

Electro-Hypersensitivity Does Not Exist

Document 8 — The Medical Profession and Electro-Hypersensitivity: What Physicians See, What Studies Test, What Remains to Be Known

Comment submitted in response to the U.S. Department of Health and Human Services (HHS) Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure, FR Doc. 2026-19252, Docket HHS-OASH-2026-0397.

Questions addressed: 4 (4h to 4m); 9 (information for health professionals); 10f; 16 (gaps in medical research).

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The subjects addressed in this document are part of an open publication, intended to receive further testimonies and contributions.

Disclaimer: the authors are not physicians. The medical elements presented here—tests, biological markers, exposure-reduction measures—are reported from published sources and existing guidelines, which are cited. They constitute neither medical advice, nor a prescription, nor a care protocol, and they do not replace the judgment of a health professional.

Abstract

Primary care physicians see patients who attribute their symptoms to electromagnetic fields. In Switzerland, as early as 2005, more than two-thirds of the general practitioners surveyed had seen such patients, and they judged the association plausible in more than half of the cases. In our experience, many others consult for the same symptoms without suspecting their cause; the attribution often comes years later (Section 3.2). The symptoms reported—sleep disorders, headaches, fatigue, cognitive problems (“brain fog”), tinnitus, palpitations—are considered real by the World Health Organization (WHO); no validated test currently makes it possible either to confirm or to rule out the diagnosis. Faced with them, two medical doctrines stand opposed. The first, that of the [WHO \(2005\)](#) and of the document prepared for French physicians at the end of 2023, focuses care on the symptoms, sets aside exposure reduction, and offers, where appropriate, cognitive behavioral therapy. The second, that of the Austrian Medical Association (2012) and of the European Academy for Environmental Medicine (2016), makes exposure reduction the main treatment. The first relies on provocation studies that test the perception of a brief exposure, not its effects; their own authors acknowledge their limitations, and two members of ICNIRP now consider there is little value in continuing them in the same form. Biological markers and a cellular

radiosensitivity have been described in electro-hypersensitive individuals, without independent replication. Between these doctrines, the patient wanders, and sometimes gives up.

This document also addresses information for health professionals; the reporting of adverse effects, which, to our knowledge, does not exist in a form suited to this exposure; and gaps in medical research. It sets out eight recommendations.

1. Purpose

Question 4 of the Request for Information is addressed to health professionals, researchers, and public health practitioners. It asks them to describe observations, from clinical practice, occupational settings, or research, that could reveal patterns of adverse effects reported in relation to radiofrequency exposure: types of effects (4h), onset (4i), characteristics of the individuals affected (4j), exposure patterns (4k), standardized assessment methods (4l), and recommendations for research and surveillance (4m). Question 9 asks what technical and exposure-related information should be communicated to, among others, health professionals; we answer for the latter, the other audiences being addressed in Documents 3, 7, and 9. Question 10f concerns the reporting of adverse effects; the other surveillance systems are addressed in Document 4. Question 16 concerns priority research gaps: Document 7 gives the overall picture, and this document details the medical aspect.

We do not claim to speak on behalf of physicians. We report what the medical literature, guidelines, and published surveys say about their observations, and what we ourselves have observed on the patients' side.

2. Methods and Sources

As the Request for Information asks, we specify the nature of our supporting evidence. The sources are of five kinds: peer-reviewed publications; medical guidelines; documents from agencies and administrations; court decisions; and observations by the authors, one of whom is electro-hypersensitive.

The following were analyzed: the review by [Rubin et al. \(2005\)](#); the articles by the ARTAC team from 2015, 2020, and 2024; the Inserm study ([Sonzogni et al., 2025](#)); the survey by [Leszczynski \(2025\)](#); the article by [Ashton \(2025\)](#); the ruling of the [Riom Court of Appeal \(2025\)](#); the guide “Et si c’était les ondes ?” [What if it were the waves?]; and the guidelines of the Austrian Medical Association, in German, and of EUROPAEM, in its 2016 French translation; only the English version of the latter is authoritative; the one passage quoted directly in this English version is from the original English text, and the others are paraphrased from the French translation. Only the abstract was read for [Huss and Rösli \(2006\)](#), [Huss et al. \(2007\)](#), [Schmiedchen et al. \(2019\)](#), [Pall \(2013\)](#), and the neurology publications on multiple sclerosis ([Thompson et al., 2018](#); [Solomon et al., 2016](#); [Kaisey et al., 2019](#); [Montalban et al., 2025](#)); the commentary by [Solomon and Brodersen \(2025\)](#) is cited from its title; the article by Dr. Boutbaoucht was reread in full, from the copy kept in our files; excerpts were read for

de Vocht and Rössli (2025). The WHO fact sheet was read in English and in French; the 2018 opinion of Anses (French Agency for Food, Environmental and Occupational Health & Safety) was reread, and its expert report is cited from our reading notes. The document of the French Society of Occupational Health, SFST (2023), was read with an automated reading tool, and the passages quoted were checked against the text of the PDF. The pages and documents of institutions (FDA, U.S. Access Board, Anses, Haute Autorité de santé (French National Authority for Health), ICNIRP, French Senate, Institute of Medicine, MTHR program), the patent cited, and the pages of the diagnose:EHS website were consulted in their original text. Quotations in English are reproduced as written. Quotations from French and German sources are our translations; the original wording appears in the French version of this document.

