



# BMJ Open Undergraduate exposure to patient presentations on the acute medical placement: a prospective study in a London teaching hospital

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## ABSTRACT

**Objectives** To identify the availability and variability of learning opportunities through patient presentations on an acute medical placement at a teaching hospital.

**Design** A prospective study evaluating all acute admissions to the Acute Medical Unit over 14 days (336 hours). Clinical presentations and the day and time of admission were recorded and compared with the learning outcomes specified in the medical school curriculum.

**Setting** An Acute Medical Unit at a London teaching hospital.

**Outcomes** (1) Number of clinical presentations to the Acute Medical Unit over 14 days and (2) differences between the availability and variation of admissions and presentations between in-hours and out-of-hours.

**Results** There were 359 admissions, representing 1318 presentations. Of those presentations, 76.6% were admitted out-of-hours and 23.4% in-hours. Gastrointestinal bleeding, tachycardia, oedema and raised inflammatory markers were over three times more common per hour out-of-hours than in-hours. Hypoxia was only seen out-of-hours. Important clinical presentations in the curriculum such as chest pain and hemiparesis were not commonly seen.

**Conclusions** There is greater availability of presentations seen out-of-hours and a changing landscape of presentations seen in-hours. The out-of-hours presentation profile may be due to expanded community and specialist services. Medical schools need to carefully consider the timing and location of their clinical placements to maximise undergraduate learning opportunities.

## BACKGROUND

Clinical placements within the healthcare delivery system are an essential element of undergraduate medical education.<sup>1</sup> However, the structure of healthcare delivery is constantly evolving to adapt to the changing needs of the population.<sup>2</sup> In recent years, these developments have included increasing numbers of specialist and community-based services, as well as enhanced out-of-hours services.<sup>2</sup> These changes to the healthcare system may mean that some patients

## Strengths and limitations of this study

- This study demonstrates the profile and variations of clinical presentations, and thus learning opportunities, in-hours and out-of-hours, at a London teaching hospital, which informs medical school curricula.
- The duration and timing of the study was a limitation as collecting data during a different time of the year, or over a longer period, may yield a greater or lesser variety of presentations.
- The study included a single centre only, which limits the generalisability of the results.

traditionally seen in Acute Medical Unit are being redirected to specialist centres in the first instance, managed in the community or are more likely to be admitted out-of-hours.<sup>3–6</sup>

As such, the educational opportunities experienced by medical students on traditional clinical placements may also be changing. In the UK, there is currently no regulatory obligation for medical schools to provide undergraduates with out-of-hours placements prior to the student assistantship recommended in their final year of study.<sup>7,8</sup>

However, it is well documented that overnight experiences provide important educational opportunities, particularly for admitting, following through and managing new patients in the acute and emergency setting, which only a minority of students will experience prior to their last year of medical school study.<sup>9–12</sup> Furthermore, early exposure to clinical environments which enables students to follow up and manage patients in a similar capacity to junior doctors, allows for better transition from student to clinician.<sup>13</sup>

With the changing nature of clinical practice, medical schools need to review the timing and location of their clinical placements to ensure students receive the full breadth of

clinical exposure required to obtain the competencies expected of medical graduates.<sup>1</sup>

At the Imperial College School of Medicine, the initial acute medical placement forms part of the year 3 medicine rotation. This in turn accounts for one-third of the clinical placements in year 3. During this year, students also attend a taught course in which they learn about acute medical presentations through a range of teaching modalities, including interactive lectures and team-based learning. The key learning outcomes include becoming proficient in medical history-taking, performing systematic physical examinations, formulating differential diagnoses, and planning initial investigations and management for core presentations and conditions. These learning objectives are further reinforced in the senior medical placement in the final year of medical school.

The aim of this pilot study was to identify the availability and variability of learning opportunities through patient presentations, and assess whether the traditional acute clinical placement continues to provide the educational opportunities expected for undergraduates.

## METHODS

### Data collection

All acute medical admissions at a London teaching hospital were evaluated over a continuous 14-day period, totalling 336 hours. New admissions to the medical team were identified using the electronic patient records and data were collected anonymously using a digital proforma. The date, time, age, gender and clinical presentations of each patient were collected based on the electronic patient admission documentation. All data were double-coded and agreed by two individuals. Clinical presentations were defined as any symptom, physical

sign or abnormal investigation result, as per the core presentations in the Imperial College School of Medicine curriculum, which was present on admission to the Acute Medical Unit. Patients with multiple reports would have all clinical presentations included in the dataset.

