tension is probably due to a sudden decrease in systemic levels of circulating renin.

The radiologist is also in a unique position to participate in the management of many of the clinical problems encountered by the biliary surgeon. "Skinny-needle" techniques coupled with fluoroscopy and radiography provide an anatomic overview that is often superior even to direct surgical exposure. The intrahepatic and extrahepatic biliary ducts are well visualized despite adhesions from previous surgery, diffuse tumor encasement, or marked obesity. Percutaneous access to the biliary tree for interventional purposes has existed for many years through surgically created drainage tracts. More recently, several reports have documented the feasibility of introducing catheters directly into the intrahepatic ducts through a percutaneous transhepatic approach.[8] These catheters can be manipulated through the biliary tract to provide nonsurgical solutions to many clinical problems. In addition, preoperative instrumentation by the radiologist can improve the patient's condition and facilitate subsequent surgery. Similar procedures are being performed in the urinary tract, and percutaneous nephrostomies, transrenal ureteral catheterization, and drainage procedures are now becoming commonplace.

All these developments have provided the radiologist with an exciting opportunity to participate actively in patient management. It is not at all uncommon today to see diagnostic radiologists making rounds, answering clinical consultations, and seeing patients in follow-up visits. This expanded role has led to a rethinking of the type of training most suitable for this kind of radiologic practice. The more clinical experience trainees have before starting a radiology residency, the better they seem to do. This observation is probably one of the factors that prompted the American Board of Radiology to change its present requirements for board certification. Starting in 1983, one of the prerequisites for residents starting training programs will be satisfactory completion of a clinical internship.

Newer therapeutic procedures require a combination of sophisticated and expensive x-ray equipment and the type of room and support facilities generally reserved for operating suites. This service must also be available around the clock, seven days a week. In our present era of rising health costs, it is satisfying to be able to propose a new program that is so clearly cost effective. It would be difficult to argue that the patient who leaves the hospital 24 hours after successful transluminal angioplasty for iliac stenosis was not treated in a more cost-effective way than the patient who required a seven- to 10-day hospitalization after a surgical bypass. This difference is even more meaningful when one considers that, so far, follow-up patency rates for iliac and femoral dilatations are approximately the same as those for patients treated surgically by endarterectomy or bypass.[9] At the Hospital of the University of Pennsylvania last year, we performed over 400 noncardiac, interventional radiographic procedures. These procedures included transluminal angioplasty, therapeutic embolization for tumor or bleeding therapy, vasopressin infusions for gastrointestinal bleeding, biliary drainage, removal of biliary stones, percutaneous nephrostomies, and ureteral drainage. It is important to point out to the critics of our health-care system that not all technical advances made by the medical profession necessarily lead to more expense.

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FOOD ALLERGY — MATERIAL AND ETHEREAL

THE subject of food allergy is usually referred to as confusing and controversial. Confusion among professionals and the public can be traced in part to lack of a rational integration of existing knowledge with basic concepts that could aid in the care of patients with suspected adverse reactions to foods. Food and eating occupy such a prominent position in our psychosocial world that they are only too readily blamed for our most ethereal woes. More confusion than relief has come from claims spread through the mass media that a staggering array of symptoms can frequently be ascribed to foodstuffs — claims unsupported by objective, scientific observations.

There has been a resurgence of scientific investigation into adverse reactions to foods, and an orderly, rational, practical approach to clinical management is at hand.[1] A few simple concepts have been most helpful: first of all, there is a need to maintain the distinction between immunologic and other adverse reactions to foods; secondly, scientific procedures must be followed in all investigations of reactions to food, with insistence that correlations be made between accurate laboratory determinations and precise clinical appraisals; and, finally, it must be recognized that the appearance of symptoms depends on the quantitative aspects of the stimulus-response relation.

