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Using realist evaluation to explain preparedness for doctors' memorable 'firsts'

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Title: 'Do you remember the first time?' Qualitative research using realist evaluation to explain preparedness for doctors' memorable 'firsts'

Abstract

Doctors must be competent on day one of practice if patients are to be safe. Medical students and new doctors are acutely aware of this but describe being variably prepared. This study aimed to identify causal chains of contextual factors and mechanisms leading to being capable (or not) of completing tasks for the first time.

Methods

We studied three stages of transition: anticipation, lived experience and post-hoc reflection. In the anticipation stage medical students kept logbooks and audio diaries and were interviewed. Consenting participants were then followed into their first jobs as doctors, making audio diaries to capture the lived experiences of transition. Reflection was captured using interviews and focus groups with other postgraduate trainee doctors. All materials were transcribed and references to 'firsts' were analysed using the lens of realist evaluation.

Results

32 medical students participated, 11 were followed through their transition to doctor. In addition, 70 postgraduate trainee doctors from three local hospitals who were graduates of 17 UK medical schools participated in ten focus groups.

We identified three categories of firsts (outcomes): those anticipated and deliberately prepared for in medical school, firsts for which total prior preparedness is not possible due to the step change in responsibility between student and doctor identities, and experiences of failure. Helpful interventions in preparation (context) were opportunities for rehearsal and being given responsibility as a student in the clinical team. Building self-efficacy for tasks was an important mechanism. During transition the key contextual factor was the right sort of support from colleagues.

Discussion

Transition is a step change in responsibility for which total preparedness is not achievable and this is experienced as a 'rite of passage' when the newly qualified doctor first makes decisions alone. This study extends existing literature by explaining mechanisms involved in preparedness for firsts.

Introduction

Newly graduated doctors have long felt unprepared for their new roles on qualification (1,2). Perceptions among UK medical graduates of their own preparedness for practice vary within cohorts, between medical schools and between tasks (3,4).

Research has tended to focus on preparation in advance of practice (5,6). Newer curricula are designed to prepare graduates better than 'traditional' curricula, and there is evidence of modest improvement (7). Nonetheless, approaches which focus on individual preparation assume that better preparation of the individual is the solution to the problem of struggling doctors in transition. Such an approach ignores how regulation, context and organisational culture shape dynamic interactions between individuals and teams within workplaces. It may also underestimate the shift in internal perspective and external feedback that arises as a result of a changed level of responsibility once the individual is situated in practice.

Transitions are risky for both patients and doctors (8). The patient's experience and patient safety are linked to the abilities and attitudes of the staff who deliver their care (9–11) so it is vital that transitions from student to qualified roles for health care professionals are understood. Apprenticeship models are considered key (12) but there is debate regarding apprenticeship as a concept and how to balance learners' needs for active participation with safe and effective service delivery (13). We do not know precisely what it is about apprenticeship, shadowing or other workplace learning that mitigates the risks of transition nor what other transition gaps remain. Without this knowledge, practical implementation of the 'shadowing' model of apprenticeship (now mandatory in the UK) may result in providing inadequate solutions. A true understanding of the root causes of current problems is required, along with recognition of how workplace cultures and practices will re-shape the delivery of such aspirational educational models of apprenticeship. Kilminster et al have suggested that "each institution and clinical setting has its own learning culture and professional practices are affected by the extent to which the workplace culture recognises transitions as critically intensive learning periods" (8). Understanding this and the questions which arise about which factors in the student assistantship, the induction and the early days of the qualified doctor's experience exacerbate or mitigate the risks of transition is worthy of further study.

One approach to understanding what students and new doctors perceive to be the higher-risk realities of the transition is to explore what they identify as significant firsts during their transition into clinical practice. Targeting these and any other areas of concern is consistent with meeting both the needs of learners and patients. Our research question was therefore 'What are the memorable 'firsts' in the transition to being a qualified doctor and how can these be understood within a three stage framework of transition (anticipation, lived experience, reflection)?'

In this paper we describe and critically analyse memorable firsts in the transition to becoming a qualified doctor with the objective of understanding what underpins the success or failure of these firsts.

Methods

Methodology and theoretical orientation

To develop our conceptual framework we drew on sociocultural theories of workplace practices and workplace-based experiential learning (14), in order to focus our analysis on social processes and interactions influencing the transition from final year student to qualified doctor. Our three-stage conceptual framework (see below) is consistent with existing theory and empirical evidence regarding experiential and workplace-based learning (15) but it is, as far as we have been able to determine, novel to conduct an investigation of transitions with such a framework. We mapped our areas of investigation to the framework by investigating each stage as follows:

(1) Anticipation of transition: lived experience of preparation for practice during final year assistantships in hospital and in general practice;

(2) Lived experience in transition: self-reported 'firsts' – considering the first time a newly qualified doctor undertakes a high stakes activity with the responsibility of their recently acquired qualification; and

(3) Reflections on transition: 'look back data' from medical graduates in the first four years of practice.

