

Vital Link

The professional journal of the Canadian Association of Naturopathic Doctors

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Walking the Talk of
EMF-RF

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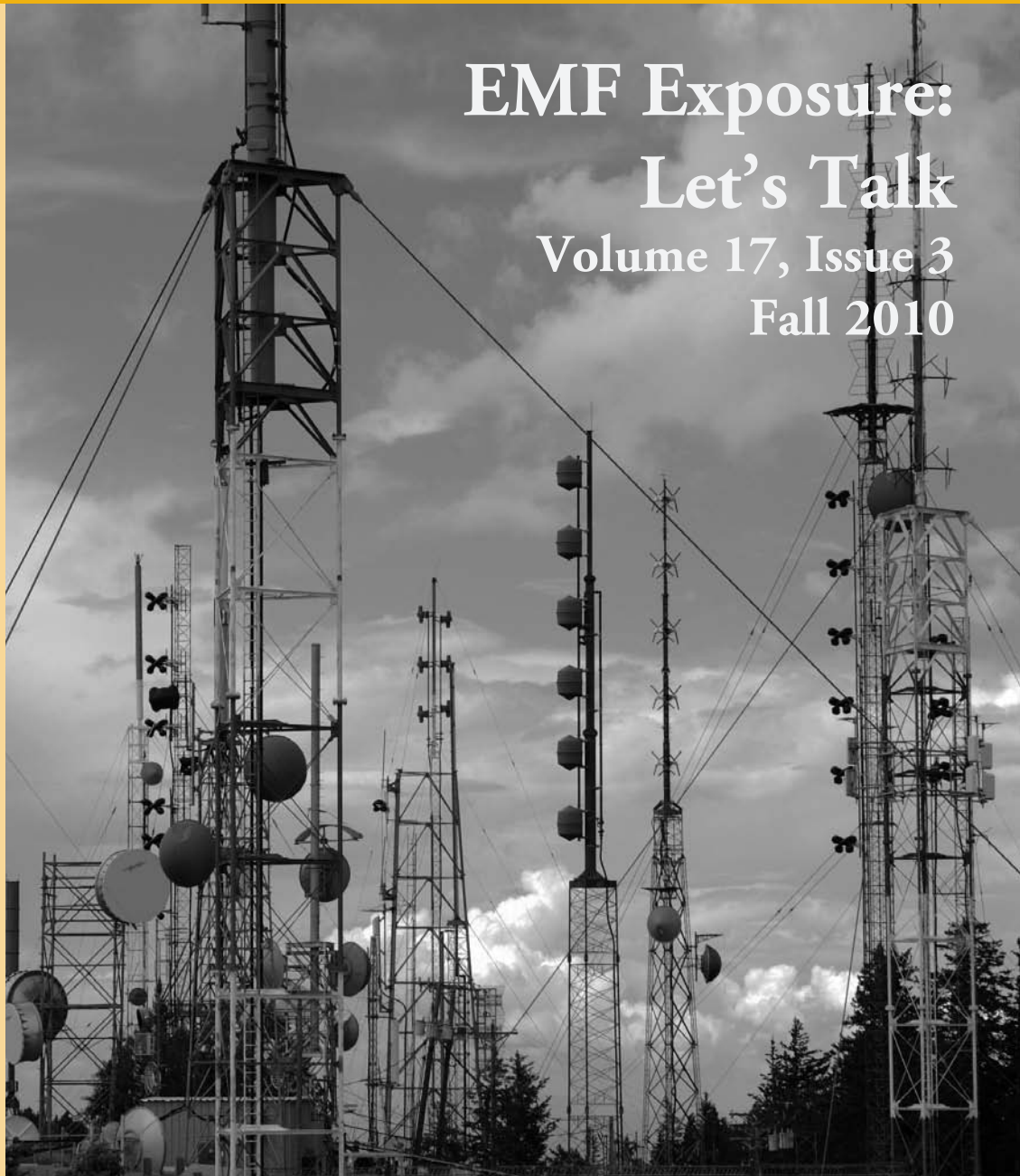
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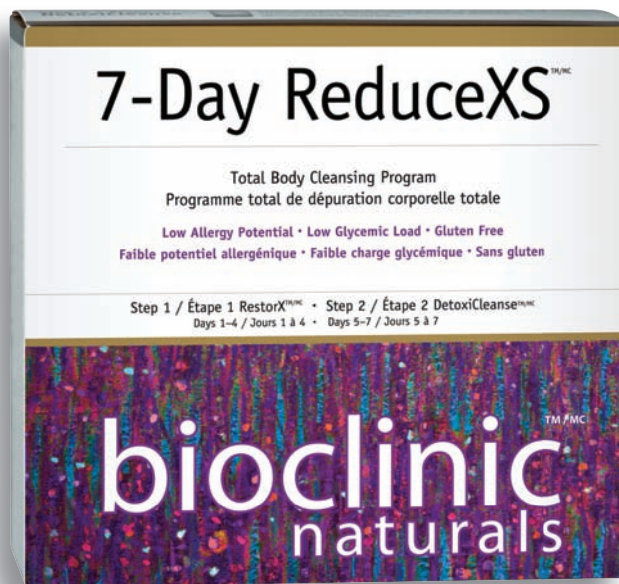
Are cell phones
actually safe for our
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Dr. Marianne Trevorrow, ND, MA

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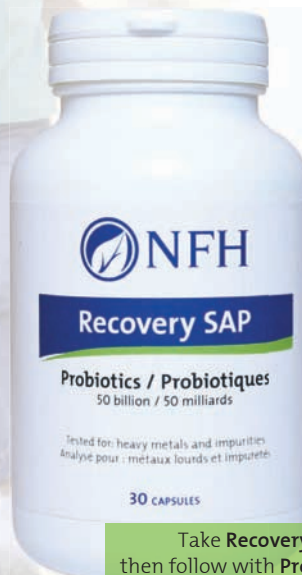
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<i>Lactobacillus plantarum</i> R1012	440 million
<i>Lactobacillus casei</i> R0215	440 million
<i>Bifidobacterium longum</i> R0175	330 million
<i>Bifidobacterium infantis</i> R0033	330 million
<i>Bifidobacterium breve</i> R0070	330 million
<i>Streptococcus thermophilus</i> R0083	220 million
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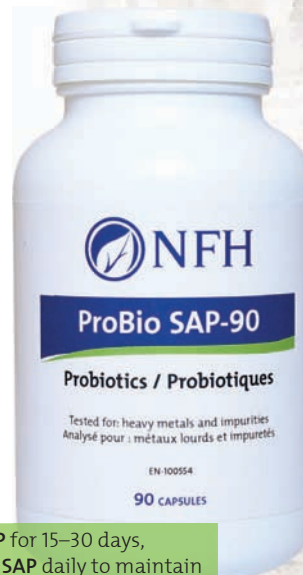
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Vital Link

Volume 17, Issue 3, Fall 2010
EMF Exposure: Let's Talk

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The *Vital Link* is the professional journal of the Canadian Association of Naturopathic Doctors (CAND). It is published primarily for CAND members and features detailed reviews of specific causal factors: philosophical and research-based papers, clinical practice articles and case reviews, as well as international updates on the profession. The *Vital Link* has an outreach to other health care professions and promotes qualified naturopathic doctors to corporations, insurance companies and the Canadian government.

Forthcoming Themes

Winter - Spring 2011

The Missing Ingredient: Posture

Summer 2011

The Psychology of Healing

Submissions

When writing for the *Vital Link*, keep in mind its broad readership and outreach to other professions. Your contribution to the *Vital Link* will benefit the naturopathic profession as a whole and provide you with personal professional exposure. Previously unpublished material is preferred. Please contact the managing editor for submission guidelines.

Circulation

The *Vital Link* is published three times per year and is distributed to over 1900 qualified Canadian NDs and students of CNME-accredited naturopathic programs in Canada and the U.S. The *Vital Link* is also distributed to the CAND's corporate members and in our media kit. The journal is available electronically to members only.

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Professional vendors providing NHPD-compliant products or other services to NDs are encouraged to advertise in the *Vital Link*. The CAND's advertising partners enjoy unequalled exposure to qualified Canadian naturopathic doctors.

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Naturopathic Notes

Dr. Iva Lloyd, RPP, ND, CAND Past-Chair
Vital Link Naturopathic Editor in Chief

I am very excited about this edition of the *Vital Link* and its review of the current research on electromagnetic and radio-frequencies. Exposure to electromagnetic frequencies (EMFs) or “electropollution” is a growing concern. It may be the most devastating threat to health yet and deserves much more attention from the technology and health care industries.

The goal of this *Vital Link* is to assist NDs in identifying and addressing when EMF radiation is a factor for our patients or when it is an obstacle to cure.

Like heavy metals and environmental toxins, the impact of EMF exposure is ubiquitous, pervasive and rapidly increasing. The symptoms associated with EMF exposure range from mild irritation, anxiety, insomnia and skin rashes to continual disruption of the sympathetic nervous system increasing cortisol levels to severe symptoms and diseases such as infertility, autoimmune diseases, neurological disorders and cancer. We are only starting to understand the true impact of EMF radiation, owing partly to the reluctance of the sector's key companies to fully delve into the short- and long-term health impacts of EMF exposure, and otherwise due to a consumer desire for technological progress and advancement versus environmental sustainability and disease prevention.

The way in which naturopathic doctors practice medicine is changing. Asking questions about EMF exposure, time spent on cell phones, PDAs, iPhones, cordless phones and around wireless networks; the number of appliances in bedrooms and work areas, about where patients live and their proximity to cell towers, has become a necessary aspect of an intake. An increasing list of factors needs to be explored and considered when dealing with patients' health concerns; especially those of young children.

Electropollution is invisible, yet its impact is immense. It, like many other factors, is becoming an obstacle to cure. It is becoming increasingly important for naturopathic doctors to recognize that the physical body is never the cause of disease; the body reacts and responds to the tangible and intangible forces that it encounters. Health cannot simply be achieved by focusing on symptoms. It is only by identifying and addressing the causal factors of disease that the body burden can be decreased sufficiently to allow the healing ability of the body to take over.

The articles within this edition provide information on how to assess the prevalence of electropollution; how it contributes

to a patient's diagnoses, when it is an obstacle to cure and the steps you can take to assist your patients in minimizing their exposure. There is also a helpful patient information sheet on EMF exposure available for download http://www.cand.ca/fileadmin/cand/documents_members/environmental/EMF-RF_exposure_251010.pdf

In this *Vital Link* Dr. Mitchell Zeifman, ND provides a detailed review of iPhone applications to assist practitioners. The demand for information to be available at our fingertips is another way in which the practice of medicine is changing. It is important for naturopathic doctors to stay current with technology and the tools available to simplify practicing in an increasingly complex field. I encourage you to try the applications listed and see how they could simplify the way you practice.

I recognize the irony of discussing iPhone applications as a benefit to practice at the same time as discussing the concerns associated with wireless technology. This illustrates a challenge that we all face both personally and professionally.

As part of an ongoing initiative to highlight naturopathic doctors that are making a significant contribution to the profession, this edition takes a look at Dr. Glenna Morris, ND from Halifax, Nova Scotia. Glenna has served as a CAND board member and is one of the profession's strongest supporters in Nova Scotia's quickly-changing naturopathic environment.

Our readers will also benefit from this issue's excellent research and practice papers, contributed by naturopathic doctors Caroline Bearss, Deborah Kennedy and Marianne Trevorrow.

As we strive to create a professional journal that is an invaluable reference to the naturopathic community we welcome your comments, feedback and ideas. There is a lot of wisdom within the naturopathic profession and the *Vital Link* will continue to provide a voice for that wisdom.

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ND Spotlight: Dr. Glenna Morris, ND

Dr. Jennifer Salib Huber BSc, Pdt, ND

Dr. Glenna Morris, ND owner of Balance Naturopathic Health Centre in Halifax, Nova Scotia knows all about maintaining balance in her life as a busy naturopathic doctor and new mom to five month-old Isabel. I sat down with her to chat about her path to becoming an ND, and how she achieves balance in her life.

