

Science
eLearning
Ms. Hammond

Name _____
Date _____

In the event that ACAS is closed due to inclement weather, students are expected to complete the assignments listed below. Should students have questions regarding these assignments, they may contact me by e-mail (maryellenhammond@acalt.org) between 9:30 a.m.-11:00 a.m. and 1:00 p.m.-2:30 p.m. to receive assistance. These assignments are due within two days of our return to school. **Failure to turn in all work within two days of returning to school will result in a zero for each day, and no seat hour will be awarded for the day(s) missed.**

Students should complete the attached worksheets.


**Cultural
Diversity**

Cancer—Uncovering the Culture Connection

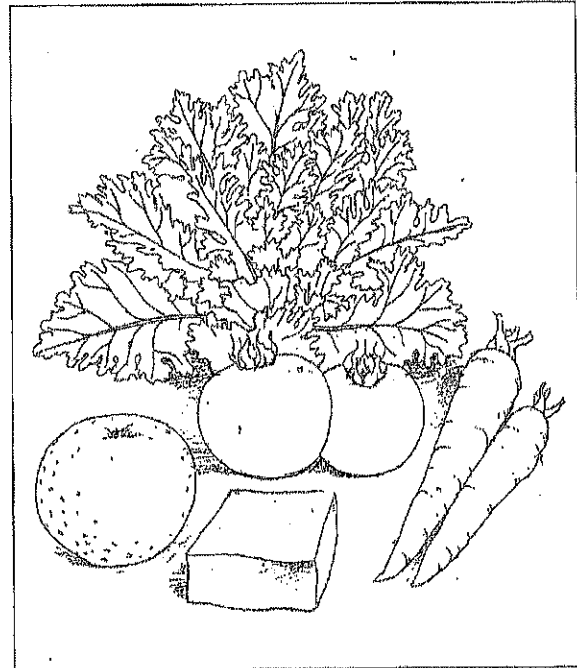
**Activity
12**

On the other side of the globe from the United States, breast cancer affects five times fewer women in Japan and China. The rates of colon cancer and, until a few years ago, lung cancer, also are lower in Japan and China than in the United States. On the other hand, the occurrence of stomach cancer in both China and Japan is astonishingly high. In China, for instance, the rate is 90.9 cases in 100,000 people, compared to a rate of 6.5 in the United States. Scientists are exploring answers to the question “why?” They began to ask themselves whether the tendency to get—or not to get—cancer was an inherited trait. Their observations, however, took them in a different direction.

A Change of Direction

If protection against cancer—or the tendency to get it—were largely genetic, then it shouldn’t matter where a person lived. Yet, environment does seem to play an important role. Studies have shown that cancer incidence often changes as people migrate from one place to another. As with breast cancer, the rate of colon cancer is lower in Japan than in the United States. But when Japanese people move to the United States, their risk of developing colon cancer increases. On the other hand, their rates of stomach cancer decrease. What causes the rates to change?

As scientists started hunting for changes in lifestyle that could account for differences in cancer rates among people of different cultures, they began looking at dietary habits. For instance, the Japanese have long eaten a diet low in fat. For example, in 1955, only nine percent of a typical Japanese woman’s diet consisted of fat—about a third of that typical for American women. Researchers began looking at fat intake, as well as estrogen levels, in order to find potential causes of breast cancer. (Fatty food and substances such as alcohol increase estrogen levels in women.)



Studies have shown that eating a diet containing such foods as carrots, tomatoes, kale, soy, and oranges can lower a person’s risk of certain cancers.

In a press release from November of 1999, the Harvard School of Public Health (HSPH) reported that the cause of the cancer might not be directly related to high levels of estrogen, as researchers had begun to think. In fact, the rates of breast cancer in Japan and China remain lower, even among women with estrogen levels similar to those of women in the United States. The cause instead might be related to a protein, called a receptor estrogen, that causes estrogen to be absorbed by cells. American women have higher levels of the protein. If this research continues to prove that the protein is a factor in causing breast cancer, rates of it might be controlled through both diet and drugs.

And what about stomach cancer? Does diet play a role in its incidence, too? A clue to the answer was unearthed in the city of Linxian in China.

