1. Phone Book

　　1. Find
　　　　By Name
　　　　By Entry
　　　　By Group
　　　　SIM Name
　　　　SIM Entry

　　2.New

　　3.Group
　　　　No Name
　　　　Family
　　　　Friend
　　　　Colleague
　　　　Business

　　4.My Name Card

　　5.Send V-Card
　　　　My Name Card
　　　　Phone Book

　　6.My Phone #

　　7.Memory Info

　　8.Delete All
　　　　Phone Phonebook
　　　　SIM Phonebook
　　　　All Phonebook

2.Recent Call

　　1.Received

　　2.Dialed

　　3.Missed

　　4.Delete All
　　　　Received
　　　　Dialed
　　　　Missed
　　　　All Calls

5.Call Timers
　　　　Last Call Timer
　　　　Total Received
　　　　Total Dialed
　　　　Lifetime
　　　　Reset Timer

6.GSM Call Cost
　　　　Last Call Cost
　　　　Total Cost
　　　　Max Cost
　　　　Reset Cost
　　　　Set Max Cost

3.Message

　　1.New Text Msg

　　2.New Pix Msg　　　　　　　for CDMA only　　　　　　Info pop up screen.. (Not available in GSM mode)

　　3.Voice Mail

　　4.Inbox

　　5.Outbox

　　6.Saved/Draft

　　7.Web Alert

　　8. Quick Text
　　　　　　Text Msg
　　　　　　Pix Msg

　　9. Message Settings

　　　　1.Text Msg Settings
　　　　　　Save In Outbox
　　　　　　　　Auto Save
　　　　　　　　Prompt
　　　　　　　　Not Save
　　　　　　Insert Signature
　　　　　　　　On/Off

GSM Delivery Ack
　　　　On/Off

Auto Play
　　　　Auto Play/Manual

Direct View
　　　　On/Off

2.Pix Msg Settings
　　Save in outbox
　　　　Auto Save
　　　　Prompt
　　　　Not Save

　　Delivery Ack
　　　　On/Off

　　Retrieval Mode
　　　　Automatic Mode
　　　　Prompt Mode
3.Msg Aert
　　Volume/Vibrate

　　Ringer Type
　　　　Text Msg Alert
　　　　Pix Msg Alert
　　　　Voice Mail Alert
　　　　Web Alert

　　Reminder
　　　　Off/Once/Every 2 Min/Every 10 Min

4.Entry Mode
　　Alphabet
　　T9 Word
5.Callback #

6.Auto Delete
　　Auto Delete
　　Prompt
　　Not Delete
7.Voice Mail #

8.GSM Settings

Setting1
- Service Center
- Default Destination
- Default Type
- Default Validity
- Setting Name

Setting2
- Service Center
- Default Destination
- Default Type
- Default Validity
- Setting Name

Reply Path
- On/Off

Delivery Reports
- On/Off

Sending Setting
- Setting 1
- Setting 2

Voice Mail #

10. Delete All
- Old Inbox
- New Inbox
- Outbox
- Draft
- Voicemail
- Web Alert
- SIM Memory
- All Messages
  - Phone Memory
  - SIM Memory
  - Phone&SIM

11. Memory Info
- Phone Memory
- SIM Memory

4.Get It Now   for CDMA only

      1.Launch Get It Now

5.Mobile Web

      1.Launch Web

      2.Prompt

6. Multimedia

      1. Camera

          1.Take Pix

          2.Camera Settings
                Image Size
                Image Quality
                Flash
                Self-Timer
                Color
                Shutter Sound
                Auto Save

          3.Memory Info

      2. Media Gallery

          1.Photo Gallery
                Default Album

                ID Photo

                User Album01-04

          2.Image Gallery
                Preloaded
                    Set Wallpaper/Send Message

