The preparedness of UK graduates in acute care: a systematic literature review

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ABSTRACT

Purpose of study The ability to recognise acutely unwell patients and to instigate generic resuscitation is essential for all newly qualified doctors. The aim of this review is to synthesise recent work examining the perceived preparedness of UK medical graduates in acute care, relative to the other outcomes detailed in Tomorrow's Doctors (2009).

Study design A systematic literature search was performed using five databases. It sought literature related to preparedness in acute care and other Tomorrow's Doctors outcomes from the perspectives of the graduates themselves and their professional colleagues. Two researchers undertook data extraction and quality scoring, and preparedness ratings in each outcome were mapped to a generic rating scale to allow comparison between studies.

Results 256 articles were recovered, with 10 included in the final analysis. The 10 articles suggested that graduates perceive themselves to be least well prepared in acute care and prescribing. Their professional colleagues perceive them to be less prepared in acute care than in any of the other outcomes and perceive preparedness in acute care to have declined since the first publication of Tomorrow's Doctors. Furthermore, there is evidence that preparedness in acute care is an area of concern for UK graduates.

Conclusions The assimilation of evidence in this review suggests that recent changes in UK undergraduate training, while improving preparedness in some areas, may have neglected acute care. While not a good surrogate for actual preparedness, perceived preparedness is important in influencing the behaviour of new graduates and therefore warrants further consideration.

INTRODUCTION

The fundamental aim of any primary medical educational programme is to adequately prepare students for clinical practice.¹ In 1993, the General Medical Council published the first version of Tomorrow's Doctors,² a document designed to guide UK medical school curricula. Its recommendations prompted all UK medical schools to initiate major curricular reforms and provided a clear framework against which preparedness could be evaluated. Despite these reforms, only 59% of 2004 graduates³ and 58% of 2005 graduates⁴ agreed that their medical school had adequately prepared them for their first post.

The vast majority of graduates from UK medical schools proceed to the Foundation Programme, which consists of 2 years of largely hospital-based training known as Foundation Year 1 (FY1) followed by Foundation Year 2 (FY2). The third

edition of Tomorrow's Doctors published in 2009¹ lists 16 outcomes which graduates must be able to demonstrate in order to be 'properly prepared for clinical practice and the Foundation Programme'.¹ One such outcome is the ability to 'provide immediate care in medical emergencies'.¹ This outcome has relevance to all specialities, whether hospital or community based, and the potential to reduce mortality by focusing on the delivery of care to this vulnerable group of patients is increasingly being recognised by healthcare improvement agencies throughout the developed world.^{5,6} It is of the utmost importance to senior colleagues, prospective employers and, of course, current and future patients that medical graduates feel able to recognise acute illness and institute generic resuscitative measures while awaiting senior assistance.

Aim

The overarching aim of this review was to investigate the perceived preparedness of UK medical graduates in acute care relative to the other outcomes detailed in Tomorrow's Doctors (2009). More specifically, the objectives were to establish the following:

- ▶ how perceived preparedness in acute care compares with perceived preparedness in other Tomorrow's Doctors (2009) outcomes;
- ▶ how the change in perceived preparedness in acute care over time compares with the change in perceived preparedness in other Tomorrow's Doctors (2009) outcomes over the same period;
- ▶ whether preparedness in acute care is a source of concern.

All three objectives were examined in relation to self-perceptions and those of other healthcare professionals.

METHODS

Search strategy

On 11 September 2011, the search strategy shown in box 1 was used to recover relevant articles. Medical Subject Headings were used infrequently, as they have not been designed for the purpose of recovering medical education articles and consequently yield large numbers of irrelevant articles.

All prefix and suffix instructions, abbreviations and symbols were used as defined in the Ovid Gateway.⁷ The search was limited to articles published from 1993 onwards, when the first publication of Tomorrow's Doctors provided an explicit framework for evaluation of preparedness for practice. Equivalent searches were carried out in five databases: MEDLINE, Education Resources Information Center, Embase (Excerpta Medica), Cumulative Index to Nursing and Allied Health

Box 1 Search strategy

1. Foundation doctor*.tw OR foundation train*.tw OR FY1*.tw OR foundation year 1.tw OR foundation year one.tw OR (foundation adj3 train*).tw OR (foundation adj3 doctor*).tw OR new* qualif* doctor*.tw OR PRHO*.tw OR houseman*.tw OR house man*.tw OR house officer*.tw OR (medic* adj3 graduat*).tw
2. Programme Evaluation/OR exp Professional Competence/OR exp Curriculum/OR (prepar* adj3 practi*).tw
3. exp Great Britain/OR Ireland/
4. 1 AND 2 AND 3
5. Limit 4 to yr='1993–Current'

Literature and PsycINFO (American Psychological Association). Titles and abstracts were recovered for all search results.

