

**“Good sense, good design:
Interior design in dementia
accommodation”**

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Wayfinder design**

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Introduction

- **Dementia-specific design: about accessibility, safety & security**
- **Colour & Colour Contrast – widely used as cueing strategy + safety**
- **..... only effective when sufficient Light to perceive Colour**
- **Minimal light ... colour is ‘greyed’ (tone)... spaces & objects less identifiable**
- **Consequently, colour strategies diminished if tonal relationships are inappropriate**
- **Reduced visual ability - difficulty in daily tasks**
- **Persons with dementia of the Alzheimer’s type - have disruption to basic visual capacities**
- **Canvass Colour & Tonal Contrast and Lighting in Dementia Accommodation**

Colour Vision & Perception

- **Colour Vision - many variables.....**
 - **stimulus itself; other stimuli in field of view;**
 - **other stimuli recently viewed; size & shape of object viewed;**
 - **stationary or moving; memory of colour &**
 - **visual abilities of the observer!**
- **Visual Field - Yellow (20° in from peripheral), Blue, Red then Green within a 40° cone**
- **Reduction of visual field with increasing age - red and green more important?**
- **One Research Study reports selective disruption to visual capacities (Cronin-Golomb, 1995):**
 - e.g. depth perception; contrast sensitivity & colour discrimination**
 - it is suggested that difficulties in activities in daily living may be attributable to specific visual dysfunction e.g. problems in spatial orientation & locomotion may be related to deficient depth perception**

Colour Vision & Perception

- **Common strategy in many dementia-specific facilities: highlight/landmark toilet doors with colour and/or pictures/pictograms object is for a resident to find the toilet by themselves.**
- **Success of these strategies is contingent upon:**
 - **level of cognitive decline; visual ability of the person;**
 - **ability to identify colour; contrast between door and architrave;**
 - **contrast between door and handle; recognition of picture/pictogram**
 - **contrast of picture/pictogram with the door**
 - **amount & type of available natural or artificial light?**
 - **time of day?, sunny or cloudy?**
 - **level of glare & resultant disruption to visual functions**
- **As for cognitively intact people, colour and tonal contrast in the environment can be both guiding when correctly used, and confusing when misused**

Colour Vision & Perception

- **Some researchers have investigated Colour Vision for people with dementia of Alzheimer's type - the research is minimal and the studies have all been small**
- **A small study (24 people) reported that people had their colour sense intact regarding:**
 - **colour identification and memory of common colour names**
 - **ability to discriminate between various kinds of small colour differences****(Wijk & Sivik, 1995)**
- **In a further study (50 people) researchers found:**
 - **discrimination ability better in yellow and red area and for lightness differences**
 - **cognitive decline had a significant impact on naming mixed colours and using elaborate colour names (Wijk, Berg, Sivik & Steen, 1999)**
- **And as stated earlier, another researcher reported selective disruption in contrast sensitivity & colour discrimination (Cronin-Golomb, 1995)**

Colour Vision & Perception

- **The findings are of the studies into Colour Vision are inconclusive and in some cases they are conflicting.**
- **All researchers advise that further research is required with larger numbers of participants to verify the findings**
- **However, the early results are of interest - they suggest that, in the absence of conclusive or definite findings, good sense should prevail and that we should use caution when specifying colour in dementia accommodation**

Lighting

- **Light essential for the perception of colour**
- **Sight - most important sense for acquiring information**
- **People with partial sight (low vision) receive distorted or disturbed visual pictures**
- **Incorrect inferences/incorrect behavioural responses: because of too much, too little or wrong type of light in the environment**
- **Safe & comfortable visual environment depends mainly on: avoidance of excessive illuminance variations; absence of direct glare; appropriate luminance distribution; light sources with suitable colour characteristics**
- **AS1680.2.0:1990 (Australian Standard, Interior Lighting, Part 2.0: Recommendations for specific tasks and interiors) - missing from the Standard - recommendations for Nursing Homes, Hostels & Retirement Living**
- **AS1680.0:1998 (Australian/New Zealand Standard, Interior Lighting, Part 0: Safe Movement) – again, no specific lighting design guidance**

Lighting

- **In the absence of ‘Specific Lighting Guidelines’ for aged care accommodation - *good sense* should prevail**
- **No excuse for ‘bare’ lamps shining into the eyes of residents from either ceiling, wall mounted or any other type of light fitting**
- **Many facilities now ‘high care’ -residents confined to bed, flotation chairs or similar: face the ceiling a great deal of the time**
- **Installation of light fittings shining into peoples eyes: inappropriate, irresponsible**
- **Dimmers? -not good enough to suggest that lighting can be controlled by dimmers - experience shows that rarely occurs -staff have neither the time or would forget - residents are still facing ‘bare lamps’**
- **Mobile residents are just as affected: glare introduces problems of light & dark adaptation - leads to incorrect inferences & responses, placing residents at risk**

Lighting

- **Luminaire (Light Fitting) Design** - the majority is very low standard - little thought give to people with visual handicap of any sort.
- **Very few Luminaires comply with the 'low glare/no glare' requirement**
- **Examples from: RP-28-98 'Lighting and the Visual Environment for Senior Living'**
ANSI: Approved American National Standard



Figure 1
Pendant + Cove Lighting



Figure 2
Pendant Lighting



Figure 3
Pendant + Cove Lighting

Lighting



Figure 4
Appropriate Lighting ?

