

Publisher's Note

This first edition of *Salem Health: Women's Health* includes nearly 300 articles in 2 volumes on all aspects of health that relate to women specifically—from childhood to adulthood. The articles in this 2-volume set address diseases, conditions, symptoms, syndromes, risk factors, treatments and cultural and social perspectives.

This comprehensive reference publication builds on several other Salem Health titles, from *Magill's Medical Guide to Salem Health: Nutrition and Salem Health: Community & Family Health Issues*. It will be of interest not only to public library patrons but also to premedical students specializing in female-specific fields and those building collections for the patient population.

Essays vary in length from 400 to 2,000 words, ranging from one to five pages. The material in this edition is arranged in eight categories:

- Anatomy
- Biology
- Development
- Diseases/Disorders
- Procedures
- Social Issues
- Specialties
- Treatments

Essays include “For Further Information” sections, listing several additional resources on the topic. A “Complete List of Contents” at the beginning of every volume assists readers in locating topics of interest from each volume. Photographs, tables and diagrams are included to better illustrate anatomy, diseases, treatments and procedures.

In addition, the following appendixes appear at the end of volume 2:

- Federal Health Resources, listing several government agencies, including websites and phone numbers
- Crisis Organizations and Hotlines, listing several emergency resources for readers in need of urgent care
- Glossary
- Category Index
- Subject Index

Salem Health: Women's Health has benefited by the contributions of many experts—physicians, nurses, pharmacists, and professional medical writers—whose names are listed following this Publisher's Note. Salem Press thanks Editor Michael A. Buratovich, Ph.D., Spring Arbor University and reviewer Kimberly Ortiz-Hatman, Psy.D, LMFT.

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A

Abdomen

CATEGORY: Anatomy

KEY TERMS:

chyme: the semiliquid state of foods that have gone through the first stage of digestion in the stomach

Kupffer cells: specialized cells in the liver that perform the function of removing bacterial debris from the blood that has circulated throughout the body

urea: the major waste product produced in the kidneys that, when gathered in sufficient quantity and liquefied, flows into the bladder for elimination as urine

STRUCTURE AND FUNCTIONS

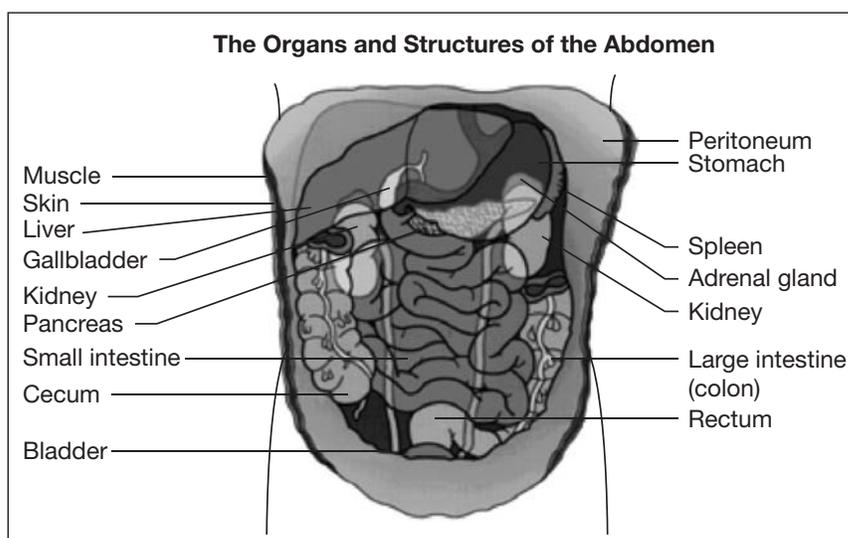
The abdomen is the portion of the body's trunk that begins immediately below the diaphragm, which is the main respiratory muscle in the chest cavity, and extends to the lower pelvic region. The abdominal area is defined by a muscular wall made up of fatty tissue and skin, which determines the general shape of the body from the chest to the lower pelvis. The entire abdominal cavity is lined by a membrane called the peritoneum. This membrane encloses the essential organs of the abdomen: the stomach, small and large intestines, liver, gallbladder, bladder, pancreas, and kidneys. In females, the abdominal casing also contains the uterus, ovaries, and Fallopian tubes. At the front of the abdomen is the navel, essentially a scar which forms following the cutting of the umbilical cord after birth.

