Drug-induced esophageal damage (DIED) is far more common than one would suspect from reports in the medical literature. The sequelae of this injury are poorly understood by many physicians. Fortunately, some patients recognize the etiologic or chronologic relationship of their esophageal symptoms to drugs they are taking and either stop the drug or alter the dosing schedule.

Diagnosis. Patients with DIED most often present with mid-chest pain (61-72%). The pain is usually continuous and may increase when further doses of the offending drug, food or fluid are taken. Odynophagia (painful swallowing), the next most common symptom, is found in 50-74%. In some cases, it is incapacitating and prevents the patient from taking an adequate diet. This symptom is more often due to antibiotics, non-steroidal anti-inflammatory drugs or Fosamax than to potassium chloride or quinidine. Dysphagia (difficult swallowing), reported in 20-40% of cases of DIED, usually indicates severe inflammation or stricture formation and as a common presenting complaint, is most often found in patients with injury by potassium chloride or quinidine.

Symptoms of chest pain and odynophagia can develop within hours up to ten days after starting medication depending on predisposing conditions.

In nearly all cases, the diagnosis of DIED can be suspected based on the history. Presenting symptoms and medication history are the major clues. When the clinician combines the information on sex, age, disorders that may predispose to DIED, the medications taken and the details of the patient's method of taking the medication, a prompt, accurate diagnosis is made.

Dysphagia, odynophagia or esophageal chest pain that occur in association with other conditions should provoke the physician's suspicion of a drug-related esophageal problem. Typical examples would be: 1) the adolescent with acne or the adult with chronic obstructive pulmonary disease (emphysema) who most likely suffer from doxycycline injury; 2) a female with bladder infection and symptoms of DIED likely would be taking an antibiotic; 3) the patient with heart disease will be exposed to potassium chloride, quinidine or a beta-blocker; 4) esophageal injury; and 5) the patient with arthritis or musculoskeletal pain probably has been treated with NSAIDs (drugs such as ibuprofen, non-steroidal anti-inflammatory drugs).

Carlborg has made the interesting observation that patients who frequently complain of hang up of pills are not prone to retain pills in the esophagus more often than normal persons. He believes they simply are likely to be more able to sense delayed transit. It appears that these persons have less risk for retention of drugs in the esophagus because of their habit of regularly using large amounts of liquid when taking medications to avoid the sticking sensation.

Barium contrast x-ray (barium swallow) using double contrast technique usually is positive in patients with dysphagia secondary to DIED. The barium esophagram also is helpful to evaluate for extrinsic compression of the esophagus that may be contributing to the DIED but is not readily detected by endoscopy.

Fiberoptic esophagoscopy is the technique par excellence for detecting esophageal mucosal injury and clarifying the differential diagnosis by direct inspection, biopsy, cytology and microbiological studies as indicated. In one report, endoscopy has been found abnormal in 99% (135 of 136) of patients with DIED in whom it was performed. When indicated, it is best done as soon as possible after the onset of symptoms. Early endoscopy not only insures that mucosal lesions will be found but may also provide other helpful clues such as identifiable intact pills or residue. The usual findings are discrete erosions or ulcerations from pinpoint size to circumferential lesions up to 6 cm in length. Focal ulcerations or erosions without stenosis typically are caused by antibiotics and NSAIDs.

Endoscopy is not considered indicated in every patient, especially when the history and chronology of an acute syndrome of retrosternal pain and odynophagia correlate with the ingested drug. The best treatment is removal of the offending drug and supportive care. Parenteral (injectable) or liquid oral pain relievers may be required for a short time. There is no proof that any therapy other than removing the causative drug plays an active role in the recovery process.

DIED must be considered preventable in most cases if adequate patient and physician education can be accomplished. The public should be educated since they risk injury from self-medicating their ailments as well as from drugs prescribed by physicians. Nursing personnel and nursing attendants in hospitals and nursing homes must somehow be reached with warnings about DIED. Simple instructions and a bit of common sense are all that are needed if everyone is aware of the dangers of drug-induced esophageal damage.