My Image

Set Wallpaper
Send Message
Delete
Mark&Delete

3.Sounds

Preloaded

Set Ringtone
Send Message

My Sounds

Set Ringtone
Send Message
Delete
Mark&Delete

4.Fun Frame

5.PIX Templates

6.Animelody Gallery

7.Memory Info

8. Delete All

Photo Gallery
Image Gallery
Melody *Gallery*
Animelody Gallery
All Gallery

7.Settings

2.Language

English, Spanish

1.Phone Mode

CDMA / Int'L-GSM

3.Profile

Normal

1. Volume/Vibrate

2. Ringer Type

3. Key Beep

Volume

Tone Length

4. Alerts

Minute Beep

Service

Connect

Disconnect

Fade

Roaming

Privacy

Power On/Off

5. Power On/Off

On/Off

6. Roam Ringer

On/Off

7. Whisper

On/Off

Meeting

1. Volume/Vibrate

2. Ringer Type

3. Key Beep

Volume

Tone Length

4. Alerts

Minute Beep

Service

Connect

Disconnect

Fade

Roaming

Privacy
Power On/Off

5. Power On/Off
On/Off

6. Roam Ringer
On/Off

7. Whisper
On/Off

Drive
1. Volume/Vibrate

2. Ringer Type

3. Key Beep
Volume
Tone Length

4. Alerts
Minute Beep
Service
Connect
Disconnect
Fade
Roaming
Privacy
Power On/Off

5. Power On/Off
On/Off

6. Roam Ringer
On/Off

7. Whisper
On/Off

Manner -> Silent
1. Volume/Vibrate

2. Ringer Type

3. Key Beep
Volume
Tone Length

4. Alerts

       Minute Beep
       Service
       Connect
       Disconnect
       Fade
       Roaming
       Privacy
       Power On/Off

5. Power On/Off

       On/Off

6. Roam Ringer

       On/Off

7. Whisper

       On/Off

Outdoor

1. Volume/Vibrate

2. Ringer Type

3. Key Beep

       Volume
       Tone Length

4. Alerts

       Minute Beep
       Service
       Connect
       Disconnect
       Fade
       Roaming
       Privacy
       Power On/Off

5. Power On/Off

       On/Off

6. Roam Ringer

       On/Off

7. Whisper

       On/Off

4.Display

1.Style
　　　Basic/Dynamic

2.Animation
　　Power On
　　　　　Main LCD
　　　　　Sub LCD
　　Power Off
　　　　　Main LCD
　　　　　Sub LCD
　　Wallpaper
　　　　　Main LCD
　　　　　Sub LCD

3.Banner

4.Backlight
　　　5 Seconds/ 10 Seconds / 15 Seconds / Folder Open/ Power Save

4.Backlight
　> 1. LCD > 5 seconds/10 seconds/ 15 seconds/ Folder Open
　　 2. Keypad > 5 seconds/10 seconds/ 15 seconds/ Folder Open
　　 3. Power Save > On/ Off

5. Service LED
　　　On/ Off

6. Auto Hyphen
　　　On/Off

5.Security

1. Lock Phone

2. Change Lock

3. Emergency Number

4. Voice Privacy
　　　On/Off
5. Restriction
　　　Outgoing Call
　　　Incoming Call
　　　Phonebook

6. Delete Memory
　　　Phone Memory

SIM Memory

7. Reset Phone

8. PIN check
Enable / Disable

9. Change PIN

10.Change PIN2

11. FDN Mode

12. SIM Lock

6. Answer Options

Call Answer

Send Key / Folder Open / Any Key

Auto Answer

Off/After 5 Sec/ After 3 Sec/ After1 Sec

7.Call Options

Auto Retry
Off/After 10 Sec/ After 30 Sec/ After 60 Sec

Data
Auto Detect
Data Off/Data For Next Call/Data Until Powered Off
Baud Rate
Auto/19200/38400/57600/115200/230400
Airplane Mode
On/Off

8.Roam Option
Home Only/ Automatic

9.Shortcut List

10.Location
Location On/ 911 Only

11.Phone Info

12.GSM Services

    1.Call Diverting
        Divert Always
        Busy
        No Reply
        Unreachable
        Cancel All

    2.Call Barring
        All Outgoing
        International Outgoing
        All Incoming
        In While Roaming
        Out. Int. Home
        Deactivate Call
        Change Password