Inclusion criteria

Articles were included if they fulfilled all of the criteria listed in table 1. In the case of any doubt regarding inclusion, the full article was recovered and used to assess suitability. The reference lists of all articles fulfilling the inclusion criteria were searched for other relevant articles that may have been missed by electronic searching.

Data extraction

Data extraction and quality scoring of all articles fulfilling the inclusion criteria were undertaken by two researchers independently (VRT and SES), each with a clinical background and educational research experience. All data were collated onto a pre-prepared data extraction form in Excel (Microsoft Office 2007). Discrepancies were resolved by discussion until agreement was reached.

The following data were extracted for all included articles:

- ▶ location of study (medical school or deanery);
- ▶ number and grade of participants;
- ▶ method(s) of data collection;
- ▶ year of graduation;
- ▶ time since graduation;

Table 1 Inclusion criteria

Inclusion criterion	Justification
1. The article contains information on perceived preparedness in acute care as defined in paragraph 16 of Tomorrow's Doctors (2009), 'provide immediate care in medical emergencies'. ¹	Acute care is the focus of the review, and Tomorrow's Doctors (2009) is the template chosen to compare studies included in the review.
2. The article is related to the transition from medical student to practising doctor.	This review focuses on preparedness for practice as a new medical graduate. This criterion therefore excludes studies of preparedness for other transitions such as that from specialty training to consultancy.
3. The article is either primary empirical research or course evaluation.	This criterion excludes case studies, editorials and opinion pieces which, while of interest, do not provide empirical data.
4. The work originates from a UK medical school or deanery.	The aim of this review is to focus on preparedness of UK graduates. Given the differences in the structure of training and hospital systems elsewhere, only UK studies are relevant to the research question.

- ▶ Tomorrow's Doctors (2009) outcomes evaluated;
- ▶ summary of perceived preparedness relative to each outcome;
- ▶ quality of study.

Quality scoring

The methodological quality of each included study was assessed using the Best Evidence in Medical Education quality indicators (BEMEIQ) developed by Buckley *et al* and summarised in table 2.⁸ BEMEIQ was chosen from the many methodological scoring systems in existence due to its relevance to the studies included in the review. Studies were considered to be of high quality if they met seven or more of the 11 quality indicators, as originally proposed by Buckley *et al* and employed elsewhere.⁹ Studies with a BEMEIQ score of <7 were excluded from the review.

RESULTS

The initial search undertaken using the MEDLINE database yielded 256 articles. Six articles were considered to fulfil all inclusion criteria. Equivalent searches in Education Resources Information Center, Embase, Cumulative Index to Nursing and Allied Health Literature and PsycINFO yielded two new articles, and hand searching of reference lists yielded three more.

One of the 11 studies¹⁰ was given a BEMEIQ score of <7 by two researchers working independently and was therefore excluded from the review. Five of the remaining ten studies evaluated the preparedness of graduates of English universities,^{11–15} one study investigated preparedness of graduates of a Scottish university,¹⁶ one multicentre study included graduates from two English and one Scottish universities¹⁷ and another surveyed graduates of all UK medical schools.⁴ One study evaluated doctors practising in the West Midlands deanery,¹⁸ and another focused on doctors working in two hospitals in the North East Thames region.¹⁹

All 10 studies explored preparedness as perceived by newly qualified doctors within their first year of practice. Two studies surveyed doctors between 1 and 3 years post graduation,^{4 12} and one study explored the perceptions of doctors with up to 8 years of clinical experience.¹³ Four studies sought the views of consultants or educational supervisors on the preparedness of their junior colleagues,^{12 16–18} and one study incorporated the perceptions of nursing staff and other allied health professionals.¹⁷

Six of the studies contained quantitative ratings of preparedness that could be mapped to paragraph 16 of Tomorrow's Doctors (2009).¹ Table 3 shows the number of studies providing

