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To my Medical Colleagues, GPs, Psychiatrists, Neurologists and others:

## **Electrosensitivity – an Environmental illness, an Authentic Diagnosis, not a Delusional Disorder**

### **Summary:**

Electrosensitivity is the symptomatic sensitivity to Electric or Magnetic Fields of any frequency, including RadioFrequency (RF or Microwave) transmissions. As a symptomatic condition, it is becoming common due to the increasing environmental pressure on human biology. The source is pollution from wireless and other EM fields. Doctors as yet rarely recognize it due to educational issues. Safety always lags technological advance. There are barriers to recognition of harms. Current UK Advisory Safety Limits are based upon the outdated and disproven myth that Non-Thermal means Non-Harmful. Society and organizations have yet to fully travel the road from 'there isn't a problem', 'there might be a problem but it's very small' to 'there is a problem'. Society does not recognize humans as electromagnetic beings, as well as physical bodies needing careful nutrition to maintain health. Meanwhile, increasing numbers of people suffer, often ignored or dismissed because society doesn't yet appreciate the issue, and doctors have no answers. Electrosensitivity is soundly supported by both biology and physics.

You may be being consulted by a person who has this under-recognised condition. Thank you for reading this. It provides information that you may not easily find elsewhere. **Electrosensitivity (ES)** is a condition first described in 1932, and is when a person's physiology is affected by external Electromagnetic (EM) fields, giving rise to a typical spectrum of symptoms, often neurological. It is therefore an illness caused by environmental agents – essentially an environmental toxic pollutant. Electrophobia is a fear of EM fields, and is a placebo driven response. Symptoms of fear or paranoia about any agent, circumstances, person or issues can be part of a psychiatric condition, and may be part of a delusional state which will have other features. ES is completely separate from any delusional condition and from Electrophobia. ES is a condition that can arise due to continued exposure to an environment polluted by man-made EM and RF (radio-frequency) wireless signals at levels at orders of magnitude below heating effects, and is well understood in Russia. Symptoms include headaches, fatigue, disturbed sleep, tingling, pains in limbs, head or face, stabbing pains, brain-fog and impaired cognitive function, dizziness, tinnitus, nosebleeds, palpitations and others.

Chronic Fatigue Syndrome, (now known to be partially a failure of mitochondrial function) was initially difficult to diagnose and indeed dismissed by some as psychological illnesses. I have written this briefing sheet to summarise my understanding of ES in case you wish to consider it in your differential diagnosis.

**My qualifications** for this are as follows: I trained at Guy's Hospital, and have been a GP since 1989, seeing a wide range of Primary Care Practice. I have a special interest in Health and Well Being, both physical, psychological and emotional, and have studied this whilst working with my patients. I seek to give the best of orthodox diagnoses and treatment, and also recognise other factors that contribute to and may maintain ill health, in order to eliminate them if possible. I have a wide-ranging interest in factors that affect health. I work for NHS Somerset CCG as a GP Patient Safety Lead, where I have done a number of Investigations into Root Causes, for the University of Bristol as an Examiner and Educator and former Somerset Academy GP Lead, and am approved under the Mental

Health Act as a Section 12 Doctor. I teach Doctors on Health and Self-Care on behalf of the BMA and in Somerset Hospitals and wider afield.

I am also a trustee of the charity ES-UK, which post has given me access to more information and research about the condition than many clinical colleagues, and in this I have consulted scores of people (at no charge) with electrosensitivity, severe enough to impact badly upon their lives.

**My Experience:** As a Section 12 Approved Doctor under the Mental Health Act, I have been involved in at least 400 Mental Health Act Assessments over ten years, and have good relationships with our excellent Somerset Psychiatrists. In all of the assessments I have done, though I have seen many patients with paranoia or delusional states including reference and being watched from the television and the like, I have never seen anyone with ES during an MHAA.

