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# 现代外科学英语精要

## Current Surgical Diagnosis & Treatment

*Edited by* **Lawrence W. Way**

 人民卫生出版社

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# 现代外科学英语精要

## Current Surgical Diagnosis & Treatment

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现代外科学英语精要

Current Surgical Diagnosis & Treatment

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# 序

英语是世界医学领域不可由其他语言替代的通用语言。作为医学科技工作者，只有掌握英语，才能顺利阅读日益增多的医学文献和原著或熟练地从因特网上获取医学专业发展的前沿信息，从而充实提高自己的医学专业知识；也只有掌握英语才能将自己研究的成果或经验体会报道和发表出去。

对于医学生和青年医生来说，有了一定的公共英语基础知识以后，尽快接触医学专业英语，掌握一定量的医学专业单词，有目的地训练自己在英语方面的听说读写能力，对从事专业上的对外交流和对内传播有着极其重要的意义。正是由于这个原因，经全国高等医药教材建设研究会研究决定，由人民卫生出版社邀请内、外、妇、儿四大专业具有良好英语功底和丰富临床经验的专家选摘编写了这套“现代医学英语阅读精要”系列丛书。我相信这套丛书在引导医学生和青年医生获得医学知识的同时，还可以使他们学习到规范的医学专业英语单词和语句，对提高他们阅读英语文献和原著的能力将有很大的帮助。希望读者认真利用这套丛书，体会医学专业英语的精髓、特点和使用习惯，举一反三，触类旁通，不断提高自己的医学英语水平。

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2002年10月1日

# 前 言

根据全国高等医药教材建设研究会和卫生部教材办公室关于加强英语教学的精神,我们组织了具有丰富教学经验而且英语水平较高的外科专家摘编了这本英文版教科书,作为全国高等医药院校五年制和七年制规划教材《外科学》(中文版)的配套教材。

本教材以目前在欧美广泛使用的最新版本外科学教材为基础,以外科学教学大纲为依据,结合编者自己多年的教学经验摘编而成。在编排顺序上,与中文版《外科学》教材基本保持一致,以便学生在学习过程中能够同步阅读专业外语知识。摘编内容侧重于疾病的诊断和治疗两个部分,主要目的是帮助学生规范的外科学专业英语,同时了解国外对相关疾病的诊断和治疗方法。

需要提出的是,为了使学生更好地了解英文原版著作中的表述方式,我们特别保留了原著中计量单位、诊疗程序、药物名称及剂量等书写和表达的原貌。原著中使用的标准值与国人的数值有一定的差异,希望学生在学习过程中仍参考相应的中文版教材。教材中保留了原著中使用的英制单位(如英尺、英寸、磅、克分子浓度等),学生在学习过程中需作相应的换算。原著中描述的诊疗程序与我国目前临床上采用的诊疗常规不尽相同,本教材的有关内容仅供参考。国内外在外科疾病诊疗过程中使用药物的名称和剂量也不一致,学生还需遵循我国现行的用药原则。

受编者的水平所限,在摘编过程中难免有疏漏或错误之处,恳请广大师生在使用本教材的过程中,不吝赐教,提出宝贵意见,以便再版时进一步修订。

编 者  
2001 初冬

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# Approach to the Surgical Patient

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1

*J. Englebert Dunphy, MD \* & Lawrence W. Way, MD*

摘编 陈孝平

The management of surgical disorders requires not only the application of technical skills and training in the basic sciences to the problems of diagnosis and treatment but also a genuine sympathy and indeed loves for the patient. The surgeon must be a doctor in the old-fashioned sense, an applied scientist, an engineer, an artist, and a minister to his or her fellow human beings. Because life or death often depends upon the validity of surgical decisions, the surgeon's judgment must be matched by courage in action and by a high degree of technical proficiency.

## THE HISTORY

At their first contact, the surgeon must gain the patient's confidence and convey the assurance that help is available and will be provided. The surgeon must demonstrate concern for the patient as a person who needs help and not just as a "case" to be processed through the surgical ward. This is not always easy to do, and there are no rules of conduct except to be gentle and considerate. Most patients are eager to like and trust their doctors and respond gratefully to a sympathetic and understanding person. Some surgeons are able to establish a confident relationship with the first few words of greeting; others can only do so by means of a stylized and carefully acquired bedside manner. It does not matter how it is done, so long as an atmosphere of sympathy, personal interest,

and understanding is created. Even under emergency circumstances, this subtle message of sympathetic concern must get across.