Table 2 A summary of the Best Evidence in Medical Education quality indicators (BEMEIQ) adapted from Buckley *et al*⁸

Quality indicator	Detail
Research question	Is/are the research question(s) clearly stated?
Study subjects	Is the study group appropriate (size, characteristics, selection)?
Data collection methods	Are the methods reliable and valid?
Completeness of data	What is the drop out/attrition/response rate?
Control for confounding	Have confounding variables been removed/minimised/accounted for?
Analysis of results	Are the methods of analysis appropriate?
Conclusions	Can the data justify the conclusions?
Reproducibility	Could the study be repeated by another group?
Prospective	Is the study prospective (forward looking), as opposed to retrospective?
Ethical issues	Were ethical issues addressed adequately?
Triangulation	Are the results supported by data from other studies?

Table 3 Numbers of studies containing quantitative ratings of preparedness relating to each of the Tomorrow's Doctors (2009) outcomes for graduates

Tomorrow's Doctors (2009) outcomes for graduates (with corresponding paragraph number in brackets)	Studies (n)	References of studies
Apply biomedical scientific principles, method and knowledge to medical practice (8)	0	
Apply psychological principles, method and knowledge to medical practice (9)	0	
Apply social science principles, method and knowledge to medical practice (10)	0	
Apply population health and health improvement principles, methods and knowledge to medical practice (11)	0	
Apply scientific methods and approaches to medical research (12)	1	16
Able to carry out a consultation (13)	1	16
Diagnose and manage clinical presentations (14)	1	16
Communicate effectively with patients and colleagues in a medical context (15)	3	12 16 18
Provide immediate care in medical emergencies (16)	6	12 13 16–19
Prescribe drugs safely, effectively and economically (17)	6	12 13 16–19
Carry out practical procedures safely and effectively (18)	2	16 18
Use information effectively in a medical context (19)	2	16 18
Behave according to ethical and legal principles (20)	3	13 16 17
Reflect, learn and teach others (21)	0	
Learn and work effectively within a multi-professional team (22)	4	12 13 17 18
Protect patients and improve care (23)	0	

quantitative data in relation to each of the Tomorrow's Doctors (2009) outcomes for graduates. Some of the Tomorrow's Doctors (2009) outcomes were not covered by any of the studies included in the review. When an individual outcome had been subdivided within a study (such as paragraph 15, 'communicate effectively with patients and colleagues in a medical context',¹ which was divided to provide separate preparedness ratings in relation to patient and interprofessional communication in several studies^{13 17 20}), all ratings in relation to that particular outcome were excluded from the review on the basis that the study did not provide a single preparedness rating in relation to a Tomorrow's Doctors (2009) outcome.

Comparing perceived preparedness in acute care with other Tomorrow's Doctors (2009) outcomes

Self-perceptions of preparedness relative to Tomorrow's Doctors (2009) outcomes are summarised in figure 1. Only outcomes that have quantifiable data relating to preparedness available from more than one study are included in figure 1, as it is the trends and comparisons that form the particular focus of this review (seven of the 16 outcomes for graduates listed in table 3 are included in figure 1). The key to the shading in figures 1 and 2 is shown in figure 3 and allows comparison across studies asking subtly different questions or reporting data in different ways. The ratings of self-perceived preparedness shown in figure 1 show that overall graduates consistently consider themselves to be well prepared in communication and team working. The two outcomes in which graduates consistently feel least well prepared are acute care and prescribing, which, together, account for eight of the nine ratings equating to unprepared.

Figure 2 summarises the graduate preparedness ratings given by eight groups of healthcare professionals in four separate

studies. Five of the ratings are provided by consultants, and the three others are given by heterogeneous groups of Foundation Year 2s, more senior trainees, consultants and nursing staff. Ratings are generally lower than those given by the graduates themselves, and there are no outcomes in which graduates are consistently perceived to be well prepared. However, similar patterns emerge in relation to the outcomes in which graduates are felt to be poorly prepared, with acute care accounting for three of the five ratings equating to unprepared (obtained from three different studies).

Changes in perceived preparedness since the first publication of Tomorrow's Doctors

The results in figures 1 and 2 are displayed in reverse chronological order using the year of graduation of the newly qualified doctors (not the publication years of the studies). There is some suggestion from figure 1 that self-perceptions of preparedness in relation to practical procedures and team-working have improved since 1993. In contrast, self-perceptions of preparedness in relation to acute care, communication and ethics have remained fairly static, with self-perceived preparedness in prescribing appearing to have declined.