    3.Network Selection
        Automatic/Manual

    4.Caller ID
        Default/Hide Number/Send Number

    5. Closed User Group
        Index List
        Outside Access
        Default Group
        Deactivate

    6.Band Selection
        GSM 900/1800

8.Planner

    1.Calendar

    2.To Do List

    3.Alarm Clock
        Alarm1
        Alarm2

Alarm3
Alarm4
Auto Power

4.Time/Date

5.Memo Pad

6.World Time

7.Calculator

9.Voice Kit   for CDMA only

1.Voice Dial
Record
Review
Delete All

2.Voice Memo
Record
Review
Delete All

3.Voice Screen
On/Off
Inbox
Greeting
Call Sound
Wait Time

4.Voice Settings
Voice Kit Active
Adapt Digits
Reset Digits

Usage guidelines — all about performance and safety

Understanding signal strength

The quality of each call you make or receive, is dependent upon the signal strength in your area. Your phone will inform you of the current signal strength by displaying a number of bars next to the signal strength icon. The more bars displayed, the stronger the signal. The signal strength indicator ( ) displays in the upper left corner of your display screen. The voice quality of your phone will always be at its clearest when the antenna is fully raised. If you're inside a building, reception may be much better near a window.

Understanding the power save mode

If you are trying to use your phone in an area where the signal is too weak, the Power Save feature will automatically activate to conserve battery power when you have been unable to pick up a signal for 15 minutes. If your phone is on, it will periodically recheck service availability, or you can do so yourself manually by pressing any key. A message will be displayed on the screen any time Power Save has been activated. When a signal is found, your phone returns to standby mode.

Understanding how your phone operates

Your phone is basically a radio transmitter and receiver. When it is turned on, it receives and transmits radio frequency (RF) signals. When your phone is in use, the system handling your call controls the power level. This power can range from 0.006 watts to 0.355 watts in digital mode.

Specifications are subject to change

The information contained in this manual is believed to be correct at the time of printing, however, Samsung reserves the right to change or modify any of the specifications without notice or obligation to update existing units.

FCC RF Exposure information

The design of your Samsung Phone complies with updated NCRP standards described below:

In 1991-92, the Institute of Electrical and Electronics Engineers (IEEE) and the American National Standards Institute (ANSI) joined in updating ANSI's 1982 standard for safety levels with respect to human exposure to RF signals. More than 120 scientists, engineers and physicians from universities, government health agencies and industries developed this updated standard after reviewing the available body of research. In 1993, the Federal Communications Commission (FCC) adopted this updated standard in a regulation. In August 1996, the FCC adopted hybrid standard consisting of the existing ANSI/IEEE standard and the guidelines published by the National Council of Radiation Protection and Measurements (NCRP).

Use only the supplied or an approved antenna. Unauthorized antennas, modifications, or attachments could impair call quality, damage the phone, or result in violation of FCC regulations

Do not use the phone with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. Please contact your local dealer for a replacement antenna. The design of the phone complies with these updated standards. Of course, if you want to limit RF exposure even further than the updated standard, you can choose to control the duration of your calls and operate your phone in the most power-efficient manner.

*   You should not touch the antenna unnecessarily when using the phone.
*   Touching the antenna may affect the call quality and may cause the unit to operate at higher power than it would need otherwise.
*   When using the handset, hold the handset just as you would hold any other telephone, and keep the antenna pointed up and over your shoulder.
*   Use of hands-free devices will further limit RF exposure.

Body-worn operation

SAR compliance for body-worn operating configurations is limited to the specific belt-clip/ holster supplied or approved by Samsung, if available. End-users must be informed of the body-worn operating requirements for satisfying RF exposure compliance. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure compliance and should be avoided.

Vehicle mounted external antenna (if available)

A minimum separation distance of 7.9 inches (20 cm) must be maintained between a person and the vehicle mounted external antenna to satisfy FCC RF exposure requirements.

Note: For more information about RF exposure, please visit the FCC website at www.fcc.gov.

How to order accessories

Most Samsung accessories can be purchased by visiting our web site at www.samsungtelecom.com or calling 1.800.SAMSUNG.

The accessories available for this phone include:

• Travel adaptor
• Desktop adaptor
• Hands-free headset
• Car adaptor
• Standard, and Extended-life batteries
• Hands-free car kit
• Data cable
• Leather case
• Holster

The use of any other power accessory will invalidate any approval or warranty applying to the phone, and may be dangerous.

When you disconnect the power cord of any accessory, grasp and pull the connector, not the cord.