Within this framework we conducted a realist evaluation of the contexts and mechanisms which led to successful completion (or otherwise) of each identified 'first'. Realist evaluation is relatively new to medical education research but is appropriate for analysis of complex systems involving diverse people (16–18). It is primary research with an explanatory focus which involves consideration of *what works for whom and why?* and lends itself to understanding and making changes to complex systems such as educational programmes in which the *contexts* determine what *mechanisms* are triggered by the *interventions* in the system in order to produce the *outcome(s).* Asking participants at each stage in the process of the transition how they perceive their preparation for doctors' 'firsts' generated a rich vein of context-mechanism-outcome (CMO) configuration data that we present in the findings below. Consequently, this is a multiphase ethnographic study.

Recruitment and participation

In the academic year 2013/4 all final year medical students from Keele - a UK medical school - were invited to participate in a study of final year assistantship and transitions to being foundation (or post-graduate) year one (FY1) doctors. In the UK all newly qualified doctors enter a two year Foundation Programme in which they rotate through six supervised training posts in a broad range of specialities including general practice before entering specialist training. Keele University School of Medicine's final year consists of 25 weeks of assistantship during which students work alongside FY1 doctors in medicine and surgery (5 weeks of each) and 15 weeks in a general practice. The other element of final year is 5 weeks of acute and critical care (emergency room, intensive care and anaesthetics). To obtain data about the preparatory experiences of graduates from other medical schools, all foundation and speciality training doctors at our three local hospitals were invited to join focus group discussions in 2013/4 and 2014/5. Invitations were sent via the Foundation Schools. A sub-set of the foundation doctors at one of these hospitals was also interviewed individually by one of the researchers (RK) as part of a linked study exploring preparedness for acute care responsibilities.

Data generation

We wished to capture 'snapshots' of participant experiences of anticipation and transition, with their immediate reflections about them before memories had degraded. We chose learning logs and audio diaries as non-intrusive methods of capture. We then aimed to involve these participants in analysis of their anticipation and transition through interviews in which their own recorded data was discussed. Data was generated from participating final year medical students who used learning logbooks to record all activity for one week of their final year of study. The week they were asked to log was one of six periods of interest during the year, the fourth week in each of three 5 week hospital rotations, or week 4, 9, or 14 of the 15 week GP assistantship. Participants also recorded daily audio diaries during the same week to capture their immediate reflections on new, interesting and significant experiences. Subsequently face-to-face interviews were conducted by researchers who were medical school staff but not directly involved in the students' education. The following year, during their first jobs as doctors some of these participants contributed audio diaries by a secure telephone service to capture in-the-moment experiences of transition. Participants who phoned this 'answerphone' service were asked by a recorded message "Please tell us about your experiences of FY1. What have you done for the first time? What happened that was important to you?" and their responses were recorded. A prior emailed briefing expanded what they might talk about (see Appendix 1: information for participants). This was followed by a telephone interview at the end of the first four months of being a doctor. These interviews were done by an independent researcher following a bespoke guide developed by the researchers for each participant.

In order to gain wider perspectives and reflections on firsts and preparedness for transition we recruited participants post-graduation (i.e. already in FY1 or specialty training at first contact with the research team, mostly from other UK medical schools but including some of our school's graduates). We used focus groups to generate data because they can help participants compare their experiences of transition in the light of their varied contexts (both medical school preparation and personal factors). Focus groups were arranged as an optional add-on to training days. Each focus group started with a discussion of things done for the first time since being a doctor and reflections on preparedness for those tasks, then a discussion of their responses to the standard UK graduating medical students' preparedness questionnaire compared to their lived experiences of transition (see Appendix 2 for interview guide). All audio files were transcribed verbatim and anonymised. Figure 1 shows a flow diagram of the participant activities.

Insert Fig 1 near here or in appendices

Ethical approval was granted by Keele University School of Medicine ethics committee on 4.9.13.

Analysis

Data generation and analysis were conducted concurrently. Each member of the research team (the authors) undertook primary coding of a share of the transcripts. For the initial focus groups and interviews coding was followed by collective reading and detailed discussion of both tentative codes and whole transcripts to identify emergent themes. These then formed an iterative framework which was used to code subsequent transcripts alongside identifying new codes and themes as and when these arose, which in turn generated a refining of the framework. Transcripts were coded in

NVivo™(19) with long sections of transcript (usually a paragraph) being included in each cut in order to enable analysis of context. Overall this ensured that data analysis led to our emergent programme theory though a bi-directional process of assimilation and accommodation between new data and the thematic framework. In addition, constant comparison was used to ensure new codes or themes were checked against previous data (20).

One theme was 'firsts'. The transcript sections coded as firsts were initially analysed to identify the 'firsts' considered significant by participants in their early careers. These became our outcomes of interest in the subsequent realist analysis.