Figure 2 suggests that other healthcare professionals perceive graduate preparedness in communication, ethics, prescribing and practical procedures to have remained relatively static since 1993. In contrast to the self-perceptions data, figure 2 highlights acute care as the one outcome in which graduate preparedness is perceived to be declining, with three of the four most recent ratings equating to unprepared in the generic rating scale.

Concerns relating to preparedness in acute care

Five studies provided information on whether graduates were concerned about preparedness in acute care. The questionnaire used by Goldacre *et al* in their study of the perceived preparedness of all UK graduates in 2002 and 2005 did not include a question relating to acute care, but free text comments highlighted a desire for more 'acute emergency training'.⁴

The qualitative arm of the study by Illing *et al* (2008) collected data using interviews with Foundation doctors at several points during their first year of practice.¹⁷ At the beginning of their first post, 'particular concerns were expressed about taking immediate steps with acutely ill patients, although this was seen as tied to the inescapable change in responsibility which comes with being a doctor, and which cannot be directly prepared for'.¹⁷ Even at the end of their FY1 'being the first doctor to deal with a sick patient was an area of concern', with some graduates feeling that 'having to deal with an acutely unwell patient before senior help arrived had implications for patient safety'.¹⁷

Evans *et al* investigated the 'three main concerns'¹⁵ of three cohorts of Barts and the London, Queen Mary's School of Medicine and Dentistry graduates, shortly before starting work as doctors. In 2000, only 2% of 48 graduates expressed concern about emergency care of patients. However, around 10% of both graduate cohorts in 2004 raised emergency care as one of their top three concerns about starting work.¹⁵ Only one concern, 'team support', was raised more frequently.

A study by Lempp *et al* involving interviews with 16 graduates from Guy's, King's and St Thomas' School of Medicine in 2001 revealed that 'stress was related to high personal expectations and competence in emergency situations...'.¹⁴ Matheson *et al* echoed such findings in their survey evaluation of a four-week preparation for practice course undertaken by 76 graduates of Nottingham medical school in 2006. Four months after starting work, responses to a free text question asking what else

First author, respondent group, year of graduation and sample size	Description of Likert scale used	Tomorrow's Doctors (2009) outcomes for graduates (with paragraph number in brackets)						
		Communication (15)	Acute care (16)	Prescribing (17)	Practical procedures (18)	Information usage (19)	Ethics (20)	Team-working (22)
Tallentire <i>et al.</i> FY1s, 2009 (n=19)	4 point scale (1=poor, 4=very good)	Mean 3.00 (SD 0.74)	Mean 2.37 (SD 0.76)	Mean 2.37 (SD 0.76)	Mean 3.11 (SD 0.74)	Mean 2.68 (SD 0.75)	Mean 2.84 (SD 0.76)	
Brown <i>et al.</i> FY1s, 2008 (n=200)	5 point scale (5=very competent, 1=not at all competent)	79.1% rated as 4 or 5	56.4% rated as 4 or 5	40.3% rated as 4 or 5				79% rated as 4 or 5
Tallentire <i>et al.</i> FY1s, 2008 (n=36)	4 point scale (1=poor, 4=very good)	Mean 3.53 (SD 0.56)	Mean 2.58 (SD 0.87)	Mean 2.69 (SD 0.86)	Mean 3.14 (SD 0.76)	Mean 3.19 (SD 0.58)	Mean 2.78 (SD 0.68)	
Illing <i>et al.</i> Glasgow graduates, 2007 (n=131)	5 point scale with upper end indicating preparedness		Mean 3.443 (SD 0.776)	Mean 2.893 (SD 0.963)			Mean 3.153 (SD 0.898)	Mean 4.420 (SD 0.581)
Illing <i>et al.</i> Newcastle graduates, 2007 (n=226)	5 point scale with upper end indicating preparedness		Mean 3.411 (SD 0.810)	Mean 2.982 (SD 0.863)			Mean 3.231 (SD 0.866)	Mean 4.280 (SD 0.646)
Illing <i>et al.</i> Warwick graduates, 2007 (n=123)	5 point scale with upper end indicating preparedness		Mean 3.390 (SD 0.685)	Mean 2.983 (SD 0.836)			Mean 3.174 (SD 0.782)	Mean 4.279 (SD 0.695)
Tallentire <i>et al.</i> FY1s, 2007 (n=52)	4 point scale (1=poor, 4=very good)	Mean 3.13 (SD 0.68)	Mean 2.52 (SD 0.70)	Mean 2.33 (SD 0.79)	Mean 2.75 (SD 0.82)	Mean 2.92 (SD 0.76)	Mean 2.82 (SD 0.74)	
Brown <i>et al.</i> FY2s, 2007 (n=95)	5 point scale (5=very competent, 1=not at all competent)	90.9% rated as 4 or 5	80.3% rated as 4 or 5	54.6% rated as 4 or 5				90.8% rated as 4 or 5
Berridge <i>et al.</i> FY1s pre-course, 2005 (n=50)	5 point scale (1=confident, 5=not confident)		Mean 3.26 (median 3, IQR 3-4)	Mean 3.26 (median 3, IQR 3-4)				
Berridge <i>et al.</i> FY1s one month post-course, 2005 (n=35)	5 point scale (1=confident, 5=not confident)		Mean 2.46 (median 3, IQR 2-3)	Mean 2.40 (median 2, IQR 2-3)				
Wall <i>et al.</i> PRHOs, 2003 (n=193)	6 point scale (1= strongly disagree I am prepared, 6=strongly agree I am prepared)	Mean 4.8834	Mean 4.0337	Mean 4.1839	Mean 4.4767	Mean 4.4508		Mean 4.9922
Clack Graduates, 1985-86 and 1989-90 (n=371)	Course content rated as too much, about right or too little. Attributes rated as yes, partially or no.		57.3% felt they had 'not enough' training	67.6% felt there was 'too little' course time			62.8% felt there had been 'too little' course time	64.4% felt they had the ability to work in a team

