ICNIRP - a Review, mainly for Medical Centres

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A summary for medical professionals particularly when working in a hospital.

Quotes are all from ICNIRP documents; **Emphasis** is all the authors.

The main ICNIRP report is headed:

"ICNIRP GUIDELINES

FOR LIMITING EXPOSURE TO ELECTROMAGNETIC FIELDS
(100 KHZ TO 300 GHZ)"

https://www.icnirp.org/en/publications/article/rf-guidelines-2020.html

Introduction

The report, published by Wolters Kluwer Health, Inc. on behalf of the Health Physics Society and thus beginning with page 483 as relative page1, begins with the introduction which mentions only "humans". All other biological forms are simply not mentioned.

> "*THE GUIDELINES described here are for the **protection of humans** exposed to radiofrequency electromagnetic fields (EMFs) in the range 100 kHz to 300 GHz"*

This caution is added:

> *"Although these guidelines are based on the best science currently available, it is recognized that there may be limitations to this knowledge that could have implications for the exposure restrictions."*

ICNIRP makes no announcement nor interim publication when new evidence is found or faults are found in the assumptions or reasoning. Science in this field is advancing rapidly and it is arguable that interim updates should be issued annually.
(Noted by the 2022 paper by the International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF) to which ICNIRP made no response.).

The report then expands its rationale in the next section and it is worthwhile to point out that it immediately states it is for the "*protection for all people against **substantiated adverse health effects***", in other words ICNIRP recognises that there are proven adverse effects from WiFi. Later in the document it discusses **how** these may come about but I won't discuss that here.

Purpose and Scope

> *"The main objective of this publication is to establish guidelines for limiting exposure to EMFs that will provide a high level of protection for all people against **substantiated adverse health effects** from exposures to both short- and long-term, continuous and discontinuous radiofrequency EMFs."*

Continuing,

> *"However, some exposure scenarios are defined as **outside the scope** of these guidelines. Medical procedures may utilize EMFs, and metallic implants may alter or perturb EMFs in the body, which in turn can affect the body both directly (via direct interaction between field and tissue) and indirectly (via an intermediate conducting*

> *object). For example, radiofrequency ablation and hyperthermia are both used as medical treatments, and radiofrequency EMFs can indirectly cause harm by unintentionally interfering with active implantable medical devices (see ISO 2012) or altering EMFs due to the presence of conductive implants. As medical procedures rely on medical expertise to weigh potential harm against intended benefits, ICNIRP considers such exposure managed by qualified medical practitioners (i.e., to patients, carers and comforters, including, where relevant, fetuses), as well as the utilization of conducting materials for medical procedures, as beyond the scope of these guidelines (for further information, see UNEP/WHO/IRPA 1993)."*

and

> *"Radiofrequency EMFs may also interfere with electrical equipment more generally (i.e., not only implantable medical equipment), which can affect health indirectly by causing equipment to malfunction. This is referred to as electromagnetic compatibility, and is outside the scope of these guidelines (for further information, see IEC 2014)."*

Three mechanisms of action are discussed in the section "*Radiofrequency EMF Health Research*" from page 486 (or 5). Although there is little detail the section does mention "nerve stimulation" plus "*two primary biological effects: changes in the permeability of membranes and temperature rise*." This latter serves to confirm that it has considered **only the thermal effects**, leaving addressed the question of possible non-thermal effects.

Given this, It would be easy in a hospital or other medical setting to think that your consideration as to any affect on staff, patients and visitors has to be made on a scientific basis. However the decision that you take is not a scientific decision; it is an **ethical decision**, possibly a political decision and certainly not a scientific one even though it is **guided** by science.

The Principles report is a companion report to the Guideline.

https://www.icnirp.org/cms/upload/publications/ICNIRPprinciples2020.pdf

This much shorter article explains the main principles that guide the development of the report. It includes this note concerning **indirect effects**:

> *“Most health effects considered in non-ionizing radiation protection are direct effects. However, health effects can also arise from indirect pathways. For instance they may occur from an electric discharge arising from metallic objects charged by exposure to some types of non-ionizing radiation; these types of indirect effects are considered by ICNIRP. Other types are not, for example, heating of metallic objects in the body, such as prostheses, or an influence on the operation of medical devices such as pacemakers. The latter electromagnetic interference effects are of a technical nature and do not fall within the remit of ICNIRP.”*

These effects can be caused by medical equipment itself such as an MRI.

> *"ICNIRP provides scientifically-based advice and guidance on protection **against adverse effects** of non-ionizing radiation, including the provision of guidelines on limiting exposure."*

Note that ICNIRP provides " *scientifically-based advice"* yet **you** must take an **ethical** decision on the same issue.

Why would a Guideline be needed were there no "adverse effects" or it had been proven 100% "safe"?

> *"To establish a consistent framework of radiation protection over the entire spectrum of ionizing and non-ionizing radiation, the general principles for non-ionizing radiation protection are based, wherever appropriate, upon the well established principles for protection against adverse health effects from ionizing radiation (ICRP 2007) and the **underpinning ethical values**, as published by the International Commission on Radiological Protection (ICRP)."*

It continues with **Categories of exposure**

> *"In non-ionizing radiation protection, a distinction is made between **occupational** exposure, exposure of the general **public**, and **medical** exposure of patients."*

This is because those with occupational exposure are expected to have received **suitable education and training** about their own risks in the work environment whereas the general public and those in hospital for treatment cannot be expected to know to what they are being exposed nor what might be "safe". Note that ICNIRP never claims EMF to be "SAFE".