I have however, separately (i.e. not in Mental Health Act Assessment settings) seen patients whose symptoms are reliably caused by exposure to Electromagnetic fields, especially RF (Radiofrequency) transmitting technology, but also by EM Fields and by Dirty Electricity (for an explanation see below). It is only too easy, as I know from my medical career, to make a diagnosis only from the choices within the medical framework that we have learnt about, often years ago, especially when faced with a condition whose aetiology we cannot explain.

**System Educational Problem:** The aetiology of ES is discussed below but essentially the big problem that we all face as Clinicians, Scientists and Researchers is that the Medicine we have learnt is predominantly based on the discipline of Chemistry – not Physics. Yes, MRI Scanners and CT scans are Physics (i.e. information technology) based – however the vast majority of the narrative of pathology, physiology, anatomy, diagnostics and therapeutics is Chemistry based. Yet we are seeing in the field of IT that a Physics based understanding of technology has changed our world (yes, your phone, computer, internet use etc. has Chemistry based hardware, but the working of it is largely Physics based). And all clinicians are aware, from the history of medicine, that new insights into understanding are always occurring.

Actually, there is a growing awareness that the human body works on biophotons and information flows <https://www.ncbi.nlm.nih.gov/pubmed/15947465> and electromagnetics as well as Chemistry, and that proteins in cell walls work as switching transistors. No wonder that exposure to certain frequencies of EM or RF fields at low power can have a biological effect – because this is how the cells work on microvoltage and microwattage powers (see *Energy Medicine*, James Oschman, 2<sup>nd</sup> ed. 2015, Elsevier). And of course the first noticed symptomatic effects will be on the nervous system, especially if already compromised due to (common) sub-clinical nutritional deficiencies of Omega 3 fatty acids, B Vitamins (think pellagra as a deficiency illness), intra-cellular magnesium, zinc, manganese and others.

**Potential Diagnostic Traps:** If we as doctors cannot explain something, it's only too easy to diagnose the problem as either psychological or delusional, and in this we may fall into error, caused by our own unfamiliarity or the progress of understanding faster than our educational system transmits to us. If one has never yet diagnosed a case, it can need an astute diagnostician to differentiate between the unfamiliar yet real effects happening in a body at unseen levels resulting in distressing symptoms which give avoidance behaviour (because that person knows that they feel unwell near certain devices), and on the other hand a patient with a true delusional state as part of a mental disorder. However, once the clinician is aware of the existence of Electrosensitivity, the differentiation becomes easy, especially after seeing the pattern of several cases, as delusional states usually have several characteristic facets to them, and do not claim a plausible (though as yet unfamiliar) Physics based explanation.

An **unfortunate myth/mantra** perpetuated in science, by Private Industry Bodies such as ICNIRP, with its

own vested interests, and repeated by Regulatory Bodies including PHE (HPA), (some of whose advisers are members of ICNIRP, which is surprising, and could be construed as a conflict of interest) is that **non-thermal = non-harmful (now known to be FALSE)** (i.e. if it doesn't heat you over 6 minutes) – but this completely ignores all signal effects, which have known biological consequences. If ants can die from proximity to a wifi router, mobile phone or laptop on wifi (because they lose their ability to navigate, as caused by a signal, not a thermal effect) <https://www.ncbi.nlm.nih.gov/pubmed/23977878> ), rats' retinas be harmed by certain frequencies of LED light <https://www.ncbi.nlm.nih.gov/pubmed/25863264> whilst our ears can detect a billionth of a watt and our eyes a single photon, then is it surprising that measurable EM or RF fields can affect some people – and some people become hypersensitive and develop nervous system symptoms to extremely weak signals?

**Safety issues always lag technological advance**, whether from new medicines, car safety (think seat belts and tyre tread), asbestos etc, and early advice about possible problems is often ignored by not believing, by discrediting or worse by blaming the messenger. (It is human nature to be conservative).

