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What is a Normal Heart Rate Prior to Surgery?

To the Editor:—In a recent issue of ANESTHESIOLOGY, Hansen¹ reported a case of cardiac arrest during induction of anesthesia in an apparently healthy unmedicated adult male patient with an underlying asymptomatic cardiomyopathy. The author believes that the patient had no signs or symptoms of pre-existing heart disease, contending that his patient's sinus tachycardia of 115 beats per min is not unusual in anxious, unmedicated surgical outpatients. Sinus tachycardia is commonly perceived by members of the medical profession to accompany preoperative anxiety. However, recent reports²⁻⁴ suggest that sinus tachycardia may not be as common as once thought, reporting average pre-induction heart rates of 75 beats per min to 84 beats per min in unmedicated adult outpatients. One cannot determine the incidence of sinus tachycardia in their patient populations from their reports, but the normal mean rates with the standard errors suggest that tachycardia in the patient described by Hansen may have been unusual.

A retrospective review of 364 unselected charts of adult patients entering our operating rooms unmedicated and scheduled for orthopedic, gynecologic, and general surgical procedures revealed that only five patients (1.37%) had sinus tachycardia with heart rates above 100 beats per min while 27 patients (7.3%) had bradycardias with heart rates below 60 beats per min (table 1). The median heart rate was 72 beats per min with a range of 48–120 beats per min. The majority of heart rates were normal or slow, suggesting that parasympathetic predominance is more common than sympathetic predominance in these anxious patients. This finding is not surprising because vagal inhibitory effects on sinus node discharge becomes increasingly exaggerated as the prevailing background level of sympathetic tone becomes greater.⁵ The five patients with sinus tachycardias were scheduled for the following operations:

- 1) An elective cesarean section with tubal ligation, 120 beats per min.
- 2) Three postpartum tubal ligations, 112, 108, and 102 beats per min.
- 3) An adult male having hardware removed from a fracture site, 102 beats per min.

Contrary to current dogma, sinus tachycardia is unusual in unmedicated anxious healthy adults for elective outpatient surgery. A rapid heart rate, especially in the realm of 115 beats per min, is uncommon

enough to warrant caution and is cause to look for an explanation other than anxiety. In our patients, four of the five with tachycardia were in the peripartum period. The adult male had the slowest heart rate, 102 beats per min, and the only sinus tachycardia in which there was no identifiable cause other than anxiety. The list of differential diagnoses for tachycardia can be long, but the most likely in a patient such as Hansen's patient are cardiac, medicinal, endocrinologic, or metabolic in origin. Had sinus tachycardia been considered as unusual and suggestive of underlying disease in Hansen's case, the approach to anesthesia may have been more conservative and the ensuing cardiac arrest would have been less likely to occur.

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TABLE 1. Preoperative Heart Rates (beats per min) of 364 Unmedicated Adults for Outpatient Surgery

Number of patients* Beats per min	1 (0.27) 40–49	26 (7.1) 50–59	114 (31.3) 60–69	119 (32.7) 70–79	83 (22.8) 80–89	16 (4.4) 90–100	3 (0.82) 101–110	2 (0.55) 110–120
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* Percent of total patients in parenthesis.