Role of Diet, Stress and Cell Phone use In Cancer & Cancer Prevention

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Adapted this power point from presentations compiled
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**PURE FOOD:**

“O ye who believe! eat of the good things We have provided for you, and render thanks to Allah, if it is He Whom you worship.” (Holy Qur’an 2:173)

- Muslims should avoid those things, which will injure their physical, moral and spiritual health (commentary on verse 2:173)

- Pure food is the basis for good morals

- Holy Qur’an speaks of a time when it will be very difficult to find pure and wholesome food.
Cancer is a preventable disease

<table>
<thead>
<tr>
<th>CANCER RISK FACTORS</th>
<th>PERCENT OF CANCER DEATHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>30</td>
</tr>
<tr>
<td>Diet</td>
<td>30</td>
</tr>
<tr>
<td>Lack of exercise</td>
<td>5</td>
</tr>
<tr>
<td>Cancer causing agents</td>
<td>5</td>
</tr>
<tr>
<td>Family history of cancer</td>
<td>5</td>
</tr>
</tbody>
</table>

By choosing the right diet, we can drastically decrease chances of getting cancer
Important Questions . . .

• How cancer initiates in the body and what factors can affect this process?

• What is DNA, oxidizing agent, antioxidant?

• How diet and associated habits can decrease or increase the risk of cancer? (types of food, cooking methods, fat, vitamins, and food colors etc.)

• How certain foods can prevent or even treat cancer?

• What is an anticancer diet? And what is not an anticancer diet?
Continuous exposure to anything which changes the information on DNA and/or makes it unstable, can potentially cause cancer.
What is Cancer? Insults to the DNA…

The genetic code can be likened to a library. One book from that library will tell that cell what kind of cell it is going to be; whether it is going to be a skin cell or a kidney cell etc. Sometimes the cell suffers an insult and a page of that book gets ripped out. When one page of the book is lost the cell can still figure out what to do because there are enough pages in the book still giving information. When too many pages get ripped out the cell doesn’t know how to behave. It doesn’t know how to be that kidney cell or liver cell - so it keeps multiplying and doesn’t know when to stop…

That is Cancer.
What causes the information on DNA to change?

Extrinsic Factors
(UV, radiation, Chemicals, Viruses)

Intrinsic Factors
(Food and by-products of food, acid, heat, errors by repair)

DNA Damage, (Information changed)
If not repaired
Cancer, Heritable diseases

major contributor to cancer and aging
What is the source of DNA damaging, cancer causing agents, in our food?

Food

↓

Added by farmer

(pesticides, herbicides, hormones)

↓

Added by Manufacturer

(food colors, preservatives, salt, nickel, chromium in vitamins)

↓

Added during cooking

(frying, salt)

↓

Digestion

Waste Products

↓

Processed

Oxidative byproducts

(oxidizing agents, damage DNA)

↓

How we eat and how much we eat
How we eat, and how much we eat

“Calorie restriction is the most potent, broadly acting dietary regimen for suppressing the carcinogenesis process; Carcinogenesis, 2010 31(1):83-89”

Rats

<table>
<thead>
<tr>
<th>Regular food</th>
<th>20% less food</th>
<th>30% less food</th>
<th>40% less food</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tumor Incidence reduced by 33%</td>
<td>• Tumor incidence reduced by 42%</td>
<td>• No tumors</td>
</tr>
<tr>
<td></td>
<td>• Tumor Stress reduced by 32%</td>
<td>• Tumor stress reduced by 72%</td>
<td>• No tumors even with oily food</td>
</tr>
</tbody>
</table>

Eating too much at one time; surge of oxidative mets Risk to DNA
Eating too much overall; continuous exposure Increased risk
Calorie restriction; reduces oxidative stress, increases efficiency and accuracy of DNA repair
Allah the Almighty has always reminded us to take extra care of our stomach. He the Almighty said, *Eat and drink and be not immoderate.*" (Surah 7:Verse 31)

So, how moderate is moderate?

Our beloved Prophet Muhammad (may Allah’s peace and blessings be upon him) gave us a great guidance to solve this issue.

Prophet saws said: “Man fills no vessel worse than his stomach. It is sufficient for the son of Adam to have a few mouthfuls to give him the strength he needs. If he has to fill his stomach, then let him leave one-third for food, one-third for drink and one-third for air.” (Reported by al-Tirmidhi and Ibn Maajah. Saheeh al-Jaami’, 5674).
Cooking method can also increase cancer risk

When we fry meats, extremely harmful oxidizing agents (HAAs) are produced.