Guidelines for prevention of DIED should include the following:

1. All oral medications should be taken in the upright position whenever possible.
2. The person should remain upright at least 10-15 minutes after swallowing, to allow gravity to assist passage of tablets or capsule.
3. At least 100 ml of fluid should be taken after each tablet or capsule.
4. Special warnings should be stressed to all persons with neuromotor or obstructing lesions of the esophagus and in those (continued)
with cardiomegaly or other forms of extrinsic compression.
5. When the possibility of delayed passage of tablets or capsules through the esophagus exists, due to motility dysfunction, an obstructing lesion or required recumbency, medications should be in liquid form or crushed and dispersed in adequate volumes of fluid whenever possible.
6. Special caution is required when prescribing potassium chloride in solid form, especially wax-matrix, slow-release, and for the 12 mm diameter "megapill" of quinidine gluconate (quinaglute).
7. Drug manufacturers should heed the advice that small oval tablets are best and if large tablets are needed, these should be oval, not round. Also capsules of high density (weight) are easier to swallow than lighter ones.
8. Only physician awareness, education of the population of the world, pharmaceutical success in producing safer formulations and patient compliance with the simple guidelines listed above are likely to ultimately reduce the frequency of drug-induced esophageal damage.

In any event, less rather than more drugs should always be the goal of the therapist. The risks of drug therapy must be balanced against the risks of the disease they are used to treat.

ESOPHAGEAL MANOMETRY STUDY
Umesh Choudhry, M.D.

Esophageal manometry (the study of esophageal motility), is a test used to detect disorders of motor (muscle and nerve) function of the esophagus. Once identified, some of these disorders can be successfully treated resulting in alleviation of disabling symptoms. These problems commonly present in the form of difficulty in swallowing both solid and liquid food material. They are often slowly progressive, coming to the notice of the physicians months or years after development of symptoms. Patients often relate to having had some degree of slowly progressing difficulty swallowing for long periods and seeking help only when symptoms become disabling or embarrassing. Some patients have never known "normal swallowing", while others ascribe these problems to advancing age. Although esophageal motility disorders are more common in the elderly, aging per se does not necessarily result in poor esophageal motility.

Another common reason for which physicians or surgeons request esophageal manometry study is as a part of pre-operative workup of gastroesophageal reflux disease (GERD). This is done to rule out disorders of esophageal function which may either interfere with a good outcome or complicate such a surgery. The test is often done in conjunction with a 24 hour pH testing, a test which documents the occurrence/severity of acid reflux. Manometry testing in fact enables us to perform pH testing in a more accurate manner because of the additional information it provides about the location of the sphincter muscle or valve (LES) at the lower end of the esophagus.

The procedure is very safe, done on an outpatient basis, and takes 30-40 minutes to perform. The Center for Swallowing Disorders has been performing this test for the past 10 years with exceptional attention to quality and detail. To obtain the best results the test needs to be done with the patient awake. However, local anesthesia in the form of spray or numbing gel application to the back of the throat may be provided. The test is scheduled in advance, explicit verbal and written instructions about stopping the medications that might affect the test results are provided by our Patient Care Coordinators. It requires the patient to present with an empty stomach to motility lab located in the E zone of the USF Medical Clinics at the assigned time. The patient is not required to bring an escort unless stated.

The test itself consists of passing a very thin plastic tube through the mouth or nose into the esophagus (food pipe). The tube can cause some degree of gagging which may be minimized with the help of a spray and by concentrating on breathing and paying attention to the instructions of the physician and the assisting nurse. The test does not interfere with breathing and is successfully completed by most of the patients, even the most serious "gaggers". The physician and the nurse are trained to be very encouraging, supportive and caring. The test is very easy after the tube is passed beyond the pharynx (throat) and once the patient concentrates on breathing. The patient is then asked to lie down on the right side and the tube is then slowly withdrawn. The patient is asked to swallow saliva (dry swallow) or take a measured sip of water from a syringe held to lips by the nurse. Several such swallows (wet swallows) are performed during the study. The contraction and relaxation of the muscles of the esophagus as a result of these swallows is recorded on a moving graph paper. The recording is then analyzed by the physician and diagnosis of the esophageal disorders made. A judgement of the presence or absence of peristalsis (normal motility pattern of the esophagus), its strength, any other coexisting problems and the coordination of the upper and lower sphincters (valve) muscles during swallowing is then made. After the successful completion of the test the patient is given brief, simple to understand, information about the test results. Preliminary results may be verbally conveyed to the referring physician and a formal report is mailed in about a week.
EFFECTS OF AGING ON SWALLOWING
Joy E. Gaziano, M.A., CCC/SLP

