

## Light and length of stay in hospital

**B L Diffey** PhD *Regional Medical Physics Department, Dryburn Hospital, Durham DH1 5TW*

**A Storey** BSc *Regional Information Systems Section, Northern Regional Health Authority, Newcastle upon Tyne NE1 4PY*

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### Summary

A study was carried out to examine whether the time spent as an inpatient in hospital showed a seasonal dependence which could be attributed to differences in ambient lighting levels between summer and winter. It was found that the season of admission to hospital did not make any appreciable difference to how long patients took to recover before they were discharged.

### Introduction

The belief that sunlight is beneficial to health has existed for more than two millennia. Sunbathing was prescribed by many early physicians for the treatment of countless diseases<sup>1</sup> and the practice has persisted into the 20th century<sup>2</sup>. In 1828 Hautrive wrote<sup>1</sup> 'We know how the gentle climate and sun of southern Italy and France contribute to the cure of the spleen of the bored Englishman . . . In the interior of houses and the narrow streets where there is no direct sunlight, find ways to deflect it'. An enthusiastic protagonist of the role of light in the proper care of the sick was Florence Nightingale. In her book<sup>3</sup> *Notes on Nursing* published in December 1859 she spoke of the 'acute suffering' caused by a sick person by being so placed that it is impossible to see out of the window.

It goes without saying that most of us are stimulated on a blue sky, sunny day and are depressed on a rainy, overcast day. The beneficial psychological response to bright light has been exploited recently in the treatment of certain forms of depressive illness using high levels of artificial illumination<sup>4</sup>, and it is pertinent to ask whether other diseases may be affected similarly. If it could be shown that patients spend less time, by and large, in hospital during the summer months, than in the winter months, there may be a case for increasing the levels of artificial illumination in ward areas during the winter, since, at this time of the year, the illumination in wards with the lights switched on is generally less than 5% of outdoor illumination levels in the summertime. Furthermore, many patients spend much of their recovery period sitting in the open air in the summer months but are confined indoors in the winter. Architects and lighting engineers are well aware of the importance of combining good lighting levels with visual contact with the outside world, and normally achieve this with a combination of daylight and artificial lighting.

Several million people are admitted to hospitals in the UK each year and, on average, patients will stay in hospital for about one week. The considerable economic cost of hospital admissions is well appreciated, and any means that might reduce the length of stay of patients, without compromising medical care, warrant investigation. The study described below

was designed to examine whether the time spent as an inpatient in hospital showed a seasonal dependence which could be attributed to differences in ambient lighting levels between summer and winter.

### Method

Patient admissions in the Northern Region during 1985 formed the basis of the data set. During this year, data were available for 334 828 discharges, having a total stay in hospital of 2.96 million days. Patients were divided into two groups; one group comprising those patients discharged during the summer (defined as April to September inclusive), and the other group consisting of patients discharged during the winter (January to March and October to December). Differences in the length of stay between the two groups of patients were examined using the log rank test for each of the International Classification of Diseases (ICD) categories 001-999. These diagnostic categories encompass virtually all hospital admissions.

### Results

Of the 999 diagnostic groups, a statistically significant ( $P < 0.05$ ) seasonally-dependent length of stay in hospital could be demonstrated in only 42 groups comprising a total of 26 979 patients (8% of the total inpatient admissions). Of these patients, two-thirds remained in hospital longer in the summer months than in the winter. This is contrary to the hypothesis that increased illumination levels in the summer aid in the patients' recovery. Instead, it may reflect the fact that fewer patients are admitted during the summer than in the winter and so the demand for bed occupancy is less acute.

### Discussion

This study has shown that the season of admission to hospital, and consequently the ambient illumination, does not make any appreciable difference to how long patients take to recover before they are discharged. It would appear, therefore, that although sunlight acts directly on man to alter his chemical composition, control the rate of his maturation and drive his biological rhythms, it does not influence his length of stay in hospital.

### References

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