

Medical warnings needed on DECT cordless phone use

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In mid July I was contacted by a female who was on a waiting list to see an ACNEM affiliated doctor specializing in treating Chronic Fatigue Syndrome (CFS). She was very concerned that she may have to sell her home because she thought that her insomnia and fatigue had something to do with her house and the possibility of excessive EMF exposure was uppermost in her mind.

I asked her about the usual sources of exposure, such as electric blanket use at night, heated water beds, proximity to powerlines, location of the meter box, etc. All seemed okay until I asked if any appliances were by the bed. She revealed that some months earlier she had purchased a DECT cordless phone which was now on the bedside table. As I had previously spoken with two people in Hobart who had encountered sleep problems after purchasing a DECT phone and having it by the bed, I advised her to replace the DECT phone with a traditional wired telephone. Upon checking back with her in late August, she reported that she had removed the DECT phone and was sleeping much better. However, as she had also started treatment for her CFS at about the same time, it is impossible to draw any conclusions about possible reasons for the improvement.

As a result of the widespread use of DECT phones in Australian homes, it is essential that medical practitioners working with patients who are having fatigue and sleep problems, for whatever reason, advise them not to use DECT phones as a precaution. Consider:

The problem with DECT

Digital Enhanced (formerly European) Cordless Telecommunications (DECT) telephones have been used in Australia for about three years now, mainly operating in the 2.4 GHz frequency band. Due to their improved performance, compared to the old analogue cordless phones, DECT phones are rapidly replacing wired phones as a means to provide a basic home telephone. This new growth area is very important to DECT / cell phone manufacturers. Cell phone saturation in the developed countries is now so high that consumer purchasing of new cell phones is decreasing and driving market growth down for an industry that depends on ever-increasing market growth. (1) According to the *DECT Forum*, an international DECT industry association, that growth is now in DECT technology which must be maintained by "permanent innovation"(2) - meaning an endless product development of new DECT devices for the consumer.

There is now a progression from 2.4 GHz to 5.8 GHz DECT technology because of the increasing use of 2.4 GHz 'wireless local area networks' (WLAN) in homes and offices. This is causing increasing interference or 'congestion' in the 2.4 GHz band thus necessitating a move to a higher frequency. (3)

A major difference between the older cordless phone and the DECT cordless phones is that the DECT phone's base station continuously emits pulsing microwave radiation at full power as long as the base station/charger is plugged into the 240 VAC wall socket. This means that the base station, usually placed on a bedside table, or on a work desk, is broadcasting a 2.4. or 5.8 GHz transmission (in Australia) regardless of whether the handset is charging in the base station cradle or being used 300 meters away.

In a situation where a sleeper is about half a meter away from a typical DECT phone placed on a bed side table, he or she is constantly being exposed to a pulsing microwave signal with an electrical field strength of about 6.5 Volts per meter (V/m) – the max. limit of the meter. (4) According to the manufacturer of the meter an electric field level of 6 V/m is roughly equivalent to a power density of 10 microwatts per square cm. (10uW/cm²) for continuous wave transmissions - which cannot be applied to pulsing DECT transmissions. According to a paper published by the Interphone Study group (Germany), measurements taken on DECT systems by private engineering companies in Europe have revealed power densities between 4 to 170 mW/m² for distances of up to 3 meters from the base station. (5) This converts to 0.4 uW/cm² to 17 uW/cm².

These figures may appear to be insignificant in isolation but when compared to epidemiological studies / surveys that considered fatigue and sleep disruption in humans exposed to radiofrequency transmissions, cautionary advice is warranted.

