




May 18th, 3:30 PM - 4:00 PM

# Mathematical modeling of normal and abnormal responses to the Valsalva maneuver

Eric Benjamin Randall

*North Carolina State University, ebrandal@ncsu.edu*

Follow this and additional works at: <http://scholarscompass.vcu.edu/bamm>

 Part of the [Ordinary Differential Equations and Applied Dynamics Commons](#), and the [Physiology Commons](#)

---

<http://scholarscompass.vcu.edu/bamm/2017/thursday/7>

This Event is brought to you for free and open access by the Dept. of Mathematics and Applied Mathematics at VCU Scholars Compass. It has been accepted for inclusion in Biology and Medicine Through Mathematics Conference by an authorized administrator of VCU Scholars Compass. For more information, please contact [libcompass@vcu.edu](mailto:libcompass@vcu.edu).

## **Mathematical modeling of normal and abnormal responses to the Valsalva maneuver**

**Eric Benjamin Randall**<sup>1</sup>, Jesper Mehlsen<sup>2</sup>, Mette Olufsen<sup>1</sup>

North Carolina State University, Raleigh, NC<sup>1</sup>

Coordinating Research Center at Frederiksberg Hospital, Frederiksberg, Denmark<sup>2</sup>

The human papillomavirus (HPV) vaccine has been in prevalent use for the last decade. Though many individuals have no issues with the vaccine, some HPV-vaccinated patients suffer from side effects, such as fibromyalgia and postural orthostatic tachycardia syndrome (POTS). Many of these side effects share common symptoms, such as dizziness, widespread pain, and syncope, classified as functional somatic syndromes (FSS). We currently do not understand what causes FSS. We use mathematical modeling with healthy and POTS data to create simple cardiovascular and neurological models that mimic various responses to the Valsalva maneuver. This presentation will elucidate our recent results and their physiological repercussions.