Although the aging process can cause changes in the structure and function of many organs, there is limited evidence to suggest that the aging process alone causes oropharyngeal swallowing dysfunction. Granieri (1990) categorizes three types of aging effects on swallowing ability. Primary effects of aging are those which are thought to be a result of aging alone. Secondary effects of aging are due to disease states which frequently affect the elderly and can cause difficulty in swallowing (dysphagia). Tertiary effects of aging involve those changes which result from social psychological, or environmental factors.

While the prevalence of dysphagia in elderly nursing home populations may range from 30% to 50%, the incidence of dysphagia among all hospitalized patients ranges from 10% to 15%. The increased prevalence of dysphagia among older Americans has led us to believe that it is likely due more to co-existing diseases and the unique environmental, social, and psychological issues that they face.

There are some primary age-related changes with swallowing. Anatomical changes in the mouth may include wasting of the alveolar bone if teeth have been lost and ossification of the jaw which may lead to poorer chewing ability. Older people tend to position the food more posteriorly in the mouth and use more tongue movement to prepare the food for swallowing. In the pharyngeal phase of swallowing, anatomical changes include lowering of the larynx which stretches the muscles in the pharynx and reduced flow of secretions that bathe the vocal folds. Generally the swallow is slower as we age and there is a slight delay in the initiation of the swallow reflex. This delay can cause foods to pool in the pharynx before the swallow triggers. General reductions in taste and small鱿ld be added for you to call with billing questions. The number is 1-888-873-3627. This number is for calls originating in Florida and is only for billing questions and help with insurance authorizations.  

3. DILATIONS: For our patients who receive periodic esophageal dilations: Please try to anticipate and contact our office at least 2 to 3 weeks in advance of your need for dilation, if at all possible. We have been having to schedule return cases 3 to 4 weeks in advance due to our heavy patient load. We do not want any of you to suffer unnecessarily, so please help us with your appointment needs.

less hungry and therefore, not receive adequate nutrition. Tremendous challenge exists in the management of swallowing disorders in the senior adult population. While age itself does not lead one to experience swallowing problems, there are a multitude of factors which can be unique to this group that can combine to cause dysphagia. The variety of problems experienced underscores the importance of team management. Physicians experienced with geriatric medicine as well as specialists in gastroenterology, otolaryngology, neurology, radiology, and psychiatry (physical medicine and rehabilitation) can coordinate quality team care. Support personnel in speech pathology, occupational therapy, physical therapy, nursing, nutrition, social work, and community agencies may round out the team. Counseling and education of the patient and family members are critical in ensuring safe and adequate nutrition.

The USF Swallowing Center is only able to institute, conduct and expand its research and education activities by developing economic support from outside sources. Income generated from clinical practice is not sufficient to provide the fiscal support needed for both operating expenses as well as research and education programs. Consequently we are dependent upon private donations to conduct these important academic functions. Donations for research and education are deposited in, and invested by, the USF Foundation to generate interest income in perpetuity to support academic activities. This resource will assure funding for our medical faculty in future years to continue research to improve the methods for diagnosis and therapy of those who suffer from swallowing disorders.

We are grateful to all of our patients, friends and regional corporations for their generous contributions to establish an endowment and sustain our operation during its first ten years.

The University of South Florida Center for Swallowing Disorders recently has been designated beneficiary of another major donation to our endowment fund by Joy M. Culverhouse. Her generous gift will provide significant support of our goals for research and education that lead to improved patient care.

On the occasion of our tenth anniversary, the director and medical staff wish to express our sincere appreciation to all of our donors over these years for their continuing and generous support of both the USF Center for Swallowing Disorders and the University of South Florida.