

IMAGE AWARENESS HEALTHLETTER

THE IMMUNE SYSTEM

The Enemies: Bacteria

VOLUME 102 NO. 1

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NOTICE

This newsletter is designed for educational purposes only. Any individual suffering from health problems which are mentioned or discussed should consult a physician for proper diagnosis and treatment.

OVERVIEW

The immune system is the part of body chemistry that protects us from disease and allows the human body to flourish free from illness and allergic responses. Any study of the immune system must consider the enemies of that system, the defenders, and environmental and nutritional factors that influence the system.

The enemies of the immune system are viruses, bacteria, worms, protozoa and fungus. The defenders are specialized cells produced in the bone marrow. Environmental factors which can detrimentally affect the immune system include ex-

posure to toxic chemicals in food, water or air. Poor heredity or malnutrition of infant or mother during pregnancy can result in a weak immune system.

Lack of nutrients can cause collapse of the immune system and make it impossible to cope with toxic chemicals in the environment. The role of individual nutrients in the health of the immune system is now being actively studied.

ILLUSTRATION

THE TROJAN HORSE

The Greek and the Trojan warriors had swept across the battlefields of Asia Minor for ten years. The attacking Greeks seemed powerless to penetrate the powerful defenses of the fortress of Troy.

Finally a Greek warrior conceived of a plan to deceive the minds of the strategists of the city of Troy. A large wooden horse was built, hollowed out, and filled with Greek warriors. It was left at the gate to the city of Troy as the Greek

army sailed to a nearby island.

After the Greeks had been gone for two weeks, the Trojans brought the horse into their city and entered into a drunken orgy of revelry over their victory. Some of the Trojans had a sense of forboding, from which we get our saying, "Beware of Greeks bearing gifts."

In the dead of night the Greek warriors emerged from their hiding place in-

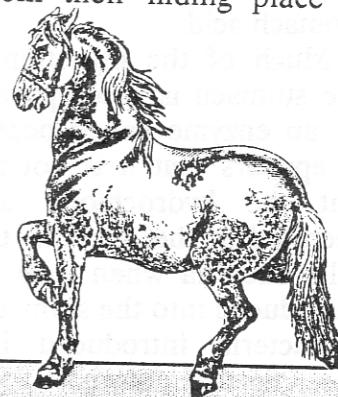
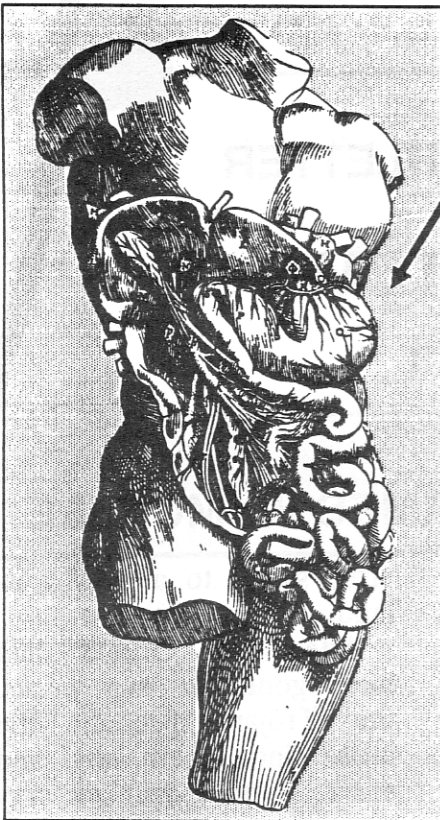


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The stomach is the guardian of the digestive tract and the body as a whole through its production of hydrochloric acid.

era when the organisms were administered with bicarbonate (a common ingredient in antacids). The predictability of infection could be enhanced with antacids.

This discovery indicates that the routine administration and advertisement of antacids today is flawed and should be reconsidered.

One of the bacteria that has developed resistance to antibiotics is salmonella. The severity of infection by this organism is linked to the amount of stomach acid an individual produces.

In one study patients with normal stomach acid had diarrhea less than 6 days and stool volume was less than 1 liter a day. By contrast, those with inadequate stomach acid had diarrhea for 7 to 14 days with stool volumes ranging from 3.5 to 10.5 liters a day.

STOMACH ACID AND SALMONELLA SEVERITY		
	NORMAL	LOW
DAYS ILL	6	7-14
FECAL VOLUME LITERS PER DAY	1	3.5-10.5

Reference: Giannella, Ralph, M.D., Broitman, Selwyn, Ph.D., and Zamcheck, Norman, M.D., "Influence of Gastric Acidity on Bacterial and Parasitic Enteric Infections", *Annals of Internal Medicine*, 78: 271-276, 1973.