<table>
<thead>
<tr>
<th>Type of Meat</th>
<th>Method of Preparation</th>
<th>Amount of DNA damaging HAAs produced (ng/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEEF</td>
<td>Fry</td>
<td>31-36</td>
</tr>
<tr>
<td></td>
<td>Grill</td>
<td>0.8-3.2</td>
</tr>
<tr>
<td></td>
<td>Steam/Boil/Bake</td>
<td>- -</td>
</tr>
<tr>
<td>CHICKEN</td>
<td>Fry</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Grill</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Steam/Boil/Bake</td>
<td>0</td>
</tr>
<tr>
<td>FISH</td>
<td>Fry</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>Grill</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Steam/Boil/Bake</td>
<td>0</td>
</tr>
<tr>
<td>SEA FOOD</td>
<td>Fry</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Steam/Boil/Bake</td>
<td>0</td>
</tr>
</tbody>
</table>

HAAs also occur in tobacco smoke and diesel exhaust.

Avoid frying meats if possible, and food should be cooked at a lower temperature (below 200°C), cooking more slowly for a longer period of time. This technique releases the HAA reaction precursors from the meat.
Eating too much red meat may increase cancer risk

- Consumption of large amounts of meats may increase cancer risk (animal fat, DNA damaging agents produced during nitrogen metabolism and cooking)

- Eating too much red meat raises the risk of breast and colorectal cancer; (women who reported eating more than one and a half servings of red meat per day had almost twice the risk of developing cancer)

- Fish seems to reduce the risk of several cancers including prostate, esophageal etc. (Fish has several anticancer and antioxidizing agents such as selenium, omega-3-Fas, vitamin E)
Vitamins may increase or reduce cancer risk

- Deficiency of vitamins B12, folic acid, B6, niacin, C, and E, iron, or zinc, appears to mimic radiation in damaging DNA.

- Certain vitamin supplements increase cancer risk in clinical trials. However studies also show that eating foods rich in these supplements, decreases cancer risk.

- Heavy metals (nickel, chromium, mercury etc), added in most vitamins, constitutively activate DNA repair and destabilize DNA. (aluminum foil, antacids, auto exhaust, baking powder, bleached flour, cans, color additives, cosmetics, pesticides, pollution, tobacco smoke, vanilla powder).

Our first choice should be to get our vitamins from fresh fruits, vegetables, and nutrient rich foods, not from pills. If we need to have vitamins, find simple plant based vitamins without heavy metals and without unnecessary additions.
Artificial Food Colors Are Threats To DNA

Organic food is better than non-organic

Under organic production, the use of conventional non-organic pesticides, insecticides, and herbicides, is greatly restricted. If livestock are involved, they are not given routine antibiotics and growth hormones, and generally fed a healthy diet. In most countries, organic produce may not be genetically modified.
Food as Medicine
Green Tea

- Green tea consumption is associated with decreased risk of cancer (breast, pancreatic, colon, esophageal, and lung cancers)

- EGCG

\[ \text{Green Tea} \]

\[ \text{EGCG} \]
broccoli sprouts can help in both the treatment and prevention of esophageal cancer
Barrett’s Esophageal Cancer (a cancer associated with heartburn)

- Normal esophageal cells
- Acid Reflux
- DNA Damage
- Barrett’s esophagus (substantial changes in DNA)
• Broccoli is associated with decreased risk of cancers including the prostate, lung, breast and colon in humans. This protective effect is mostly attributed to isothiocyanates present in these vegetables.

• L-Sulforaphane

Broccoli

L-Sulforaphane
Soy products can prevent cancer by protecting DNA

- Dietary intake of soy has been linked with decreased cancer risk including breast and especially prostate.

- The active anticancer compounds in soy are isoflavones, which have been shown to decrease the levels of oxidative DNA damage in humans.

- A clinical study at WSU, showed that drinking one glass of organic soy milk daily should significantly reduce prostate cancer risk.
Dietary fiber is necessary for cancer prevention

- Dietary fiber is the indigestible portion of plant foods and absorbs water throughout the digestive system has bulking action. **High fiber diet significantly lowers the chances of colorectal and also other cancers because:**

  - It quickly moves waste products carrying DNA damaging agents through the intestines, decreasing the contact time between carcinogens and the intestine.

