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CONCISE STUDY OF POSITIVE AND NEGATIVE SIDES OF BLUETOOTH EARPIECE

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ABSTRACT

Bluetooth is a (short-range) wireless standard, which has been improved over the years. Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs).Now a days, Bluetooth ear piece have become very popular and some people wear it all day long on their ear, these people also hold their cell phone in their pockets or in a belt-clipper and by that they get exposed to electromagnetic radiations all day long. This paper will focus on the basic introduction of Bluetooth technology , benefits of Bluetooth earpiece, effects of earpiece on health (i.e. negative side of Bluetooth earpiece), and alternatives of Bluetooth earpiece and at the end of this paper we will conclude about the positive and negative side of Bluetooth earpiece. The main aim of the paper is to make a clear vision about effects of Bluetooth earpiece, because when we use earpiece we expose our self double to radiations.

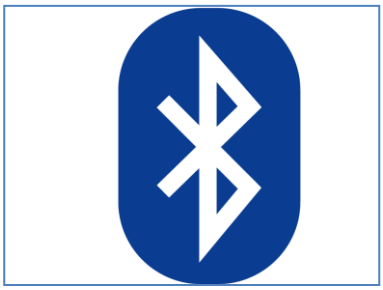
Keywords: *Pulsed Radio Frequency Signals, Special Interest Group (SIG), Electromagnetic Field (EMF) , Faraday Cage Effect, Air Tube Headset ,Retro Handset Telephone.*

INTRODUCTION

Bluetooth is a name of wireless technology that uses pulsed radio frequency signals. Here is what Dr. Andrew Goldsworthy has to say about pulsed radiation: "Pulses carried by microwaves are particularly dangerous. This is because their very short wavelength allows

the transmission of pulses with extremely rapid rise and fall times , and it is the rate of change of the fields (rather than their total energy) that does most of the biological damage ’’. When we talk about the pulsed radio frequency signals we are of course talking about radiations, are in this case Bluetooth radiation. Bluetooth is now used extensively in today’s world , in cell phone headsets , computer accessories such as keyboards , printers , personal digital assistants (PDAs) , personal media players , GPS , gaming equipment , and also various medical health and wellness devices. The development of the "short-link" radio technology, later named Bluetooth, was initiated in 1989 by Nils Rydbeck, CTO at Ericsson Mobile in Lund, Sweden, and by Johan Ullman. The purpose was to develop wireless headsets, according to two inventions by Johan Ullman, SE 8902098-6, issued 1989-06-12 and SE 9202239, issued 1992-07-24. Nils Rydbeck tasked Tord Wingren with specifying and Jaap Haartsen and Sven Mattisson with developing. Both were working forEricsson in Lund. The specification is based on frequency-hopping spread spectrum technology.

WHAT IS BLUETOOTH?



According to some researchers we can define Bluetooth as: “A proprietary open wireless technology standard for exchanging data over short distance ”. which basically means it is a wireless system . Bluetooth transmits a frequency level in the 2.4 GHZ band: this is same as microwave oven (means we dealing with electromagnetic field or EMF). The Bluetooth logo is a bind rune merging the Younger Futhark runes (Hagall) (ᚼ) and (Bjarkan) (ᛒ), Harald's initials

Fig.1: This figure shows extensively the connectivity and use of Bluetooth in various devices

Class	Max power		Typical range (m)
	(mW)	(dBm)	
1	100	20	100
2	2.5	4	10
3	1	0	1

Fig.3: Different classes of Bluetooth technology

A Bluetooth earpiece or headset provides a two way connection to the users' cell phone via Bluetooth. Bluetooth cell phone users are employing two wireless technologies: Bluetooth technology between ear and cell phones and the carrier transmission technology between cell phone and cell tower. When we use a Bluetooth earpiece we are always exposing ourselves to both Bluetooth radiation and cell phone radiation, a double whammy. We are getting a double dose of microwave radiation.

POSITIVE SIDE OF BLUETOOTH EARPIECE.

