Meet Your Presenters

Lisa Warnock
Principal, Myhre Group Architects

Lisa Warnock has over 20 years of interior design, space planning, and business experience. Lisa is currently the Principal of MGA’s interior design team. She is very passionate and knowledgeable about sustainable lighting design practices and specializes in designing senior living communities.

Ray Yancey
Principal, Myhre Group Architects

Ray Yancey has over 25 years of experience in the architectural field and currently leads MGA’s senior living design team. Having completed over 50 senior living projects, Ray has a vast knowledge of designing for residents’ needs, incorporating current design trends, and navigating unique design challenges.
Agenda

1. Fundamentals
2. Enrichment
3. Lighting
A Healthy Environment for Care Providers and Residents

- A healthy and happy care provider is one of the most important assets for your community.
- How can we provide spaces that nurture our care providers so they can nurture residents?
  - Create environments that foster staff retention.
  - Healthy environments for both staff and residents (lighting, finishes, etc.)
  - Staff amenities (daycare, lounges, etc.)
Interior Design Considerations

- Design spaces that are timeless and practical, not just attractive and trendy.
- Focus on finishes that promote clean air conditions.
- How do we create "clear air"?
  - Low VOC, eliminate off gassing
  - Air changes with ERV's (energy recovery ventilators)
  - Design HVAC systems that are appropriate
  - Be careful not to add unnecessary elements that can add impurities to air

FUNDAMENTALS

Embrace innovative technology and new products.

Specify furnishings that promote independent resident transfer, eliminate/mitigate falls and ensure the resident is comfortable so they remain engaged in the community.

Specify floor products and transitions that reduce falls.
According to a 2004 study by the National Eye Institute, the four most common age-related eye diseases (AREDs) are:

- Glaucoma
- Age-related macular degeneration (AMD)
- Diabetic Eye Disease
- Cataracts

Common types of vision loss from AREDs are:

1. Central Vision Loss (age-related macular degeneration)

2. Side (peripheral) vision loss (glaucoma)

3. Overall blurring, clouding of images, sensitivity to light and decreased contrast (cataracts)

4. Spotty field of vision (diabetic eye disease)
Carpet Patterns

- Avoid creating visual "confusion" with carpet patterns that are disorienting
- Avoid creating "black hole" with insets and boards that are too high contrast
- Do create a residential environment by mixing a variety of finishes in a pleasant way
- Do create contrast (carefully) to assist with wayfinding

Finish Considerations:

- Design should start with SAFETY as a priority while balancing caregiver effectiveness and homelike Aesthetics.
- Seniors typically see a loss of color saturation with a yellowing eye lens that worsens over time, finish selections need to take that into consideration.
- Ensure that wall finishes, floor finishes and furniture all have enough CONTRAST for those with impaired vision to see the change in plane
Enrichment

Innovations that Enhance Resident Independence While Providing Support

- Embrace innovative technology and new products
  - **Fitbit**, track residents’ activity levels to monitor decline
  - Grabcessories
  - Lean rail
  - Pull-down shelves in closets/kitchens
Recruitment & Retention

- Design great spaces for care providers to be nurtured at work to retain them.
- Amenities:
  - Daycare
  - Carpool/transportation incentives
  - Bicycle parking/shower facilities
  - Comfortable work environment (lighting, well thought out layouts that minimize travel distances and redundancies)
  - Lounges (internet cafes, access to natural light)

Aquaponics
Aquaponics

- A system of aquaculture in which the waste produced by farmed fish or other aquatic animals supplies nutrients for plants grown hydroponically, which in turn purifies the water.