### Patient and public involvement

No patients were involved.

### Analysis

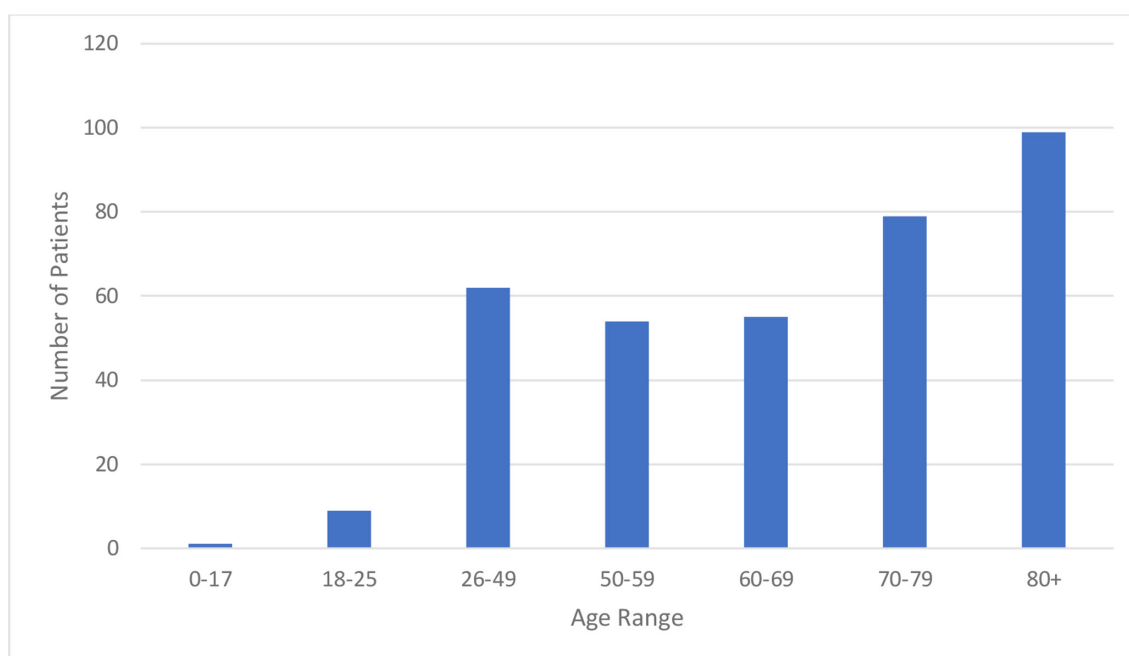
The number and type of presentations admitted per hour in-hours and out-of-hours were compared. In-hours was defined as weekdays Monday to Friday between 09:00 and 17:00 and out-of-hours as weekdays between 17:00 and 09:00 and weekends.

## RESULTS

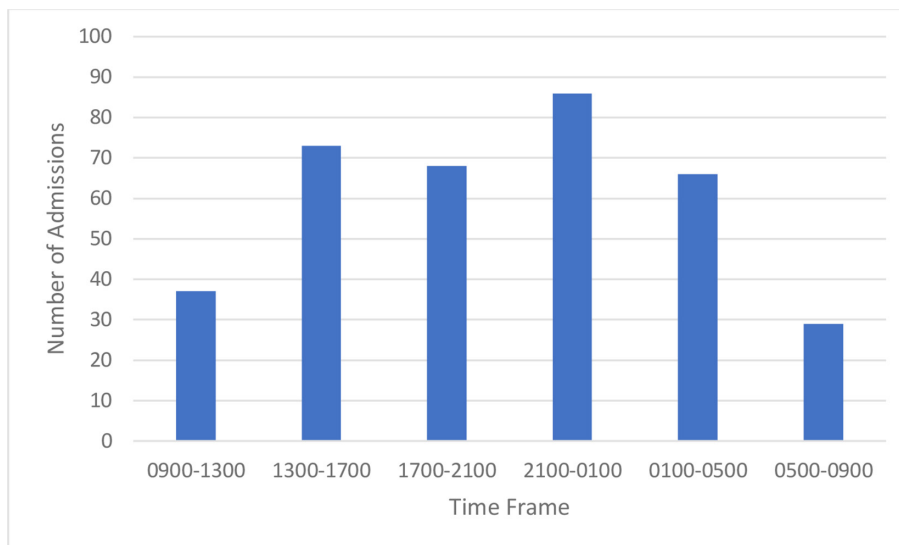
During the continuous 336-hour period, there were 359 acute medical admissions. All admissions during this period had electronic admission documentations. The 359 admissions accounted for 1318 presentations. Male patients accounted for 49.9% of the admissions, and female patients accounted for 50.1%. The median age of the patients admitted was 69 years (range 17–101 years) ([figure 1](#)).