Any overview of the abdomen requires a composite view of the functions performed by each of the organs contained in it. With the exception of the female reproductive organs, all

the organs contained in the abdominal cavity serve in one way or another in the process of food digestion, the transfer of diverse essential food by-products to the rest of the body, and the disposal of waste products via the urinary tract and the anal passage.

The esophagus is the tube through which all solid and liquid foods enter the stomach, which is the top-most organ in the abdominal cavity. Because it is essentially a bag, the stomach can assume different shapes and adjust in size to accommodate different volumes of food that reach it through the esophagus. In adult humans, the average capacity of the stomach is about one quart. The essential digestive function of the stomach is to convert foods from their original states to a general semiliquid state referred to as *chyme*.

This first stage of digestion is carried out by the chemical action of some thirty-five thousand gastric glands that make up the inner folds of the inner layer of the stomach, the gastric mucosa. As the gastric glands actively secrete gastric juice, the second layer of the stomach wall, which is muscle tissue, contracts and expands, providing the physical movement that is



Abdominal organs and structures are those located between the rib cage and the pelvic bone. © EBSCO

necessary for the gastric juice and food material to come into full contact.

Gastric juice actually begins to flow from the inner lining of the stomach even before food is present. This may occur when one smells food or even when one imagines the flavor of food. Among the component parts of gastric juice are the enzymes pepsin and rennin, hydrochloric acid, and mucus, the latter of which protects the lining of the stomach from the effects of high acidity. Pepsin and rennin begin to break down different types of proteins when an optimum acid environment (a pH between 1 and 3) exists.

Once the initial stage of digestion has occurred, food passes from the stomach into the upper portion of the small intestine, or duodenum, via the pyloric sphincter. This passageway will not allow food to enter the small intestine until it is suitably modified by the action of the stomach.

In the small and large intestines, partially broken-down food is reduced further by the action of gastric juices that are either secreted into the intestines from other abdominal organs (the pancreas and liver, most notably) or secreted by the mucous membranes of the intestines themselves. It is in the small intestine that most of the breaking-down digestive work of gastric juices takes place. Food particles reach a certain level of decomposition so that they may be absorbed into the bloodstream through the mucous membranes of the intestine. The bulk of what is left is allowed to pass from the small intestine and through a gate-like passageway called the cecum and then to the large intestine or colon.

The function of the colon and the component juices that it contains is to separate out the three essential components that remain following the absorptive work of the small intestine: water, undigested foodstuff, and bacteria. Most of the water passes back into the body through the walls of the colon, while undigested food and bacteria are propelled farther down the gastrointestinal tract for eventual elimination as feces.

The importance of other organs in the abdomen—the liver, kidneys, pancreas, gallbladder, and bladder—is as complex as that of the intestines and in several cases goes beyond the basic function of digestion. Closest to the stomach and the digestive process itself, perhaps, is the action of the pancreas. The pancreas is the glandular organ located directly beneath

the stomach. It is connected to the duodenum (the first and shortest segment of the small intestine), to which it provides pancreatic juice containing three digestive enzymes: trypsin, amylase, and lipase. These agents join the secretions of the small intestine, as well as bile flowing from the liver, to complete the digestive process that breaks down proteins, carbohydrates, and fats. They can then be absorbed through the walls of the intestine for the general nourishment of the body. In addition to its role in the digestive process, the pancreas possesses endocrine cells, called the islets of Langerhans, that secrete two hormones, insulin and glucagon, directly into the bloodstream. These two hormones work together to influence the level of sugar in the blood. When the insulin-secreting cells of the pancreas fail to function effectively, then diabetes mellitus may result.

Like the pancreas, the liver, which is the largest glandular organ of the body, shares in the digestive process by producing bile, a fluid essential for the emulsification of fats passing through the small intestine. Bile salts, as they are called, are stored in the gallbladder until they are released into the small intestine. This contribution to the digestive process, however, represents only a minimal part of the liver's functions, many of which have vital effects on body functions far beyond the abdominal cavity. Because blood filled with oxygen flows into the liver from the aorta through the hepatic artery, on one hand, and blood containing digested food enters the liver from the small intestine via the portal vein, on the other, the relationship between "harmonizing" liver functions and the content of the blood is absolutely critical.

