

Microwave Theory and Techniques
Prof. Girish Kumar
Department of Electrical Engineering
Indian Institute of Technology, Bombay

Module - 01
Lecture - 05
Effects of Microwaves on Human Body – II

Hello and welcome to today's lecture on cell, tower, antenna, radiation hazards and solutions. In the last lecture I had actually talked about what are the various RF sources in India and then we talked about health hazards associated with cell phone. Now, let us look into what are the radiation hazards from cell tower and what are the possible solution?

Now in India, we have too many technologies. We have a CDMA technology, GSM 900, 1800, then 3G, 4G and now we have Wi-Fi, almost you can say everywhere. Wi-Fi is present in schools and colleges, at airports, railway stations and there is a proposal to make a Wi-Fi enabled city and this particular frequency just to tell you 2400 to 2500. The center of that which is 2450 megahertz is used in a microwave oven. And you know that you can cook the food in a microwave oven in about few minutes. Of course, that power is very high and Wi-Fi radiation power is much smaller.

But however, we also know that energy is power multiplied by time. So, if I reduce the power by 1000 times then the time taken will be 1000 times more. Similarly, if I reduce the power by 10000 or 20000 times, similarly the time taken will be more. But you can actually think about that in one particular day see we have 60 minutes multiplied by 24 hours, you multiply that by 365 in a year and you can see how many minutes are accumulated. And then you can compare the power of Wi-Fi which is typically of the order of 0.1 watt compared to the microwave oven power which is around 500 watt of power. In fact, I would like that all of you people please see this website Wi-Fi in schools dot com.

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Cell Tower Antenna Radiation

Antennas on cell tower transmit in the frequency range of:

- 869 - 890 MHz (CDMA)
- 935 - 960 MHz (GSM900)
- 1805 – 1880 MHz (GSM1800)
- 2110 – 2170 MHz (3G)
- 2300 – 2400 MHz (4G)
- 2400 – 2500 MHz (Wi-Fi, Bluetooth)

<http://www.wifiinschools.com/>

This website is dedicated to help the public realize that wireless internet, or WiFi, emits radiation that causes a myriad of serious **health effects, including damage to DNA, cancer, and infertility.**



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In fact, this website is dedicated to help the public realize that wireless internet or Wi-Fi or cell phone or cell tower or any RF radiation the causes serious health effects, such as damage to DNA, cancer and infertility.

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Cell Towers Installed in Mumbai



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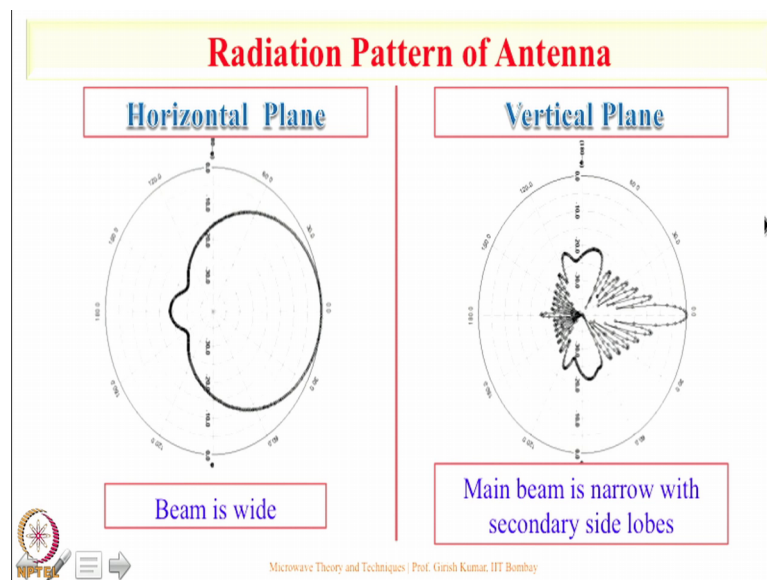
So, just to show you some of the pictures of the thing, you can see here that various antennas are mounted. You can see over here these are mounted on top of the building. Here these are mounted on the side of the building. I just want to tell you there are two main types of antenna; one are these circular ones here, these are actually circular dish

antenna. And in fact, these do not transmit to very high power. In fact, most of the time, they transmit about 1 watt of power and they are actually meant for packet transmission.

So, though basically they do not communicate with a mobile phone, they communicate with each dish is communicating with another dish. And in fact, they do not want any human being to be there in between, so that the communication is not broken. However, if any bird flies in that particular region will do get affected. So, it actually these vertical one which actually communicate with the mobile phone and I have given a very simple name to these. These are I have given name as tube lights, vertical tube lights. Why I call them tube light? Because when you turn on a tube light, it takes time to turn on.

Similarly, our human brain which cannot see microwave, which cannot hear microwave, which cannot smell microwave, so we are not willing to understand also: what are the health hazards associated with these microwave radiation. So in India, we allow these particular antennas to transmit 20 watt of power for 2G and 3G and we allow them to transmit 40 watt of power for 4G.

