In your home

The In your home set of articles article is separated into 8 sections, each of which can be individually downloaded. It is a 'work in progress' incorporating new information whenever time permits.

Section 3

Computers

1. Introduction; powerfrequency (ELF) EMFs; radiofrequency (RF) EMFs; measuring EMFs; the importance of timing
2. Appliances A-C; air conditioners, amateur (Ham) radio transmitters, amplifiers, electric guitars and keyboards, aquarium, baby monitors, bath hoists, battery operated equipment, battery re-charging mats, beds, blood glucose monitors, bottle warmer, bra, burglar alarm, camcorder, carbon monoxide detectors, CD player, central heating, motor-controlled chairs, clock radio, clothes dryer, coffee grinder, coffee maker
3. Computers; monitors (Visual Display Units or VDUs), wired and optical mice, health effects, laptop computers, wireless enabled laptop, PDA (Personal digital assistant), computer wireless LAN (local area network), Schools' reactions, parents, broadband, computer games consoles, tablets, computers and Electrical Hypersensitivity (EHS), protection devices against EMFs from computers
4. Cooking; electric ovens and hobs, microwave cooking, barbecues, deep fat fryers
5. Appliances D-H; dehumidifier, dishwasher, doorbell, electric (el) blankets, el can opener, el clock, el drill, el guitar, el kettle, el knife, el lawn mowers, el shavers, el shower, el toothbrush, el vehicles, electricity meter, exercise machine, extractor fan, fan, fax machines, fire alarm, fitness devices, floor polisher, food processor, foot spa, foot & hand warmer, fridge, fridge/freezer, hair curlers/tongs, hair dryers, headphones, hearing aids
6. Appliances H-S; heart pacemakers, heaters, central heating boilers, heating pads, hi-fi, etc., hostess trolleys, immersion heater, iron, Jacuzzi, musical keyboard, lift, loudspeaker, magnetic field therapy mats, meters, mixer & blender, music centre, nightlights, pagers, PDAs, pencil sharpeners, personal alarms, personal radios, pet fences, photocopiers, plasma balls, power tools, printers, projectors, radar, radios, radio transmitters, sandwich maker, sauna, scanner, security systems
7. Appliances S-Z; sewing machines, smoke detector, sockets, solar panel water heating, solar photovoltaic panels, soldering irons, spinners, stairlift, static electricity, sun beds, sun lamp, tea maker, telephone, television, TV and radio transmitters, TENS unit, toaster, toys, transformers, trouser press, tumble drier, typewriters, vacuum cleaners, vagina speakers, washing machines, washer/dryer, waste disposal unit, water filters, water heater, water softener, water supply, wheelchairs, wristwatches
8. Grounding & 93 references

Computer monitors (Visual Display Units or VDUs)

Old monitor screens used to give off very high levels of EMFs, until they became strictly limited due to pressure from a Swedish trade union. As a result of changes in standards within a few years low EMF computer monitors were readily available. A study by Lakshmi (2010) showed more DNA damage and increased frequency of micronuclei and micro nucleated cells in people who had used VDTs for longer than 10 years, which period of time could have included working on some of the old-style monitor screens.

Despite the changes, the number of people affected by suspected hypersensitivity to electricity has increased dramatically. An article in a Swedish computer magazine in 1989 included " ... *Stopping working with VDUs was the most well-tried, and similarly the most effective method of reducing symptoms. Changing to a "low-emission" VDU usually did not lead to improvements - on the contrary, in several cases deterioration was noted ...*" It seems that even low-emission VDU monitors can provoke symptoms in electrically hypersensitive people.

TCO95 became the first global environmental labelling scheme, giving off less than 10 V/m & 0.20 µT at 50cm, and containing less polluting. TCO standards also require that screens be treated with conductive coatings to reduce the static charge on the monitor.

TCO99 replaced TCO95 reducing eye fatigue caused by image flicker and the TCO99-certified monitors save up to 50% more energy than TCO95 displays.

In our experience it is unwise to have a vertical refresh rate slower than 75 or faster than 100 times a second as more people report eye strain and headaches outside of this range. Make sure that the vertical refresh rate is between 72 and 96 times each second. If unsure, contact your IT technician or a local dealer.

