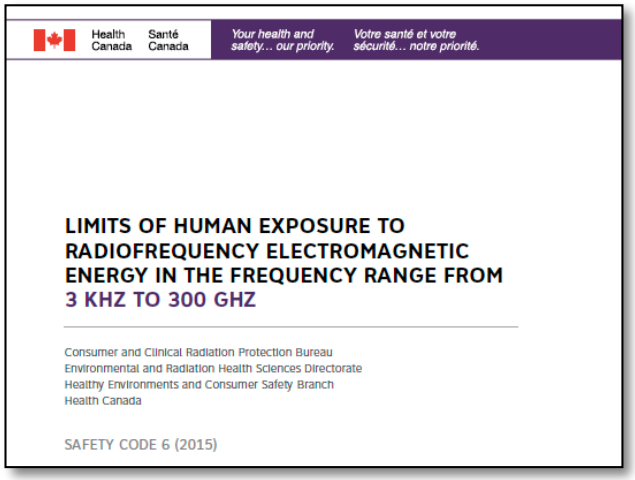
Item 5:
Opt-out Program for the Advanced Metering System

City of Winnipeg's smart water meter program aka Advanced Metering System (AMS) / Advanced Metering Infrastructure (AMI)

Does Health Canada's Safety Code 6 Protect the Public and Workers?






Health Canada Santé Canada

Your health and safety... our priority. Votre santé et votre sécurité... notre priorité.

LIMITS OF HUMAN EXPOSURE TO RADIOFREQUENCY ELECTROMAGNETIC ENERGY IN THE FREQUENCY RANGE FROM 3 KHZ TO 300 GHZ

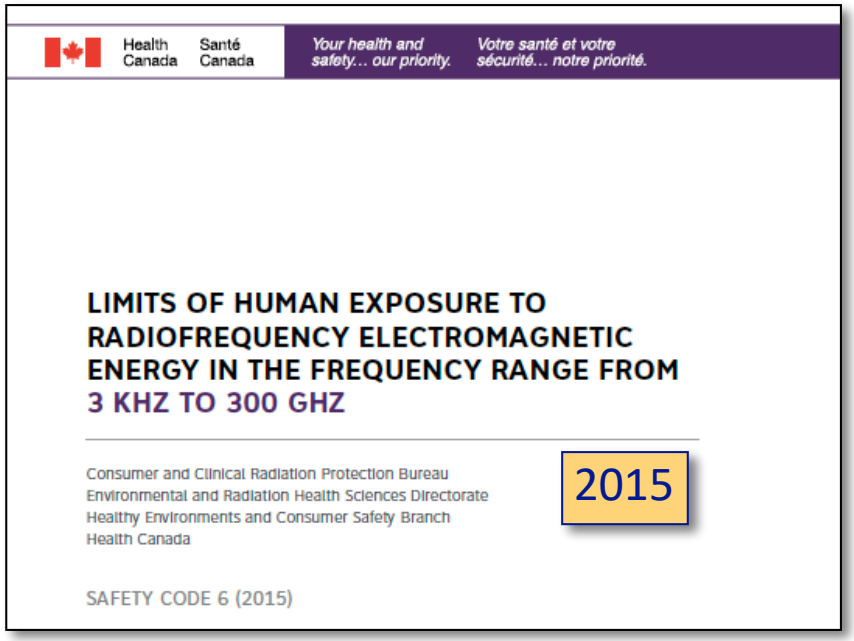
Consumer and Clinical Radiation Protection Bureau
Environmental and Radiation Health Sciences Directorate
Healthy Environments and Consumer Safety Branch
Health Canada

SAFETY CODE 6 (2015)

Magda Havas, Ph.D., Professor Emerita, Trent University;