3. What Physicians See (Question 4)

3.1 Types of Effects Reported (4h)

The symptoms that patients attribute to electromagnetic fields are, first of all, nonspecific. In a telephone survey of 342 randomly selected Swiss general practitioners, sleep disorders, headaches, and fatigue were the most frequent symptoms at the most recent consultation of this kind (Huss and Rössli, 2006). The EUROPAEM guideline gives a broader list: sleep problems, fatigue, exhaustion, lack of energy, restlessness, heart palpitations, blood pressure problems, muscle and joint pain, headaches, an increased risk of infections, depression, difficulty concentrating, coordination problems, forgetfulness, anxiety, urinary urgency, anomia (difficulty finding words), dizziness, tinnitus, and sensations of pressure in the head and ears (Belyaev et al., 2016). The guide for practitioners opens with a similar list (Collective, 2020). To these is added brain fog, which we ourselves have experienced; the website of the diagnose:funk association notes that, in children, electro-hypersensitivity usually manifests itself as headaches, “brain fog,” and learning difficulties (Gutbier, 2021).

The World Health Organization, whose December 2005 fact sheet has not been replaced, considers these symptoms real: “The symptoms are certainly real and can vary widely in their severity”; whatever their cause, they can be disabling (WHO, 2005). Anses wrote in 2018 that the complaints “correspond to a lived reality” (Anses, 2018).

What characterizes the clinical picture is not any one symptom but its relationship to exposure: symptoms appear or worsen in the presence of sources and subside at a distance from them. The guide for practitioners makes this its main criterion: “The best diagnostic criterion remains the improvement, or even the disappearance, of symptoms after a prolonged cessation of exposure to electromagnetic fields” (Collective, 2020, p. 11).

3.2 Onset of Symptoms (4i)

The EUROPAEM guideline describes a gradual onset: depending on the individual state of sensitivity, symptoms often occur only from time to time, but over time they may increase in frequency and severity (Belyaev et al., 2016). Symptoms can also persist after exposure: the authors

of the most cited review of provocation studies themselves note that the electro-hypersensitive “sometimes report symptoms that can last for several days” (Rubin et al., 2005).

The link with exposure is often established only after years. A British author reports having diagnosed himself “6 years after my condition had started” (Ashton, 2025). One of us went through a comparable course: more than fifteen years of successive symptoms whose source he did not know, apart from the warming of the face felt during phone calls, before he could relate them to exposure by comparing what he felt with measurements, without ever having been told about electro-hypersensitivity. In both cases, the attribution did not precede the symptoms; it followed them.

3.3 The Individuals Affected (4j)

The known characteristics of the electro-hypersensitive—female predominance, age, associated conditions—are presented in Document 4 (Questions 10 and 11). Three features are of particular interest to the clinician. The first is the frequent association with multiple chemical sensitivity: in the cohort followed in Paris by the Association for Research and Treatments Against Cancer (ARTAC), it affects 25% to 30% of the electro-hypersensitive, depending on the publication (Belpomme and Irigaray, 2020; Irigaray et al., 2024). The second is the overlap with other syndromes that have no validated marker, which the EUROPAEM guideline groups together with electro-hypersensitivity among chronic multisystem illnesses: multiple chemical sensitivity, chronic fatigue syndrome, fibromyalgia (Belyaev et al., 2016). The third is a cellular radiosensitivity, found in all the volunteers of an Inserm cohort (Section 5.2).

In the Swiss survey, general practitioners holding a certificate in complementary medicine reported these consultations much more often (Huss and Röösl, 2006). Either patients turn to these physicians, or these physicians more readily recognize the link that patients allege; in either case, the frequency of the syndrome is difficult to estimate from general practice alone.

3.4 Exposure Patterns (4k)

In the Swiss survey, the sources that patients implicated were mainly base stations, power lines, and their own mobile phones (Huss and Röösl, 2006). The EUROPAEM questionnaire asks about the mobile phone, the DECT cordless phone, Wi-Fi, compact fluorescent lamps, a nearby antenna, power lines and transformers, and Bluetooth in the car (Belyaev et al., 2016). The exposure at issue is rarely that of a single source: it is the sum of public and domestic sources (Document 7, Section 5), and it is at night, in bed, that domestic sources are closest to the body. In our experience, the symptoms also vary with the sources involved, their frequencies, and the duration and intensity of exposure. Nor does the absence of symptoms in other members of the household rule out the link: they are not exposed in the same way from day to day, nor are they receptive in the same way (Section 5.4).

EUROPAEM derives from this a method of attribution: assessing the “variation in health problems depending on time and location and individual susceptibility” (Belyaev et al., 2016). It is a clinical method, based on repeated observation of what changes when exposure changes.

3.5 Assessment Methods: Two Doctrines (41)

There is no common standardized method. Two medical doctrines coexist, and they diverge on a decisive point.

	First doctrine: WHO (2005), SFST (2023)	Second doctrine: Austrian Medical Association (2012), EUROPAEM (2016), 2020 guide
Approach	Rule out other causes, medical and psychological	Thorough case history, focused on the relationship between symptoms, time, and place, with other causes ruled out
Exposure	No avoidance; very gradual exposure within cognitive behavioral therapy; measurements “most often unnecessary” in the general environment	Measurements entrusted to trained specialists; exposure reduction as the main treatment
Psychotherapy	Psychological evaluation; cognitive behavioral therapy offered	The same significance as in other illnesses
Coding	No specific code	Symptom codes, with R68.8 and Z58.4 (ICD-10)
Certificate	Never attest to electro-hypersensitivity; describe what the patient reports	Descriptive certificate, at the physician’s discretion

The WHO fact sheet states that treatment “should focus on the health symptoms and the clinical picture, and not on the person’s perceived need for reducing or eliminating EMF,” and recommends a medical evaluation and “a psychological evaluation to identify alternative psychiatric/psychological conditions” (WHO, 2005). In France, the document prepared by the SFST at the request of the Ministry of Health, online since January 2024 (Sénat, 2025), holds that “Measurements do not fall within medical competence,” that “devices for protection against electromagnetic fields show haphazard effectiveness in practice,” and that “Multiplying measurements can generate anxiety.” It concludes that “there is no argument to date for proposing avoidance of electromagnetic waves in individuals who describe themselves as EHS” and that “it could be beneficial to encourage very gradual exposure to electromagnetic waves within the framework of CBT,” since avoidance risks trapping the patient in “a vicious circle of increasing avoidance, leading to ever greater social and occupational isolation”; it points out that “listening and empathy are called for” (SFST, 2023).