The way the monitor screen is lit is that you have a blindingly bright flash of say 10 microseconds repeated about 100 times per second, so the flash is actually 1000 times brighter than the screen appears and can be up to 5000 times as bright. This extreme form of pulsing will certainly affect visual evoked potentials (VEP) in the viewer and will probably affect other EEG signals as well. Sandström (1997) found that the VEPs of people reporting EHS symptoms could react to higher frequencies than non-affected people.

It is illegal for employees to have to work with a computer with any visible screen display instability, flicker or wobble. If your monitor behaves in this way, it is almost certainly in magnetic fields which are far too high for *you* to work in, as well as being illegal.

All VDUs give off higher fields at the back and sides. You should ensure that there is more than 1 metre from the rear of a VDU, at home, or in the office. Magnetic fields travel through walls, so be aware of any monitors in the room next to you if you sit next to a wall. Smaller VDUs are not necessarily better, either, because the field strength depends more on the internal design than on the screen size.

Modern monitors all seem to have a built-in earthed electrostatic screening layer on their front face and give off minimal levels of electric fields.

Advanced semiconductor 'TFT' colour screens are only a few inches thick and have very clear displays and give off very low EMFs. ES people should go for a good quality flat screen display. Extremely ES people could consider using a ceiling mounted projector, such is used by people giving illustrated talks. These are expensive but do separate the user from the display circuitry and EMFs.

Using screen savers and dimming the display will do nothing to reduce the fields.

Some monitors are US EPA "Energy Star" compliant. These detect a shut-down signal from the computer software and do almost completely turn themselves off when not required. These take

about 30 seconds to come back on line and need a special driver card and software in the computer itself.

Ideally, when you buy a new computer monitor, switch it on in an unused well-ventilated room for at least two weeks allowing the fire-retardant chemicals to out-gas. These can produce quite toxic side-effects in people who use them and could provoke electrical hypersensitivity. Some chemicals can continue to be 'out-gassed' for up to 6 months or even longer.

Spider plants, Boston ferns and peace lilies can cleanse the air chemicals in small quantities. Root microbes biodegrade the pollutants into structures that can be used as a source of food for the microbes and the plant. So there is nothing toxic left to remove. Plants in a room also release phytochemicals that suppress mould spores and bacteria by up to 60%, when compared with a room with no plants.

Wireless and optical mice

Optical mice use a tiny camera to take 1,500 pictures every second. Able to work on almost any surface, the mouse has a small, light-emitting diode (LED) that uses light to detect changes in the image and move the cursor accordingly. The advantages of LED mice include their being easier to keep clean and they don't require a special surface.

Most wireless mice communicate using radiofrequency microwaves, we cannot recommend them. Some use infra-red and are not a problem.

Health effects

The American Academy of Pediatrics recommends no screen time for children under the age of 2 and limited screen time for all children (Rosen 2014). Research shows that children, preteens, and teenagers with more screen time have been shown to have increased obesity, reduced physical activity, and decreased health. Over half of school students, especially boys, are high users of TV, computer, video and DVD (Hardy 2006), exceeding Australian guidelines.

In 2005, a study by Carbonari and colleagues found cellular damage, as did especially in women working on VDUs for 5 years or more. There was an increase in central nervous system and ocular disease and a *very significant* increase in skin problems (a common EHS symptom). 50% of the study participants reported these problems. Spatari (2007) found skin diseases amongst screen workers and Estécio & Silva (2002) found chromosomal aberrations.

Professor Olle Johansson of the Karolinska Institute has studied people suffering from exposure to computer monitors and other EMF sources. Many of these people first suffer from skin symptoms, including those caused by damage to nerve fibres in the epithelium. The normal purpose of these nerve fibres is unclear, but it does appear they are involved in at least some cases of EHS. They seem to become super-sensitive and react more to external stimuli - especially electric fields and some chemicals. It is known that new electronic equipment, including computers, give off significant levels of fire-retardant chemicals that are believed to be involved in the triggering of EHS in some people. In a study in 1996, Professor Johansson concluded *"We cannot, based upon the present results, draw any definitive conclusions about the cause of (skin) changes observed. Whether this is due to electric or magnetic fields, a surrounding airborne chemical, humidity, heating, stress factors, or something else, still remains an open question."*

Mast cells play a large role in various types of well known allergic reactions, such as asthma, and have been seen to increase in the skin of healthy volunteers sitting in front of some computer monitors.

