Муниципальное автономное общеобразовательное учреждение

«Гимназия №87»

The impact of cell phones

on human health

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# Introduction

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|  | ***People were free***  ***when phones were on a leash*** |

Nowadays everyone’s life depends on cell phones and using it became a part of our daily routine. But have you ever thought how dangerous these small gadgets are? Till certain time nobody cared about this but right now lots of people concerned on a problem of negative impact of cell phones. So let’s try to investigate the nature of this problem and find the best ways to solve it.

The aim of my report is:

Determine the amount of harm which phones can do with our health.

**To achieve this aim, the following tasks were defined:**

* find advantages and disadvantages of cell phones;
* describe ways to protect yourself from negative impact of cell phones;
* perform research among students.

# History of cell phones

The history of cell phones started in early 1947 when AT&T Inc. came up with suggestion of creating a cell phone which would be installed only in cars. Anyway such system existed till 1973. At that time Martin Cooper an engineer of Motorola Inc. conducted a test of the first portative cell phone. It was called Motorola DynaTAC 8000X. However, phones became mass-produced only in the past decade. Anyway almost everyone from children till adults has phones, but children suffer from phones in the highest degree.

The cell phone is a wonderful invention and there are several advantages to cell phones. Cell phones have changed the way society thinks, operates and communicates. One advantage of cell phones is that it allows its users the advantage of a wider opportunity to communicate by a principle call frequency reuse. Through this principle the same frequency can be used by different cells without creating interference from other cells. Cell phones operate within cells and can switch cells as the user moves around. Someone using a cell phone can drive hundreds of miles and maintain a conversation during the entire journey. In any cell, as many as fifty-six people can be talking on their cell phone at one time. This seems to be a more efficient and effective way to communicate. A second advantage of cell phones is that they are small and easy to carry around.

# Advantages of using cell phones

* In emergency situations/call for help;
* You can call friends/family to let them know of important event: deaths in family, illnesses, births of babies, etc.;
* If you're running late, you can call ahead and let your friends/boss/day care center know that you will be a little late;
* If you forget something at home, you can call someone to get it for you;
* If you're grocery shopping, someone from home can call you to remind you to buy something that's not on your list;
* You can use your phone as a quick way to keep in touch with friends;
* If you don't have a watch, you can check the time on your cell phone (same goes for a calendar/date);
* If you're bored, you can play some games on your phone;
* You can pretend to be talking to someone, when in reality, you just don't want to be bothered by anyone;
* You can check the internet for last minute news;
* They are easier to pickpocket;
* Being contactable at all times.

## Cell phones and business

Cell phones are becoming very popular for today's business person. No longer is it necessary for the salesperson to go back to the office to place an order into the computer, now it can be done by plugging his or her laptop computer into the portable cell phone in car. Clients waiting for the late salesperson can now be told from the traffic jam or the broken-down vehicle by that person using a cell phone. The doctor is never too far away from with the convenience of the cell phone. Cell phones are becoming an integral part of today's business world. Local-delivery truck drivers are equipped with cell phones to maintain close contact with the company in case of pick-up or delivery changes while on the road. The application of cellular phone to the business community seems endless.

Emergency calls placed on cellular phones are rising rapidly. People are reporting drunk drivers and staying a safe distance behind them to lead the police to the exact location. Before I had a cell phone, I stopped to help at an accident scene and was informed that another motorist already summoned help on his cellular phone. The Virginia State Police reported 100 calls to 911 in a single day back in June of 1997. These calls consisted of reports of traffic accidents, drunken drivers, vehicle and brush fires, and some crimes in progress. The Richmond Times Dispatch, December 1, 1997 reported that a woman involved in a car accident was hanging upside down in her car by her seatbelt. Being in that position, she could not reach her cell phone to call for help. Fortunately for her, two men showed up at the scene with cell phones and summoned help. Police departments across the country welcome the calls because accurate reports are made of the situation due to the fact the person reporting it, is usually still on the scene. A cell phone should be a must for any person that drives long distances from home during the day and especially at night. No one should be walking along an interstate highway seeking help, when help could be a phone call away from the safety of your vehicle.