Has the establishment given proper training and education to all staff?

In any hospital the amount of wifi used in treatment and monitoring can be very high for 24 hours a day. It's important to recognise that the exposure Guidelines in the Report are specified as 6 minutes for the public and 30 minutes for trained workers. Staff at least have an opportunity to go home to an improved environment where they have at least some control but patients do not. And patients are, or can be, especially vulnerable, mentally and physically, for many reasons.

The Guideline also assumes occupational workers to be exposed for **40 hours a week**. We can probably guess that to be an under-estimate for many hospital staff but, more importantly, it is definitely so for in-patients who, each week of their stay, are exposed to occupational levels over 4 times that of staff.

ICNIRP agrees;

> "*Patients under medical care are another special category. They can be exposed to relatively high levels of non ionizing radiation for diagnostic or therapeutic purposes. If the applied non-ionizing radiation levels exceed the exposure restrictions for the general public*, the intended benefits of the procedure should outweigh the possibility of adverse effects. This justification is the **responsibility of physicians** who are diagnosing or treating the patient, and who have been **properly trained** to make such judgements.*"

*which is most likely

This decision will be different at different stages of treatment and recovery, and again assumes that the doctors and others have been properly and fully trained. Can we assume that all doctors and nurses have been properly educated and trained?

Note: Education is about giving people the ability to think for themselves in and around the subject. Training is showing people how to do something, without needing a deeper understanding. I would argue that for all patient facing medical staff they all need education.

Staff who are **pregnant** become a special, category for ICNIRP.

> *"Pregnant workers comprise a special category. The fetus has to be considered as belonging to the general population. If a female worker has declared that she is pregnant, she can only be exposed above the exposure restrictions for the general public provided that the exposure of the embryo or fetus remains below the general*

> *public restrictions."*

There is further guidance on foetus exposure within Appendix A at "*Considerations for fetal exposure*".

We should also consider that same guidance is even more important for pregnant women (workers and patients) in the maternity ward(s) and for nursing mothers before they return home - having been given guidance about a baby's (and a child's) sensitivity to EMF.

and in a more general sense,

> *"Exposure in occupational situations, both from natural and man-made sources, has to be regulated to prevent excessive exposure. It is also required that exposed workers be informed about the risks and measures they can take to prevent excessive exposure."*

It should be understood that patients will be exposed more than occupational workers so medical staff need training in mitigation **for those patients**. For example, 'what can be turned off at night', and 'restricting mobile phone usage to areas outside wards'.

ICNIRP does mention the difficulties of multiple sources of emissions such as will be common in a hospital, including staff and patients using mobile phones and tablets. One patient reading from a tablet could be in the bed next to someone who suffers with EMR-S; electromagnetic radiation syndrome. It raises a serious question as to whether every hospital should have a 'white ward' where there is no EMF at all.

> *"It is important to determine whether, in situations of simultaneous exposure to fields of different frequencies, these exposures are additive in their effects."*

A third relevant document is

The Statement;
Gaps in Knowledge Relevant to the “ICNIRP Guidelines ..."

Note this particular statement;

> *"THE MAIN goal of ICNIRP is to provide advice and guidance **to protect people and the environment** from unfavorable exposure to all forms of non-ionizing radiation (NIR)."*

yet nowhere in the Guideline does it mention the "environment", something of a contradiction.

A little further in we see

> *"Although the Guidelines are based on the best science currently available, during the preparation process ICNIRP identified limitations in the data available from the international scientific literature that are likely to have a tangible impact on future guideline development ..."*

The limitations are somewhat a natural part of science as it advances knowledge, so it is worth noting that the current version in mid-2025 is dated 2020 and the research leading to that would necessarily be completed sometime before the actual publication date.

There is also an element of it being a self-induced limitation terms of the relatively limited range of research that was used.

The paper concludes rather openly with,

> *"we have identified some gaps in knowledge that, if addressed with the above*

specified research, would greatly assist ICNIRP and others in the future development of radiofrequency EMF exposure guidelines"

I know of no steps that ICNIRP is taking to address these gaps.

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Based on ICNIRP 2020

Note 1: There is additional guidance courtesy of UKHSA and the Health & Safety Executive, though the latter does not mention hospitals and in other situations covers only workers.

Note 2: It is worthwhile to note that in response to a Freedom of Information request, the UKHSA responded that it is the duty of the device wearer to stay away from the exclusion zones of any transmitting device, eg a base-station. You might immediately wonder how they would know anything about that and, even if they were aware there was such a thing as an exclusion zone, they still wouldn't know exactly where that exclusion zone was, Since companies rarely give that information with any accuracy. How then is it possible for them to stay safe?

On a personal note, a good friend of mine had a defibrillator fitted and has said to me that whenever he walks near a telecoms base-station, the pain is agonising.