While a student at St. Francis Xavier University in Antigonish, NS, Glenna knew she was looking for a health care profession that addressed both the mental and physical aspects of wellness. She wanted to provide a service that would empower patients to make positive changes towards their health. After briefly considering nursing or kinesiology, Glenna continued towards her degree in human nutrition. After a fateful encounter with Dr. Lois Hare, ND in Berwick Glenna knew she'd found what she was looking for

"After just a few hours shadowing her in her clinic I knew naturopathic medicine was exactly what I was looking for. The way she was able to address her patients' whole health was what really impressed me."

After graduating in 2001, Dr. Morris returned home to Sydney, Cape Breton where she worked alongside a massage therapist, and a chiropractor. After they both left the province, she opened her own small clinic and practiced in Cape Breton for another two years.

In 2004, she opened Balance Naturopathic Health Centre in Halifax. Why 'Balance'? Glenna because she wanted a simple, easy to remember name that people from all walks of life could relate to as a concept. She wanted to attract the individuals who were already aware of naturopathic medicine but also wanted the name to catch the attention of those who were unfamiliar with naturopathic medicine.

But running a multi-disciplinary clinic has its challenges.

"The biggest challenge is the management aspect. Building a cohesive team requires one to be flexible, patient, confident and able to see things from many different perspectives. The administrative support that each profession requires is varied so deciding what the front desk staff needs to prioritize can be a challenging task. To run a large clinic the owner needs to be able to continuously step back and look at the whole. Different practitioners may have different needs and expectations so being up front from the very beginning of each relationship will save time and energy in the long run. The owner must be able to wear different hats throughout the day without the transition taking away from their focus on their practice. Finding a team that works well together and has the same philosophy is extremely helpful but takes perseverance. Each individual in the clinic needs to be a team player in order for the clinic to thrive as a whole".

I asked Glenna what is the most challenging aspect of being an ND.

"Right now the most challenging aspect of being an ND is juggling my career with being a new mom! On the other hand being an ND while having a small baby has allowed flexibility

that I wouldn't have had in many other professions. In general the most difficult aspect of being an ND is balancing the time given to reading/research as well to patient hours. When I am with my patients I start thinking how much I would like to increase my availability to see more patients, but the same thing happens when I am reading naturopathic information. I start thinking how much I would love to have more time to research. I think it is a great sign that I love to do both. That is why being a naturopathic doctor will keep me happy for many years to come."

When all is said and done, Dr. Morris wouldn't change a thing. She is grateful for everything she's learned during the last few years and has been able to apply this knowledge to all areas of her life. Some changes have included downsizing her clinic by approximately 50%, in order to allow her to spend less time managing, and more time practicing.

Last, but not least, I asked Glenna for some parting advice to new practitioners.

"I have worked by myself, owned clinics that were as small as three people to as large as seventeen. I think the most important thing is to know where you want to put your time and energy. Before you do make a big decision, break things down and decide what you want to spend most of your time doing. If it is practising then keep it small or even work by yourself. If you find practice is not enough for you and you want to be more involved with managing and the business side of things then try expanding, but do it slowly step by step and don't take short cuts. In the long run it will be worth it. Learning the skills that it takes to run a clinic with multiple people (both practitioners and office administrators) takes time.

"After graduation is when most of the learning takes place. Continuing education is essential to keep your practice flourishing. Conversing with colleagues will keep you refreshed and keep you advancing your skills. Having a conversation with my mentor, Dr. Kumar Biswas, ND both inspires and challenges me to continually add to my skill set.

"Above all be true to yourself in the work environment you choose just as you would in your personal life. Your work environment needs to be supportive so that you will thrive in your work whatever you choose to spend your time doing. Of course, being a naturopathic doctor, I want to add that you must be sure to take care of yourself in mind, body and spirit. Don't wait until you have nothing left to give. As my friend and colleague, Dr. Sarah Baillie, ND shared with me, take regular time off. Don't wait until you have nothing left to give to take a break, be proactive and stay healthy."

NDs: There's An App For You

Dr. Mitchell Zeifman, ND

Ladies and gentlemen, I have seen the future and it fits it the palm of your hand. The smartphone has revolutionized communication and information technology by combining their distinct elements into one portable, utilitarian and (let's be honest) aesthetic package.

Leading the charge is the Apple iPhone. Beyond the marketing hype, the iPhone (and similar devices) offers consumers thousands of applications ("apps") to choose from, some frivolous and some practical. This article will look at the more practical application of smartphone tech in the field of health care, specifically regarding the iPhone, because it offers the most robust list of applications at this time.

As the iPhone tagline goes, "There's an app for that." And there literally are hundreds of medical and health-related apps available. While browsing through the app store can make me feel like a kid in a candy shop, separating the wheat from the chaff (excuse the gluten reference) can be a time consuming proposal. To that end, I will review some of my favourite iPhone apps. While some of these apps are exclusive to the iPhone, many can be found on a number of smartphone and personal data assistant (PDA) platforms.

All-In-One Medical Apps

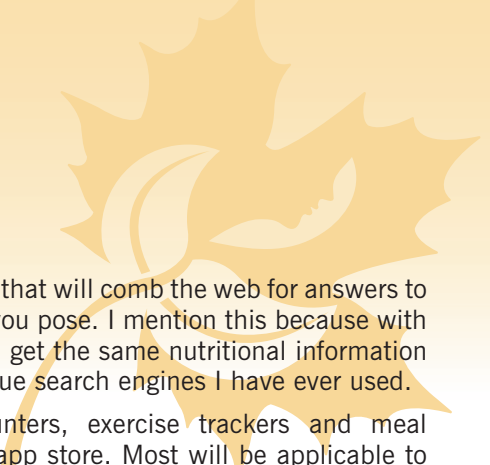
Back when smartphones were just a dream, I was using a PDA as my on-the-go medical reference tool. One of the best medical reference resources I used was **ePocrates**, so it was one of the first medical apps I added to my iPhone. There are several versions and price structures available, from a stripped-down free version (ePocrates Rx) that offers a basic drug index to the robust ePocrates Essentials Deluxe (\$199 US /yr), which adds alternative medicines, disease monographs, diagnostic and laboratory tests and a medical dictionary to its suite of resources. I settled on ePocrates Essentials (\$159 US /yr), which has all the features of the deluxe package, save for ICD codes and the medical dictionary. The price may seem steep, but it is well worth it as I use this app constantly in my private practice and when teaching. Some of its better features are: regular content updates; a drug interaction checker that can combine a number of drugs and natural medicines; a fairly comprehensive disease section that includes cross-searchable differentials and images; and medical news updates that can be customized to your areas of interest (within the confines of western medicine). It also boasts a tools section that contains useful medical calculators (BMI, Pregnancy Wheel, Ideal Body Weight, etc.) and stand-alone free apps that greatly expand tools, like their BMI app that calculates and charts BMI, BMR, and offers general treatment suggestions and algorithms. The main criticism I have of ePocrates is that it is missing a symptom check tool (which was present in the PDA version) that allows you to choose presenting symptoms to determine a differential list.

Also, it uses US drug brand names (though generic name is always referenced and searchable) and its disease database seems incomplete when it comes to less common diagnoses. However, content updates make this package a continually evolving resource.

Lest this become an ePocrates love-in, let's take a look at a few other all-in-one medical apps. **PEPID** evolved to the smartphone from the PDA, like ePocrates. The free version (PEPID Elements) is based around a toxicology database, but also contains a drug interaction checker and a differential diagnosis tool that allows you to enter symptoms for a list of differentials. However, there is no drug or disease information contained in this free version. PEPID Elements is the base app for a line of paid medical programs; the one most comparable to ePocrates is PEPID PCP Platinum (\$240 US /yr). It boasts primary care content, a drug database, a differential generator (as in the free version), a drug interaction generator (as in the free version), medical calculators, laboratory and diagnostic test information and many illustrations. Users can try out PEPID PCP Platinum in a free 14-day trial.

Lexi-Comp is another suite of medical apps in one, available on multiple platforms. Unfortunately, Lexi-Comp's free app is only a 30-day trial for its paid versions, so your options are limited. There are a variety of paid versions from Lexi-Comp to choose from, the most applicable to a primary care ND being: Lexi-Clinical Suite (\$180 US/yr), which offers drugs, drug interactions, lab tests and Harrison's Practice; Lexi-Select (\$220 US/yr), which adds natural product and infectious disease databases to the list, as well as a host of specialty specific databases; and Lexi-Complete (\$300 US/yr), their most comprehensive package, which adds resources like The 5-Minute Pediatric Consult, medical abbreviations, Stedman's Medical Dictionary and a medical calculator to the mix. The steep price tag to these Lexi-Comp products does not reflect their value to a naturopathic doctor. The best component is the natural product database, which is quite extensive, informative and well-referenced. The lab test and drug databases are comparable to other apps, as is Harrison's Practice akin to other disease databases mentioned. Finally, the functionality of this product is less user-friendly, as one has to scroll through each individual entry rather than being able to open separate elements individually (for example, drug dosing, interactions, adverse reactions).

The focus so far has been on apps that offer a lot, for a price. **Medscape**, from WebMD, which runs a popular web-based



medical information site, is a wonder, as it is free and loaded with practical information. At its core are the standard drug and disease databases, which are completely searchable and cross-referable. Plus, the drug section includes an extensive herbal and nutritional medicine database and interaction check that is comparable to the paid version on ePocrates. Medscape also sends the most current research and medical news to your iPhone. And did I mention it's free? This one doesn't take much clinical decision making to figure out its worthiness. Download it.

Finally, in the all-in-one category we look at **Skyscape**. Another program that started on the PDA platform, Skyscape is unique from the other apps discussed so far in that it is both a free suite of medical products and a platform for other medical databases and electronic texts. The base app contains a medical tool suite, a drug database and drug interaction tool, and updates from medical news, research and safety. The interface is slightly confusing when trying to access information in a busy clinical setting, but these basics are worth the price of admission (i.e. memory space). Where Skyscape truly excels is as a portal and platform to other purchasable content. From the perspective of a ND, it provides access to many specifically applicable texts and resources, one of which is Natural Standard, a web and smartphone based natural product resource. It is beyond the scope of this article to go into detail about the many resources available, so suffice it to say that it pays to have Skyscape on your smartphone for those texts and services you may want to purchase, along with the free resources mentioned.

CAM Apps

With all the aforementioned medical apps (and more) available on the iPhone, the CAM-specific apps are paltry in comparison. There is a definite dearth of apps that contain the level of professional information NDs need. I will highlight some of the top apps in this category and point out the losers.

In the nutritional medicine category, the first app that catches the eye is **VitaminPlus** (free), a vitamin and mineral database. To say it is a bare bones database is like calling the Sahara a little bit dry. Medscape's nutritional information far outshines the content of VitaminPlus (I'm still trying to figure out what the "Plus" refers to). Don't waste your space on this app. There are a few apps that allow you to calculate nutrition content, like what appears on labels of food products. You can specify amounts in some of these apps to get incremental nutritional information. There is little reason to spend money on an app such as this, so if you are interested download the free **Nutrition Facts Calculator**. But, there is an app called Wolfram Alpha (\$1.99), that is a

scientific search engine that will comb the web for answers to the scientific question you pose. I mention this because with Wolfram Alpha you can get the same nutritional information in one of the most unique search engines I have ever used.

There are calorie counters, exercise trackers and meal planners galore in the app store. Most will be applicable to your personal life or as recommendations to your patients, but not as clinical applications. The Glycemic Index (GI) specific apps may be more applicable to a clinical setting. In this category it seems you get what you pay for; the free and less expensive apps are basic, though the paid apps may charge more than they are worth to you. However, the best from GI Diet focused apps are **Diabetic Meal Planner Pro** (\$13.99), which specifically focuses on low glycemic impact meals and allows the user to calculate the Glycemic Index (GI) and Load (GL) for individual meals or the entire day. **Diet Science Pro** (\$9.99) contains a number of diet-based calculators, including GI and GL, BMI and daily calorie requirements. Finally, a little app I love is **What's on my Food?** (free), provided by the Pesticide Action Network. It provides a listing of pesticides found on or in most foods and compares the foods to their organic counterparts. It is fascinating and frightening; an app you and your patients will want to have.