The metabolic cells that make up liver tissue, known as hepatic cells, are highly specialized. According to their specialized function, the hepatic cells in the four unequal-sized lobes of the liver may affect several factors: the amount of glycogen (converted and stored glucose) that should be reconverted to glucose and passed (for added energy) into the bloodstream; the conversion of excess carbohydrates and protein into fat; the counteraction of the harmful ammonia by-product of protein breakdown by the production of urea; the production of several essential components of blood, including plasma proteins and blood-clotting agents; the storing of key vitamins and minerals such as vitamins A, D, K, and B-12; and the removal of bacteria and other debris that collect

in the blood itself—a function of the phagocytic, or Kupffer, cells in particular.

It is the next pair of vital abdominal organs, the kidneys, that separates many of the waste products associated with the liver's metabolic functions, including urea and mineral salts, out of the blood and removes them from the body in the form of urine. This separation is performed by millions of tiny filtering agents called nephrons. Blood penetrates the interior of the kidney by way of an incoming arteriole that branches off from the main renal artery. After the filtering process has been completed, cleansed blood flows back into the main bloodstream via an outgoing arteriole and a system of blood vessels leading to the main renal vein. Waste materials remain, after filtering, in a tube-like extension of each nephron until they can be concentrated in the form of urine in a chamber in the middle of the kidney called the kidney pelvis. From this chamber, urine is propelled by muscular compression through the ureter tubes leading to the bladder, the last organ (in males) contained within the lower abdominal cavity. In addition to removing waste products from the blood, the kidneys can adjust the level in the blood of other substances—such as sodium, potassium, and calcium—that are needed by the body but that may exist in excess at certain times. Because the two kidneys perform exactly the same functions, it is possible to survive with only one healthy kidney.

Although obviously essential for temporary storage of urine and final elimination of liquid waste through the process of urination, the bladder is the least complicated organ in the abdominal cavity. The bladder is essentially a sac with a liquid capacity of about one pint. Its functions are governed by varied tension in and loosening of muscles in the walls of the sac and the external sphincter. When the pressure of collected urine reaches a certain point, nervous impulses cause the external sphincter to relax. Urine flow out of the bladder into the urethra tube can be controlled, up to a certain point, in humans and most mammals by conscious thought.

DISORDERS AND DISEASES

Given the concentration in the abdomen of vital regulatory organs, much medical research has focused on the pathology of this area of the body. Although there are a number of specific diseases that attack individual abdominal organs, the entire region is

vulnerable to cancerous tumors. Medical science has tended to associate cancers in certain abdominal organs with dietary habits that are either of recent origin (consumption of highly processed foodstuffs in industrialized Western societies, for example) or geographically or ethnically distinctive—the East Asian, specifically Japanese, vulnerability to certain types of stomach cancer, for example. The latter vulnerability may, however, also be tied to dietary or other environmental considerations that vary in different populated areas of the globe.

Although cancers may strike any of the vital abdominal organs, chances of successful surgical intervention to remove tumors vary greatly according to the location of the cancer. Liver cancer, for example, is essentially untreatable through surgery, while the treatment of cancer of the colon has a significant success rate. This variation is partially attributable to the fact that the vital processes performed by the intestines may not be seriously threatened when a portion of the organ is removed in cancer surgery.

The most important specific diseases associated with the abdomen include peritonitis, hepatitis, and diabetes. Among these diseases, diabetes has received the most attention, both for its widespread impact on all sectors of the population and for the amount of research that has gone into the task of finding a cure. Diabetes occurs when the pancreas fails to produce enough insulin to metabolize the sugar substance glucose. A breakdown in this function impairs proper cell nourishment and results in excessive sugar in the blood and urine. This state, referred to as hyperglycemia, can affect a number of body functions outside the abdominal cavity, leading, for example, to atherosclerosis and vascular degeneration in general. Because many diabetes patients must inject insulin into their bodies to counteract a malfunctioning pancreas, an opposite, equally dangerous side effect, hyperinsulinism, may also occur. The most serious degenerative effect that menaces patients suffering from diabetes, however, occurs when the chemical and hormonal imbalance originating in the pancreas brings negative reactions to the kidneys, causing the latter to fail. Medical science has perfected various technical means for addressing this problem, most of which are connected with the mechanical process called dialysis.