From research, I have learnt about the **importance of sleep, posture, breathing, emotional support, nutritional correctness, and freedom from electromagnetic transmission fields** amongst other areas. I have seen a number of people who feel unwell in the vicinity of wireless transmitters, mobile phone masts, cordless phones, from using a mobile phone, and from active alarm sensors, amongst other things, in my practice as a GP and elsewhere. I can confirm this from experience of headaches, brain fog and word finding difficulties with prolonged exposure to RF including wifi, mobile or cordless phones.

A **typical history** of a more severe case is that after an electromagnetic insult (such as a new powerful RF (wireless) device being introduced into the person's environment, or an electric shock), symptoms may progressively appear, in response to exposure to electromagnetic fields of various different types. These fields include using appliances such as hair-driers, vacuums or cookers, which produce high levels of electric and magnetic fields, or cordless phones, wifi routers, mobile phones and a whole range of wireless transmitting technology which produces RF (radiofrequency, or microwave) transmissions, or computers, monitors and other devices, and fluorescent lights (as opposed to the older incandescent type of bulbs). A **careful history** is paramount in detecting this condition, especially if aggravating and alleviating factors are described and detected, possibly helped by using field detectors (measuring devices for EM fields and wireless radiation).

**Symptoms** include headaches, fatigue, disturbed sleep, tingling, pains in limbs, head or face, stabbing pains, brain-fog and impaired cognitive function, dizziness, tinnitus, nosebleeds, palpitations and others. It is clear that the primary area of disturbance is in the nervous system. It is not known why some people react to these and others do not, however it may be that **heterogeneity of genetic make-up, nutritional status, and other factors** predispose people to develop the condition once sensitised. Certainly general factors like lack of sleep can exacerbate the issue.

**Mechanisms** include voltage-gated calcium channel disruption, upregulation of the sympathetic nervous system, interference in the blood brain barrier and alteration of melatonin production, production of heat shock proteins, failure of DNA recombination due to the radical spin pair mechanism, and interference with intercellular microsignalling and circadian rhythms. It is likely that biophoton communication patterns are disrupted. What is certain is that it is not a nocebo effect, as animals are affected, such as ants, fruit flies and others. As we understand more about biological systems using electromagnetic signals to communicate, a whole host of biological effects will become apparent. We already know that semen quality is affected by RF <https://www.ncbi.nlm.nih.gov/pubmed/24927498> .

**Prevalence:** some people suffer from Electrosensitivity to a severe and incapacitating degree, which affects less than 1% of the population, whilst moderate may affect up to 3-5%, and mild 20-30%. Please see: [The Austrian Medical Association EMF Guidelines](#), and also Chapter 47 “Electrosensitivity: Sources, Symptoms and Solutions” by Tresidder and Bevington, in *Textbook of Bioelectromagnetic and Subtle Energy Medicine*, 2<sup>nd</sup> ed., Paul Rosch, 2015.

**Electrosensitivity** is an under-recognised illness in the Western world. However, since the 1930s it has been recognised by Russia and the former Eastern Bloc countries, and also by the US in Naval Medical research [http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Barrie\\_Trower\\_SA.pdf](http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Barrie_Trower_SA.pdf) It did not exist before mains current was used. Now that many people are being exposed to radio frequency transmissions, both in and outside the home and workplace, the number of people who fall ill because of this will rise. Current sufferers, if able to obtain a correct diagnosis, are likely to be seen in retrospect as the canaries, the early messengers of problems. ES appears to be a disability caused by environmental pollution, and may be a useful warning sign for society of a problem. For an interesting view on this, with research based upon many years of government activity from the 1950s on, see <http://www.radiationresearch.org/10-uncategorised/336-wifi-a-thalidomide-in-the-making-who-cares> . The whole area may be an inconvenient truth, managed by Active Denial, and sometimes it is easier to discredit the messenger than to honestly investigate forwards. It is **not yet taught about at medical school or to PostGrads** and therefore is unlikely to be diagnosed by most GPs or Hospital Specialists at present. In two or three years’ time, the picture is likely to be different regarding medical knowledge and expertise. This is a new area of disability that is explicitly recognised in Canada, Sweden and the USA, and is becoming more and more important.