Several categories of adverse reactions to foods — immunologic, toxic (biochemical), and psychologic — may lead to gastrointestinal, respiratory, cutaneous, and perhaps neurologic complaints. It is essential to realize that the reactions occur in human beings and are therefore enmeshed in the interplay between body, mind, and soul. One could not expect to distinguish the less flagrant, truly physical reactions from imaginary phenomena without the scientific use of a double-blind food challenge to eliminate the effects of bias on the part of both physicians and patients about the relation of foods to symptoms. Only through experience with blind food challenges can the amazing power of self-deception be appreciated — only about one fourth of histories of adverse reactions can be confirmed, the remainder being psychologic or imaginary.[2]

Once psychologic reactions have been identified through the lack of consistent responses to double-blind food challenges, differential diagnosis of other adverse reactions can proceed according to customary medical methods. To distinguish immunologic from toxic (biochemical) reactions may be especially difficult. Components of foods beneficial to many people are not tolerated by a relative few: the aminoacidurias and carbohydrate intolerances due to enzyme deficiencies are prime examples. Many other substances that occur naturally as constituents of foods or commonly accompany foods as contaminants or additives may, in sufficient amounts, be antigenic or toxic in human beings.

An excellent example of scientific investigation of an adverse reaction to a foodstuff is provided in the report by Moroz and Yang in this issue of the *Journal*. Thorough investigation revealed that an enzyme occurring naturally in soybeans had served as an antigen for immunologic sensitization and was the basis of anaphylactic reactions. This study also illustrates the principle that an adverse reaction should not be considered immunologic in nature until evidence for immunologic sensitivity is provided. Widespread failure to observe this principle, lack of precise appraisal of suspected reactions by means of blind challenge, and application of the term "allergy" to every suspicion of reaction to a food have rendered the term nearly useless; "food sensitivity" might be reserved to designate immunologic reactions to food.

When antigenic material from a foodstuff penetrates the intestinal mucosa of an immunologically competent person, sensitization will develop through stimulation of antibody production or altered cell reactivity. On subsequent ingestion of the specific antigen responsible for sensitization, a complex series of events must occur before clinical manifestations can be observed. These include escape of antigenically intact material from digestion, penetration of the mucosa by the material to encounter antibody or reactive cells and evoke responses in the form of mediator release, cell damage or proliferation, and, finally, the effects of these responses on end organs that give rise to observable clinical manifestations.

In this chain of events, each step depends on the responses in the preceding steps for its stimulation. If the quantitative aspect of the stimulus-response relation is kept in mind, puzzlement over discrepancies between the evidence for immunologic sensitization and the clinical response to food challenge will cease. For clinically important, symptomatic responses to the ingestion of food to appear in a specifically sensitized person, enough antigenically intact material must penetrate the mucosa and react with antibodies or cells. This reaction must be sufficient to cause a cellular response or release of mediators to a degree that evokes end-organ responses that can be recognized clinically. If, in a sensitized person, the stimulus at each step in the chain of events is not great enough to result in an observable response in the body, no symptoms appear, and a state of asymptomatic, clinically unimportant sensitization exists.

The crucial consideration is therefore whether a high degree of sensitization is present — as revealed, for example, by marked wheal reactions to small amounts of antigenic materials injected into the skin. The stimulus provided by ingestion of antigen in persons with lesser degrees of sensitization is unlikely to yield successive responses sufficient to produce symptoms.

With consistent application of scientific procedures, the true nature of symptoms that are largely subjective or bizarre may some day be ascertained. In this way, the present confusion generated among the public and the profession by unscientific enthusiasts concerning the relation of foodstuffs to hyperactivity, "tension-fatigue," and so on may be overcome. Unless this requirement is met, no claims about reactions due to foodstuffs, contaminants, or additives can be accepted.

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VITAMIN D AND CALCIUM HORMONES IN PREGNANCY

THERE is no time of life, and there are few diseases, in which such massive shifts in calcium occur so regularly as during pregnancy. Fetal bone formation demands that 25 to 30 g of calcium be deposited in the fetal skeleton, almost all of it during the second half of gestation. To prepare for this process and for the losses of calcium that occur with lactation, maternal calcium accretion begins early in pregnancy. Well before the major fetal ossification of late pregnancy, intestinal absorption of calcium is enhanced in the