In Sweden, there is a phenomenal increase in asthma amongst youngsters up to the age of 18 years. It is thought that this may be the result of an idiopathic reaction to intensive use of computers.

Work done at Bristol University has shown that the static electric field generated by monitors and TV screens attract negatively charged particles to the screen and positively charged particles are attracted in the opposite direction - towards the user. These particles may include chemicals that can trigger or perpetuate EHS symptoms. It is important to keep a computer area free of pollutants for this reason.

Another study by Sandström (1997) hypothesised that the exposure to flickering light might lead to typical symptoms of hypersensitivity. The higher the amplitude modulation level was, the more negative effects were reported.

Cyberbullying most often comprises harassment in forums, blogs, chats or social networks. Primary school children in a study by Bilić (2014) mostly knew the identity of the bully, while a minority believed that bullies are the same ones who also physically abuse them at school.

Subrahmanyam (2000) reported that playing violent computer games may increase aggressiveness and desensitise a child to suffering, and that the use of computers may blur a child's ability to distinguish fantasy from reality.

Laptop computers

Laptops with LCD or TFT screens give off very low EMFs, however they use high-frequency fields for driving the back-illumination and also can emit significant levels of radio-frequency electric fields from the back illumination and scanning processes.

However when they are run from the mains adapters they can give off VERY high electric fields next to the keyboard and display. This is because they usually come with two-wire mains leads or adapters and are often described as being double-insulated. This is done for a variety of reasons, including protecting against electric shock. It is cheaper to cover metal objects in plastic than it is to ensure good electrical earthing of exposed metal parts. Also, if you are holding a plastic object it doesn't provide an electrical return path to earth in the most unlikely event of your also happening to touch a 240v live electrical conductor, so you will not get a severe electrical shock.

The downside is that they radiate very high electric fields (often several hundreds of volts per metre nearby). Most of these can be cured of giving off high electric fields by taking an 'earthing' wire from their mains plug to an exposed screw or piece of metal on the laptop, you may want to use a USB cable. If you do not have a piece of metal or are unsure how to do this, you can buy a laptop mains earthing lead, with or without a plug, from www.emfields-solutions.com

Exposure to the electromagnetic radiation emitted by LCD monitors have been found (Lewicka 2015b) to cause adverse effects within blood platelets' oxygen metabolism and thus may lead to physiological dysfunction of the organism.

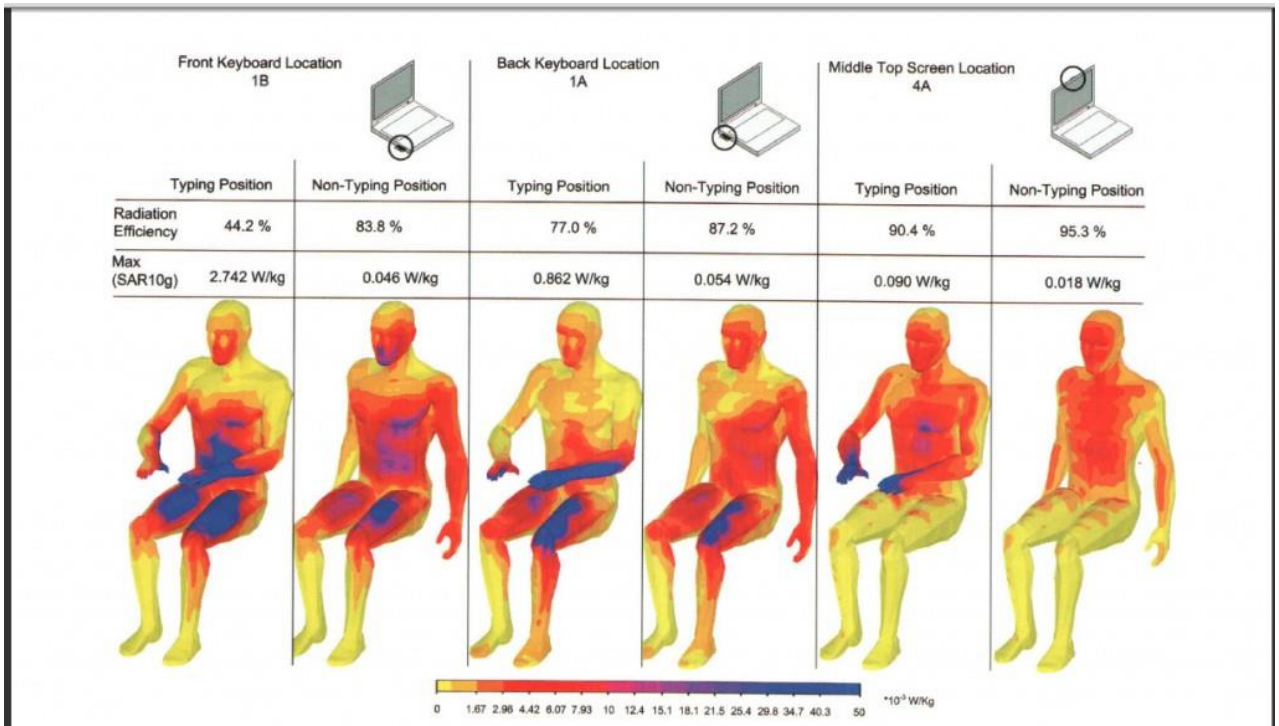
The heat generated by the underside of the laptop computer is enough to cause a nasty rash, especially if it is used against bare skin for hours at a time (BBC October 2010).

