Objective: To characterize, with observational tools, patterns of socialization and physical aggression among patients in a community-based nursing home unit. In addition, to develop automated algorithms capable of detecting disruptive behaviors consistent with observational work.

Design: An observational, descriptive study.

Materials And Methods: The main hallway, dining and living room of a dementia unit were instrumented with 4 unobtrusive cameras and 8 microphones. The activities of 8 consenting residents were recorded from eight hours a day for 8 consecutive days. The residents’ mean age was 89 years, with a mean Mini Mental Status Exam score of 9 (range 7-10). Time-synchronized splicing of the entry and exit points of each participating subject was used to form a collage of each individual’s activities in the open spaces of the dementia unit. The task of data reduction and extraction of high-level activity information was approached through both automated and manual techniques. For the manual encoding, 4 undergraduate students were trained by a geriatric psychiatrist to code the data frame-by-frame. A computer interface allowed coders to annotate behaviors of interest, as well as physical pose and ambulatory status. Behaviors of interest were identified with the Cohen-Mansfield Agitation Inventory and grouped into 4 sub-categories: physically aggressive, physically non-aggressive, verbally aggressive, and verbally non-aggressive. These manual encodings are currently forming the development of automated techniques at Carnegie Mellon University to extract information relevant to the detection of anomalous and disruptive physical activities. This includes automated tracking and extraction of navigational patterns; a survey of the ongoing research will be presented in the context of our report.
**Results:** Subjects were found to be in the open spaces of the unit between 13.6 and 24.6% of the recorded time. Interpersonal interactions of any kind (verbal or physical; with staff, visitors, or other residents) spanned less than 20% of the recorded time. Meal times accounted for over 75% of the interpersonal interactions. Two subjects accounted for all bouts of verbal or physical aggression; in a majority of these cases, the bouts were not witnessed by staff. Additionally, two subjects successfully eloped from their locked unit on six of eleven attempts behind unsuspecting staff/visitors; none of these events were witnessed by staff.

**Conclusions:** The National Science Foundation funded CareMedia Project is facilitating the characterization of continuous normative social behaviors on the part of patients with dementia, as well as atypical, and aggressive, physical events. An accurate representation of such behaviors as they occur in a real-time, continuous fashion will permit the development of automated algorithms to do similar analyses. This automation promises to permit more objective, longitudinal behavioral and functional assessment of nursing home residents.