Preventing electromagnetic hypersensitivity (EHS)

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Table 1
Five common precursors and triggers of electromagnetic hypersensitivity (EHS)

Biological	Chemical, heavy metals	Genetic	Power frequency, 'dirty' electricity	Radiofrequency
Bacteria, Viruses	Air particulates, Magnetite	DNA-repair gene variants	Electrical wiring	Mobile phones
Brain injury, Inflammation	Aluminium, Cadmium, Iron, Lead, Mercury	Genetic predisposition to EMF-related cancer	Electricity meters	Phone masts
Mitochondrial dysfunction, Oxidative stress	Neonicotinoids, Pyrethroid pesticides	(null)GSTT1 + (null) GSTM1	Power lines	'Smart' meters
Moulds	Organophosphates, e.g., fire retardants	PIEZO1/2 variants, Reduced myelin	Substations	Wi-Fi

Michael Bevington discusses strategies for recognising and reducing the impact of manufactured electromagnetic fields (EMFs) and radiation, focusing on EHS triggers, risk reduction, and long-term non-thermal guidelines

Electromagnetic hypersensitivity (EHS) can be prevented by removing the man-made electromagnetic fields (EMFs) and radiation that cause it. EHS and its adverse symptoms exist only in the presence of EMFs. Society needs to ensure the safety of EMFs, as with other substances to which some people are hypersensitive.

This article addresses three issues. First, it reviews five common precursors or triggers of EHS. Secondly, it provides ten methods for removing or reducing EMFs. Thirdly, it lists guidelines with long-term non-thermal limits for sensitive groups, including people with EHS.

Table 2
Ten ways to prevent EHS and its symptoms by removing or reducing RF exposures

	National	Local planners	Neighbours	Hospitals, Schools, Travel	Individual expensive*
Adopt protective long-term non-thermal limits	X	X			
Relocate phone masts		X			
Create/move to zero-RF zones		X			X*
Refuse wireless 'smart' meters			X	X	X
Ethernet or DLAN, not Wi-Fi or mobiles			X	X	X
Avoid wireless 'smart' appliances				X	X
EMF-blocking coverings for living spaces**					X*
EMF-blocking canopies of silvered netting					X*
EMF-blocking mesh glasses and clothing					X*
Cars with no Wi-Fi or Bluetooth, low EMFs					X*

** Creating a Faraday cage is difficult and can cause adverse effects, even if earthed. Carbon paint can be difficult to remove.

Common precursors or triggers leading to EHS

Several precursors or triggers are usually combined in causing EHS, but differently for different people (Table 1). Of the five, the most common, aside from EMFs, are chemicals and genetics. Chemical exposures include pesticides from farm spraying and mercury dental amalgams. Some genetic haplotypes are nearly ten times more common in EHS people than others. Myelin, which insulates the electrically conductive axons in the nervous system, is important for three reasons. Firstly, children have less myelin than adults. Secondly, myelin can be attacked by some illnesses or viruses. Thirdly, myelin is affected by EMFs, and the primary sensors PIEZO1/2 are associated with hypersensitivity. The most common trigger, of course, is intense exposure to EMFs, often through the installation or presence of phone masts, Wi-Fi, smart meters, an electricity meter, or overhead cables. Exposure to chemicals and EMFs can be reduced, but genetics and viruses are more challenging.

Ways to remove or reduce harmful EMFs

Removing or reducing man-made EMFs (Table 2) can help prevent EHS and its disabling symptoms. The most effective solution is for governments to adopt long-term non-thermal protective limits, replacing the ICNIRP's unprotective short-term thermal limits (see below). In addition, local authority planners should keep masts away from residences, schools, hospitals, and workplaces, and create zones with no or very low levels of man-made EMFs.

Individuals and their neighbours should refuse wireless 'smart' meters and replace Wi-Fi with wired networks. Individuals can also protect rooms or purchase protective canopies, EMF-blocking glasses, and garments, though these are expensive.

Table 3
Four long-term, non-thermal RF guidelines to prevent EHS, contrasted with ICNIRP's unprotective short-term, thermal RF guidelines

Guidelines	**Sensitive [1]**	**Non-sensitive**	**Electric Field** *Volts per meter*	**Power Density** *microWatts per metre squared*	**SAR** *Watts per kilogram*	**Notes** *(Some guideline details are simplified)*
Long-term, non-thermal limits, preventing EHS						
BioInitiative	X		0.03 V/m	3 μW/m^2		Children
		X	0.05 V/m	6 μW/m^2		Adults
EUROPAEM [2]	X		0.006 – 0.19 V/m	0.1 – 100 μW/m^2		According to the type of signal
		X	1.9 – 19 V/m			Night – Day
IGNIR	X		< 0.02 V/m	< 1 μW/m^2		Averages should be at the next lower limit
		X	0.06 – 0.2 V/m	10 – 100 μW/m^2		Night – Day
Seletun	X				0.0003 W/kg	
Short-term, thermal limits, unprotective for EHS and other sensitive groups						
ICNIRP		X	61 V/m	10,000,000 – 40,000,000 μW/m^2	0.08 – 2 – 4 W/kg	core – head – limbs, short-term heating limits

[1] Sensitive includes people with EHS, children, pregnant women, the elderly, and the ill. [2] For over four hours.

Non-thermal long-term Guidelines

Many countries still lack the most effective means of prevention, namely the adoption of long-term, non-thermal protective limits (Table 3). The ICNIRP's short-term thermal limits, based on Schwan's invalidated hypothesis of 1953 that the only adverse effect of RF-EMF is heat, are unprotective for people with EHS, since EHS is caused by non-thermal exposures. Three of the four sets of non-thermal guidelines listed provide limits for sensitive groups, including the 1.2 % to 3.6 % of the population severely affected by EMFs, as well as pregnant women, children, the elderly, and the ill. A safe limit may be 0.02 V/m, at which mobile phones can still receive signals. Protective limits will prevent people with extreme EHS from being forced to live in cars or tents in the woods and also help conserve wildlife, plants, and animals.

There are various RF meters that are easy to use. These allow everyone to check the quality of their environment at home, school, and work. They are essential for people with EHS to assess an area's safety. They help parents, teachers, and employers to provide a healthy environment.
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