

# Learning from Error: Exploring Barriers to Enquiry-Based Methods in Teaching Patient Safety to Students and Junior Doctors

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## Abstract

Research on methods of undergraduate teaching of patient safety is limited to the United States. Here we report on pilot teaching composed of a pair of tutorials utilising Enquiry-Based Learning (EBL) in the interval between sessions in Year 5 and the Foundation year (F1). The evaluation included focus groups (for both grades) and interviews with F1 doctors following teaching. This paper summarises what we learned both about successful strategies and barriers to enquiry and learning, proposing a teaching format for Year 5.

## Method

Evaluation of views of teaching addressed both the process of the pilot and the broader context of learning. Student groups were facilitated and recorded by the teacher/researcher alone. For the F1 teaching, an independent facilitator met five doctors in a focus group immediately afterwards, while a medical student researcher sampled nine of the remaining twenty participants for interviews 4-6 weeks later. These explored views on student experience, teaching methods and more sensitive topics, for instance errors related to inadequate supervision.

Discourse was recorded by camera (focus groups) or audio (interviews) respectively, transcribed and subjected to qualitative analysis. As part of a larger multi-institutional survey an anonymous questionnaire had gathered quantitative and qualitative data on attitudes to error from a cross section of 100 Manchester medical students. The lead researcher and student first identified themes independently in the survey data and transcripts, coming together later for comparative analysis. Since two thirds of the doctors had graduated locally, the survey data helped triangulation.

## Results

During the first F1 session a 'post-it' wall of personal errors provided group safety. In the second session analysis and presentation of these by type was valued, but recall of disclosure learning was poor. The course largely failed to engage students or doctors in workplace enquiry.

Several grievances probably contributed to difficult large group dynamics and poor responsibility for learning, including EBL. These were:

- Lack of confidence in managing error;
- Complaints of inadequate training and reporting systems;
- Feelings of inevitability of error and reports of negative institutional culture, both critical seniors and nurses' defensive use of reporting forms.

## Conclusion

This report contributes to understanding of learning about error in the transition from senior student to doctor. Skilled teaching methods may be needed to overcome barriers to learning. Recommendations are made but require further evaluation.

## Background

Reports on undergraduate and early graduate teaching about patient safety and managing error are limited to the United States. Descriptions of needs assessment and

curricula often do not address barriers to learning, some of which may be context specific. Teachers need guidance on effective teaching methods and timing. This report describes the evolution of a pilot delivered first to Year 5 students, and then to junior doctors ending their first year of practice. The two sessions of Problem-Based Learning consisted of first, cases on root cause analysis, then encouragement of workplace discussion in the interval, and finally a second session on managing disclosure. Engaging medical students stalled because of low recruitment. The teaching was then delivered near the end of doctors' Foundation (F1) curriculum and, to augment formal feedback, volunteers were sought for research evaluation.

## What was known about Student Attitudes to Patient Safety and Error?

Concurrent with this work, Manchester participated in a larger study involving other UK medical schools which successfully validated a questionnaire (unpublished to date). 100 Manchester medical students completed an anonymous online survey covering nine attitudinal domains, each of which comprised several questions. These domains are shown in the table below:

1. Importance of learning about patient safety	5.08	6. Responsibility to disclose error to patients and others	5.07
<b>2. Confidence in reporting error / talking to a supervisor</b>	<b>3.84</b> Std 1.18	<b>7. Inevitability of error</b>	<b>6.2</b> Std 0.95
3. Teamwork and training in error reduction;	5.44	8. Relation of errors to working hours / shift patterns	5.25
<b>4. Adequacy of training to date</b>	<b>4.09</b> Std 1.05	9. Patients' role in preventing or causing error	4.81
5. Incompetence as a cause of error	3.18		

*Table 1* Manchester students' attitudes to error.

