Risks for falls increase with age and pose a major threat to the independence of older adults. The visual system plays an important role in maintaining balance, so age-related changes to the visual system can compromise postural stability. LRC researchers have designed two night-lighting systems that provide low ambient light, together with enhanced visual elements using linear arrays of light-emitting diodes (LEDs) or lasers. One system provided horizontal and vertical cues, accomplished by using linear LED arrays placed vertically along the sides of a doorframe and horizontally along the top of the doorframe, and a second system had laser lines outlining the pathway. By enhancing spatial elements in the room, older individuals can better orient themselves to the environment, thereby improving their balance.

**Experiment**

These new lighting techniques were tested with participants ages 65 and older who were categorized into two groups: those with a high risk and those with a low risk of falls. Participants were exposed to three lighting conditions: high, daylight-like light level provided by ceiling lights; low light level typical of a conventional wall-plug night light; and one of the novel night lighting systems, either using the horizontal and vertical LED arrays or the laser lines outlining the pathway.

**Results**

Using standardized tests for balance and gait measures, the data showed that the enhanced horizontal and vertical LED system enabled both groups to maintain balance significantly better than the wall-plug night light condition when transitioning from a sitting to a standing position. While walking, the laser lines outlining the pathway significantly increased velocity and reduced step length variability compared to traditional wall-plug night lights. These studies demonstrated that a novel night lighting system providing robust spatial cues is a practical and effective aid in reducing falls risk at night for older adults.

**Publications**


**Sponsor**

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