Now a days as we are seeing that everyone is using Bluetooth earpiece by working, sitting or doing anything .This is becoming a lead of life. Here we are discussing about the positive points of Bluetooth device as follow:

i. **Productivity**

Headsets free our hands so that we can work, take notes open drawers to find files and do a myriad of other things while you're on the phone. Bluetooth is great for the home worker but perhaps even more beneficial to the mobile user who needs to conduct business on the go. This technology offers opportunities with free and inexpensive VoIP calls among associates. With support for land lines, mobiles and IP telephony, these headsets allow workers to be more accessible while presenting themselves in a professional manner at all times. For instance, switching the device to your PC in Wi-Fi hotspots allows you to discuss important matters and access critical files at the same time. This can be done even if you are miles away from the home office.

ii. **Sound Quality**

Wireless audio technologies sound quite appealing. However, when it comes to Bluetooth audio, there is a concern that the convenience of it comes at a price: "compromising sound quality". This prevents many audio enthusiasts from removing all those lengthy and tangled wires with the peace of mind of maintaining a quality listening experience.

For many years, the de facto standard codec for Bluetooth audio was Low Complexity Sub-band Coding (SBC). In recent years, another codec has gained popularity. It is called aptX.

In addition, many headsets also have noise cancelling technology that actively blocks background sounds.

iii. **Stylish & Affordable**

Wireless earpiece and earphones are sophisticated and stylish. Many have a sporty design because they are made to stay firmly in place when you are working out or running for long distances. Even casual listeners can enjoy the sleek design of any style of wireless headphones. The seek design of Bluetooth creates a fashion trend for the young generations.

iv. Compact

Bluetooth headsets are small and lightweight which makes it easy to carry them and wear them. It easily fits all types of ears.

NEGATIVE SIDE OF BLUETOOTH EARPIECE

Devices such as Bluetooth headsets emit wireless microwave radiation. Microwave signals have shorter wavelengths and a rapid rate of oscillation which enables them to carry information over long distances without wires. Their short wavelength and rapid oscillation also helps them to penetrate living tissues down to the cellular level. Soviet Russia used this characteristic of microwave signals against U.S. when it developed dangerous weapons in 1950s. These weapons caused leukemia in people. This indicates that even microwave radiations used in wireless communication can cause severe health damages. Microwave radiations from Bluetooth devices cause biological changes in body. These biological changes take place at cellular level and can transmit to offspring via DNA and RNA.

Another type of danger that is being caused by Bluetooth headsets is distraction while driving vehicles. According to a survey that I conducted on Bluetooth headset users, about 70 % of users take calls while driving. Distraction or lack of attention while driving may cause accidents, especially during bad weather conditions, bad mood or heavy traffic.

Long- term exposure to microwave radiation has been linked to:

- Head aches
- Cancer
- Leukemia
- Brain tumors
- Alzheimer
- Autism
- ADD (Attention Deficit Disorder)
- Miscarriages
- Birth defects
- Hair loss
- Suicide
- Multiple sclerosis
- Autoimmune illness