For each section of text where it was possible to do so, we identified CMO configurations - what in the context made the doctor capable (or not) of completing the first and why. This coding was then reviewed and checked by other team members in regular analysis meetings in which all the researchers participated.

In the realist analysis (16–18) we composed an initial programme theory from the literature plus our own experiences of preparation for practice. A programme theory expresses what is thought to be producing the outcomes of a complex system with diverse participants, and how that might be happening. We then tested and refined our initial programme theory in analysis discussion meetings by extracting middle range theories from the coded CMO configurations relating to significant firsts. A middle range theory in realist evaluation is a judgement about the repeatability of a one or a set of related context-mechanism-outcome (CMO) configurations. Middle range theories "lie between the minor but necessary working hypotheses that evolve in abundance during day-to-day research and the all-inclusive systematic efforts to develop a unified theory" (Merton 1967 p39) (21). They are as close as sociological research can get to proof and need to be trustworthy enough to justify making changes to the programme theory.

In our initial programme theory we considered the *context* in which the firsts took place to include both the participant's internal context (incorporating an examination of their perceived prior preparation) and their external context (including factors in the workplace). We have found this consideration of participants' internal contexts helpful before in a realist evaluation of an educational intervention (22).

Mechanisms are processes – the way in which the context influences the reasoning or behaviour of individuals to cause the *outcomes* of interest (17). The global outcome of preparedness was conceptually defined as the sum of successful completions of the intermediary outcomes of firsts. Interim mechanisms were processes leading to preparedness for 'firsts'. We sought to identify mechanisms operating within or triggered by the various types of context which led to being capable (or not) as a new doctor.

Patterns of CMO configurations were identified and used to test and develop middle range theories about elements of the preparation experiences with potential to trigger certain common mechanisms. For example, one middle range theory (which formed part of our initial programme theory arising from the apprenticeship model (2,8,12) and which we wished to test and refine) was that familiarisation with the common tasks of FY1 doctors is a *mechanism* designed to be triggered by apprenticeship of students to FY1 doctors *(intervention in the appropriate context)*, with the *outcome* that the student will be able to perform these tasks independently when s/he is a FY1 doctor. These middle range theories were then built into a final programme theory about the chain of causation in how doctors approach their significant firsts.

Reflexivity

We are a multidisciplinary team comprising general practitioners, a palliative care physician, an emergency physician and a basic scientist. All but SY are stakeholders in the Keele curriculum having developed and led aspects of the program since its inception.

We brought the perspectives of our disciplines to the development of an initial programme theory, and in data analysis we rigorously tested our individual explanations in group discussions to ensure that all perspectives were examined in the light of our disparate gazes.

Results

32 medical students participated during their final year. Of these, 14 consented to be followed through their transition to FY1. 11 of the 14 submitted audio diaries and 6 of the 11 were interviewed. In addition, 57 FY1 doctors from three local hospitals who were graduates of 17 UK medical schools participated in eight focus groups and 13 postgraduate year 4 doctors who were in their second year of general internal medicine training participated in two focus groups. Seven further individual interviews of FY1 doctors at one of the hospitals were conducted.

Each of the ten focus groups listed and then discussed their significant 'Firsts'. These firsts have been categorised during transcript analysis into three categories of experience of preparedness: firsts which were anticipated and deliberately prepared for in medical school, firsts for which total prior preparedness is not possible due to the step change in responsibility between student and doctor identities, and firsts which were experiences of failure. These are listed in table 1 and subdivided for ease of comparison into firsts in team working, patient encounters, prescribing and clinical procedures. There is overlap between the first two categories and the third, as all the tasks involved in failures would be tasks which might or might not have been prepared for, but in this category the experience of failure was in itself a first which came to mind when participants were asked to describe their significant firsts.

Further analysis of the transcripts of focus groups, audio diaries and student and FY1 interviews was carried out to develop middle range theories explaining what it was about the context and the doctor's preparation which produced the nature of each of these three categories of firsts.

Table 1: Lists of significant 'Firsts' as new doctors generated by j participants divided at transcript analysis into categories of predominant experience of preparedness*.

Firsts which were anticipated and prepared for in medical school	**Firsts for which total prior preparedness is not possible due to the step change in responsibility**	**Firsts which were experiences of failure (whether or not they were prepared for the task)**
Teamwork Carrying a bleep (pager) First ward round presenting patients and writing in the notes Being the first assistant in theatres Writing discharge summaries	**Teamwork** First ward round on own First on call-holding the cardiac arrest bleep Being the sole person responsible – the only doctor in the ward	**Teamwork** Speaking to a consultant and trying to justify a request The first time being told off down the phone The first incident report filled out

