The effect of medical school on postgraduate fitness to practise decisions: a retrospective cohort study

Given evidence of differences between UK medical schools' curricula and assessments, and their graduates' performance in Royal college examinations, this retrospective cohort study analyses the effect of medical school on the incidence of General Medical Council fitness to practise sanctions.

The General Medical Council is responsible for ensuring that the graduates of all UK medical schools are competent and fit to practise medicine. The specific learning outcomes which must be met by graduates are set out in the General Medical Council's *Tomorrow's Doctors* (General Medical Council, 2009) and monitored by their Quality Assurance of Basic Medical Education programme. There is evidence that medical schools in the UK differ in the methods used to select students (Parry et al, 2006), as well as their curricula (Howe et al, 2004), the assessments used for graduation (McCrorie and Boursicot, 2009) and the passing standards set (Boursicot et al, 2006, 2007). Perhaps as a result of these differences, graduates of different medical schools perform differently in various Royal college examinations (Wakeford et al, 1993; McManus et al, 2008; Bowhay and Watmough, 2009; Rushd et al, 2012).

Another postgraduate outcome is the professional behaviour of doctors, which in the UK is monitored by the General Medical Council, who can impose sanctions or restrictions on doctors if their fitness to practise medicine safely, competently or professionally has been compromised. The General Medical Council has identified that male doctors and those obtaining their primary medical qualification overseas are at an increased risk of being found unfit to practise medicine and obtaining higher severity fitness to practise sanctions (General Medical Council, 2011b,c).

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There is no evidence comparing the rates of fitness to practise sanctions between graduates of different medical schools in any country, although data from the USA suggest that there is a difference in the likelihood of malpractice lawsuits between graduates of different medical schools, and that schools categorised as having a high percentage of graduates sued for malpractice tend to remain in that category (Waters et al, 2003).

Given the debate as to whether a national test of knowledge should be introduced on graduation from medical school in the UK (Noble, 2008; Ricketts and Archer, 2008), more evidence regarding the extent of any differences in postgraduate outcomes between graduates from different medical schools is required. This study evaluates the effect of medical school attended on the likelihood of having a current General Medical Council fitness to practise sanction for doctors who qualified between 2002 and 2011 inclusive.

Methods

Study design and data collection

A retrospective cohort study was carried out using data from an electronic version of the List of Registered Medical Practitioners (LRMP) which was provided by the General Medical Council on 4 September 2013 as an Excel spreadsheet. The file included the following information on each registered doctor: General Medical Council registration number, name, year of provisional registration, medical school, gender, specialty of qualification (if any), date of entry onto specialist register (if appropriate) and 'live' sanctions. All of these data are in the public domain (General Medical Council, 2012a), but the online version requires each doctor to be searched for individually, using their name or General Medical Council number.

All doctors qualifying from a UK medical school, registering with the General Medical Council between 2002 and 2011 (inclusive) and listed on the List of Registered Medical Practitioners on 4 September 2013 were eligible for inclusion in the study. Doctors who had been previously on the register but were 'not registered' on this date because they were 'deceased', 'having relinquished registration' or for 'administrative reason' were excluded. The ten qualification years included in the cohort ensures that 2011 graduates have had time to complete the foundation programme, covering the first 2 years of clinical practice. Doctors who had been qualified for more than 10 years were not included since the effect of medical school on the risk of being sanctioned is likely to fall as time from qualification increases.

There are 24 medical schools included in the analysis (*Table 1*). Two pairs of medical schools have been amalgamated because one in each pair has only recently begun awarding their own degrees: the University of Cardiff is grouped with the University of Wales and Leicester/Warwick Medical School is grouped with the University of Warwick. The medical schools of the University of London are all recorded as one in the General Medical Council database.

The outcome measure is whether or not a doctor had a current General Medical Council fitness to practise sanction as at 4 September 2013. There are five possible types of fitness to practise sanction: 'Warnings' – which do not restrict a doctor's practise, 'Conditions' and 'Undertakings' – which do restrict the practise of a doctor, 'Suspension' – which temporarily forbids a doctor to treat patients, and 'Erased after Fitness to Practise panel hearing' – which permanently removes a doctor from the register (General Medical Council, 2012a).