Figure 1 Self-perceptions of preparedness relative to Tomorrow's Doctors (2009) outcomes. FY, Foundation Year; PRHO, Pre-registration House Officer.

should be included in the course highlighted a desire to learn 'how to respond to on-call emergencies'¹¹ and 'what to do with a sick patient'.¹¹

Only one of the included studies made direct reference to concerns of other healthcare professionals in relation to acute care. Tallentire *et al* thematically analysed free text responses from 47 FY1s and 109 educational supervisors and noted that 'identification and management of acutely unwell patients appeared to be a source of concern for both educational supervisors and FY1s'.¹⁶

DISCUSSION

This review provides an overview of current research on perceived preparedness in acute care and an opportunity to reflect on how it compares to perceived preparedness in other domains, using the framework provided by Tomorrow's Doctors (2009). The results suggest that acute care and prescribing are the outcomes in which graduates throughout the UK perceive themselves to be least well prepared for professional practice. Senior colleagues and other healthcare professionals working alongside newly qualified doctors perceive them to be less prepared in acute care than in any of the other outcomes. In addition, perceived preparedness in acute care appears to have declined since the first publication of Tomorrow's Doctors in 1993. Studies of preparedness for practice which have provided the option of a free text response have consistently shown acute care to be an area of concern for UK graduates.

The preparedness ratings given by newly qualified doctors (figure 1) are frequently higher than those given by their

professional colleagues (figure 2) across the majority of Tomorrow's Doctors (2009) outcomes. This disparity has been noted elsewhere,^{16 18 21} and while various authors have offered explanations for the differences, studies exploring this specific issue are lacking. This review highlights that prescribing appears to be an exception, with preparedness ratings given by FY1s consistently lower than those given by healthcare colleagues. A similar review focusing on preparedness in prescribing would help to establish whether this observation is merely an artificial product of the studies investigating preparedness in both acute care and prescribing.

The results presented within this paper may be of little surprise to those involved in either undergraduate or postgraduate medical training. The care of acutely unwell patients is complex, involving a myriad of technical and non-technical skills in time-pressured situations and increasingly litigious environments. It is therefore unlikely that new graduates will ever feel completely at ease with acute care; perhaps it is preferable from a patient safety perspective that they do not, prompting them to call for senior help more readily. It is, however, of concern that graduate preparedness in acute care, as perceived by their professional colleagues, compares so unfavourably with preparedness in other outcomes and appears to be trending downwards. All UK medical schools would claim that their graduates can assess acutely unwell patients and instigate generic resuscitative measures, but senior doctors and other healthcare professionals have rated FY1s as unprepared to do so in several recent studies. In their paper published 5 years ago, Wall *et al* concluded by asking, 'have the