Making a phone call to a consultant Being praised for doing a good job **Working out of hours** Being on call **Administrative responsibilities** Certifying a death	Organising leave **Situational awareness** Learning to prioritise jobs **Identity** Introducing yourself as a doctor Taking responsibility by signing for something Someone wanting to speak to 'the doctor'	against one **Situational awareness/Resilience** The day when everything goes wrong First time using an unfamiliar system to request an X-ray
Patient encounters Clerking patients Attending an acutely ill patient Attending a cardiac arrest Confirming death Breaking bad news	**Patient encounters** Assessing an acutely unwell patient alone Being the first person at an arrest Making a decision without needing to check it with anyone else Talking to families about patients (ITU)	**Patient encounters** Causing harm to a patient
Prescribing Medication Fluids Insulin	**Prescribing** Prescribing without someone checking Prescribing under pressure on a ward round	**Prescribing** Making the first drug error
Procedures Suturing Catheterisation Femoral artery blood sampling Nasogastric tube insertion Cannulating feet	**Procedures** Taking blood from an aggressive patient	**Procedures** Taking blood (as a doctor) and failing Being asked to put a nasogastric tube down a patient who is fighting back (and the experience of failing to do so)
***These lists were generated by focus groups on flip charts. Each first was mentioned by one or more participants as significant to them. Interviews with FY1 doctors also added firsts to this list.**		

Firsts which were anticipated and prepared for in medical school

Some, but not all, firsts were anticipated and had been rehearsed as far as practically possible during medical school. Rehearsal both in simulation and in clinical practice was appreciated and there was evidence that the benefits of rehearsal as a student did transfer to working as a doctor. Self-efficacy for FY1 tasks was built by being successful and by gaining approval from seniors and patients. The perceived extent of opportunities for rehearsals during medical school was positively associated with perceptions of a smoother transition. However, UK medical schools varied considerably in how much preparation or rehearsal opportunities students perceived that they had received for their 'significant firsts'. Some participants reported the ability to mentally prepare on their own initiative as a partial substitute for institutional rehearsal opportunities. (See box 1 for examples of the variety of preparation for this set of firsts).

Insert Box 1 near here please

Firsts for which total prior preparedness is not possible due to the step change in responsibility

The second category of firsts was those involving the step change in responsibility attending the new identity of doctor. Those who had rehearsed responsibility under supervision in their final year at medical school generally found this step less daunting but still found it difficult to adjust to the different way they were now being treated by nursing staff and patients. (See Box 2 for examples of firsts where the new identity is taking some getting used to, and examples of medical school interventions giving responsibility to students in preparation for this step change).

Insert Box 2 near here please

Being alone and unsupported

A sub-set of the second category (being responsible) are firsts which were anticipated but had only been rehearsed mentally because they involved being alone and unsupported. The first night or weekend on call was the epitome of this anticipated challenge. In anticipation and in in-the-moment talk it was described as a sort of rite of passage which was dreaded, had to be passed through and, once it had, there was a surge in self-efficacy. In the event, the reality was often not as bad as the anticipation, because new doctors discovered that they were not so alone and as long as the context included supportive senior colleagues and nursing staff, the decision-making firsts were eased. If support was not provided when needed, participants were aware that they had some fearful and dysfunctional reactions which could compromise patient care. Box 3 shows examples.

Insert Box 3 near here please

Firsts which were experiences of failure

The final set of significant firsts were the failures. Box 4 gives some examples and also illustrates some mechanisms for recovery from failure. Failure occurred for a number of contextual reasons external to the new doctor such as unfamiliarity with the way things work in the hospital (M1FG8FY), but fragile self-efficacy was also an important internal factor contributing to 'the day when everything goes wrong' (ID28). Dysfunctional mechanisms were triggered by the context of the previous failure and made the next failure more likely. Two prominent dysfunctional mechanisms for new doctors faced with firsts were face-saving and avoidance. Face-saving was described in the context of the expectations they felt burdened with, and their ignorance of the support available (F5FG3FY, F3FG2CT2). Avoidance was described in the context of low self-efficacy (ID28 box 3). Confusion and freezing were also mechanisms described when the stress levels were too high (ID4; F3FG2CT2).

Failure was anticipated but might have been better prepared for (M2FG2CT2 box 3). In order to salvage self-efficacy and start things going right again, the right sort of support could trigger an

adaptive mechanism. For example encouragement and advice is better than an offer to take over and complete a task in which they were failing (ID28).

Insert Box 4 near here please

Discussion

Our initial programme theory about how simulation, shadowing and being given responsibilities as a student apprentice could lead to preparedness for the doctor's 'firsts' was that they would build self-efficacy for those firsts. We also predicted in the initial programme theory that the context in which they first took place (in particular the supportiveness of the team) would influence success. This study has demonstrated that medical students can indeed be helped prepare for practice, and to develop insight into its roles and responsibilities prior to graduation, but more could be achieved by increasing opportunities for rehearsal of authentic doctors' tasks in genuine contexts as has been previously advocated (2,8).