The Austrian Medical Association starts from the same observation—“Es gibt keine EMF-spezifischen Befunde,” there are no findings specific to electromagnetic fields—but draws a different method from it: diagnosis rests essentially on a thorough case history, supplemented by stress markers interpreted together (Österreichische Ärztekammer, 2012). In 2018, Anses saw in it the document that was “probably the most elaborate with regard to the diagnostic approach,” while considering that this approach “would deserve to be the subject of clinical studies” (Anses, 2018).

EUROPAEM adopts this approach, entrusts measurements to trained and experienced specialists, and makes exposure reduction the main treatment, while calling for products claimed to neutralize electrosmog to be assessed with great restraint (Belyaev et al., 2016). The guide for practitioners, reviewed by the oncologist Dominique Belpomme and by a general practitioner, states: “Avoidance of harmful sources is essential for improvement or recovery” (Collective, 2020, p. 12).

The two doctrines agree on listening to the patient and on ruling out other causes. They diverge on one action, reducing exposure: the first advises against it, the second makes it both the treatment and the diagnostic test.

They also diverge on the medical certificate. In France, a note of May 26, 2014, from the Directorate General for Health leaves the issuing and content of certificates “to the physician’s discretion, case by case” (cited by Collective, 2020, p. 12); the SFST considers that “under no circumstances should a physician write on a certificate that he or she observes, or even confirms, a situation of EHS,” the physician being able only to certify that he or she is following the patient and to report what the patient describes (SFST, 2023). A court, for its part, was able to adopt an approach close to the second doctrine: the Riom Court of Appeal relied on certificates spread over time, describing the symptoms, their relationship to exposure, and the other diagnoses ruled out; in the view of the Riom Court of Appeal, general objections about the absence of harmfulness and compliance with exposure limits “have no bearing on this finding of an individual impact on health” (Riom Court of Appeal, 2025).

4. What Provocation Studies Test

4.1 The Protocol and Its Conclusion

Negative conclusions on the causal link rest mainly on so-called provocation studies: the subject is exposed, blind, sometimes to a real field and sometimes to a sham field, most often for a few minutes to a few tens of minutes, and what the subject perceives or feels is recorded. The most cited review brings together 31 experiments involving 725 volunteers who described themselves as electro-hypersensitive; it concludes that “it has proved difficult to show under blind conditions that exposure to EMF can trigger these symptoms. This suggests that ‘electromagnetic hypersensitivity’ is unrelated to the presence of EMF, although more research into this phenomenon is required” (Rubin et al., 2005). Its lead author belonged to the Mobile Phones Research Unit at King’s College London; the work was funded by the British Mobile Telecommunications and Health Research program, whose core funding, approximately £12 million, was provided “in approximately equal share by government and industry,” with projects selected and monitored by an independent management committee (MTHR, 2013). In France, the document given to physicians sums up: “the vast majority of the studies available for several decades find no correlation” (SFST, 2023).

The question of funding is not a neutral one. Among 59 experimental studies on the effects of radiofrequency exposure, those funded exclusively by industry were the least likely to report a statistically significant result: odds ratio 0.11 (95% confidence interval: 0.02 to 0.78) compared with studies funded by public agencies or charities (Huss et al., 2007); its 2010 update confirms this

result (Document 7, Section 6.2). One of the authors of this finding, Martin Rösli, later sat on the ICNIRP Commission from 2016 to 2024 (ICNIRP, 2026).

4.2 What the Authors Themselves Say

The limitations of this body of work are acknowledged by the very authors who draw negative conclusions from it.

- Rubin et al. (2005) note that “the majority of studies included relatively small sample sizes and failed to justify this by providing a power calculation” and that “Low statistical power might also explain some of the negative findings”; at least two studies reported hangover effects from one session to the next.
- A systematic review of 28 blinded studies, conducted by researchers from RWTH Aachen University and the Norwegian University of Science and Technology, identifies limitations “that might have either fostered false or masked real effects of exposure”: participant selection, order of exposures, effectiveness of blinding. It concludes that no effect has been demonstrated, adding: “If physical effects exist, previous findings suggest that they must be very weak or affect only few individuals with IEI-EMF,” and recommends studies conducted “at the individual level” (Schmiedchen et al., 2019).
- EUROPAEM criticizes these studies for short exposures and short observation periods, for sessions spaced too closely together, which neglect post-exposure effects, and for sham exposures carried out under conditions likely to provoke a response in sensitive individuals (Belyaev et al., 2016).
- In 2018, Anses recommended “that provocation studies using polysomnography be carried out” (Anses, 2018).
- In 2025, Frank de Vocht, a member of the ICNIRP Commission and an occasional consultant to the Electric Power Research Institute, and Martin Rösli wrote that “there is little value in continuing the same research.” They propose “the single-case repeated design” and a model based on long-term exposure, while maintaining that “psychogenic reactions play an important role” (de Vocht and Rösli, 2025).

4.3 A Test of Perception, Not a Test of Effect

These studies ask the patient a question—do you perceive the exposure, do you feel a symptom, right now?—that is not the clinical question. The clinical question is the one posed by the guide for practitioners: do the symptoms improve when exposure ceases for a sustained period? Three gaps separate the two.

- **Duration.** A few minutes or tens of minutes of exposure, whereas the symptoms are described as gradual, cumulative, and sometimes long-lasting (Section 3.2).
- **What is measured.** A subjective judgment, not a state of the body. Yet as early as 2005, the WHO stated that “hyper reactivity in the central nervous system and imbalance in the autonomic

nervous system need to be followed up in clinical investigations” (WHO, 2005), and Anses called for the use of polysomnography.