In the category of botanical medicine, there are not many worthy apps for advanced practitioners. As with the nutritional apps, Medscape offers better free information on herbal medicines than most of the paid herbal apps. Until a more professional herbal medicine app is available, there is nothing I can recommend either free or paid. However, under the category of herbal medicine in the iTunes store you will find a little gem of an app. **TCM Clinic Aid** (\$5.99) combines the information from texts by Bensky, Deadman, Maccioca and more, into a searchable and customizable database for TCM diagnosis, acupuncture and herbal treatments. Point location and graphics are very accurate and listed by individual points and channels, including auricular points. The materia medica is arranged by herb categories, individual herbs, formula categories and individual formulas. I don't want to say it too loudly, but I can't believe this app is only six dollars as the information and functionality of this app make it worth at least ten times as much. You can also buy add-ons such as Master Tung Point Reference, Wrist/Ankle Acupuncture, and a self-testing app. Look no further for your smartphone pocket reference to Asian Medicine.

Homeopathy is another category that is, surprisingly, poorly developed with regards to apps. I have looked at most of the homeopathy apps currently available and none has the depth necessary for clinical reportoring, even on a basic level. Most of the homeopathy apps are for the layman, so if you want a quick reference to major remedies for common conditions you can download **iHomeopathy** (\$3.99) or **iHomeopath**

NDs: There's An App For You, continued

(\$7.99). In the category of physical medicine there is one app that stands out and little else to recommend. **Muscle Trigger Points** (\$2.99) is just the handy kind of app that makes the iPhone fun and functional. Its centerpiece is a 3D model of a human figure detailing the musculature alone. The figure can be rotated to view mapped trigger points, which, when pressed, take you to a more detailed illustration of the trigger point and its radiation patterns. This app can also be mapped by muscle zones and searched by individual muscle. For the price of a cup of tea you get an extremely practical resource for discerning tension patterns of pain in your patients.

Diagnostic Apps

If you are budgeting your resources and do not want to shell out a yearly fee for one of the all-in-one-apps (though, if you've purchased an iPhone, you're hardly on a budget), there are a few handy diagnostic apps and medical tools you should have in your medical folder. **Diagnosaurus DDx** (\$.99) is a fairly basic differential diagnosis database, but right for the price. One can search by symptom, disease or organ system for the most likely diagnoses and their descriptions. This app lacks a multi-symptom check feature, which is helpful when trying to figure out a more complex presentation. At ten-times the price, **Differential Diagnosis i-pocket** (\$9.99) does not possess many more features than *Diagnosaurus*, especially the all-important multi-symptom check. **Medical Lab Tests** (\$5.99) is a pocket reference for lab values alone. It provides a list of tests by category and a search function. The description of each test provides a general overview, reference values, clinical information and interpretation of abnormal results. As a stand-alone laboratory reference **Medical Lab Tests** is, as the name implies, just about lab tests and overlooks non-lab based diagnostic tests. Also, it is deficient in a number of important tests, making this app hard to recommend. **Lab Dx** (\$9.99) is a more robust lab reference, with a place for notes, reference values in both SI and conventional units and links to website information.

Medical calculator tools are a feature of most medical app suites, like the ones mentioned in this article. And, although as naturopathic doctors we have less use for a good number of the featured tools (Ranson's Criteria anyone?), there are a surprising number of tools one would find useful on a regular basis. I would recommend downloading a free medical calculator tool, even if you have an all-in-one app, as they have a surprising range of applications beyond what is found in the medical suite medical tools. Two of the best, free medical calculator apps are **QxCalculate** and **MedCalc**. *QxCalculate* is a medical algorithm calculator stuffed with scores, scales and classifications. Some of the more useful calculators include Framingham Risk Score, Due Date by LMP, BMI, Metabolic Syndrome, and dermatome maps. *MedCalc* is a slightly fuller package, with a few more useful (to the ND) calculators, illustrations and charts than *QxCalculate*, like a Snellen eye chart. *MedCalc* can also be upgraded (\$7.99) to a "Pro" version that allows one to build

a patient database and provides formula list captions to help identify what the formula is about.

Resources for medical information abound in the app store and downloading too many will leave you looking at none. A couple of my favourites are **PLoS Medicine**, an open access medical journal and **MedPage Today**, a customizable medical news portal. For PubMed access, there are a few portals, and one generally has to pay for the service if you want a fully functional search app. App prices range from \$2.99 to \$9.99 and you may find that the least expensive (**PubMed on Tap**) is better suited to your needs than the most expensive (**PubMed Library**).

With all of these information and diagnostic apps one might think that the iPhone could take your place as the doctor. Of course that is not true, but solid diagnostic skills are the key to successful treatment. The iPhone can help you keep up those skills with apps that include anatomy quizzes, ECG interpretation guides, auscultation aids and physical exam resources. Most are inexpensive and provide a convenient way to brush up on and improve your abilities. In addition, most app developers respond to consumer reviews and update their apps to fix problematic issues, so the app you originally purchase will improve over time.

I find the handy resource of my iPhone medical apps indispensable in my daily practice. If you are not using medical apps on your smartphone, you are not using it to its full potential. I hope this article helps you get on your way, or helps more experienced users clear out the app clutter. And if you haven't got a smartphone, I've provided you with some great reasons to consider the investment.

About the Author

Mitchell Zeifman, ND is a graduate of the Canadian College of Naturopathic Medicine and has been practicing in Toronto since 2003. In addition to running a private practice in midtown Toronto, Dr. Zeifman is also a supervising naturopath at the Robert Schad Naturopathic Clinic, the teaching clinic at the Canadian College of Naturopathic Medicine, and an instructor/co-ordinator for the second year botanical medicine course at CCNM.

Dr. Zeifman treats a wide range of health concerns in his practice and has a specific interest in environmental medicine. He is also passionate about herbal medicine and uses herbs as one of his main treatment modalities.

He is also passionate about his iPhone, so if you see him walking down the street with his eyes focused on its screen, please make sure he doesn't bump into any objects while you tell him about your favourite apps.

Please note that app prices were accurate at the time of press.

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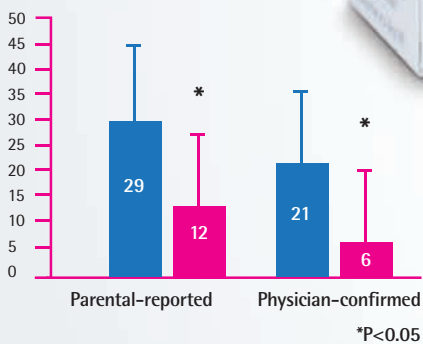
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Government Relations and Policy Update

Shawn O'Reilly
Executive Director, Director of Government Relations



Status of GST/HST Application

- During summer 2010 all provincial and territorial associations submitted letters of support to the Department of Finance
- The Finance Department has advised that the results of their review have been forwarded to the Finance Minister for a decision
- The CAND is in following up with the Minister and will advise members accordingly

Standing Committee on Health, Sub Committee on Health Human Resources

- The CAND appeared before the Committee to outline how NDs are already positively impacting the challenges in HHR, could assist further and highlighted barriers to interprofessional collaboration
- The Committee's report was released during the summer
- The CAND is referenced in Chapter 5 – "Promoting Innovative Solutions to HHR Challenges"
- The Report incorporates two of our recommendations:
 - o That the federal government identify and address systemic barriers to the implementation of inter-professional collaborative practice within its jurisdiction, including its responsibilities as the employer of the federal public service and the health benefits and services it provides to federal client groups
 - o That the federal government consider the possibility of establishing sustained funding mechanisms devoted to promoting interprofessional collaborative practice within the provinces and territories
- The full report and the government's response can be found on the website for the Standing Committee on Health (www2.parl.gc.ca/committeebusiness/CommitteeHome.aspx)
- The government's response does not reflect the Committee's recommendations leading one to wonder why the Committee was struck

Natural Health Products

- In August the Unprocessed Product License Application Regulation (UPLAR) came into force to address the National Association of Pharmacy Regulatory Authorities (NAPRA) position statement
- Products currently in the application process will now be given Exemption Numbers, after an initial review for safety, allowing their continued sale until they have completed the application process
- As a result NAPRA has amended its position to state that pharmacies should not sell a marketed health product unless it has a DIN, NPN, DIN-HM or EN
- The CAND is pleased to announce that it has been appointed a member of the permanent Program Advisory Committee (PAC) of the Natural Health Products Directorate (NHPD) following its participation in the inaugural Committee. The appointment is for a term of three years. Full details on the PAC including all reports, can be found on the NHPD website

Fall Sitting of the House of Commons

- Bill C-36, The Canada Consumer Product Safety Act is currently in debate following second reading. It will shortly be sent to the Standing Committee on Health for review. It is important to remember that the Bill contains a specific exemption for Natural Health Products
- There is the potential for government to reintroduce proposed amendments to the Food and Drugs Act this fall. Sources have advised the CAND the government will first gauge the reaction to Bill C-36 before proceeding
- The CAND continues to monitor federal legislation, and meet with members of parliament and staff on issues important to the profession



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Physician Heal Thyself – Walking the Talk of EMF-RF

Dr. Caroline Bearss, MA, ND, BBEC

Electromagnetic radiation is a controversial issue worldwide. Various studies globally have identified that extremely low frequency (ELF), radio frequency (RF) and microwave radiation (collectively called electrosmog or electromagnetic radiation – EMR) can negatively affect us over prolonged periods of time (acute exposures are not commonly seen except perhaps occupationally).

Experienced and knowledgeable medical professionals can provide the public with reliable, accurate information about the health risks associated with EMR as well as how to reduce these risks. At the same time, there is also a growing population that is becoming sensitive to EMR. Similar in nature to multiple chemical sensitivities, electro sensitivity presents with a range of physiological reactions to various sources of EMR. Some people are more sensitive to the strong electric and magnetic fields associated with high tension power transmission lines while others are more sensitive to RF from cell towers, cell phones and wi-fi. Reactions can vary from mild to severe and the onset can be slow to abrupt. The slower the onset and the milder the symptoms the more difficult it is to identify EMR sensitivity as the cause. Reported symptoms vary widely and can include:

- Neurological symptoms – headaches, dizziness, disorientation, nausea, tinnitus, insomnia, fatigue, anxiety, irritability, depression, flu-like symptoms, weakness, fever, difficulty concentrating, memory loss, tremors, muscle spasm, restless leg syndrome, muscle and joint discomfort, leg and foot pain, ear discomfort, tingling and numbness in extremities
- Dermatological symptoms – skin itching, burning, tingling, swelling, rashes and facial flushing
- Cardio-vascular symptoms – altered heart rate, arrhythmias, unusual cardiac sensations described as thumping, bounding or pounding, chest pain, chest pressure and shortness of breath not related to exertion
- Respiratory symptoms – asthma, sinusitis, nasal congestion, bronchitis and pneumonia
- Digestive symptoms – nausea, worsening of Candidiasis, irritable bowel and leaky gut symptoms, gluten and dairy sensitivities
- Ophthalmological symptoms – pain or burning of the eyes, unexplained deteriorating vision, pressure in or behind the eye, floaters and/or cataracts
- Immune system symptoms – allergies, increased susceptibility to colds and flues, auto-immune symptoms and diseases
- Miscellaneous – impaired smell, varied GI symptoms, excessive thirst, dryness of orifices, nosebleeds, elevated blood sugar, hypoglycaemia, redistribution

of toxic elements, deteriorating dental amalgams, enlarged thyroid, testicular and ovarian discomfort, and infertility

- More severe symptoms – internal bleeding, unconsciousness, paralysis and seizures
- Exposure tends to exacerbate existing conditions of Lyme, autism and multiple chemical sensitivities and those suffering with these conditions seem to be more susceptible to electro (EMR) sensitivity symptoms

Naturopathic doctors are trained to look up-stream to identify the source of symptoms and dis-ease. The list of symptoms associated with EMR sensitivity are warning signals of biological discord. For example, these symptoms may be signals that the immune system is in a state of allergic response to EMR, in which case prudent avoidance of EMR would be indicated. Undiagnosed EMR sensitivity is an obstacle to cure. The task of avoiding EMR, however, is becoming more and more difficult in a society that is becoming increasingly dependent on electrical devices and wireless technology.