July 8, 2025

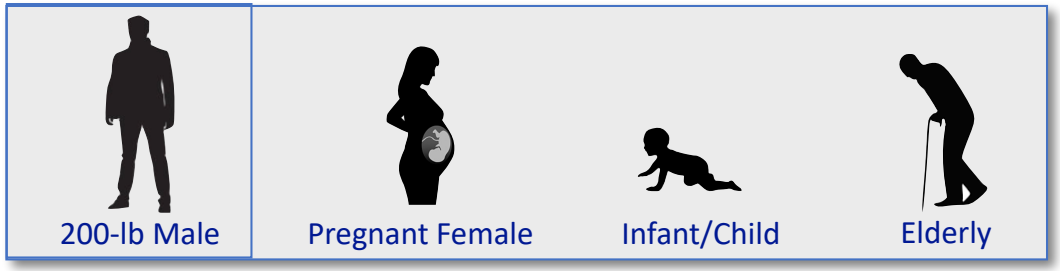
QUESTION: Does Health Canada's **Safety Code 6** Protect the **Public** & **Workers?**



ANSWER #1: **YES** … against **shock** (low frequencies) & against **heating** (high frequencies)

ANSWER #2: **NO** … as it does not consider **non-thermal effects** other than **shock**.

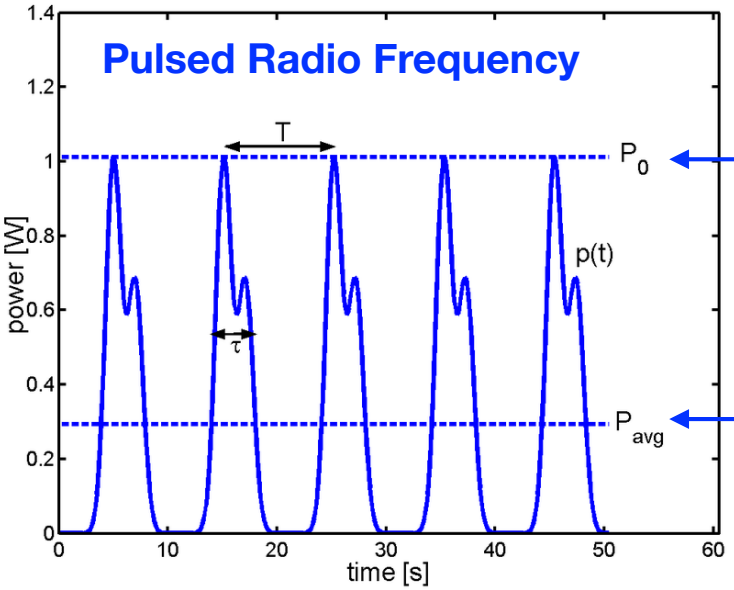
SC6 does NOT **differentiate** between effects on:



SC6 does NOT consider:

- Cancers
- Ocular Effects
- Reproduction
- Cognitive Effects
- Immune System
- Neurological Effects
- Hormonal Effects
- Multiple Toxins
- Duration of exposure





Peak Power
(Biologically Active)

Average Power

Assumed "safe"



Averaged over 6 minutes



According to Health Canada ... Canadian RF limits are among the most stringent science-based limits in the world.

Health Canada

FALSE!

Table 2. International radio frequency exposure guidelines for 1800 MHz range and common levels of exposure in natural and urban environments [based on: www.slt.co]

	Guidelines	Power Density (microW/m²)	Exposure Times	Limit Based on	Reference
Short-Term	Most of Western Europe	10,000,000	30 min	thermal/heating	IEEE C95.1-1999 & ICNIRP
	USA	10,000,000	30 min	thermal/heating	(FCC) IEEE C95.1-1999 & ICNIRP
	Canada	10,000,000	6 min	thermal/heating	Safety Code 6, Table 5 (2015)
	Russia, China, Italy, Most of Eastern Europe	100,000	3 hours plus	biological effects	Sanitary Norms
Long-Term	Switzerland	100,000	long term	precautionary	Ordinance on Protection from Non-ionizing radiation
	Toronto, Canada	100,000	long term	precautionary	Toronto Board of Health, Proposed 1999
	BioInitiative Report	1000	long term	biological & precautionary	BioInitiative Report Recommendations 2007
	Salzburg Resolution	1000	long term	precautionary	Preventive Public Health Protection, Salzburg, 2000
	European Parliament	106	long term	precautionary	Resolution 1815, Strasburg, 2011
	Germany (sleeping areas)	0.1	long term	precautionary	Building Biology Guidelines; level of no biological concern