- **Participants.** Patients with severe forms, who cannot tolerate a prolonged stay in an exposed environment, are by construction the least likely to take part in a laboratory experiment; the authors of the Inserm study themselves note “the difficulty for EHS patients to move, travel, and leave their homes where they often have protection against waves” (Sonzogni et al., 2025).

Nonhuman living organisms, for their part, “perceive” nothing, and yet they react (Document 6): for the robin or the tadpole, the organism is measured; the electro-hypersensitive individual is asked what he or she feels.

The placebo effect exists: the expectation of harm can cause symptoms, and experiments show this (de Vocht and Röösli, 2025). It is not enough to explain a course in which symptoms precede any attribution to waves by several years (Section 3.2). The German association diagnose:funk, which campaigns against exposure to electromagnetic fields, puts it this way: “Bei einem Nocebo-Effekt müssen die Bedenken am Anfang stehen”—in a placebo effect, the concern must come first (Haidlauf, 2026).

5. Biology: Leads, No Validation

5.1 The Markers of the ARTAC Cohort

Since 2009, ARTAC has followed in Paris a cohort of more than 2,000 cases of electro-hypersensitivity, multiple chemical sensitivity, or both. Its researchers measured blood and urine markers—histamine, heat shock proteins, S100B protein, nitrotyrosine, anti-myelin antibodies, urinary melatonin—and report that with seven markers, 76% to 86% of cases can be objectively characterized (Irigaray et al., 2024). According to them, their clinical observations “strongly suggest” that these are “objective somatic disorders, which can neither be claimed as originating from some psychologic or psychiatric-related conditions, nor from placebo effects” (Belpomme and Irigaray, 2020).

They themselves acknowledge the limitations: “none of our biomarkers are per se specific” (Belpomme et al., 2015); the assays were performed in a single Paris laboratory, and “these biochemical tests remain to be reproduced by other laboratories” (Irigaray et al., 2024). This work is funded by ARTAC, which in 2015 declared donations from patients and grants from foundations, and, for the 2020 article, partly by the Osato Research Institute (Japan). The first author of that article is a co-inventor of a U.S. patent, held by the company Osato International, on the treatment of electro-hypersensitivity with a fermented papaya preparation (Osato International Inc, 2021); the guide for practitioners recommends this preparation under its trade name (Collective, 2020, p. 12). In 2018, Anses judged these results “to be considered as preliminary results, to be interpreted with the greatest caution,” to be confirmed using validated assay methods and matched controls (Anses, 2018). An international survey of 142 individuals from 21 countries who described themselves as electro-hypersensitive, 62 of whom had a medical diagnosis, starts from an observation—“There are

no medical tests for detecting sensitivity to wireless radiation”—and concludes that “currently, it is not possible to diagnose sensitivity to wireless radiation exposures”; the results reported “certainly indicate some kind of physiological stress but there is no evidence that this physiological stress was caused or is modulated by EMF exposures” (Leszczynski, 2025). Its author, a researcher at the University of Helsinki, was funded by a grant from the Finnish Electrosensitivity Foundation.

The EUROPAEM guideline, for its part, proposes a laboratory workup organized by type of sample: in blood, markers of oxidative and nitrosative stress (nitrotyrosine, malondialdehyde, glutathione), of inflammation (high-sensitivity C-reactive protein, interleukin-1, TNF-alpha, IP-10), histamine and diamine oxidase, vitamin D3, and thyroid hormones; in the second morning urine, adrenaline, noradrenaline, dopamine, and serotonin; in 24-hour urine, the ratio of 6-sulfatoxymelatonin to creatinine; in saliva, cortisol at 8 a.m., noon, and 8 p.m., and, in addition, DHEA and alpha-amylase (Belyaev et al., 2016). These tests serve to assess the state of the body and to monitor its course as exposure decreases; none is specific, and Anses noted that the choice of these markers and tests “is not substantiated” (Anses, 2018).

5.2 Fibroblast Radiosensitivity (the DEMETER Study)

A public research team approached the question by another route. In Lyon, Inserm joint research unit 1296 applied its clinical radiobiology protocol to skin fibroblasts from 26 volunteers who described themselves as electro-hypersensitive: “By applying X-rays, all the DEMETER cell lines (26/26) appeared characterized by delayed radiation-induced ATM nucleoshuttling (RIANS)”; the biological data were acquired before the sealed questionnaires were opened. According to the laboratory’s earlier literature, radioresistant individuals represent about 75% to 85% of the population. The authors derive from this “a preliminary molecular model of EHS,” while specifying that “a given patient showing delayed RIANS does not necessarily suffer from EHS.” They themselves point out the small size of the cohort and a possible “group effect,” since the volunteers belong to the same association; the controls come from an earlier collection of the laboratory, and the exposure tested is to X-rays, not radiofrequency (Sonzogni et al., 2025). The study was co-funded by Anses. It does not demonstrate that radiofrequency acts through this mechanism; it shows that these volunteers share a measurable biological feature, established without relying on their own statements.

5.3 The Circularity Objection

Two members of ICNIRP object that the search for biomarkers “suffers from circular reasoning”: to test a marker, the electro-hypersensitive must be identified, which, in the absence of a marker, can only be done through their own self-report (de Vocht and Röösl, 2025). The objection applies to any clinically defined syndrome, such as migraine, fibromyalgia, or chronic fatigue syndrome; medicine usually answers it by setting clinical criteria and then testing markers prospectively. Chronic fatigue syndrome provides the precedent: long disputed, it was presented in 2015, on the publication of the report of the U.S. Institute of Medicine, as a “legitimate, serious, and complex systemic disease,” and the committee chair identified “the skepticism of health care providers about these patients” as an obstacle to diagnosis (IOM, 2015). The absence of a validated marker at a given

time does not prove a psychological origin. Designs based on removing exposure, moreover, escape the objection: they do not ask the patient to attribute his or her symptoms; they observe what changes when exposure ceases.