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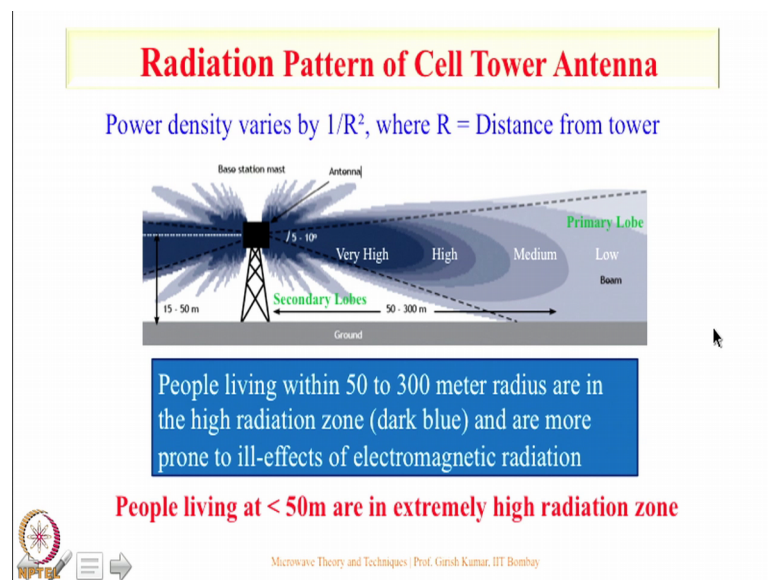


So, let's see what is the typical radiation pattern of these antenna. So, of course, a radiation pattern of the antenna is a 3 dimensional thing. But just to make things little simpler, we have actually divided into two plane; horizontal plane and vertical plane. So, you can see that the beam is wide in the horizontal plane. So, if you think I am that antenna, then the beam coverage will be wide. So, all the people in this particular area

will receive more radiation and people behind me or in this side will receive lesser radiation.

But in the vertical, you can see that the maximum radiation is in the forward direction. So, people living in that particular direction will receive very high radiation compared to other people. Now, beside this is the radiation pattern of the antenna.

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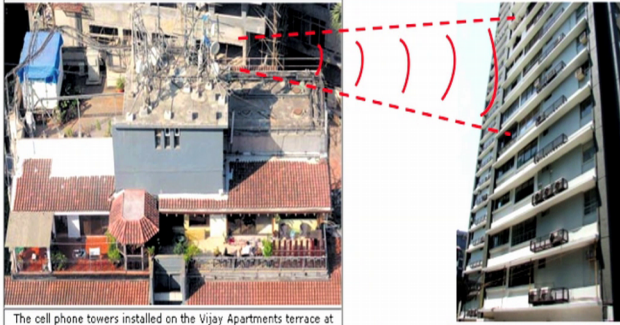


However, there is another phenomenon which is power density varies by $1/R^2$, where R is distance from the tower. So that means, let us say if there is a tower here and you are at this distance and if this distance is increased by 10 times, then what will happen? Power will decrease by 100 times. So, this is important to understand that as you go away, the radiation intensity is decreasing.

However, this I have taken from one of the German website and what they have written; people living within 50 to 300 meter radius are in the high radiation zone and are more prone to ill effects of electromagnetic radiation. And if you see in India, people are living even at 10 meter or 20 meter distance from the tower. So, people living at less than 50 meter distance are in extremely high radiation zone. So, this is the one of the case which actually became quite popular in Mumbai area about 4 years back.

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CASE STUDY Usha Kiran Building, Worli, Mumbai



The cell phone towers installed on the Vijay Apartments terrace at Carmichael Road pic/Bipin Kokate

Usha Kiran Building

Six cancer cases in consecutive floors (5th, 6th, 7th, 8th and 10th) directly facing and at similar height as the mobile phone towers of four telecom companies placed on the roof of opposite building.

 NPTEL

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So, what had happened 4 years back in this particular Usha Kiran building, four cancer cases were reported on 6th floor, 7th floor, 8th floor and they actually found out that there were multiple towers were installed in the opposite building. And all these antennas on the towers were transmitting and this being in the main beam and as I mentioned that this is installed on the 7th floor.

So from the 7th floor: where the maximum radiation will go towards 6, 7, 8 floor. Now, while these people were fighting with the cellular operator trying to convince them to remove the tower, four cancer cases actually became six cancer cases and you can see that these are almost in consecutive floor. So, basically why: because this is actually speaking leading and trailing edge of the main beam. So, of course, after several years of battle they were finally able to get the towers removed.

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EMF Radiation Standards for GSM900		
Country	Milliwatt / m ²	Watt / m ²
INDIA (adopted ICNIRP)	4500	4.5 (f2000)
INDIA (Adopted 1/10th of ICNIRP on Sep. 1, 2012)	450	0.45 (f2000)
AUSTRALIA (New South Wales proposed)	0.01	0.00001
AUSTRIA (Salzburg city)	1	0.001
BELGIUM	45 to 1125	0.045 to 1.125
BELGIUM (Luxembourg)	24	0.024
BIO-INITIATIVE REPORT (Outdoor)	1	0.001
BIO-INITIATIVE REPORT (Indoor)	0.1	0.0001
CANADA (Toronto Board of Health - proposed)	100	0.1
CHINA	400	0.4
FRANCE (Paris)	100	0.1
GERMANY (ECOLOG 1998 - Precautionary Recommendation)	90	0.09
GERMANY (BUND 2007 - Precautionary Recommendation)	0.1	0.0001
ITALY	100	0.1
NEW ZEALAND (Auckland)	500	0.5
POLAND	100	0.1
RUSSIA	100	0.1
SWITZERLAND (Apartments, Schools, Hospitals, Offices & Playgrounds)	42	0.042
USA (Implementation is strict)*	3000	3 (f3000)
Final Recommendations		
Indoor - include apartments, schools, hospitals, offices & playgrounds.	0.1	0.0001
Outdoor - people spend few minutes a day.	10	0.01

*USA - FCC Guidelines OET56: Power transmitted is 0.5 to 1 W in the Urban Area

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Now, just would know: what are the standards in India and abroad. Now, I just want to mention that India had adopted ICNIRP guideline just to tell you, what is ICNIRP? ICNIRP stands for International Commission for Non Ionizing Radiation Protection and people think that it must be an international body something similar to WHO, which is actually speaking taking care of health of the entire world well that is not true.

