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Hrisheekesh J. Vaidya

Alexander W. Emery

Emma C. Alexander

Angus J. McDonnell

Charlotte Burford

See next page for additional authors

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Authors
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Clinical specialty training in UK undergraduate medical schools: a retrospective observational study

Hrisheekesh J Vaidya, Alexander W Emery, Emma C Alexander, Angus J McDonnell, Charlotte Burford, Max K Bulsara

ABSTRACT

Objectives To determine if increased exposure to clinical specialties at medical school is associated with increased interest in pursuing that specialty as a career after foundation training.

Design A retrospective observational study.

Setting 31 UK medical schools were asked how much time students spend in each of the clinical specialties. We excluded two schools that were solely Graduate Entry, and two schools were excluded for insufficient information.

Main outcome measures Time spent on clinical placement from UK undergraduate medical schools, and the training destinations of graduates from each school. A general linear model was used to analyse the relationship between the number of weeks spent in a specialty at medical school and the percentage of graduates from that medical school entering each of the Core Training (CT1)/Specialty Training (ST1) specialties directly after Foundation Year 2 (FY2).

Results Students spend a median of 85 weeks in clinical training. This includes a median of 28 weeks on medical firms, 15 weeks in surgical firms, and 8 weeks in general practice (GP). In general, the number of training posts available in a specialty was proportionate to the number of weeks spent in a specialty at medical school, with some notable exceptions including GP. Importantly, we found that the number of weeks spent in a specialty at medical school did not predict the percentage of graduates from that medical school entering that specialty at CT1/ST1 level (β coefficient=0.061, p=0.228).

Conclusions This study found that there was no correlation between the percentage of FY2 doctors appointed directly to a CT1/ST1 specialty and the length of time that they would have spent in those specialties at medical school. This suggests that curriculum adjustments focusing solely on length of time spent in a specialty in medical school would be unlikely to solve recruitment gaps in individual specialties.

INTRODUCTION

The National Health Service is facing unprecedented recruitment pressures, particularly in areas such as general practice (GP). In 2015, the Department of Health set a specified target to recruit an extra 5000 GPs by 2020. However, there are concerns this target may not be met. Other areas are also facing pressures, notably psychiatry and emergency medicine. It has been suggested that increasing exposure to these specialties at medical school may help increase recruitment. We wished to investigate this hypothesis.

After medical school, doctors in the UK enter a 2-year Foundation programme...
(FY1, FY2), the completion of which allows entry into a specialty training programme after a competitive application process. Approximately half of FY2 doctors progress directly into these training programmes, while the other half take time out or do not continue postgraduate training. Further specialty training takes the form of Core Training (CT1) or Specialty Training (ST1) programmes. Core training programmes are generally 2 years long, and trainees then progress into specialty training programmes (ST3), whereas specialty training programmes run straight through from ST1 to completion of training.

Several factors may influence the specialty that doctors choose to enter, including personality traits, perceptions of the work-life balance, length of training and quality of placements during medical school. These have generally been studied through questionnaires of medical students or junior doctors. Outside of the UK, studied approaches to increase recruitment to hard-to-recruit specialties or rural areas have included placing students local to home, early sign-ups for medical internships and mentoring, with some studies suggesting that positive rural placements lead to increased interest in rural practice. Within the UK, it has also been suggested that length of exposure to a medical specialty at medical school influences career choice. Based on this, it is argued that medical school curricula should be more appropriately tailored to the recruitment demands of the 21st century.

Recent research appears to have identified an association between the quantity of clinical GP teaching at medical school and entry into UK GP training; Alberti found that there was a statistically significant association between the quantity of clinical GP training and the percentage of graduates entering the GP training pathway directly after FY2. However other specialties have not, to our knowledge, been examined in the same way. The majority of other evidence supporting the suggestion that exposure determines later choices comes from surveys conducted during medical school, where students are asked either about their interest in pursuing a specialty after having been exposed to that specialty on placement, or about their perceptions or attitude to that specialty as a whole. However, preferences at this point may be transient and so not actually have an impact on future career decisions. Furthermore, historical trends do not appear to show that progressive increases in exposure to general practice over the last 30 years have correlated with an increase in the proportion of UK graduates entering GP training.

In the UK, the General Medical Council supports and regulates medical education, and is responsible for quality assurance. Medical schools are free to design their own curricula, which must give medical students experience in a range of specialties, in different settings, with the diversity of patient groups that they would see when working as a doctor. We wanted to understand the current exposure to different medical specialties at UK undergraduate medical schools and examine how this compared with the number of posts available at CT1/ST1. We also wanted to examine the relationship between exposure to clinical specialties at medical school and the percentage of each school’s graduates being appointed to each postgraduate CT1/ST1 specialty training programme directly after FY2.

