

## The Valsalva Maneuver for Assessment of Cardiovascular Baroreflex Sensitivity

CARMEN CAMPALANS, CARSTEN FLORES-HANSEN, SCOTT MATJEKA,  
CLARISSA QUEZADA, DONOVAN L. FOGT, and WILLIAM H. COOKE

Integrated Cardiopulmonary and Autonomic Performance Laboratory; Department of  
Kinesiology, Health, and Nutrition; San Antonio, TX

---

*Category: Undergraduate*

*Advisor / Mentor: Cooke, William (William.cooke@utsa.edu)*

### ABSTRACT

The cardiovascular baroreflex is fundamental to understanding normal autonomic neural function, but can be difficult to assess. **PURPOSE:** In this study, we highlight the utility of the Valsalva maneuver for the assessment of cardiovascular baroreflex sensitivity during both vagal inhibition and activation. **METHODS:** Thirteen supine male subjects ( $21 \pm .7$  yrs;  $173 \pm 2$  cm;  $78 \pm 4$  kg) were instrumented with an electrocardiogram and a finger photoplethysmograph (Finometer, to assess beat-by-beat arterial pressure). Subjects then exhaled against resistance to an expiratory pressure of 40 mmHg for 15 s followed by a 2-min recovery. Subjects performed three trials, and we averaged systolic arterial pressure (SAP) reductions during phase II straining, and SAP increases during phase IV release from strain. Cardiovascular baroreflex sensitivity during vagal inhibition (phase II) and activation (phase IV) was assessed by calculating linear regressions between SAP and R-R interval. **RESULTS:** During phase II straining, SAP decreased by  $26 \pm 4$  mmHg (mean  $\pm$  SE), and during phase IV increased by  $39 \pm 6$  mmHg. Correlation coefficients ( $r$ ) during phase II were  $.92 \pm .02$ , and  $.75 \pm .04$  during phase IV. Cardiovascular baroreflex sensitivity ( $\beta_{1x}$ ) was  $11 \pm 2$  ms/mmHg during phase II, and  $10 \pm 2$  ms/mmHg during phase IV. **CONCLUSION:** Our results demonstrate that the Valsalva maneuver is a simple, yet informative non-invasive technique yielding insight into dynamic changes of the cardiovascular baroreflex during both vagal inhibition and activation. This descriptive study identifies responses of apparently healthy, college-age men, and provides baseline data from which comparisons might be made with other matched subjects with conditions characterized by autonomic dysfunction.