Activity 12 (continued)

The people of Linxian have very high rates of stomach cancer. And unlike Americans, they have a diet high in preserved vegetables, and low in fresh fruits and vegetables. Their salted, pickled, low-fat diet helps prevent colon cancer, but may be contributing to higher incidences of stomach cancer.

Other studies have revealed that stomach cancer also is common in places such as Japan, Korea, Chile, and India. In these places, the people have a diet high in salted, pickled, smoked, and cured foods, and low in fresh fruits and vegetables containing vitamins A and E. In a recent long-term experiment, people likely to get stomach cancer were given vitamin supplements to increase their levels of vitamins A and E. Their cancer rates decreased by 13 percent.

An Infamous Culprit

Habits other than diet also can decrease the risk of getting certain cancers. Before the 1960s, relatively few Japanese people living in Japan developed lung cancer. In 1960, for example, lung cancer accounted for only two percent of deaths among middle-aged Japanese men. By 1995, however, that figure had soared to an alarming 18 percent, and it's still rising.

What had protected the Japanese men from getting lung cancer that no longer protected them? Cigarette smoking had not been common in Japan prior to the middle of the 1900s. Then, as the decades passed, cigarette smoking became more popular. A lifestyle that had protected the people of Japan against lung cancer began to vanish.

Clearly, lifestyle choices, including those related to diet and tobacco use, have an impact on cancer rates. Looking at and comparing the different lifestyles of cultures around the world can help scientists unravel the mystery of what causes cancer, a complex group of more than 100 different diseases.

By borrowing the most healthful practices from countries around the world and avoiding harmful practices, people can lower their cancer risk. Because this is a field where research is continuous, individuals periodically should check reliable sources of information for updates.

Active Reading

1. What are some of the risk factors for cancer?
2. What might contribute to the high rates of stomach cancer in China and Japan? What nutrients are missing from the diet of the people in those countries?
3. What choices can you make that could help reduce your risk of cancer?
4. Studying other cultures can provide clues to preventing cancer. What other health benefits might be gained from the study of other cultures?

Alternate Assessment

Some causes of cancer are directly related to a choice of foods and other substances. Create a poster showing which foods and substances may help protect the body from cancer and which may expose it to increased cancer risk. **Hint:** Visit science.glencoe.com to start your research on this topic.



Cultural
Diversity

Acupuncture—Modern Uses for Traditional Medicine

Activity

8

A patient lies in a bed in a doctor's office with a dozen steel needles sticking out of her arms, legs, and ears. At first, this sight might look painful. Nevertheless, the patient is having the treatment performed in order to relieve the pain in her body. The procedure is known as acupuncture, and it is an ancient Chinese healing art that is increasing in popularity throughout Western countries. This technique is widely used to treat a number of ills, including backache, headache, arthritis, and substance abuse.

Where It Began

No one knows exactly how or when the practice of acupuncture developed. Historians do know that the strategic placement of needles in various parts of the body to treat health problems began at least 2,500 years ago in China. The ancient Chinese text called *Yellow Emperor's Classic of Internal Medicine* (or *Canon of Medicine*) is the first written source known to discuss the practice of acupuncture. The text only dates to 200 B.C., but attributes the principles of acupuncture to the Yellow Emperor, Huang Di, who lived around 2500 B.C. The text explores the philosophy behind traditional Chinese medical practices. The basis of this philosophy is the balance of opposing natural forces known as *yin* and *yang*.

Some historians estimate that the practice started closer to 4,000 years ago. Others cite evidence that such treatments began 10,000 years ago when people may have used stone needles, called *bian shi*, to press into one part of the body to stop pain in another part.