**Treatment is currently problematical.** It is essential to **minimise exposure** to adverse EM fields, as well as **pay attention to nutrition, sleep and other factors to ensure high levels of health**. Despite this, many people steadily worsen, and become casualties of the environmental RF and EM pollution, causing a steady decline in their health, often losing their jobs, ability to enter public places, and sometimes even unable to remain in their houses. Current UK NHS medical knowledge and approaches offer little hope of any treatment or improvement, although a number of GPs and others do recognise the condition. Future hope may be found by taking a salutogenic (health oriented) approach.

Current and historical UK PHE (HPA) advice is based on the **outdated incorrect theory** that only thermal effects may cause harm, and takes no recognition of signal effects, and therefore is unhelpful. The PHE advice is based upon the flawed Advisory Group on Non-Ionising Radiation (AGNIR) 2012 Report, which has ‘**an incorrect and misleading executive summary and overall conclusions, inaccurate statements, omissions and conflict of interest**’ (see Appendix). Unfortunately, senior people in UK Scientific and Advisory bodies still trust this outdated theory, partly due to the System Educational Problems. A few authorities still consider that the condition is a psychologically mediated nocebo effect (‘we don’t know what’s going on, so blame the patient’) – such authorities come from the same school of thought that decided that CFS/ME was psychologically mediated, without understanding the biological basis of compromised mitochondrial function. This historical view can be replaced now we understand how mitochondrial function is implicated. <http://www.ijcem.com/files/IJCEM812001.pdf> . A thorough review of up-to-date papers appears in Bevington’s summary ‘Select Studies on ES and EHS’ available on the Research tag in the ES-UK website: <http://www.es-uk.info/attachments/article/85/Selected%20ES%20and%20EHS%20studies%20-%20Oct.2016.pdf>

Society is aware that most mobile and smart phones now include advice to keep them away from the body (though ‘pocket hotspots’ are being popularized); it seems as though the industry may be shifting

position towards acknowledging not just heating effects, but also other significant non-thermal effects. Some areas of the Insurance Industry have serious concerns about the health effects, and exclude cover for EM and RF from their policies. In the USA, unusual multifocal breast cancers in young women in their 20s have been reported immediately adjacent to where their mobile phone has been kept in the bra. Since symptoms from EM exposure can be delayed and cumulative, a patient's history of symptoms and exposures may be difficult to follow for someone not experienced in the types of technology now known to have biological effects.

Thankyou for considering this diagnosis in your differential of possibilities. I hope this is of assistance to you. Yours sincerely,

Andrew Tresidder

### Useful resources:

Valuable technical studies on objective physical markers and symptoms include:

- The Austrian Medical Association Guidelines: <http://electromagnetichealth.org/wp-content/uploads/2012/04/EMF-Guideline.pdf>
- Belpomme et al, 2015: *Reliable disease biomarkers characterizing and identifying electrohypersensitivity and multiple chemical sensitivity as two etiopathogenic aspects of a unique pathological disorder.* <https://www.ncbi.nlm.nih.gov/pubmed/26613326>
- Belyaev et al, 2016: *EUROPAEM 2016 EMF Guideline 2016 for the Prevention, Diagnosis and Treatment of EMF-related Health Problems and Illnesses* <https://www.ncbi.nlm.nih.gov/labs/articles/27454111/>
- Work (trans.) by the German psychiatrist and psychotherapist C Aschermann: <http://emfsafetynetwork.org/wp-content/uploads/2009/10/Aschermann2009.pdf>
- Andrew Tresidder & Michael Bevington: "Electrosensitivity: Sources, Symptoms and Solutions" ch. 47 in: *Textbook of Bioelectromagnetic and Subtle Energy Medicine*, 2<sup>nd</sup> ed., Paul Rosch, 2015.
- Dieudonné M, 2016: *Does electromagnetic hypersensitivity originate from placebo responses? Indications from a qualitative study.* <https://www.ncbi.nlm.nih.gov/pubmed/26369906>

There is a good deal of useful info at: [www.es-uk.info](http://www.es-uk.info) and [www.powerwatch.org.uk](http://www.powerwatch.org.uk) , and also the Bristol University site from Prof. Denis Henshaw: [www.electric-fields.com](http://www.electric-fields.com).