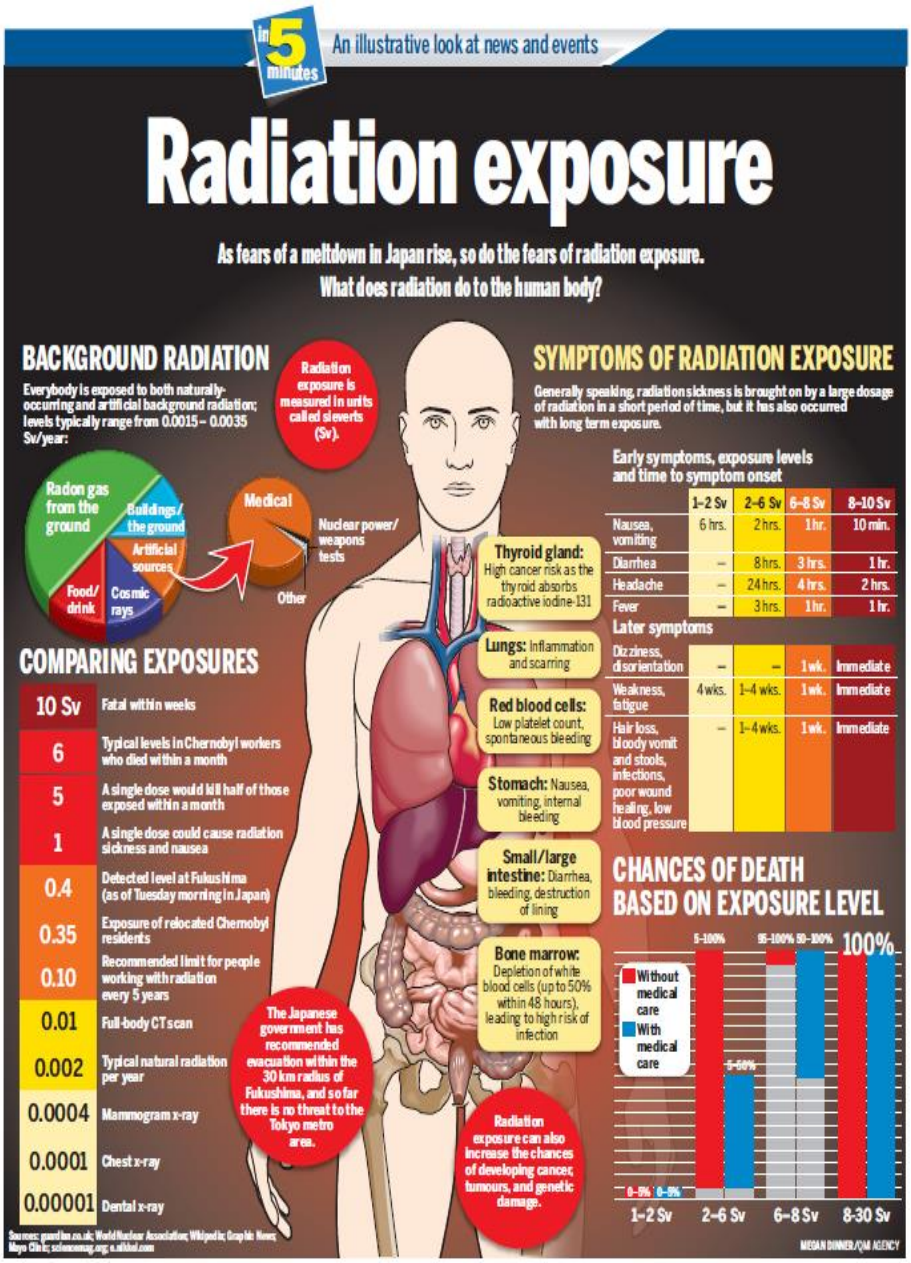


Fig.3: It shows the effects of radiation in our body

Microwave radiation has been shown to affect biological changes within the body. These biological changes on a cellular level and their effects can be passed on to offspring via genetic damage (DNA, RNA). The research, from Search for Health (spring, 1992): After study participants consumed microwaved vegetables, Swiss Scientist Hertel measured the following effects:

- Cholesterol levels increased rapidly.
- Hemoglobin decreased significantly (creating anemic tendencies.)

- Lymphocytes (white blood cells) showed a significant term decrease.
- Increased stress (evidence by the increase of leukocyte)
- NOTE: Leukocyte response can indicate pathogenic effects such as poisoning and cell damage.

Multiple studies have reported that as short as a single, two-hour exposure to cell phone or Bluetooth radiation will result in pathological leakage of the blood-brain barrier. Using a Bluetooth headset exposes the brain, the ears and the eyes to a strong field of microwave radiation.