IT IS EXTREMELY IMPORTANT THAT ONLY GENUINE SAMSUNG AUTHORIZED ACCESSORIES BE UTILIZED WITH YOUR SAMSUNG PHONE. THIS IS BECAUSE ACCESSORIES MIGHT APPEAR TO BE A PERFECT MATCH, AND LABELED SUITABLE FOR YOUR SAMSUNG PHONE, BUT THEY CAN CHARGE AT DIFFERENT CURRENT RATES. THE CURRENT PROVIDED THROUGH THE ACCESSORY MAY NOT MATCH THE CURRENT THAT IS REQUIRED BY YOUR SAMSUNG PHONE AND THE RESULT OF USING AN UNAUTHORIZED ACCESSORY MAY BE A BATTERY OR PHONE MELT DOWN. YOUR WARRANTY OF COURSE, WOULD BE NULL AND VOID.

Operating a motor vehicle

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY AND PROPERTY DAMAGE.

You should never use a hand-held phone while operating a motor vehicle. It may divert your attention away from driving and may be illegal in some cities, states, and jurisdictions. You should park your vehicle legally before using your hand-held phone. Remember, safety comes first.

- Your hand-held phone should be stored in a secure place so that, in the event of a sudden stop or collision with another vehicle, the phone will not damage property or injure anyone. For example, airbags inflate very quickly and with great force. Serious injury may result if you have placed your phone in the area of deployment of an air bag and the bag inflates. Park your vehicle legally before using your hand-held phone.

- Call to report serious emergencies. No charges from your carrier.

- Use your phone to help others in emergencies.

- Call roadside assistance or a secret non-wireless number when necessary.

Following safety guidelines

To operate your phone safely and efficiently, always follow any special regulations in a given area. Turn your phone off in areas where use is forbidden or when it may cause interference or danger. All wireless phones may be subject to radio interference, which may affect their performance.

Turning off your phone in dangerous areas

To avoid interfering with blasting operations, turn off your phone when in a blasting area or in other areas with signs indicating that two-way radios should be turned off. Construction crews often use remote-control RF devices to set off explosives.

Turn off your phone when you're in any area that has a potentially explosive atmosphere. Although it's rare, your phone or its accessories could generate sparks. Sparks could cause an explosion or a fire resulting in bodily injury or even death. These areas are often, but not always, clearly marked. They include:

- Fueling areas such as gas stations
- Below deck on boats
- Fuel or chemical transfer or storage facilities
- Areas where the air contains chemicals or particles such as grain, dust or metal powders
- Any other area where you would normally be advised to turn off your vehicle engine

Restricting children's access to your phone

Your Samsung phone is not a toy. Children should not be allowed to play with it because they could hurt themselves and others, damage the phone or make calls that increase your phone bill.

Turning off your phone before flying

Turn off your phone before boarding any aircraft. To prevent possible interference with aircraft systems, the U.S. Federal Aviation Administration (FAA) regulations require you to have permission from a crew member to use your phone while the plane is on the ground. To prevent any risk of interference, FCC regulations prohibit using your phone while the plane is in the air.

Maintaining your phone's peak performance

To operate your phone properly — that is, to maintain safe and satisfactory service — you should follow these rules:

- For best reception, extend the antenna fully.

- Hold the phone with the antenna up and over your shoulder.

- Do not hold, bend, or twist the phone antenna at any time.

- Close the phone antenna when not on a call.

- Do not use the phone with a damaged antenna.

- Speak directly into the microphone.

- Avoid exposing your phone and accessories to rain or liquid. If your phone does get wet, immediately turn the power off and remove the battery.

- Only Samsung authorized personnel should service your phone and accessories.

Using your phone near other electronic devices

Most modern electronic equipment is shielded from radio frequency (RF) signals. However, some electronic equipment may not be shielded, or adequately shielded, from RF signals. RF signals from wireless telephones may affect such equipment.

RF signals from your phone may affect systems in your vehicle, including improperly installed or inadequately shielded electronic operating and entertainment systems in motor vehicles (such as electronic ignition systems, electronic speed control systems, electronic anti-skid or anti-lock braking systems, and air bag systems). You should check with the manufacturer of your vehicle (and the manufacturers of any equipment added to your vehicle) to determine whether its systems are adequately shielded from external RF signals and to determine appropriate safety precautions.