Hepatitis is an inflammation that attacks the liver. The two common forms are hepatitis A (formerly

called infectious hepatitis) and hepatitis B (formerly called serum hepatitis). Both are transmitted as a result of unsanitary conditions, the first in food and water supplies and the second when unsterile hypodermic needles or infected blood come into contact with the victim's own bloodstream. Unlike most other diseases associated with the abdominal organs, hepatitis is extremely contagious. Hepatitis B can present dangers in using plasma supplied by donors, as there can be an incubation period from six weeks to six months before external signs of the disease occur.

Perhaps the most common abdominal disease, curable through the use of antibiotics if treated in time, is peritonitis. This is an acute inflammation of the peritoneum, the membrane that lines the entire abdominal cavity. It can occur as a result of direct bacterial invasion from outside the body or as a side effect of ruptures occurring in one of the organs contained in the abdomen. Peritonitis typically develops as a result of complications from appendicitis, bleeding ulcers, or a ruptured gallbladder.

A number of disorders located in the abdomen are unique to women. Obviously, women experience pain as a result of menstrual cramps. *Endometriosis* is a condition that arises when uterine lining tissue grows outside of the uterus, possibly resulting in painful menstrual cramps, heavy menstrual bleeding, pain during sex, and infertility. Pain that comes from the uterus and that is worse during menstruation is called *dysmenorrhoea*. *Ovarian cysts* are frequently benign and can result in various symptoms, including increased urination, vomiting, lightheadedness, pain, and others. *Polycystic ovarian syndrome* is an imbalance in reproductive hormones that affects women of childbearing age; typically, the ovaries or adrenal glands of a woman with POCS produce more male hormones than normal. Pain can result from *ovarian torsion*, which refers to a change in the position of an ovary in a woman's body. An *ectopic pregnancy* is one in which the egg is fertilized in the fallopian tube, potentially causing the fallopian tube to rupture. *Salpingitis* is a painful inflammation of the fallopian tubes. Chlamydia and gonorrhea can lead to *pelvic inflammatory disease* in women. *Fibroids* are noncancerous growths in the uterus.

As they get older, many women notice an increase in abdominal fat, or "belly fat," even when they are not gaining weight overall. Typically, this condition is the result of a decreased level of estrogen, which impacts where fat gets distributed in the body. This fat

is problematic because it is not just subcutaneous fat but includes visceral fat, which accumulates deep inside the woman's abdomen and surrounds internal organs. Visceral fat has been linked to cardiovascular disease, Type 2 diabetes, high blood pressure, high cholesterol, and breathing problems—and thus with premature death.

PERSPECTIVE AND PROSPECTS

The history of medical analysis of disorders of the abdominal area goes back as far as written history itself, ranging from simple indigestion and painful (and possibly fatal) gallstones to very serious and only recently understood diseases such as diabetes.

Perhaps the most noteworthy advancement in medical knowledge affecting the organs of the abdominal region has been the development of more sophisticated means to counteract the effects of kidney disorders. While there were some striking advances (but not full levels of success) in organ transplant surgery beginning in the 1970s, a technique called dialysis made remarkable strides. First used shortly after World War II as an effective but costly and physically limiting treatment, dialysis involves the use of a machine that receives blood pumped directly from the patient's heart and processes this blood in place of the kidney. This involves filtering out excretory products, adding essential components that "refresh" blood needs (such as heparin to combat clotting as well as proper amounts of saline fluid), and then returning the blood to resume its vital function within the circulatory system.

Although the essential principles of dialysis did not change drastically in the last quarter of the twentieth century, levels of efficiency in a process that had to be repeated over a ten-hour period several times a week definitely did. Development of much smaller, portable dialysis devices made it possible for patients to follow their doctors' instructions in carrying out their own treatment between hospital or office visits, thus lessening the chances of very dangerous crises at the outset of kidney failure.

The most notable hope for patients afflicted with kidney disorders is successful transplant from a healthy or recently deceased donor. By the early twenty-first century, transplants had also become foreseeable for those suffering from diseases that strike other organs in the abdominal cavity, especially the liver. Thus, healthy organ transplant technology can

be said to represent one of the most important domains of future research, involving specialists of all the subsections of medicine relating to the abdominal cavity.