5.4 The Individual Tolerance Threshold

Several readings converge on the same idea: what matters is not only the intensity of the signal but the body's capacity to withstand it. EUROPAEM attributes most symptoms to inadequate regulation (decompensation) and proposes adjusting the duration of provocation tests according to individual regulatory capacity (Belyaev et al., 2016). A cellular mechanism has been proposed: according to a 2013 review, twenty-three studies show that blockers of voltage-gated calcium channels, located in cell membranes, abolish or greatly reduce various effects of electromagnetic fields, and the pathological effects would involve calcium entry into the cell, followed by the nitric oxide, peroxynitrite, and oxidative stress pathway (Pall, 2013). This hypothesis remains debated; its author, a biochemist and professor emeritus at Washington State University, is engaged in criticism of the standards. It is consistent with the markers of oxidative and nitrosative stress reported by ARTAC (Section 5.1). A physician, Dr. Mohamed Boutbaoucht, derives a clinical model from it, in an undated article whose publisher has not been identified: electro-hypersensitivity would reflect the loss of a “cellular tolerance threshold,” linked to the state of the mitochondria, of membranes and ion channels, of minerals, of the microbiota, and of mast cells (Boutbaoucht, 2026). To our knowledge, this model has not been published in a peer-reviewed journal.

Two consequences follow. A lowered individual threshold does not lessen the responsibility of exposure: it explains why the same exposure, tolerated by some, makes others ill, and it calls for reducing exposure at the source, not for adapting individuals to it. And, in our experience, sheltering from radio waves alleviates the symptoms, but the sensitivity remains, so protection must be lasting.

6. Between Two Doctrines, Diagnostic Wandering

The course described on the website of the diagnose:funk association (cited in Section 4.3) resembles the one we ourselves went through: attending physician, blood tests, electrocardiogram, then ophthalmologist, ear, nose, and throat specialist, or neurologist; “Die somatische Diagnostik ist nicht wegweisend” (the somatic workup is not indicative); for lack of any other explanation, the disorders are then often classified “als stressbedingt oder psychosomatisch,” as stress-related or psychosomatic (Gutbier, 2021). EUROPAEM adds that some individuals with EHS may be misdiagnosed with multiple sclerosis (MS), since most of the symptoms are similar (Belyaev et al., 2016).

The resemblance lies in the nature of these symptoms. France's Haute Autorité de santé describes multiple sclerosis as an “inflammatory disorder of the central nervous system,” in which fatigue is “one of the most disabling symptoms” and which combines “motor, sensory, cognitive, visual, bladder and sphincter, and genito-sexual disorders, among others” (HAS, 2024). The EUROPAEM list for electro-hypersensitivity likewise includes fatigue, difficulty concentrating, coordination

problems, dizziness, and urinary urgency (Section 3.1). These signs, described as nonspecific, indicate that something is wrong without identifying the cause: very different conditions can produce the same clinical picture.

What distinguishes the two, then, is not the clinical picture but the tests. The diagnosis of multiple sclerosis rests on international criteria, known as the McDonald criteria, which require demonstrating the dissemination of central nervous system lesions in space and in time; where dissemination in space has been demonstrated, the presence of specific oligoclonal bands in the cerebrospinal fluid allows the diagnosis; and the criteria stress that there must be no better explanation for the presentation (Thompson et al., 2018). Their 2024 revision adds the optic nerve as a fifth location and accepts, as supportive evidence, imaging signs and the measurement of kappa free light chains in the cerebrospinal fluid (Montalban et al., 2025). Electro-hypersensitivity has, to date, no validated marker (Section 5); what characterizes it is the relationship between symptoms and exposure (Section 3.1).

Misdiagnosis is, moreover, common in neurology, quite apart from radio waves. At four U.S. academic centers, 110 patients who had been wrongly diagnosed with multiple sclerosis in fact had, among other conditions, migraine (22%), fibromyalgia (15%), nonspecific neurological symptoms with an abnormal MRI (12%), or a conversion or psychogenic disorder (11%); among the leading causes of the error was “overreliance on MRI abnormalities in patients with nonspecific neurologic symptoms”; 70% of these patients had received disease-modifying therapy, and the misdiagnosis had lasted ten years or more for a third of them (Solomon et al., 2016). At two centers in California, 17% and 19% of the 241 patients referred with an established diagnosis of multiple sclerosis had been misdiagnosed, migraine being the most common alternative diagnosis (Kaisey et al., 2019). The first author of the 2016 study, who took part in revising the criteria, considers that the 2024 revision carries a risk of overdiagnosis (Solomon and Brodersen, 2025).

EUROPAEM’s remark is consistent with this finding: a patient whose symptoms depend on exposure may, on the strength of nonspecific MRI abnormalities, receive a diagnosis of multiple sclerosis or, if the MRI is normal, that of a psychogenic disorder, as long as the question of exposure is not asked. One hypothesis goes further: among the markers measured by ARTAC are anti-myelin antibodies (Section 5.1), whereas myelin, the sheath of nerve fibers, is the target of multiple sclerosis, a so-called demyelinating disease (Solomon et al., 2016). This lead has not been validated (Sections 5.1 and 5.3); it could explain the similarity of the symptoms; it does not prove that the two are the same condition.

Our experience sheds light on three mechanisms. The presentation changes over time—urinary problems, tachycardia, nausea, visual disturbances, insomnia, tinnitus—and each symptom leads to a different specialist; it is the succession itself, with no visible common thread, that can earn the patient the label of hypochondriac. Time is short: our consultations lasted about fifteen minutes. Finally, the literature is mostly in English: a general practitioner we consulted, who had done independent research, found that it exists, that it is almost entirely in English, and that it is not a matter of consensus.

