HOW TO ELIMINATE AND REDUCE ELECTROMAGNETIC FIELD (EMF) EXPOSURE IN THE CLASSROOM: A GUIDE FOR SCHOOLS

ENVIRONMENTAL HEALTH TRUST

EHT recommends eliminating sources of EMF radiation inside school buildings by the installation of corded/wired (instead of wireless) internet/phone/tech connections. Corded/wired connections will significantly reduce hourly and overall exposures to students, teachers and staff.

HEALTHY TECH ROUTINES IN THE CLASSROOM

- At start of class, remind students to power off cell phones and Personal Digital Devices.
  - Regularly remind students about phones and wireless PDD: Distance devices away from body and,
  - If cell phones are needed for photos or video remind students to turn transmitting antennas off: Select "airplane mode" and disable all wireless antennas including Cellular, Wi-Fii, Mobile hotspot, Mobile data, Siri, Bluetooth and Location.
- Post policy and best practices signs in every classroom and prominently at room entrances.

CURRICULUM PLANNING

- When curricula requires internet connectivity, limit it to specific times rather than interspersed throughout class. For example, curricula should not require students to use phones to look up things during class. Instead, have a plan that includes time when students organize their research questions and, subsequently, a separate time when students research online.
- When internet or other electronic connections are needed, use hardwire connections (cords/cables/wires/adapters) for all equipment (personal computer, any size electronic screen, printer, audio speakers, headphones, microphone, smartboard, printer, mouse, keyboard, and other devices and accessories).
- If hardwire connections are not available in the school, minimize use of cloud and other wireless network services and instead use applications and content that are pre-downloaded onto devices.
- Download and install files for curriculum prior to students' use. This will eliminate the need for Wi-Fi during class.
- Teach students to turn OFF wireless antennas when not in use (Wi-Fi, Bluetooth, Data, Cellular) and to select Airplane Mode for their personal devices including on cell phones, laptops, and other wireless devices. Note that students may need to go to Settings to fully disable Wi-Fi and Bluetooth.*
- Store laptop carts outside of the classroom, and avoid recharging laptops near students/staff.
- Instead of virtual reality "field trips," show movies and video in class on a large screen.

** Wi-Fi "OFF when not in use" will still result in radiation exposures to students and staff during Wi-Fi use and continuously from WLAN access points. EHT recommends the installation of wired networks.*

COMMUNITY EDUCATION

- Regularly schedule parent, teacher and community education sessions about safer use of technology, e.g.:
  - Strategies and practical advice on how to minimize health risks of cell phones, screens, and wireless digital devices.
  - Hands-on workshops that explain and demonstrate how to hardwire home electronics and create a low-EMF computer workstation.
- Regularly hold discussion forums about strategies to address the challenges of parenting in the digital age.
- Hold student forums about how to reduce radiation, reduce eye strain, and minimize adverse psychosocial impact.

SCHOOL POLICY

- Create and regularly update policies for cell phone and digital device use in classrooms that includes medical recommendations for children's health and safety related to eyes, posture, addiction, and radiation.
- Institute a ban on personal cell phones and personal hotspot devices. Prohibit use of all internet-connected devices in classrooms unless during supervised use for specific instructional purpose. Such a policy may help prevent students from rushing through schoolwork to go online for gaming or other non-school purposes.
- PDD bans (unless wireless transmissions are OFF) should be extended to school buses. Prohibit Wi-Fi and cell phone network use in buses because EMF radiation is intensified inside metal vehicles.

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HOW TO ELIMINATE AND REDUCE ELECTROMAGNETIC FIELD (EMF) EXPOSURE IN THE CLASSROOM: AN INTRODUCTORY GUIDE FOR SCHOOLS

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- Institute a policy that allows for convenient, non-wireless methods for students to communicate with parents about last-minute scheduling issues. Non-wireless methods could include: corded phones, electronic bulletin board, and other practical, accessible ways to get messages to/from students.
- Incorporate a Technology Curriculum into other curricula. For example,
  - In the health curriculum, include information about why and how to reduce exposure to wireless radiation, including step-by-step instructions how to disable wireless on their personal devices.
  - In the environmental science curriculum, review current and historical regulatory policies on EMFs, including international approaches.
- Educate administrators, staff, and volunteers at least annually and when newly hired, about the safer use of technology. This might include:
  - Reviewing school policies and how to reinforce them in the school setting,
  - Explaining how to eliminate/minimize health risks of cell phones, screens, and wireless digital devices with hands-on workshops that explain and demonstrate how to hardwire electronics and create a low-EMF computer workstation.