I would like to propose to fellow naturopathic doctors that they look closely at the above list and question whether you notice these symptoms in yourself or in your family members. Include questions about exposure, number of electronic devices in the bedroom and work area, time spent on cell phones or around wireless networks in your intake or in your questionnaire. Then take note of when the symptoms are experienced. Similar to uncovering food sensitivities, this task can be challenging especially if symptoms are mild and the onset of symptoms is not immediate. Identify sources of EMR in your home, office and in public places. When exposed to known EMR sources, tune into how it makes you feel. Next, consider having your home and office inspected by an EMF specialist or building biologist for EMR sources. This is particularly important in your sleeping area which is a critical area of the home to be EMR-free, as EMR has been shown to affect melatonin levels and thus, interfere with sleep and regeneration. Naturopathic doctors can conduct inspections themselves and meters can be purchased at www.safelivingtechnologies.ca. Alternately, EMR inspectors, can be found at www.buildingbiology.net.

By first tuning into these issues ourselves, on a personal level, we will be able to act as agents of education and change in our professional environment. By healing ourselves and our environments we can more clearly understand what is required to help others.

In addition to an EMR inspection of our homes and offices, the following actions can be taken to greatly reduce the controllable sources of EMR in our environments. Please feel free to use this list – what I call an “EMR Cleanse” for yourself, your family and clients.



From Left to Right: Cecilia Ho ND, Adriana Restagno ND, Tanya Salituro CanPrev Founder, Janet Neilson HD, Natalie Lauzon HD

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Physician Heal Thyself – Walking the Talk of EMF-RF, continued

EMR Cleanse

Appliances – Extremely Low EMF:

- Inspect your home/office and note all of the electrical devices, tools and appliances – from refrigerators to electric toothbrushes
- In the areas of your home/office where you spend long periods of time, make sure you keep all electrical devices away from you by at least one metre.
- If possible, have an EMF inspection of at least your sleeping area, identifying the specific electrical circuits that elevate your body voltage to above 20 milli Volts (mV) and either install a “demand switch” or “demand remote” to switch these circuits off at night. Switching them off manually each night is also an option.
- If an EMF inspection is not an option, keep all electric devices such as electric clocks, radios, TVs, telephone answering machines, voltage converters and other electrical devices one metre or more from beds; choose battery operated alarm clocks
- Arrange beds away from any major appliances or electrical panel boxes in the bedroom or on adjacent walls
- Avoid the use of electric blankets, heating pads or water beds
- Stand back at least one metre from operating a toaster, electric kettle, electric stove or oven or toaster oven when immediate attention is not required
- Avoid the use of microwave ovens or stand away by one metre when in use
- Cook on rear elements of electric stoves instead of front elements to provide safer distance from source of EMF
- Avoid use of electric hair dryers, especially on children
- Avoid or use extra caution when using electrical appliances when pregnant
- If you choose to use a wireless device, recharge away from the sleeping area
- If possible, sleep on bed systems without any metal and ideally made of natural organic material

Cell Phones, Cordless Phones and Wireless devices – Radio and Micro wave frequencies:

- Limit time spent on cell phones – use speaker phone away from your body; use text messaging over speaking
- Avoid wireless ear attachments such as Blue Tooth – instead use an air-tube headset – the air portion of the wire interrupts transmission of RF to the head
- Use a wired land line for Internet and phone; if not possible, unplug the wi-fi at night
- Strongly discourage children and adolescents from using cell phones
- Limit passenger use of cell phones or similar communication devices in the car to limit exposing others to second hand RF radiation
- Limit the use of other communication devices such as PDA, BlackBerry, Bluetooth and iPhone

- Do not use a cell phone when reception is poor (less than three bars) – to avoid surges of increased power from the device
- Do not carry a cell phone on your person when it is turned on as it will be transmitting signals to the base station – keep it in a separate area – hand bag, backpack, etc.
- Avoid using a cell phone when pregnant or while carrying small children
- Avoid living, working and schools that are within 1.25 km from a cell phone base, tower or antenna
- Use hard-wired baby monitors and security systems as opposed to wireless types
- In the case of high RF readings (greater than 50 uW/m²) in the sleeping areas, consider RF shielding material for canopies and drapes and/or RF film for the windows. In extreme conditions or in cases of extreme sensitivity, with the guidance of a trained specialist, RF shielding paint can be applied to the bedroom walls

Computers:

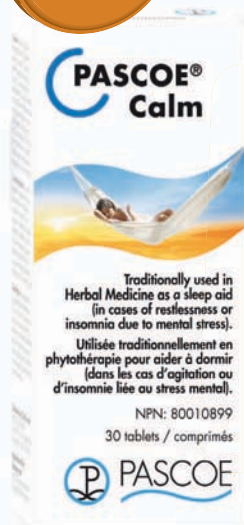
- Always use a wired internet connection rather than wi-fi
- Never use your laptop computer on your lap while using AC power (while plugged into an electrical outlet) – use battery power instead
- While working on your laptop when plugged in, use a wired extension key board and wired extension mouse
- You can also use a grounded copper sheet or Mu-metal (a nickel-iron alloy that has a high magnetic permeability making it effective in shielding magnetic fields) under your laptop when in use on a table to limit EMF from emanating downwards
- Locate the computer tower, surge protectors, voltage converters, cables and wires as far away from your person as possible – at least one metre
- Do not locate a computer on a common wall with a bed, crib, sofa or reading chair
- Avoid work areas, businesses and public areas that have wireless installations such as wi-fi
- Lobby against the use of smart metres on homes for measuring utility consumption and the use of WLAN (wireless local area network) and Wi-Max (wireless metropolitan area network) in cities
- Upgrade monitors from an old cathode ray tube (CRT) design to a low-emission liquid crystal display (LCD)
- Avoid low voltage lighting, fluorescent lighting including compact fluorescent lights (CFL). Use incandescent or light emitting diode (LED) light fixtures/bulbs. Avoid use of rotary and sliding dimmer switches to control light levels as they are a source of magnetic and radiofrequency fields

As more emerging information comes forth about the electromagnetic world and its biological impacts, it is my hope that as a profession we will become an authority for how we can support and heal those affected by EMR. This journey has just begun, and in the words of Lao Tzu, “the journey of a thousand miles begins with a single step”.

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*Grundmann et al. 2009. Pharmazie 64: 63-64, Mavalegh et al. 2008. Anesth Analg 106: 1728-1732.

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The Evolving Picture of EMR and Its Biological Effects

Dr. Caroline Bearss, ND, MEd, BBEC

Background

During the last number of years, the issue of electromagnetic fields (EMFs) and Radio frequencies (RF), collectively termed Electromagnetic radiation (EMR) has received a lot of conflicting attention in the media. As a naturopathic doctor, building biologist and environmental consultant, my hope is that this paper will help clarify and demystify some of the issues around EMR in addition to providing information around sources, potential risks and how to minimize exposure.

Public exposure to non-ionizing radiation has increased dramatically during the last 20 years, particularly to RF radiation which comes from wireless transmission devices. For the first time in history, more than 4 billion people worldwide are holding microwave transmitters (cell phones/cordless phones) next to their heads for minutes to hours every day.¹ Wireless technologies have intensified the electromagnetic environment with unprecedented levels of RF that have risen ten-fold to a hundred-fold in many urban areas due to wireless transmission for cellular phones.^{2,3} In some cases wi-fi networks blanket entire cities with RF fields called Wi-Max. As primary health care providers, it is important that we have a clear understanding of EMR as a potential concern and possible bio-toxin which can contribute to the development of symptoms, disease and perhaps function as an obstacle to cure. Moreover, limiting one's chronic exposure to EMR may be one of the most important aspects of prevention.

The spectrum of electromagnetic frequencies encompasses a range of electric, magnetic and radio frequencies which span a spectrum from slower to faster cycles per second. The electromagnetic spectrum begins at one end with non-ionizing fields and proceeds to include ionizing radiation such as X-Rays, gamma rays and cosmic rays. The two principle types of EMFs discussed in this paper are extremely low-frequency electromagnetic fields (ELF-EMF), which are produced when electrical power is transmitted and distributed and radiofrequency/microwave radiation (RF), which is a faster frequency produced by cell phones, cordless phones and all other wireless devices.

Sources

Sources of EMR are many in our homes, work, learning and public environments. Let's first look at how to identify and measure these fields. Then let's look at the signs, symptoms and disease states that have been associated with EMR. This article does not address laboratory assessment tools, for example, blood, saliva and urine tests, for diagnosing EMR influences, simply because it is not known how these diag-

nostic tools might apply. This article does not review different treatment options, as the possible effects of EMR are far-reaching, from insomnia to electro sensitivity to leukemia.

Naturopathic doctors know that the treatment for those suffering from these symptoms and diseases is individual-based and must be addressed accordingly. Prudent avoidance of known and controllable sources of EMR is crucial to treatment and prevention. By removing EMR sources, especially in one's sleeping area, it is clinically seen that many health issues improve. This article reviews how as primary care physicians NDs can identify possible signs and symptoms that are suggestive of EMR effects and how to limit EMR exposure. Very similar to the effects of removing an allergen from a person's environment, the body has a greater opportunity to heal without being in a state of biological stress under the continual influence of that allergen.

Sources of electric, magnetic and electromagnetic fields include any electrical device. Inside the built environment this includes any appliance, electrical wiring, electric panel boxes and electronics. The strongest fields come from the stove, microwave, refrigerator, electrical wall/baseboards heaters, dimmer switches, TVs and computers. Other sources include: hair dryers, electrical exercise machines, electrical blankets, clock radios, electric instruments, electrical tools and air conditioners. It is best not to stand close to, sleep next to or sit for periods of time close to these devices. It is important to note that even if an electrical device is turned off there is still an electric field emitted from the appliance as long as it is plugged in. There is no magnetic field emitted from an appliance unless it is turned on, in which case there are both electric and magnet fields present. EMF sources outside a building include high voltage power transmission lines carrying electricity from power generating plants to communities and power distribution lines, that bring electricity into the house, schools and workplaces. On the higher end of the electromagnetic frequency spectrum there are radio frequencies emitted from wi-fi, baby monitors, hydro Smart Meters on homes, fluorescent lighting, cordless phones, cell phones and cell towers.

Electric fields can be measured with electric field meters. Magnetic fields can be measured by a gauss meter. Radio Frequencies can be measured by RF meters. These meters can be purchased at www.safelivingtechnologies.ca or in finding a Building Biologist (also known as a Bau Biologist), one can have their living, work and/or learning environment inspected and measured with recommendations as to how to create a healthier space. A list of certified Bau Biologists, as well as courses on EMF can be found at www.buildingbiology.net.

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The Evolving Picture of EMR and Its Biological Effects, continued

Research

It is significant that many of the studies conducted on radio frequencies have been financed by the communications industry. This is a conflict of interest and as a recent Swiss analysis on cellular phone studies states, the source of research funding has affected the reporting of results. Specifically, those studies funded by the telecommunications industry were least likely to report a statistically significant result.⁴

There is also the limitation that EMF studies cannot be performed on humans. As there is a possible disease contributing effect of EMF, human rights laws protect scientific experiments from being conducted on humans. Thus, double-blinded placebo-based research has been conducted almost entirely on animals. Conclusions from these studies are limited in their application to human populations because of the differences in species. Many studies have microscopically examined the effects on EMR on human cells, in particular human DNA, however this form of research limits our scope of causal conclusions of how EMR affects the whole organism.

Epidemiological studies have been used to study the potential biological effects of EMFs. This form of research is also inherently limited. With epidemiological studies, human groups are examined over a period of time and patterns are analysed within these specific groups. The limitation with epidemiological research is that direct causal relationships cannot be made; only inferences, correlations and possible links can be concluded as there are too many variables at play with groups of people in their own natural environments. Another limitation with epidemiological research is that in order to see any potential patterns, people need to be examined over a period of time greater than 10 years, which has been the assessed minimum amount of time that it takes to note significant developments of disease patterns in populations. The long and costly nature of these studies significantly delays the implementation of corrective public health measures.