A study by Mueller & Oppenheimer (2014) found that people remember lectures better when they've taken handwritten notes, rather than typed ones. Laptop-using students did not perform as well academically, and were also less happy with their education. The authors believed that taking notes by hand needed selectivity, which helped with long-term comprehension. Dr Gal ben Yahuda found that students in a pen and paper classroom got 86% of questions right, whilst those in a computer classroom only managed 73%.

Wireless enabled laptop

Most laptops now are sold with WiFi built-in, as it is assumed by the manufacturers that they will be used at home with a wireless internet system, or whilst the purchaser is 'on the move'. A study

(Papageorgiou 2011) looking at the effects of WiFi found changed attention and memory, especially in males. Sperm samples exposed for 4 hours to a wireless internet-connected laptop showed a significant decrease in sperm motility and an increase in sperm DA fragmentation (Avendaño 2012). Yildirim (2015) reported a negative correlation between wireless Internet usage duration and total sperm count, compared with a wired internet connection.



	Front Keyboard Location 1B		Back Keyboard Location 1A		Middle Top Screen Location 4A	
	Typing Position	Non-Typing Position	Typing Position	Non-Typing Position	Typing Position	Non-Typing Position
Radiation Efficiency	44.2 %	83.8 %	77.0 %	87.2 %	90.4 %	95.3 %
Max (SAR10g)	2.742 W/kg	0.046 W/kg	0.862 W/kg	0.054 W/kg	0.090 W/kg	0.018 W/kg

Figure 22. The absorption of electromagnetic energy in human tissue: the resulting antenna radiation efficiencies and SARs in the operator's body at 2.44 GHz for different inverted-F antenna (IFA) element locations.

From www.wirelesswatchblog.org

If your laptop has adaptive power control and a wLAN access point is fairly close, the signals from the laptop will be much lower even when transmitting.

If you do not wish to use it in this way, you may want to disable the WiFi system as your laptop will continue to radiate RF until it is disabled. To check RF levels from your laptop, you could hire an Acoustimeter or buy an Acousticom 2 from EMFields. Laptops vary as to how to disable their WiFi, so we recommend that you look at the manufacturer's instructions to find out how this can be done. Some software updates may re-enable your WiFi system, so it is worth while checking every now and again to ensure that the wireless capacity remains disabled.

Increasingly, laptops are being sold with a Bluetooth capability as well. This may be situated in a different part of the laptop to the WiFi circuitry, and will have to be separately disabled. Again, we refer you to the manufacturer's instructions.

PDA (Personal digital assistant)

Personal and occupational use of personal digital assistants (PDAs or palm-held wireless units) produce high intensity bursts of extremely-low frequency electromagnetic fields (ELF-EMF). These emissions could result in comparatively high ELF-EMF exposure in persons that carry a PDA close to the body or held to the head for mobile phone conversations (Sage 2007).

Computer wireless LAN (local area network)

Computer wireless LAN broadband connections are becoming increasingly popular. These systems also give access to portable lap-top computers that may be used by different members of a household, offering the apparent freedom to have fast access without needing to have a fixed source. Systems such as these fill the house with pulsing microwave radiation all of the time (even when the computer(s) is/are not in use), and we believe they should not be used at all.

dLAN devices, are an alternative solution to WiFi. They connect to one another through the mains wiring in a building, allowing access to the network/internet from any mains socket in the building.

