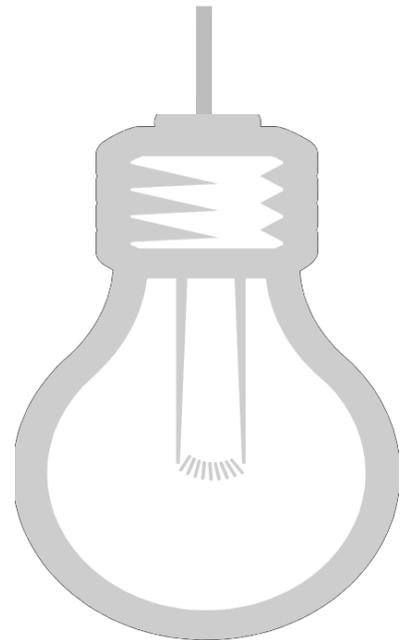


# Lighting

Many factors affect a person's ability to manage and interpret their environment. As a person ages there are a number of "normal" age-related changes to vision that may be anticipated. Additionally, age is the greatest risk factor for Alzheimer's disease and related dementias (ADRD). Therefore, changes to vision due to aging eyes coupled with problem solving and perceptual difficulties associated with ADRD, persons living with dementia especially need appropriate lighting to assist with positive perceptions and interpretations of their environment.

Research on adequate lighting and its effects on persons living with dementia (PLWD) indicate the possibility to:

- **Dissipate shadows**
- **Reduce responsive behaviours**
- **Positively affect eating**
- **Optimize communication opportunities**
- **Encourage wellbeing**
- **Increase natural, meaningful, activities**
- **Reduce falls**



For further information on lighting literature and dementia, please refer to the companion document *Why is Lighting Important to Older Adults?* on the brainXchange ([www.brainXchange.ca](http://www.brainXchange.ca)) or on the Murray Alzheimer Research and Education Program (MAREP) website at ([www.marep.uwaterloo.ca](http://www.marep.uwaterloo.ca)).

For more information on Falls Prevention specifically, please visit the Fall Prevention Community of Practice: Loop ([www.fallsloop.com](http://www.fallsloop.com)).

## **DEMENTIA - Friendly *Design Considerations***

**AUDIENCE DISCLAIMER:** This and the companion document are geared towards care partners of persons living with dementia (PLWD).

## Light Intensity & Colour

### RECOMMENDATION:

**Include lighting with a high colour rendering index providing 30-70 foot candles (1 foot candle = 10 lux) for indoor illumination in main areas of long term care (LTC) including living rooms, resident rooms, bathroom, tub, and activity areas.**

**Rationale:** Lighting in LTC is often well below the required level for normal age-related changes (1,2). There are a variety of terms that describe lighting including the term 'full spectrum lighting' that has been identified as the best type of artificial light (1). Ambient areas such as living rooms should be at 30 – 50 foot candles (300 – 500 lux). Lux levels should increase for task specific activities to 50 – 70 foot candles (500 – 700 lux) (4,5).

### Strategies:

- Lighting that mimics natural sunlight such as incandescent or new fluorescent T8 lamps (3)
- Avoidance of only one source of lighting to achieve adequate illumination

## Task Lighting

### RECOMMENDATION:

**Ensure task lighting (direct illumination) over work surfaces (i.e. tables, dining room, sinks) is at higher levels than ambient lighting, with an average of 700 lux as the recommendation (4,5).**

**Rationale:** Task lighting is provided to highlight areas of interest. With shadows eliminated, better task lighting allows a person to be more interested in their activity and function at a greater capacity (6). Examples of areas of interest can include: dining areas, bathroom shaving areas, reading or activity areas, physical/occupational therapy, or examination rooms.

### Strategies:

- Utilize task lighting to draw people to participate in areas of interest
- Provide alternating light levels across all rooms, differentiating between task and ambient lighting as appropriate

## Natural Light

### RECOMMENDATION:

**Provide access to natural light (e.g., windows, outdoor activities, greenhouse activities) and windows overlooking outdoor areas to promote wellbeing.**

**Rationale:** Natural light enhances wellbeing and natural rhythms of our body improving overall health, decreasing responsive behaviours, and helps to regulate normal sleep patterns (8). Engaging with the natural environment involves allowing for both planned and spontaneous outdoor opportunities – including wintertime activities (6).

### Strategies:

- Provide access to windows which overlook a positive and stimulating focus like a bird feeder or woods vs. parking lot which may promote exit seeking
- Position/place positive "centres of focus" (e.g., aquarium, mural) near any windows where views are deemed to be poorly located

Windows are to provide positive stimulation and foster positive memories.

## Adapting to Transitions in Lighting or Way Entrance

### RECOMMENDATION:

**Provide seating just inside building entrances to allow vision time to adjust. Avoid seating areas near dementia unit entrances.**

**Rationale:** Older eyes take longer to adapt to light changes (9). Graduated lighting avoids temporary blindness due to extreme changes in bright to dark and dark to light, and can reduce the risk of falls (5)

### Strategies:

- Use awnings and brighter interior lights in entrance ways
- Wear hats or sunglasses to help with transitions in lighting

## Day and Night Lighting

### RECOMMENDATION:

**Lighting which has the ability to be adjusted throughout the day is best. This will act as a cue for day time and night time for persons living with dementia.**

**Rationale:** Bright corridor lighting at night can cause confusion for persons living with dementia as it does not provide any cues, and it can disrupt sleeping patterns and routines (7). Seasons and weather can also affect the brightness of an area and the need for dimming.