LOW-EMF INFRASTRUCTURE IN SCHOOL BUILDINGS

- Install wired rather than wireless LAN and communication services in schools.
- Only purchase or use computers, tablets, and other school and personal technology devices that can be ethernet-connected and allow all wireless applications (including locators) and antennas to be disabled.
- Locate computer stations and ethernet ports throughout school for convenient internet access.
- Hard wire all technology devices. This includes: fixtures such as printers, projectors, scoreboard controls, and boards; computer accessories such as audio speakers, mouse, keyboard, microphone, headphones, etc.; all locations at school (auditorium, gymnasium, library, office, indoor and outdoor lounge or activity areas, daycare facilities, etc.). Always include a step to disable Wi-Fi/Bluetooth antennas via settings in the device, because otherwise even when the device is connected with wires, it's antennas will often continue to emit EMF radiation.
- Operate laptops and tablets only in battery mode and not when plugged into an electrical outlet.
- Place corded phones in every room and in common areas so students and staff can communicate without cell phones. No cordless phones.
- Hardwire security systems.
- Do not use fluorescent lights. If fluorescents are already installed, consider improvements and perhaps optimizing natural daylight.
- Do not use RFID systems for persons or property.
- Install wired charging systems instead of wireless charging systems.
- Do not place microwave ovens in classrooms or schools. If you must use microwaves, then ensure ovens are checked for leaks and damaged seams. Teach students and staff to distance themselves from ovens.
- Replace utility smart meters with analogue meters.
- Replace wirelessly communicating environmental sensors with non-wireless alternatives.
- Ensure the electrical wiring in all school rooms complies with U.S. National Electrical Code and applicable state electrical code and local jurisdiction regulations. Have an electrician evaluate, and remediate if necessary, to ensure:
  - Student- and staff-occupied areas have no common wiring errors,
  - ELF magnetic field exposure is not above 1 mG (100 nT).
  - Classrooms are not above electrical panels, electronics, or facility equipment/appliances that generate high EMFs.
- Ensure cell network towers, antennas, and boosters are not located on, in, or near school property.

For documentation and references please see
EHT's Question and Answer on Wi-Fi in Schools



HOW TO ELIMINATE AND REDUCE WIRELESS RADIATION AND EVERYDAY ELECTROMAGNETIC FIELD (EMF) EXPOSURE IN DORMITORIES

ENVIRONMENTAL HEALTH TRUST

LOW-EMF INFRASTRUCTURE IN SLEEPING AREAS

Internet Connections

- Install wired (instead of wireless, and instead of cordless) LAN and communication services in each building.
- Ensure every room has multiple ethernet ports near desks in each room (at least 2 per resident).
- Wi-Fi routers, access points, boosters, smart speakers, wireless electronics, wireless charging systems, wireless video games and Bluetooth devices should not be in sleeping areas and should not be in hallways near sleeping areas.
- At minimum, Wi-Fi routers can be turned off at night to support a healthier sleep.

Telephones

- Ensure every dorm room has a wired telephone, preferably with caller ID.
- Cell phones can be forwarded to this corded phone for voice calls in the dorm room.
- Students can plug their cell phones into the internet with ethernet cords instead of cellular or Wi-Fi for most applications.

STUDENT EDUCATION

- Why and how to reduce cell phone radiation exposure and other electromagnetic fields (EMFs).
- How to turn off the wireless antennas of cell phones and other tech so they are not always transmitting wireless radiofrequency radiation. For example, if Bluetooth is not in use, it can be turned off. If cellular is not in use, it should be turned off. Students should not sleep with transmitting cell phones near their heads or with phones resting on their body. Students can learn about how to use Airplane Mode to decrease unnecessary exposure.
- Practical information on how to ethernet plug in their computers and cell phones with adapters so they can access the internet without Wi-Fi.
- Safer charging: Using a phone while it is charging increases EMF exposure. Students need to know why they should distance themselves from chargers and unplug chargers when not in use. Laptops and cell phones should not be charged while resting on soft materials like a bed or couch.
- Safer technology Informational posters can be placed and maintained throughout the dormitory to provide this information.

Additional Important Ways to Minimize EMF Exposure

- Ensure every student receives a battery powered alarm clock.
- Ensure every student has a wired speaker to hear music/audio in their own room instead of Wi-Fi connected speakers or virtual assistants.
- Do not use fluorescent lights.
- Do not provide wireless charging.