You must consult the manufacturer of any personal medical devices (such as pacemakers and hearing aids) to determine if they are adequately shielded from external RF signals and the appropriate safety precautions to take with such devices. For example, safety instructions for pacemakers may include minimum distances that the phone should be kept from the pacemaker, areas where the phone should not be kept (for example, the breast pocket), use of the ear opposite the pacemaker, and other such safety instructions. The advice from the manufacturers may change from time to time. If at any time you suspect any such interference, turn off your phone immediately.

Turn off the phone in health care facilities and request permission before using the phone near medical equipment.

Storing your phone

You must not store or carry your phone, its parts, or accessories in the same compartment or other area where there flammable liquids, gases, or explosive or flammable materials.

Your phone as a network device

Your telephone requires a service provider in order to send and receive calls. Your phone is only one part of a system or "network" of devices, that makes it possible to send and receive calls, text messages, voice message, access the Internet using the MiniBrowser, and to take advantage of all of the other services and features provided to you and your phone.

Your phone will always try your call using your home system, but if this is unavailable, then the phone will use the preferred roaming system.

If you cannot roam, your call will not be connected, and in some service areas, an operator may ask you how you would like to pay for the call.

To make all of the features available to you, your phone is designed by Samsung and your service provider to allow your service provider to send (at any time) a variety or information and messages to your phone. You may think of this as an over the air service to your phone. During an over-the-air programming session, your phone may display the following messages:

- **"Programming in progress..."** - this message means the phone is downloading data. *Do not turn your phone off while this is occurring*. See the **CAUTION**: below.
- **"Programming successful!..."** - if this message displays after a series of other messages, then it means that your phone has been successfully reprogrammed. You can now continue to use your phone as you normally do.
- **"Programming unsuccessful!"** - if this message appears contact your service provider.

CAUTION: If you turn off your phone during a programming session, your phone (or some features) may not work properly in the network. If this happens don't worry, contact your service provider for help in correcting the problem.

Acknowledging special precautions and the FCC and Industry Canada Notice

Information to user

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation; if this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient / Relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

Cautions

Any changes or modifications to your phone not expressly approved in this document could void your warranty for this equipment and void your authority to operate this equipment.

Only used approved batteries, antennas, and adaptors. The use of any unauthorized accessories may be dangerous and will invalidate the phone warranty if said accessories cause damage or a defect to the phone.

Although your phone is quite sturdy, it is a complex piece of hardware and can be broken. Use common-sense guidelines to avoid dropping, hitting, bending or sitting on it.

FCC compliance information

This device complies with part 15 of the FCC Rules. Operation and is subject to the condition that this device does not cause harmful interference.

Owner's record

The model number, regulatory number and serial number are located on a nameplate inside the battery compartment. Record the serial number in the space provided below. This will be helpful if you need to contact us about your phone in the future.

Model:

Serial No.:

FDA consumer update

FDA has been receiving inquiries about the safety of mobile phones, including cellular phones and PCS phones. The following summarizes what is known - and what remains unknown - about whether these products can pose a hazard to health, and what can be done to minimize any potential risk. This information may be used to respond to questions.

Why the concern?

Mobile phones emit low levels of radio frequency energy (i.e., radio frequency radiation) in the microwave range while being used. They also emit very low levels of radio frequency energy (RF), considered non-significant, when in the standby mode. It is well known that high levels of RF can produce biological damage through heating effects (this is how your microwave oven is able to cook food). However, it is not known whether, to what extent, or through what mechanism, lower levels of RF might cause adverse health effects as well. Although some research has been done to address these questions, no clear picture of the biological effects of this type of radiation has emerged to date. Thus, the available science does not allow us to conclude that mobile phones are absolutely safe, or that they are unsafe. However, the available scientific evidence does not demonstrate any adverse health effects associated with the use of mobile phones.

What kinds of phones are in question?

Questions have been raised about hand-held mobile phones, the kind that have a built-in antenna that is positioned close to the user's head during normal telephone conversation. These types of mobile phones are of concern because of the short distance between the phone's antenna - the primary source of the RF - and the person's head. The exposure to RF from mobile phones in which

the antenna is located at greater distances from the user (on the outside of a car, for example) is drastically lower than that from hand-held phones, because a person's RF exposure decreases rapidly with distance from the source. The safety of so-called "cordless phones," which have a base unit connected to the telephone wiring in a house and which operate at far lower power levels and frequencies, has not been questioned.