This then brings us to the complex issue of public health standards. It has been stated by many that the existing standards for non-ionizing radiation are inadequate to protect public health and do not include any possibility of long-term effects which are the most common type of exposure and is most likely to produce effects on health, including cancer. Existing standards for ELF-EMF are set at 904 milligauss. However, science has shown that cancer risk may begin to increase at only two milligauss.⁵ Similarly, standards for cell phones are erroneously based on acute exposure and on thermal effect alone. The assumption is that unless RF exposure is strong enough to heat human tissue within 30 minutes, it is safe. Standards for personal wireless devices such as cell phones are based solely on absorbed heat into the skull, a measured unit called the Specific Absorption Rate (SAR). The Canadian and U.S. standard for cell phones is 1.6 watts per kilogram [W/kg], which is not sufficiently protective given evidence that health effects may occur at lower levels.⁶

In summation, we have a combination of limiting research, which takes a long time to conduct and informs inadequate public health standards. We also have modern societies

depending on the use of electricity and radiofrequency communications. Anything that restricts this would have potentially significant economic consequences. In the last 20 years, we have experienced globally massive technological advancements in wireless technologies and products that have fuelled a massive public demand. Add the fact that the electric utility and communications industries have enormous financial and political influence. It could be said that we have a nicely insulated and protected system. Some analysts suggest that situation mirrors the distortion of science pioneered by the tobacco, lead and asbestos industries and the subsequent delay in public health protection.

Signs and Symptoms

When examining research results from a number of reputable studies, it can be stated that there is a growing body of evidence, nothing one study could accomplish by itself, that strongly suggests that chronic low-exposure to non-ionizing radiation from radio frequency/microwave (RF) and extremely low frequency electromagnetic fields (ELF-EMF) may increase the risk of adverse health effects in children and adults.⁷ Substantial evidence suggests that ELF-EMF and RF can damage DNA, modify gene expression, and lead to altered cellular function as well as cancer.⁷ Recently, one of the largest international cell phone studies conducted by the INTERPHONE Study Group under the World Health Organization found an increased risk of malignant brain tumours called gliomas. These tumours are found at double the expected rate at only 10 years latency (time between exposure and diagnosis of cancer) when cell phones were used predominantly on one side of the head (laterality).^{8, 9} Further studies from Sweden and other parts of the world, including meta-analyses of studies conducted, have similarly shown an elevated risk of developing acoustic neuromas (a tumor on the nerve that passes from the inner ear to the brain related to hearing and balance). Similar to the Interphone study, these studies also showed an increased incidence of gliomas when cell and cordless phones were used for more than 10 years and predominantly on one side of the head.¹⁰⁻¹³ The International Association for Research on Cancer (IARC) classifies ELF-EMF as a Group 2B carcinogen (possible human carcinogen). This classification was made based on 25 years of study between the association between exposure to ELF-EMF and the risk of childhood leukemia. The IARC concluded that high (above 4 milligauss) and prolonged average levels of ELF-EMF exposure were associated with increased risk of childhood leukemia.^{14, 5} They further found evidence that suggests an increased risk of childhood leukemia following maternal occupational exposure to ELF-EMF during pregnancy. In adults, the IARC found that men who work in electrical occupations have an increased risk of breast cancer.¹⁵⁻¹⁷ Two studies in Sweden found that women who were both exposed to high-voltage power lines at work and at home had a higher risk of developing breast cancer than those exposed just at home.^{18, 19} A new study from China suggests that genetic variability in DNA repair mechanisms may make some children more susceptible to leukemia when chronically exposed to ELF-EMF during prenatal development.²⁰

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The Evolving Picture of EMR and Its Biological Effects, continued

With regard to what is empirically seen in practice, the following symptoms are commonly reported by patients claim to be 'reacting' to ELF - EMF and RF: insomnia, heart palpitations, fatigue, cold and/or tingling extremities, burning skin, unexplained dizziness and loss of balance, headaches, hyperactive behaviour, learning disabilities and difficulty concentrating. Others have noted a worsening of multiple chemical sensitivity reactions and allergy symptoms, sinusitis and sinus infections, and hormone irregularities. Other interesting findings that have been documented by Dr. Magda Havas, PhD from Trent University in Peterborough, Canada are elevated glucose levels in diabetics and Rouleaux formation, or clumping of live red blood cells, within 10 minutes of working on a computer, cordless or cellular phone. There is also a growing awareness of a syndrome called electrohypersensitivity syndrome (EHS) or electro sensitivity (ES). With this syndrome, any combination of symptoms present when the subject is around EMR. The term "radio-wave sickness" was historically used by Russian doctors to describe an occupational illness developed by large numbers of workers exposed to microwave or radiofrequency radiation. The symptoms were called "neurasthenic" and are similar to some of the symptoms associated with EHS.²⁰ EHS behaves similarly to an allergic condition. Unfortunately there are few EMR-free zones making finding a relief challenging. There are numerous associations and organizations, particularly in Europe, which have formed for the purpose of support, sharing information and promoting awareness for this syndrome. In Sweden EHS is a recognized disability.²¹

Specific to RF, children and adolescents seem to be more at risk than adults. Researchers have suggested that it could be because children's brains are still developing and their skulls are much smaller and thinner than adults allowing RF to penetrate more deeply into the brain. This may increase children's risk of developing brain cancer in early adulthood.^{22, 23} In June 2008, an international panel of physicians and scientists endorsed an appeal in relation to the use of mobile phones. The appeal included an analysis of recent studies and 10 precautionary measures.²⁴ As a result the governments of Germany, France, Austria, and the UK, the European Environmental Agency and the Russian National Committee on Non-ionizing Radiation Protection have warned the public to reduce wireless exposures and warned against cell phone use by children.²⁵⁻³⁰

Testing and Mitigation

It is unclear why some people are affected by EMR while others seem impervious to feeling any effects. Perhaps it is related to a combination of factors such as individual constitution, nutritional status, stress, pre-existing conditions, level of toxic burden, dysbiosis and general sensitivity. It has been clinically seen that one's level of hydration and mineral status plays a factor in whether one is more or less conductive and therefore susceptible to the effects of EMR. It has also been clinically seen that those with a diagnosis of multiple chemical sensitivities, autism, Lyme disease, fibro myalgia and chronic fatigue syndrome are more sensitive to EMR.

The EMFs from surrounding wiring, appliances, and electron-

ics in our bedroom and in rooms above, below and adjacent to our bedrooms are amplified by our metal bed systems. While lying in bed, we can measure our body voltage with a meter called a Body Voltage Multi Meter. With levels above 20 milli Volts (mV) we begin to see biological effects. A reading of less than 20 mV is considered to be extremely low, is almost never naturally found and is rarely accomplished. Instead, common measurements of body voltage are in the thousands of milli Volts. At higher levels of body voltage electro sensitivity symptoms have clinically been seen to resolve or greatly reduce as a result of lowering the subject's evening body voltage. The most thorough method of addressing an elevated body voltage is firstly to have one's body voltage assessed by a professional EMR specialist, and secondly to turn off the electrical circuits that have been determined are negatively affecting one's body voltage. This can be accomplished via a "demand switch" – a remote control switch that connects to specific circuits and disables them on demand. From an environmental medical and building biology perspective, ensuring the body's voltage is kept below 100mV at night as well as mitigating any RF in sleeping areas are two of the most important considerations. It is widely recognized that sleep is a critical state for our bodies to rest, heal and regenerate. It is understood that if a restful and regenerative state at night can be achieved, people we are better able to cope with the biological stressors they encounter during the day. Thus it is important to ensure as natural an environment as possible at night.

RF in sleeping areas first must be measured by an RF meter to assess the level of radio frequencies. A reading below 1 microwatt per metre squared (uW/m²) is ideal. For readings above 50 uW/m² it is recommended to block the RF from coming into the sleeping area. First look to mitigate sources inside the building like wi-fi, cordless phones, CFLs and fluorescent lighting and baby monitors. Materials to block RF from outside sources include RF film for windows, RF shielding material which can be used to make a bed canopy or curtains. There is also RF shielding paint which can be used, however it must be properly grounded and no EMR sources can be used from within the space as the RF paint will magnify it. For a complete list of recommendations for limiting EMR daily exposure please see the article on page 17 called "Physician Heal Thyself – Walking the Talk of EMF-RF".

Conclusion

NDs need to continue investigating the effects of EMR. We are only beginning to discover the possible cumulative long-term effects of this relatively new potential biological risk. We need to familiarize ourselves with the problems around interpretation and conclusions with respect to the current and future research. We need to understand that much of the research that has been conducted suggests that there are potential risks associated with chronic exposure to EMR. As NDs we must also personally and professionally exercise prudent and cautionary avoidance to limit our exposure. Our first tenet of naturopathic medicine is to "First Do No Harm" and as such we need to exercise avoidance of EMR exposure where possible in the public spaces that we are responsible

for. Moreover, we must educate the public about the possible risks associated with EMR. As a profession we must support unbiased research, and legislation to strengthen national and international standards for non-ionizing radiation to ensure that children and the unborn are adequately protected; standards that reflect the state of the science regarding the complexity of disease causation, and that reflect the range of exposure where people live, work and play.

EMR Reading Recommendations for NDs and Their Patients

Waugh, Jim. Living Safely with Electromagnetic Radiation – A Complete Guide for Protecting Your Health. Castle Mountain Publishing, BC, 2010. ISBN 978-0-9865099-0-2

Baker LaPorte, Paula. Prescriptions for a Healthy House – A Practical Guide for Architects, Builders and Homeowners. New Society Publishers, BC, 2001. ISBN 0-86571-434-7

Thompson, Athena. Homes That Heal and those that don't. New Society Publishers, BC, 2004. ISBN 0-86571-511-4

Carlo, George and Schram, Martin Cell Phones – Invisible Hazards in the Wireless Age. Carroll & Graf Publishers, NY, 2001.

Adams, Casey. Electromagnetic Health: Making Sense of the Research and Practical Solutions for Electromagnetic Fields (EMF and RF). (see www.amazon.com)

Fisher, Howard. The Invisible Threat: The Risks Associated with EMFs and Effective Interventions (Kindle e-book, see www.amazon.com)

About the Author

Caroline has been a practicing Naturopath since 2000 and has focused much of her practice on Auricular Medicine and Environmental Medicine. In 2007 she became a certified Building Biologist and Environmental Consultant. She has also received certification in Environmental Medicine. She and her husband Scot Appert own and operate BioHealthy Homes, a consulting and building company focusing on healthy natural ecological building. Caroline practices in Muskoka, Ontario and Seattle, Washington. They are both currently enrolled in a sustainable MBA program at The Bainbridge Graduate Institute in Washington. Caroline can be reached at Caroline@BioHealthyHomes.com.

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An Invisible Web of Energy: The impact of radiofrequency/ microwave technology on our health

By Dr. Deborah Kennedy, MBA, ND

Recently, the CBC reported that parents in Ontario were concerned about wireless fidelity (wi-fi) installations in their children's elementary school since many of their children were complaining about experiencing headaches, dizziness, nausea, and loss of balance.¹ While Lakehead University has stated that they will not expand their wi-fi networks on their Thunder Bay and Orilla campuses until there is greater clarity regarding the health effects, if any.²

The Issue

In 2008 there were approximately 8,000 cell phone towers in Canada.³ These towers are installed on existing structures such as the roof tops of buildings or as free standing structures. The Canadian Cellular Towers Map website (http://www.ertyu.org/steven_nikkel/cancellsites.html) provides a Google map of the cell phone tower locations. Viewing this map gives one a sense of the density of cell phone towers in Canada. The energy emitted by cell phone towers and wi-fi is a radiofrequency (RF) of 2.45 Giga Hertz (GHz). This is the same frequency that microwave ovens use, though at a much lower power intensity.⁴

The demand for wireless connectivity grows daily. Communities plan "hotspots", businesses wi-fi-enable their offices, schools wi-fi-enable their campuses, and we, our own homes. Mobile networks are increasing to ensure the cell phone coverage consumers desire. Additional RF exposure also comes from Digitally Enhanced Cordless Telecommunications (DECT) portable cordless telephones, baby and security monitors.

