

Background

Recent published summaries of epidemiological studies of cell phone and cordless phone users suggest that after ten years of heavy use there is an increased risk of malignant brain cancer and a kind of benign tumor in the inner ear, particularly on the side of the head where these phones are usually placed for use (refs) The Division of Environmental and Occupational Disease Control has reviewed this literature and done its own unpublished meta-analysis and agrees with the above conclusion.

While the lifetime risk of acquiring a malignant brain cancer is low 0.6% (99.4% chance of NOT getting brain cancer), one would only need to multiply this small risk by a factor of 1.002 to produce an added lifetime risk of regulatory concern (an added lifetime risk of 1/100,000). The epidemiological studies suggest relative risks of anywhere from 1.2 to 3.00 in heavy users. If these statistical associations reflect a true causal influence and not some consistent study flaw (for example differences in the way that cancer patients and health comparison subjects remember their use of telephones), this potential effect would be of regulatory concern. It is not clear what aspect of the complex mixture of frequencies of electromagnetic fields emitted by these devices might be responsible for such an effect. There is no general agreement about biological mechanisms that might be responsible although a body of inconsistent experimental evidence has generated some hypotheses.

If these statistical associations reflect a causal process, in another decade millions of Californians and tens of thousands of state employees would find themselves at a 1.2 to 3.0 fold increased risk of brain cancer because of their heavy use of these devices. , For these individuals the absolute added risk would range from :

0.6% background lifetime risk of brain cancer * 1.2= 0.72% lifetime risk of brain cancer (99.3% chance of NOT getting brain cancer)

0.6% background lifetime risk of brain cancer * 3.0 = 1.8% (98.2% chance of NOT getting brain cancer)

Thus, although most cell phone and cordless phone heavy users would not get brain cancer, the number of brain cancer patients coming to hospital would increase and would represent a significant cost to society in suffering, medical costs and economic costs that one would want to avoid.

There is also epidemiological evidence (refs) to suggest that the use of handsfree and handheld cell phones while driving may cause distraction and a slowing of reaction times and a doubling in the risk of automobile accidents. California recently put into effect a law banning the use of hand held cell phones while driving but allows the use of hands free cell phones while driving.

What the State government and its Employees can Do to Lower Potential Risks from Cordless Phones and Cell Phones:

Purchasing:

- 1) The department of General Services could ask information about the intensity of extremely low frequency and high frequency magnetic and electromagnetic fields from different models of cell phones and blue tooth devices and weigh this information among other things when ordering in bulk.
- 2) The Department of General Services could ask manufacturers to provide earpieces with ferrite rings to further reduce fields created by resonance to the main field of cell phones.
- 3) State employees could avoid purchasing cordless phones for office use
- 4) State employees should always purchase wired ear pieces to use with existing or newly purchased cell phones (some blue tooth devices also emit lower fields than those derived from holding cell phones against the ear, but these are not so well studied as wired ear pieces)

Use

- 1) Management could have a policy that indicates which employees really need to be on constant call. These employees could have a beeper to warn them of an urgent call (these do NOT emit electromagnetic fields since they are merely receivers)
- 2) These employees could leave their cell phones and blackberries off until beeped. Then they should place them at arms length , use an earpiece and turn the device on to receive the message and return the call.
- 3) Employees could be encouraged NOT to make phone calls, even with an earpiece while driving. They could pull over to a safe place to make these calls.
- 4) Employees who are not required to be on call could use their cell phones as mobile answering machines. They could check them every few hours and return their calls while using an earpiece and keeping the phone at arms length while using them. Keeping the back of the phone facing away from the table will allow the phone to make connection to the nearest base station at the lowest possible power, thus further reducing exposure to the user.
- 5) At home, employees should know that cordless base stations in the home are constantly emitting fields particularly to those working near them. The phone itself provides fields equivalent to that of a cell phone when held against the head. Prolonged conversations thus provide similar exposures to that of a cell phone. Using a speaker phone and moving away from the cordless base station or switching to the cell phone and using an earpiece, keeping the cell phone at arms length will reduce exposure.

The following further advice can be found at the website of the University of Pittsburgh web site:

http://www.upci.upmc.edu/news/upci_news/072308_celladvisory.cfm

1. Do not allow children to use a cell phone, except for emergencies. The developing organs of a fetus or child are the most likely to be sensitive to any possible effects of exposure to electromagnetic fields.
2. While communicating using your cell phone, try to keep the cell phone away from the body as much as possible. The amplitude of the electromagnetic field is one fourth the strength at a distance of two inches and fifty times lower at three feet. Whenever possible, use the speaker-phone mode or a wireless Bluetooth headset, which has less than 1/100th of the electromagnetic emission of a normal cell phone. Use of a hands-free ear piece attachment may also reduce exposures.
3. Avoid using your cell phone in places, like a bus, where you can passively expose others to your phone's electromagnetic fields.
4. Avoid carrying your cell phone on your body at all times. Do not keep it near your body at night such as under the pillow or on a bedside table, particularly if pregnant. You can also put it on "flight" or "off-line" mode, which stops electromagnetic emissions.
5. If you must carry your cell phone on you, make sure that the keypad is positioned toward your body and the back is positioned toward the outside so that the transmitted electromagnetic fields move away from you rather than through you.
6. Only use your cell phone to establish contact or for conversations lasting a few minutes, as the biological effects are directly related to the duration of exposure.
For longer conversations, use a land line with a corded phone, not a cordless phone, which uses electromagnetic emitting technology similar to that of cell phones.
7. Switch sides regularly while communicating on your cell phone to spread out your exposure. Before putting your cell phone to the ear, wait until your correspondent has picked up. This limits the power of the electromagnetic field emitted near your ear and the duration of your exposure.
8. Avoid using your cell phone when the signal is weak or when moving at high speed, such as in a car or train, as this automatically increases power to a maximum as the phone repeatedly attempts to connect to a new relay antenna.
9. When possible, communicate via text messaging rather than making a call, limiting the duration of exposure and the proximity to the body.
10. Choose a device with the lowest SAR possible (SAR = Specific Absorption Rate, which is a measure of the strength of the magnetic field absorbed by the body). SAR ratings of contemporary phones by different manufacturers are available by searching for "sar ratings cell phones" on the internet.

Cultivating these habits and following these no and low cost measures will lower the intensity and duration of exposure to cell phones, blackberries and cordless phones substantially and may have beneficial health effects.