

# Minimize health risks from electronic devices

By Adrienne Markowitz and Eileen Senn

Desktops, laptops, tablets, eBook readers, printers, projectors, smart boards, smart TVs, cellphones, cordless phones and wireless networks (WiFi) have become ubiquitous in schools. At their best, they are powerful tools for education. At their worst, they threaten the physical and mental health of teachers, paraeducators, secretaries, librarians and other school staff members and students who spend numerous hours using the devices.

Physical health risks from electronic devices include pain and tingling from repetitive strain injuries to the hands and wrists; pain in the neck, shoulders and back; dry, burning, itchy eyes, blurred vision and headaches; altered sleep patterns and next-day fatigue from exposure to blue screen light; distracted driving; and various health problems from exposure to radiation.

Mental health risks arise from stress due to raised expectations for multitasking, productivity and proficiency with devices; dealing with malfunctioning devices; student and colleague distraction from and addiction to devices; and intrusion of devices into nonwork time.

## WiFi devices emit radiation

Radio frequency (RF) electromagnetic frequency (EMF) radiation is sent and/or received by the antennae of phones, routers and other wireless devices. RF radiation is capable of causing cancer, reproductive, neurological and ocular effects. The amount of radiation exposure received depends on the amount of time exposed and distance from the source. Radiation levels fall off exponentially with distance from antennae. If you double the distance, the radiation is four times less. If you triple the distance, it is nine times less, and so on. Children and developing fetuses are particularly at risk because their bodies are still growing. People with implanted medical devices are at risk for device interference.

## Hazards and solutions

The most straightforward ways to minimize health risks are to use electronic devices in moderation and to maximize your distance from them. There are also specific solutions to specific hazards listed below.

Local associations should work with their UniServ field representative to negotiate solutions that are in the control of district administrators such as providing training and ergonomic equipment and hard-wiring devices. Individuals should take steps within their control, such as:

### For repetitive strain injuries

- Use voice control/speech recognition.
- Use ergonomic alternatives to traditional mice and keyboards.
- Use as many fingers as possible when typing and both thumbs when texting.

### For neck, shoulder and back pain

- Ensure an ergonomic workstation.
- When using a hand-held device, support it and the forearms.
- Avoid bending the head down or jutting it forward.
- Take frequent, short breaks from the device.
- Ensure good posture and change positions frequently.
- Stand and do stretching exercises.

### For eye pain, blurred vision and headaches

- Use sufficient, but not excessive, lighting.
- Use assistive technology built into Apple, Android and Windows devices.
- Enlarge and darken the cursor and pointer.
- Enlarge the font; magnify the text.
- Use text-to-speech instead of reading.
- Use special computer glasses.
- Relax the eyes on a minibreak.

### For altered sleep patterns and next-day fatigue

- Stop using devices at least one hour before bedtime.

### For distracted driving

- Use hands-free devices, preferably speakerphones.
- Pull over and park.
- Let someone else drive.

### For radiation exposure

- Keep devices away from the body and bedroom.
- Carry phones in briefcases, etc., not on the body.
- Put devices on desks, not laps.
- Hard wire all devices that connect to the internet.
- Hard wire all fixed devices such as printers, projectors and boards.
- Use hard-wired phones instead of cell or cordless phones.
- Text rather than call.
- Keep conversations short or talk in person.
- Put devices in airplane mode, which suspends EMF transmission by the device, thereby disabling Bluetooth, GPS, phone calls, and WiFi.
- Use speaker phone or ear buds instead of holding the phone next your head.
- Take off Bluetooth devices when not using them.

### For stress

- Training in device use, assistive technology.
- Easy access to user manuals.
- Easily available technical support. 🛠️

*Adrienne Markowitz holds a Master of Science in Industrial Hygiene from Hunter College, City University of New York. Eileen Senn holds a Master of Science in Occupational Health from Temple University in Philadelphia. They are consultants with the New Jersey Work Environment Council, which is a frequent partner with NJEA on school health and safety concerns.*



# For more information

- ✓ **“Job stress: Is it killing you?”** *NJEA Review*, May 2012. [bit.ly/jobstress8](http://bit.ly/jobstress8)
- ✓ **“As schools lift bans on cell phones, educators weigh pros and cons,”** Kinjo Kiema, *NEA Today*, Feb. 23, 2015. [bit.ly/2b6eOr8](http://bit.ly/2b6eOr8)
- ✓ **Be kind to your eyes,** *NJEA Review*, September 2012. [bit.ly/2bdZnAp](http://bit.ly/2bdZnAp)
- ✓ **Computer workstations eTool,** Occupational Safety and Health Administration (OSHA). [bit.ly/2aJUeRw](http://bit.ly/2aJUeRw)
- ✓ **“Stretching Exercises at Your Desk, 12 Simple Tips,”** WebMD. [wb.md/2beOvUk](http://wb.md/2beOvUk)
- ✓ **“Cell phone facts and tips,”** Grassroots Environmental Education. [bit.ly/2bqpFQP](http://bit.ly/2bqpFQP)
- ✓ **“Radiofrequency and microwave radiation,”** Occupational Safety and Health Administration (OSHA). [bit.ly/2aR1TIY](http://bit.ly/2aR1TIY)
- ✓ **“Report of Partial Findings from the National Toxicology Program (NTP) Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd: Sprague Dawley SD Rats (Whole Body Exposure).”** [bit.ly/2bqq8Cc](http://bit.ly/2bqq8Cc)
- ✓ **“Low EMF Best Practices,”** Collaborative for High Performance Schools (CHPS), 2014. [bit.ly/2bs51Rx](http://bit.ly/2bs51Rx)
- ✓ **Microsoft Accessibility Center:** [www.microsoft.com/enable](http://www.microsoft.com/enable)
- ✓ **Apple Accessibility Center:** [www.apple.com/accessibility](http://www.apple.com/accessibility)
- ✓ **Google/Android Accessibility Center:** [www.google.com/accessibility/products-features.html](http://www.google.com/accessibility/products-features.html)



## Cell phones and cancer

The National Toxicology Program (NTP) is conducting the largest set of laboratory rodent studies to date on cellphone RF radiation. The studies cost \$25 million and are designed to mimic human exposure. They are based on the cellphone frequencies and modulations currently in use in the United States. The NTP studies are designed to look at effects in all parts of the body.

On May 27, 2016, NTP released a report with partial results of the studies. They found increased occurrence of rare brain tumors called gliomas and increases in nerve tumors called schwannoma of the heart in male rats. The released results are partial because more rat studies and all of the mouse studies will be forthcoming by 2017. The cells that became cancerous in the rats were the same types of cells as those that have been reported to develop into tumors in human cellphone users.

The EMF produced by cellphones was classified as possibly carcinogenic to humans by the World Health Organization in 2011. They found that long-term use of a cell phone might lead to two different types of tumors, gliomas and acoustic neuroma, a tumor of the auditory nerve.