The outcome may be giving up: the patient stops seeking care and disappears from health care statistics. The document given to French physicians itself identifies “The breakdown of the therapeutic relationship with the medical profession” as “a major danger” (SFST, 2023). In 2018, Anses judged that the suffering expressed “requires and justifies appropriate care by the health care system,” and that “it is above all essential to establish and preserve a climate of trust” (Anses, 2018). A doctrine that asks physicians not to center care on exposure reduction, when the patient has observed, sometimes for years, that his or her symptoms depend on it, makes such trust difficult.

7. Information for Health Professionals (Question 9)

What health professionals mainly receive today is a conclusion. The WHO fact sheet asks governments to provide them with information that includes “a clear statement that no scientific basis currently exists for a connection between EHS and exposure to EMF” (WHO, 2005). In France, Anses recommended in 2018 to “develop physician training on the issue of the effects of radiofrequency on health,” and to ask the Haute Autorité de santé to consider whether care recommendations were warranted, as it had done for fibromyalgia (Anses, 2018). At the end of 2019, the Ministry entrusted the drafting of practical guidance to the SFST, whose document has been online since January 2024 (Sénat, 2025).

To assess an individual case, the physician needs information of a different kind.

- **The patient’s exposure:** location and power of nearby transmitters, results of measurements at home and at the workplace, domestic sources (Document 3). Measurement is not within the physician’s competence, as the SFST points out; it must therefore be accessible to the physician, carried out by trained specialists, as EUROPAEM requests, noting that it is generally not covered by health insurance (Belyaev et al., 2016).
- **How devices behave:** a mobile phone emits even when no call is in progress, and the base of an ordinary DECT cordless phone even when idle (Document 7, Section 5.1); measured in contact with the body, the specific absorption rate of one phone model led France to suspend its sale in 2023 (Document 3, Section 3.5).
- **Reference values and their status,** from regulatory limits to precautionary values, to interpret a measurement (Document 7, Section 5.3).
- **The actual state of medical knowledge:** the two doctrines, the limitations of provocation studies, the biological leads and their status, the codes that can be used (Sections 3 to 5; Document 4, Section 3.2).
- **Possible accommodations.** In the United States, the U.S. Access Board states that, under the Americans with Disabilities Act and other disability laws, public and commercial buildings must provide reasonable accommodations for individuals with chemical or electromagnetic sensitivities; among the accommodations it lists as possible at the patient’s request is requiring that cell phones and computers be turned off; the page, which is undated, is part of the research section of the agency’s website and does not state its regulatory status (U.S. Access Board, 2026).

Document 9 offers a practical version of this information for primary care physicians.

8. Reporting of Adverse Effects (Question 10f)

In the United States, the Food and Drug Administration offers a form for reporting “accidental radiation occurrences,” open to manufacturers and to the public for any radiation incident or potentially hazardous event, and the MedWatch system for medical products; the page presenting them mentions neither phones nor wireless devices (FDA, 2018). In France, the electro-hypersensitive can be seen at the regional centers for occupational and environmental diseases, at their own request or at that of their attending physician or occupational physician (Sénat, 2025). These centers feed the common database of a national vigilance network, coordinated by Anses, which records about 30,000 consultations a year and whose mission is to identify emerging occupational and environmental risks (Anses, 2026); the page presenting this network does not mention electromagnetic fields. To our knowledge, there is no system, either in Europe or in the United States, that allows a patient or a physician to report symptoms attributed to radiofrequency exposure and to obtain, in return, a measurement of that exposure.

Such a system would have three advantages: detecting signals, in particular clusters of symptoms after a transmitter is brought into service (Document 4, Section 5); building, together with the measurements, a database useful for research; and recognizing what patients are going through. It would face three difficulties, each of which can be overcome. The lack of a specific code: existing codes make up for it (Document 4, Section 3.2). Attribution bias: a standardized questionnaire that records symptoms without asking about their cause, together with a measurement of exposure where the patient lives, corrects it. Underreporting: discouraged patients no longer seek care (Section 6), and only direct access, without having to go through a physician, would reach them.

9. Gaps in Medical Research (Questions 4m and 16)

Document 7 ranks the diagnosis and follow-up of electro-hypersensitivity among research priorities (Document 7, Section 3.3). From a medical standpoint, we detail six of them.

1. **Provocation protocols designed on the basis of what patients describe:** long and repeated exposures, sufficient intervals between sessions, conducted at home rather than in the laboratory so as to include severe forms, with physiological endpoints—heart rate variability, polysomnography, biological markers—rather than perception alone; repeated single-case designs, recommended by Schmiedchen et al. (2019) as well as by de Vocht and Rösli (2025).
2. **Trials based on removing exposure:** real or sham reduction of exposure at the sleeping place, blinded, with monitoring of symptoms and physiological markers. This is the experimental translation of the diagnostic criterion adopted by practitioners (Section 3.1).
3. **Independent replication of the biological findings:** replication of the ARTAC markers, with validated methods and matched controls, as Anses requested; replication of the radiosensitivity found by Inserm, with controls recruited for the study and exposure to radiofrequency.

4. **Validation of clinical diagnostic criteria**, building on the Austrian and European guidelines; Anses considered the former worthy of clinical studies and noted, regarding the latter, that “The choice of these various markers and tests is not substantiated.”
5. **Study of the overlaps** with multiple chemical sensitivity, chronic fatigue syndrome, and fibromyalgia, which share a common core of symptoms.
6. **Study of the medical pathway itself**: time to diagnosis, number of physicians consulted, misdiagnoses, forgoing of care. We know of no quantitative data on these points.

