

SILVERADO SENIOR LIVING/UNIVERSITY OF CALIFORNIA, SAN DIEGO

STUDY ON THE EFFECTS OF LIGHT ON PERSONS WITH DEMENTIA.

Beginning in October 1998 and ending in October 1999, Silverado Senior Living, through its affiliation of the University of California, San Diego (UCSD), participated as a research site for a major study on the effects of natural light on persons with dementia. Dr. Sonia Ancoli-Isreal directed the study on behalf of the UCSD Alzheimer's Disease Research Center with the assistance of Dr. Peter Brooks of UCSD and Wendy Graca, RN Silverado Senior Living's Corporate Director of Health Services. The study was conducted at our Silverado Senior Living-Escondido location.

Study Format:

Residents were initially screened for the appropriateness of participating in the study. The accuracy of diagnoses was evaluated and baselines were established as to behavior and sleep patterns. All residents were screened for cognition and a sample was selected in the early, mid, and late stage of disease development.

With a UCSD researcher conducting interactions, residents were asked to sit in front of a high intensity light box every day (3500 lux) for an accumulated time of two hours each day. During these times, the interviewer might talk or play a game with the resident during the light box period. Each day, changes in the resident's behavior throughout the day and night were recorded. Bed times and sleep periods were recorded also.

Theory:

Sufficient light has been established as an important ingredient in the well being of all persons. As a person ages, the visual field narrows and the pupil gets smaller, decreasing the amount of light that enters the eye. The pupil of the average five year old child is 7mm, whereas the pupil of the average sixty-five year old is only 2.5mm. In addition the lens of the eye thickens with age, loses transparency, and turns a yellow brown in color, and the sensitivity of the retina diminishes. The combined effect of the reduction in the size of the pupil and the thickening of the lens result in two-thirds less light reaching the retina by age 65¹.

According to Dr. Robert E. Jenkins, Director of the Clymer Health Clinic in Pennsylvania, "We are only beginning to understand the deficiencies caused by and the impact on significant amounts of light indoors. A room lighted with fluorescent lighting is less than one-tenth as bright as the area under a tree on a bright sunny day."² It is being documented with greater frequency that the illumination level for indoor lighting is typically equivalent to the twilight and the equivalent of biological darkness. These light levels are barely adequate to see, and, without question they are not sufficient to send an effective signal to the biological clock for the regulation of hormones and rhythms.³ Sunlight is a source of well being and provides persons with dementia a sense of orientation, and a subconscious reference to time- both the hour of the day and the

changing of the seasons. Sunlight stimulates the circadian and neuroendocrine systems that regulate the body's entire homeostasis.⁴

STUDY RESULTS:

During a presentation at the Alzheimer's Disease Research Symposium in May 2000, Dr. Ancoli-Israel reported that as the result of the study conducted at our Silverado Senior Living, Escondido location, much more has been learned about the importance of light to persons with dementia. Some of the facts noted were:

- **Exposure to sunlight or bright light that simulates sunlight reduces "sundowning" symptoms and restlessness.**
- **Exposure to sunlight in the late afternoon helps improve the length and quality of sleep at night.**

SILVERADO SENIOR LIVINGS RESPONSE TO RESIDENT LIGHT REQUIREMENTS:

As the result of information known about the loss of vision in persons who are elderly as well as the information gained through the light study, Silverado Senior Living has instituted the following practices at each one of our communities:

- **Expansion of the fenced outdoor areas of each Silverado community to include as much of the available land area as possible.**
- **Design of the outside areas enhanced with meaningful activities so as to attract residents outside and to help keep them outdoors for a longer period of time. Varied surface walking paths help maintain balance and make the residents' excursions more interesting. Resident gardens, flowers, fountains, and child play areas help focus residents' attention so that they are more likely to go and remain outdoors.**
- **Outside doors into yard areas are kept open every day except during periods of extreme weather. (Most other assisted living communities seldom use outdoor areas or even make them accessible to residents).**
- **Whenever possible, a transition area is created between the interior and exterior of the Silverado building, so that residents experience a gradual increase in light intensity, making the transition to the outdoors more inviting.**
- **Interior lighting in all Silverado Senior Living communities has been upgraded to compact fluorescent T-8 lighting of at least 2000 lux in resident common areas resulting in a brighter and more natural interior living environment.**

Further information on the Silverado Senior Living Light Study conducted with the University of California, San Diego Alzheimer's Disease Research Center can be received by contacting Stephen Winner, Chief of Culture at Silverado Senior Living at our web site location silveradosenior.com

¹ Noell, E. Long Term Care Design: Lighting. *Journal of Healthcare Design*. Vol IV (1991): 65-69

² Colby, B. *Color and Light: Influences and Impact*. Glendale, Ca.: Chroma Productions (1990)

³ Brainard, G. The Future is Now: Implications on the Effect of Light on Hormones, Brain, and Behavior. *Journal of Healthcare Design*, Vol. VII(1994) 49-56.

⁴ Brawley, E. Designing for Alzheimer's Disease, *Chapter 8, The Dramatic Effect of Lighting*, (1997) 85-105.