**ENRICHMENT**

Aquaponics

- Traditional soil-based gardening issues:
  - Weeds, animals, pests
  - Amount of water required
  - Heavy digging, bending, back strain

- How Aquaponics changes things:
  - Waist-high aquaponics gardening eliminates weeds, back strain and small animal access to your garden
  - Reuse resources. Watering is integral to an aquaponics system
  - Uses 1/10th of the water compared to soil-based gardening
Intergenerational Daycare

- Potential for frequent interaction with children throughout their day
- Physical activity in playing with children
- Opportunities to play, laugh and enjoy the spirit and joy that children bring to their home environment
- Renewed sense of self-worth
- Opportunity to transfer knowledge and ability to serve as a role model

Animal Companionship

- Connecting seniors with animals
- Therapy animals
- Pet coordinator
- Pet grooming
- Pet walking
Virtual Reality

Expanding and enhancing a resident’s experience by providing a way for seniors to relax other than watching television, as well as a welcome change of scenery for those that can’t get out as much.

- “And for those unhappy in the present day, virtual reality might provide an escape into an immersive world that allows them to forget their chronic pain, anxiety, the fact that they are alone.” – Dr. Sonya Kim

- “...a new care modality to bring to a senior care setting like this, to inspire them to live another day, where they’re happy.” – Dr. Sonya Kim
Flexible Catalyst Spaces

- Lab space(s)
- Beer & wine making
- Makers studio
- Canning & pickling

Lighting
Lighting

- Natural Light wins over artificial light any day. But... make sure to carefully control natural light.

- Reduced Energy Costs/Consumption
  - Ranked only behind food service, hospitals, grocery stores. Assisted-living care facilities rank fourth in energy use intensity nationally.

- Artificial light should be LED whenever possible

- Embrace available incentives to help offset costs.

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Why is Well Designed Lighting Important?

- Benefits of well designed lighting, for both care providers and residents include:
  - Increased safety
  - Increased staff retention
  - Reduced need for psychotropic medication
  - Energy efficiency and reduced operating costs

- Research studies show an increased risk of cancer, particularly breast cancer, for night shift employees. Some studies suggest up to a 50% risk increase.
Light Color & Temperature

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Eye-to-Brain Pathways

1. Retina
2. Optic Nerve
3. Visual Cortex
4. Retinohypothalamic Tract (RHT)
5. Suprachiasmatic Nucleus (SCN)
6. Pineal Gland (Melatonin Secretion)
7. Spinal Cord
8. Superior Cervical Ganglion (Sympathetic Nervous System)
**Melatonin**

- Highest levels are produced at night.
- Regulates activity-sleep cycle and body temperature.
- Is not adversely affected by daytime light exposure.
- Reduced levels can negatively influence circadian rhythm.
- Healthy melatonin production can suppress cancer and cell growth.
- Production is reduced by nighttime exposure to light, particularly blue light.

**Effects of Blue Light**

How exposure to blue light affects your brain and body:

- The disruption to your sleep schedule might leave you dizzied and impair your memory the next day.

A poor night’s sleep caused by smartphone light can make it HARDER TO LEARN.

- Over the long term, not getting enough sleep can lead to NEURODEGENERATIVE diseases. This makes it even harder for you to get good sleep.

- People whose melatonin levels are suppressed and whose body clocks are thrown off by light exposure are more prone to DEPRESSION.

- By disrupting melatonin and sleep, smartphone light can also mess with the hormones that control hunger, potentially increasing OBESITY RISK.

- There’s some evidence that blue light could damage eye vision by harming the RETINA over time. More research is needed.

- Researchers are investigating whether or not blue light could lead to CATARACTS.

- There’s a connection between light exposure at night and the disturbance of sleep that come with it and an increased risk of breast and prostate CANCERS.
Circadian Rhythms

Why are they important for both staff and residents?

- Exposure to light increases impulse control, pleasure and alertness
- Exposure to darkness increases sleep, intelligence and memory
- Circadian rhythm disruptions occur from lighting and changes in work schedules. These often result in increased daytime sleepiness, insomnia, upset stomach, irritability and mild depression
- Adaptation to night shift work is possible with timed light exposure at night and light avoidance by day
- Intermittent bright light can reset the clock

Light and Dark

- Both light and dark are essential to good health
- Quality darkness is needed
- People often experience too little of both
- Lighting for well-being includes avoidance of discomfort
Tunable LED Lighting

What is Tunable LED Lighting?