Data analysis

Data were extracted from the file provided by the General Medical Council, before being transferred to STATA v12 for analysis. To determine the effect of medical school on having a fitness to practise sanction, a logistic regression was performed, controlling for gender and year of provisional registration. Presence on the GP or specialty register was not controlled for, because of uncertainty over the direction of causation. A *P* value of <0.05 was considered statistically significant.

Power and sample size

The total number of graduates from the 24 UK medical schools averaged around 5500 per year for the period 2002–11, giving an estimated study population of 55 000 doctors. The authors assumed an equal number of graduates from each school (1250), as they did not know whether any outlier schools would be smaller or larger than the average school.

Data on fitness to practise sanctions imposed in 2010 and 2011 suggest an annual incidence rate of around 0.24% (General Medical Council, 2012b). Since sanctions are usually imposed for more than 1 year and, in the case of erasure, are permanent, the prevalence of fitness to practise sanctions is likely to be in the region of 0.5%. Waters et al (2003) found that medical schools in the top decile for malpractice claims against their graduates had up to twice the rate of claims compared to the median rate, so a relative risk of 2 was used as the effect size in the power calculation.

Owing to the difficulties of estimating power for a logistic regression with a categorical predictor, the statistical power was estimated in STATA v12 based on a comparison of the rate of fitness to practise sanctions across the 24 medical schools, with the null hypothesis that the rate of fitness to practise sanctions is 0.5% in every school. Using alpha=0.05 gave 86% power to detect three outlying medical schools (i.e. just over 10%, corresponding to Waters et al's top decile) having a fitness to practise sanctions rate of 1%, with the remaining 21 schools having a rate of 0.5%.

Ethical approval

The Science, Technology, Engineering and Mathematics Ethical Review Committee

Table 1. Participant characteristics

Number (*n*) doctors	56 003	
On general practice register *n* (%)	10 148 (18.1)	
On specialty register *n* (%)	1970 (3.5)	
Males *n* (%)	23 060 (41.2)	
Year of graduation *n* (%)	2002	4129 (7.4)
	2003	4307 (7.7)
	2004	4532 (8.1)
	2005	4885 (8.7)
	2006	5286 (9.4)
	2007	5765 (10.3)
	2008	6455 (11.5)
	2009	6659 (11.9)
	2010	6890 (12.3)
	2011	7095 (12.7)
Medical school *n* (%)	Aberdeen	1666 (3.0)
	Belfast	1793 (3.2)
	Birmingham	2895 (5.2)
	Brighton & Sussex	437 (0.8)
	Bristol	1769 (3.2)
	Cambridge	1256 (2.2)
	Dundee	1370 (2.5)
	East Anglia	535 (1.0)
	Edinburgh	2156 (3.9)
	Glasgow	2292 (4.1)
	Hull/York	456 (0.8)
	Leeds	2091 (3.7)
	Leicester	1793 (3.2)
	Liverpool	2395 (4.3)
	London	14 696 (26.2)
	Manchester	3957 (7.1)
	Newcastle	2591 (4.6)
	Nottingham	2407 (4.3)
	Oxford	1291 (2.3)
	Peninsula	654 (1.2)
	Sheffield	2123 (3.8)
	Southampton	1817 (3.2)
	Wales	2501 (4.5)
	Warwick	1062 (1.9)
General Medical Council fitness to practise sanctions *n* (%)	Doctors with one or more sanctions*	321 (0.6)
	Erased	27 (0.05)
	Suspended	25 (0.04)
	Fitness to practise condition	49 (0.09)
	Fitness to practise undertaking	82 (0.15)
	Fitness to practise warning	146 (0.26)

* Doctors may have more than one type of sanction

at The University of Birmingham advised that this study did not require ethical review because it used publicly-available secondary data.

Results

A total of 56 003 doctors were registered with the General Medical Council on 4 September 2013, having qualified at a UK medical school between 2002 and 2011. The characteristics of these 56 003 doctors are shown in *Table 1*. Males make up around 40% of the cohort and there is an increase in the total number of graduates over time, as a result of increased admission to existing medical schools as well as the formation of five new medical schools since 2000.

A total of 321 doctors (0.6%) had one or more current sanctions imposed by the General Medical Council as at 4 September 2013. The proportion of sanctioned doctors ranged from 0% at Brighton & Sussex to 1% at Aberdeen. Brighton & Sussex was therefore excluded from further analysis, leaving 55 566 doctors. The results of the logistic regression analysis are shown in *Figure 1*. The regression controls for gender and year the doctor qualified, and comparisons are made to the University of Cambridge, whose graduates had the median proportion of sanctions (0.56%).