Eventually, all histories must be formally structured, but much can be learned by letting the patient ramble a little. Discrepancies and omissions in the history are often due as much to over-structuring and leading questions as to the unreliability of the patient. The enthusiastic novice asks leading questions; the cooperative patient gives the answer that seems to be wanted; and the interview concludes on a note of mutual satisfaction with the wrong answer thus developed.

## BUILDING THE HISTORY

History taking is detective work. Preconceived ideas, snap judgments, and hasty conclusions have no place in this process. The diagnosis must be established by inductive reasoning. The interviewer must first determine the facts and then search for essential clues, realizing that the patient may conceal the most important symptom e.g., the passage of blood by rectum—in the hope (born of fear) that if it is not specifically inquired about or if nothing is found to account for it in the physical examination, it cannot be very serious.

Common symptoms of surgical conditions that require special emphasis in the history taking are discussed in the following paragraphs.

### Pain

A careful analysis of the nature of

---

\* Deceased.

pain is one of the most important features of a surgical history. The examiner must first ascertain how the pain began. Was it explosive in onset, rapid, or gradual? What is the precise character of the pain? Is it so severe that it cannot be relieved by medication? Is it constant or intermittent? Are there classic associations, such as the rhythmic pattern of small bowel obstruction or the onset of pain preceding the limp of intermittent claudication?

One of the most important aspects of pain is the patient's reaction to it. The over-reactor's description of pain is often obviously inappropriate, and so is a description of "excruciating" pain offered in a casual or jovial manner. A patient who shrieks and thrashes about is either grossly over-reacting or suffering from renal or biliary colic. Very severe pain—due to infection, inflammation, or vascular disease—usually forces the patient to restrict all movement as much as possible.

Moderate pain is made agonizing by fear and anxiety. Reassurance of a sort calculated to restore the patient's confidence in the care being given is often a more effective analgesic than an injection of morphine.

### **Vomiting**

What did the patient vomit? How much? How often? What did the vomitus look like? Was vomiting projectile? It is especially helpful for the examiner to see the vomitus.

### **Change in Bowel Habits**

A change in bowel habits is a common complaint that is often of no significance. However, when a person who has always had regular evacuations notices a distinct change, particularly toward intermittent alternations of constipation and diarrhea, colon cancer must be suspected. Too much emphasis is placed upon the size and shape of the stool e.g., many patients who normally have well-formed stools may

complain of irregular small stools when their routine is disturbed by travel or a change in diet.

### **Hematemesis or Hematochezia**

Bleeding from any orifice demands the most critical analysis and can never be dismissed as due to some immediately obvious cause. The most common error is to assume that bleeding from the rectum is attributable to hemorrhoids. The character of the blood can be of great significance. Does it clot? Is it bright or dark red? Is it changed in any way, as in the coffee-ground vomitus of slow gastric bleeding or the dark, tarry stool of upper gastrointestinal bleeding? The full details and variations cannot be included here but will be emphasized under separate headings elsewhere.

When there is a history of trauma, the details must be established as precisely as possible. What was the patient's position when the accident occurred? Was consciousness lost? Retrograde amnesia (inability to remember events just preceding the accident) always indicates some degree of cerebral damage. If a patient can remember every detail of an accident, has not lost consciousness, and has no evidence of external injury to the head, brain damage can be excluded.

In the case of gunshot wounds and stab wounds, knowing the nature of the weapon, its size and shape, the probable trajectory, and the position of the patient when hit may be very helpful in evaluating the nature of the resultant injury.

The possibility that an accident might have been caused by preexisting disease such as epilepsy, diabetes, coronary artery disease, or hypoglycemia must be explored.

When all of the facts and essential clues have been gathered, the examiner is in a position to complete the study of the present illness. By this time, it may be possible to rule out (by inductive reasoning) all but a few possible diagnoses. A novice diagnostician asked to evaluate the causes

of shoulder pain in a given patient might include ruptured ectopic pregnancy in the list of possibilities. The experienced physician will automatically exclude that possibility on the basis of sex or age.

### **Family History**

The family history is of great significance in a number of surgical conditions. Polyposis of the colon is a classic example, but diabetes, Peutz-Jeghers syndrome, chronic pancreatitis, multiglandular syndromes, other endocrine abnormalities, and cancer are often better understood and better evaluated in the light of a careful family history.