ICNIRP is nothing but an NGO and which was actually formed by doctor Michael Rapper Shelley. And if you just Google search about him you will find that there are lots of websites claiming and saying that he was always an industry person. So, all the things which are there in the ICNIRP guideline, they basically suit the industry. However, there are still few interesting things are there.

ICNIRP guideline itself says that these guidelines are only for short term exposure and not for long term exposure. And in fact, this guideline of 4500 milliwatt per meter square for GSM 900 is only valid for 6 minutes per day. But in India, we adopted this particular guideline for 24 hours a day. I mean just think about you put the food in a microwave oven for 1 minute or 100 minute, what will be that case? The food will be totally charred.

Now, I just want to mention here. So, in India technology came in 1995, there were absolutely no guidelines. So, in 2008, they followed ICNIRP guideline and then again they had come out with the white paper where they mentioned that they are going to look at it. And 2010, my journey from Mumbai to Delhi started. So, just to tell you, between

2010 and 2014 I made more than 30 trips to Delhi, I met TRAI people, TZ people, D O T people.

I made presentations to the inter ministry committee which consisted of D O T people, health ministry people, as well as environment ministry. And then, I had also submitted my report to D O T secretary in December 2010. And then, IMC report came in January 2011. They did mention about lot of health problems, but at the same time they also mentioned it is not conclusive and they recommended that one tenth of the ICNIRP norm should be adopted.

And then in September 1, 2012, one-tenth of the ICNIRP norm was incorporated in India. However, again if this is valid only for 6 minutes per day, one-tenth of that is only valid for 60 minutes per day which really means 1 hour per day whereas, people who are living next to the cell tower are exposed to radiation 24 hours a day.

So, really speaking, India has really adopted a very very high radiation for 24 hour exposure. If you see now, most of these things are below 450 majority of them, except if you look at here 3000 and 3000 is implemented by USA. And most of the time cellular operators actually code that, oh USA has adopted 3000, but we also know that they are very particular about the health hazard.

So, I just want to tell you that you actually look at the USA FCC guideline OET 56 page number 21 and it has a one paragraph where it is actually written there that they allow high power transmission in the rural or along the highways. In the urban area, they allow only 0.5 to 1 watt of power. So, in India we allow them to transmit 20 watt of power and for 4G, we allow them 40 watt of power and that is why people in India are developing health problems at a much faster rate than the counterparts in the other countries.

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Guidelines of Austrian Medical Association

Adopted on 3rd March 2012 in Vienna

Irrespective of the ICNIRP recommendations for acute effects, the following benchmarks apply to regular exposure of more than four hours per day.

High-frequency electromagnetic radiation (as power flow density)

▫ $\geq 1000 \mu\text{W}/\text{m}^2$ ($\geq 1 \text{ mW}/\text{m}^2$)	very far above normal
▫ $10\text{-}1000 \mu\text{W}/\text{m}^2$ ($0.01\text{-}1 \text{ mW}/\text{m}^2$)	far above normal
▫ $1\text{-}10 \mu\text{W}/\text{m}^2$ ($0.001\text{-}0.01 \text{ mW}/\text{m}^2$)	slightly above normal
▫ $\leq 1 \mu\text{W}/\text{m}^2$ ($\leq 0.001 \text{ mW}/\text{m}^2$)	within normal limits

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So, I just want to also mention here Austrian Medical Association adopted on 3rd March 2012 and see what they are saying; irrespective of ICNIRP recommendation. So, they also know: what are the ICNIRP recommendations. ICNIRP is in Germany and they are in Vienna, Austria. So, they know each other pretty well and see: what are their guidelines and they are talking about regular exposure of more than four hours per day.

So, if you are exposed for more than four hours per day, then even 1 milliwatt per meter square is very far above normal and, in India what we have, 450 milliwatt per meter square for 24 hour exposure. So, you can see that we are literally speaking, sitting on radiation time bomb which is going to create havoc in India in time to come; So, just to tell you that we have done radiation measurement at more than thousand places and just to highlight the few cases, here in this particular place here.

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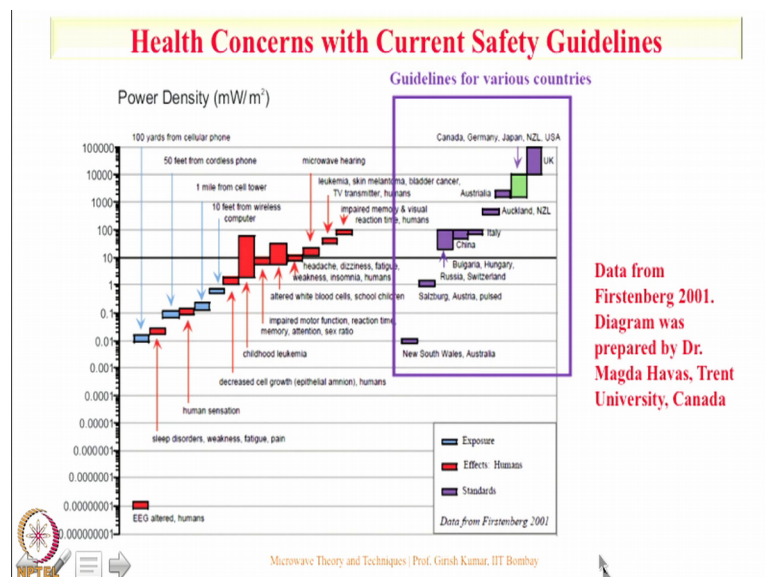
Radiation Measurement at Various Locations