We found that for many, transition may be a misnomer for the change from final year student to first day junior doctor: rather than a transitional period there is a feeling of discontinuity or a step-change driven by the change in responsibilities – both as perceived by the new doctor and conferred by other professionals and employers.

Furthermore, our initial middle range theory about rehearsal was modified when we found that rehearsal was so important that, in its absence, medical students rehearsed mentally instead in an attempt to prepare. Success depended on the student's internal context and exposure to and insight into the realities of practice under different conditions.

The supportiveness of the team was confirmed as an important factor in the context. Indeed, both perceived 'failure' and 'success' offer opportunities for students and newly qualified doctors to, with appropriate support, develop resilience and a professional identity (23).

Overall, the identified mechanisms operating when faced by a first can be categorised as constructive, safe and effective *or* avoidant *or* dangerous. Examples of constructive, safe and effective mechanisms are activating what has been rehearsed physically or mentally, welcoming correction. Examples of avoidant mechanisms are losing confidence or passing the buck. Examples of dangerous mechanisms are face-saving, confusion and freezing. Both avoidant and dangerous mechanisms can result in practice which is unsafe for patients and for the professional. Such avoidant and dangerous responses to the pressures of being a doctor in training have been described in previous research (24–26). Our study sheds light on what it is in the context (or what is lacking) which triggers these reactions.

The recurrent CMO configurations (middle-range theories) found in these firsts suggest that educational systems which allow responsibility under supervision in senior assistantships where students undertake real doctor duties to build both transferable competencies and at least partial self-efficacy for the tasks. Simulation is partially effective as a system of preparation for most students, although the resulting level of self-efficacy for the real first varies. Self-efficacy is an

important interim outcome of medical school preparation if avoidant and dangerous mechanisms are not to be triggered in the new doctor when faced with a first.

Another interim outcome described by participants as contributing to safe and effective patient care is *knowing how to get help*. The context in which firsts occur can still trigger success or failure. Whether failure becomes an interim outcome on the path to success depends on the context, how help is given and how supportive colleagues are about the initial attempt. There might also be ways of prompting the development of adaptive mechanisms. Could we do better in preparing medical students and newly qualified doctors for what to do in the event of failure?

Our programme model for successful firsts as a junior doctor has evolved as we have discovered the important mechanisms acting when new doctors are faced with their first experiences of being FY1s. The main features of this complex social system are represented in figure 2.

Figure 2: Programme Model for how new doctors are able to face their firsts

Fig 2: please insert attached pdf

Limitations

The study was confined to a single health and training economy and so any generalisation of the study findings beyond these educational and working environments must be made with caution as perception of the climate and its consequences could be different elsewhere. However, the large number of focus groups and the participation in these of 70 doctors from 17 different UK medical schools who were now working in three distinct hospitals makes us confident that the reported firsts and range of preparation are representative of the current situation in FY1 within the UK.

Student and doctors self-reported their perceptions of what happened during firsts so the 'snapshots' are subjective rather than observed. Despite our efforts to capture participant experiences as early as possible, there would inevitably be an element of post hoc rationalisation of perception (especially in the case of the focus groups where experiences are interpreted in the light of group think) and some selective recall of medical school experience including perceptions of the curriculum as well as preparedness. The trustworthiness of the middle range theories we developed would have been best confirmed by respondent validation. This was not practical but trustworthiness was enhanced by including realist evaluation interview questions about what it was which had enabled participants to do things for the first time, and by reflexive team discussions to develop the most plausible explanations.

Recommendations for practice

Opportunities to rehearse aspects of the new doctor's role though assistantship and immersion in authentic clinical practice while still a student is an indispensable part of preparation for practice by enabling a phased transition to the adoption of responsibility and decision-making and development creating the foundations for further transitions into greater seniority (15,27). Rehearsal of what to

do in the eventuality of failure may help students to develop safe help-seeking and stress-calming mechanisms. But though very helpful, rehearsal is insufficient for success in transition (28). The discontinuity in decision-making and responsibility which new doctors experience during the first days and weeks of FY1 means the current efforts to perfect advance preparation (1,6) are inherently flawed. Investment is required in real time, person centred (to address the heterogeneity of responses to similar contexts) and authentic 'on the job' support for new doctors rather than further online or classroom based induction (5). Practitioners and policy makers need to consider whether the status quo of withholding authentic real time tasks from students risks more than it solves with respect to patient safety (9–11,13). These findings are a powerful demonstration of the need for further research to increase our understanding of this discontinuity and to support the progressive development of independence and adoption of graded responsibilities across the boundary between undergraduate and qualified doctor.

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Appendix 1 : information for participants

Thank you for agreeing to continue to participate in the Transitions Study.
You will be sent a memory-jog text daily from Aug 1st for the first 10 days then weekly for 4 weeks then monthly until 1 week following transition into your second FY post. You don't have to respond each time but we would like to hear from you as often as you have something to say about life as an FY1.
Please phone to leave a voicemail on: (phone number)
Your voicemails will be transcribed and made anonymous under your participant ID.