Exposures	Power Density (microW/cm²)	Exposure Times	Exposure	Reference
Average indoor urban exposure Toronto, Canada	200 – 500	–	urban	Safe Living Technologies, Inc. 2011
Cell Phone Operation Requirements	0.001	–	cell phone requirements	
Natural Cosmic Radiation	0.000 0.001	long term	natural	MAES 2000

www.slt.co
www.katharinaconsulting.com

RFR Guidelines



Thermal – 6 to 30 minute exposure

least protective guideline

(physicists/engineers)

Precautionary – "non-thermal"

more protective

(biologists/doctors)



The key point . . . we can reduce SC6 guidelines from 10 million to less than 1 (microW/m²) and our cell phones would still work and so would most forms of wireless technology!

International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF)
Environmental Health (2022) 21:92
https://doi.org/10.1186/s12940-022-00900-9

Environmental Health

COMMENT

2022

Open Access

Scientific evidence invalidates health assumptions underlying the FCC and ICNIRP exposure limit determinations for radiofrequency radiation: implications for 5G

(Health Canada)

International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF)*

ICBE–EMF
INTERNATIONAL COMMISSION ON THE BIOLOGICAL EFFECTS OF ELECTROMAGNETIC FIELDS

Independent group of International EMF Scientists

230 references

Abstract

In the late-1990s, the FCC and ICNIRP adopted radiofrequency radiation (RFR) exposure limits to protect the public and workers from adverse effects of RFR. **These limits were based on results from behavioral studies conducted in the 1980s involving 40–60-minute exposures in 5 monkeys and 8 rats,** and then applying arbitrary safety factors to an apparent threshold specific absorption rate (SAR) of 4 W/kg. **The limits were also based on two major assumptions: any biological effects were due to excessive tissue heating and no effects would occur below the putative threshold SAR,** as well as twelve assumptions that were not specified by either the FCC or ICNIRP. In this paper, we show how the past 25 years of extensive research on RFR demonstrates that the assumptions underlying the FCC's and ICNIRP's exposure limits are invalid and continue to present a public health harm. **Adverse effects observed at exposures below the assumed threshold SAR include non-thermal induction of reactive oxygen species, DNA damage, cardiomyopathy, carcinogenicity, sperm damage, and neurological effects, including electromagnetic hypersensitivity.** Also, multiple **human studies have found statistically significant associations between RFR exposure and increased brain and thyroid cancer risk.** Yet, in 2020, and in light of the body of evidence reviewed in this article, the FCC and ICNIRP reaffirmed the same limits that were established in the 1990s. Consequently, these exposure limits, which are based on false suppositions, do not adequately protect workers, children, hypersensitive individuals, and the general population from short-term or long-term RFR exposures. Thus, urgently needed are health protective exposure limits for humans and the environment. These limits must be based on scientific evidence rather than on erroneous assumptions, especially given the increasing worldwide exposures of people and the environment to RFR, including novel forms of radiation from 5G telecommunications for which there are no adequate health effects studies.

https://ehjournal.biomedcentral.com/articles/10.1186/s12940-022-00900-9

https://www.youtube.com/watch?v=HnY-Dpl6i9U

14 flawed assumptions replaced by Scientific FACTS

FCC USA · ICNIRP International Commission on Non-Ionizing Radiation Protection · ICBE–EMF International Commission on the Biological Effects of Electromagnetic Fields

SAR 4 W/kg Effects documented well below threshold

1. **4 W/kg is NOT an adequate limit to prevent harm** since **adverse health effects** have been **documented** at levels **well below this thermal limit**.