There are at least 4 types of dLANs. The 14 Mbit/sec device is the cheapest. It is also the slowest and it produces a higher level of dirty electricity (see 'Your low EMF home' Section 2 – Dirty Electricity). The 85 Mbit/sec device does not seem to cause a lot of trouble, and it produces low levels of dirty electricity. This is probably the best type of dLAN for most people, though those with ES may still react even to the very low levels near the dLAN device. The 240/250 Mbit/sec device generates more RF noise, and provides too much bandwidth for the needs of most homes. The 1 Gbit/sec device is causing major problems with RF interference.

dLANs can only be used with earthed laptops, or high electric fields will be generated.

Homeplug devices add some RF noise to the mains wiring. However, the levels we have measured (a few tens of microvolts) are negligible in comparison with WiFi devices, and what increase in fields that we measured was only in very close proximity to mains wiring (within a few tens of centimetres). Since we already advise against spending large amounts of time in such close proximity to mains wiring, we believe that the fields generated are unlikely to cause problems other than in the most highly electrically sensitive people.

The RF signals will interfere with short-wave radios and some units with medium-wave and long-wave radios as all of these are sensitive to a few micro-volts per metre AM radio energy.

We still think that wired Ethernet is the best option, however dLAN units seem to be a reasonable compromise provided that you are aware that there are potential problems, and we consider it to be vastly preferable to WiFi.

There are additional security considerations when it comes to dLANs. Because they use the mains wiring to transfer data, this means that anybody on your wiring circuit can add their own dLAN unit and listen to the network traffic. Since most houses have their own wiring circuit, this is only relevant in shared housing and some flats. Some dLAN units offer features to encrypt the network, which would eliminate this issue. We still consider dLAN units to be significantly more secure than WiFi, which can be listened to simply by being nearby, without requiring physical access to a plug socket. WiFi encryption systems provide some level of security, but they are still not completely secure from network intrusion.

Increasingly wireless LANs are being used in schools, as are interactive whiteboards. Both of these will increase children's exposure to microwave radiation. Microwave exposure is associated with memory and concentration problems, headaches, fatigue, behaviour and mood disturbances, and possibly cancer in the long term.

Philip Parkin, who used to be the general secretary of Voice (the union for education professionals) stated in an interview in May 2009 "*There seems to be an increasing quantity of evidence being produced around the world which suggests that exposure to electromagnetic radiation can have long-term health impacts both on children and adults but particularly children. It is a considerable concern that in schools we are installing wi-fi systems and we have no clear evidence that they are safe. We are not trying to turn back the tide as far as technology is concerned but we have to be sure that as well as*

doing a job for us, and there is no question that wi-fi does a wonderful job, we have to be absolutely sure that it is safe."

Schools' reactions

We know of at least 3 schools that re-thought their policy on providing wLAN equipment in their schools due to pressure from parents or teachers. Prebendal School in Chichester had reliability problems and changed it for a conventional cabled system. At Ysgol Pantycelyn, in Carmarthenshire, the Head Teacher agreed to switch off the wireless network as he said "the concerns of the parents are of greater importance than our need to have a wireless network." A concerned parent said "they are like having a phone mast in the classroom and the transmitters are placed very close to the children."

Stowe School in Buckinghamshire removed part of its wireless network after one of their teachers who had been at the school for 28 years became too ill to teach as he had had such a violent reaction to the network, suffering from headaches, pains throughout his body, sudden flushes, pressure behind the eyes, skin pain, burning sensations and bouts of nausea. The head teacher intends to put cabled networks in all new classrooms and boarding houses.

Parents

Some of the US top executives from Google, Apple, Yahoo and Hewlett-Packard send their children to the nearby Waldorf school, where there are no computers in the classrooms (Mail Online October 2011). Teachers don't even like their students to go online at home. Rather than expand the minds of young children, advocates of the Waldorf syllabus believe computers can inhibit attention spans and human interaction.

Alan Eagle, Google executive, says *"I fundamentally reject the notion you need technology aids in grammar school."* The Waldorf school, where his children go, is where ¾ of the pupils have parents with connections to the hi-tech industry.

The association of Waldorf Schools of North America says that 94% of students graduating from Waldorf High Schools between 1994 and 2004 attended college, with many heading to prestigious universities.