One medical school, Aberdeen, had a fitness to practise sanctions rate approximately double that of the median rate, while three schools, Hull/York, Warwick and Oxford, had a particularly low rate of sanctions. However, none of the individual medical school coefficients are statistically significant. The largest effect is for gender, with an odds ratio for males of 3.02 (95% confidence interval 2.39–3.82). There is some evidence of a trend of reduced odds of a sanction for more recent graduates, although 2007 is a high sanctions outlier.

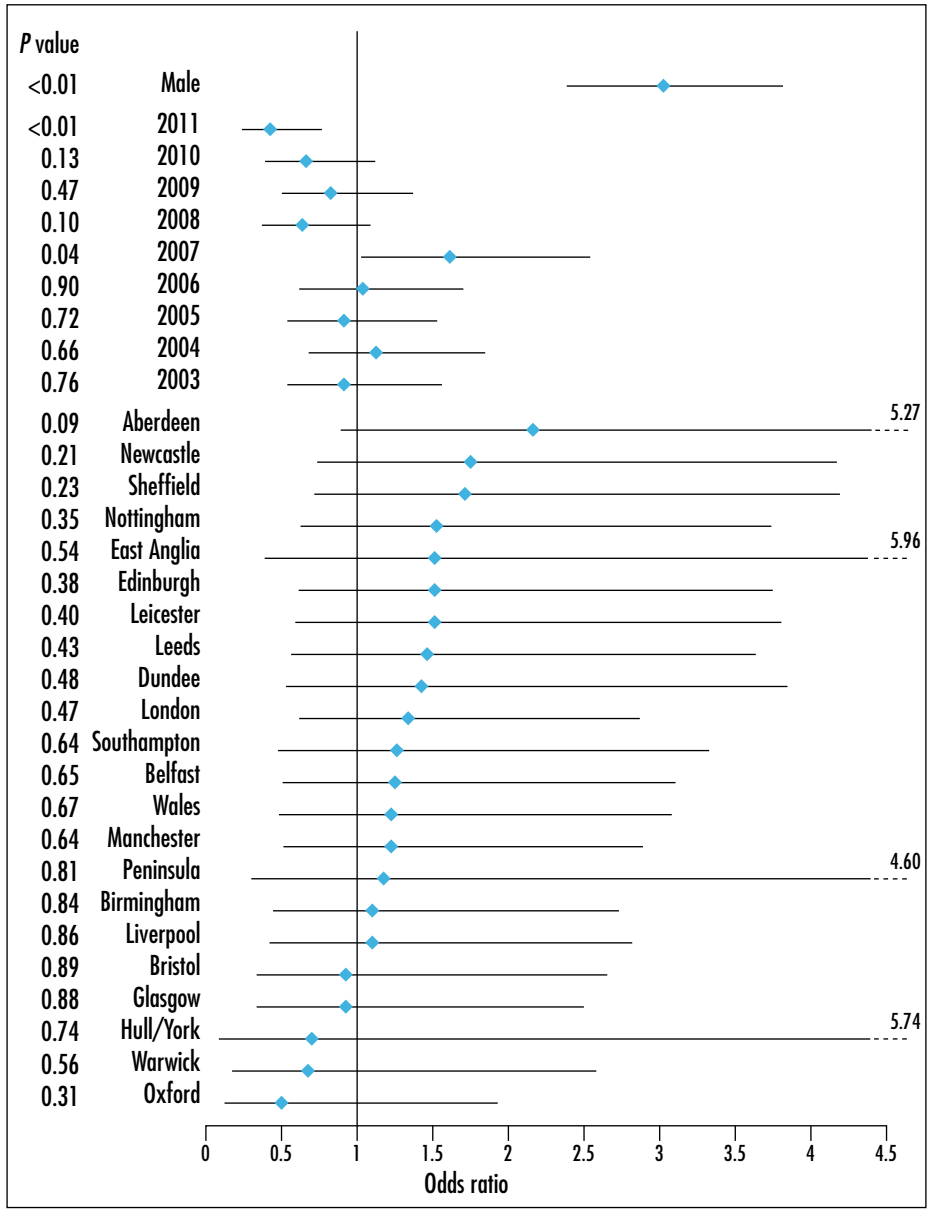
Discussion

The analysis in this article shows that there are no statistically significant differences between UK medical schools in the odds of graduates having a General Medical Council fitness to practise sanction. The key strength of this study is that all registered doctors who qualified in the UK were included in the analysis. However, it was not possible to account for doctors with expired fitness to practise sanctions in the analysis, first because this would have required looking up 56 000 doctors individually on the online List of Registered Medical Practitioners and second as data on expired sanctions are only available from October 2005 onwards. In addition, the List of Registered Medical Practitioners does not include information on other potentially important explanatory variables, such as personal health (General Medical Council, 2011a), personality (McManus et al, 2004; Duberstein et al, 2007) or learning style (McManus et al, 2004), and the exclusion of these variables may explain the low R2 value (0.04) for the logistic regression model.

The rate of sanctions among the doctors in this study (0.6%) was similar to that used in the power calculation (0.5%), although only one school had a rate twice this baseline rate rather than the three used in the sample size calculation (while three had a rate half that of the baseline rate). It is therefore plausible that this study is underpowered, although in patient safety terms, this is a positive outcome.

The results of this study suggest that differences between passing standards across medical schools (Boursicot et al,

Figure 1. Forest plot showing the likelihood of being sanctioned for graduates from each medical school compared to the reference medical school University of Cambridge. Error bars indicate the 95% confidence interval for the odds ratio.



2006, 2007) or graduates' perceptions of their preparedness to practise between medical schools (Cave et al, 2007; Illing et al, 2008) do not extend to differences in the likelihood of General Medical Council fitness to practise sanctions, although sanctions are a particularly high-level outcome and differences in clinical performance cannot be ruled out, particularly given evidence on differences in performance in Royal College examinations (Wakeford et al, 1993; McManus et al, 2008; Bowhay and Watmough, 2009; Rushd et al, 2012). These results do not concur with those from a similar USA study where medical school attended did influence outcomes (Waters et al, 2003), although the outcome was malpractice claims rather than sanctions imposed by the regulatory body.

