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Admission to bed 13 in the ICU does not reduce the chance of survival

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ABSTRACT

Purpose: To examine whether admission to bed number 13 on our intensive care unit has any negative impact on the patient's hospital mortality.
Materials and methods: We conducted a retrospective cohort study of 1568 patients admitted to our ICU over a two-year period. Observed hospital mortality, predicted mortality using the ICNARC and APACHE II scoring systems and standardised mortality ratios were used to compared patients admitted to bed number 13 with those admitted to beds number 14–24.
Results: Of the 1568 patients admitted to ICU, 110 were placed in bed number 13 and 1458 into bed numbers 14–24. Demographics and ICNARC and APACHE II scores were similar between the two groups. There was no significant difference in the ICNARC predicted hospital mortality (mean 21.0%, median8.5% in bed 13 compared with a mean 17.5%, median 6.4% in beds 14–24, $p = 0.33$), APACHE II predicted hospital mortality (mean 18.4%, median 9.9% in bed 13 compared with mean 18.7%, median 8.9% in beds 14–24, $p = 0.74$), or observed hospital mortality (20.2% compared with 15.2%, OR 1.41 (CI 0.87 to 2.30), $p = 0.17$).
Conclusions: Admission to bed number 13 was not associated with a significant increase in hospital mortality when compared to admission to other bed numbers.

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1. Introduction

In many cultures around the world particular numbers are regarded as unlucky. For example, in modern popular culture the number 666 has been associated with the devil [1]. In East and South West Asia, the number 4 is avoided as it sounds similar to the word for death [2]. In Western cultures, the number 13 has long been associated with unlucky connotations [3], to the extent that those who fear or avoid the number are said to have triskaidekaphobia. The exact origin of the beliefs about number 13 is unclear, and several theories exist. In Nordic mythology the thirteenth guest at a dinner party for the gods killed another guest, leading to the Earth being enveloped in darkness [4]. English beliefs originating in the 1890s led to the 'Judas theory' in which Judas, the disciple who betrayed Jesus, was the thirteenth to sit at the last supper, although the Bible does not specify this [3]. More objectively, some believe that 13 is the first 'unfamiliar' number we come across in school when learning multiplication tables up to 12 [5]. The number 12 is often regarded as 'complete' as there are 12 Apostles, Gods of Olympus, Labours of Hercules, months of the year and signs of the Zodiac, and so 13 is unlucky [4].

An extension of triskaideokaphobia in Western culture is fear of Friday 13th – paraskevidekatriaphobia. This is believed to have originated from the fact that the mass arrest and execution of the Knights Templar began on Friday 13th 1307 AD [6]. A phobia is an irrational fear [7], but this has not prevented many from associating bad things with Friday 13th. In 2004, the Stress Management and Phobia Institute in North Carolina, United States of America estimated that $800-900 m were lost annually by businesses as employees refused to work or fly on Friday 13th [4]. Around 170 Friday 13th occur each century [8] and this belief is an excellent example of confirmation bias – people are more watchful for unfortunate events and are thus more likely to find and associate them with the date itself rather than simply occurring randomly.

A number of publications have examined the influence of Friday 13th and explored whether there is any scientific evidence of harm associated with it. A study in 1993 examined traffic flow on the M25, the London orbital motorway, on two Friday the 6th and the 13th in five separate months across a three-year period [9]. They discovered that despite significantly fewer vehicles on the road on Friday 13th, there were more traffic accidents on most of the Friday 13th compared with Friday 6th. Although admissions to emergency departments due to accident or poisoning were slightly higher on Friday 13th compared with Friday 6th, this difference was not statistically significant. However, another study utilising the Finnish road accident database compared Friday 13th to the previous and subsequent Fridays during the period 1989 to 2002 and found no significant difference in frequency of accident, likelihood of injury or admission to hospital in male or female patients [10].

Admissions due to acute coronary syndrome were no different on Friday 13th compared with other days of the month [11], but 5 other

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day/date combinations were associated with a statistically significant reduction in related mortality. Extending investigation to other superstitious beliefs and phobias, another group showed that Friday 13th, moon phase and Zodiac sign had no effect on surgical blood loss, frequency of emergency surgery or surgical complications [12].