- Tunable LED lighting had the capacity to change from cool to warm lighting based on a schedule, user input or ambient light levels. Additionally, lumen output can be controlled to change from high to low levels based on a schedule.

- Better matches the color of natural light, and therefore reduces the negative impacts of artificial light.

- “Light plays a key role in setting and regulating the body’s biological clock. Both the intensity and the spectral content of light can be used to stimulate or suppress the secretion of melatonin and other hormones that in turn affect our mood, alertness and health.”
Stack Lighting

- Stack Lamps as an option for technology lag in aesthetics of tunable lighting fixtures.
- Tunable White lighting fixture design is still catching up.
- Retrofit bulbs allow for the benefit of color changing light while using more residential light fixtures.

Stack Lighting
Case Study
Sacramento ACC Care Center

• Study Areas: Corridors, nurse stations and resident room(s)
• Objectives:
  • Better equip the caretakers and nursing staff to provide excellent care by improving the quality of lighting (e.g. reduced glare, better controllability) relative to the incumbent lighting.
  • Learn more about how tunable-white lighting impacts the sleep patterns, nighttime safety and other behaviors of residents, including those with Alzheimer’s or related dementia.
  • Provide illumination for the residents to safely navigate to and from the bathroom at night, without having to use the overhead lighting.
  • Provide low-level navigation lighting for nurses who enter the room at night, without the need to turn on additional lighting that could disrupt the residents’ sleep.
**Case Study**

- **Tunable light settings at corridors:**
  - 7AM – 2PM: 6500K @ 66% output
  - 2PM – 6PM: 4000K @ 66% output
  - 6PM – 7AM: 2700K @ 20% output

- **Tunable light settings at resident rooms:**
  - 7AM – 2PM: 6000K
  - 2PM – 6PM: 4100K
  - 6PM – 8PM: 2700K
  - Night-light option: 2400K

- Controlled by motion sensors, activated when the resident placed his or her feet on the floor near the bed or when a nurse entered the room.

- The amber color avoids wavelengths that have the most potential to suppress melatonin.
Case Study
Sacramento ACC Care Center

For the three months following the trial installation, the following occurred:

- An estimated 68% reduction in energy use relative to the incumbent system (from 3,641 kWh to 1,182 kWh) was measured. This is significant as the healthcare industry accounts for 9% of the energy used in commercial buildings, with lighting systems representing the largest electricity end use in healthcare.
- Reduction of behaviors such as yelling, agitation and crying
- Reduced psychotropic and sleep medication use by residents.
- Longer sleep periods at night by residents included in the study.
- Fewer resident falls.

Industry Feedback

- “In fact, by installing brighter lights on psychiatric ward, depressed patients had a three-day shorter duration of hospitalization.”
  Anna Wirz-Justice, PhD in Design and Health Scientific Review 2010

- “Patients getting more sunlight experience less stress and lower analgesic medication use.”
  Jeffrey M. Walch in Psychosomatic Medicine 67: 156-163, 2005

- “Bipolar depression: morning sunlight reduces length of hospitalization.”
  F. Benedetti et al in Journal of Affective Disorders 2001

- “Neonatal ICs: cycled lighting improves pre-term sleep and weight gain.”
  C.L. Miller et al in Infant Behavior and Development 1995
Summary

- Healthy environments result in happy care providers and residents
- Good design in Senior Living is about a careful balancing act of Function and Form
- Don’t underestimate the power of light.
- Tunable lighting is becoming more accessible, even in retrofits thanks to companies like Stack.

Questions?

Lisa Warnock & Ray Yancey
Email Lisa: LisaW@Myhregroup.com
Email Ray: RayY@myhregroup.com

Myhre Group Architects
620 SW 5th Avenue, Suite 500
Portland, OR 97204
Telephone: (503) 236-6000