nearly 1½ years has been seen in a patient treated by PRT for early squamous cell carcinoma recognized initially by sputum cytology. Further, carcinoma in situ and severe metaplasia also retain Hpd. As shown by Hayata and others, such lesions can be eradicated by PRT with very little trauma and few side effects. The challenge, of course, is to find such patients.

Earlier reports have demonstrated the use of Hpd fluorescence to localize early tumors of the bronchus. The combination of early localization by Hpd fluorescence and early eradication by PRT of both frank carcinoma and cases of severe metaplasia is potentially of considerable significance. In addition, the fluorescence can be helpful in identifying areas of tumor invasion even in patients with evident tumor in other areas.

Many questions regarding PRT remain to be answered, especially regarding long-term clinical results and technical questions related to light dosimetry and the possible contribution of heat during treatment to the overall effects. The interest of groups of clinicians, physicists, engineers, and chemists in these problems provides the hope that the answers will not be much longer in coming.

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The Rhythms of Aging
What New Do We Know from Holter Monitoring?

The history of ambulatory ECG monitoring exemplifies the tendency of medical science to apply a diagnostic test to populations of diseased or symptomatic persons prior to accumulating an adequate data bank on normal persons. The obstacles to compiling such a data bank are great. A "truly normal" population must be identified. Explicit in the identifying process is the ethical question: How extensively must we test a "presumably normal" person before we are satisfied that that person can be correctly classified as "certainly normal"? Brodsky and co-workers approached the problem by studying a group of male medical students, presumed normal because of their youth and sanctioned as certainly normal after only minimal noninvasive testing. That method, although expedient, provided results not necessarily applicable to the older population among whom most clinical diagnostic testing is performed.

In this issue of Chest (page 302), Fleg and Kennedy report a study that goes a long way toward quantifying the incidence of arrhythmias found in ambulatory ECG recordings from an asymptomatic "normal" population, but that still, understandably, falls short of an ideal population study. Fewer than half of their subjects had screening echocardiograms or thallium perfusion studies, although all had normal exercise ECGs. Also, included in the group were 12 subjects with supraventricular and eight with ventricular ectopic beats on resting ECGs. Although the appearance of supraventricular ectopic beats has been found to be innocuous, it must be questioned what effect on the study results the inclusion of those 12 subjects might have had. Ventricular ectopia on resting 12-lead ECGs of individuals free of clinically apparent organic heart disease may be associated with future cardiac events. The group with PVCs would probably best have been deleted from the study group.

Aside from the problem of defining a normal population, the attempt to gather diverse data by applying a "wide variety of noninvasive tests assessing pulmonary function, intelligence and personality, vision and hearing, basal metabolism and glucose tolerance" while recording the ambulatory ECGs may have placed a "presumably normal" population
into "certainly abnormal" circumstances. Lown et al\(^4\) have advocated that stress may be a potent arrhythmogenic agent, so that findings during such a testing period might reflect not a natural history, but an iatrogenic one.

Despite the methodologic problems, the authors supply some intriguing data. Both ventricular and supraventricular ectopic beats were common among their healthy, active subjects, aged 60 to 85 years, results similar to those from our laboratories, studying the same age group.\(^5\) In contrast, Kostis et al\(^6\) found a much lower incidence of simple and complex ventricular ectopic beats among 101 subjects with a mean age of 48.8 years, who had chest pain but normal results on physical examinations, chest x-ray films, resting ECGs, maximal exercise tests, echocardiograms, and right and left heart catheterization including coronary angiography. The disparity in incidence of arrhythmias between these study groups may be attributed to the presence of undetected heart disease in those volunteers not subjected to extensive invasive testing. Likely, too, is the influence of age on the results; arrhythmias increase in frequency with advancing age. Although these elements of patient selection might have contributed to the disparities in results, it seems unlikely that they could explain the total difference. The reasons for these discrepancies remain unresolved.

Regardless of these concerns, the bottom line is that ambulatory monitoring can only be meaningfully applied to symptomatic populations after systematic investigations of the occurrence and prognostic significance of major arrhythmias in asymptomatic persons have been reported. Extensive invasive, and even noninvasive evaluation of normal subjects will probably never be practical. Quantitative data will probably only be available after long-term follow-up studies of "presumably normal" subjects are completed.

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**Verapamil for Treatment of Supraventricular Tachyarrhythmias**

Intravenous (IV) verapamil has recently become available in the United States for treatment of supraventricular tachycardia. It will probably be available for oral administration in the near future. Verapamil, a coronary vasodilator, was originally introduced in Germany in 1962 as an anti-anginal agent, and has been used in Europe for more than 18 years for this purpose. More recently, studies from Europe and the United States have demonstrated that IV verapamil is an extremely effective agent for interruption of paroxysmal supraventricular tachycardia and for control of the ventricular rate during atrial fibrillation or flutter.\(^1\)\(^-\)\(^7\)

Verapamil is a slow channel blocker.\(^8\) The slow channel is responsible for the electrophysiologic properties of the sinus node and the A-V node and is mainly, although not entirely, calcium dependent. Consequently, verapamil is most effective for termination of tachycardias that incorporate the sinus node or A-V node within the tachycardia circuit.\(^1\) The ECG, the effect of physiologic maneuvers on the tachycardia, and if necessary intracardiac electrophysiologic studies can be used to define supraventricular tachycardia as: sinus node reentrant, atrial (automatic or reentrant), A-V nodal reentrant, and A-V reciprocating (tachycardia circuit usually incorporating the A-V node antegrade and a bypass tract retrograde). Intravenous verapamil will rapidly terminate 70 to 80 percent of episodes of sinus node reentrant, A-V node reentrant, and A-V reciprocating tachycardias.\(^1\)\(^-\)\(^4\) It is less likely to terminate atrial tachycardia but may result in a decrease in the ventricular response due to its A-V nodal blocking properties. Similarly, verapamil is associated with only a 10 to 15 percent incidence of termination of atrial fibrillation or flutter but usually results in a significant decrease in the ventricular rate due to A-V nodal blockade.\(^3\)\(^-\)\(^5\)

Verapamil is particularly attractive and may be useful for the treatment of supraventricular tachycardia in patients with chronic obstructive pulmonary disease since, unlike the \(β\)-blockers, it does...