



**We invite you to participate in the**

Fifth Annual WPIC Research Day

**Monday, June 13, 2005**

9:00 am – 3:30 pm

Biomedical Science Tower, First Floor (Room S-100)

Keynote Speaker

**Katherine Wisner, M.D.**

Professor of Psychiatry

Research Day Awards Presentation

**Thomas Detre, M.D.**

Distinguished Service Professor of Health Sciences

Professor of Psychiatry

Mentorship Award Presentation

**David J. Kupfer, M.D.**

Thomas Detre Professor and Chair

Department of Psychiatry

**There will be a \$750 prize for the best poster and best oral presentations**

This full day event celebrates the research accomplishments of those in training at WPIC.

We invite you to join us for this exciting program.

**Please make plans to participate!**

## CareMedia: Automated Video and Sensor Analysis for Geriatric Care

*AJ Bharucha, D Chen, H Wactlar, S Stevens, C Atkeson, MA Dew, BG Pollock  
University of Pittsburgh School of Medicine and Carnegie Mellon University*

Study: The Omnibus Budget Reconciliation Act of 1987 (OBRA-87) mandated non-pharmacological interventions for the emotional and behavioral problems of nursing home residents prior to resorting to pharmacotherapy. Nonetheless, the design and implementation of specific non-pharmacological interventions has been hampered by the lack of a sound understanding of the environmental context of these disturbances in nursing homes. CareMedia is developing a suite of techniques and methodologies that capture in real-time a continuous audiovisual and sensor record of the pattern of activities, behaviors and social interactions of nursing home residents while simultaneously developing tools for automated data reduction, and safeguarding privacy.

Methods: A pilot, feasibility study was conducted on a dementia unit by instrumenting the hallway, dining and living room with video cameras and audio-phones that stored data directly onto computer hard drives. The residents' activities were recorded during 4 two-hour blocks of time over 10 days, and these data were processed with human coding and machine intelligence technologies.

Results: During the recordings, 8 consenting residents were observed in the non-private spaces of the dementia unit for 13.6-24.6% of the recorded time. Of this, interpersonal interactions of any kind (verbal or physical; with staff, visitors, other residents) were noted in < 20% of the recorded time. Meal times accounted for > 75% of the interpersonal interactions. Seven bouts of physical aggression were observed, all accounted for by two residents, and preceded in 4 cases by verbal aggression within 30 seconds of the events. The remaining 3 bouts of physical aggression were un-witnessed by staff, as were six elopements from the unit behind unsuspecting staff and visitors.

Conclusion: Application of computer machine intelligence technologies in a nursing home environment is feasible, and will permit *truly longitudinal*, ecological studies of chronic care populations with continuous capture of *objective* measurements of their patterns of activities, behaviors and social interactions.

Significance: Objective, continuous measurement of various aspects of physical and emotional health of nursing home residents will permit more appropriately targeted interventions, and this technology will serve as a sensitive outcomes measurement tool.

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