## What else?

Modern digital cell phones can process millions of calculations per second in order to compress and decompress the voice stream. Cell phones have full duplex. This means that you can use one frequency for talking and a second frequency, separate frequency for listening. Both people on a cell phone can talk at once. The cell phone can communicate on 1,664 channels or more. In addition, cell phones (TDMA) use a dual band. This means that it can operate in both 800 MHz and 1900 MHz bands. Other advantages of us cell phones are that it gives you a wide variety of functions, for example, you can store information, make task or to-do lists, keep track of appointments and set reminders. Cell phones have a built-in calculator for math, you can send, receive calls, get information for a variety of sources, such as, news, entertainment, stock quotes, play simple games. Cell phones have great influence in our everyday life and are convenient to have around. Cell phones are a faster and more effective way to transfer information. Some parents use cell phones to keep in contact with their children. Other uses it for business and to keep in contact with loved ones. Cell phones have played a vital role in bringing the world closer together; indeed, it is an added resource that gives it user's great advantages.

# Disadvantages of using cell phones

Unfortunately, cell phones have some disadvantages. Of course, it is problem with health when people use phones very often. Although it isn't proved by scientists harm of mobiles, but the most of them says that it is dangerous. So we must limit to use phones.

* Less people be hurt because they use a cell phone to benefit themselves;
* Distracting when driving/at movie theatres;
* Can be expensive, depending on your plan;
* Annoying ring tones;
* People who talk loudly on cell phones in quiet environments;
* Some people spend more time on the phone then interacting with each other in person;
* Give-up cell phones would pollute the environment seriously;
* Increased crime;
* Increased dependence;
* CANSER RISK;
* Mental health problematic use of cell phones and found a link between low self-esteem and problem cell phone" use. A study measuring the link between cell phones and mental health found that teens who used cell phones the most were more likely to be anxious and depressed;
* Bullying*:* Text messaging is increasing used by bullies to torment their victims. Cyber bullying, psychological harassment in text or instant messaging is more often perpetrated by girls, who initiate inappropriate messages or spread damaging gossip.
* Eye strainand "digital thumb": Just like other repetitive strain injuries that can result from computer use and other repetitive tasks, these conditions can result from focusing continually on a small screen and typing on small buttons.
* Bacteria:Because of the close proximity to the mouth where germs can be passed from breathing, coughing and sneezing, most cell phones are crawling with bacteria. Additionally, many people use their phone everywhere, even in the bathroom.
* Brain tumors:While some research investigating the effects of electromagnetic radiation from cell phones in close proximity to the body have found statistical associations, other studies have found no increased risk.
* Lack of sleep*:* One study found that some teen cell phone users are likely to be woken at night by incoming text messages or calls, and are therefore more likely to be tired and less able to focus throughout the day.

## Students and phones

Schools seem to be getting sick of cell phones interrupting the education of students. Many school districts are banning student's use of cell phones in school. School districts and law enforcement agencies say those electronic devices are used more often than not for drug related and gang related activities. Students bringing cell phones to school have place an awesome responsibility on teachers and other educator to provide a safe and orderly environment for students because of student's access to calls in schools and especially in classrooms. Students bringing cell phones to school can be faced with too many temptations that interfere with their schooling.

## Impact of cell phones on human body

In our world like all other human inventions cell phones have either positive or negative aspects. Despite huge quantity of information about radiation made by phones nobody gives us correct and clear answer on question “How much does cell phone harm our health?” So, phone radiation – what is it? According to the researches of scientists we can say that radiation in cell phones is a microwave wave which is the same that in UHF where we heat our food every day! But UHF fully protects us from microwaves except cell phone which we put in our pockets.

The maximum power of microwave radiation is measured in SAR (Specific Absorption Rate), and all cell phone manufacturers are required to indicate the SAR indicator on their cell phone models. By the way, most phones these days radiate from 0.5 to 1 watt per kilogram. At the same time, the maximum permissible SAR value in Europe is 2 watts per kg.

How does the telephone have a negative effect on the body? Electromagnetic radiation propagates radially, which in general does not allow us to reduce its amount, since by reducing it we will come to the loss of the connection. Given this fact, it is impossible not to notice that technologies in the field of communication have reached such a level that phones, being in rooms with poor transmission capacity of electromagnetic waves, begin to increase the power of this radiation, bringing it to the maximum value described above (2 watts per kilogram). Sometimes a cell phone can be in this state for 10 hours or more. Most often, the cell phone is located on the body of a person or in close proximity to it. As a result, cell phones cause enormous damage to our organism.

Most of all, the brain, vision, heart, reaction, cognitive function, nervous system and the entire psyche as a whole suffer from microwave radiation. Speaking about the effects on the brain, it is difficult not to notice that most people talk on a cell phone, applying it to their ear. Researches of different scientists come to the conclusion that electromagnetic radiation increases the risk of developing a brain tumor several times!