We are interested in:
- Doing things for the first time, or experiencing things for the first time. What happened and how did it feel?
- How well prepared were you for these "firsts"? (preparation from medical school? from formal FY induction? or informal support?)
- Any reflections on how you might have been better prepared.
- Please also describe any other events which felt significant to you.

Appendix 2: Focus Group guide

Generate a list of firsts for the FY1 as a warm-up exercise

- What was it like doing things for the first time?
- How has reality compared to your anticipation of transition?
- How did your medical school experience prepare you for these transitions? (what transitional doctor roles were you given, what activities were helpful?) Consensus? Different views?

Three types of firsts to ask more about:

1. One or two which they have mentioned being significant for them
2. Those which surveys show FY1s feel poorly prepared for (eg prescribing)
3. Some of the firsts listed which they might have done already as a med student (eg writing TTOs and discharge summary) so they can talk about the transition having started in med school (if it did)

What did you find difficult in the transition from student to doctor?
What gave you confidence? Consensus? Different views?
What else has helped you with the transition? Consensus? Different views?

Why are there differences between medical schools in the levels of preparedness of their graduates?

What might you have done at medical school which would have helped you make the transition?

	2013		2014						2015
	Sept	~	May		Aug	~	Nov	Dec	Jan
Final year student participants n=32	Learning logs Audio diaries and interviews			Consented to be followed through the transition n=14	FY1 Voice-mail diaries n=11		FY1 interviews n=6		
FY1 and CT2 doctor recruits n=70	FY1 individual interviews n=7	Four FY1 focus groups n=29	Two CT2 focus groups n=13						Four FY1 focus groups n=28

Box 1: Medical school preparation of graduates for their firsts:
examples of context(C) –mechanism (M) -outcome (O) configurations where these could be identified.

Repeated practice writing a management plan for a patient (C) gives you a lot of confidence about doing the same task as a doctor (O) by getting some of your firsts under your belt as a student (M): I think the first time obviously I wasn't too sure what to write for the medical plan and stuff but, you know, the times that came after, I was almost, you know, completely right, and that made me feel like oh at least I know where to start – at least in my first year if it is AMU, when I'm a junior doctor, at least I know how to handle it, so that experience made me feel more confident. **Student interview 06m**

Giving advice to a patient on a GP student assistantship with support from the GP (C) and being believed (C) generated self-efficacy (M) and thus transferable decision-making skills to being a doctor? (O): The patient was very accepting to what I had to say so I felt that this was very good, that I could give good advice and someone believes me, even though I'm a medical student. And it was all correct and witnessed by the doctor, so that was good as well. **Student 03f GP audio diary**

Some students prepare if they know they should have seen or done something but have not (C). By internal anticipatory thought (M) they prepared to witness a death (O): My most significant first is going to be seeing a patient pass away, 'cause I've never actually seen that before. I'm prepared… I think that will impact me a lot, but I hope I'm prepared for it at that time. **Student interview 29f**

Box 2: Firsts for which total prior preparedness is not possible because they involve taking on a new responsible identity: examples of context (C) –mechanism (M) -outcome (O) configurations

Memory still fresh of the required internal reframing (M) in the sudden transition from being helpful (student) (C) to being responsible (doctor) (C): In a ward environment, when any professional speaks to you as a student, the stock answer is '*oh I'm just a student let me get you the doctor*'. And now all of a sudden, that's you. **M11 FG1 FY**

And going through with the experience (M) is the only way to learn some things: There are a lot of things that you will only learn in those moments, in those horrible, terrifying, heart-wrenching moments when you are an F1 – those moments when you just, like, you want to cry, but you will not learn those things until it is your time and you're an F1 and you're in that horrible situation – that's the only time you're going to learn it. As much as… you can prepare a medical student as much as you want, but those moments aren't going to come until their name is the name that's going to be signed and they're the ones that the nurses are looking to for an answer – it's just not going to happen **F2 FG3 FY**

Efforts to prepare for this change in responsibility:

Doing FY1 role with no FY1 to shadow (C) felt like a very evident transitional role (M) resulting in preparedness for responsibility (O): On the ward round, one time it was just me and the consultant, so I was sort of… so that's when I sort of feel I was being transitioned to the F1 because I was sort of doing the F1 job. **Student interview 26f**

An out-of-hours studentship (C) bolsters self-efficacy for FY1 (O) by being treated and feeling like an FY1 (M): When I did out of hours, because I was on AMU, there wasn't that many… well there wasn't a consultant at night and stuff, so I actually got to get more hands-on work, 'cause the junior doctor I was with, she just said "you take a history, examine, make a provisional plan, you come and tell it to me and I'll tell you if it's appropriate, then I'm not going to come with you, you just go to the registrar and then present and they're going to ask you as if you were me" – as if I was an F1 –I found that really helpful because it makes me feel more comfortable. If I can do it now, then that means next year I won't have any trouble. **Student interview 05m**