### METHODS

#### Data collection

Freedom of Information (FOI) requests were sent to all 29 UK undergraduate medical schools asking how much time students spend on placement in each of the medical specialties as part of their clinical education. We excluded schools that were solely Graduate Entry due to differences in the structure of their curricula, and we also excluded recently established schools who had not yet produced medical graduates. Where data were missing, or medical schools did not respond, we accessed university websites (March 2017) to obtain as complete a dataset as possible.

An additional FOI request was sent to Health Education England (HEE) to determine the medical school attended by each doctor entering a specialty training programme immediately after foundation training in 2016. This used the self-declared appointments of FY2 doctors completing the mandatory National F2 Career Destination Survey 2016. Approximately half of these doctors did not enter any specialty training programme at this point. We received permission from HEE to publish the data in a journal.

Finally, we accessed publicly available data on 2016 specialty training posts and applications from the HEE website.

#### Patient and public involvement

There was no patient or public involvement in this study.

#### Data cleaning

Data were collated into a spreadsheet and analysed with Microsoft Excel 2016, SPSS V.24.0, and SciPy (Scipy V.0.19.1, Python V.3.6.0).

Any medical schools for which we could only classify a number of weeks less than one IQR below the lower quartile (Q1-IQR) were excluded due to insufficient data. The names and scope of individual curricula components differed between medical schools. We therefore standardised the curricula based on the training programmes offered by HEE so that appropriate curriculum components were linked with their relevant CT1/ST1 specialty (online appendix table A1). As very few medical schools offered cardiothoracic surgery, maxillofacial surgery or neurosurgery specifically, and all three are available at both ST1 and ST3 level, we combined these into surgery.
Special attention is drawn to the components of the Acute Care Common Stem (ACCS) programme: Emergency Medicine, Anaesthetics, Critical Care, Acute Medicine. The latter two of these were combined into Medicine for the first part of the analysis, as this is how HEE group the subjects. However, for the final part of our analysis, specialty information from the survey carried out by the UK Foundation Programme Office (UKFPO) was provided with data grouped as ‘ACCS’ and ‘Anaesthetics’. We collated both into a single ‘ACCS’ specialty, and compared this with a composite category from our curricula data with all four ACCS components (figure 1).

Statistical models

A Shapiro-Wilk test for normality was performed using SPSS V.24.0 to determine appropriate descriptive statistics to describe our data. The Shapiro-Wilk test for normality revealed that data for two specialties, ACCS and ophthalmology, were non-normally distributed, so the median was used to describe all data.

A general linear model was used to analyse the relationship between the number of weeks spent in a specialty at medical school and the percentage of FY2 graduates from that medical school entering each of the CT1/ST1 specialties.

RESULTS

Current clinical curricula at UK undergraduate medical schools

Our FOI requests gathered responses that detailed placement time for all clinical years from 24 of the 29 established undergraduate medical schools in the UK. Three of the five remaining schools had sufficiently detailed information on their websites for our analysis. The remaining two medical schools were excluded due to insufficient data, leaving 27 medical schools in our analysis.

UK medical students spend a median of 85 weeks in clinical training, with a wide variation between medical schools (range 64–99, figure 2).

During this time, a median of 28 (IQR 22–35) weeks is spent in medical specialties, 15 (IQR 11–18) weeks in surgical specialties and 8 (IQR 5–10) weeks in GP (figure 3). The remaining time is spent on obstetrics and gynaecology, paediatrics and psychiatry (6 weeks each), ophthalmology (1 week; figure 3) and other specialties.

Notably, most medical schools had several weeks that could not be classified, as the information provided by the medical school was unclear, or it varied between students, such as in student-selected components (also known as ‘special study modules’) or FY1 shadowing/student assistantships. Medical schools had a median of 5.2 weeks in this ‘Unknown’ category.

From the available data it appeared that some specialties lacked dedicated time within the curricula of most medical schools. Notably, of 27 schools, only 10 reported dedicated time in anaesthetics, only six for public health and three for clinical radiology. None of the medical schools allocated any clinical time specifically to histopathology that was labelled as such.

