physical activity (30- to 45-min brisk walk most days), moderation in sodium intake (100 mmol/day), and increase in potassium intake (90 mmol/day). Tobacco avoidance and aggressive treatment of diabetes mellitus and lipid disorders are most important for overall cardiovascular risk reduction.

Drug therapy is discussed in detail: once-a-day drugs are advised, combinations are useful, and special consideration is given to many comorbid conditions and drugs that affect therapeutic decisions. Managed care programs have an important role in coordinating approaches to care, using various health-care professionals and appropriate frequency of visits, patient counseling, and controlled formularies while monitoring outcomes (eg, blood pressure levels, adherence to therapy, morbidity and mortality, resource utilization). Hypertension experts can provide guidance and counseling, particularly for patients with secondary hypertension, resistance to treatment, and complex comorbid conditions.

When the decision has been made to start drug therapy for uncomplicated primary hypertension, in the absence of contraindications, diuretics and β-blockers should be chosen because numerous RCTs have shown a reduction in morbidity and mortality with these agents. There are additional, compelling indications for these and other antihypertensive drugs in certain conditions based on RCTs results. In patients with diabetes type I with proteinuria, angiotensin-converting enzyme (ACE) I agents are indicated; in heart failure, ACE I and diuretics; in myocardial infarction, β-blockers (nonintrinsic sympathomimetic activity) and ACE I (with systolic dysfunction). For the treatment of hypertension in older persons, diuretics are preferred, and in those with isolated systolic hypertension, a long-acting dihydropyridine calcium antagonist can also be considered. In other clinical situations where there are not yet sufficient outcomes data, the choice of therapy should be individualized based on the patient’s needs. Specific therapies for persons with left ventricular hypertrophy, coronary artery disease, heart failure, pulmonary disorders, pregnancy, and renal insufficiency are described. The choices of drugs in the management of hypertensive emergencies and urgencies include the newer intravenous vasodilators, nicardipine and fenoldopam.

These national guidelines must be adapted and implemented in local and individual situations. Widespread application of the recommendations contained in the report should improve detection, treatment, control, and prevention of hypertension. Further reductions in stroke and coronary disease can be anticipated, and attenuation in end-stage renal disease and heart failure is expected as the NHBPEP looks toward the next 25 years.

Sheldon G. Sheps, MD, FCCP
Rochester, Minnesota
Richard A. Dart, MD, FCCP
Marshfield, Wisconsin

Dr. Sheps is Emeritus Professor of Medicine, Mayo Clinic; Dr. Dart is a member of the Department of Hypertension/Nephrology, Marshfield Clinic; and Chair of the ACCP Section on Hypertension and Clinical Cardiology.

REFERENCES

Ventilatory Impairment in Asthma
Perceptions vs Measurements

Decisions concerning asthma management rely on assessment of respiratory problem severity, its known or projected course, and on the response of individual patients to their disease and treatment. The merits and the limitations of various methods for grading asthma, also called ROAD (reversible obstructive airways disease) or VOID (variable obstructive intrabronchial disease), have been reviewed extensively, 1-5 but the conclusion that "attempts to develop a multifactorial . . . index . . . have been unsuccessful" 6 encourages additional efforts in this direction. In this issue of CHEST (see page 272), Teeter and Bleecker report that certain pulmonary function tests, the peak expiratory flow rate (PEF or PEFR), and the FEV1, are more reliable than subjective perceptions for guiding the treatment of asthma. They also state that a 17% incidence of a "relatively asymptomatic airway obstruction" (if "obstruction" means simply a PEF below established norms) is of questionable significance and that the long-term outcome of untreated or undertreated asthmatics (italics mine) is not known. The need to examine bronchodilator-induced reversibility for those with "asymptomatic obstruction" is not considered sufficiently in this report.
Both acute and chronic asthma are conventionally graded semi-quantitatively as “mild, moderate, or severe.”³(p4) Numeric scales have been devised primarily for clinical research, while it is still recognized that “there is no universally accepted and validated measure of asthma severity.”⁶ Even the elementary question of the mathematical, possibly exponential or logarithmic, relationship between symptom scores and pulmonary function tests, in particular the plethysmographic computations of airways resistance and conductance,⁵,⁷ has not been examined adequately.

The realization that clinical indexes do not reflect precisely the degree of ventilatory impairment in asthma⁷ has led to a search for a convenient and economic way to monitor airflow variability.²-⁵ Despite the limitations of the original Wright peak flowmeter (Ferraris Medical; Holland, NY) (in use for nearly 30 years) and of several subsequent similar devices, including the newly developed computerized version,⁹ which are markedly effort-dependent and detect only abnormalities in larger airways caliber,⁴,²¹ they are widely employed. The current authoritative “Consensus Report” and the “Guidelines” for asthma treatment recommend testing PEF in the medical office, the emergency room (dismissing the problem that during an acute attack patients may not be able to blow), and at home.⁵,⁴ At work PEF may help detect or raise the suspicion of occupational asthma.⁵ But there have also been some negative or critical communications. A survey in Scotland determined that “prescribing peak flow meters . . . is unlikely to improve mortality and morbidity.”¹⁰ Supporting this conclusion is the statement that PEF measurements are “not suitable” for the initial diagnosis of asthma, and that monitoring PEF is “not based on any scientific evidence.”¹¹ From Australia it was reported¹² that forced mid-expiratory flow (FEF₂₅-₇₅), tested twice weekly, reflected the course of asthma accurately, supplemented by PEF self-measurements twice daily. In fact, “if measurements of flow rates at low lung volumes (FEF₉₀, FEF₂₅-₇₅) are not performed . . . patients with pathophysiologic abnormalities . . . linked to the small airways may be underdiagnosed.”⁴(p19)