This research requires stable public funding and governance independent of industry (Document 7, Section 3.6).

10. Discussion

The title of our contribution, “Electro-Hypersensitivity Does Not Exist,” echoes a phrase that the electro-hypersensitive often hear. The institutional texts do not say this: the WHO considers the symptoms real and sometimes disabling; Anses, a lived reality that justifies care. What they say is that no scientific basis links these symptoms to exposure. This conclusion rests on a type of study that asks a different question from the clinician’s: not “does exposure make the patient ill?” but “does the patient perceive it at that moment?” The authors of these studies acknowledge their limitations, and members of ICNIRP now propose no longer repeating them unchanged. The clinical question—do the symptoms subside when exposure ceases for a sustained period?—has not, to our knowledge, been the subject of a research program commensurate with the problem.

In the meantime, the doctrine the physician follows decides the patient’s fate. That of the WHO directs the physician toward ruling out other causes and toward psychological evaluation; that of the Austrian physicians and EUROPAEM, toward reducing exposure. The simple measures the latter proposes—switching off a router at night, moving a phone away from the bed, connecting a computer by cable—have no known physical adverse effect; the SFST, however, sees in the multiplication of avoidance measures a risk of isolation. This doctrine also has limits, which are not medical: patients can reduce the sources in their own homes, but they can do nothing about the nearby base station antenna, the small cell on their street, or the building’s meter. For severe forms, the guide for practitioners contemplates that patients may have to protect themselves from these sources “or move” (Collective, 2020, p. 12); there must still be places left to go. The medical care of electro-hypersensitivity thus converges with reducing exposure at the source throughout the territory and preserving white zones (Documents 1, 4, and 5).

11. Limitations

Published observations by clinicians are rare; the Swiss survey was conducted in 2005 and its response rate was 28%. The sources are mostly European. The ARTAC markers come from a single team, without replication; the Inserm study covers 26 volunteers from the same association. Passages from the Anses expert report are cited from our reading notes. Passages from EUROPAEM

are paraphrased from the 2016 French translation, except the one quoted from the original English text. The publications on misdiagnosis of multiple sclerosis are cited from their abstracts and do not concern electro-hypersensitivity. Our own course is a testimony, not data.

12. Recommendations (Questions 4, 9, 10f, and 16)

1. In federal communications intended for health professionals, state what institutions already acknowledge: the symptoms are real and can be disabling; no biological marker has yet been validated, so that no test currently makes it possible to link electro-hypersensitivity to exposure or to rule it out on the basis of normal results; provocation studies test the perception of a brief exposure, not its effects. Make known the markers proposed by ARTAC and Inserm, which remain to be replicated (Section 5), and the criterion adopted by the guide for practitioners: improvement of symptoms when exposure ceases (Section 3.1).
2. Have practice recommendations drawn up by a group independent of industry, including clinicians who follow electro-hypersensitive patients, based on the relationship between symptoms, time, and place; on ruling out other causes; on the use of existing codes; and on exposure reduction as the first measure, at home as well as at the source.
3. Train health professionals in exposure sources, device behavior, reference values, and the actual state of knowledge, and give them access, for their patients, to exposure measurements carried out by trained specialists, at no cost to the patient.
4. Create a public system for reporting symptoms attributed to electromagnetic fields, open directly to patients as well as to physicians, combined with a measurement of exposure where the patient lives and a standardized questionnaire, and whose anonymized data are made public.
5. Fund clinical research designed on the basis of what patients describe: long and repeated exposures, at home, physiological endpoints, single-case designs, and blinded trials of removing exposure at the sleeping place.
6. Have the biological markers and the radiosensitivity described in electro-hypersensitive individuals replicated by laboratories independent of one another and of industry, with matched controls, and validate clinical diagnostic criteria.
7. Make health care facilities accessible to the electro-hypersensitive—low-exposure waiting rooms and patient rooms, phones switched off—as the U.S. Access Board already recommends for public buildings.
8. Preserve the white zones that remain and reconstitute others, where the most severely affected electro-hypersensitive individuals can live and receive care, and reduce exposure at the source throughout the territory: otherwise, the only treatment that practitioners consider effective will remain out of reach.

Glossary

Term	Meaning
ADA	Americans with Disabilities Act: U.S. federal law of 1990 on the rights of individuals with disabilities.
Anses	Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (French Agency for Food, Environmental and Occupational Health & Safety): French public body, under the supervision of five ministries, responsible for health risk assessment.
ARTAC	Association pour la recherche thérapeutique anti-cancéreuse (Association for Research and Treatments Against Cancer): French association, founded by the oncologist Dominique Belpomme, which has followed a cohort of electro-hypersensitive patients since 2009.
ATM, RIANs	The ATM protein takes part in DNA repair; RIANs (radiation-induced ATM nucleoshuttling) refers to its migration to the nucleus after irradiation, a delay in which is the signature of radiosensitivity.
Biomarker	Measurable biological parameter, in blood, urine, or a tissue, that provides information on a state or a process of the body.
Blind study	Study in which the participant, and sometimes the experimenter, does not know whether the exposure is real or sham.
Case history (anamnesis)	Account, gathered by the physician, of the patient's history and symptoms.
Cerebrospinal fluid	Fluid that bathes the brain and spinal cord; it is collected by lumbar puncture.
Chronic fatigue syndrome	Myalgic encephalomyelitis: an illness characterized by disabling fatigue made worse by exertion, which the IOM proposed in 2015 to rename "systemic exertion intolerance disease."
Chronic multisystem illnesses	Category proposed by EUROPAEM for disorders of environmental origin affecting several systems of the body: multiple chemical sensitivity, chronic fatigue syndrome, fibromyalgia, electro-hypersensitivity.
Cluster (of cases)	Grouping, in a place or a period, of cases of the same disorder that are more numerous than expected.
Cognitive behavioral therapy (CBT)	Psychotherapy that aims to modify the thoughts and behaviors associated with a disorder.
Cohort	Group of individuals followed over time to observe the occurrence or the course of a disorder.
Conversion disorder, psychogenic disorder	Disorder in which neurological symptoms, with no lesion to explain them, are attributed to a psychological factor.
DECT	Standard for household cordless phones, around 1.9 GHz; the base transmits even when idle, except in ECO mode.
EHS	Abbreviation of electro-hypersensitivity used by the sources cited.
Electric Power Research Institute	U.S. nonprofit research institute funded by the electric power sector.