Cumulative Readings including CDMA, GSM 900 and GSM 1800

Location	Reading in dBm	Readings in W/m ²	Readings in milliW/m ²
Terrace, New Rajindra Nagar, Delhi	+09	0.561	561
Resident 1, Bedroom - Chowpatty	+06	0.281	281
Resident 2, Bedrooms - Opera House	+05	0.223	223
Resident 3, Bedroom - ML Dahanukar Marg	+05	0.223	223
Delhi-Gurgaon Highway - near Toll (3 towers)	0	0.0706	70
Vashi Bridge - after Railway Station	-4	0.0282	28
Resident 3, 4 th Fl: Sergean House Lady w/cancer	-6	0.0177	17.7
Resident 4, Dadar East, Lady w/cancer	-6	0.0177	17.7
Resident 5, Opposite roof, Rane Society, Powai	-10	0.007	7
Ustav Chowk, Kharghar	-12	0.0045	4.5
Govandi- Residential towers - near Indian Oil	-14	0.0028	2.8
Lower Parel Employees-headaches, forgetfulness	-16	0.0018	1.8
Vashi Highway - near Turbhe	-18	0.0011	1.1
Nerul Bridge	-20	0.0007	0.7
Vivero pre School (opposite powai lake)	-22	0.0004	0.4
Rajeev Gandhi nagar	-26	0.00018	0.18
On road near Evita (Hiranandani Building)	-28	0.00011	0.11
D-Mart, Hiranandani, Powai	-34	0.000028	0.028
T Bombay School of Management - Entrance	-46	0.0000018	0.0018

We had done the radiation measurement and you can see this value is only 17.7 milliwatt per meter square and this later developed cancer within 1 year. In fact, later on we had sent our team to that Usha Kiran building where they had reported several cancer cases. And we found the radiation level to be between 5 to 10 milliwatt per meter square and they started developing these severe health hazards in about 2 to 4 years.

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Now, besides cancer, in fact cancer is the last stage. Lot of health problems happen before that. And I want to bring to your attention here. So, this is the power density

which is milliwatt per meter square and let just look at this one. So, 1 milliwatt per meter square, if you see here all these reds are severe health problem.

So, you can actually see here that it is actually mentioning here decrease cell growth and other thing you can see over here at the level of 2 or 3; these are giving rise to childhood leukemia. But in fact, the onset of the problem even happens at such a low level which actually means sleep disorder, fatigue, weakness and pain and I am sure people do not want to live with these kinds of a problems.

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Biological Effects

Most Common Complaints

- Sleep disruption
- Headache
- Concentration
- Forgetful memory
- Depression
- Fatigue
- Dizziness
- Palpitations of the Heart
- Visual Disorders
- Cardiovascular Problems
- Buzzing in the Head
- Altered Reflexes

Many of these are related to changes in the electrical activity of the brain

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The slide features a yellow header with the title 'Biological Effects' in red. Below it is a light blue box with the subtitle 'Most Common Complaints'. A list of twelve symptoms is presented in two columns. To the right of the list is a photograph of a person in a green shirt looking distressed, holding their head. Below the list is a photograph of a person sleeping with an alarm clock. A blue underlined text box states, 'Many of these are related to changes in the electrical activity of the brain'. The slide includes the NPTEL logo in the bottom left and the text 'Microwave Theory and Techniques | Prof. Girish Kumar, IIT Bombay' in the bottom center.

Now, what are the most common complaints? So, let us just look at the first column over here. It leads to sleep disruption, headache, concentration problem, forgetful memory, depression fatigue. And I just want to tell you India is now becoming capital of the entire world when it comes to the depression. We have several corridors of people who are depressed today.

So, I am not saying that everything is related to cell phone and cell tower or microwave radiation but that is definitely one of the reason to cause depression. And if you go with this health problem, majority of the time doctors will tell you have too much stress and too much strain and you will in general agree yeah, I have too much strain too much stress or too much strain and you may not take any precaution. But if you ignore that, now things become serious you may have a dizziness problem heart problem especially

if you keep the cell phone in your shirt pocket near the heart, visual disorder problem is also becoming a various serious issue. In fact, there are multiple reasons are there.

Let us say you have a cell phone and you are actually either playing a game or watching video and let us say it is still transmitting one or two pulses per minute. So, first of all when you are looking at it, it is a very small screen characters are very small. You are actually speaking your lips are not moving blinking much and in that case of course, there is a stress on that, but besides that there is a this radiation going on. So in fact, that radiation is coming towards you. So, your eyes are getting dried up, your lips are getting dried up and so on and that is leading to lot of visual disorder problem.

So, cardiovascular problem again, more prominent if you live next to the cell tower or if you use the cell phone next to your shirt pocket, buzzing in the head altered reflexes. If you ignore these things, not things become even more serious.

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The slide, titled "Biological Effects (contd.)", lists several health risks associated with cell phone use. On the left, a vertical list of colored boxes contains the following text: "Neurodegenerative Disorders –Alzheimer, Parkinson's", "Immune System Degradation", "Tinnitus and Ear Damage", "Irreversible Infertility", "Effect on Skin", "DNA Damage", and "Increase in Cancer Risk". On the right, a photograph of a woman talking on a mobile phone is shown with four red arrows pointing to her head and face, labeled with the following risks: "Breakdown of Blood Brain Barrier", "Increased Risk of Eye Cancers", "Increased Risk of Ear Tumors", and "Increased Risk of Other Cancers". At the bottom left is the NPTEL logo, and at the bottom center is the text "Microwave Theory and Techniques / Prof. Girish Kumar, IIT Bombay".