Obviously the schedule of testing ideally has to be based on an estimate of the rapidity of changes and for a thorough monitoring “the frequency of measurements must equal or exceed the anticipated variability cycle.”⁹ Records of PEF before and after bronchodilator and/or anti-inflammatory therapy, as well as in the course of natural or experimental bronchoconstrictive challenges, are essential²,⁹ for appropriate protective and therapeutic action. The frequent self-measurement of PEF serves the additional purpose of patient education, the value of which has been repeatedly emphasized.²(p22), 3.4,10(p1065).¹³ Even though several studies have found a lack of a significant correlation between subjective symptoms and pulmonary function measurements,¹-³,⁵,⁷ it has been noted¹⁴ that after checking their PEF at its highs and lows several times daily for 10 to 15 days, patients, including young children, learn to predict their PEF scores before they measure them (author’s unpublished observations; 1959-1997). Such fairly accurate self-perception of ventilatory impairment is more in reference to “established personal best values”³(p20-21) than predicted “normal” ranges.

Like the personal perception of “disease,” instrumental tests of pulmonary function are subject to multiple influences and, certainly, “instructions . . . do not guarantee” maximum performance.¹³ Motivation will have to be ascertained and its positive (a desire to excel and to hide malfunction) as well as negative (an attempt to appear “sicker”) effect be noted. Mood has not been found to correlate with either symptoms or PEF, although, predictably, increased symptoms were secondarily associated with a “less pleasant mood.”¹ Individual responses to sudden PEF changes also vary markedly. Some athletes, professional singers, wind instrument players, and others with high ventilatory requirements may rush for additional treatment if their PEF drops only by 10%, say, from 500 to 450 L/min. Others, leading a relatively sedentary life, may ignore a PEF below 60% predicted, especially if they are reluctant to take medication to the point of “pharmacophobia,” or are unwilling to reduce allergenic exposures such as that to a household pet (author’s unpublished observations; 1957-1997).

Evidently neither symptom scores nor ventilatory function measurements provide sufficient guidelines about when and how to treat asthma. Treatment of human beings relying only on numbers can be analogous to an appraisal of a great painting based on the milligrams of each pigment it contains.¹⁴ What is needed is patient education, to improve each person’s judgment and the capacity for self-care. The current flood of data, with 90,360 documents on the World Wide Web matching the word asthma¹⁵ and a reported “loss of trust” for physicians turning into “acute suspicion,” has prompted some journalistic comments about “prescribing just what the patient ordered.”¹⁵ If this were to mean total patient autonomy, we know that it could result in serious undertreatment, or overtreatment that might interfere with physiologic regulatory, cybernetic¹⁶ processes and actually amplify asthma.¹⁷ The logical solution, of course, is the establishment of a close rapport and a workable line of communications between pa-
tients and the health-care team. Securely supported by the necessary technical and laboratory data, clinicians must continue to listen to their patients’ personal perceptions and to make consistent efforts to understand their “subjective,” all too human, expectations and needs.

Constantine John Falliers, MD
Denver

References

5 Falliers CJ. Interpretation of consecutive lung function tests for asthma. Ann Allergy 1972; 30:443-49

Prolonged Use of Ventilator Circuits and Ventilator-Associated Pneumonia

A Model for Identifying the Optimal Clinical Practice

In this issue of CHEST (see page 405), Fink and colleagues describe their experience using various change intervals for ventilator circuit tubing at a tertiary teaching hospital. Using a sequential study design, these authors demonstrated that the incidence of ventilator-associated pneumonia (VAP) was significantly lower with circuit change intervals of either 7 days (3.3 per 1,000 ventilator days) or 30 days (6.3 per 1,000 ventilator days) compared to their established practice of changing ventilator circuits every 2 days (11.9 per 1,000 ventilator days) (p=0.0004). Additionally, extending the use of ventilator circuits to 30 days resulted in a cost savings of $4,231 for each ventilator in use at their institution.

It is important to note that the design of this study has several important limitations that restrict the general application of the authors’ findings. First, a sequential design was used which did not adequately control for ongoing changes in medical practices at the study facility. An important example of this is the switch to heated wire circuits which occurred after the second year of the study. The use of heated wire circuits may have decreased the incidence of VAP by reducing the accumulation of contaminated tubing condensate. Several studies have suggested that the presence of such condensate increases the risk of developing VAP.1,2 Second, severity of illness and hospital mortality between the study groups was not compared. Therefore, we cannot ascertain the full impact of the intervention on patient outcomes. Third, a clinical diagnosis of VAP was employed which did not rely on quantitative lower airway cultures. This clinical method of establishing the diagnosis of VAP is controversial due to its lack of specificity.3 However, investigations suggest that the use of clinical criteria are acceptable due to their greater sensitivity and their good correlation with patient outcomes.4,5

Despite the limitations noted, this investigation provides additional data confirming the safety and cost-effectiveness of prolonged ventilator circuit usage. To facilitate recommendations regarding specific medical practices, qualities of evidence for grading the available medical literature are published and have already been applied to patients requiring mechanical ventilation.6,7 At present, the results of available randomized controlled trials and