### **Past History**

The details of the past history may illuminate obscure areas of the present illness. It has been said that people who are well are almost never sick, and people who are sick are almost never well. It is true that a patient with a long and complicated history of diseases and injuries is likely to be a much poorer risk than even a very old patient experiencing a major surgical illness for the first time.

In order to make certain that important details of the past history will not be overlooked, the system review must be formalized and thorough. By always reviewing the past history in the same way, the past history by inquiring about each system as they perform the physical examination on that part of the body.

In reviewing the past history, it is important to consider the nutritional background of the patient. There is an increasing awareness throughout the world that the underprivileged malnourished patient responds poorly to disease, injury, and operation. Indeed, there is some evidence that various lesions such as carcinoma may be more fulminating in malnourished patients. Malnourishment may not be obvious on physical examination and must be elicited by questioning.

Acute nutritional deficiencies, particularly fluid and electrolyte losses, can be understood only in the light of the total (including nutritional) history. For example, a low serum sodium may be due to the use of diuretics or a sodium-restricted diet rather than to acute loss. In this connection, the use of any medications must be carefully recorded and interpreted.

A detailed history of acute losses by vomiting and diarrhea—and the nature of the losses—is helpful in estimating the probable trends in serum electrolytes. Thus, the patient who has been vomiting persistently with no evidence of bile in the vomitus is likely to have acute pyloric stenosis associated with benign ulcer, and hypochloremic alkalosis must be anticipated. Chronic vomiting without bile—and particularly with evidence of changed and previously digested food—is suggestive of chronic obstruction, and the possibility of carcinoma should be considered.

It is essential for the surgeon to think in terms of nutritional balance. It is often possible to begin therapy before the results of laboratory tests have been obtained, because the specific nature and probable extent of fluid and electrolyte losses can often be estimated on the basis of the history and the physician's clinical experience. Laboratory data should be obtained as soon as possible, but a knowledge of the probable level of the obstruction and of the concentration of the electrolytes in the gastrointestinal fluids will provide sufficient grounds for the institution of appropriate immediate therapy.

### **The Patient's Emotional Background**

Psychiatric consultation is seldom required in the management of surgical patients, but there are times when it is of great help. Emotionally and mentally disturbed patients require surgical operations as often as others, and full cooperation between psychiatrist and surgeon is essential. Furthermore, either before or after an

operation, a patient may develop a major psychotic disturbance that is beyond the ability of the surgeon to appraise or manage. Prognosis, drug therapy, and overall management require the participation of a psychiatrist.

On the other hand, there are many situations in which the surgeon can and should deal with the emotional aspects of the patient's illness rather than resorting to psychiatric assistance. Most psychiatrists prefer not to be brought in to deal with minor anxiety states. As long as the surgeon accepts the responsibility for the care of the whole patient, such services are superfluous.

This is particularly true in the care of patients with malignant disease or those who must undergo mutilating operations such as amputation of an extremity, ileostomy, or colostomy. In these situations, the patient can be supported far more effectively by the surgeon and the surgical team than by a consulting psychiatrist.

Surgeons are becoming increasingly more aware of the importance of psychosocial factors in surgical convalescence. Recovery from a major operation is greatly enhanced if the patient is not worn down with worry about emotional, social, and economic problems that have nothing to do with the illness itself. Incorporation of these factors into the record contributes to better total care of the surgical patient.

## **THE PHYSICAL EXAMINATION**

The complete examination of the surgical patient includes the physical examination, certain special procedures such as gastroscopy and esophagoscopy, laboratory tests, x-ray examination, and follow-up examination. In some cases, all of these may be necessary; in others, special examinations and laboratory tests can be kept to minimum. It is just as poor practice to insist on unnecessary thoroughness as it is to overlook procedures that may contribute

to the diagnosis. Painful, inconvenient, and costly procedures should not be ordered unless there is a reasonable chance that the information gained will be useful in making clinical decisions.

## **THE ELECTIVE PHYSICAL EXAMINATION**

The elective physical examination should be done in an orderly and detailed fashion. One should acquire the habit of performing a complete examination in exactly the same sequence, so that no step is omitted. When the routine must be modified, as in an emergency, the examiner recalls without conscious effort what must be done to complete the examination later. The regular performance of complete examinations has the added advantage of familiarizing the beginner with what is normal so that what is abnormal can be more readily recognized.