So, these are Alzheimer disease, Parkinson's disease. In fact, in India these diseases are increasing linearly, immune system degradation, I have already talked about ear damage irreversible infertility. In fact, that has become a major concern today especially, to the people who are keeping cell phone in there pant pocket because what is happening, it is affecting and it is affecting both the genders for all the males, it affects their sperm quality and quantity and for all the girls and ladies, it affects the eggs in the ovaries.

So, both of them are becoming infertile. In fact, a few years back report came in Mumbai that 46 percent of eligible couple are not able to conceive. And in fact, today IVF is one of the biggest industry and there are so many people are going and of course, it is a roaring business for IVF people. And on the lighter side, just to mention that there was a one advertisement of idea on 3G, one of the movie star had advertise that and the advertisement was like India busy busy no apathy.

And in fact, I will tell you it is a absolutely perfectly true advertisement except that one line is missing in between, India busy busy, they become infertile and hence no apathy. And I can probably predict that India may not be able to overtake china as far as the population is concerned because many people are going to die because of the health problem and many children will not be born because of the infertility issues. So, there is of course, an effect on the skin DNA damage and increase in cancer risk.

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DNA Damage

Single and double strand breaks observed in DNA from microwave exposure at levels below the current FCC exposure standard.




Fig.1 Unexposed control. Bundle of DNA (No-Tail)

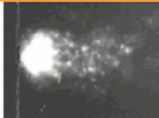


Fig.2 X-ray calibration 25.6 rads. DNA breaks are very obvious






Fig.3 Cell Phone level microwave exposure 2hrs 2.45GHz reaching so called safe SAR levels
Comet Tail = DNA Damage



Prof. Henry Lai
University of Washington
1995, Diem et al. 2005

When Damage to DNA > Rate of DNA repaired, there is possibility of retaining mutations and initiating cancer



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So, let us just look at it here. So, the professor Henry Lai had published a few papers. So, just to tell you, so this is a bundle of the DNA and if this bundle of DNA is exposed to X-ray, you can see that DNA breaks are very obvious because X-ray has a much higher energy. Here energy formula which is being uses $E = hf$, h is Planck's constant, f is frequency. So, it has a higher frequency hence it has a higher energy and it can break the bond.

Now, microwave does not have enough energy because of that particular formula $E = hf$. However, prolong use can actually do a DNA damage and that DNA damage is responsible for various health problem. In fact, when damage to DNA is greater than rate of DNA repair because human body has the mechanism to repair the DNA, but if damage is greater than DNA, there is a possibility of retaining mutation and initiating cancer. So, even if you may not developed health problem, but your children may develop health problem.

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NEWS COVERAGE in HT – 07 JAN. 2013



Radiation affects health: global report
PROOF: The Bioinitiative 2012 report refutes claims by cellular phone operators that there is no conclusive evidence to prove correlation between radiation and health problems.

towering troubles!
Mobile towers are a sight to behold in many parts of the world. But are they safe? A new report says they are not. The report says that the towers are emitting radiation that is harmful to health. It also says that the towers are causing cancer and other health problems.

HARM TO HEALTH
The report says that the towers are emitting radiation that is harmful to health. It also says that the towers are causing cancer and other health problems.

WHAT THE REPORT SAYS
The report says that the towers are emitting radiation that is harmful to health. It also says that the towers are causing cancer and other health problems.

CONG RADIATION EFFECTS
The report says that the towers are emitting radiation that is harmful to health. It also says that the towers are causing cancer and other health problems.

The safe radiation limit as per the report is

0.5

milliwatts/sq m

INDIA'S LIMIT IS

450

milliwatts/sq m

BIO-INITIATIVE REPORT 2012

- ◆ Prepared by 29 Researchers from 10 Countries
- ◆ Gave references of 1800 research papers
- ◆ Bio-initiative Report 2007 gave additional references of 2000 papers
- ◆ Strong evidence on health effects



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So, I just want to bring this Bio-Initiative Report in front of all of you people. So, there are two bio initiative report are there; one is 2007 which has given references of 2000 papers, another one is came in 2012 which gave references of 1800 papers. So, total 3800 scientific papers are there. These are written by 1000 scientists or so. And these are published in the best possible journal of the world which are peer reviewed. And you can see the details of this you can just simply say [www dot bio initiative dot org](http://www.bioinitiative.org), you can download these report. In fact, they have also given conclusion; you can read that and make the informed decision.

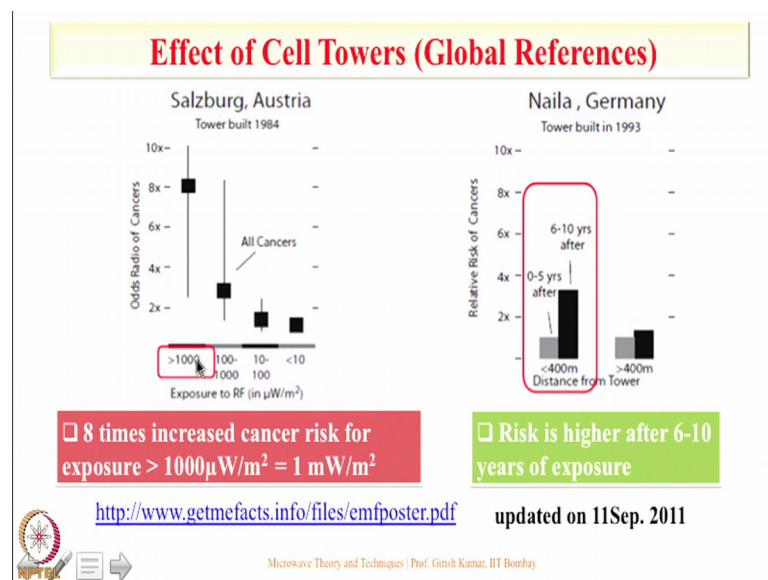
But I also want to tell you if there are 4000 papers which say there are a lot of health problem, then there are about 25000 papers which say there are no health problem. And in fact, on the internet itself you can find that out of those 25000 papers, more than 70 percent papers are funding by industry but still thirty percent is a large number. So, I