  - High fiber diet can lower the risk of breast cancer by binding estrogen in the bowels

*We should eat at least 25 grams of fiber a day. Best anticancer fiber sources are: wheat bran, kidney beans, garbanzo beans, navy beans, whole wheat, whole grains, legumes, whole grain bread, and prunes*
Diet with the following is not very helpful in preserving DNA integrity

Refined sugars, white breads, white naans, white pasta, white rice, bleached flour, high fructose corn syrup, heavy dosed vitamins and combinations, food coloring, some additives/preservatives, excessive red meat, excessive meat in general, sugary soda pops, too much fat, animal fat, hydrogenated oils
What can be a healthy diet?

- Eat less meat, especially the red meat. It is better to use more fish than other meats. Bake rather than frying or use olive oil in cooking. Cook at low temperature for longer time. Meals containing meats should include high fiber bread, plenty of salad including broccoli sprouts, flax seeds, and beans to neutralize the oxidative DNA damaging agents.

- Instead of black tea, drink green tea. Add honey for additional protection.

- Eat lots of fresh fruits and vegetables (include red grapes, tomatoes, broccoli sprouts). Increase fiber to between 25 and 35 grams a day.
➢ high fiber organic cereals in breakfast. Drink 1 glass of organic soy milk every day. Include ground flax seed in your meals.

➢ Limit dietary fat to 20 percent of total calories, with less than 10 percent of total calories as saturated fats. Eliminate hydrogenated fats. Use organic butter. Olive oil seems to be better for DNA integrity.

➢ Keep one third of your stomach empty, Stay lean, exercise.

➢ Good nutrition is one of the ways you can help your body fight the daily battle with DNA damaging agents.
Sleep Disorders, Stress, And Cell Phones; (Associated Health Risks And Their Management)
Sleep
Why we need to sleep?

Organisms survive longer without food than without sleep

AFFECTED

SLEEP

• Systems in body need a break to rest and do maintenance
• The brain has a chance to shut down and repair neurons
• Body has a chance to lower metabolic rate, energy consumption, replace chemicals, perform repair
• In children & young adults, GHs released during sleep

Deep sleep

1. Initial phase of sleep
2. Half of sleep time in babies
3. Brain develops and reorganizes connections to attain the perfect precision it needs as an adult
4. The amount of plasticity depends on the amount of sleep
5. Crucial for proper brain development and function

REM sleep (Late)

1. Brain integrates information
2. Consolidates recent experience into memory
3. Exposure to "memorable" event turns on a gene zif-268 in REM sleep
4. Zif-268 participates in cementing the memories acquired while awake
5. Important for learning and remembering new skills and decision making,
6. Students who review their notes and get good sleep, perform better.

• Systems in body need a break to rest and do maintenance
• The brain has a chance to shut down and repair neurons
• Body has a chance to lower metabolic rate, energy consumption, replace chemicals, perform repair
• In children & young adults, GHs released during sleep
7. "Have We not made the earth as a bed,
8. And the mountains as pegs?
9. "And We have created you in pairs,
10. And We have made your sleep for rest,
11. "And We have made the night as a covering,
12. "And We have made the day for the pursuits of life.

Part of the commentary by Hazrat Musleh Maood

سبات (rest) is a great Divine gift. After a day’s hard work, sleep gives rest to man’s jaded nerves and tired limbs, and thus he is refreshed and replenished for the next day’s work.
Consequences of sleep deprivation?

Sleep Deprivation

1- Mental performance
• Traffic accidents
• Poor job performance

2- Mental disorders
• Depression
• Anxiety
• Schizophrenia
• Alzheimer's disease
• Stroke
• Head injury
• Memory loss

3- Hormonal changes
• Obesity
• Increased aging
• Hypertension
• Heart disease
• Cancer
• Diabetes
• DEATH

Rats; die in 2 weeks
≤4 of sleepers at highest risk
7-8 hrs sleepers at lowest risk
Increased Telomere loss by stress may be equivalent to 9-17 years of life.
What Are Causes of Stress?

• Lifestyle choices such as poor diet, caffeine, overeating, not enough sleep, overloaded schedule.
• Negativity, pessimistic thinking, criticism, over-analyzing.
• Unrealistic expectations, taking things personally, exaggerating, rigid thinking.
• Noise, heat, confined spaces.
• Rudeness, bossiness or aggressiveness on the part of someone else.
• Red tape, deadlines.
• Major life events, death of a relative, lost job, new baby.
• Daily hassles, commuting, mechanical breakdowns.
What Are Common Symptoms of Stress?