### Strategies:

- Dimming of corridor lighting late evening or near bedtime. Similarly, brightening of
- corridors or rooms in the morning (e.g., opening curtains in morning) is equally important dependent on season and weather (e.g., sunny or overcast)
- Consider timers for automatic dimming of lighting, and a staff protocol for assessing daily for dimming and brightening
- Install light sensitive control technology

## Avoiding Misperception

### RECOMMENDATION:

**Lighting is evenly distributed throughout an area to avoid glare, pooled lighting, and shadows with the exception of task lighting in designated activity areas.**

**Rationale:** Glare can lead to discomfort, irritation, or temporary blindness (9). Persons living with dementia may have perceptual disturbances triggered by glare on surfaces such as highly polished floors, which can be interpreted as though they are wet, icy, or slippery. Bright sources of light can interfere with visibility, making it difficult for individuals living with dementia to safely and effectively navigate corridors, perform activities, and can cause discomfort (4). Further, pooled lighting and shadows can create false illusions and can create issues with depth perception as the damaged brain will often misinterpret the environment stimulus.

### Strategies:

- Use multiple lighting sources and avoid shining lighting from below (e.g., shining upwards into eyes)(5)
- Appropriate adjustment of height and angle of the light for all (e.g., including wheelchairs and those using walkers)(5)
- Consider using frosted versions of light bulbs or lamp shades to screen or reflect the light
- Use fitted sheers on windows to filter natural day light when needed (9)
- Avoid patterned curtains (such as lace curtains) that can cast a shadow and then be mistaken for perceived threats like insects or holes

## Individual Preferences

### RECOMMENDATION:

**Respect individual preferences for lighting while balancing choices with safety.**

**Rationale:** Persons living with dementia need to be provided opportunities to incorporate individual lighting preferences; there is no one standard for everyone.

### Strategies:

- Consider individual choice and vision requirements
- Assess vision regularly (e.g., cataracts, macular degeneration, prescription; check that glasses are clean and in good repair)
- Discuss with and observation of persons living with dementia in addressing their personal preferences for lighting
- Ensure light switches are easy to access and identify in bedrooms and bathrooms (e.g. a lit switch)
- Accommodate individual needs with desk lamps, night lights, and/or dimmers for built in flexibility

## Maintenance Standards

### RECOMMENDATION:

**Lighting protocols and practices are needed for all places of residence, which include or enhance lighting policies and maintenance standards currently in place.**

**Rationale:** All staff need to be skilled and aware of the unique needs for residents and be able to adjust lighting throughout the day to meet their needs (i.e. dimming lights at the end of the day, avoiding shadows) (5)

Well lit signs with directional / way finding cues will improve way-finding by staff, family, and PWDs.

*Note: For additional information on signage, please refer to the signage knowledge to practice recommendations.*

### Strategies:

- Position signage beside lights to remind staff of lighting protocols (e.g., not dimming lights because it is a hot day or to save energy).
- Ensure signs with directional and wayfinding cues are well lit
- Regularly clean and inspect residents glasses to maximize eyesight
- Pull down bedroom shades and/or dim corridor lights at bedtime
- Ensure areas are well lit during wakeful times to avoid shadows and risk for falls
- Ensure lights are immediately replaced and not turned off in high traffic areas
- Ensure windows are kept clean and bushes around windows are trimmed back to minimize shadows and increase light (5)

## Do you have design considerations to suggest?

**Please send us your feedback by visiting the brainXchange website and submitting your questions and/or comments to the Design and Dementia Knowledge to Practice Recommendations online:**

**[brainxchange.ca/design](http://brainxchange.ca/design)**

## References Cited

1. O'Keeffe, J. (n.d.) Creating a Senior Friendly Physical Environment in our Hospitals. The Regional Geriatric Assessment Program of Ottawa.
2. Lepeleire JD, Bouwen A, Coninck LD, Buntinx F. Insufficient lighting in nursing homes. Journal of the American Medical Directors Association 2007;8(5):314-317.
3. Lighting Research Center. <http://www.lrc.rpi.edu/programs/nlpip/lightingAnswers/fullspectrum/abstract.asp>
4. Illuminating Engineering Society of North America (IES) 2007
5. Pollack R, McNair D, McGuire B, Cunningham C. Designing lighting for people with dementia. 2008
6. Torrington JM, & Tregenza PR. Lighting for people with dementia. Lighting Research and Technology 2007;39(1):81-97.
7. Benbow personal communication
8. Sloane PD, Williams CS, Mitchell CM, Preisser JS, Wood W, Barrick AL, Hickman SE, Gill KS, Connell BR, Edinger J, Zimmerman S. High-intensity environmental light in dementia: effect on sleep and activity. J Am Geriatr Soc 2007;55(10):1524-33.
9. Noel-Waggoner E. Lighting solutions for contemporary problems of older adults. Journal of Psychosocial Nursing 2004;42(7):14-20.

## About Us

DEMENTIA-*Friendly* Design Considerations is a series of Knowledge to Practice Recommendations related to important physical design elements to facilitate the process of persons with dementia and their caregivers to make sense of their environment and improve wellbeing. The Knowledge to Practice Recommendations are living or dynamic documents which will be continually edited and updated by the brainXchange Design and Dementia Community of Practice based on emerging quality evidence and the integration of both practice-based and experiential knowledge of those working with persons living with dementia.

## For More Resources

Visit us online: [brainxchange.ca/design](http://brainxchange.ca/design)

Contact us: [support@brainXchange.ca](mailto:support@brainXchange.ca)