actually went through lot of those paper and you will be actually surprised that there is actually a paper which says that or this person used the cell phone for 15 minutes and that this the testing before and after use and there were no auditory problems. In 15 minutes if people had developed the hearing problem, then the whole world would have been deaf by now.

So, you know that exposure was very small duration. Similarly, there are many experiments they have done on the rats but what they do? They will expose the rat only for let us say one hour per day for 30 days and then they will say there is a no health hazard or there is a no conclusive thing. In fact, we have also done experiments where we expose the rat for 4 hours every day for 45 days and we found out 20 to 40 percent changes in biological, physical and chemical.

So, those changes are really speaking very damaging to the health of the people. So, let me take you around the world. So, you can see the nice pictures of around the world, but what I want to show you; what are the health hazards reported in different countries. So, this is Austria, Salzburg report and what you see over here odd ratio of getting cancer.

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And what this shows here greater than 1000 micro watt per meter square which really is equal to 1 milliwatt per meter square. Now, you see there, tower was built in 84 just updated on 2011. So, that is about 27 years, but just see the effect, 8 times increase in the odd ratio. Now, this is the study in Naila Germany tower was built in 1993. So, after 5

years what they found out that the odd ratio risk is roughly about 1.1. Now, 1 is normal. So, 1.1 is not at all conclusive. After 10 years, what they found out this is about 3.2 times. So, you can actually see that the risk is very high after 10 years of exposure specially to the people who are living next to the cellular towers.

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BRAZIL


New study from Brazil: direct link to 4,924 cancer deaths from cellular antennas radiation



May 17, 2011

- ❑ Scientists found between 1996 and 2006 died in Belo Horizonte a total of 4924 victims of cancer types that may be caused by electromagnetic radiation, such as **tumors in the prostate, breast, lung, kidneys and liver.**
- ❑ 80% of victims lived within 500 m's away from cell phone antennas

Source: http://www.next-up.org/pdf/Brazil_New_study_direct_link_to_4924_cancer_deaths_from_cellular_antennas_radiation_28_07_2011.pdf



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This is the report from Brazil that 80 percent of the victims out of 4924 were within 500 meters from cell phone antennas.

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Naval Medical Research Institute - USA

Naval Medical Research Institute – USA Report dated 4th Oct. 1971 acknowledges biological effects and has given 2000+ references. **Under categories A to Q, they have given more than 130 types of health hazards.**

It includes the effects on whole body, brain, eyes, head, blood, heart, infertility, Hair Loss, Mutation, and so on...



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Now, I also want to mention this is the Naval Medical Research Institute. In fact, this report was reported in 1971, but it was classified, it only got the declassified in 2017. And in fact, I said given 2000 plus references and they have actually given categories A, B, C, D up to Q and in fact, I counted disease a among these categories and they have mentioned about 130 types of health hazard. And these effects on the whole body brain, eyes, head, blood, heart infertility, hair loss, mutation and so on.

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NEWS COVERAGE in MUMBAI

DNA, Mumbai - 22 April 2013

'Cancerous' cell phone towers panic Parsi Colony

6 cancer cases in 3 yrs, residents call meet to devise strategy

Ashish Shinde journalist

Any Kanania, a resident of three-storey building in Chandra's Parsi Colony says that the facts "smell" when sitting in her room. Operated for a cancerous tumour in her stomach last year, Kanania and three other people in her building blame cell phone tower radiation for the disease.

Despite attempts of state, the communication and information and technology (Mand) Dept, stating that there is no proof that radiation from cell phone towers is hazardous to health, citizens continue to apprehend.

After six cases of cancer were reported in the past three years in the neighbourhood, the residents of the Parsi Colony are aghast but they have held up banners and distributed handbills in the area, asking people for a meeting on April 26, protesting against the cell phone towers on buildings in the vicinity.

Kanania who is still undergoing treatment just her surgery last year, says, "I can't ignore it but people like me - who have suffered from cancer - have a strong suspicion that it is due to the cell phone towers that come up around here a few years ago."

Aditya Gadhil, whose mother was detected with breast cancer in 2011, says, "Our window opens up to cell phone towers which are less than 50 metres away from their lives - who have suffered from cancer - have a strong suspicion that it is due to the cell phone towers that come up around here a few years ago."

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Chunabhathi hsg society's protests fall on deaf ears

Atulya Dhabhi journalist

Residents of a housing society in Chunabhathi, Sion, have been protesting against two mobile towers on their building, but their pleas are falling on deaf ears. They claim that their building has been pocketing the rent paid by the service providers for the towers.

The construction of the building in question, Suman Samarth started back in 2000, and by 2005, construction of the building was ready. Two years later, the builders, Bhansip-Bhansip of Suman Samarth Developers, allowed two telecom service providers to install towers on the building.