Unfortunately, the survey results were not available at the time we designed our pilot teaching. Noteworthy categories for triangulation with our qualitative results are shown

above in bold type with agreement scores on a seven point Likert scale alongside (1 strong disagreement to 7 strong agreement). Importantly, '*Confidence in reporting*' was relatively low, as were opinions of *adequacy of training to date*. For instance, students' agreement with '*Tutors emphasise the importance of learning about patient safety issues*' was only 3.64 Std 1.50. While students agreed with a realistic view of fallibility: '*Even the most experienced and competent doctors make errors*' (6.33 Std 0.88), they also saw that '*Human error is inevitable*'. It is important to ask whether there could be a tension for students, who are aware that error is common, but are also not confident in either reporting it or talking to supervisors or tutors. With hindsight, this apparent lack of confidence and perhaps potential for resigned acceptance of error might have affected the outcomes of the pilot sessions.

The survey also gathered qualitative data, to the following statements:

- What do you think are the key issues students should learn about patient safety before they qualify as doctors? (n = 60 responses)
- Why do you feel your training has/hasn't addressed these issues? (54 responses)
- Has patient safety been taught as part of the undergraduate syllabus so far? If so when and how? (35 responses)
- Do you have any suggestions on how teaching/learning about patient safety could be improved on your undergraduate course? (46 responses)

The researcher and medical student researcher identified themes from these independently *before* working on the data from the pilot reported here. Some important themes, *additional* to those we report below, were:

- integrate teaching rather than isolated, boringly titled lectures;
- explicit or structured clinical teaching;
- better role modelling by clinicians / teachers;
- more workplace experience / shadowing.

## Learning Objectives for the Sessions

Key learning objectives were derived from a consensus statement agreed at the Association for Medical Education in Europe conference 2006 (AMEE) (Sandars *et al.* 2007). Since Manchester's goals were in line with these, the paired pilot sessions focused on small group integration of knowledge and skills in the causes and management of error – emphasising objectives 1, 2, 3, 5, and 6. The remaining objectives must also be addressed: safe prescribing/communication teaching.

### Main

1. Increase knowledge - the causes and frequency of adverse events: using [www.saferhealthcare.org.uk](http://www.saferhealthcare.org.uk);
2. Develop self awareness of situations when patient safety is compromised;
3. Develop willingness to take responsibility;
4. Develop communication + team working skills.

### Lesser

5. Develop skills in root cause analysis (RCA);
6. Develop skills in dealing with the aftermath of errors, in both doctors and patients;
7. Develop skills in safe prescribing and procedures;
8. Develop skills to empower patient involvement.

## Rationale and Reflection

Because of the sensitive nature of the topic, one would expect difficulties in getting students to 'own' error or perhaps even to identify with other trainees experiencing error. The teaching sought a 'way in' to the topic that would enable an increase in interest and confidence – sufficient to stimulate interval 'enquiry' and link to a second session on disclosure. We aimed to facilitate feedback from the interval enquiry by using a short piece of reflective writing (students) or question prompts (doctors).

Given the lead tutor/investigator's inexperience in teaching the topic, the initial plan was too ambitious, in that it sought to compare groups, depending on the involvement of a personal tutor. Looking for an effect of a one-to-one relationship with a tutor as a means to overcome barriers to discussion about disclosure was a reasonable objective, but required more understanding of the way these barriers can impact on wider participation in learning. However, a literature review, conducted concurrently with this research, reveals that little attention has been paid to the learning process for this topic. So the lessons learned here may be useful at several levels - curriculum design, teacher training and providing a basis for further research.

## Teaching Approach - Report from Pilot

Two variations on a two one-hour session format separated by one to five weeks were tried out and the evaluation of the components that worked best is used to propose further Year 5 teaching.

### Year 5 Pilot

This was run twice with groups of six students and was composed of teaching on root cause analysis (RCA) using a primary care 'case', followed by encouragement to investigate error and/or disclosure of error in the workplace and with personal workplace tutors (GPs). The case centred on a falsely, high Lithium blood monitoring result because a nurse had put blood in an incorrect tube. Although mistakes in knowledge, and 'rule violations' contributed, the case also illustrated the multi-factorial nature of errors to draw out thinking about error type, and root causes like tiredness and distraction. The second session was for feedback of interval learning, and then focused on disclosure of error to colleagues and patients.