Heart. During the appearance of the first cell phones, there was a fashion for carrying them in the breast pocket. As a result, people began to complain of heart disease. There are no specific researches on this subject, but today people who use pacemakers are strictly forbidden to carry cell phones in their breast pocket.

Vision. At the moment, phones cannot boast of a large screen diagonal, so in order to see at least something on this small screen, a person increasingly has to strain his eyes. Also, due to the rapid change of the image, the eye muscle does not have time to focus; the person begins to blink less, as a result of which the eye shell begins to dry up. Studies conducted in Russia have shown that mobile phones have a negative impact primarily on the lens of the eye, which can cause the development of cataracts and lead to blindness.

The psyche. From the first days of using cell phones to this day, people have noticed deterioration in memory and attention, reaction and resistance to stress, increasing irritability and migraines. At the same time, it is worth paying attention to the fact that there is no clear and clear evidence of the impact of radiation on this factor. Therefore, most likely, a person in view of the dependence on mobile phones turns into an evil and dumb person.

There are also frequent cases of cell phone explosions. For example, in Russia, in the city of Kurgan, a seven-year-old boy died from an explosion of a mobile phone that was put on charge. The ambulance doctors noted that the child received severe burns, and they became the cause of death.

## Cancer Risk

Some people are claiming that the use of cellular phones is causing brain tumors. The Denver Post October, 1995 reported that Debra Wright who worked for a Cellular phone company in Phoenix had developed a brain tumor near left ear from the hand-held model cell phone she used for over 6 years. A woman in St. Petersburg died from brain cancer, which her husband claimed was from the use of her cell phone. The case was dismissed in court from the lack of scientific evidence. The hand-held cell phones have an antenna that sits flush with the head, exposing the head to an electromagnetic field. The long term effects of this exposure remain unknown to scientists. Cellular phones manufactures and carries have created an independent research group called Scientific Advisory Group. The industry has given the group five years and $25 million to find if brain tumors, cancer, or any other health hazards exist from the use if cell phones. The group has spent over $17 million since 1993 and has yet to find any conclusive evidence.

## Cell phone as a drug...

One of the most important problems is depending on cell phones.Really, sometimes I cannot imagine my life without cell phone! When I forget it at home I have some discomfort and often scare. I have made a survey among pupils of my school in age from 12 to 18. What does it say?

## It is interesting...

Tо be fair, no one knows exactly how much harm a cell phone do to a person. Recently, new media has reported a study showing the radiation from cell phones is so full of energy can be used to cook eggs. In the experiment, researchers placed one egg in a porcelain cup (because it is easy to, conduct heat), and put one cell phone on one side and another cell phone on the other. The researchers then called from one cell phone to another and kept the cell phones on after connecting. During the first 15 minutes, nothing changed. After 25 minutes, however, the egg shell started to become hot and at 40 minutes, the surface of the egg became hard and bristled. Researchers found the protein in the egg had become solid although the egg yolk was still in liquid form. After 65 minutes, the whole egg was well cooked. The study shows how scary cell phone radiation is. People should try to avoid use of cell phones. Although so far no one has proved the radiation from cell phones can cause something clinically significant. By the same time, there has been no one who can disprove the existence of such a risk. Children should be forbidden from cell phone use because they still grow their brains and are particularly vulnerable to radiation.

## Children as the main risk group for cell phone use

Of course, children, because of a less developed body, suffer more harm from a cell phone than adults. According to the members of the Russian National Committee for Protection against Ionizing Radiation, the potential risk to children's health is very high because:

* the absorption of electromagnetic energy in the child's head is significantly higher than in an adult (the brain tissue of children has greater conductivity, smaller head size, thin skull bones, shorter distance from the antenna to the head, etc.);
* the child's body has a greater sensitivity to the electromagnetic field than an adult; the brain of children has a greater tendency to accumulate adverse reactions in the conditions of repeated exposure to the electromagnetic field;
* the electromagnetic field affects the formation of the processes of higher nervous activity;
* modern children use mobile phones from an early age and will continue to use them as adults, so the experience of children's contact with electromagnetic radiation will be significantly greater than that of modern adults. Scientists from Swedish National institute of labor and the Norwegian Radiation Protection Authority interviewed more than 11000 users of cell phones and found out negative effects even after 2 minutes of using mobile phone.

During using cell phones children, may have risks of many diseases (cataracts, Alzheimer's disease, brain tumors, breast cancer, various cardiovascular diseases, etc.) increases several times.

According these statements we made a reminder for parents whose children attend preparatory classes in order to inform them about possible problems that their child will face after buying them a phone in early age.

