Introduction

Systemic hypertension is a very frequent condition in developed countries and therefore constitutes a common problem in the perioperative period. In the United States nearly 29% of adults in 1999 and 2000 were affected by hypertension (age-adjusted prevalence of hypertension): 30% of hypertensive individuals are not aware of their diagnosis, 59% are being treated for hypertension, and only 34% have a blood pressure below 140/90 mmHg [1, 2].

The definition of a hypertensive state is uncertain. Really, it is of crucial importance to consider definitions and charts from studies based on large patient populations, especially when both age and associated diseases are taken into account (Fig. 1). The first problem in the classification of hypertension is the definition of the upper limit of normality (systolic, diastolic, or systolic plus diastolic); most clinicians are aware of this, and several papers may help to clarify the pathophysiologic condition [2]. The second problem is that this classification is set by the peak and trough of a pressure wave in a peripheral (brachial) artery in which the arterial pulse is amplified to a variable degree [3, 4]. In subjects older than 70 years and in small children, systolic pressure (brachial or radial) is a good guide to systolic pressure in the ascending aorta and the left ventricle, whereas in adolescents and young adults, systolic pressure (brachial or radial) may overestimate the systolic central pressure by 30–35 mmHg or more (Fig. 1). Thus, systolic pressure is
an accurate index of cardiovascular risk in the elderly but a poor guide in the young [3, 4].

**Hypertension and Pulse Wave Analysis**

The basic problem in hypertension is the increase in peripheral resistance and the decrease in arterial distensibility. With aging, vascular resistance is also increased because of vascular rarefaction and stiffened arteries, with low to normal cardiac output and mean arterial pressure usually only moderately elevated [3].

There are several different methods of assessing arterial stiffness (AS), some of which are widely applicable in the clinical setting: (1) pulse pressure (the difference between systolic and diastolic pressures), which is a valuable surrogate marker for AS; (2) pulse wave velocity (the speed at which the for-