"It was only in November 2010 that we managed to form a housing society, but the developers tried stopping us by compelling us to the signature of company housing societies saying that the signatures of two residents had been forged," says Kumpura Shetty, a resident of the building.

Even applications filed under the Right to Information Act by the residents of the local Brihanmumbai Municipal Corporation office proved futile, with officials saying they were unable to meet the files of their building.

A court case against Sada Ganga, says, "The builder is not even doing anything to get the occupation certificate for the building. For over seven years now, we have been requesting them to start the process of getting the mandatory certificate issued, but he doesn't care."

Residents claim that the building is over 15-16 lakh annually as rent from these two cell phone towers.

building these towers. Sandeep Jajpandkar of Suman Samarth Developers says, "Each of these buildings did not have any floor space left. It was I who got the Right of Development Rights (DR) at a cost of Rs 50 lakh and now I need to recover my expenses."

www.dnaindia.com

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These are the cases reported in Mumbai. So, you can see that cancer is cell phone towers panic and 6 cancer cases in 3 years.

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News Coverage in Jaipur

Dec. 2011
आदिनाथ मार्ग पर ज्यादा रेडिएशन सात लोगों को कैंसर, दो की मौत
सात लोगों को कैंसर, दो की मौत
रेडिएशन का तब तक खतरा है 100 गुना अधिक, जिनकी खबरका

Seven cancer cases in C-Scheme - Jaipur City

11 May 2012
खलौन्दा बाग तमिली में कल-तीन की मौत
रेडिएशन से 6 को कैंसर का दावा
रेडिएशन से 6 को कैंसर का दावा

Six cancer cases in Shalimar Bagh - Jaipur City

अगर मोबाइल टावर सुरक्षित है... तो इनकी बीमारी का राज क्या है?
If mobile towers were safe.. What is the mystery behind their illness?

Measured levels from 10 to 50 mW/m²

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These are the reports in Jaipur; 7 cancer cases in one area, 6 cancer cases in another area. In fact, there are cancer cluster cases in the vicinity of the cellular tower. In fact, we sent our team to Jaipur and they measured the radiation level between 10 to 50 milliWatt per meter square. Of course, they are within the range of 450 milliWatt per meter square and that is what I have been telling that those things have to be changed.

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25,000 Brain Tumours Diagnosed in Andhra Pradesh and Telangana
Deccan Chronicle, Hyderabad - 9 June 2014

Over 25,000 primary brain tumours are diagnosed every year in Andhra Pradesh and Telangana. Of these, about 7 per 1 lakh population are found to be malignant tumors, while about 13 are non-malignant ones.

Dr.B.S. Shiva Reddy, neurosurgeon at Mediciti Hospital, said, "There are 120 types of brain and central nervous system tumours. The least aggressive type of tumours grow slowly while the malignant tumours, containing cancer cells, grow rapidly invading other body systems."

Exposure to ionising radiation from therapeutic and diagnostic medical procedures, atmospheric testing of nuclear weapons, industrial accidents and heavy use of mobile phones also increases the risk of gliomas - a type of brain tumour.

Neurosurgeon Dr Rama Krishna said, "There is too much of a dispute on the claim that the use of mobile phones will cause tumours. But it is clear that excessive usage of mobile phones does lead to frequent headaches in a section of people. Children below 16 years must not be given phones for use as their body systems are still developing and it can cause early damage."

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Now, I want to also mention here 25000 brain tumors have been reported in just two states, Andhra Pradesh and Telangana. And what they have written that there are about 7

cases per 1 lakh population and again the doctors have mentioned that heavy use of mobile phone also increased risk of Glioma, there are of course, saying that frequent headaches are there with several sections of people.

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Effect on Birds and Animals

Have you ever seen any bird near cell towers?
May be not, because birds have more volume and less weight, so heating effect is very fast.






Birds and Bees

- Interfere with navigation and reproduction

Animals

- Dairy cows – Decreased milk production, reproductive and developmental problems and decline in overall health.
- Sheep, dogs, cats, rabbits living near base stations affected.


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Now, cell tower radiation not only affects human being, it also affects a bird. So, birds flying in the near zone of the cellular operators are getting affected and that is why sparrows populations are disappearing in most of the metropolitan cities.

Now, of course, it also affects the animals. In fact, of dairy cows have been reported specially, when the cellular antenna is within the close vicinity that they have reported that there is an decreased milk production. In fact, these days many cancer cases have been reported for dogs also.


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Effect on Plants



4 Cell Towers near Gurgaon-
Delhi Toll Naka

In the nearby Farm House,
output of most of fruit bearing
trees drastically reduced from
100% to < 5% after 2.5 years
of cell tower installation.

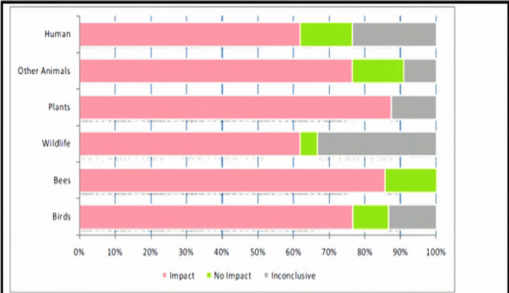


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Now, it also affects the plants. In fact, just think about it that the tower is stationary here and the tree is stationary here. So, this is constant radiation bombardment and the water in these fruit bearing trees start getting vibrated and so what happens because, of that their sizes start becoming smaller and the fruits become bitter and also the yield starts reducing. In fact, this thing I had gone to this particular place there are 4 cell towers you can see over here near Gurgaon, Delhi, Toll Naka and the owner actually mention that the lemon yield actually reduced from 100 percent to less than 5 percent in just about 2.5 years of installation.