THE "GASTRIC BARRIER"

The concept that stomach acid could protect the body from bacteria consumed in food has probably been with men since the discovery of stomach acid.

Much of the digestion in the stomach is accomplished by an enzyme called pepsin. It appears that it is not this but the hydrochloric acid secreted in the stomach that kills bacteria when they are introduced into the stomach.

Bacteria introduced into the normal stomach are killed in less than 15 minutes. Stomach acid is important for health and resistance to disease.

In 1885 Koch, the father of bacteriology, demonstrated that he could predictably infect guinea pigs with chol-

ANTACIDS

Millions of Americans routinely use antacids after meals thinking that these aid in the digestion of food. Actually this is not true. The use of antacids in the form of calcium carbonate has been encouraged by some physicians because of the calcium content.

Not only are antacids a risk from the standpoint of increasing susceptibility to bacterial invasion of the system, but they can contribute to other problems including increasing the possibility of allergic responses.

Normal guidelines for the use of antacids include the following: "Calcium carbonate and sodium bicarbonate preparations should be limited to occasional use by healthy individuals. Their frequent or continuous use should be avoided."

Under 'Possible Effects of Extended Use' the following warning is given: "Calcium carbonate may cause an abnormally high blood level of calcium, disturbance of the acid-alkaline balance of body chemistry (alkalosis), impaired kidney function, and the formation of kidney stones."

Exercise caution in the use of any antacid and use them only when absolutely necessary. Often when people take antacids they actually need a good stomach acid supplement.

Reference: Long, James, M.D., *Prescription Drugs*, New York: Harper and Row, 1977, pp. 102-107.

side the horse and opened the gates of the city to the Greek army. The city of Troy was burned to the ground and its inhabitants slain.

The human body survives in the midst of an environment no less hostile than that of the city of Troy while under siege by the Greek armies. The number of potentially lethal organisms that can be cultured from a healthy individual is quite large.

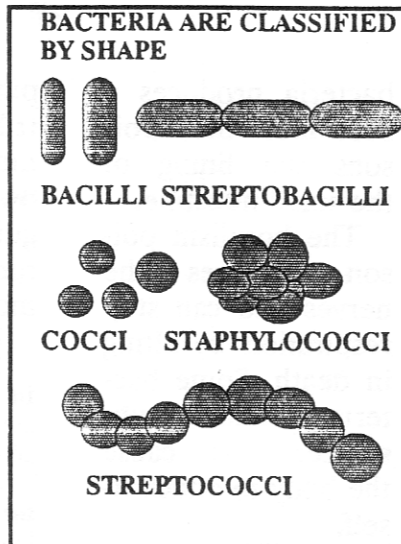
Bacteria

Bacteria are one celled plants or animals. Some produce disease and some do not. They are usually classified by shape. Bacteria cause diseases like cholera, tuberculosis, syphilis, botulism, and bubonic plague.

Bubonic plague is of interest historically. In only four years around 1347 between 17 and 28 million people died from the disease caused by the bacteria *Yersinia pestis*. Only 8 1/2 million people died in all of World War I.

Bacterial diseases have not been whipped. Legionaire's disease and toxic shock syndrome were both caused by bacteria. The bacteria responsible for legionaire's disease may contaminate the tap water in 30 percent of U.S. homes.

Botulism may become a problem at any time. The toxin produced by this bacteria is so potent that .000036 ounce could kill one million guinea pigs.



References:

"Doctor's link Legionaires' disease to home water", *The Sacramento Union*, Fri., March 6, 1987, p. A3.

Gottfried, Robert, *The Black Death*, New York: Free Press, 1983.

Brown, J. A., *The Stein and Day International Medical Encyclopedia*, New York: Stein and Day, 1971, p. 51.

Mizel, Steven, and Jaret, Peter, *In Self-Defense*, San Diego: Harcourt Brace Jovanovich, 1985, p. 15.

ANTIBIOTICS AND BACTERIA

Medical science is seeing a disturbing trend in the appearance of bacteria resistant to antibiotics. This trend can be explained by the overuse of antibiotics in animal feeds as well as by over prescription by physicians.

In 1974 three-fourths of all production of antibiotics was non-medical. Most of this was used in animal feeds. Antibiotics promote rapid growth of animals. Unfortunately, the bacteria that live in these animals have the capability of becoming resistant to antibiotics. These bacteria can then be passed on to people.