All patients are sensitive and somewhat embarrassed at being examined. It is both courteous and clinically useful to put the patient at ease. The examining room and table should be comfortable, and drapes should be used if the patient is required to strip for the examination. Most patients will relax if they are allowed to talk a bit during the examination, which is another reason for taking the past history while the examination is being done.

A useful rule is to first observe the patient's general physique and habitus and then to carefully inspect the hands. Many systemic diseases show themselves in the hands (cirrhosis of the liver, hyperthyroidism, Raynaud's disease, pulmonary insufficiency, heart disease, and nutritional disorders).

Details of the examination cannot be included here. The beginner is urged to consult special texts.

Inspection, palpation, and auscultation are the time-honored essential steps in appraising both the normal and the abnormal. Comparison of the two sides of

the body often suggests a specific abnormality. The slight droop of one eyelid characteristic of Horner's syndrome can only be recognized by careful comparison with the opposite side. Inspection of the female breasts, particularly as the patient raises and lowers her arms, will often reveal slight dimpling indicative of an infiltrating carcinoma barely detectable on palpation.

Successful palpation requires skill and gentleness. Spasm, tension, and anxiety caused by painful examination procedures may make an adequate examination almost impossible, particularly in children.

Another important feature of palpation is the laying on of hands that has been called part of the ministry of medicine. A disappointed and critical patient often will say of a doctor, "He hardly touched me." Careful, precise, and gentle palpation not only gives the physician the information being sought but also inspires confidence and trust.

When examining for areas of tenderness, it may be necessary to use only one finger in order to precisely localize the extent of the tenderness. This is of particular importance in examination of the acute abdomen.

Auscultation, once thought to be the exclusive province of the physician, is now more important in surgery than it is in medicine. Radiologic examinations, including cardiac catheterization, have relegated auscultation of the heart and lungs to the status of preliminary scanning procedures in medicine. In surgery, however, auscultation of the abdomen and peripheral vessels has become absolutely essential. The nature of ileus and the presence of a variety of vascular lesions are revealed by auscultation. Bizarre abdominal pain in a young woman can easily be ascribed to hysteria or anxiety on the basis of a negative physical examination and x-rays of the gastrointestinal tract. Auscultation of the epigastrium, however, may reveal a murmur due to obstruction of the celiac artery.

## **Examination of the Body Orifices**

Complete examination of the ears, mouth, rectum, and pelvis is accepted as part of a complete examination. Palpation of the mouth and tongue is as essential as inspection. Inspection of the rectum with a sigmoidoscope is now regarded as part of a complete physical examination. Every surgeon should acquire familiarity with the use of the ophthalmoscope and sigmoidoscope and should use them regularly in doing complete physical examinations.

## **THE EMERGENCY PHYSICAL EXAMINATION**

In an emergency, the routine of the physical examination must be altered to fit the circumstances. The history may be limited to a single sentence, or there may be no history if the patient is unconscious and there are no other informants. Although the details of an accident or injury may be very useful in the total appraisal of the patient, they must be left for later consideration. The primary considerations are the following: Is the patient breathing? Is the airway open? Is there a palpable pulse? Is the heart beating? Is massive bleeding occurring?

If the patient is not breathing, airway obstruction must be ruled out by thrusting the fingers into the mouth and pulling the tongue forward. If the patient is unconscious, the respiratory tract should be intubated and mouth-to-mouth respiration started. If there is no pulse or heartbeat, start cardiac resuscitation.

Serious external loss of blood from an extremity can be controlled by elevation and pressure. Tourniquets are rarely required.

Every victim of major blunt trauma should be suspected of having a vertebral injury capable of causing damage to the spinal cord unless rough handling is avoided.

Some injuries are so life-threatening that action must be taken before even a limited physical examination is done. Penetrating

wounds of the heart, large open sucking wounds of the chest, massive crush injuries with flail chest, and massive external bleeding all require emergency treatment before any further examination can be done.

In most emergencies, however, after it has been established that the airway is open, the heart is beating, and there is no massive external hemorrhage and after antishock measures have been instituted, if necessary, a rapid survey examination must be done. Failure to perform such an examination can lead to serious mistakes in the care of the patient. It takes no more than 2 or 3 minutes to carefully examine the head, thorax, abdomen, extremities, genitalia (particularly in females), and back. If cervical cord damage has been ruled out, it is essential to turn the injured patient and carefully inspect the back, buttocks, and perineum.