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Environment Ministry - Impacts of Communication Towers on Wildlife Including Birds and Bees (Nov. 2011)



Organism Group	Impact (%)	No Impact (%)	Inconclusive (%)
Human	60	15	25
Other Animals	75	10	15
Plants	85	5	10
Wildlife	65	5	30
Bees	85	10	5
Birds	75	10	15

Fig 2. Proportion of study results in various groups of organisms (n=919). The 'Impact' (in red) indicates percentage of studies that reported harmful effect of EMR.

Out of 919 research studies collected:
593 - report Impact; **130** - No Impact; **196** - Inconclusive



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In fact, I learned by all these things. Environment ministry had also formed a committee of 10 people and they had actually submitted the report in November 2011 and all these things actually show that they are associated health hazards.

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Scientists Recommend - RF Fields should be classified as "Class 2A" or even "Class 1"

According to Dr. Anthony Miller, who was on the IARC committee, the accumulated evidence is now strong enough to suggest RF fields really should be classified as **Class 2A (probable carcinogen)**.

In Dec. 2013, Hardell group from Sweden showed that the evidence available suggests that RF-EMF exposure from mobile (and cordless) phones should be regarded as **Class 1 "human carcinogen"**.

Alasdair Philips of [Powerwatch \(U.K.\)](#) says, "The criteria on strength, consistency, specificity, temporality, and biologic gradient for evidence of increased risk for glioma and acoustic neuroma were fulfilled."

In April 2014, it was reported that "Health risk from Wi-Fi devices rising". It stated that "Epidemiological evidence shows that radio frequency should be classified as a **known human carcinogen.**"

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Now in fact, now scientists are after WHO and they are telling them to classify RF field as class 2 A or even class 1. So, what are the solutions to reduce? So, as far as the cell phones are there, I have already told you: what are the precautions to be taken.

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SOLUTIONS TO REDUCE EMF HAZARD

- Convince DOT to reduce the norm immediately to $<10\text{mW/m}^2$
- Cellular Operators should reduce transmitted power from **20W**/carrier to max. 1-2 W in densely populated area.

HOW TO IMPLEMENT?
Remove the power amplifier or reduce gain of amplifier.

ADDITIONAL BENEFITS:

Cooling of amplifier will not be required: may not need Air conditioner → Power requirement will reduce: may not need Diesel Generator. Solar panel can meet this requirement → Operators can claim carbon credit. Leads to Green Telecom

You can see: [TRAI-Green-Telecom-Openhouse-GK Report](#)

DISADVANTAGES OF REDUCING POWER:

Range will reduce → Install more low power transmitters or low power repeaters → It will cost MORE MONEY!

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Now, as far as the radiations from cellular towers are concerned, we all have to unite and convince DOT to reduce the norm immediately to less than 10 milliwatt per meter square. I will let me tell you this is not safe, this is just a one step in between which can be immediately implemented in a very simple way that the output power instead of 20 watt, they should not transmit more than 1 to 2 watt of power in the densely populated area.


So, they can either reduce the power amplifier or reduce gain of the amplifier. In fact, this will lead to several other advantages also. So, if they use a high power amplifier, it requires cooling that will require air conditioning. So, now, they can save that particular cause. In fact, power requirement reduces means they, now they do not need diesel generators, they can use solar panel to meet this requirement, they can even claim carbon credit also. You can see this particular detail thing, you can actually see click on this particular thing and you can see my report also. But why cellular operators are not doing this thing? The disadvantage of the reduced power is that if we reduce the transmitted power, then the range will reduce from here to let us say here.

So, then the people living in this particular area will not get the radiation. So, signal will not be there. So, they have to install more number of low power transmitter. So, if they have to install more number of low power transmitter, it will definitely cost more money and that is the reason why these people are not doing it. So, just like in the western world, they transmit much lesser power and they have low power repeaters, the same solution we have to adopt in our country and that is the only way to have this wonderful technology deployed safely in our country.

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CONCLUSIONS

- There is RF radiation from cell phones, cell towers, computers, laptops, AM, FM, and TV towers, leakage from microwave oven, Wi-Fi, Radars, etc., which are additive.
- In addition, there is radiation from overhead high voltage transmission lines, which has been classified by WHO as Class 2B (Possible Carcinogen) in 2002.
- **The awareness must be created among the people. People should unite to convince Govt. of India to adopt stricter radiation norms.**

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So, just to conclude I just talk more about cell phone and cell tower, but there is a RF radiation from computers, your laptops, AM, FM, TV tower, leakage from microwave oven, Wi-Fi, radars and all that all these are additive. In fact, I also want to mention that in addition to this, overhead high voltage transmission lines which carry 50 hertz or 60 hertz. In fact, these have been classified by WHO, as possible carcinogen in 2002 itself. In fact, majority of the people are not even aware of that. In fact, there are certain rules are there that if there are high power voltage transmission line, then within 30 meter, there should be no residential building or office building. However, with growing population people are getting closer to these high power transmission line and they are developing health problem.

So, we want that the awareness must be created among the people should unite to convince government of India and all the governments in the world to adopt stricter radiation norm. And, I would request all of you people to share these slides with all your friends and known people to create awareness and we should all demand that there should be a safe radiation. And just to tell you health is fundamental right of every citizen of this world. So, we must demand safe radiation level so that we can enjoy this beautiful technology and yet we do not develop the health problem.

So, thank you very much, bye.