### Outcomes

Recruitment was hard, students were reluctant to return and barriers to discussion were obvious – except when the second session was limited to one-to-one/two teaching. Students varied in willingness to bring back learning material to share, though some did talk to their workplace tutors.

## Foundation Pilot

This was run once with 25 Foundation (F1) doctors attending the first session and for the second, 16 F1 doctors – the latter clashed with alternative teaching for some.

## The First Session

This started in lecture format to introduce the topic of classification through root cause analysis and then successfully used a 'post-it' wall of 'mistakes I have made or seen' to initiate subsequent discussion in small groups. Each participant posted one or more errors – total 27 (see Table 4 for analysis). The tutor asked the doctors to group these, but more prior direction on root cause analysis was needed here. An introduction that both builds group safety and develops this knowledge is needed.

Because of the larger participant numbers, the tutor (MP) then used prepared British Medical Journal 'lessons of the week' as a trigger for further discussion on root cause analysis – this drew negative feedback because, although hospital based, the cases were thought 'too specialist' for many F1 doctors and also focused on knowledge-based error. The lessons did not generate thought on a wide range of causes. On reflection, it may have been better to use the primary care based case tested already.

## The Second Session

A written handout to encourage doctors to raise the topic of 'learning from error' with workplace colleagues in the interval week again failed to elicit feedback on interval learning.

- Reflection to the group on process: With this 'plan failure' apparent at the start of the session, the tutor acknowledged reasons behind negative attitudes to the topic and challenged the group on their responsibility for learning.
- The tutor formally presented a PowerPoint analysis of the distribution of error types on the 'post-it' wall. The whole group debated and selected one case to discuss on the topic of *disclosure*. This was '*A positive Prostate specific antigen test (PSA) result (i.e. Cancer diagnosis) mistakenly given to the wrong man*'. Small groups then discussed disclosure: to whom, why and how?
- A plenary then brought together the small groups and spokespersons to relate their responses to evidence that the tutor offered on barriers and facilitators to disclosure (Kaldjian *et al.* 2006).

## Evaluation Method

These were assessed by a formal feedback form and qualitative analysis of a video recording of an independently run focus group (five participants immediately after the second session) and audio taped interviews four to six weeks later (nine by a Year 4 student). The interviewer sought doctors who had not volunteered group feedback to ensure a spread of response. The student interviewer could relate informally with respondents and probably recruited doctors who would otherwise not have participated, as some were reluctant to disclose experiences in the interviews and needed reassurance on confidentiality. Sensitive topics included descriptions of criticism from seniors after error and the risk of error in supervising students.

The transcribed materials were independently coded by the student and lead investigator/tutor and subject to comparative analysis to derive themes on attitudes to error and related learning, and specific feedback on the teaching sessions. Since two-thirds of the F1 doctors were Manchester graduates, we decided to use both the quantitative (Table 1 above) and also qualitative responses to the online survey of students to triangulate our data. Two interview respondents identified themselves as graduates of another medical school, and one recalled useful teaching.

## Outcomes

### Session One

The 'post-it' wall worked well as an introduction to a sensitive topic, but formal evaluation was markedly diverse. Within the interviews constructive suggestions were made, but one interview suggested that negativity reflected attitudes to the topic as much as toward the teaching!

### Session Two

The formal evaluation was numerically similar, but less critical – possibly because the tutor had confronted the difficulties in teaching/learning directly with the group, and had also shown vulnerability. If done during session one this *might* have increased enthusiasm for enquiry in the interval between the sessions. The 'post-it' wall analysis feedback and disclosure discussion of an F1 case were popular. Doctors wanted information / or protocols on avoiding error. The subsequent interviews suggested transition 'opportunities' to teach and learn, but also shed light on significant grievances that influenced the sessions. The impact of these is addressed below the evaluation



summary (Table 2). General comments on the need for better presentation and smaller groups are omitted here.