Example from: RP-28-98 'Lighting and the Visual Environment for Senior Living'
ANSI: Approved American National Standard

Light Fittings



Tonal Contrast

- **Tone is the lightness or darkness of a Hue (colour) – creates relationships between elements in the environment i.e. Tonal Contrast (also known as Luminance Contrast)**
- **Luminance Contrast: defined as the luminance difference between a task detail and its background** (Bright, Cook & Harris, 1997)
- **Where luminance contrast (tonal contrast) is minimal or non-existent between two colours - boundaries of elements become blurred and/or unrecognisable.**
- **Minimising or maximising of tonal differences between adjacent surfaces can therefore be either a positive or negative strategy!**
- **Tonal relationships are not necessarily obvious to the human eye when two colours are viewed together**
- **Tonal difference or lack of it can generally only be confirmed in ‘grey-scale’**

Tonal Contrast

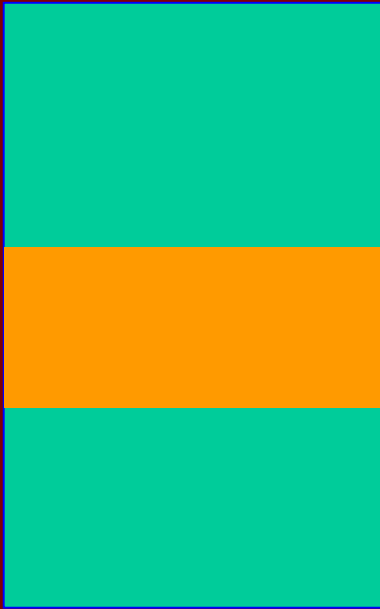


Figure 5
Colour Contrast



Figure 5A
Tonal Contrast



Figure 6A
Tonal Contrast

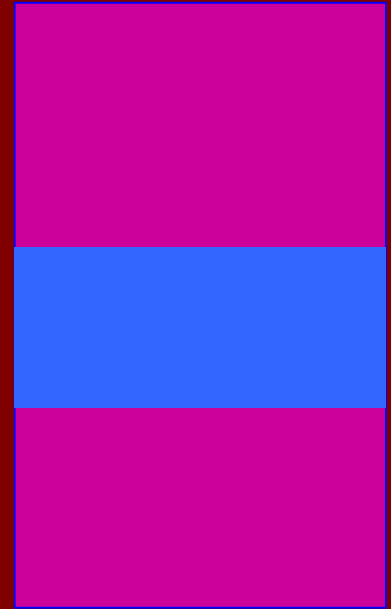


Figure 6
Colour Contrast

How can Tonal Contrast be ‘tested for’ for current or future Projects?

Tonal Contrast

“VISUAL TESTING”

- **Most basic test (shade & shadow testing) - view ‘adjacent’ samples under different light sources and low levels of light - provides an indication - requires verification**
- **Photocopy samples - basic.... provides an indication - requires verification**
- **Scan samples - input into suitable computer programme - provides good indication**
- **Digital photograph (no flash, using different electric light sources or only daylight) - input images onto suitable computer programme - again, provides clear indication of tonal relationships**
- **Monochrome images of an interior demonstrate that as light levels, light sources or light direction changes, the degree of difficulty in recognising objects increases or decreases accordingly.**
- **Interiors are dynamic - the specification of colour, colour contrast and tonal contrast need to take account of continually changing light conditions both natural (daylight) and artificial (electric light)**

Tonal Contrast



Figure 7
Colour Contrast



Figure 7A
Tonal Contrast

Sunset 'Contrast'



Sunrise 'Contrast'



Tonal Contrast

- **Appropriate ‘Tonal Contrast??**
- **e.g. what level of tonal contrast (i.e. difference) between adjacent flooring materials would be permissible so that travel would not be impeded? Unknown!**
- **Research Question: what are the minimum/maximum levels of tonality between adjacent interior elements which provide appropriate resolution under varying light conditions?**
- **Research Question: what is the method of accurately measuring the tonality levels?**
- **When answers are provided to those two questions, the guesswork will be taken out of interior design in dementia-specific accommodation**
- **Until then good sense and considered judgement prevails err on the side of caution provide maximum and minimum levels as appropriate where ever considered appropriate.**

Summary

In dementia-specific accommodation

- Residents disabled by reduced cognition, mobility & visual ability
- No Lighting Standards specifically for Aged Care environments - in their absence *good sense* must prevail -do not specify lighting (interior or exterior) which incorporates lamps (light bulbs) which shine into the eyes of residents
- Specification of inappropriate lighting causes both disability and discomfort glare
- The interior environment is dynamic - light conditions are continually changing
- COLOUR Contrast strategies: assume standard colour vision & perception - they are dependant on 'appropriate' lighting (natural or artificial)
- TONAL Contrast strategies are *good sense*: they recognise diminished visual ability and are far less dependent on the prevailing light conditions
- Research into the specification of Lighting and Colour should be a priority - the standard of the specification of both has a direct impact on the quality of the daily living experience of people in dementia accommodation