Model-based approaches for improved diagnostic and therapeutic strategies for sleep-related breathing disorders: Current and Future Directions

Focused Study Group Meeting
Sunday, June 10, 2012
8:30am -12pm - Sheraton Hotel, Boston, MA

Moderator: Michael C.K. Khoo, PhD

This is one of a series of “focused study groups” sponsored by the USC Biomedical Simulations Resource (a center funded by NIH-NIBIB), aimed at "facilitating the rational formulation of future research directions in selected fields of biomedical science and technology by engaging experts within the peer community in a constructive process of thoughtful and far-sighted deliberation".

Tentative Program & Topics for Discussion:

8:30 – 9:00 am: Continental Breakfast

9:00 – 9:30 am: Introduction; Purpose of the Meeting

9:30 – 11:00 am: Survey of past & contemporary efforts in modeling as applied to SRBD

- Has modeling contributed towards advancing the field?
- Models of ventilatory control instability; simulation models vs “minimal” models
- Estimation of loop gain – is loop gain relevant?
- Models of upper airway collapse and pharyngeal flow dynamics
- Cheyne-Stokes breathing – importance of modeling cerebral blood flow
- Modeling respiratory-cardiovascular interactions – acute and chronic effects of SRBD
- Modeling effects of SRBD on glucose metabolism

11:00 – 12:30pm: Recent and future developments in SRBD-related modeling

- Using measurements from more recent technologies (eg. PAT)
- Modeling the progression of disease
- Modeling the effects of intermittent hypoxia and ANS fluctuations on endothelial function & inflammation
- Diagnosing SRBD without sleep studies
- Development of “smart” therapeutic strategies for bilevel PAP/ventilators
- Predictive modeling approaches
Invited Participants

Dempsey, Jerome  
*University of Wisconsin*

Edwards, Bradley  
*Harvard Medical School*

Horner, Richard  
*University of Toronto*

Jocono, Frank  
*Western Reserve University*

Khoo, Michael  
*University of Southern California*

Malhotra, Atul  
*Harvard Medical School*

Penzel, Thomas  
*University of Berlin*

Sands, Scott  
*Harvard Medical School*

Terrill, Philip  
*University of Queensland*

Trinder, John  
*University of Melbourne*

Vergheese, George  
*Massachusetts Institute of Technology*

Wellman, Andrew  
*Harvard Medical School*

White, David  
*Philips Home Healthcare Solutions*

Younes, Magdy  
*University of Manitoba*