- **Physical**: fatigue, headache, insomnia, muscle aches/stiffness (especially neck, shoulders and low back), heart palpitations, chest pains, abdominal cramps, nausea, trembling, cold extremities, flushing or sweating and frequent colds.

- **Mental**: decrease in concentration and memory, indecisiveness, mind racing or going blank, confusion, loss of sense of humor.

- **Emotional**: anxiety, nervousness, depression, anger, frustration, worry, fear, irritability, impatience, short temper.

- **Behavioral**: pacing, nervous habits (nail-biting, foot-tapping), increased eating, smoking, drinking, crying, yelling, swearing, blaming and even throwing things or hitting.
What can we do about stress?

• Meditation, yoga, and regular exercise reduce stress

• Prayers (offered with full concentration)

• Balanced diet, avoid junk food, overeating

• Practice good sleep hygiene and have a healthy lifestyle

• Can also benefit from Islamic teachings (e.g., those about anger management, personal control, forgiveness, cleanliness of heart, qanaat pasandi, simplicity, work ethics, selflessness, Taqwa etc), to get rid of stress

• Sorrow makes a man old before his time.
• Submission to the Will of God, is the cure of the disease of the heart.
• The word of God is the medicine of the heart (Sayings of Hazrat Ali RA)
Cell phones and cancer risk

A growing concern regarding the harmful effects of exposure of cell phone radiation (radiofrequency electromagnetic waves; RF-EMW) on health.

850 MHz and 1900 MHz of RF-EMW (USA)
900 MHz and 1800 MHz elsewhere.

Figure 1. Estimation of the penetration of electromagnetic radiation from a cell phone based on age (Frequency GSM 900 Mhz) (On the right, a scale showing the Specific Absorption Rate at different depths, in W/kg) [1]
Summary of potential cell phone hazards

• With ≥ 10-years use, there is a significant (2- to 4-fold) increase in risk of overall **malign and benign brain tumours**.

• Tumor is usually on the side of the head habitually exposed to CP.

• The risk is higher in rural areas (battery emission up to 80 V/m vs 1V/m).

• **The risk is higher in those starting use when aged below 20 years**.

• Epidemiological data is now supported by experimental data; CP radiation can induce DNA damage, mutations, and activation of cancer genes, changes in brain/neurons.

• Many genotoxic agents produced by CP are same as induced by **stress**.

• Depending where you keep your phone, it has been associated with changes in **blood pressure, fertility**, and performance of cells.

• Usage >25 min/day may reduce melatonin, hormone helps you **sleep**.

• Fatigue, headache, reduced concentration, local irritation & burning.
Things we can do

1. Improve lifestyle, diet, sleep hygiene
2. Set your circadian clock per Islamic ways
3. Exercise regularly, lose weight
4. Deep breathing, meditation, warm bath
5. If light snoring, try sleeping on your side or head and trunk elevated.
6. Seek medical treatment for any allergies, nasal obstructions, loud snoring
7. Snacks warm milk, almonds, whole grain cereal, honey, cherries may help in sleep
8. Say prayers with full concentration.
9. Listen and submit to Word of Allah
10. Work hard but have realistic expectations
Cont:

1. Eat healthy, but **less**; do not fill your stomach.
2. Eat low fat, fiber-rich, Mediterranean diet.
3. Add **antioxidants** to diet to combat with genotoxins by stress, sleep disorders & cell phones (honey, fish, **green tea, broccoli sprouts**, flax seeds, chia seeds, olives, red grapes, lemon, avocados, **soy milk**).
4. Keep cell phones, away from your body and children, use hands free or speaker
Things to avoid:

1. Disrupting CR by staying up late for entertainment on TV, internet, Face Book, cell phone
2. Heavy meals, exercise, addressing stressful issues just before bedtime
3. Smoking, sleeping pills, sedatives
4. Long chats on cell phone
5. Giving cell phone to kids
6. Pollution
7. Lack of physical activity, laziness
8. Obesity
9. Stress & associated factors
Stress & Associated factors:

• Negative thinking: anger, hatred, meanness, jealousy, greed, selfishness...

• Frequent exposure to sun, chemicals, pesticides, radiation (X-Rays, cell phones etc)

• Bad diet:
  Refined sugars, white breads, white naans, white pasta, white rice, bleached flour, high fructose corn syrup, heavy dosed vitamins and combinations, food colors, some additives, preservatives, excessive use of meat, red meat, sugary soda pops, too much fat, animal fat, hydrogenated oils)
• Jazak ‘Allah for your attention to this important subject!