

Health effects of radiofrequency radiation: sifting and weighing the science

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Systematic Review



Addresses specific sets of questions

Captures and synthesizes all relevant information

Is collaborative, transparent and addresses bias

May build on a high quality previous review, but others are also poor quality

Canada's review of Safety Code 6 failed

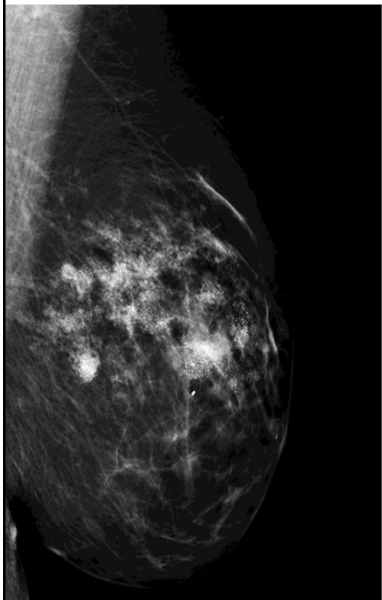
Rooney et al. 2014
The Lancet Series on
research reporting - 2014



Brain Cancer

Study	Findings	Referenced?
Hardell series Sweden	Increased tumours – e.g. glioma, acoustic neuroma higher risk with 1. early use 2. longer use Tumours more aggressive	✓/X
Peterson Sweden	No increased risk; poorer exposure ascertainment; smaller study	✓
INTERPHONE	Some countries and IARC analyses found increased risks	✓
CERENAT	Replicated Hardell earlier findings	X
Danish cohort	No increased risk with cell phone use Poor quality study	✓
English cohort	Increased acoustic neuroma with cell phone use > 10 y	✓

Breast Cancer



First case report, 2009. Nagourney, MD, PhD

- ❖ Invasive multiple primary tumors in 34 year old woman, avid runner, used her cell phone 4 hours a day; stored in her bra for 10 years.

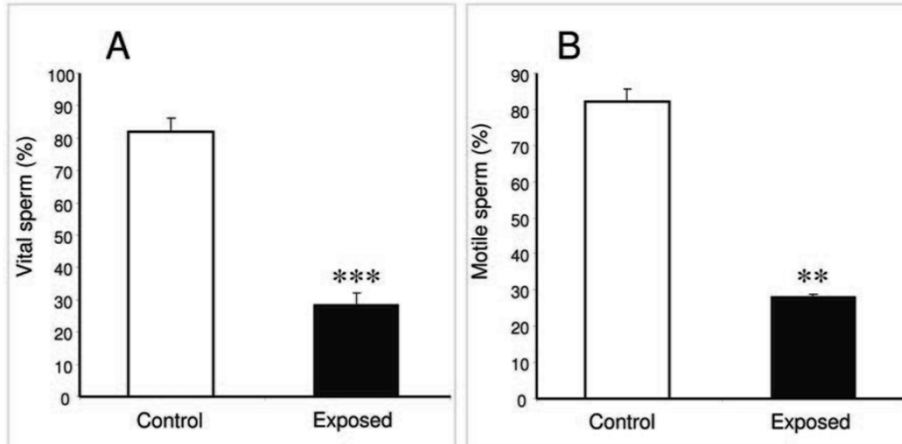
Eight more cases

- ❖ BRCA1/2 negative; no family history or other risk factors
- ❖ Unusual location of multi-focal tumors where phones were kept with mix of tubular/solid patterns of *identical nuclear morphology & grade*
- ❖ Two with metastases

ENVIRONMENTAL
HEALTH TRUST

Infertility, Birth Defects?

E.g. Sperm die, less mobile, DNA damage



De Iuliis et al. "Mobile Phone Radiation Induces Reactive Oxygen Species Production and DNA Damage in Human Spermatozoa In Vitro." *PLoS ONE* 4, no. 7 (July 31, 2009)

Access

Assess

all of the Science

Act upon

Magnitude of Research Material available

Royal Society of Canada, Chapter 7 (Health Effects): 124 publications

Bioinitiative Report 2007: 2,000 publications

Bioinitiative Report 2012: 1,800 publications

C4ST draft analysis, December 2014: 1,500 publications

Interactions of commonly used dietary supplements

with cardiovascular drugs: a systematic review: 33,224 publications

reviewed

Health Canada cannot properly determine the harmful effects of electromagnetic radiation without the proper tools and support.

Recommendation

That Health Canada conduct a comprehensive systematic review of the current scientific evidence on potential risks to human health caused by EMR, according to international best practices.

Employ scientific review panels with methodological and subject matter experts, who are balanced in opinion at the outset regarding the potential harmfulness of RF radiation.

Scientific evidence database should be routinely updated to detect when to re-assess.

Watch like a hawk for potential ill effects

The Government of Canada fund a publically available database to collect improved incidence data regarding potential links between health effects and exposure to EMR.

Include sufficient diagnostic details to support studies to detect and track trends in specific brain tumours, superficial breast cancers and other conditions such as sperm defects potentially associated with uses of wireless devices.

Exposure determinations, and assessments with multiple sources should mesh with health outcomes research.



ALARA

Health Canada be instructed to recommend precautionary approaches regarding exposures to electromagnetic radiation from wireless communications devices that are as Low As Reasonably Achievable (ALARA).

This should include, but not be limited to, minimizing exposures to protect the most vulnerable populations such as children and pregnant women.