Overprescription of antibiotics to people can also lead to bacteria resistant to these medicines. Antibiotic resistant bacteria have become a major problem in hospitals. As bacteria become resistant the problem of "super-infection" becomes very real. A bacteria resistant to antibiotics can flourish when its competitors are wiped out by administration of the antibiotic.

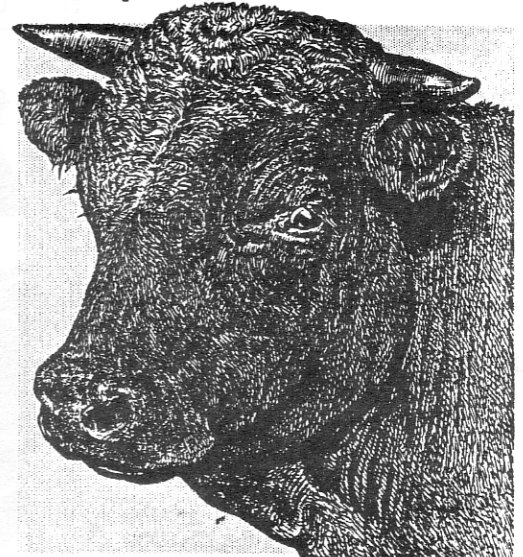
Modern medicine now commonly sees gonorrhea, pneumonia, and meningitis caused by bacteria resistant to almost all antibiotics.

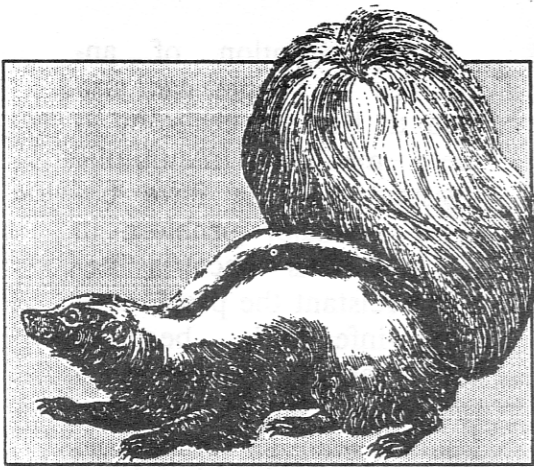
Sadly, some antibiotics actually impair the ability of the immune system to deal with invading bacteria. Thus the effect of the antibiotics is not just in strengthening the bacteria, but also in weakening the human body. Enhancement of the immune system with good nutrition is one of the best ways to avoid the need for antibiotics.

References:

Lappe, Marc, *Germs that Won't Die*, New York: Anchor Press/Doubleday, 1982, p. 127, 178.

Remington, Jack, "Trouble with Antibiotics", *Human Nature*, June 1978, p. 62.





Just as the skunk can emit powerful chemicals to confuse and distract attackers, so can bacteria release substances into their environment to confuse and distract their enemies.

Mechanism of Bacterial Attack

Bacteria do not attack the body directly. Instead they attack by producing powerful toxins that hamper the ability of the body to cope with them. In this way they can feed upon body tissues without being overwhelmed by the immune defenses of the human body.

Often the toxins produced by bacteria attack a particular tissue that will debilitate. Thus the cholera

bacteria produces a substance that poisons the lining of the small intestine.

The botulism poison damages the nerves and can stop respiration resulting in death. Some bacteria produce substances that cause the body to attack itself.

The bacteria that causes toxic shock syndrome produces many of these compounds. One toxin causes blood clots that block the movement of immune cells to the site of the infection.

Vitamin C has been shown to be capable of inactivating many of these bacterial toxins. There is scientific literature to suggest that vitamin C can neutralize the poisons produced by diphtheria, dysentery, tetanus, and staphylococcus.

In 1934 it was noted that the ability of the mouse to resist diphtheria was superior to that of the guinea

pig. This difference was attributed to the fact that the mouse can synthesize its own vitamin C while the guinea pig can not. Fortunately man can supplement his diet with vitamin C.

References:

Mizel, Steven, and Jaret, Peter, *In Self-Defense*, San Diego: Harcourt Brace Jovanovich, 1985, p. 16-17.

Stone, Irwin, *The Healing Factor*, New York: Grosset and Dunlap, 1972, p. 79.

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- Helps protect against bacteria taken in with food



James McAfee
Research Director

Next issue in this series:

- The most dangerous and most common of all diseases.
- Learn how viruses attack the body.
- How the immune system can be enhanced to cope with viruses.
- See what a virus looks like.
- Insights on Epstein-Barr virus (EBV).

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