Cognitive effects

The more regularly students use computers to write papers for school, the better they performed on the Massachusetts Comprehensive Assessment Systems English/Language Arts exam. However, students' recreational use of computers to play games, explore the Internet for fun, create PowerPoint presentations or chat with friends at home had a negative effect on students' reading scores.

Digital gaming was associated with poor school achievement and mobile phone use was frequent among adolescents whose educational prospects were poor. Intensive use of mobile phones was associated with health problems (Koivusilta 2007).

Broadband

Access to the internet at home is becoming more and more sought after as children look for help with homework or examination coursework projects, and people of all ages look for information, and leisure activities such as finding music and online game-playing, from chess to fantasy role play. Most areas are well served by broadband through their telephone or cable networks. In 2008, Bournemouth was the first town to offer internet via the sewerage system, using fibre optic connections with speeds up to 100 Mbps.

BTFon is the system BT offers to give wireless broadband access to the maximum number of people in the cheapest way possible. In theory, you can disconnect the wireless signal, but it can re-emerge. To remove all wireless signals opt out of BTFon. Reset your home hub after 24 hours and it will then register that BTFon is off.

Our recommendation would be for ADSL or ADSL2 or cable broadband. These are fastest, most secure, and give off virtually no EMFs.

Samsung is the latest to outline a vision using satellites to deliver wireless Internet to the unconnected around the world, but it's also proposing the satellite system be used to meet the needs of developed nations as well. In his 'Mobile Internet from the Heavens' paper Farooq Khan, president of Samsung Research America, outlines the 'omnify' principle, which stands for Order of Magnitude Increase every Five Years,' referring to demand for data that increases 10 times every 5 years and will continue to increase at that rate with expectations for 1,000 times increase in the next 15 years. In order to address the growing wireless capacity challenges, Khan and his colleagues pioneered the use of the higher frequencies, referred to as millimetre waves, with a potential availability of more than 100 GHz spectrum for 5G mobile communications. At millimetre wave frequencies, radio spectrum use is lighter and very wide bandwidths along with a large number of smaller size antennas can be used to provide 'orders of magnitude increase' in capacity needed in the next 15 to 20 years.

Khan's paper calls for some 4,600 satellites in orbit. SpaceX and WorldVu Satellites Limited, operating as OneWeb, are also planning to use a low-earth-orbit satellite, constellation, whilst Google's Project Loon uses balloons to reach the unconnected and Facbook's Aquila project uses drones to deliver Internet services.

Computer games consoles (e.g. X-Box 360, PS2, Nintendo Revolution etc.)

These consoles usually have a mains transformer which plugs into a power socket. The transformer gives off very high levels of magnetic fields, and should be unplugged when not in use. It is *very* important not to leave transformers plugged into the wall by children's beds as they give out quite high levels of magnetic fields all the time they are connected to the mains electricity supply. Often neither the TV nor the games controller is connected to mains 'earth' and so the hand controllers can give off electric fields of several hundred volts per metre, but it does not seem easy to predict this. Use an EMFields ELF meter, which can be bought or hired from to check out the equipment in your home.

Most consoles, including Xbox 360 & Xbox One, Nintendo Wii, Sony Playstation 4 & Playstation Vita are wirelessly enabled. These all have the capability to have wireless controllers, and have either integrated or add-on WiFi. Some modern handheld consoles (Nintendo DS, Sony PSP) also have WiFi built in. Xbox support services in November 2009 replied to a customer query "*We regret to inform you that it is not possible to prevent the Xbox from emitting microwave signals. We apologize for the inconvenience*".

Wireless entertainment systems, wireless music systems, digital wireless streamers, wireless stereo headphones and WiFi radios use either WiFi or 'class 1' Bluetooth for a distance of up to 100 metres. If you are concerned about RF field levels from these appliances you can hire or buy the Acoustimeter or Acousticom 2 from EMFields.

Xbox 360 users are able to watch TV through their console following a deal between BT and Microsoft. The BT Vision service is available to broadband customers who will have access to a range of TV shows, films and sporting events – including 'near live' FA Premier League football matches.

WiFi-enabled devices give off similar strength EMFs as an average mobile phone mast would give at under 100m. There is strong scientific evidence for mobile phone masts causing a variety of serious health issues, so we consider it prudent to take a precautionary approach and avoid prolonged use of WiFi-enabled devices. There has been some research into WiFi, for details see 'Your low EMF home' Section 5. WiFi.

