

iment above for an entire cardiac cycle; note that the portion used for analysis of T is between maximum negative dP/dt and mitral valve opening (estimated as LVEDP of the preceding beat). The plot was generated using high fidelity pressure transducers, an analog-to-digital convertor, and special computer software to produce dP/dt from the digitized pressures and time. Since Swanson and Muir did not use an A/D convertor to capture their data, the differentiated pressures might be difficult for them to obtain.

We cannot predict whether the method of analysis herein proposed would change the conclusions of Swanson and Muir. Thompson *et al.*<sup>5</sup> have shown that techniques using equation 1 underestimate T. In fact, however, T may be either overestimated or underestimated, since the P axis intercept ( $P_{\text{asym}}$ ) from equation 4 may be positive or negative (cf figure 3 from reference 6). The error becomes greater as  $P_{\text{asym}}$  becomes increasingly different from zero. When values of T are compared between interventions that may change  $P_{\text{asym}}$  (such as halothane or ischemia), both the absolute values and the conclusions may suffer. Most investigators have abandoned the equation 1 model.<sup>4-6</sup>

Finally, it is well to note that the pressure-time asymptote (or the pressure axis intercept in the dP/dt versus P plot) is not necessarily identical to the actual physiologic pressure to which the system decays. The issue is really the "apparent" value of  $P_{\text{asym}}$  that applies over the range of P(t) that is analyzed for T. Over another pressure range, different values of both  $P_{\text{asym}}$  and T may be obtained. An outstanding feature of the dP/dt versus P display is that simple inspection will reveal the extent to which any portion of the relationship does or does not follow the presumed monoexponential fall-off.

CHARLES BEATTIE, PH.D., M.D.  
LINDA S. HUMPHREY, M.D.  
GARY MARUSCHAK, R.C.P.T.

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*In Reply:*—Drs Beattie *et al.* point out a fundamental analytical error in our data describing left ventricular relaxation. We agree with their assessment, and appreciate their critical reading of our manuscript.

CLIFFORD R. SWANSON, D.V.M., M.S.  
Assistant Professor of Anesthesiology  
Department of Anatomy,  
Physiological Sciences, and Radiology  
North Carolina State University  
4700 Hillsborough Street at William  
Moore Drive  
Raleigh, North Carolina 27606

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## Use Caution when Extrapolating from a Small Sample Size to the General Population

*To the Editor:*—Sears *et al.* recently reported "that the administration of a second dose of succinylcholine to healthy adult patients after induction with ketamine is safe with respect to cardiac rate and rhythm."<sup>1</sup> They based this conclusion on the results of a study performed on eight patients. We believe their conclusion is too strong. Because they encountered no dysrhythmias and did not have a statistically significant

Department of Anesthesiology and Critical Care Medicine  
The Johns Hopkins Medical Institutions  
600 North Wolfe Street  
Baltimore, Maryland 21205

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WILLIAM W. MUIR III, D.V.M., PH.D.  
Professor and Chairman of Anesthesiology  
Department of Veterinary Clinical Sciences  
College of Veterinary Medicine  
The Ohio State University  
Columbus, Ohio 43210

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decrease in heart rate does not imply the true incidence of these undesirable side effects is insignificant.

Whenever the numerator is zero in the incidence of an effect, the true incidence in the population at large represented by the group is:

$$\sqrt{p}$$