Box 3: Firsts for which total prior preparedness is not possible because they involve being unsupervised:

<u>Anticipatory feelings about coping alone / loneliness (the internal Context for FY1 firsts):</u>

The first night on call alone with no help is a legend in the anticipatory talk (C) creating fear (M) and reduced self-efficacy (O): You do hear sort of horror stories about junior doctors being on their own for the first nights and no-one to sort of call for help, so that will probably be quite a big first. **Student interview 21f**

Being alone and taking responsibility is not necessarily a bad first in the hopeful anticipation (M) of the medical student who sees it as a rite of passage – the anticipated really important first (C): I think the first emergency situation that comes your way, where you are the only one left to deal with it, in charge – like that'll be a really important first and hopefully obviously the patient will make it and stuff, so you'll be… you'll feel like yeah, I saved that person, I was there, I had to take charge, lead a team, you know, get people to do this, this and this – that'll be a good first, I think. **Student interview 25f**

Still waiting for the rite of passage(C) and feeling avoidant about it (M) causes distracting worry (O):

Aug 4: I haven't yet really seen any sick patients, erm, but I'm sure that's going to happen at some point fairly soon. Erm, preferably when, you know, I've got lots of people around me to help.

Aug 5: It's been another long day. I held the crash bleep and went and picked up my own bleep for the year as well. Fortunately neither of them went off, but I'm sure they'll start doing, at some point. So I spent sort of most of the day worrying that they might. **FY1 28f voicemails**

Sometimes support needed on the first week is not provided (C) even though this is a predictable event. The new FY1s didn't know what to do (M) and were dysfunctional until the support arrived: On the whole, the support was generally okay – I think it just happened to be that Wednesday, during the day, there was no consultant ward round which was just very unlucky. He did come onto the ward eventually, about six o'clock. You'd think they'd realise by now that the first Wednesday of August is changeover day and there's going to be problems, but every Wednesday in August – first Wednesday in August – there's… they don't make any provisions, at all. **M2 FG2 CT2**

Box 4: **Firsts which were experiences of failure**:

Attempting a phone request when new and unsure (C) and getting in a panic (M) results in being criticised (O):
(Phoning) the neurosurgical reg' or something, you know, and then ending up just sort of being shouted at, it feels… 'cause you've not explained it very well, you've got yourself in a flap, you didn't quite understand why you were ringing him in the first place… **M1 FG8 FY**