It is not difficult to imagine that as we move through our day, we encounter these RF fields from multiple locations with varying intensity and duration that children, in wi-fi enabled classrooms, are constantly surrounded by RF radiation during the school day.

Background

Electric fields are produced as a result of voltage and measured as volts per meter (V/m). Electric fields can be shielded and the strength of the electric field can be diminished by trees, buildings and the like. Magnetic fields are generated as a result of current flowing through a wire. It is measured in micro Tesla (μ T) or Gauss (G).⁵ Magnetic fields can and do penetrate trees, buildings, and essentially all physical objects.

Electrical and magnetic fields occur together when current is flowing through a device. The strength of both of these types of fields lessens the further away you are from the point of origin.

Radiofrequency radiation is non-ionizing radiation in the 300 to 3000 MHz (3 GHz) range of the electromagnetic spectrum.⁴ This frequency range is below the visible light spectrum, and much lower in frequency than gamma and x-ray radiation. These latter two forms are known as ionizing radiation and have the ability to damage DNA as ionizing radiation causes chromosome breakage.

Microwave energy has a 2.45 GHz frequency, and the radiofrequency band ranges from approximately 3 kHz to 300 GHz.⁶ Historically, the primary concern regarding radiofrequency/microwave frequency are the thermal effects that this electromagnetic radiation has on biological tissue. As a result, exposure guidelines have been set by a variety of different agencies. In Canada, these guidelines are set out in Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz - Safety Code 6 (2009).⁷ Other countries have established their own guidelines for RF exposure. The World Health Organization in 1996 established the International EMF Project to assess the scientific evidence of possible health effects of electromagnetic fields (EMF) in the 0 to 300 GHz range.

Many public health organizations and advocacy groups are concerned that the established guidelines do not provide sufficient protection for the public. There is a growing body of evidence, albeit conflicting, that suggests that low level exposure insufficient to cause thermal effects of RF radiation, can and does nevertheless have an impact on biological tissue and physiological functions. The Bioinitiative Project report, released in 2007, calls for guidelines that also take into consideration exposure to non-thermal effects of RF radiation and an implementation of the precautionary principle.⁴ The precautionary principle, "... applies where scientific evidence is insufficient, inconclusive or uncertain and preliminary scientific evaluation indicates that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the high level of protection chosen by the EU."⁸

Key facts

- Radiofrequency (RF) radiation involves not just cell phones but includes other sources such as cell phone towers, wi-fi networks, and some baby and security monitors. Unlike cell phones where the concerns involve RF exposure to the head, these emissions encompass whole body exposure and chronic low level exposure.
- As technology implementations increase and becomes more widespread, our exposure to RF radiation increases both in terms of duration and intensity.
- Exposure to low level RF radiation has demonstrated negative effects on sleep, memory and learning, cells of the immune system and behaviour. Children are thought to be particularly susceptible as they are still in their growth and development phase.
- There are currently no exposure guidelines that address the non thermal and chronic exposure limits to RF fields. Many concerned scientists, health care practitioners, advocacy groups and parents are advocating for the precautionary principle regarding this technology and for future research into appropriate standards.
- A potential emerging illness is electromagnetic hypersensitivity disorder, characterized by a range of symptoms from headaches, nausea, and loss of balance to memory and focus problems.

Possible health impacts of RF fields

Sleep, Learning/Memory and other symptoms

The role of sleep in humans is critical. In addition to providing the necessary time for regeneration and healing, sleep is implicated in learning and memory.⁹ Melatonin is an important hormone in the body, helping to maintain the appropriate circadian rhythms of the body. In addition to controlling sleep, melatonin is a potent antioxidant and plays a role in learning and memory.^{4, 10} Extremely low frequency (ELF) exposure has been found to reduce the amount of melatonin released from the pineal gland and reduced urinary excretion of melatonin metabolites in post menopausal women who reside close to RF transmitters.¹⁰

Santini et al conducted a survey of 530 people, comparing those that lived within 300 metres of cellphone towers with those outside this range. The survey assessed 18 non-specific health symptoms. There were significant differences between the two groups. Those within the 300 metre range complained more frequently regarding headaches, sleep disturbances, depression and loss of memory versus those outside 300 metres.¹¹

In a second study, Hutter et al evaluated 365 subjects who had lived for at least one year within range one of 10 cellular towers in Austria.¹² Subjects were asked to complete

the Zerssen scale, an assessment of depression symptoms, the Pittsburgh sleeping scale, for sleep problems, and cognitive performance tests. After the testing was complete, the field strength of high frequency EMF fields in the bedroom was assessed. Their findings suggest that with increasing field strength there were greater complaints associated with headaches and poor performance tests.¹² They found no significant effect on sleep quality.

A much earlier study conducted by Kolodynski and Kolodynska, in children chronically exposed to frequencies from radio towers found that the exposed children had poor memories and attention problems versus children who were not exposed to these emissions.¹³

Free radical generation and immune system impacts

The Risk Evaluation of Potential Environmental Hazards from Low Frequency Electromagnetic Field Exposure Using Sensitive *in vitro* Methods (REFLEX) report assessed the biological effects of RF EMF fields using sophisticated and diverse research methodologies.¹⁴ The results of these *in vitro* studies demonstrated that RF EMF fields promote the generation of heat shock proteins within cells.¹⁴ Additional evidence for this phenomena has been reported by Leszczynski et al.¹⁵ The formation of heat shock proteins represents a cellular stress response. In HL-60 cells, RF EMF radiation did increase free radical generation. The *in vitro* results regarding RF EMF impact on DNA cell cycles and apoptosis were inconclusive.¹⁴

Eger et al assessed cancer incidence in a stable, closely-knit community in Naila, Germany over a 10 year period, from 1993 to 2004, after the installation of a cellular tower.¹⁶ The researchers compared the occurrence of cancer among the residence within 400 metres of the tower versus those living outside the 400 metre radius. The cancer rate tripled within the 400 metre zone in the time period from 1999 to 2004.¹⁶ The location of the cancer within the body was variable, however, those within the 400 meter radius did develop cancer at a younger age.

Some individuals report adverse skin reactions upon exposure to RF fields. Upon examination, the most common findings are increases in mast cell markers, such as histamine.¹⁷ Often, mast cell degranulation and release of histamine is associated with immune system responses to allergenic substances. Johansson has developed the "mast cell hypothesis" to explain these dermatological reactions, hypothesizing that it is the body's immune response to the detection of a foreign substance, the low level RF field.¹⁸

Behavioural impact

The association between mobile telephone and mental health behaviours in children and adolescents was recently studied for the first time by Thomas et al. Dosimetry measurements of RF field exposure over a 24 hour period were taken in 3,000 children and adolescents concurrent with mental behaviour assessments using the Strengths and Difficulties questionnaire (SDQ). The SDQ assesses overall behavioural problems, including emotional, conduct, hyperactivity and peer relationship problems. The RF exposures were quartiled and the highest quartile was associated with overall behavioural problems for adolescents (OR 2.2; 95% CI 1.1–4.5) but not for children (1.3; 0.7–2.6).¹⁹

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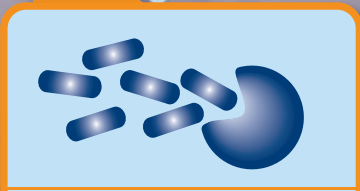
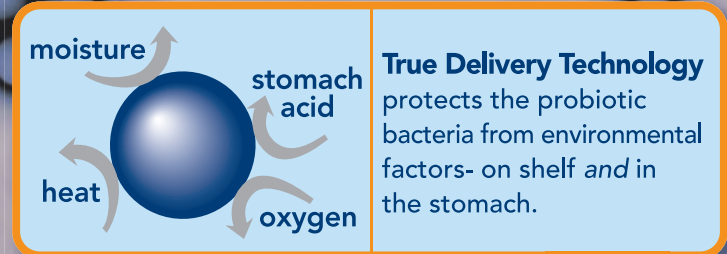
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Children

The concern for children is multi-faceted. The impact on normal growth and development of children of chronic exposure to low intensity RF fields is unknown. Children are being exposed to these RF fields at younger ages versus adults. Given this, their lifetime exposure will be much higher than for the adult population.²⁰ There is a paucity of research on the potential effects of chronic low level RF emissions in children.

An emerging illness?

Electromagnetic hypersensitivity (EHS) is associated with a wide variety of symptoms. The symptoms range from headaches, joint pain, inability to focus, feeling wired, and sleep disorders and are reported by individuals during exposure to EMF fields.²¹ For many, their symptoms are debilitating and affect their quality of life.

The points raised in this article's section on possible health impacts do suggest some mechanisms to explain the symptoms experienced by people who report EHS symptoms. However, the aetiology of EHS is unknown and the percentage of individuals impacted varies by region.²² For example, California and Sweden report prevalence rates of 3.2 % and 1.5% respectively, while in Germany it is as high as 10%.²³⁻²⁵ Sweden is the only country that recognizes EHS as a disability.^{4, 21}

Attempts have been made to evaluate these EHS phenomena through controlled studies. Generally, a group of EHS individuals and controls have been tested to assess their ability to detect the presence of low intensity RF fields. In most of these studies, EHS individuals have not always reliably detected the presence of these low level emissions, and therefore many researchers have discounted the problem.²²

Addressing the problem

How can naturopathic doctors help? Firstly, we can believe EHS suffers and their reported symptoms. This is not the first illness for which medical science has not yet confirmed an aetiology. Fibromyalgia and multiple chemical sensitivities serve as examples of illnesses that 15 years ago were not recognized as such.²¹ There is, as yet, no treatment for EHS except for avoidance. However, naturopathic doctors are guided by the therapeutic order and the first two steps in the therapeutic order may provide some assistance:

Remove the obstacles to cure.

- Replace wi-fi in the home and office with wired Internet connectivity and telephones. Avoid the use of portable telephones.
- When using your computer, turn off the wireless card when not connected to the Internet.
- Be aware of the location of cell phone towers where you/your patients live and work. Check out the cell phone tower map.
- Find RF-free zones in the home/community and spend time in these areas.
- Some studies have looked at heavy metal exposure in individuals with EHS symptoms, however, elevated

levels were not seen in those with EHS.²⁶ This may not always be the case as these assessments were not provocative.

- Following the principle of "First, do not harm." Be informed and active in your community regarding the appropriate uses of technology.

Establish a healthy regimen.

- Reduce the body's sensitivity to food and other chemical substances.
- Ensure that the body emunctories are working effectively.
- Balance the immune system so that it is less reactive to the possible effects of RF exposure.

About the Author

Deborah is a licensed naturopathic doctor in the province of Ontario and a graduate of the Canadian College of Naturopathic Medicine (CCNM). Deborah completed a two-year residency at CCNM deepening her experience with patient care. Deborah is the recipient of a three-year career development grant from the Sickkids Foundation and is pursuing a PhD in Pharmaceutical Science at the University of Toronto working under the supervision of Dr. Gideon Koren, Director of the Motherisk program at The Hospital for Sick Children. At CCNM, Deborah continues her research activities involved in the development of Lung Cancer Guidelines (a CIHR supported initiative), where her focus is on the interactions between natural health products and pharmaceutical drugs used to treat lung cancer. In addition to maintaining a part-time private practice, Deborah continues to work as a teaching assistant at the College in Integrative Therapeutics, Principles in Research and Emergency Medicine. Deborah is also a member of the Editorial Board of the International Journal of Naturopathic Medicine.

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RESEARCH

Are cell phones actually safe for our children? Or for us?

