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. 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. 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. 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-
infarction. Following instrumentation, volume loading is generally recommended when left ventricular filling pressure is suboptimal. The goal of therapy is to improve a low cardiac output by allowing the patient to operate at the apex of his curve of left ventricular function.

Cardiac tamponade represents a very different physiologic state. When one is monitoring the patient in danger of tamponade, it is the right ventricular filling pressure that exhibits the most gain. In Figure 1, it will be noted that the change that will occur from the upper limit of the range of right ventricular filling pressure (central venous pressure) to cardiac tamponade pressure is quite large (points 5 to 6). If one were monitoring left ventricular filling pressure (pulmonary capillary wedge pressure), the expected change from its upper limit to tamponade pressure (points 7 to 8) would be considerably less. Thus, when one wishes to serially evaluate a patient for the development of cardiac tamponade, the larger gain obtained by monitoring right ventricular filling pressure as reflected in the central venous pressure is a much more sensitive parameter to follow than the pulmonary capillary wedge pressure (certain multiluminal flow-directed catheters allow the simultaneous measurement of both pulmonary capillary wedge pressure and right atrial pressure).

In conclusion, catheterization of the pulmonary artery with flow-directed catheters and the measurement of pulmonary capillary wedge pressure has revolutionized the hemodynamic evaluation of the critically ill patient; however, cardiac tamponade represents one situation when central venous pressure or right atrial pressure affords a much better parameter for the continued observation of restrictive physiology. Further, it is recommended that the clinician continuously record catheter luminal pressure while passing the flow-directed catheter through the cardiac chambers. Constrictive pericarditis or cardiac tamponade, if present, will be immediately recognized by the finding of elevated and near-equal right atrial and pulmonary capillary wedge pressures. Unless such a procedure is employed, the diagnosis of restrictive physiology may not be made in the situation where it is not clinically apparent.

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Social Integration in Birds

One personality trait in birds that has been investigated to some extent is aggressiveness. In a group of given species one member tends to be dominant over the rest; another is second in rank and so on down the line. At the feeder Number One eats first and then the others follow in turn. Peck order can be observed and studied conveniently with birds in a laboratory or aviary or even in a poultry yard. The peck order is typically in a straight line A-B-C-D. A dominates all others. B is subordinate to A but dominates C and D. Occasionally we find a triangular arrangement where A dominates B and B dominates C, but C dominates A. We also find families arranged in a peck order with other families. This was the case with Canada geese and with Oregon junco families. Individual differences in aggressiveness doubtless underlie much of this. There may be even a glandular basis because hormones influence emotional disposition as was shown when starlings were injected with a certain pituitary hormone. Other things besides personality influence a bird’s rank. In poultry, the size of the comb and wattles, and even the bird’s weight, affect his dominance. When comb and wattles were removed surgically, the bird assumed a lower rank.