Median medical school exposure and number of CT1/ST1 training posts and applications

We first examined the median exposure to a specialty across all medical schools, and compared this with the total nationwide number of training posts available in that specialty at CT1/ST1 level (figure 4). Excluding GP, there is a statistically significant positive relationship between the median length of time spent in a specialty at medical school and the number of training posts available in that specialty at CT1/ST1 level (when excluding GP, correlation=0.91, p<0.001). GP is notable for having a much higher proportion of jobs available (3802 posts, 43% of all CT1/ST1 jobs) compared with the number of weeks spent on clinical attachment at medical school (median 8 weeks; less than 10% of time in the clinical years of medical school). To better visualise specialties that were comparatively over-represented or under-represented at medical school, we have plotted a line of best fit for all hospital specialties (ie, excluding GP).
We found similar results when we considered median medical school exposure and the total number of applications to CT1/ST1 posts (online appendix figure 1).

**Medical school exposure and number of alumni entering CT1/ST1 specialty training after FY2**

The data obtained from HEE included 6752 respondents from 34 UK medical schools and categories for non-UK European Economic Area and non-European Economic Area schools. Of these, 3231 doctors (47.85%) reported that their next destination was specialty training in the UK. Non-UK and graduate medical schools were excluded, as were those responses that were left blank. This left 2672 responses. These results were normalised with the total number of respondents as the denominator, to give the percentage of respondents from each included medical school that picked a particular specialty (including GP). This was then compared with the number of weeks that students from that medical school spend on that specialty.

A generalised linear model was fitted to investigate the relationship between medical school exposure and number of alumni entering specialty training. The dependent variable was the percentage of graduates from each medical school who entered a specialty after FY2, and the independent variables were the number of weeks during medical school spent on that specialty, the specialty, and the medical school. Our model shows the number of weeks of training does not have any impact on the percentage of alumni choosing the specialty (β coefficient=0.061, p=0.228).

A scatter plot (figure 5) visualises this relationship. Overall, there is a clear correlation between the number of weeks spent on a specialty and the percentage of doctors picking that specialty after FY2: medical students spend more weeks in specialties that have more jobs. However, looking at any individual specialty, there is no association; that is, changing the number of weeks spent on a specialty between medical schools has no impact on the percentage of FY2 doctors entering that specialty.

**DISCUSSION**

We found that the clinical curriculum in medical schools across the country varies widely, both in the total number of weeks spent in clinical education, and in how this time was divided among different clinical specialties. This division of time in medical school is generally proportional with the number of posts available at CT1/ST1 level,
with the notable exception of GP. However, we found no
evidence that spending more weeks on a specialty place-
ment at medical school had any effect on a students’ like-
ilhood of entering that subject at CT1/ST1 level.

Compared with the percentage of CT1/ST1 jobs available,
students spent a disproportionately long time in medical
school on obstetrics & gynaecology and surgical special-
ties. Conversely, GP was under-represented, with students
spending a median of 8 weeks (9%) on GP placements,
even though over 40% of CT1/ST1 posts were in GP. Simi-
larly, students spent less time in the ACCS specialties than
the number of CT1 jobs would imply is appropriate, and 17
schools did not report any formal time in anaesthetics.
We also found that most medical schools did not allo-
cate and label any specific clinical time on radiology, histo-
pathology or public health. It may be argued that much of
the content of these specialties is covered in preclinical
and extraclinical education, and some specialties have
greater crossover than others—for example, radiology
is interwoven into most other specialties; positive expo-
sure to obstetrics could make a student more sympathetic
to surgery in general; end of life experiences across all
specialties could encourage an interest in palliative medi-
cine. Similarly, the lower amount of time spent on GP
placement may simply be because many of the diseases
and treatments experienced in GP are also encountered
across the various hospital specialties.

However, their exclusion may force many doctors to seek
exposure during taster weeks in the foundation years if they
wish to experience the day-to-day life of doctors in these
specialties. This is significant as data from UKFPO (2016)
show that 62% of doctors do not change their first prefer-
ence of specialty training programme over the course of
their Foundation years.21 Of those that do, 19.7% preferred
a different specialty, rather than being deterred from their
original choice due to a negative rotation (3%) or due to
a change in personal circumstances (7.8%).21 Additionally,
some competitive specialties such as neurosurgery usually
require a rich CV with multiple publications in order to
secure a training number, which may be hampered by insuf-
cient exposure during medical school. Overall, however,
our data suggest that relative exclusion or overemphasis of
specialties does not appear to affect career decisions. This is
contrary to previous studies that used survey responses after
medical school placements.11 14-16

Our results also differ from a study conducted by Alberti et
al using data from doctors starting GP training in 2014 and
2015, which had reported a significant association between
the quantity of ‘authentic’ GP teaching in medical school
(defined as teaching in a practice with patient contact) and
the percentage of graduates entering GP training9 directly
after FY2. We looked at all specialty training programmes,
including GP training, and found no association. This
difference may be explained by a number of factors. First, a
statistically significant association (defined without correc-
tion for multiple analyses at P=0.05) was only found in the
subgroup analysis for ‘authentic GP teaching’ whereas
our analysis may have also captured non-clinical specialty
exposure during clinical years, for example through small
group teaching. Second, the observed association was weak;
Alberti reported correlation coefficients of 0.41 and 0.3 for
2014 and 2015 respectively.