In January 2009, there were about 5 million Nintendo Wiis in the UK, including consoles especially for toddlers. The Wii remote uses a mixture of Infra-Red and Bluetooth technologies. Infra-Red is used to provide a 'pointer' on-screen which is used to select various on-screen buttons, in a similar way to a computer mouse, while Bluetooth is used to detect and supply information about movements that are made by the Wii Remote to the Wii console – for example, detecting a swing of the Wii Remote to represent a tennis racquet being swung.

The Wii emits constantly when switched on. The hand held device is also emitting. The wired controllers apparently work much better, but the console continues emitting. It is not possible to stop it transmitting without unplugging the mains lead or switching off at the mains socket. Using the Xbox 360 off switch left the RF unit still emitting at full power.

Residents of care homes in the north east of the UK are using Wii computer game consoles to keep fit and healthy. The hand-held consoles simulate games such as bowling or golf and have proved a big hit.

Nintendo advises that the remote, or console, should not be operated within 9" (23 cm) of a pacemaker (Rajani 2008).

Tablets

Tablets are being used for multiple purposes in and around the home. They will only work using WiFi as they have no socket to connect to a wired system.

Computers and Electrical Hypersensitivity (EHS)

EHS can have a variety of causes. Computer monitors (VDUs) are believed to be one of the most common initiators of the problem. A small student survey in Estonia found 13.5% EHS reactions to computer use, this figure is probably a little on the high side, but one of the few pieces of research attempting to quantify the problem.

Many people experience an abrupt onset of EHS symptoms following exposure to a novel EMF such as fields associated with a new computer. Some EHS people react even more strongly to laptops with LCD or TFT screens which is why MPRII and TCO standards specify much lower limits for higher frequencies. ELF (5 Hz to 2 kHz) allowed electric and magnetic fields EMFs are about 10 times higher than those allowed at VLF (2 kHz to 400 kHz).

British biophysicist Peter Alexander said, "*Once the individual is sensitized to an agent the initial aggressor is immaterial. The biological reaction will be the same to* ***all*** *agents.*"

Many electrically sensitive people seem to have quite dry skin and can carry high electrostatic charges on their body. Not only can other people experience a 'zap' when touching the person, but the electrostatic charges can also be transferred to electronic equipment causing equipment to malfunction. This can sometimes give an appearance of clumsiness or ineptitude, which can lead to a lack of confidence in using electrical equipment. This is quite concerning when young people, even in pre-school nurseries, are being exposed to computers, and they may develop this sensitivity, which can lead to a lifelong lack of confidence and self-esteem problems.

A high-profile EHS sufferer was reported in the Norwegian papers in March 2002. The World Health Organisation (WHO) Director-General and former Norwegian Prime Minister, medical doctor and master of public health, Gro Harlem Brundtland, has symptoms from her laptop PC,

but not a desktop PC. If she holds it to read what's on the screen, she says "*it feels like I get an electric shock through my arms.*" She says "*Some people develop sensitivity to electricity and radiation from equipment such as mobile phones and personal computers. Whether this sensitivity can lead to serious outcomes such as cancer or other diseases, we still do not know, but I am convinced this must be taken seriously.*"

Some people with mercury/amalgam fillings in the teeth seem to react more to VDUs.

Using a computer if you have severe EHS symptoms

One EHS sufferer found that he could use his computer occasionally if he kept the computer base unit 6 metres away from where he sits and has an LED-lit data projector for display and an infra-red keyboard and mouse.

Protection devices against EMFs from computers

Many devices claim to help protect against or neutralize the EMFs from electrical appliances such as computers. With most of the products we have tested there is no scientific foundation for these claims. The pseudo-scientific information is usually flawed and completely useless.

Some of these devices may have a very subtle effect on the body's immune system, and help the person using the device to be able to resist the damage from EMFs by improving their immune function. However, scientific instruments to measure such subtle changes in body dynamics do not commonly exist. The source of the potential damage can still be measured.

Individual people's immune systems and general biological responses to the environment vary greatly. Subtle effects on the immune system may make a significant difference to the well-being of some people. If you are tempted to try one of these devices, obtain it on a money-back if not satisfied arrangement. If it works for you, keep it; if it doesn't, return it.