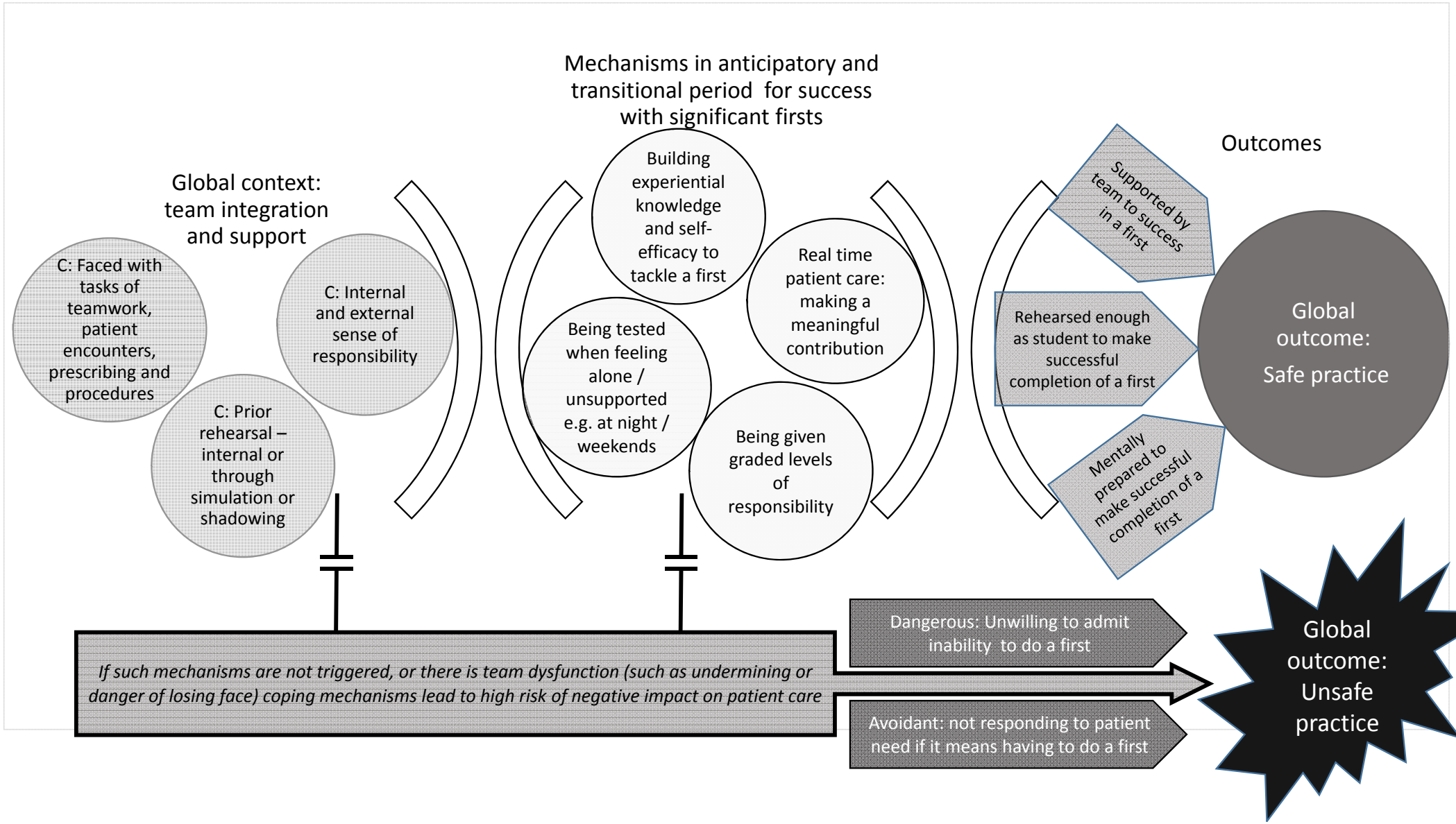
Having an offer to take over when you failed (C) undermines the new FY1's confidence (M) resulting in reduced self-efficacy (O). Coaching for the next attempt would be preferred:
Aug 6: Thursday was a horrible day, it felt like everything that I did I failed at.
Aug 8: In terms of when things aren't successful, I think I've realised the type of feedback I respond well to is supportive, encouraging feedback that's, you know, *oh give it another go*, or constructive feedback, telling me what I've done wrong and saying *right, now try it again this way* or *try it again like this next time. S*ome of the feedback I'd been getting on Thursday was *oh, you can't do it, you don't know how to do it* and I'd only tried most things once, but people were just like *oh it's okay, I'll do it*, and that just feels quite undermining and makes you feel like… feel very incompetent when you're not incompetent, you're just learning and you just need a bit of support and encouragement rather than someone to come in and just take things over from you. **28f Voicemail**

Face-saving (M) is a dangerous way of handling the transition in identity. The step change in nurse expectations and attitudes as a result of status (C) may be a cause of such over-reaching in decision-making (O):
I think the expectation that you should hit the ground running when in fact it takes some time to adapt, and you want to please, you don't want to be the one who struggles to get going with things **31f FY1 Interview**

Feeling alone and unable to call for help (M) due to inexperience in team working (C) could allow the situation to deteriorate (O): *You make it sound as if you were very alone?* F3 – with those surgical twilight shifts, it certainly felt like that. I mean you can be quite alone at times, if your SHOs are off, your registrar's in clinic and things are going wrong and you can't reach anybody – yeah, definitely, times when you feel very alone. *Scared?* F3 – oh yeah. Definitely. ….but there's always someone you can call and you don't always realise that as an F1. **F3FG2 CT2**

A critical illness (C) triggered confusion and possibly avoidance (M)
The nurse came out and went *oh there's some blood on the bed* and I'm thinking oh blood on the bed, oh my life. So that was a bit of a panic moment and rather than sort of doing your ABCD assessment, it all just goes out of the window and you just think *oh my God blood*. So fortunately an SNP was near then and they came and helped me….And the patient was taken to theatre straight away, so… I perhaps didn't take as active a role as I would have liked. 4f FY1interview

Being bleeped (C) is confusing (M) making the F1 ineffective (O): Being on ward cover, getting bleeped incessantly and not being able to know where to go first, so you just end up going everywhere in all sorts of directions, not being able to make a plan. **F3 FG2 CT2**


Mechanisms in anticipatory and transitional period for success with significant firsts
Global context: team integration and support
C: Faced with tasks of teamwork, patient encounters, prescribing and procedures
C: Internal and external sense of responsibility
C: Prior rehearsal – internal or through simulation or shadowing
Building experiential knowledge and self-efficacy to tackle a first
Being tested when feeling alone / unsupported e.g. at night / weekends
Real time patient care: making a meaningful contribution
Being given graded levels of responsibility
Outcomes
Supported by team to success in a first
Rehearsed enough as student to make successful completion of a first
Mentally prepared to make successful completion of a first
Global outcome: Safe practice
If such mechanisms are not triggered, or there is team dysfunction (such as undermining or danger of losing face) coping mechanisms lead to high risk of negative impact on patient care
Dangerous: Unwilling to admit inability to do a first
Avoidant: not responding to patient need if it means having to do a first
Global outcome: Unsafe practice