—Byron D. Cannon, Ph.D.
Updated by Michael J. O'Neal

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Abdominal disorders

CATEGORY: Disease/Disorder

KEY TERMS:

gastrointestinal: referring to the small and large intestines

pathogen: any microorganism that can cause infectious disease, such as bacteria, viruses, fungi, or other parasites

peritoneum: a membrane enclosing most of the organs in the abdomen

CAUSES AND SYMPTOMS

The main trunk, or torso, of the human body includes three major structures: the chest cavity, contained within the ribs and housing the lungs and heart; the abdomen, containing the stomach, kidneys, liver, spleen, pancreas, and intestines; and the pelvic cavity,

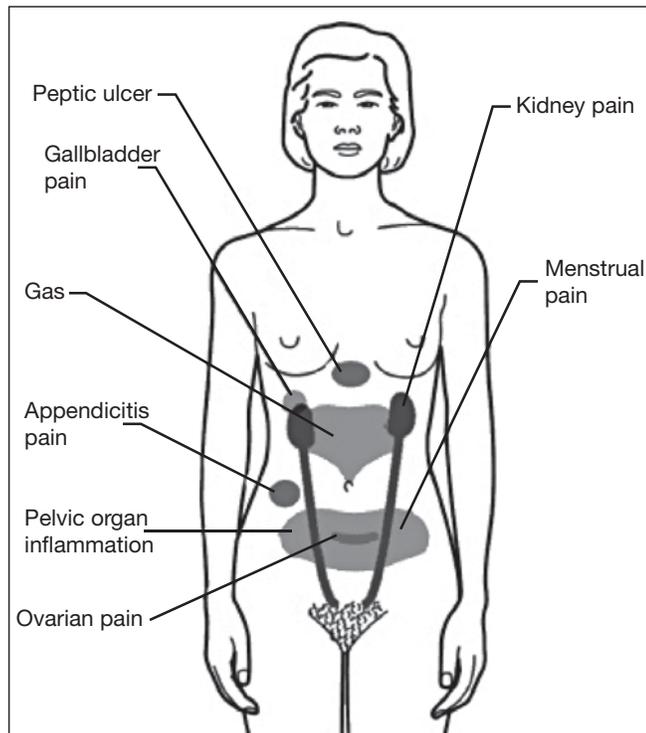
housing the sexual organs, the organs of elimination, and related structures.

The abdomen is, for the most part, contained within a membrane called the peritoneum. The stomach lies immediately below the chest cavity and connects directly with the small intestine, a long tube. It fills the bulk of the abdominal cavity, winding around and down to the pelvic bones in the hips. The small intestine then connects to the large intestine, which extends upward and crosses the abdomen just below the stomach and then turns down to connect with the rectum. Other vital organs within the abdominal cavity include the liver, kidneys, spleen, pancreas, and adrenal glands. All these structures are subject to infection by viruses, bacteria, and other infective agents; to cancer; and to a wide range of conditions specific to individual organs and systems.

Diseases in the abdominal cavity are usually signaled by pain. Identifying the exact cause of abdominal pain is one of the most difficult and important tasks that the physician faces. The familiar stomachache may be simple indigestion, or it may be caused by spoiled, toxic foods or by infection, inflammation, cancer, obstruction, or tissue erosion, among other causes. It may arise in the stomach, the intestines, or other organs contained within the abdominal cavity. In addition, pain felt in the abdomen may be referred from other sources outside the abdominal cavity. A good example would be a heart attack, which arises in the chest cavity but is often felt by the patient as indigestion. Another example is the abdominal cramping that is often associated with menstruation and premenstrual syndrome (PMS). However, because severe abdominal pain could mean that the patient is in great danger, the physician must decide quickly what is causing the pain and what to do about it.

By far the most common cause of stomach pain is indigestion, but this term is so broad as to be almost meaningless. Indigestion can be brought on by eating too much food or by eating the wrong foods or tainted foods; it can be brought on by alcohol consumption, smoking, poisons, infection, certain medications such as aspirin, and a host of other causes. It may be merely an annoyance, or it may indicate a more serious condition, such as gastritis, gastroenteritis, an ulcer, or cancer.

The stomach contains powerful chemicals to help digest foods. These include hydrochloric acid and chemicals called pepsins (digestive enzymes).



Abdominal disorders are many and varied; some common disorders and their sites are shown here. ©EBSCO

To protect itself from being digested, the stomach mounts a defense system that allows the chemical modification of foods while keeping acid and pepsin away from the stomach walls. In certain people, however, the defense mechanisms break down and bring the corrosive stomach chemicals into direct contact with the stomach walls. The result can be irritation of the stomach lining, called gastritis. Gastritis may progress to a peptic ulcer, identified as a gastric ulcer if the inflammation occurs in the stomach wall or a duodenal ulcer if it occurs in the wall of the duodenum, the first section of the small intestine. In most cases, the ulcer is limited to the surface of the tissue. In severe cases, the ulcer can perforate the entire wall and can be life-threatening.