Despite the paucity of evidence, triskaideokaphobia and paraskevidekatriaphobia have permeated many aspects of Western society, with over 80% of blocks of flats omitting floor number 13 and many airports and hospitals omitting gate and bed number 13 [4]. In our new hospital, which opened in May 2014, designers chose to include location and bed number 13 despite the aforementioned phobias. We sought to examine whether bed number 13 in our ICU was associated with a difference in patient outcome.

2. Materials and methods

The intensive care unit (ICU) at Southmead Hospital in Bristol is a 48-bed facility supporting general medical and surgical services for the local population as well as specialist regional services for neurosciences, major trauma, plastic and reconstructive surgery, urology and nephrology. The unit admits >2000 patients per annum and is divided in to four "Pods" (A to D), each containing 12 beds and run by its own consultant-led medical team. Beds number 13 to 24 are housed in Pod B.

A team of audit nurses collects and enters data on every patient admitted to the ICU using Ward Watcher software (Critical Care Audit Ltd). The ICU also participates in the Intensive Care National Audit and Research Centre's (ICNARC) case mix programme [13]. We used Ward Watcher to access data on all patients admitted to Pod B for the two-year period between 1st January 2015 and 31st December 2017. We then compared the characteristics and outcomes of patients admitted to bed number 13 to those admitted to beds 14 to 24. Predicted mortality was calculated using both the Intensive Care National Audit and Research Centre (ICNARC) model [13] and the Acute Physiology and Chronic Health Evaluation (APACHE) II model [14], allowing calculation of the standardised mortality ratio (SMR) from the predicted and observed in-hospital mortality. SPSS 24 (IBM Corp, released 2016) was used to perform statistical analysis, using Chi-Squared and Mann Whitney *U* tests as none of the data was normally distributed. Ethics Committee approval was not required for this study and no patients were involved in its development or design.

Since neither author confesses to a superstitious nature, our hypothesis was that there would be no significant difference between the mortality of patients admitted to bed number 13 and those admitted to beds 14 to 24.

3. Results

During the two-year period from 1st January 2015 to 31st December 2017, a total of 1568 patients were admitted to ICU Pod B at Southmead Hospital. One hundred and ten of these were placed in bed number 13 and 1458 in beds 14–24. The number of patients admitted to each bed space in the study period varied from 92 (bed 24) to 173 (bed 22), with a median of 128 admissions per bed space.

The group demographics were similar for patients admitted to bed 13 compared with those admitted to beds 14–24 in terms of age, gender, length of stay on the ICU and referring specialty (Table 1). The two groups had similar ICNARC and APACHE II predicted mortalities (Fig. 1). There was no significant difference between ICNARC or APACHE II predicted and observed hospital mortality in the two groups (Table 1, $p = 0.33$, $p = 0.74$ and $p = 0.17$ respectively). There was no significant difference in standardised mortality ratio using either the ICNARC or APACHE II models.

Table 1
Comparison of patient characteristics and outcomes between those admitted to bed 13 and those admitted into beds 14 to 24.

		Bed 13 (n = 110)	Beds 14–24 (n = 1458)	Significance
Gender % male		55%	57%	p = 0.82
Age median (IQR)		66 (21)	62 (25)	p = 0.10
Length of ICU stay (days) median (IQR)		2.9 (6.5)	3.2 (5.4)	p = 0.52
Specialty n (%)				p = 0.82
General Medicine		26 (23.6%)	339 (23.3%)	–
General Surgery		18 (16.4%)	190 (13.0%)	–
Neurosurgery		233 (30.0%)	494 (33.9%)	–
Obstetrics & Gynaecology		1 (0.9%)	3 (0.2%)	–
Plastics		2 (1.8%)	19 (1.3%)	–
Trauma & Orthopaedics		11 (10.0%)	183 (12.6%)	–
Urology		9 (8.2%)	92 (6.3%)	–
Vascular Surgery		10 (9.1%)	135 (9.3%)	–
ICNARC score median (IQR)		14 (11)	13 (11)	p = 0.38
APACHE II score median (IQR)		13 (9)	13 (9)	p = 0.80
ICNARC predicted hospital mortality	mean	21.0%	17.5%	–
	median (IQR)	8.5% (27.1%)	6.4% (20.5%)	p = 0.33
APACHE II predicted hospital mortality	mean	18.4%	18.7%	–
	median (IQR)	9.9% (24.6%)	8.9% (22.2%)	p = 0.74
Observed hospital mortality n (%)		22 (20.2%) (one case missing)	221 (15.2%) (three cases missing)	OR 1.41 (95%CI 0.87–2.30) p = 0.17
Standardised mortality ratio (ICNARC)		0.97 (95%CI 0.72–1.22)	0.87 (95%CI 0.78–0.95)	NS
Standardised mortality ratio (APACHE II)		1.09 (95%CI 0.73–1.45)	0.85 (95%CI 0.76–0.94)	NS