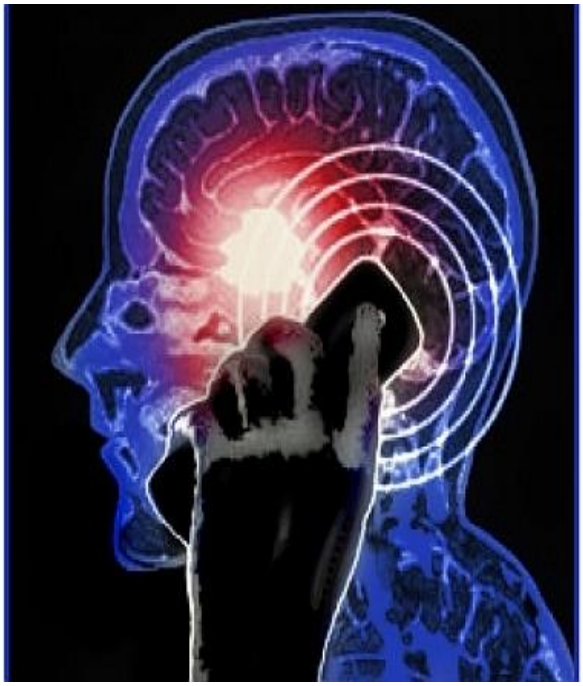


Fig.4: It shows how a Bluetooth headset exposes the brain , the ears and the eyes

If we use Bluetooth earpiece in a car the effect are multiplied due to the faraday cage effect. (using cell phone in car is dangerous . not just because it can cause an accident. There is also an different effect on our health. The radiations emitted from our cell and Bluetooth device are reflected back by the cars metallic structure magnifies the radiation. It's called the faraday cage effect, but using a cell phone in a car works on the same principles as microwave oven. In both the cases they are metallic enclosures where radiations are magnified. This radiations from cell phone bounces around car and is observed by our body at a much higher level than would otherwise be.

Fig.5: It shows Faraday Cage Effect.

I. ALTERNATIVE WAY FOR BLUETOOTH HEADSET

We can use a radiations free air tube headset. These work much like a wired headset but there are no wires to conduct the radiation but the air tubes conduct the sound.(By this alternative we can reduce the radiations of both Bluetooth and cell phone radiations).

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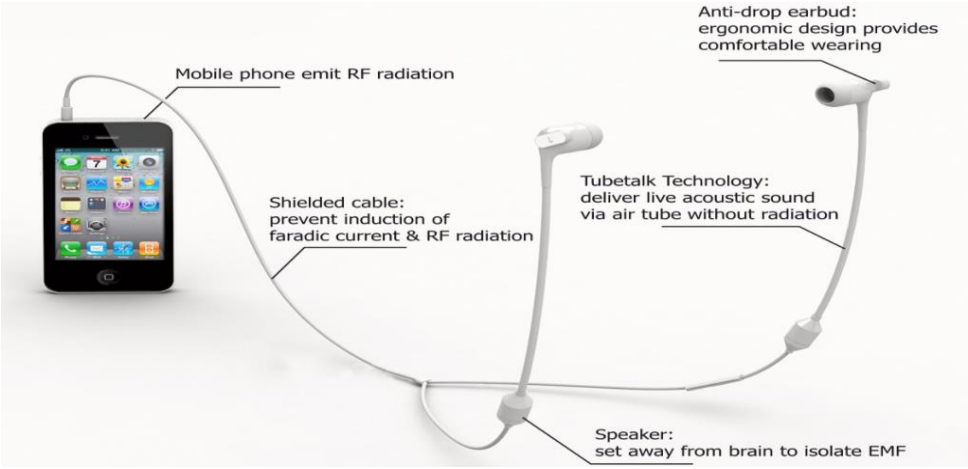

Fig.6: Air tube headset-Anti radiation.

Use a retro handset telephone. The length of the cord means you're still in close proximity to your cell phone so the device is clearly much better than having cell phone pressed against your ear. (We can use this instead of Bluetooth earpiece and can minimize the Bluetooth radiations as well as cell radiations.)

Fig.8: Retro handset telephone

CONCLUSION

At last if we talk about the facility given by Bluetooth earpiece then definitely we will say Bluetooth earpiece are very cool they allow us to communicate without using cord and wires. But there is a down side also. All Bluetooth devices emit electromagnetic radiation. This radiation is dangerous because they are held within centimeter of the brain and they are used In conjunction with a cell phone(double radiation).In this paper we have studied about the positive and negative sides of Bluetooth device , means how it is beneficial for us and in other hand how harmful for us. On the basis of discussion we can conclude that we should minimize the use of Bluetooth device and in case if we need the use then we should go with its safer side (alternative approach i.e. air tube headset , retro handset telephone).

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