Women's stomachs empty more slowly than men's, which helps to explain why women tend to suffer from bloating and nausea more frequently than men, a condition called gastroparesis. Various conditions can affect gastric emptying, including diabetes, stomach surgeries, infections, medications and low thyroid level; these conditions can damage the nerves responsible for gastric emptying.

A common cause of stomach pain is the medication used to treat arthritis and rheumatism. These drugs include aspirin and a group of related drugs called nonsteroidal anti-inflammatory drugs (NSAIDs). As part of their activity in reducing bone and joint inflammation and pain, NSAIDs interfere with part of the stomach's network of self-protective devices and allow acids to attack stomach and duodenal walls, sometimes resulting in gastritis or ulceration.

Bacterial and viral infections often result in abdominal distress. Foods that sit too long unrefrigerated provide a good environment for bacteria to grow. These bacteria may be inherent in the food itself (for example, *Salmonella* in poultry and *E. coli* in meats) or they may come from the hands of people who prepare and serve them. The bacteria may cause human infection directly, or they may release toxins into the food. The result can be mere annoyance, debilitating illness, or deadly infection, depending upon the organism involved. *Salmonella* and *Staphylococcus* are two of the many bacteria that can cause food poisoning. Toxin-producing *E. coli* can be acquired from improperly cooked meat and can cause fatal infections. *Clostridium botulinum* toxin, occasionally found in canned or preserved foods, leads to probably the most serious form of food poisoning; victims often do not recover. Women are susceptible to toxic shock syndrome, caused by staphylococcal or streptococcal infections association usually with the use of tampons.

Other bacterial and viral infections of the gastrointestinal tract are also common causes of abdominal disease. Some of these viruses and bacteria include noroviruses, rotavirus, and *Shigella*. Viral gastroenteritis is the second most common disease in the United States (after upper respiratory tract infections) and a leading cause of death in infants and the elderly.

Appendicitis (inflammation of the appendix) is frequently seen. The appendix is a tiny organ at the end of the small intestine. It has no known purpose in the physiology of modern humans, but occasionally it becomes infected. If the infection is not treated quickly, the appendix can burst and spread infection throughout the abdominal area, a condition that can be life-threatening.

Diarrhea, with or without accompanying abdominal pain, is a major symptom of gastrointestinal disease. It is commonly associated with bacterial or viral

infection but may also be attributable to the antibiotics used to treat bacterial infections, or to noninfectious inflammatory conditions such as Crohn's disease or ulcerative colitis; women experience both forms of irritable bowel syndrome, including Crohn's disease and ulcerative colitis, at a rate of about twice that of men. On the flip side of diarrhea is chronic constipation, which afflicts women more often than it does men and which tends to worsen as women age. The treatment generally includes 20 to 35 grams of dietary fiber each day, along with ample fluids and exercise.

Irritable bowel syndrome (IBS) is a particular problem for women, afflicting them anywhere from two to six times more often than in men. IBS involves sensitivity to irritants, such as gas, that typically are not a bother to other people. It is believed that IBS results from the way the intestinal nerves communicate with the brain and the way the brain responds to the signals it is getting from the gut. Emotional stress appears to be the main trigger for IBS, but the good news is that IBS is a functional problem rather than a problem resulting from damage to the intestinal lining.

Other gastrointestinal diseases are peritonitis (inflammation of the membrane that covers the abdominal organs), diverticulitis, constipation, obstruction, colitis, and the various cancers that can afflict the gastrointestinal system, such as stomach and colon cancers. The latter is one of the more common, yet preventable, forms of cancer in the United States, and colon cancer ranks third among the types of cancer that affect women.

The liver is the largest internal organ in the human body and perhaps the most complicated; it is subject to a wide range of disorders. It is the body's main chemical workshop, and it is responsible for a large number of activities that are vital to body function. The liver absorbs nutrients from the intestinal tract and metabolizes them; that is, the liver modifies nutrients so that they can be used by the cells. The liver introduces nutrients into the bloodstream, supplying it with glucose, protein, and other substances that the body needs. The liver detoxifies the blood and allows poisons, drugs, and other harmful agents to be eliminated. The liver also manufactures and stores many important substances, such as vitamin A and cholesterol.

