

Biomedical Simulations Resource

University of Southern California

DYNAMICS OF RESPIRATORY VARIABILITY: MECHANISMS AND ANALYSIS

May 17, 1997
The Tuscan Inn
425 Northpoint Street
San Francisco, California

Sponsored by

BIOMEDICAL TECHNOLOGY PROGRAM
NATIONAL CENTER FOR RESEARCH RESOURCES
NATIONAL INSTITUTES OF HEALTH

Chairman and Organizer
Michael C.K. Khoo, Ph.D.
Biomedical Simulations Resource

**THE
BMSR**

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1997 USC BIOMEDICAL SIMULATIONS RESOURCE WORKSHOP
DYNAMICS OF RESPIRATORY VARIABILITY: MECHANISMS AND ANALYSIS

Abstract:

Breath-to-breath ventilation and its associated timing and volume components exhibit a considerable degree of variability. Based on the belief that this variability represents physiological noise, researchers and clinicians commonly adopt the practice of averaging. However, an alternative view is that respiratory fluctuations reflect the dynamic behavior of a complex and nonlinear self-regulating system. This workshop will address (1) state-of-the-art tools that are can be used to characterize and better understand respiratory variability, and (2) potential mechanisms underlying spontaneous changes in ventilation.

Program:

7:30 - 8:00: **Registration**

8:00 - 8:10: **Introduction and Overview**

Michael C.K. Khoo, Univ. of Southern California, Los Angeles, CA

8:10 - 8:50: **Correlation analysis of breath-to-breath ventilation**

Martin J. Tobin, Loyola University of Chicago, Maywood, IL

8:50 - 9:30: **Recurrence quantification analysis of piecewise-deterministic respiratory dynamics**

Charles L. Webber, Jr., Loyola University of Chicago, Maywood, IL, and
Joseph P. Zbilut, Rush Medical College, Chicago, IL

9:30 - 10:10: **Nonlinear dynamics of respiratory rhythm generation**

David Paydarfar, Tufts University, Boston, MA

10:10 - 10:30: Coffee Break

10:30 - 11:10: **Quantitative assessment of respiratory variability using cortical evoked potentials**

J. Andrew Daubenspeck, Dartmouth Medical School, Lebanon, NH, and
Metin Akay, Rutgers University, Piscataway, NJ

11:10 - 11:50: **Fluctuations in state and ventilatory stability**

Michael C.K. Khoo, Univ. of Southern California, Los Angeles, CA

11:50 - 1:00: Lunch Break

1:00 - 1:40: **Chemoreflex-mediated mechanisms of respiratory variability**

Eugene N. Bruce, University of Kentucky, Lexington, KY

1:40 - 2:20: **Cyclic variability in the arousal threshold**

Richard B. Berry, University of California-Irvine & VA Medical Ctr., Long Beach, CA

2:20 - 3:00: **Role of dynamic changes in brain blood flow on respiratory variability**

Richard A. Parisi, UMDNJ-Robert Wood Med. School, New Brunswick, NJ

3:00 - 3:20: Coffee Break

3:20 - 4:00: **Changes in respiratory variability from increased inspiratory controller gain during sleep**

Magdy K. Younes, Univ. of Manitoba, Winnipeg, Canada

4:00 - 4:40: **Contributions of respiratory control system inertia to sleep-disordered breathing**

Jeromé A. Dempsey, Univ. of Wisconsin, Madison, WI

4:40 - 6:00: General Discussion & Reception

BIOMEDICAL SIMULATIONS RESOURCE
UNIVERSITY OF SOUTHERN CALIFORNIA

1997 Workshop

**ADVANCED METHODS OF
PHARMACOKINETIC AND PHARMACODYNAMIC
SYSTEMS ANALYSIS**

May 16-17, 1997
Marina del Rey, California

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