The *Powerwatch Handbook* by Alasdair & Jean Philips ([Amazon](http://www.amazon.com)) is recommended, as is "Electrical Hypersensitivity: A Modern Illness" at <http://www.powerwatch.org.uk/library/index.asp>.

*Electromagnetic Sensitivity* by Michael Bevington is an excellent overview with 1828 scientific references, available from ES-UK, BM Box ES-UK, London WC1N 3XX for £12: [www.es-uk.info](http://www.es-uk.info).

An interesting patient perspective from a man severely affected by ES is: [www.wavegoodbye.info](http://www.wavegoodbye.info).

Professor Martin Blank's "[Overpowered](http://www.overpowered.com)" (2014) is a useful overview, including the politics, whilst the textbook that all doctors and medical students should read is *Energy Medicine: The Scientific Basis*, 2<sup>nd</sup> Ed, James Oschman, Elsevier 2015 (especially Ch 16, The Electromagnetic Environment)

Dr Mallery-Blythe's excellent scientific overview: "[Electromagnetic Radiation, Health and Children](http://phiremedical.org)" <http://phiremedical.org> Jeromy Johnson: "[TEDX-Berkeley: Wireless Wake-up Call](http://www.tedx-berkeley.com)"

## Appendix – conflicts of interest and flawed conclusions in science

The ‘authoritative’ 2012 AGNIR report has been analysed in the following paper, and found to be flawed: <https://www.ncbi.nlm.nih.gov/pubmed/27902455> The abstract states “The Advisory Group on Non-ionising Radiation (AGNIR) 2012 report forms the basis of official advice on the safety of radiofrequency (RF) electromagnetic fields in the United Kingdom and has been relied upon by health protection agencies around the world. This review describes incorrect and misleading statements from within the report, omissions and conflict of interest, which make it unsuitable for health risk assessment. The executive summary and overall conclusions did not accurately reflect the scientific evidence available. Independence is needed from the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the group that set the exposure guidelines being assessed. This conflict of interest critically needs to be addressed for the forthcoming World Health Organisation (WHO) Environmental Health Criteria Monograph on Radiofrequency Fields. Decision makers, organisations and individuals require accurate information about the safety of RF electromagnetic signals if they are to be able to fulfil their safeguarding responsibilities and protect those for whom they have legal responsibility. PHE and AGNIR had a responsibility to provide accurate information about the safety of RF fields.

“Unfortunately, the report suffered from an incorrect and misleading executive summary and overall conclusions, inaccurate statements, omissions and conflict of interest. Public health and the well-being of other species in the natural world cannot be protected when evidence of harm, no matter how inconvenient, is covered up.” One hopes that PHE may wish to reconsider the safety of the AGNIR Conclusions, as the current analysis illuminates serious conflicts of interest and errors within AGNIR’s report, and shows either 1) predetermined conclusions, 2) scientific bias, conscious or unconscious (including System Educational Problems), 3) errors in analysis and flawed conclusions, or, 4) less comfortably, that greater forces have required this result (‘Active Denial’ is a strategy used by individuals, companies and governments to avoid responsibility). There are no other obvious explanations. PHE may have trusted the independence of AGNIR without appreciating these factors, or the System Educational Problems mentioned above.