Term	Meaning
Electro-hypersensitivity, electrosensitivity	Electrosensitivity refers to a sensitivity to electromagnetic fields shared, to varying degrees, by all human beings; electro-hypersensitivity, to its highest degrees. We regard it as a syndrome, not as a disease (see Document 4, Section 3.1).
Electrosmog	All the artificial electromagnetic fields to which a human being is exposed at a given moment.
EUROPAEM	European Academy for Environmental Medicine, which in 2016 published a guideline on the prevention, diagnosis, and treatment of disorders related to electromagnetic fields.
FDA	Food and Drug Administration: U.S. federal agency responsible, among other things, for radiation-emitting products.
Fibroblast	Connective tissue cell; skin fibroblasts are easy to culture and are used for radiosensitivity tests.
Fibromyalgia	Syndrome combining widespread pain, fatigue, and sleep disorders, with no validated biological marker.
Haute Autorité de santé	French National Authority for Health: French public authority responsible, among other tasks, for drawing up good practice guidelines for health professionals.
Heart rate variability	Variation in the interval between two heartbeats, reflecting the activity of the autonomic nervous system.
Heat shock proteins (Hsp27, Hsp70)	Proteins produced by cells in response to stress.
HSEM	Hypersensibilité électromagnétique (electromagnetic hypersensitivity): abbreviation used in the French version of the WHO fact sheet.
ICD-10	International Classification of Diseases of the WHO, tenth revision. R68.8 designates “Other specified general symptoms and signs,” and Z58.4, exposure to radiation.
ICNIRP	International Commission on Non-Ionizing Radiation Protection: a private-law association registered in Germany, whose guidelines underpin European exposure limits.
IEI-EMF, IEI-CEM	Idiopathic environmental intolerance attributed to electromagnetic fields (IEI-CEM is the French abbreviation); term adopted by the WHO and Anses; “idiopathic” means that the cause is unknown.
Inserm	Institut national de la santé et de la recherche médicale (French National Institute of Health and Medical Research); French public body for biomedical research.
IOM	Institute of Medicine, now the National Academy of Medicine: U.S. academy that advises the federal government on health matters.
Mast cell	Immune system cell that releases histamine and other mediators of inflammation.
McDonald criteria	International diagnostic criteria for multiple sclerosis, revised several times, most recently in 2024.

Term	Meaning
MedWatch	FDA system through which health professionals and patients report adverse effects of medical products.
MRI	Magnetic resonance imaging: imaging technique that shows, among other things, lesions of the brain and spinal cord.
MTHR	Mobile Telecommunications and Health Research: British research program on mobile telephony and health, funded by government and industry.
Multiple chemical sensitivity	Syndrome of symptoms affecting several organs upon exposure to various chemical substances at concentrations well below those that affect the general population.
Multiple sclerosis (MS)	Inflammatory disease of the central nervous system in which myelin is destroyed in places; its diagnosis rests on the McDonald criteria.
Myelin	Sheath that surrounds nerve fibers and speeds up the conduction of nerve impulses.
Nitrotyrosine	Marker of nitrosative stress, produced by the action of peroxynitrite on proteins.
Nocebo effect	Adverse effect attributed to the expectation of harm rather than to the agent itself.
Odds ratio	Measure of statistical association; a value of 0.11 means that the event is about nine times less likely, in terms of odds, in one group than in the other.
Oligoclonal bands	Antibodies produced in the central nervous system and detected in the cerebrospinal fluid; their presence supports a diagnosis of multiple sclerosis.
Polysomnography	Simultaneous recording, during sleep, of brain, cardiac, respiratory, and muscle activity.
Provocation study	Experiment in which a subject is exposed, blind, to a real or sham field, and what the subject perceives or feels is recorded.
Radiosensitivity	Increased sensitivity of an individual or of their cells to ionizing radiation.
Regional centers for occupational and environmental diseases	French hospital consultations specializing in work-related and environment-related diseases; they feed the national vigilance network coordinated by Anses.
Repeated single-case design	Protocol in which the same individual is exposed several times, blind, to real and sham conditions, the individual's responses being analyzed individually.
S100B	Protein produced mainly by the glial cells of the nervous system, used as a marker of brain damage.
SFST	Société française de santé au travail (French Society of Occupational Health); learned society of occupational medicine and occupational health.
Small cell	Low-power, short-range antenna installed close to the ground, on street furniture or building facades, and connected to the operator's network like a base station; "small-area wireless access point" in European Union law (see Document 5, Section 4.1).
Specific absorption rate (SAR)	Power absorbed per unit mass of tissue, in watts per kilogram; it is used to check the compliance of devices worn near the body.

Term	Meaning
U.S. Access Board	U.S. federal agency responsible for accessibility rules for individuals with disabilities.
Voltage-gated calcium channels	Channels in cell membranes that open in response to a change in electrical potential and let calcium into the cell.
White zone	In territorial planning, an area without mobile coverage, which public policy aims to eliminate; for the electro-hypersensitive, a place almost free of artificial radiation, which must be preserved (see Document 1).
WHO	World Health Organization.
Wi-Fi	Wireless local area network, around 2.4, 5, and 6 GHz.

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