the influence of α1-antitrypsin variants as determinants of COPD in smokers and to determine the tests necessary for detecting these variants. Then the cost effectiveness of more widespread application of measurements of α1-antitrypsin in selected populations can be addressed.

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REFERENCES

Test Your Lungs?

Public awareness that serious chronic disease may be present without symptoms has prompted widespread screening campaigns to identify occult abnormalities. This is particularly true in diabetics, where urine tests are offered, and in hypertension, where individuals are urged to “have their blood pressure checked” at work, at shopping centers, and while seeking medical care for other problems at hospitals, clinics, and physicians’ offices. A simple measurement of blood pressure takes only about a minute, is reassuring to the patient when normal, and offers a signal intended to lead to a further, more detailed evaluation if the results are abnormal. Most individuals today know the importance of blood pressure determinations, usually know the accepted normal systolic and diastolic readings, and have begun to recognize that hypertension is an important forerunner of major vascular disease. This has resulted in a healthy awareness of the importance of early identification and remedial therapy among increasing numbers of people.

Like hypertension, the spectrum of chronic pulmonary diseases looms as a major health problem in all industrialized countries. Most pulmonary scientists realize that both chronic obstructive and restrictive pulmonary disease may have a long, relatively asymptomatic or nearly symptom-free interval before sufficient impairment is present to cause the symptoms which result in the patient seeking medical evaluation and care; however, those of us who have spent considerable time studying and treating advanced disease, particularly advanced chronic obstructive pulmonary disease, recognize that although marked benefit can accrue from systematic management, advanced disease is progressive in the long term.

Wouldn’t it be better to diagnose disease earlier? Although the answer to this question is clearly not available in terms of studies that establish that the natural history of chronic obstructive pulmonary disease can be altered by management, some hints that functional benefit may be gained already exist in mild and even more advanced degrees of physiological disorder measured by conventional spirometric tests.1,2

Conventional clinical spirometry is certainly not suited for widespread use. Thus, a need for simple, accurate spirometers suitable for office and clinic use and, in fact, use in the field is clearly present. Waterless electronic spirometers of a variety of designs have recently been developed and marketed. They have been criticized as being inaccurate,3 but at least one device was found to be quite accurate when tested against a standard Collins water-sealed spirometer.4 Comparison of FVC, FEV1 and MVV (maximum voluntary ventilation) correlated well with simultaneous determinations on the Collins spirometer. The testing procedure might be criticized as a “load” to the flow transducer, but this is a small load and in individual subjects when clinical measurements were made separately on each device at one sitting, no statistically significant differences were present for FVC, FEV1, or MVV. Electronic spirometers must be carefully standardized, of course. A further criticism of electronic spirometers is that they offer a digital readout without a tracing to evaluate the patient’s effort or an opportunity to evaluate the full curve. This of course is true, but after all, we accept the blood pressure reading, no

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matter whether the cuff size is appropriate for the patient's arm and whether or not the observer can detect the point of diastolic pressure, and we even accept the fact that the physician, nurse, or technician might have incorrectly recorded systolic and diastolic readings! The point is that we accept rapid screening tests of reasonable accuracy in order to identify patients that may be at risk and that this approach has been valuable in improving health consciousness and, in fact, has ultimately led to improvement in care for patients with hypertension and other diseases.

Therefore, why not accept a spirometer of approximately ± 10 percent accuracy as a useful screening instrument? The devices available today can measure forced vital capacity (FVC), forced expiratory volume in one second (FEV₁), peak flow, and sometimes maximum midexpiratory flow and the useful FEV₁/FVC ratio in approximately one minute. If the tests are done in duplicate or triplicate with repeatable results, it is unlikely that the patient's effort is inadequate. If the results of the tests are normal, it is highly likely that the patient is normal. If the results of the tests are abnormal, certainly rechecking should be done by a more deliberate method in an established pulmonary function laboratory.

The argument has been offered that identifying patients early might only improve our knowledge of how long the disease exists before it becomes symptomatic and that knowledge of an abnormality may do the patient a disservice.² I cannot accept this argument in an enlightened country where medical scientists and the public alike are searching for improved methods of identification and treatment of disease. Only by finding patients early will we ever have the opportunity to affect behavioral changes regarding smoking habits or be able to treat them! If treatment is offered in a systematic fashion, we will ultimately learn whether early identification, behavior modification, and treatment are effective. We simply can't wait until all of the answers on the early natural history of all chronic pulmonary diseases are known and treatment is established in a controlled double-blind scientific way. Do you want to be the control? Test your lungs?

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References

Limitations in the Use of the Pulmonary Capillary Wedge Pressure

Cardiac Tamponade

The introduction of the Swan-Ganz flow-directed catheter in 1970 has been a major advance in the management of the hemodynamic status of the critically ill patient.¹ Evaluation of left ventricular filling pressure (pulmonary capillary wedge pressure) represents an improvement over central venous pressure because the central venous pressure may be an inaccurate representation of a patient's hemodynamic status in several clinical settings. These include acute and chronic pulmonary disease, right ventricular myocardial infarction (in the presence of diaphragmatic myocardial infarction), and left ventricular failure in the absence of right ventricular failure. Therefore, measurement of central venous pressure in the coronary care unit has been largely abandoned in favor of the pulmonary capillary wedge pressure.

Passage of the flow-directed catheter to the pulmonary artery and measurement of pulmonary capillary wedge pressure are easy, safe bedside procedures, but complications have been recognized.¹-³ These include arrhythmias, thromboembolism, pulmonary ischemia, hemoptysis, pulmonary hemorrhage, perforation of the pulmonary artery, intracardiac knotting of the catheter, local infection, and sepsis. There is another type of "complication" that has not yet been fully appreciated. This involves the one clinical situation where monitoring the central venous pressure provides information that is superior to that obtained by monitoring the pulmonary capillary wedge pressure, i.e., cardiac tamponade. The reason for this deserves reevaluation of the physiologic principles underlying the assessment of right or left ventricular function, or both, and how these relate to restrictive heart disease.

When one wishes to evaluate left ventricular function, an index of left ventricular filling pressure (pulmonary capillary wedge pressure) must be measured. The same may be said for right ventricu-