Dr. Marianne Trevorrow, ND, MA

Cellular telephones have become an almost universal feature of contemporary life across both developed and developing countries. Health Canada reports that more than 2/3 of Canadians now own cell phones.¹ As cellular technology has developed, mobile phones are increasingly becoming indispensable as personal computer-like devices; allowing users to access the Internet, download and send emails, store music and photo files, watch videos, play games, as well as use increasing numbers of sophisticated software applications. For many of us, using cell phones has become a daily activity, to the point where some people report 'withdrawal-like' symptoms when they are away from their phones for more than a few hours.²

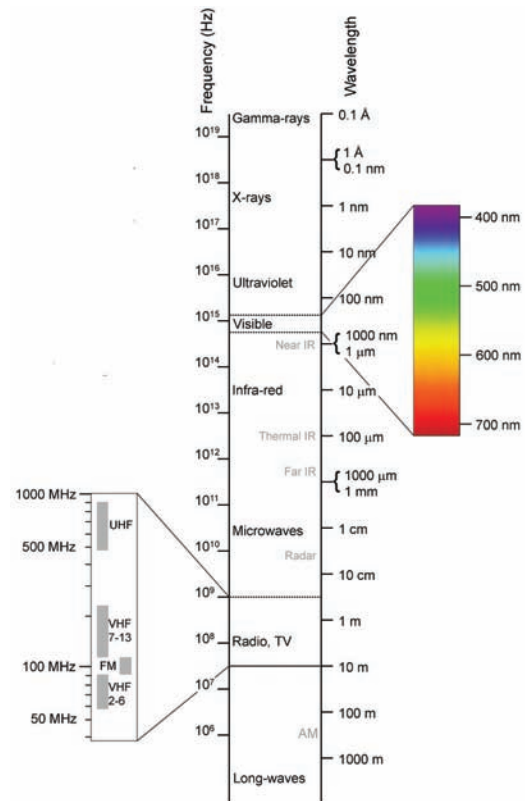
Many consumers assume that government agencies are regulating these devices to make them safe. In the meantime, however, there is growing awareness that we may actually know very little about the extent to which exposure to radio frequency (RF) signals from cell phones pose an actual health risk. A large multi-national epidemiological study commissioned by the World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) recently suggested a possible increased risk of certain types of brain tumours—specifically gliomas and meningiomas—in heavy users of cell phones³. Still, results have been conflicting, with some longer-term use studies showing clear associations and others showing either equivocal relationships or no associations. Of particular concern are the possible effects of long-term exposures to RF signals from cell phones on children, who could potentially be heavy users of this technology for periods of 40 or 50 years or more. In this sense, we are entering a worldwide population experiment where the cellular radiation exposure is at least 10-15 years ahead of the epidemiological studies we need to establish whether these kinds of heavy exposures are, in fact, safe.

What is RF radiation and why does it matter?

Current cell phones emit electromagnetic radio frequency (RF) waves in the 800-900 megahertz (MHz) or 1800-1900 MHz bands, which enables phones to connect to the network's base station or cell tower. RF waves are emitted continuously during calls from antennae located inside the handset, but are also emitted in pulses while the cell phone is turned on and resting in order for the base stations to keep track of the location of cell phones in their network.

The numbers 800 MHz and 1800 MHz refer to the frequency range of waves emitted by cell phones antennae, similar to the frequency of AM or FM radio stations. This is why cellular radiation is referred to as RF radiation; it operates in similar

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regions of the electromagnetic spectrum (Figure 1). RF radiation has long been considered safe, since its wavelengths are much longer than more dangerous forms of radiation such as gamma rays, x-rays or computerized tomography (CT).

These better known forms (termed ionizing radiation) can break ionic bonds in living cells, potentially damaging tissue in humans and other living beings. Since they lack this ability, Micro- or RF waves from devices such as cell phones, TVs, and WLAN networks, on the other hand, are known as non-ionizing radiation. Because of this, they were not believed to have biological effects, although this picture is changing with new evidence of biological effects in several *in vitro* studies^{4,5,6,7,8}

In addition to frequency, another variable of electromagnetic fields important to understanding potential health effects of cell phones is the power density of the field, measured in watts per square metre (W/m²). Modern digital phone handsets have a peak power of 1-2 watts, although the actual power generated during a call is almost always much less. This level is established dynamically at the moment a call is initiated and varies over the period that the call is taking place. Most digital phones in use since the mid-1990s use a feature called 'Adaptive Power Control' (APC) whereby the phone continually adjusts the power it transmits to the minimum needed for the base station to receive a clear signal—

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one important feature that differentiates these phones from earlier 'analogue' cell phones. In listening mode, for example, the output RF power is minimal, but increases as the user speaks into the phone, when there are physical obstacles between the phone and the base station, or when the phone is a large distance from the base station⁹. Still, APC or not, some transmitted RF waves are absorbed by the body, particularly the area closest to the handset antenna, including the ear, cheek and temporal lobe of the brain.¹⁰

The rate at which energy is absorbed into the body over time, called specific absorption rate (SAR), has been extensively studied and is expressed in units of watts per kilogram (W/kg). It should not be surprising that RF energy from cell phones can cause heating in body tissues because microwave ovens use similar electromagnetic wavelengths. However, unlike microwave ovens, cell phones are held against the head or body for extended periods of time, increasing the potential for absorption of RF radiation. Limits to RF radiation levels, measured as SAR, are recommended by groups such as the International Commission on Non-ionizing Radiation (ICNIRP) and the International Committee on Electromagnetic Safety (ICES). In North America, the FCC (Federal Communication Commission) in the US and Health Canada have set an acceptable SAR of 1.6 W/kg for exposure to the head and trunk^{11,12}. In Canada, cell phone manufacturers must also perform SAR testing on cell phones and all RF devices that are intended for use within a 20cm radius of the body.¹³

SAR regulatory limits for cell phones are based on exposure studies performed on several different adult human head models (called 'Phantoms' in the cell phone industry) which are filled with liquid and have electrical properties similar to human brain tissue.^{14,15} Using computer modelling of readings similar to MRI imaging, research teams have found that individual SAR doses from cell phones depend on a number of factors, including antenna type and position, head morphology, distance between the phone and the head, and power output of the phone.^{9,16}

Additionally, these SAR effects of cell phones appear to be highly localized. An often-cited 2008 study by scientists at two International Agency for Research into Cancer (IARC) labs conducted on over 100 different cell phone models found that between 50-60% of total RF energy was absorbed by the temporal lobe of the brain on the side the phone was used.¹⁰ The researchers also found little difference in SAR with the phone held in different positions (i.e. against the head or with the mouthpiece tilted away) or whether there was an extended antenna or not. According to their computer modelling, average SAR appeared to diminish rapidly with tissue depth; indicating that absorption was highest in the outermost layers of the brain. This finding replicated an earlier 1996 US public/cell phone industry study that had found that 20-30% of RF energy is absorbed by the brain as a whole—with the most RF being absorbed by the skin, salivary glands and the external ear on the ipsilateral side of phone use.¹⁷ Other groups have similarly found that energy absorption in the brain is highest in the glial and meningeal tissues located in the outermost layers of the temporal, frontal and parietal lobes.^{15,18} These findings raise particular concerns about

cancers arising from these tissues with long term exposures to cell phone radiation—namely acoustic neuromas, gliomas, meningiomas and parotid gland tumours.

In trying to determine cell phone RF risks specific to children, there is also considerable debate over whether the "Phantom" models named above account for differences in children's body size, shape and tissue conductivity. Several studies suggest that children's heads actually absorb more RF radiation than adults.^{19,20,21,22} In 2008, scientists from France Telecom analyzed cell phone SAR in a number of child and adult head models using MRI-type 'slicing' and found significantly increased mean SAR levels in children's brain tissues in all of the models used, suggesting that established SAR safety levels in adults may lead to excessive RF exposures for children under regular cell phone use.²³ Similar to the previous authors, Wiart et al. concluded that the increased SAR levels they found would be expected due to the smaller thicknesses of the skin, external ear (pinna) and skull of children leading to reduced distance from the cellular antenna to a child's brain tissue. Given that researchers from both academia and the cellular industry also agree that SAR measurements are subject to considerable variability due to differences in individual head morphology,^{10,21,23} this presents the possibility that children may be exposed on a regular basis to SAR levels above the current Health Canada safety limits. As widespread as current cell phones use is among children and teenagers in Western countries, there is the potential for an unprecedented level of RF exposures long term, with a health risk that is currently yet to be determined.

The Cancer Studies: the INTERPHONE group vs. Hardell et al.

The most serious health effects linked to cell phone use — and the subject of considerable debate between researchers and public health experts — are brain tumours.

In 1998, the IARC sponsored an international case-control study, known as INTERPHONE, to address public safety concerns about long term exposure to cell phone radiation as a possible link to brain cancer.²⁴ Some studies published prior to INTERPHONE indicated no correlation between cell phone use and brain tumours over the short term;^{17,25,26,27} however given the long induction time for many brain tumours, and the dramatic increase in use of cell phones worldwide, serious concerns remained.

Thirteen countries including Canada contributed data to INTERPHONE using a common core protocol which included data from diagnosed cases of glioma, meningioma, acoustic neuroma and parotid gland tumours—the tissues most likely to be exposed to RF radiation from cell phones.²⁸ The objective was to determine whether exposure to RF fields from cell phone use was associated with an increased incidence of these relatively rare cancers, and specifically, whether cell phone RF radiation is tumorigenic. Eligible cases were sampled from residents of the study areas aged 30-59 with a confirmed first case of primary glioma (2765 cases), meningioma (2425 cases), malignant parotid gland tumours (109 cases) or acoustic neuroma (1121 cases) during the study period of 2000-2004. These cases were matched with 7658 controls of "never regular users" randomly selected from the source populations and matched for age, sex and study

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region. History of cellphone use was ascertained through personal interviews for both cases and controls. Interestingly, "regular use" of cell phones was defined as those subjects who recalled an average of at least one call per week for six months or more.

The final results and conclusions of the INTERPHONE study on brain tumours were published in May 2010 in the *International Journal of Epidemiology*, six years after the conclusion of the study period.³ Overall, they found a reduced odds ratio (OR) if ever having been a regular cell phone user for glioma (OR=0.81) and meningioma (OR=0.79). These reduced ORs held for ipsilateral (same side) main use for regular use in > 1 year for both meningiomas (OR=0.86) and gliomas (OR=0.84). In the entire study, the only increased odds ratio they found was for gliomas and meningiomas in the highest exposure groups, defined as "ever" cell phone use of over >1640 hours for 10 years, or approximately 30 minutes a day. However, the authors ascribed this finding to 'implausible values' and 'potential bias'. Overall, INTERPHONE authors believe that selection, recall and other biases make their results inconclusive in determining whether long term use of cell phones actually confers an increased risk of brain tumours.

How to lower exposure to RF radiation from cell phones for children or adults:

1. Do not keep a cell phone in a pocket or on a belt unless turned off.
2. If the phone needs to be on, store in a purse or backpack.
3. Do not keep a cell phone turned on close to where you sleep.
4. Use text rather than speaking and when texting, hold the phone at least 10 cm away from your body.
5. For children; use headphones or speakerphone when talking on a phone, and keep use to a minimum.
6. For adults, consider wired headphones, low powered Bluetooth or speakerphone when talking on the phone.
7. Don't use radiation shields or similar devices, as these may reduce connection quality and actually increase the RF signal strength.