Of the 359 acute medical admissions, 76.6% of these were admitted out-of-hours, with only 23.4% admitted in-hours. The busiest period on any given day during the 2 weeks for acute medical admissions was between 21:00 and 01:00 ([figure 2](#)).

The 359 admissions represented 91 unique presentations. Of the unique presentations, 63.7% were more commonly seen out-of-hours compared with 36.3% in-hours.



**Figure 1** Number of patients in various age ranges admitted to the Acute Medical Unit during the 2-week period.



**Figure 2** Number of admissions in each time frame during the 2-week period.

Four presentations (gastrointestinal bleeding, tachycardia, oedema and raised inflammatory markers) were over three times more common per hour out-of-hours compared with in-hours (figure 3). Hypoxia was only seen out-of-hours during the continuous 336 hours of data collection. There was also a 40% increase in patients admitted with more than one cardiorespiratory presentation per hour during out-of-hours compared with in-hours.

Key presentations in the undergraduate medical curriculum, such as chest pain and hemiparesis, were the 9th (42 cases) and 52nd (3 cases) most common medical presentations seen on the Acute Medical Unit during this period.

## DISCUSSION

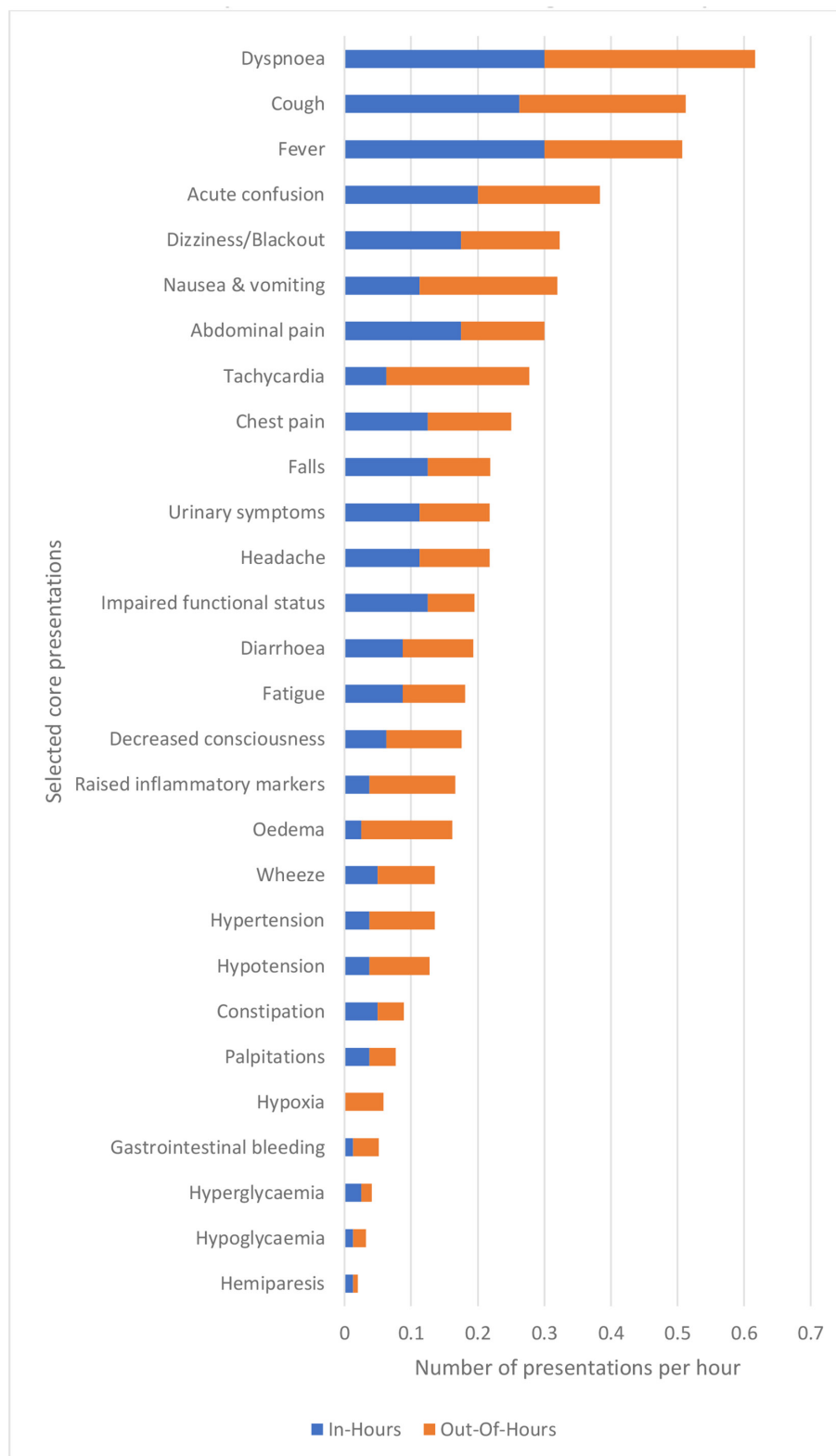
Current acute medical placements continue to offer a wide range of presentations and learning opportunities to medical students. Our data represent the potential exposure to acute medical presentations over a continuous 14-day period (336 hours). To achieve an equivalent number of hours of exposure, students would need to spend 8 weeks, consisting of five 8-hour shifts per week, on the acute medical placement.