Tension pneumothorax and cardiac tamponade may easily be overlooked if there are multiple injuries.

Upon completion of the survey examination, control of pain, splinting of fractured limbs, suturing of lacerations, and other types of emergency treatment can be started.

## **LABORATORY & OTHER EXAMINATIONS**

Laboratory examinations in surgical patients have the following objectives: (1) screening for asymptomatic disease that may affect the surgical result (e.g., unsuspected anemia or diabetes); (2) appraisal of diseases that may contraindicate elective surgery or require treatment before surgery (e.g., diabetes, heart failure); (3) diagnosis of disorders that require surgery (e.g., hyperparathyroidism, pheochromocytoma); and (4) evaluation of the nature and extent of metabolic or septic complications.

Patients undergoing major surgery, even though they seem to be in excellent health except for their surgical disease,

should have a complete blood and urine examination. A history of renal, hepatic, or heart disease requires detailed studies. Latent, asymptomatic renal insufficiency may be missed, since many patients with chronic renal disease have varying degrees of nitrogen retention without proteinuria. A fixed urine specific gravity is easily overlooked, and preoperative determination of the blood urea nitrogen and creatinine is frequently required. Patients who have had hepatitis may have no jaundice but may have severe hepatic insufficiency that can be precipitated into acute failure by blood loss or shock.

Medical consultation is frequently required in the total preoperative appraisal of the surgical patient, and there is no more rewarding experience than the thorough evaluation of a patient with heart disease or gastrointestinal disease by a physician and a surgeon working together. It is essential, however, that the surgeon not become totally dependent upon a medical consultant for the preoperative evaluation and management of the patient. The total management must be the surgeon's responsibility and is not to be delegated. Moreover, the surgeon is the only one with the experience and background to interpret the meaning of laboratory tests in the light of other features of the case—particularly the history and physical findings.

## **Imaging Studies**

Modern patient care calls for a variety of critical radiological examinations. The closest cooperation between the radiologist and the surgeon is essential if serious mistakes are to be avoided. This means that the surgeon must not refer the patient to the radiologist, requesting a particular examination, without providing an adequate account of the history and physical findings. Particularly in emergency situations, review of the films and consultation are needed.

When the radiological diagnosis is not

definitive, the examinations must be repeated in the light of the history and physical examination. Despite the great accuracy of x-ray diagnosis, a negative gastrointestinal study still does not exclude either ulcer or a neoplasm; particularly in the right colon, small lesions are easily overlooked. At times, the history and physical findings are so clearly diagnostic that operation is justifiable despite negative imaging studies.

### **Special Examinations**

Special examinations such as cystoscopy, gastroscopy, esophagoscopy, colonoscopy, angiography, and bronchoscopy are often required in the diagnostic appraisal of surgical disorders. The surgeon must be familiar with the indications and limitations of these procedures and be prepared to consult with colleagues in medicine and the surgical specialties as required.

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## 2 Fluid & Electrolyte Management

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The surgical patient is liable to develop numerous disorders of body fluid volume and composition and volume of the body fluids and the principles of fluid and electrolyte therapy is therefore essential for patient management.

### VOLUME DISORDERS

#### Recognition & Treatment of Volume Depletion

Since volume depletion is common in surgical patients, a general approach to the diagnosis and treatment of volume depletion should be developed and applied to each patient systematically. The clinical manifestations of volume depletion are low blood pressure, narrow pulse pressure, tachycardia, poor skin turgor, and dry mucous membranes. The history may suggest the reason for volume depletion. Records of intake and output, changes in body weight, urine specific gravity, and analysis of the chemical composition of the urine should confirm the clinical impression and be useful when a treatment plan is being devised. Therapy must aim to correct the volume deficit and associated aberrations in electrolyte concentrations.

#### Volume Depletion

The simplest form of volume depletion is water deficit without accompanying solute deficit. However, in surgical patients, water and solute deficits more often occur together. Pure water deficits occur in patients who are unable to regulate intake. They may be debilitated or comatose or may have increased insensible water loss from fever.

Patients given tube feedings without adequate water supplementation and those with diabetes insipidus may also develop this syndrome. Pure water deficit is reflected biochemically by hypernatremia; the magnitude of the deficit can be estimated from the  $P_{Na}$ .