Source:

Environmental Working Group. Cell Phone Radiation: Science Review on Cancer Risks and Children's Health [2009; cited 2010 Oct 2] Available from: <http://www.ewg.org/project/2009cellphone/cellphoneradiation-fullreport.pdf>

Davis, Devra, PhD, MPH. Disconnect: The truth about cell phone radiation, what the industry has done to hide it, and how to protect your family. New York: Penguin Group (USA) Ltd. 2010. (www.devradavis.com)

Individual study centre participants in INTERPHONE have also published their findings, mostly finding either inconclusive or negative associations between cell phone use and brain tumours.^{29,30,31,32} For acoustic neuromas, several INTERPHONE reports found mixed results: 5 studies found that cell phone use of less than 10 years exposure

was associated with no increased risk of acoustic neuroma^{33,34,35,36,37} although one of these 'negative' studies did find an increased OR for ipsilateral use 10 years or longer (OR=1.8).³⁷ The other study that focused on exposures over 10 years also found increased risk of acoustic neuromas.³⁸

For malignant parotid gland tumours, an INTERPHONE group from Israel found increased risk of tumours from ipsilateral and 'both sides' use in the heavier categories of use, which they defined as >266 hours of use over 5 years.³⁹

In 2008, well after the end of the INTERPHONE study, but before the final conclusions were published, a Swedish research group lead by Lennart Hardell published a meta-analysis using several of their data sets along with their own case-control studies on cell phone use in Sweden, and some of the earlier studies from Inskip and others. In contrast to INTERPHONE however, the Hardell group found that using a cell phone for 10 years or more approximately doubles the risk of ipsilateral brain tumours.⁴⁰ For gliomas, the risk was doubled; while that for acoustic neuromas increased by 2.4 times. No increased risk was found specifically for meningiomas. This supported several previous case-control studies published by the Hardell group.^{41,42,43,44} The following year, a meta-analysis limiting inclusion to studies where subjects had used phones for 10 years or more found approximately a twofold risk for ipsilateral brain tumors of any type.⁴⁵

Researchers from both INTERPHONE and the Hardell groups have criticized each other's methodology, particularly the problems of potential recall and/or response error related to subjects' reporting of cell phone activity and laterality. Because both groups relied on participants' own recollection of their previous cell phone patterns, exposure levels were subject to considerable precision errors in both groups.⁴⁶ Validation studies carried out as part of INTERPHONE showed that many subjects substantially over- or under-estimated both the number of calls they made and their duration.⁴⁷ Given that substantial precision errors may exist even in relation to short term recall of cell phone use, the uncertainty in estimated vs. real exposures has led several researchers to question whether INTERPHONE's methodology has led to underestimation of the risks.^{45,46} In turn, several of the INTERPHONE researchers have questioned whether the Hardell group's methods may have overestimated the risks.^{28,48,49} These issues aside, a significant question that remains to be answered is the possible mechanism(s) by which RF radiation may induce head and neck tumours, or whether the role of RF tumorigenesis is via induction or promotion.⁴ In a sense, it is not surprising that both sides of the epidemiological debate have suggested that further investigation is needed.

Still, given that the latency period for many brain tumours caused by radiation is estimated to be 10-15 years⁵⁰, these findings are troubling; all the more so because the rate of cell phone use in children and young adults across many countries has been rising dramatically since 2000.

What does this all mean and what do we do with our phones now?

At this point few epidemiological or lab studies have explored the possible effects of cumulative RF radiation exposures on children, despite indications of increased vulnerability due to

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Are cell phones actually safe for our children? continued

factors such as developing neuronal systems and greater RF radiation penetration relative to head size.⁵¹ As several reviewers have noted, children who are currently using cell phones can expect to have lifetime cumulative doses of RF radiation well in excess of current use. This is sobering for those of us who work with children and teenagers and we cannot help but wonder; will there be an epidemic of head and neck tumours for these kids 20 years down the road? Where does this leave us with our patients? After reading the current evidence, I believe that we should encourage our patients (and ourselves) to look at ways to decrease cell phone radiation exposure whether it is by using speaker-phones, wired or wireless headsets, or simply by using cell phones less.

For children, the best options would be to encourage them not to use their phones for conversations unless they are using headphones or speaker settings. They should be taught to use the phones held away from the body as much as possible—including not storing the phones in pockets or close to the body—and to turn their phone off when not in use. Overall, I think the most important message is that we need to stop assuming that RF radiation from cell phones is safe at any dose and for any period of time. As consumers, we need to demand lower SAR phones and that SAR specifications be clearly labelled on all cell phone packaging. We also need to lobby regulatory agencies such as Health Canada to decrease allowable SAR levels to accommodate use by children. As clinicians, we need to educate ourselves about actual cell phone risks and ways to minimize RF radiation exposures in order to help our patients make informed decisions for themselves—and their children—about whether to use cell phones, and if so, how to use them safely (see the box below for guidelines). Personally, I will be encouraging parents not to buy cell phones for children under 12, and to encourage their adolescents to use various hands-free devices or text rather than holding the phone against the head. Other clinicians may want to make different recommendations but the key is education and shared informed decision making. The information is out there now—we just need to put our phones down long enough to start paying attention to it.

About the Author

Dr. Marianne Trevorror, ND, MA holds degrees from McGill University, the University of Chicago, and Bastyr University, where she graduated with her ND in 2006. She did post-graduate work in Nutrition and Anti-Aging Medicine at Bastyr from 2006 to 2007 and is currently in private practice in Victoria, BC. Her clinical focus is on environmental health and developmental disorders in children, including ADHD, autism, Down's syndrome, allergies, asthma and other chronic conditions of childhood. She has been a Defeat Autism Now! certified clinician since 2006.

Dr. Trevorror is increasingly interested in the links between nutrition, environment and toxicity and regularly counsels her patients to minimize environmental hazards from exogenous pesticides, hormones and hormone analogues, particularly compounds contained in many regular household and cosmetic items. She can be reached at drmarianne@inspired-health.ca

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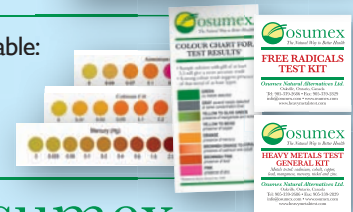
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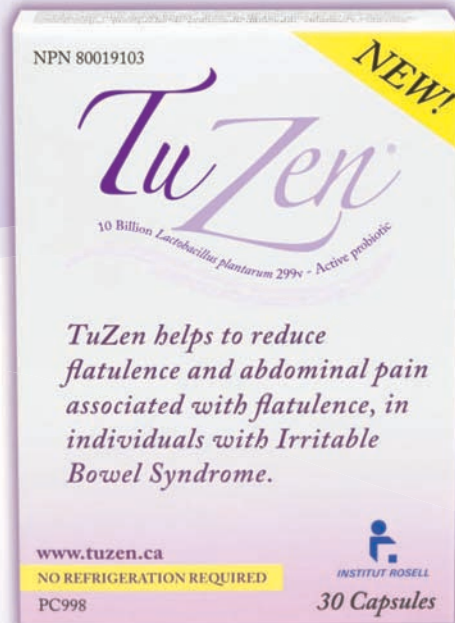
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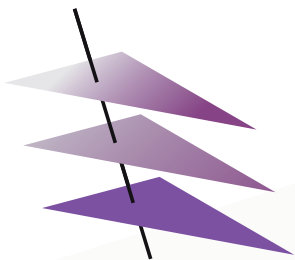


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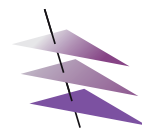
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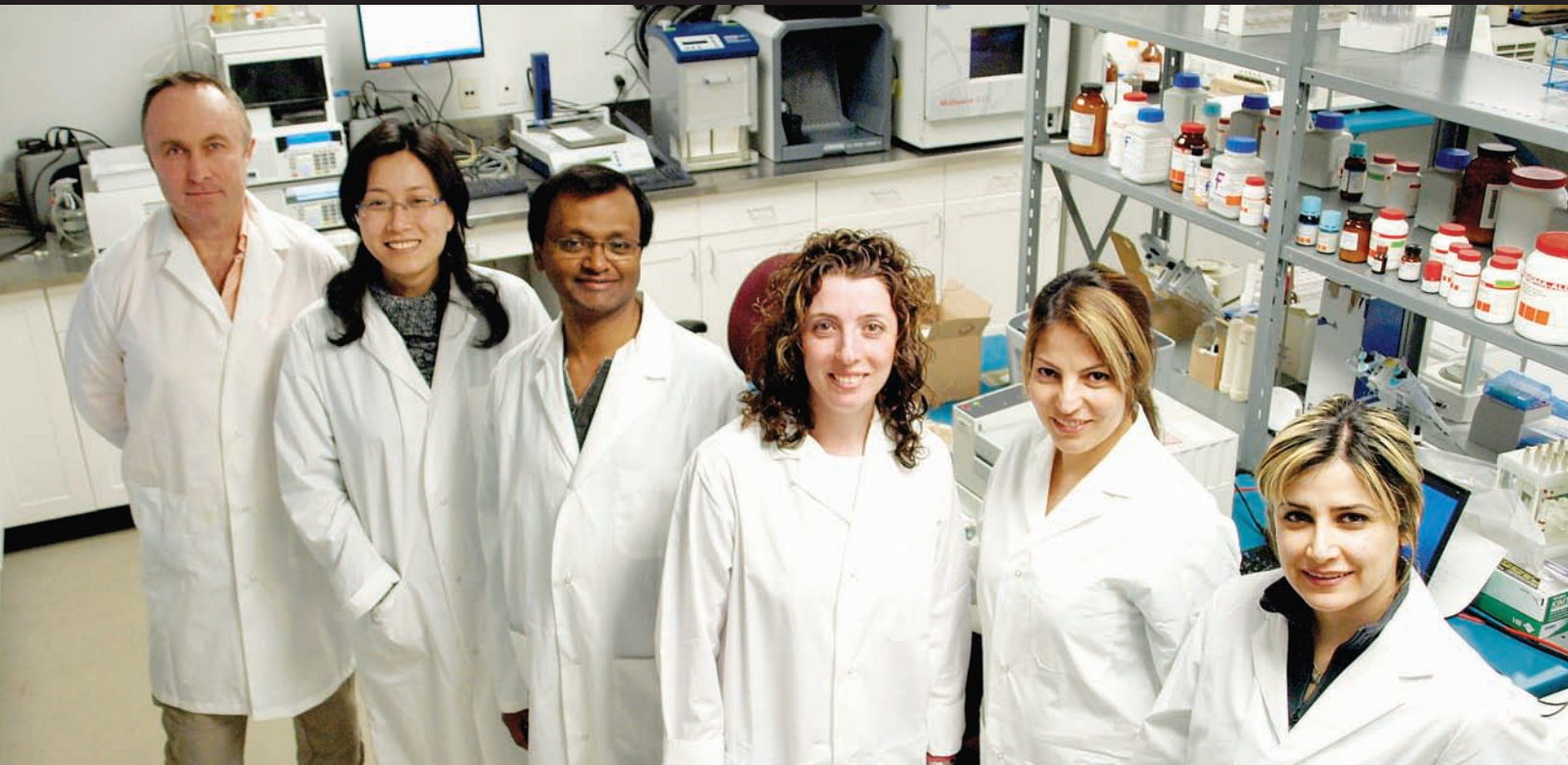


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THE IMMUNE SYSTEM IS ONE OF GUNA'S STRONG SUITS

IMMUNIZE YOUR PATIENTS FOR ANY FLU STRAIN THAT COMES ALONG WITH GUNA



PROGRAM your patients' immune system for full-spectrum protection against all types of pathogens with **CITOMIX**. This formula specifically enhances immune response by providing immune components such as interleukins which promote the production of antibody-producing cells.

CITOMIX is an immune modulator that can be used alone or in concert with any other homeopathic or regulating substance.

AS AN IMMUNE BOOSTER:

3 pellets of **CITOMIX** 3 x day for 1 month

WHEN TREATMENT IS REQUIRED FOR SPECIFIC PATHOGENIC CONDITIONS ... you can use **CITOMIX** on its own or in combination with your favorite influenza protocols. Consider **CITOMIX** the conductor, use it in concert with your usual cold remedies or with other GUNA formulas.

Access our scientific
publications online at :
www.gunacanada.com



GUNA

biotherapeutics

GUNA COLD AND FLU PROTOCOLS



CITOMIX + GUNA-FLU

For cold & flu, chills and fever, aches, pains and fatigue associated with cold and flu. 3 pellets of **CITOMIX** 3 x day for 5-10 days, and 1 unidose tube of **GUNA-FLU** once a week for 2 weeks or until flu symptoms disappear. **GUNA-FLU** should be taken separately; **a two-hour window from the CITOMIX dose is ideal.**

CITOMIX + GUNA-FLAM

For pharyngitis, laryngitis, otitis, bronchitis, fever, sore aching muscles associated with viral or bacterial infections.
3 pellets of each for 5-10 days.

CITOMIX + GUNA-VIRUS

SUPER-STRENGTH ANTIVIRAL PROGRAMMING

For prophylactic treatment during the flu season: 3 pellets of **CITOMIX** + 3 pellets of **GUNA-VIRUS** 2 x day for 3 weeks.

Benefit from our research and experience, CONTACT US ANYTIME, to help you choose the right product or to put together a protocol ... it's as quick as a phone call!

1-877-486-2226

GUNA CANADA

600 Sir-Wilfrid Laurier Blvd., Mont-St-Hilaire, Qc J3H 4X6

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