Anyway, phones except disadvantages have lots of positive functions. However, everyone uses cell phones and understands how useful they are. First of all, they can save your life. Great example is a history of Sylvester, Paris citizen, whose phone saved him from being hit by shrapnel during a terrorist attack near the State de France stadium. Of course, this is such a pretty luck, but how many people survive every day because of call to the emergence service? At that case phone is the fastest way to save your life. Secondly, mobile is the best way to communicate with people. You can call, chat and speak with people from the other side of Earth. Thirdly, cell phones help us to distract from daily routine in a way of playing different games, watching videos and films. Also, cell phone is a small encyclopedia in your hands. You can find all answers on all questions which you have. Eventually, cell phone is so nice recording device.

# Practical research. Materials and methods.

Based on the above statements, we decided to find out the level of awareness of students from 10-11 grades of "Gymnasium № 87", as well as ordinary Saratov’s passers-by about the impact of cell phones on the human body.

*Research method:* questionnaire survey and social survey. 254 people were interviewed. (see ap. 1)

Results of research

* 94% of respondents know about negative impact of cell phones;
* 63% of respondents use cell phone more than 3 hours per day;

17%-not more than 3 hours;

12% -not more than an hour;

8% -less than 30 minutes.

* 59% of pupils speak during a call applying phone to ear;

18% -use speakerphone;

12% -use wireless headset;

11% use wire headset.

* 49% of respondents started to use cell phone at age from 7 to 8;

33% -at age from 5 to 6;

7% -at age from 3 to 4;

11%-at age from 8, and etc.

* 44% of respondents put their cell phone near the bed during sleep;

28%-put their phone far from the bed;

18%-put their cell phone to the other room;

10%- put their cell phone under the pillow.

* 64% of respondents carry their cell phone in the pocket;

31% -in the bag;

only 1% -carry their cell phone on the neck using a special case;

4% -use other way of carrying cell phone.

# Conclusion

[There are a number of advantages](http://www.phones-for-kids.net/why-kids-should-have-cell-phones.php) of cell phones. Firstly, a cell phone connects the children with their parents. If children are stuck in some traffic while coming back to home, they can inform their parents. Another benefit of cell phones is that they have features like calendars and reminders which let the children keep track of their activities. They can also use the alarm feature to schedule their time and develop the habit of rising early. Finally, these cell phones have also proved to be beneficial for home sick children. Such children can be in touch with their family even from school with the help of these mobiles.

There are various disadvantages of cell phones as well. Firstly, children do not have much idea about the [calling rates](http://www.phones-for-kids.net/phone-plans-for-kids.php) and tariff. At such, they might spend a lot of money on mobiles. A major disadvantage of cell phones is that small children might use it for bad works like prank calling or abusing others.

Moreover, you should not buy very costly mobile for your child. This will reduce the possible money waste in case of any mishandling. You should first teach them about the benefits of cell phones. You should also inform them about the ill-effects of misusing cell phones. The need for cell phone should also be judged after considering various parameters. For instance, if your child does not spend much time outside home, there is no point in buying a mobile for him. Similarly, if the place visited by the child has proper means of communication, cell phone might not be required.

# Appendix

1. Questionnaire

|  |  |
| --- | --- |
| 1. Do you know about the harmful effects of cell phone on the human body? | a) yes  b)no |
| 2. At what age did you get a cell phone? | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 3. How long do you use your phone in a day? | a) less than 30 minutes  b) not more an hour  c) not more than 3 hours  d) more than 3 hours |
| 4. How do you talk on the phone? | a) by putting it to your ear  b) using a speakerphone  c) using wireless headset (Bluetooth)  d) using wired headset (wired headphones, microphone) |
| 5. Where is your phone when you sleep? | a) under the pillow  b) away from the bed  c) next to the bed  d) located in another room |
| 6. Where do you carry your mobile phone? | a) in your pocket  b) on the neck  c) in your bag  d) others |

2. Results of practical research

3. Reminder for parents

If you decide to buy a phone for your child, you should remember:

The cell phone is an incredibly powerful source of electromagnetic radiation, which adversely affects the unformed body of the child.

In order to reduce the absorption to a minimum you should:

* reduce cell phone usage time to a minimum
* teach your child to carry the cell phone exclusively in the bag
* teach your child to use the speakerphone during a call
* prohibit the child from sleeping with the cell phone under the pillow
* forbid the child from talking on the cell phone for more than 5 minutes
* reduce the time of playing on the cell phone to a minimum, so as not to develop addiction and vision damage in the child

*Try to turn off the child's phone if there is no special need for it.*