First author, respondent group, year of graduation and sample size	Description of Likert scale used	Tomorrow's Doctors (2009) outcomes for graduates (with paragraph number in brackets)						
		Communication (15)	Acute care (16)	Prescribing (17)	Practical procedures (18)	Information usage (19)	Ethics (20)	Team-working (22)
Tallentire <i>et al.</i> Consultants, 2009 (n=24)	4 point scale (1=poor, 4=very good)	Mean 2.58 (SD 0.65)	Mean 2.05 (SD 0.72)	Mean 2.22 (SD 0.90)	Mean 2.10 (SD 0.88)	Mean 2.88 (SD 0.74)	Mean 2.65 (SD 0.83)	
Brown <i>et al.</i> Consultants, 2008 (n=345)	5 point scale (5=very competent, 1=not at all competent)	63.9% rated FY1s as 4 or 5	30.7% rated FY1s as 4 or 5	39.0% rated FY1s as 4 or 5				48.1% rated FY1s as 4 or 5
Tallentire <i>et al.</i> Consultants, 2008 (n=16)	4 point scale (1=poor, 4=very good)	Mean 2.81 (SD 0.75)	Mean 1.86 (SD 0.53)	Mean 2.13 (SD 1.15)	Mean 2.00 (SD 0.68)	Mean 3.06 (SD 0.57)	Mean 2.86 (SD 0.77)	
Illing <i>et al.</i> Glasgow team members, 2007 (n=25)	Rating of prepared, unprepared or don't know		16% felt graduates were prepared	72% felt graduates were prepared				80% felt graduates were prepared
Illing <i>et al.</i> Newcastle team members, 2007 (n=22)	Rating of prepared, unprepared or don't know		57% felt graduates were prepared	67% felt graduates were prepared				90% felt graduates were prepared
Illing <i>et al.</i> Warwick team members, 2007 (n=16)	Rating of prepared, unprepared or don't know		60% felt graduates were prepared	73% felt graduates were prepared				87% felt graduates were prepared
Tallentire <i>et al.</i> Consultants, 2007 (n=45)	4 point scale (1=poor, 4=very good)	Mean 2.71 (SD 0.66)	Mean 2.20 (SD 0.68)	Mean 2.09 (SD 0.79)	Mean 2.09 (SD 0.78)	Mean 2.98 (SD 0.74)	Mean 2.48 (SD 0.71)	
Wall <i>et al.</i> Consultants, 2003 (n=212)	6 point scale (1=strongly disagree PRHOs are prepared, 6=strongly agree PRHOs are prepared)	Mean 4.3986	Mean 3.9552	Mean 3.8066	Mean 4.3703	Mean 4.6203		Mean 4.5778

Figure 2 Other healthcare professionals' perceptions of graduate preparedness relative to Tomorrow's Doctors (2009) outcomes. FY, Foundation Year; PRHO, Pre-registration House Officer.

undergraduate curriculum reforms concentrated too much on communication skills to the detriment of basic clinical competencies, such as treatment, prescribing and managing emergencies?¹⁸ The studies presented in this review go some way to providing an answer.

Limitations

By including only studies which contained questions or themes that could be mapped directly onto the outcomes detailed in Tomorrow's Doctors (2009), it is possible that this review has excluded additional studies containing relevant information, particularly studies that have subdivided outcomes. In addition, the relatively small number of studies included in the review means that only tentative suggestions can be made in

relation to trends. Many of the included studies were undertaken by employees of UK medical schools investigating the preparedness of graduates from their own institutions. It is therefore likely that a variety of non-financial internal factors such as departmental pressure to publish, rarely disclosed as competing interests, exerted undue influence on the authors of such studies.²²

However, the main limitation of this review is the use of a subjective outcome measure; perceived preparedness cannot be assumed to correlate with actual preparedness. Self-assessment is important, as the self-regulating nature of the medical profession within the UK relies on the abilities of doctors to identify their own learning needs. However, self-assessment as general and unguided reflection on one's performance is

Figure 3 Key to shading in figures 1 and 2. FY, foundation year.