Some studies trying to elucidate the issue (eg Kings’ College London) have reached flawed conclusions. In the otherwise excellent (from the data, method and analysis point of view) BMJ published KCL paper by Rubin in 2006 *Are some people sensitive to mobile phone signals? Within participants double blind randomised provocation study*. <https://www.ncbi.nlm.nih.gov/pubmed/16520326> and <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1440612/> ‘sham’ was not ‘sham’ – because in ‘sham’ mode the headset heated itself to a similar degree as when ‘active’ RF was being transmitted – of course by electricity, generating EM Fields – and the transmissions were changed to ‘internal divert’ – therefore current was still passing: ‘It was possible to divert power in either variant to an internal load to provide sham RF exposure conditions with heating and low frequency magnetic fields similar to the exposure modes’. <http://www.mthr.org.uk/documents/MTHRreport2012.pdf> p26. Rubin states ‘For the sham exposure, a continuous wave signal was generated to ensure that the system heated up to the same degree as the active exposures but was diverted to an internal load instead of being transmitted through the antenna; only minimal leakage of this signal occurred’. For a sensitive person, this, of course, would be an active test – no wonder the paper was unable to state that sensitive subjects had a different experience from sham – because ‘sham’ was active. (The unfortunate error was to fail to appreciate that signal effects can occur at a wide range of power outputs with sensitive biological systems, and that low frequency magnetic fields similar to the exposure modes may also cause symptoms – as opposed to power (heating) effects which tend to diminish with decreasing power – and therefore to assume that the described ‘sham’ really was ‘sham’).



Any lay analysis of the results (fig 2) clearly shows that there are two distinct groups – the controls, who had few symptoms at all at any point through the study, and the sensitives, who after being near the controls at the start, had steadily increasing symptoms (far more than the controls), at all stages after the commencement of the study, until a relative decline after the transmission was switched off at 50 minutes. Rubin comments **‘Sensitive participants reported headache-like symptoms in a mean of 70.4% of calls. The next most common symptoms were skin warmth or burning (43.8% of calls), difficulty concentrating (30.0%), and dizziness (20.8%). Very few control participants reported any symptoms in relation to mobile phone signals; the highest mean frequency was for skin warmth or burning (2.9%). For headache, burning sensations, skin sensations, and eye pain we found evidence of a main group effect—sensitive participants reported greater severity.’** Rubin’s data shows that in the sensitive group, 2 subjects were excluded due to severe symptoms at baseline, 6 withdrew at stage one (half due to severe symptoms), and 3 at stage 2. He also states ‘We also analysed the number of severe reactions seen in each condition, with a severe reaction defined as a participant requesting that an exposure be terminated early or withdrawing from the study entirely after an exposure. **Twenty-six such reactions occurred in the sensitive group (9 withdrawals; 17 early terminations), and none occurred in the control group’.** This is helpful evidence to support the fact that sensitive subjects really do develop symptoms to the point that they have to withdraw – whereas controls do not.

Unfortunately, the conclusion included the sweeping assertion that there is no biological basis - an assertion made in a paper with only 19 references - and no analysis of or reference to the thousands of papers documenting biological evidence on animals and humans available even in 2005, and in opposition to understanding of voltage-gated calcium channels effects, amongst other mechanisms. It is most unfortunate that because the authors (mainly psychologists, with no biologists) did not appreciate that the supposed ‘sham’ (with current passing in a device strapped to the head and transmission happening ‘internally’) was not sham at all, but active, it was assumed that only psychological mechanisms were involved. The paper’s conclusion is ‘No evidence was found to indicate that people with self reported sensitivity to mobile phone signals are able to detect such signals or that they react to them with increased symptom severity. As sham exposure was sufficient to trigger severe symptoms in some participants, psychological factors may have an important role in causing this condition’. This conclusion of course fits with the then prevailing chemistry narrative of medicine rather than an informational physics perspective as explained by Oschman in *Energy Medicine*, Elsevier, 2000