Student exposure to certain clinical presentations is limited in-hours and more key curriculum presentations are seen per hour during out-of-hours. The difference was especially noted for hypoxia, gastrointestinal bleeding, tachycardia, oedema and raised inflammatory markers, with hypoxia only being seen out-of-hours during this period. Fewer clinical presentations may have been admitted per hour in-hours due to expanded primary care and community services or delays in transportation to secondary care.<sup>4 5 14 15</sup> It is also possible that the increase of certain presentations out-of-hours, such as hypoxia, may be due to higher frequency of investigations outside normal working hours.

Furthermore, presentations such as chest pain and hemiparesis were less commonly seen. These presentations are typically associated with myocardial infarction and stroke and may have presented less to the Acute Medical Unit due to increased numbers of specialist centres such as Heart Centres and specialist Stroke Units.<sup>2 3</sup>

With no requirement for undergraduate acute medical placements to be scheduled out-of-hours, students may be exposed to fewer, less variable and less acute presentations per hour during in-hours placements compared with placements that include more out-of-hours shifts.<sup>4 7 14 16</sup> This could potentially lead to fewer educational opportunities to follow up and manage new patients in the acute and emergency settings.

Certain conditions are better seen and learnt about in the Acute Medical Unit. However, our findings suggest that particular presentations, such as chest pain, hemiparesis, gastrointestinal bleeding and hypoxia, may not be seen sufficiently frequently in a predominantly in-hours acute medical placement. This suggests that for students to gain adequate experience in the diagnosis, investigation and management of these cases, they may require additional exposure to these presentations outside the current acute medical placements. This could be achieved through adjusting the timing of the acute medical placement to include more out-of-hours shifts, and including placements based at specialist centres and in the community.<sup>17</sup> These adjustments, however, will need to be balanced against the demand on out-of-hours workforce and teaching, and the impact on student availability for in-hours learning the following day. Increasing out-of-hours undergraduate clinical placements on the Acute Medical Unit may require more student-led learning methods, such as task-based learning, and increased adoption of educational toolkits, such as the Royal College of Physicians' 'Teaching on the Acute Medical Unit' toolkit.<sup>18 19</sup>



**Figure 3** Frequency of selected core presentations admitted to the Acute Medical Unit per hour in-hours compared with out-of-hours during the 2-week period.

This pilot study is limited by the duration and timing of the data collection which was conducted during the summer. It is possible that collecting data during a different time of the year, or over a longer period, may yield a greater or lesser variety of presentations due to

different service pressures. Furthermore, additional data such as the source of admission, that is, from general practice or the emergency department, and 'Early Warning Scores' at presentation, may also provide greater insight into the variation of clinical severity, and thus learning

opportunities, between in-hours and out-of-hours. This pilot included a single centre only, which limits the generalisability of the results. Further study of other Acute Medical Units at a variety of teaching and general district hospitals would be required to identify whether these results are consistent across both settings and how these placements complement other experiential learning opportunities offered in each medical school curriculum.

## CONCLUSION

Medical schools need to carefully consider the location and timings of their acute medical placements to maximise the learning opportunities experienced by medical students. This may include introducing formal out-of-hours placements and incorporating placements in specialist centres and community-based units.

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**Patient consent for publication** Not required.

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**Data availability statement** Data are available upon reasonable request.

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