This result does not exclude the possibility that time
spent on specialty rotations does affect career preference,
rather that whatever that effect may be did not translate
to a measurable change in specialty training choice in our
study. Any effect may also be masked by other factors. For
example, some students may be dissuaded from doing
a specialty after placement time, or doing a placement
may encourage students to choose a specialty, but in a
non-linear way—such that doing 10 weeks may be no more
influential than doing 1 week. As reported in Burford et
al when investigating student interest in the brain-related
specialties, factors such as a negative experience on place-
ment were self-reported as deterrents, but additional
factors such as positive experiences during intercalated
degrees may be influential.22

We believe our study is the first to consider actual career
destinations of all UK CT1/ST1 doctors in a single year
and attempt to correspond these with the clinical curricula of their medical school. We acquired
unpublished data directly from nearly all medical schools
in the UK from HEE, and hope this resource may be
helpful for educators and students.

There were several limitations in our methodology.
First, we looked at 2016/17 data for the medical school
curricula, and 2016 data for CT1/ST1 jobs. However,
drivers applying in the 2016 cycle would have completed
medical school in 2014. The curricula at their medical
school may have changed in that time.

Second, we looked at just 1 year’s worth of data, while
the number of doctors entering each training programme
changes year-on-year. However, this year-on-year variation
is small relative to the differences between specialties
(online appendix figure 2).

Furthermore since our data were from UKFPO’s report
on destinations after FY2, we only have information on
doctors who are directly progressing to ST1/CT1 immedi-
ately after FY2. We do not have information on the special-
ties chosen by the 50.4% of doctors who did not directly
enter specialty training after FY2. These graduates may
disproportionately be those attempting to enter competi-
tive specialties, or doctors who are still undecided between
multiple specialties, and therefore the specialty decisions of
these doctors remain unknown.

Thirdly, it is possible that some exposure to certain
specialties was not captured by our study. Every medical
school we studied had some time allocated for student-se-
lected components (special study modules), or assistant-
ships. The specialties involved in these components of
clinical courses would vary from student to student, and
so we could not categorically allocate it to any individual
specialty. A median of 5.2 weeks (IQR 3.6–12) is spent
on this ‘Unknown’ category, and for some students this
will have included specialties we thought were under-rep-
resented or over-represented. Indeed, student-selected
components are frequently chosen in the specialties
students most think they wish to do in the future, and
therefore this ‘Unknown’ may hide the most formative
weeks in a student’s clinical education.

In addition, it should be mentioned that some medical
schools are moving towards earlier clinical contact even
from the first year. This is particularly the case for GP
where some schools conduct visits once a week during
the traditionally ‘preclinical’ years. Depending on how
universities interpreted our request, such exposure could
have been missed.

Finally, we do not have a breakdown of which specialty
each doctor applied to for their CT1/ST1 job based
on their medical schools. The application process is
competitive, so even if spending longer on a placement
increased an applicant’s desire to enter a specialty, this
may not show itself in the numbers of candidates who
were successful. We do note however that on a nation-
wide scale, the specialties that that are oversubscribed at
CT1/ST1 level are not those that are over-represented
in medical school.21

CONCLUSION

UK medical school curricula are heterogeneous, with
different universities allocating often vastly different
amounts of time to different specialties. Across the UK
as a whole, the amount of time spent in medical school
on a specialty is approximately proportional with number
of specialty training posts available in that specialty, with
notable exceptions including GP. However, analyses from
our study have suggested that the amount of time spent
in different specialties at medical school does not impact
on the likelihood of graduates from that medical school
entering that specialty directly after completion of foun-
dation training.

Our findings challenge the perception that increasing
specialty exposure enhances recruitment and suggest that
curriculum adjustments focusing solely on length of time
in certain settings will not resolve recruitment gaps going
forward.

Contributors HJV, AWE and AJM conceived of the study and its design. ECA and
AWE completed initial data collection and HJV, AWE and AJM completed data
extraction. MKB and HJV completed the statistical analysis and CB assisted. HJV
and AWE wrote the majority of the first draft, and the other authors contributed to
refining it. All authors then contributed to refine and review the final draft and gave
their consent for submission. HJV serves as the guarantor for this piece.

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