2. **Ionizing radiation (IR) is the wrong model for non-ionizing radiation (NIR) bioeffects** since **IR** has a **direct effect** while **NIR** has an **indirect effect** on DNA. One of the **mechanisms** is **oxidative stress.**



Acute experiments cannot predict **Chronic** effects.

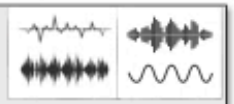
3. **FCC/ICNIRP limits do NOT protect against chronic exposure** since they did **not** test chronic exposure with long-term studies.

Synergistic effects with RFR & **environmental agents**



4. **FCC/ICNIRP ignore interactions with environmental agents** despite studies showing **synergistic** effects with various **carcinogens, mutagens,** and **inflammatory agents**.

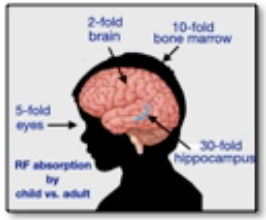
modulation
pulsing
frequency
polarization are bioactive



5. **FCC/ICNIRP ignore wave characteristics by focusing exclusively on SAR** despite these being bioactive.



6. **Statement that brain tumors are NOT increasing is false** because **glioblastoma** incidence has been increasing in UK & US since 1990s, which agrees with case-control experiments showing greatest risk is for **ipsilateral tumors** in parts of the brain that receive the **highest radiation from mobile phones** (i.e. **cerebellum, frontal & temporal lobes**).



Children absorb more RFR than adults

7. **FCC/ICNIRP ignore differences in RF absorption** despite the fact that **children absorb more RF radiation than adults** since they have a **thinner skull**, a **smaller head**, more **conductive brain tissue** & are still **growing** & **developing**.



8. **FCC/ICNIRP ignore individual sensitivities** despite the fact that **children, pregnant women** & those with **EHS** are more vulnerable to most environmental pollutants including **RFR**.

SAR 4W/kg HARMFUL



300–1000 SF

9. **50-fold safety factor for whole body exposure to RF radiation is inadquate to protect the public.** A more **appropriate safety factor** based on toxicology should be between **300 & 1000-fold**.

10 g tissue 2.0 W/kg
1 g tissue 1.6 W/kg



Under Estimates Effect

10. **10-fold safety factor for whole body exposure to RF radiation is inadequate to protect workers** who have **not been informed of the real health risks** since **FCC/ICNIRP believe there are no health effects** below their **thermal limit**.

SAR 4W/kg HARMFUL





100–1000 SF

11. **The larger the tissue (1 g vs. 10 g) and the higher the frequency the less reliable the SAR for localized effects. Tissue size is too large** for documenting effects at the **cellular level** and **SAR is an inappropriate metric above 6 GHz.**

10 g tissue 10 W/kg
1 g tissue 8 W/kg



Workers NOT informed of Risk

12. **Item 11 applies to the general population and item 12 applies to workers. Workers are NOT informed of health risk.**



13. **FCC/ICNIRP ignore environmental effects of RF radiation** despite numerous studies documenting EMF interference with **orientation, migration, food finding, mating, nest & den building** in **animals. Plants** are also adversely affected by RFR.



Untested & results in **higher exposures**

14. **5G small cells are likely to increase RF exposure** since many **more antennas** will be **closer to human populations** & since **5G** consists of **microwaves** used in **3G & 4G** (which are known to be **harmful**) and **mmwaves** (which **have not been tested for safety**).

QUESTION: Does Health Canada's Safety Code 6 Protect the Public & Workers?

No!

Wireless technology should be restricted to mobile devices!

If it is stationary ...



Smart Meter

it does not need to be wireless!