If one reinterprets the data in this light, and includes a less narrow literature search of relevant human and animal studies (e.g. see the 1828 references in Bevington’s 2013 book), the data in Rubin’s 2006 paper is truly excellent support of the fact that Electrosensitivity exists. **Rubin could be congratulated upon this research, if the erroneous conclusions made in 2006 were now reframed to the diametrically opposite point of view.** A new conclusion might state: **‘Evidence was found to indicate that people with self reported sensitivity to mobile phone signals at even very low levels are able to detect such signals** or that they react to them with increased symptom severity from either active transmission or biologically active internal divert. As even the lower level of exposure originally thought to be sham exposure was sufficient to trigger severe symptoms in all sensitive participants, **this is important evidence that some subjects are sensitive to field strengths dramatically below SAR limits set by ICNIRP, and therefore that reliance upon thermal safety limits alone is invalid. This study disproves the fiction that non-thermal equals non-harmful’.** (The Insurance industry also has these reservations)

**EM Pollution and Electromagnetic Stress – General Advice Sheet**

*This advice is ahead of its time. It is written with the benefit of experiencing many cases of electrosensitivity. This is a contested area, as 'Safety ALWAYS lags technological advances' (think tyre tread, seat-belts, asbestos, lead in petrol etc.). The reader is asked to research for themselves.*

**Human health** is a delicate balance. It can be adversely affected by interfering factors such as chemical pollution, smoke, pollens, moulds, the food we eat, what we drink, lack of sleep, lack of fresh air, lack of sunlight, lack of fresh water and so on. **Electromagnetic pollution** is another factor which affects the body. Our bodies were developed in an environment free from man-made EM signals (which are up to  $10^{18}$  stronger than background), whilst the body uses minute micro-currents for cellular function.

**Symptoms** may be none, or include tiredness, poor quality sleep, irritability, heart palpitations, headaches and a feeling of pressure in the head, speech and thinking disturbance, brain fog, dizziness, tinnitus, vertigo, tinglings and odd sensations in the limbs, joint pains, rashes and others.

**Electromagnetic problems** are caused by:

1. **Field effects** from cables and appliances (e.g. lights, hairdryers, washing machines, cookers, bedside radios etc.).
2. **Signal effects** from microwave transmitting technology (e.g. microwave ovens, mobile phone masts, cordless phones, mobile phones, WiFi, wireless routers, Wii devices, laptop computers, wireless printers, alarm sensors, iPads, Blackberries, baby alarms, utility smart meters, wireless central heating controls, and a car's Bluetooth devices).
3. **'Dirty electricity'** also [damages health](#).

The key solution is to **minimize your exposure in the home**, especially during sleep time:

- **Switch off** wifi routers and cordless phone base stations and any other devices whenever you can – remember the signal is designed to go through walls and throughout the house.
- Put iPads, phones and other wireless devices onto **airplane mode**.
- Instead of WiFi, consider a **DLAN wired router** system for computer internet via the ring main.
- Consider changing alarm sensors to **passive only** (rather than active which use microwaves).
- Think about **refusing offers** of wireless central heating controls and wireless smart meters.

The Council of Europe recommends a **Precautionary** approach, although current UK Public Health England advice is based on heating effects of transmissions only, not the observed signal effects. The World Health Organization's IARC says that wireless technologies are a **Class 2b possible carcinogen**.

**Accepted biological effects** of EM fields include: increased childhood leukaemia, adverse effects on sperm production, pregnancy, embryo development and hormones; there are links with depression, Motor Neurone and Parkinson's diseases, several cancers, behavioural problems and cataracts.

**Mechanisms** include: changes in calcium efflux/influx, failure of repair of DNA breaks, blood brain barrier permeability, heat shock protein production, disruption of vital melatonin production (e.g. by blue light from screens), general sympathetic (stress) upregulation of the body and disruption of cell to cell signaling. The overall effect may be to age us all more quickly...

Industry pressure may hinder discussion or reporting, or ridicule the 'Canaries in the Coal Mine' who are the early ES sufferers. **Please do not take this on trust: research and make up your own mind! read...**

'The Powerwatch Handbook' by Alasdair Phillips, 'Overpowered' by Martin Blank, and 'Energy Medicine' by James Oschman