



## KEY POINT SUMMARY

### OBJECTIVES

The objective of this study was to show evidence of a quantitative relationship between daylight intensity and length of stay in hospitals.

### DESIGN IMPLICATIONS

The implications for design from this study: Patient rooms to be designed with access to daylight

## Impact of daylight illumination on reducing patient length of stay in hospital after coronary artery bypass surgery

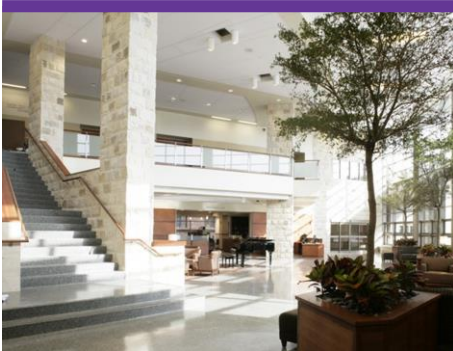
Joarder, A.R. & Price, A.D.F. 2012 | *Lighting Research and Technology*. Volume 45, Pages 435-449

### Key Concepts/Context

The authors indicate the lack of specificity in past research about the physiological impacts of daylight on the performance of an individual. They indicate that studies in the past did not incorporate true measurements given the many factors that could affect daylight and its measurement in an inpatient room. For this research, indoor data loggers were used to measure daylight intensity (accounting for patients/ family who may have adjusted the blinds on the windows) and its impact on the length of stay of patients was examined. They found that for every 100-lux increase in daylight illuminance, the length of stay decreased by 7.3 hours.

### Methods

The methodology involved the measurement of interior daylight intensity in patient rooms in a tertiary care hospital in Dhaka, Bangladesh. Indoor data loggers were installed at the wall behind the head side of each bed in 13 single-bed and nine two-bed rooms of the Cardiac Surgery Inpatient Unit (CSIU). To maintain reliability, patients of similar physiological state following cardiac artery bypass graft (CABG) were recruited. Data was collected between July 2009 and July 2010. Clinical and demographic data of the patients was collected from patient records. Daylight data was gathered between 6.00 a.m. and 6.00 p.m. During the data collection period, a total of 278 CABG patients were admitted to the CSIU. After eliminating patients for malfunction of equipment and lengths of stay shorter than 48 hours, the final sample size was 263. The dependent variable was length of stay and the independent variables included the demographic, clinical, and environmental data. The data analysis was done using multi-linear regression.



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## Findings

The study found that:

- Length of stay of patients was affected by three environmental variables - patient room rent, daylight and view of outside; and three clinical variables - heart rate, mean arterial pressure, and diabetes mellitus.
- Patient room rent, daylight, and views of the outside reduced length of stay ( $p < 0.001$ ,  $p = 0.016$ , and  $p = 0.037$ , respectively).
- With every 100-lux increase of daylight illuminance, there was a reduction in LOS by 7.3 hours.
- Having a view to the outside reduced LOS by 17.4 hours.

## Limitations

The authors mention the following to be limitations of their study:

- There were other factors whose measurements may have changed the final outcome of the study. These factors were:
  - Daylight reaching patient's eyes, direction of daylight, pattern of daylight, photic history and spectrum)
  - Non-clinical variables like profession, social and cultural differences related to family
- The assumption that the statistical relationship between daylight intensities and length of stay was linear

Other limitations of the study:

- There is no comparison made between lengths of stay of patients occupying single-bed rooms versus those in double-bed rooms.

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