How much evidence is there that hand-held mobile phones might be harmful?

Briefly, there is not enough evidence to know for sure, either way; however, research efforts are on-going. The existing scientific evidence is conflicting and many of the studies that have been done to date have suffered from flaws in their research methods. Animal experiments investigating the effects of RF exposures characteristic of mobile phones have yielded conflicting results. A few animal studies, however, have suggested that low levels of RF could accelerate the development of cancer in laboratory animals. In one study, mice genetically altered to be predisposed to developing one type of cancer developed more than twice as many such cancers when they were exposed to RF energy compared to controls. There is much uncertainty among scientists about whether results obtained from animal studies apply to the use of mobile phones. First, it is uncertain how to apply the results obtained in rats and mice to humans. Second, many of the studies that showed increased tumor development used animals that had already been treated with cancer-causing chemicals, and other studies exposed the animals to the RF virtually continuously - up to 22 hours per day.

For the past five years in the United States, the mobile phone industry has supported research into the safety of mobile phones. This research has resulted in two findings in particular that merit additional study:

1. In a hospital-based, case-control study, researchers looked for an association between mobile phone use and either glioma (a type of brain cancer) or acoustic neuroma (a benign tumor of the nerve sheath). No statistically significant association was found between mobile phone use and acoustic neuroma. There was also no association between mobile phone use and gliomas when all types of types of gliomas were considered together. It should be noted that the average length of mobile phone exposure in this study was less than three years.

    When 20 types of gliomas were considered separately, however, an association was found between mobile phone use and one rare type of glioma, neuroepithelliomatous tumors. It is possible with multiple comparisons of the same sample that this association occurred by chance. Moreover, the risk did not increase with how often the mobile phone was used, or the length of the calls. In fact, the risk actually *decreased* with cumulative hours of mobile phone use. Most cancer causing agents increase risk with increased exposure. An ongoing study of brain cancers by the National Cancer Institute is expected to bear on the accuracy and repeatability of these results.[1]

2. Researchers conducted a large battery of tests to assess the effects of exposure to mobile phone RF on genetic material. These included tests for several kinds of abnormalities, including mutations, chromosomal aberrations, DNA strand breaks, and structural changes in the genetic material of blood cells called lymphocytes. None of the tests showed any effect of the RF except for the micronucleus assay, which detects phone

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1.Muscat et al. Epidemiological Study of Cellular Telephone Use and Malignant Brain Tumors. In: State of the Science Symposium; 1999 June 20; Long Beach, California.

radiation, but only after 24 hours of exposure. It is possible that exposing the test cells to radiation for this long resulted in heating. Since this assay is known to be sensitive to heating, heat alone could have caused the abnormalities to occur. The data already in the literature on the response of the micronucleus assay to RF are conflicting. Thus, follow-up research is necessary.[1]

Two other studies of interest have been reported recently in the literature:

1. Two groups of 18 people were exposed to simulated mobile phone signals under laboratory conditions while they performed cognitive function tests. There were no changes in the subjects' ability to recall words, numbers, or pictures, or in their spatial memory, but they were able to make choices more quickly in one visual test when they were exposed to simulated mobile phone signals. This was the only change noted among more than 20 variables compared.[2]

2. In a study of 209 brain tumor cases and 425 matched controls, there was no increased risk of brain tumors associated with mobile phone use. When tumors did exist in certain locations, however, they were more likely to be on the side of the head where the mobile phone was used. Because this occurred in only a small number of cases, the increased likelihood was too small to be statistically significant.[3]

In summary, we do not have enough information at this point to assure the public that there are, or are not, any low incident health problems

1.Tice et al. Tests of mobile phone signals for activity in genotoxicity and other laboratory assys. In: Annual Meeting of the Environmental Mutagen Society; March 29, 1999, Washington, D.C.: and personal communication, unpublished results.
2.W, Iwi, G, Davies-Smith, A, Wesnes, K, Butler, S, Lim, E, and Varey, A. Effect of a 915-MHz simulated mobile phone signal on cognative function in man. Int. J. Radiat. Biol., April 8, 1999.
3.Hardell, L, Nasman, A, Pahlson, A, Hallquist, A and Mild, KH. Use of cellular telephones and the risk for brain tumors: a case-control study, Int. J. Oncol., 15: 113-116, 1999.

associated with use of mobile phones. FDA continues to work with all parties, including other federal agencies and industry, to assure that research is undertaken to provide the necessary answers to the outstanding questions about the safety of mobile phones.