Magnetic Field Exposure

- Ensure appliances, utility meters, electronics, or electrical machinery are not on the walls of sleeping areas, and are not on walls adjacent to sleeping areas, and are not on or near ceilings below sleeping areas.
- Extension cords and electrical wiring should not be under or near beds.
- Small dorm refrigerators also emit high levels of EMF and should not be placed near beds and not directly behind bedroom walls.
- Microwaves also emit high magnetic fields. They should be distanced from beds and preferably not in bedrooms at all. Replace microwave ovens with toaster ovens as a best step. If a microwave oven is absolutely necessary, it must not be in a bedroom nor in a room adjacent to a bedroom, and should be distanced as far as possible from all bedrooms.

Purchasing

- Schools can request non wireless corded telephones. Some phones have screens and are internet connected so students can text etc.
- Intentionally purchase or use only computers, tablets, and other school and personal technology devices that can be ethernet-connected and can successfully connect when all wireless applications (including locators) and antennas are disabled.
- Schools can purchase ethernet adapters for the various make and models of devices so students have the technology they need to connect.
- Contract and purchase building equipment, systems, and services that do not rely on using or generating wireless signals/emissions during regular operating or standby conditions (e.g., vending machines, HVAC, security, pest control, bank machines, laundry facilities, furnishings and equipment in common areas/washrooms/bathrooms/fitness areas/etc.).
- Minimize blue light as much as possible with both software programs and external protective screens for all screens supplied by the school.

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HOW TO ELIMINATE AND REDUCE WIRELESS RADIATION AND EVERYDAY ELECTROMAGNETIC FIELD (EMF) EXPOSURE IN DORMITORIES

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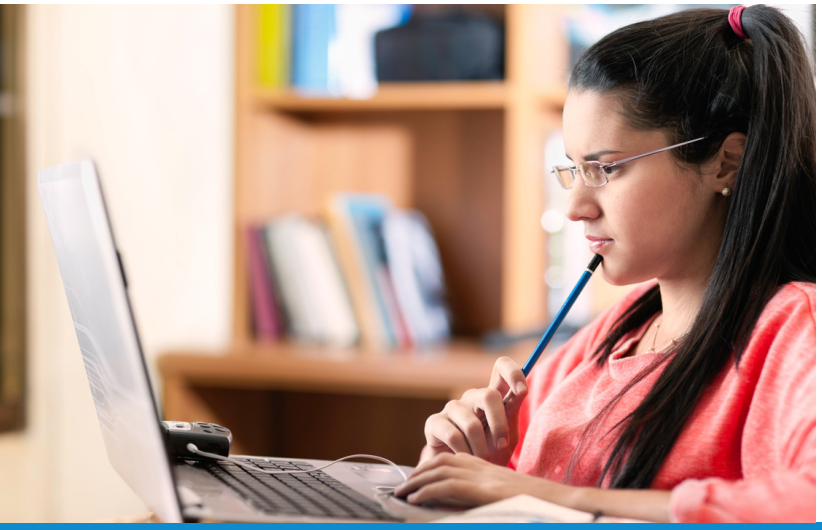
LOW EMF POLICY IN DORMS

Schools need to develop, implement, and enforce personal devices policies that minimize emissions and eliminate sources in the dormitory.

- Students need practical and ongoing education on how to reduce EMFs.
- Safe alternatives for playing music, accessing the Internet, and communicating must be accessible so students and staff can have needs met with low-EMF technology or non-EMF alternatives.
- Student and staff culture needs to shift so it is accepted that reducing EMF is important and behaviors that reduce emissions and exposures are valued.
- Dormitories without Wi-Fi and with low EMF need to be available in every school.
- Measure EMFs in dormitories, both wireless radiofrequency as well as magnetic fields and compare to Collaborative for High Performance Schools identified threshold.

COMPUTER ROOMS & WORKSPACES

- A dedicated computer room in a dormitory with wired technology, printers, electronic accessories, and other technology is an important component of a low-EMF building — to create a separation between sleeping areas and work areas and to ensure people have access to information and communication technologies.
- Connect all technology devices (printers, computers, fax machine etc. with wires, cords, or cables, and use non-wireless adapters.



RESOURCES

- New Jersey Educational Association “Minimize health risks from electronic devices”
- Massachusetts Breast Cancer Coalition Let’s Talk Prevention Classroom Modules Download Module 3 on Cell Phones
- Alliance of Nurses for Healthy Environments Textbook of Environmental Health in Nursing 2nd Edition Includes Cell Phone, Cell Tower and Wi-Fi Radiation and EMF
- Collaborative for High Performance Schools Low EMF Criteria

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