Chief among liver disorders are the various forms of hepatitis and cirrhosis. Hepatitis is inflammation of the

liver, and it can be caused by a viral infection, alcohol, or drugs. There are many forms of viral hepatitis; the three most significant are hepatitis A, B, and C.

Hepatitis A is the most common form; it is caused by a virus that is transmitted through contaminated food or water. Hepatitis B and C are blood-borne diseases; that is, these viruses are carried in the blood and in other body fluids, such as semen and saliva. They can be transmitted only when infected body fluids are transferred from one person to another. These diseases are commonly spread through the use of contaminated needles and during surgical and dental procedures. Nurses and other staff members in health care facilities can be exposed to hepatitis B and C when taking and handling infected blood samples. A pregnant woman who is infected can pass the disease on to her fetus. In the past, blood transfusions were a common source of infection; however, blood tests for these viruses are now available. Potential blood donors are screened, and those who test positive cannot donate blood.

Cirrhosis develops when the liver is damaged by some substance such as alcohol. Liver cells are destroyed, and as the liver attempts to regenerate, scar tissue is formed. The steady flow of blood through the organ is impeded, as are vital functions such as the removal of waste materials from the blood.

The liver is also subject to a number of cancers. Cancer cells can spread to liver tissue from other parts of the body, or they can originate there as a result of hepatitis B or C or other chronic liver diseases such as cirrhosis. The chief issue involving the liver for women has to do with enzymes. Slight differences in the functioning of enzymes in the liver (and small intestine) mean that women handle various medications in a way different from men, resulting in the drug having too little or too much effect.

The gallbladder is a small sac connected to the liver. The liver manufactures bile, a substance that aids in the digestion of fats. Bile is stored in the gallbladder and passes through the bile duct into the small intestine. A common disorder of the gallbladder is the formation of gallstones, crystalline growths that can be as fine as sand or as large as a golf ball. If the stones clog the passage to the bile duct, severe pain may result. Removal of the gallbladder (cholecystectomy) is often necessary. Women's gallbladders empty more slowly than men, leaving women twice as likely to form gallstones. Pregnancy can exaggerate the

effect because of hormone secretion, explaining why many women develop gallstones after delivering a baby.

The pancreas, a vital gland situated near the liver, contains both exocrine tissue (which produces digestive enzymes) and endocrine tissue (which produces the hormone insulin). Both are subject to disease. Dysfunction of the endocrine portion (“Islets of Langerhans”) causes diabetes mellitus, a disorder of glucose metabolism. Pancreatitis is a potentially life-threatening inflammation of the pancreas caused most frequently by gallstones or by alcohol and other toxins.

The other major organ system in the abdomen is comprised of the kidneys and the urinary tract. The system includes the two kidneys, which sit in the middle of the back on either side of the spine; the two ureters, which transport urine from the kidneys; the bladder, a pouchlike organ that collects the urine; and the urethra, which expels urine from the body. The kidneys and related organs are subject to several disorders. Infection of the bladder or kidneys is quite common, particularly in young women and in the elderly. Kidney stones are also common and may be familial. Illnesses in other organs and systems may be reflected in the kidneys, and cancer may be primary in the kidney or may spread there from another site. Medications, other drugs, and toxins may cause severe kidney damage as well.

The peritoneum is the membranous lining of the abdominal cavity. When the organs within the cavity become inflamed, and particularly if there is any leakage of their contents, the peritoneum also becomes inflamed, a condition called peritonitis.

TREATMENT AND THERAPY

Many abdominal disorders are related to the overproduction of stomach acids, which damage the intestinal walls; the treatment of such conditions is often associated with changes in lifestyle. In treating gastrointestinal reflux disease, or GIRD, in which stomach acid backs up into the throat, physicians may suggest that the patient change habits that may be contributing to the condition, perhaps by stopping smoking, reducing the intake of alcohol, losing weight, and avoiding certain foods and medications. Preparations to neutralize stomach acids are used, as well as drugs that reduce the amount of stomach acid produced. Surgery is rarely indicated.

Hiatal hernia, the protrusion of part of the stomach through the diaphragm, usually produces no symptoms. There may be reflux of stomach acids into the esophagus, which can be treated by the same methods used in treating gastrointestinal reflux disease. Surgery is sometimes indicated.

