizing Radiation Protection (ICNIRP)*². OHA looks to the various agencies and researchers as they continue to study this topic, review the available literature, and determine how to extrapolate RFR doses and effects from animals to humans.

World Health Organization

Information on non-ionizing radiation

https://www.who.int/topics/radiation_non_ionizing/en/

¹ <https://www.fda.gov/media/135043/download>

² <https://www.icnirp.org/cms/upload/publications/ICNIRPnote20192020.pdf>