4. Discussion

There is a paucity of good quality research examining the true impact of the number 13 or the date Friday 13th in relation to medical outcomes. One demonstrated that despite a statistically significant reduction in road traffic on Friday 13th there was a trend towards greater admissions to emergency departments, but without statistical significance [9]. We believe our study is the first to examine whether bed number has any association with a patient's hospital outcome, or alternatively, whether patients admitted to bed number 13 in our ICU are "unlucky".

Triskaideokaphobia and paraskevidekatriaphobia have significant effects upon business [4], and it is widely recognised that hospital and hotel designers avoid assigning the number 13 to rooms, floors, wards and beds to address these phobias [15]. The designers of Southmead Hospital's new Brunel Building, which opened in May 2014, included bed number 13 across the hospital's clinical areas. Our study demonstrates that this decision has not compromised intensive care patients' outcomes. We hope that our data will reassure patients, their families, and indeed staff members who may have this phobia, and encourage a less superstitious and a more sensible approach to the numbering of hospital wards and beds.

Over the two-year period analysed, different numbers of patients were admitted to each bed space during the study period, with fewer than the median admitted to bed 13. This is almost certainly a random observation due to the relatively small number of patients in the study and, the l layout of our ICU Pod B where beds 13 and 24 are designed to be suitable as isolation rooms and therefore not immediately utilised, to ensure an isolation facility is available in the Pod should it be required.

Patients admitted to bed number 13 had similar outcomes to those admitted to beds 14–24 and there were no statistically significant differences between the two groups. The SMR derived from the more United Kingdom specific ICNARC model, was remarkably similar for both groups of patients, and is also in line with our overall ICU SMR in recent years. There was also no difference in the SMR derived from the APACHE II model.

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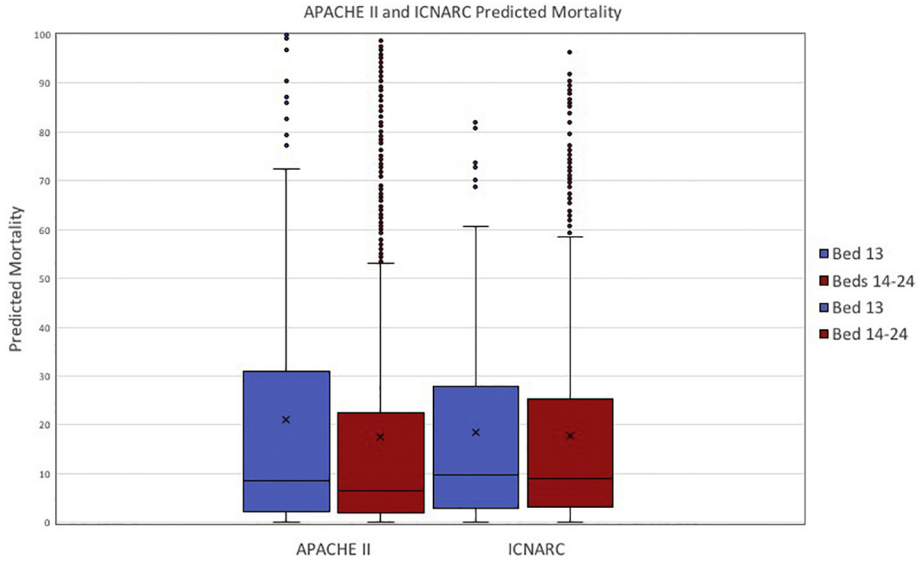

Fig. 1. Comparison of APACHE II and ICNARC predicted mortality between Bed 13 and Beds 14-24.

We conclude that admission to bed number 13 does not reduce the patient's chance of survival to hospital discharge, and that there is a need to reassure people with triskaideokaphobia that they have little to fear from being admitted to our ICU bed number 13. Indeed, in our ICU they can be assured that they remain less likely to die than scoring systems may predict. These data, and potentially data from other centres with bed number 13 may further support this conclusion.

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Conflict of interest

The authors declare that they have no conflict of interest.

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