Overall review rating	Equivalent rating in studies
Very well prepared	At least 90% of respondents feel confident / prepared (or consider their FY1 colleagues to be) or mean score equal to or above 'very well prepared' or equivalent on Likert scale
Well prepared	At least 75% but fewer than 90% of respondents feel confident / prepared (or consider their FY1 colleagues to be) or mean score equal to or above 'well prepared' but below 'very well prepared' or equivalent on Likert scale
Prepared	At least 50% but fewer than 75% of respondents feel confident / prepared (or consider their FY1 colleagues to be) or mean score equal to or above 'adequately prepared' but below 'well prepared' or equivalent on Likert scale
Not prepared	Fewer than 50% of respondents feel confident / prepared (or consider their FY1 colleagues to be) or mean score below 'adequately prepared' or equivalent on Likert scale

unreliable.²³ Despite the high face validity of self-preparedness ratings, a systematic review comparing doctor self-assessment ratings against independent assessment ratings found that only seven out of 20 studies demonstrated a positive correlation.²⁴

Implications for practice

This review has identified several areas requiring further work. Studies that quantify perceived preparedness of graduates across the whole range of Tomorrow's Doctors (2009) outcomes are required, in order that medical schools can focus curriculum developments on the areas in which new graduates and their colleagues have concerns. A more detailed understanding of the specific challenges faced by newly qualified doctors in the context of acute care is required in order that tailored educational interventions can be developed.

Simulation training is rapidly gaining popularity as a means of exposing trainees of all levels to challenging clinical scenarios without risk of harm to patients. While simulation training is expensive in terms of faculty and resources, medical schools may need to consider running such courses throughout the undergraduate curriculum in order to adequately prepare their students for practice. Other studies have called for training strategies which 'sufficiently mimic the real clinical environment, involving multiple demands on time, the need to prioritise and the responsibility of dealing with acute cases'.¹⁷ The General Medical Council mandated Student Assistantship 'a period during which a student acts as assistant to a junior doctor, with defined duties under appropriate supervision',¹ is currently being integrated into all UK medical school curricula. It will be interesting to explore whether students gain experience of managing acutely unwell patients during their assistantships and to monitor perceived preparedness in acute care, and more generally, during this period.

CONCLUSION

The literature included in this review suggests that graduates and their clinical colleagues perceive preparedness in acute care to lag behind preparedness ratings mapped onto most other Tomorrow's Doctors (2009) outcomes. The results of this study suggest that recent changes to UK undergraduate training, while improving preparedness in some areas, may have neglected acute care skills. It is well recognised that perceived preparedness is a poor surrogate for actual preparedness. However, whether accurate or not, a perceived lack of preparedness in acute care exacerbates the stress and anxiety experienced by newly qualified doctors, which, in turn, impacts behaviour in complex ways.²⁵ Improving perceived preparedness in acute care, along with actual preparedness and the accessibility of senior

Current research questions

- What are the specific challenges faced by newly qualified doctors in acute care contexts?
- How can postgraduate training evolve to better support FY1s and help them feel prepared for all aspects of their work?
- Aside from acute care, which other Tomorrow's Doctors (2009) outcomes require renewed emphasis in undergraduate curricula in order that graduates are optimally prepared for postgraduate practice?

supervision, is thus an important component of enhancing patient care and alleviating some of the inevitable anxiety related to the transition between undergraduate training and postgraduate practice.

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Competing interests VR Tallentire, SE Smith and HS Cameron are authors of one of the studies included in this review. VR Tallentire is a specialty trainee in acute medicine, and J Skinner is a consultant in emergency medicine.

Contributors VRT designed the study, performed the literature searches, undertook data extraction and quality scoring, and drafted the manuscript. SES performed data extraction and quality scoring, and assisted in drafting the manuscript. JS and HSC advised on all stages of the study, and all four authors reviewed the final manuscript prior to submission.