For example, in a New Zealand study on the health impacts on residents living near an AM and FM radio tower in Ouruhia, NZ in 1998, there was a significant incidence of both chronic fatigue (37%) and sleep problems (35%). The highest combined AM/FM reading from any single site was 2.6623 V/m. The authors of the Oururah investigation also mentioned that the 2.6623 V/m measurement corresponded to a power density of 0.0838 uW/cm² for the Oururah transmissions. (6)

In a large-scale five-year study on people living near a short-wave transmitter in Schwarzenburg, Switzerland, 55% of residents suffered from disturbed sleep, 35% from full insomnia. The researchers reported that *"sleep difficulty was especially disturbing. This leads on to increasing fatigue and reduced feelings of well-being."* The sleep disturbance was associated with power density exposures from 0.7 uW/cm² to the maximum found of 1.85 uW/cm². The study found a statistically significant association between extremely low intensity RF exposures averaging 0.236 uW/cm² and a wide range of health and well-being variables. (7) Interestingly the researchers were able to have the transmitter turned on and off on different nights and symptoms were greatly reduced when the transmitters were turned off.

What these two studies clearly suggest is that prolonged radiofrequency exposures, of a far less intensity than that emitted by a DECT base station/charger by a bedhead (or desk), are implicated with sleep disruption and fatigue.

DECT technology also caters for the very young as well with DECT baby monitors gaining wide popularity with parents. It's also a very profitable business venture. One major manufacturer proudly states on their web site for DECT baby monitors: *"Happy babies make happy parents. Regaining their market leading position makes a happy business."* (8)

Whether or not this makes for happy babies is debatable, for according to the UK based organization *Powerwatch*:

“Over the past five years we, with the help of parents, have measured a variety of baby monitors and the DECT pulsing ones seem to be far more disruptive of the infant’s sleep and state of contentment (causing restlessness, irritability and crying). The old wired ones and the older “analogue” cordless ones do not seem to cause the same problems if kept at least one metre from the cot / bed.

We have had a number of reports from parents that their babies did not sleep well and cried a lot when they used DECT monitors but were ok when no baby monitor was used. When they then tried a cheaper analogue monitor, the infant then slept as well as they did with no monitor.

A DECT monitor placed in your baby’s bedroom will expose them to more pulsing microwave radiation that living near to a mobile phone base station mast would do. As a result, whilst there have been no studies done into baby monitors specifically, studies that cover mobile phone masts provide a good background to the effects that would be expected in your baby.” (9)

Official warnings

Soon after DECT phones were first introduced in Europe, mainly for use in office buildings, concerns were raised over possible health effects. One of the largest white collar trade unions in Europe, the Swedish Union of Clerical and Technical Employees in Industry, issued advice to its members to take steps to minimize their exposure to DECT because the system always operated at maximum power and there was insufficient research on possible long-term health effects. (10)

The initial market success for DECT was found in Germany in the early 1990s and it was in that country where adverse health effects from DECT technology soon became apparent. Soon after the introduction of DECT in Germany Dr. Leberecht von Klitzing, a medical physicist and researcher from the University of Luebeck had infants brought to him who were perfectly healthy, but their heart beat became erratic for no obvious reason. As soon as the DECT cordless phone was removed from the bedroom or neighboring apartment, the infant's heart beat returned to normal. (11)

Concerns within the German medical community led to the *Freiburger Appeal* in October 2002 , signed by over 130 medical practitioners from the German environmental medicine medical organisation, *Interdisziplinäre Gesellschaft für Umweltmedizin e. V.* (IGUMED). The appeal was to express their concern over their medical observations of adverse health impacts from the use of both cell phones and DECT cordless phones. Symptoms were attributed to exposure to pulsed microwave radiation from cell phone and DECT technology. The following is an extract:

Out of great concern for the health of our fellow human beings do we - as established physicians of all fields, especially that of environmental medicine - turn to the medical establishment and those in public health and political domains, as well as to the public.

We have observed, in recent years, a dramatic rise in severe and chronic diseases among our patients, especially:

· Learning, concentration, and behavioural disorders (e.g. attention deficit disorder, ADD)

- Extreme fluctuations in blood pressure, ever harder to influence with medications
- Heart rhythm disorders
- Heart attacks and strokes among an increasingly younger population
- Brain-degenerative diseases (e.g. Alzheimer-s) and epilepsy
- Cancerous afflictions: leukemia, brain tumors

Moreover, we have observed an ever-increasing occurrence of various disorders, often misdiagnosed in patients as psychosomatic:

- Headaches, migraines
- Chronic exhaustion
- Inner agitation
- Sleeplessness, daytime sleepiness
- Tinnitus
- Susceptibility to infection
- Nervous and connective tissue pains, for which the usual causes do not explain even the most conspicuous symptoms

Since the living environment and lifestyles of our patients are familiar to us, we can see especially after carefully-directed inquiry a clear temporal and spatial correlation between the appearance of disease and exposure to pulsed high -frequency microwave radiation (HFMR), such as:

- Installation of a mobile telephone sending station in the near vicinity
- Intensive mobile telephone use
- Installation of a digital cordless (DECT) telephone at home or in the neighbourhood". (12)

Specifically in relation to DECT phones the IGUMED called for a ban on DECT telephones in preschools, schools, hospitals, nursing homes, events halls, public buildings. They also called for a revision of the DECT standards to reduce the radiation intensity. (13)

The German Federal Radiation Protection Agency (Bundesamt für Strahlenschutz – BfS) has expressed concerns over DECT phone use. They stated in a January 2006 press release that a DECT cordless phone is often the strongest single source of microwave radiation in a private home. To prevent possible health risks the Agency recommended minimizing personal radiation exposure (if a DECT phone is used) by placing the base station in a place where you do not spend much time, for example a hall. For the workplace the Agency specifically advised to avoid placing DECT phones on work desks and called upon manufacturers to redesign the phones to include a feature of power output control, so that the power output during a call would be adapted to the distance of the handset from its base station. This would allow phone use only to the level of power necessary to keep the communication going and power would be down while on standby and connected to the base station/ charger. (14)

In December of 2005 the Public Health Department, Salzburg Region, Austria issued advice to the government, schools and parents warning of the lack of studies available on either short-term or long-term health effects from WLAN and DECT devices. However the department saw evidence of possible adverse effects such as headaches, concentration difficulty, restlessness, and memory problems etc. The official advice of the Public health Department is not to use WLAN and DECT in Schools or Kindergartens. (15)

Of course the industry manufacturing DECT technology say that there is no conclusive evidence that DECT technology is harmful. This is true, especially considering that the technology is being developed and marketed well before any relevant research on possible long-term health effects. For example:

Irrelevant research

In July 2006, the findings of an epidemiological study on DECT phone use by Joachim Schuz *et al* was published in *Radiation Research*. This study found no evidence of a higher risk of brain tumours (Glioma and Meningioma) in a small number of exposed subjects that slept close to a DECT base station in the bedroom. (16) This study will no doubt be quoted by the DECT industry as proof that their phones are safe, but the concerns over DECT phones and possible health hazards have **not** been about the possibility of brain tumours, as examined in this article. Simply put: the researchers did not look at the relevant health issue. A far more useful investigation could have looked for sleep disruption and fatigue in the subjects sleeping next to a DECT phone.

As for a lack of statistical power, out of the total of 747 cases of Glioma and Meningioma combined in the Schuz study, only 10 people were identified who had definitely or possibly placed their DECT cordless phone base station by the bed.

In addition, brain tumours can take many years to develop, with evidence pointing to a 10-year latency. (17) The case could therefore be made that widespread DECT phone use has not gone on long enough to see any population trends in relation to brain tumour incidence. For example, in the Schuz *et al* study, out of 366 Glioma cases only two had used DECT for 5+ years (controls 732/6) and for the 381 Meningioma cases only four were in the 5+ year category (controls 762/7). (18)

Therefore the study's conclusion that it is "*a first indication that residential low-level exposure to RF EMFs may not pose a higher risk of brain tumors*" is overstating the case.

Conclusion:

As exemplified in this paper, there is a body of evidence that warrants medical practitioners to take a precautionary approach to DECT technology and to, at the very least, advise patients with sleep and fatigue symptoms to avoid the use of DECT phones altogether. The traditional wired phone may be more inconvenient, but may prove to be far safer in the long run.

If patients insist on having a DECT phone, at least advise them not to place the base station by the bed or anywhere where they spend extended amounts of time. As for a recommended distance from a bed head or desk, at least three meters would be an absolute minimum.

It is recommended that advice to new parents would be to have nothing to do with DECT baby monitors whatsoever.

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