What is known about cases of human cancer that have been reported in users of hand-held mobile phones?

Some people who have used mobile phones have been diagnosed with brain cancer. But it is important to understand that this type of cancer also occurs among people who have not used mobile phones. In fact, brain cancer occurs in the U.S. population at a rate of about 6 new cases per 100,000 people each year. At that rate, assuming 80 million users of mobile phones (a number increasing at a rate of about 1 million per month), about 4800 cases of brain cancer would be expected each year among those 80 million people, whether or not they used their phones. Thus it is not possible to tell whether any individual's cancer arose because of the phone, or whether it would have happened anyway. A key question is whether the risk of getting a particular form of cancer is greater among people who use mobile phones then among the rest of the population. One way to answer the question is to compare the usage of mobile phones among people with brain cancer with the use of mobile phones among appropriately matched people without brain cancer. This is called a case-control study. The current case-control study of brain cancers by the National Cancer Institute, as well as the follow-up research to be sponsored by industry, will begin to generate this type of information.

What is FDA's role concerning the safety of mobile phones?

Under the law, FDA does not review the safety of radiation-emitting consumer products such as mobile phones before marketing, as it does with new drugs or medical devices. However, the agency has authority to take action if mobile phones are shown to emit radiation at a level that is hazardous to the user. In such a case, FDA could require the manufacturers of mobile phones to notify

users of the health hazard and to repair, replace or recall the phones so that the hazard no longer exists.

Although the existing scientific data do not justify FDA regulatory actions at this time, FDA has urged the mobile phone industry to take a number of steps to assure public safety. The agency has recommended that the industry.

- support needed research into possible biological effects of RF of the type emitted by mobile phones.
- design mobile phones in a way that minimizes any RF exposure to the user that is not necessary for device function; and
- cooperate in providing mobile phone users with the best possible information on what is known about possible effects of mobile phone use on human health.

At the same time, FDA belongs to an interagency working group of the federal agencies that have responsibility for different aspects of mobile phone safety to ensure a coordinated effort at the federal level. These agencies are:

- National Institute for Occupational Safety and Health
- Environmental Protection Agency
- Federal Communications Commission
- Occupational Health and Safety Administration
- National Telecommunications and Information Administration

The National Institutes of Health also participates in this group.

In the absence of conclusive information about any possible risk, what can concerned individuals do?

If there is a risk from these products - and at this point we do not know that there is - it is probably very small. But if people are concerned about avoiding even potential risks, there are simple steps they can take to do so. For example, time is a key factor in how much exposure a person receives. Those persons who spend long periods of time on their hand-held mobile phones could consider holding lengthy conversations on conventional phones and reserving

the hand-held models for shorter conversations or for situations when other types of phones are not available.

People who must conduct extended conversations in their cars every day could switch to a type of mobile phone that places more distance between their bodies and the source of the RF, since the exposure level drops off dramatically with distance. For example, they could switch to:

- a mobile phone in which the antenna is located outside the vehicle,
- a hand-held phone with a built-in antenna connected to a different antenna mounted on the outside of the car or built into a separate package, or
- a headset with a remote antenna to a mobile phone carried at the waist.

Again, the scientific data do not demonstrate that mobile phones are harmful. But if people are concerned about the radio frequency energy from these products, taking the simple precautions outlined above can reduce any possible risk.Where can I find additional information?

For additional information, see the following web sites:

Federal Communications Commission (FCC) RF Safety Program (select "Information on Human Exposure to RF Fields from Cellular and PCS Radio Transmitters"): http://www.fcc/gov/oet/rfsafety

World Health Organization (WHO) International Commission on Non-Ionizing Radiation Protection (select Qs & As): http://www.who.int/emf

United Kingdom, National Radiological Protection Board: http://www.nrpb.org.uk

Cellular Telecommunications Industry Association (CTIA): http://www.wow-com.com

U.S. Food and Drug Administration (FDA) Center for Devices and Radiological Health: http://www.fda.gov/cdrh/consumer/