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REFERENCES

1. *Tomorrow's Doctors*. London: General Medical Council, 2009.
2. *Tomorrow's Doctors*. London: General Medical Council, 1993.
3. **Cave J**, Goldacre M, Lambert T, *et al*. Newly qualified doctors' views about whether their medical school had trained them well: questionnaire surveys. *BMC Med Educ* 2007;**7**:38.
4. **Goldacre M**, Taylor K, Lambert T. Views of junior doctors about whether their medical school prepared them well for work: questionnaire surveys. *BMC Med Educ* 2010;**10**:78.
5. *Aims of the Scottish Patient Safety Programme*. <http://www.patientsafetyalliance.scot.nhs.uk/programme/about/aims> (accessed 13 Oct 2010).
6. *Improving Outcomes for High-Risk and Critically Ill Patients*. <http://www.ihl.org/Programs/Collaboratives/ImprovingOutcomesforHigh-RiskandCriticallyIllPatients.htm> (accessed 13 Oct 2010).
7. **OvidSP**. *Symbols and Abbreviations*. <http://gateway.ovid.com/autologin.cgi> (accessed 5 Jun 2011).
8. **Buckley S**, Coleman J, Davison I, *et al*. The educational effects of portfolios on undergraduate student learning: a Best Evidence Medical Education (BEME) systematic review. BEME Guide No. 11. *Med Teach* 2009;**31**:282–98.
9. **Miller A**, Archer J. Impact of workplace based assessment on doctors' education and performance: a systematic review. *BMJ* 2010;**341**:c5064.
10. **Lempp H**, Seabrook M, Cochrane M, *et al*. The transition from medical student to doctor: perceptions of final year students and preregistration house officers related to expected learning outcomes. *Int J Clin Pract* 2005;**59**:324–9.
11. **Matheson C**, Matheson D, Saunders J, *et al*. The views of doctors in their first year of medical practice on the lasting impact of a preparation for house officer course they undertook as final year medical students. *BMC Med Educ* 2010;**10**:48.
12. **Brown JM**, Watmough S, Cherry MG, *et al*. How well are graduates prepared for practice when measured against the latest GMC recommendations? *Br J Hosp Med (Lond)* 2010;**71**:159–63.
13. **Clack GB**. Medical graduates evaluate the effectiveness of their education. *Med Educ* 1994;**28**:418–31.
14. **Lempp H**, Cochrane M, Seabrook M, *et al*. Impact of educational preparation on medical students in transition from final year to PRHO year: a qualitative evaluation of final-year training following the introduction of a new year 5 curriculum in a London medical school. *Med Teach* 2004;**26**:276–8.

Main messages

- Graduates from UK medical schools perceive themselves to be less well prepared in acute care and prescribing than other Tomorrow's Doctors (2009) outcomes
- Senior doctors and other healthcare colleagues perceive newly qualified doctors to be less prepared in acute care than in any other Tomorrow Doctors (2009) outcome
- Preparedness in acute care may have declined since the first publication of Tomorrow's Doctors and is an area of concern for UK graduates

15. **Evans DE**, Roberts CM. Preparation for practice: how can medical schools better prepare PRHOs? *Med Teach* 2006;**28**:549–52.
16. **Tallentire VR**, Smith SE, Wylde K, *et al*. Are medical graduates ready to face the challenges of Foundation training? *Postgrad Med* 2011;**87**: 590–5.
17. **Illing J**, Morrow G, Kergon C, *et al*. *How Prepared are Medical Graduates to Begin Practice? A Comparison of Three Diverse UK Medical Schools*. London: GMC Education Committee, 2008.
18. **Wall D**, Bolshaw A, Carolan J. From undergraduate medical education to pre-registration house officer year: how prepared are students? *Med Teach* 2006;**28**:435–9.
19. **Berridge EJ**, Freeth D, Sharpe J, *et al*. Bridging the gap: supporting the transition from medical student to practising doctor—A two-week preparation programme after graduation. *Med Teach* 2007;**29**:119–27.
20. **Matheson C**, Matheson D. How well prepared are medical students for their first year as doctors? The views of consultants and specialist registrars in two teaching hospitals. *Postgrad Med* 2009;**85**:582–9.
21. **Jones A**, McArdle PJ, O'Neill PA. How well prepared are graduates for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors. *Med Educ* 2001;**35**:578–84.
22. **Walsh K**, Sandars J. Competing interests and research in medical education. *Postgrad Med* 2008;**84**:113–14.
23. **Eva KW**, Regehr G. Self-assessment in the health professions: a reformulation and research agenda. *Acad Med* 2008;**80**:S46–54.
24. **Davies D**, Mazmanian P, Fordis M, *et al*. Accuracy of physician self-assessment compared with observed measures of competence. *JAMA* 2006;**296**:1094–102.
25. **Tallentire VR**, Smith SE, Skinner J, *et al*. Understanding the behaviour of newly qualified doctors in acute care contexts. *Med Educ* 2011;**45**:995–1005.

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