This study does not provide evidence to suggest that a national qualifying examination is required to ensure that graduates from all UK medical schools are 'up to scratch', but evidence on additional outcomes, such as career progression and performance in clinical practice, is required before the need for such an examination could be eliminated altogether.

The rate of prescribing errors for graduates of different medical schools could also be assessed, particularly given the growth of electronic prescribing to facilitate data collection. Such a study would be important given the relatively high incidence of prescribing errors among junior doctors (Dornan et al, 2009) and would be timely given the current Prescribing Skills Assessment pilots for final year UK undergraduates (British Pharmacological Society, 2012).

Such research could be undertaken in conjunction with a study of the predictive validity of the new Situational Judgement Test, which is in effect a national exam used as part of the selection process for the foundation programme, the 2-year training programme undertaken by graduates in the UK. As the Situational Judgement Test aims to assess professionalism, General Medical Council sanctions, as used in this study, should also be used as an outcome measure in validation.

Further work to explore why individual junior doctors are sanctioned by national regulatory bodies is also required. This could begin with a review of published fitness to practise decisions made by the General Medical Council on the doctors sanctioned in this cohort, although qualitative work to investigate the early career experience of sanctioned doctors would also be important. Such research may enable 'early warning' mechanisms to be identified, so that pre-remediation could be undertaken to help prevent a sanction from being imposed. **BJHM**

The General Medical Council provided complimentary access to the List of Registered Medical Practitioners to Mr A Sanders so he could complete his project.
Conflict of interests: Dr CA Taylor has funding from the Medical Schools Council to lead a pilot project comparing passing standards for written finals examinations across UK medical schools and from the British Pharmacological Society to provide a psychometric analysis of the 2012/13 Prescribing Skills Assessment pilot; Mr A Sanders: none.

KEY POINTS

- UK medical schools differ in their curricula, assessments and passing standards for clinical examinations, and in the performance of their graduates in postgraduate examinations.
- In the USA, medical school attended influences the likelihood of being sued for malpractice.
- For UK graduates, medical school attended does not influence the likelihood of receiving a fitness to practise sanction from the General Medical Council.
- Future research should evaluate other postgraduate outcomes, such as prescribing skills.
- It is important to identify any 'early warning' signs which could be used to initiate remediation and prevent junior doctors from being sanctioned by the General Medical Council.

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