Associated findings are an increase in the plasma osmolality, concentrated urine, and a low urine sodium concentration ( $<15$  meq/L) despite hypernatremia. The clinical manifestations are chiefly caused by hypernatremia, which can depress the central nervous system, resulting in lethargy or coma. Muscle rigidity, tremors, spasticity, and seizures may occur. Since many patients suffering from water deficit have primary neurological disease, it is often difficult to tell if the symptoms were caused by hypernatremia or by the underlying disease.

Treatment involves replacement of enough water to restore the plasma sodium ( $P_{Na}$ ) concentration to normal. The excess sodium for which water must be provided can be estimated from the following expression:

$$\Delta Na = (140 - P_{Na}) \times TBW \dots (1)$$

The  $\Delta Na$  represses the total milliequivalents of sodium in excess of water. Divide  $\Delta Na$  by 140 to obtain the amount of water required to return the serum sodium concentration to 140 meq/L. Because of the dehydration, an estimate of total body water (TBW) should be used that is somewhat lower than the normal values. In addition to correction of the existing water deficit, ongoing obligatory water



losses (due to diabetes insipidus, fever, etc) must be satisfied. Treat the patient with 5% dextrose in water unless hypotension has developed, in which case hypotonic saline should be used. Rarely, isotonic saline may be indicated to treat shock due to dehydration even though the patient is hypernatremic.

### **Volume & Electrolyte Depletion**

Combined water and electrolyte depletion may occur from gastrointestinal losses due to nasogastric suction, enteric fistulas, enterostomies, or diarrhea. Other causes are excessive diuretic therapy, adrenal insufficiency, profuse sweating, burns, and body fluid sequestration following trauma or surgery. Diagnose is of combined volume and electrolyte deficiency can be made from the history, physical signs, and records of intake and output. The clinical findings are similar to those of pure volume depletion. However, the urine  $\text{Na}^+$  concentration is often less than 10 meq/L, a manifestation of renal sodium conservation resulting from the action of aldosterone on the renal tubule. The urine is usually hypertonic ( $\text{spgr} > 1.020$ ), with an osmolality greater than 450–500 mosm/kg. The decreased blood urea nitrogen (BUN) and serum creatinine. Prerenal azotemia is characterized by a disproportionate rise of BUN compared to creatinine; the normal BUN/creatinine ratio of 10 : 1 is exceeded and may go as high as 20–25 : 1. This relationship helps differentiate prerenal azotemia from acute tubular necrosis, in which the BUN/creatinine ratio remains close to normal as the serum levels of both substances rise.

Combined water–electrolyte deficits are corrected by restoring volume and the deficient electrolytes. The magnitude of the volume deficit can be estimated by serial measurements of body weight, since acute changes in body weight primarily reflect changes in body fluid. Central venous or pulmonary artery pressure may be low in blood volume deficits and may be useful

for monitoring replacement therapy.

The composition of the replacement fluid should take into account the plasma sodium concentration: if the  $P_{\text{Na}}$  is normal, fluid and electrolyte losses are probably isotonic, and the replacement fluid should be isotonic saline or its equivalent. Hyponatremia may result from salt loss exceeding water loss (i.e., the decrease in  $\text{Na}^+$  will be greater than the decrease in TBW) or from previous administration of hypotonic solutions. In this situation, the magnitude of the salt deficit can be calculated from equation (1).

Replacement therapy should be planned in two steps: (1) the sodium deficit should be calculated, and (2) the volume deficit should be estimated from clinical signs and changes in body weight. From these calculations, a hypothetical replacement solution can be devised in which the sodium deficit is administered as NaCl and the volume deficit as isotonic NaCl solution. Then administer isotonic NaCl solutions containing appropriate amounts of additional NaCl and monitor the patient's response (i.e., urine volume and composition, serum electrolytes, and clinical signs). When replacement is adequate, renal function and serum  $\text{Na}^+$  and  $\text{Cl}^-$  concentrations will return to normal.

### **Volume Overload**

Hormonal and circulatory responses to surgery result in postoperative conservation of sodium and water by the kidney that is independent of the status of the ECF volume. Antidiuretic hormone, released during anesthesia and surgical stress, promotes water conservation by the kidneys. Renal vasoconstriction and increased aldosterone activity reduce sodium excretion. Consequently, if fluid intake is excessive in the immediate postoperative period, circulatory overload may occur. The tendency for water retention may be exaggerated if heart failure, liver disease,