The bull's registered name was High-Tech Medicine, out of Empiricism by Experimental Method. His remote ancestors included Superstition, Nurture, Traditional Wisdom, Caritas, and Placebo; but later breeding selected sires named Secularization, Quantification, Somatification, Instrumentation, and Chemicalization.

The dominance and penetrance of these newer gene pools produced big, beautiful herds, which were impossible to domesticate. They rushed headlong through ordinary fences and crashed through standard barns, devastating neighboring farms. They could be corralled only in huge new feedlots, where they consumed extraordinary amounts of grain from millions of acres of the best land.

The meat from these herds was heavily marbled with fat and was considered a delicacy by those who could afford it. In Japan it was said to sell for $180 per pound, and in the United States the cost of its production was 12 percent of the gross national product. The Producer's Association squelched rumors that the meat caused atherosclerosis among its habitual consumers — mainly the middle and upper classes. Milk from the herds was scant and poor in nutrition, unsuitable for the children of the poor.

Nevertheless, the owners of High-Tech Medicine and his descendent blood lines became rich and powerful and insisted upon their dominance in the cattle industry, even though they could not feed all the people and might have caused harm had they succeeded. They became adept at securing government subsidies and corporate contracts to maintain their herds and resisted other subsidies (which they contemptuously called welfare) to feed the poor. When the poor complained about not having enough meat and milk, the owners spoke of rationing and devised a food stamp plan, which was never fully funded.

Reformers arose among the hungry and disenfranchised, who tried to breed animals more suitable to their needs; but the Bull Registry regulations and breeding policies made it impossible for new breeders to become licensed, accredited, and certified. The monopoly was able to prevent the development of a promising new breed, Low-Tech Medicine, which was leaner and gave much more milk. It was dismissed as inferior, even though it was successful on the few farms where it got a fair trial.

Finally, there was a great famine in the land that decimated all the herds. The big red bulls were protected to the end, but they were eventually butchered by their owners, who ate marbled meat until they too starved.

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A “New” Standard For The Diagnosis Of Mild Hypertension?

More than 60 million persons in the United States have hypertension, including 3 million children. A diagnosis of hypertension must be accurate because of the high costs of treatment and follow-up. The 1992 US treatment costs for persons with hypertension is estimated at $15 billion. Treatment of hypertension can be associated with metabolic or other side effects, including physical symptoms or a decrease in the quality of life. In addition, the benefits of treating mild elevations of blood pressure (systolic 140 to 150 mmHg or diastolic 90 to 95 mmHg) remain controversial because of a borderline risk-benefit ratio, the effects of labeling, and the high cost of newer antihypertension medications.

Routine office blood pressure measurements are the current standard used to diagnose and monitor hypertension. Office measurements, however, can have limited validity as the result of measurement errors and the phenomenon of clinic or “white coat” hypertension (elevated clinic blood pressures that are normal at other times). Approximately 7 percent of the general

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population and 20 to 45 percent of persons classified as having mild hypertension by office measurements actually have normal blood pressures outside the office. This pattern has also been recognized in children. Individuals who exhibit “white coat” hypertension have no additional risk for structural or functional cardiac abnormalities when compared with normotensive individuals.

Ambulatory blood pressure monitoring (ABPM) offers a potential solution to distinguish those who will most benefit from hypertension treatment. ABPM provides a more reliable estimate of blood pressure and its diurnal variability than does office measurement. ABPM also helps determine which individuals have “white coat” hypertension. Many studies, dating as far back as 1966, have shown that 24-hour ABPM correlates better with target organ complications, including left ventricular hypertrophy and cardiovascular risk, than either home or office measurements. ABPM also has been useful in monitoring the efficacy of therapy.

ABPM units are approximately the size of a Holter monitor. Blood pressure is measured using cuff pressures sensed by oscillometric waves or a microphone to detect Korotkoff sounds. Readings are stored by a microprocessor and are analyzed using microcomputer software. The blood pressure cuff inflates at preset time intervals to provide 50 to 100 readings in a 24-hour period. Several instruments are available that are accurate and reliable, and reference values are available for a variety of patient populations.

In this issue of JABFP, Ferguson and Shaar compare office with ambulatory blood pressure measurements in individuals found to have elevated office blood pressure or who have a diagnosis of hypertension. Their conclusion that many patients with elevated office blood pressure could be misclassified as hypertensive is consistent with conclusions from earlier studies in other populations. The authors appropriately compare morning pressures (typically the highest pressures of the day) using both office measurements and ABPM and blood pressure “load” to assess the diagnosis of hypertension. Their finding of lower whole-day pressures is consistent with findings from other studies and emphasizes that the threshold values for hypertension based on ABPM be lower. The authors also suggest that ABPM be used to monitor treatment effects when office blood pressure readings are elevated or inconsistent. This clinical study is important because it not only provides an example of primary care research in evaluating an approach to common problems but also describes a new approach for the evaluation of hypertension.

Some limitations of the study design, methods, and interpretation deserve comment. The substantially different readings obtained from the office measurements and ABPM findings could have been related to systematic measurement bias of the office or ABPM sphygmomanometers or operator errors. Office classification was followed by the use of ABPM, and the consistently lower readings could have been influenced by the statistical phenomenon of regression to the mean. The strong correlation of repeated office pressures and the consistency of ABPM differences in both study patient groups, however, suggests that the measures were highly reproducible.

Practical limitations to office-based ABPM include cost, personnel time, training, and expertise in interpretation. Initial purchase costs of equipment and software are $7,000 to $10,000, and typical charges are $200 to $300 for a monitored session. Third-party reimbursement varies by individual carriers, and ABPM is currently not covered by Medicare. Measurement accuracy and quality require calibration before each use, as well as careful microphone placement, and they can be affected by patient upper arm size, excessive arm movement, dysrhythmias, and environmental noise. The technical errors with ABPM, however, are minor when compared with the error of estimating a patient’s blood pressure profile based on office readings.

Blood pressure measurement at home by patients or family members is another alternative. Home measurement correlates better with ABPM than does office measurement, is less expensive, and is a better predictor of left ventricular hypertrophy than office measurement, although home measurement is not as predictive as ABPM. Patients must be able to see and hear adequately and must have training in the measurement procedure. The instruments must be durable and accurate, and they should be
periodically calibrated with a calibrated office sphygmomanometer.

Routine office blood pressure measurement remains an important screening procedure. Using home measurements or ABPM to establish a diagnosis of hypertension or to monitor treatment effects provides an important additional assessment for borderline readings, particularly with patients at higher risk of “white coat” hypertension, such as the young, female, borderline or mildly hypertensive patient. It is important to note that while most researchers agree that patients with “white coat” hypertension have no greater morbidity and mortality than those patients with normal pressures, a recent study indicated patients with “white coat” hypertension could have a higher likelihood of metabolic risk factors (obesity, lipoproteins, hyperinsulinemia, and glucose intolerance) and could be at greater risk of developing hypertension. Because of the high rate of cardiovascular disease in the US, all patients with consistently elevated blood pressures should be screened for risk factors or cardiovascular abnormalities.

By properly excluding from treatment patients who could avoid antihypertensive medication, a potentially large cost savings for individuals and the health care system could be realized. ABPM costs less than the combined costs of medication, laboratory monitoring, and follow-up office visits. Physicians should carefully consider the consequences of the diagnosis of hypertension, while taking care to treat adequately those patients who have been carefully evaluated.

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References