Gastritis is commonly treated with agents that neutralize stomach acid or other agents that reduce the production of stomach acid. When gastritis appears to be caused by drugs taken for arthritis or rheumatism (for example, aspirin or NSAIDs), the physician may change the drug or the dosage to reduce stomach irritation.

In treating gastric and duodenal ulcers, the physician seeks to heal the ulcers and prevent their recurrence. Acid-neutralizing agents are sometimes helpful, but more often agents such as histamine (H₂) blockers and proton pump inhibitors that reduce the flow of stomach acids are used. It has been suggested that gastritis and ulcers are associated with certain bacteria. Consequently, some physicians add antibiotics to the regimen to destroy the pathogens. Surgery is sometimes required to control bleeding from ulcers.

Bacterial infections in the gastrointestinal tract are, as a rule, self-limiting. They run their course, and the patient recovers. Sometimes, however, appropriate antibiotics are needed. Likewise, little other than supportive therapy can be offered for most viral infections.

Appendicitis is usually treated surgically. Peritonitis, whether resulting from appendicitis or from other causes, is treated with antibiotics following surgical repair of the primary problem.

Most cases of hepatitis A resolve without complication; no specific treatment is available. Bed rest, dietary measures, and general support procedures are the only steps that can be taken. Hepatitis B and C can become chronic and can progress to chronic active hepatitis, which may lead to liver failure, cirrhosis, liver cancer, and death. New treatments with antiviral drugs and immune modulators such as interferon are curative in some patients. Vaccines against both hepatitis A and B are available and recommended for all children and for adults who are at high risk. There is no vaccine for hepatitis C. There is no treatment for cirrhosis, although physicians may be able to treat some of its complications.

Kidney infections are usually readily treated with antibiotics. Kidney stones often require surgical

removal or lithotripsy, a procedure in which ultrasonic waves are used to break up the stones. Recurrence is common, but sometimes can be prevented with dietary changes or medication.

PERSPECTIVE AND PROSPECTS

Medical science has made great progress in the treatment of disorders arising in the abdominal cavity, but there is much to be done. Most important is the identification of agents to treat or immunize against various viral diseases, particularly those that occur in the gastrointestinal tract and the liver.

The vaccine against hepatitis B has been in use for years, but the incidence of the disease has remained relatively constant. If immunization is used for children successfully, however, the rate of hepatitis B infection among children should drop.

New treatment modalities are being developed for many of the diseases that occur in the abdominal cavity. One of the most significant successes has been in the treatment of peptic ulcers. The new drugs being used not only neutralize acid in the stomach but also cut off the secretion of acid into the stomach. One of these agents was the most-prescribed drug in the world for many years, indicating the importance of this therapeutic approach.

Innovations are also occurring in the treatment of diabetes mellitus, the disease caused by malfunction in the pancreas. Medications have been found that promise to treat and prevent some of the potentially fatal diseases that diabetes can cause.

Because the abdominal area contains so many vital organ systems, it is the seat of perhaps the widest range of diseases that afflict the human body—and hence, the target for the greatest amount of research and, potentially, the greatest advances in medicine.

—C. Richard Falcon;

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Abortion

CATEGORY: Procedure

KEY TERMS:

dilation: making something wider or larger

embryo: the unborn young from conception to about eight weeks

fetus: the unborn young from about eight weeks to birth

quickening: the point at which a fetus first begins to move in the uterus

uterus: a hollow, muscular organ located in the pelvic cavity of females, in which a fertilized egg develops

viability: the point at which a fetus is able to survive outside the uterus

THE CONTROVERSY SURROUNDING ABORTION

Induced abortion is the deliberate ending of a pregnancy before the fetus is born. Abortion has been practiced in every culture since the beginning of civilization. It has also been controversial. The first law designating it as a crime dates to ancient Assyria, where, in the fourteenth century BCE, women who were convicted of abortion were impaled on a stake and left to die. Early Hebrew law also condemned abortion, except when necessary to save the woman's life. The Greeks allowed abortion, but the famous physician Hippocrates (ca. 460 BCE–ca. 370 BCE) denounced the procedure and said that it violated a doctor's responsibility to heal. Roman law said that a fetus was part of a woman and that abortion was her decision, although a husband could divorce his wife if she had an abortion without his consent. Most abortions in ancient times seemed to be related to unwanted pregnancies.