The tools for administering acupuncture have changed over time. The needles of stone gave way to needles of

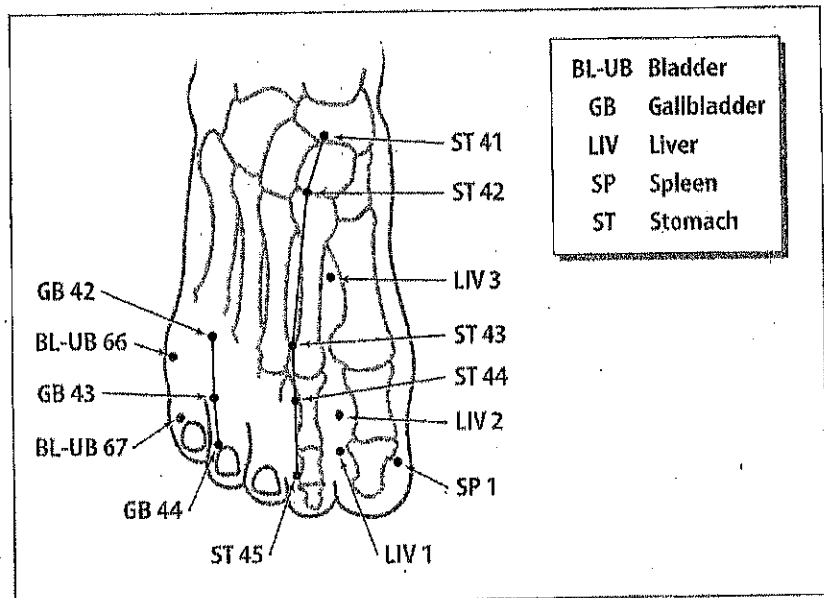
bronze, gold, and silver made in nine different shapes, each serving a specific purpose. Today, acupuncture practitioners use stainless steel needles and various surgical instruments.

The Flow of Qi

Qi energy is believed to flow to all parts of the body through 14 major pathways that run along the skin and into the body. When the *qi* is imbalanced or blocked, acupuncture treatment restores the proper flow of energy. Needles are inserted at one or more of the nearly 2,000 acupuncture points on the body.

Often, the desired acupuncture point may not be near the affected body part. A kidney problem, for example, might call for a few needles in the arms and ears. And sometimes, the needles aren't even inserted under the skin—they barely touch the surface.

Acupuncture may relieve pain by prompting the nervous system to release chemicals called endorphins and other natural pain relievers. Acupuncture also may prompt the pituitary gland in the brain to produce pain blockers and



Many acupuncture points on the foot are believed to affect internal organs.

Activity 8 (continued)

to trigger a process that releases anti-inflammatory agents into the bloodstream.

To put it another way, acupuncture seems to stimulate the body's own painkillers. And it succeeds so well that in China, Sri Lanka, and other Asian countries, minor surgery often is performed without anesthesia. Acupuncture has none of the adverse effects (such as nausea and, occasionally, death) brought on by conventional general anesthetics. Recently, it has been used this way in the United States, as well.

Integrating Two Approaches

In light of acupuncture's benefits, some U.S. physicians have overcome their suspicion of this alternative treatment and have embraced the ancient technique. Still, many U.S. physicians remain wary of acupuncture because how it works is unproven by Western medicine's standards. Today, at least 3,000 U.S. doctors use acupuncture to treat patients. In addition, 7,000 other practitioners use acupuncture for a broad range of

health problems, sometimes together with herbs, massage, and other Eastern treatments.

Acupuncture may prove especially valuable in two areas where Western treatments have been challenged: chronic pain and substance abuse. In numerous cases of chronic pain, such as backache and arthritis, patients who undergo regular acupuncture treatments are able to reduce their use of medication and resume normal activities. As for substance addiction, acupuncture practitioners have enjoyed notable success in treating patients addicted to drugs such as cocaine and alcohol.

According to Dr. Michael O. Smith of Lincoln Hospital in the South Bronx neighborhood of New York, withdrawal symptoms and drug cravings disappear within minutes of the acupuncture treatment. Acupuncture also soothes patients who might otherwise panic or show hostility. If an addict is calm—that is, if his or her *qi* is in harmony—he or she is more likely to benefit from counseling.

Active Reading

1. What is the idea behind how acupuncture works?
2. How does the insertion of acupuncture needles cause the body to react?
3. How does the basis of acupuncture differ from the basis of Western medicine?
4. How does the Chinese theory of acupuncture differ from Western ideas on how it works?

Alternate Assessment

Find out more about one aspect of acupuncture. Focus on how it is used today to relieve pain or to treat a medical condition, or find out more about the major pathways and points of the system. Create a visual display to present your findings to the class.