<p><b>Session 1: effective</b></p> <ul style="list-style-type: none"> <li>• Humour and safety of post it wall</li> <li>• Seeing range and type of errors</li> </ul> <p><i>Dr 1 ...definitely a helpful session, first to see what kind of mistakes everyone's done and then you feel a lot better about yourself and think oh I'm not the only one. And I think maybe 75% of the mistakes were due to a lack of experience ...you're in a safe environment, its ok.</i></p>	<p><b>Improve</b></p> <ul style="list-style-type: none"> <li>• More on protocols to avoid and report error.</li> <li>• Relevant cases for RCA</li> </ul> <p><i>(Our view:earlier development of small group safety and acknowledgement of grievances)</i></p>
<p><b>Session 2: effective</b></p> <ul style="list-style-type: none"> <li>• Presented analysis of error types</li> </ul>	<p><b>Improve</b></p> <ul style="list-style-type: none"> <li>• More guidance on how to disclose and practice role play?</li> </ul>

Table 2 F1 doctors' evaluation of teaching process.

## Barriers to Teaching and Learning

The grievances listed below, especially the first three, could be barriers to learning and also undermine confidence.

- **Inevitability of Error/Nihilism**

If error is seen as common and normal, it might also be linked with negative attitudes.

*Dr 7 ...we all discussed errors but it kind of highlighted the problem that errors do occur, but not much can be done about them.*

*Dr 5 (L 26) ... you find that a lot of the errors that we make are very similar and possible guidance should be put up in the hospital to actually stop it from happening in the first place*

*(L75) ...talking about it helps only to a certain extent... you need to be involving the whole hospital to implement changes which is never going to happen.*

- **Lack of transparency/lack of feedback on reporting error**

Negative feelings appeared to be intensified when often there was no feedback on the outcomes of reporting.

- **Blame/shame culture**

Seniors could be critical of error and some doctors viewed admission as a threat to careers.

- **Ignorance of systems**

Resentment related to unmet need for guidance and better protocols.

- **Inter/Intra-professional tensions**

Nurses were thought to use 'incident' reporting forms defensively, to avoid taking responsibility in the workplace.

The following quotation illustrates both the difficulties in challenging seniors e.g. in other specialties, and the lack of feedback.

***Dr 8** I've filled in one (reporting form) ...with regards to a patient who we wanted reviewing by, am I allowed to say, the gynae team, ...a ring for a prolapse that she had and it had become dislodged and they were just telling me as a house officer "oh its easy, just remove it" and I tried telling them I don't feel confident, .. I don't really know what I'm doing Can you please review them? and this went on for over probably about a month and I just don't really feel it was satisfactory.*

*Q: and did you hear anything back about the incident form?*

*A: ... well I've not heard anything back as of yet. They decided it wasn't really an emergency and that it was probably, it would probably just come out anyway, I don't know how it was resolved.*

## Transition Opportunities for Teaching and Learning

Some F1s doubted the relevance of learning to current Year 5s, because they were -'not making decisions,' and not under the same work pressures. But several F1s felt that they could be effective teachers and outlined the potential.

***Dr 2** ...F1 they are the most approachable doctor you're going to be able to get for a medical student because they're not really doctors and they're not really medical students ... able to relate to the medical students a lot more.*

However, these statements were made to a medical student researcher and were not usually iterative. So it is not clear that F1s would have either the confidence or time to teach a Year 5 in a shadowing workplace role. The optimum time for learning is probably shortly after doctors start in service, but it is also vital to prepare students.

## Discussion and Further Development

A provisional format based on the pilots is offered below, but requires further development (e.g. on a 'checking' exercise). We may need to accept that even the best EBL strategies will meet some learner reluctance, so that tutors should prepare themselves with alternative resources: e.g. scenarios to supplement the 'post-it' wall. However, it is important to add that some students, especially in the smaller groups, did show an interest in workplace enquiry. This was also indicated in some of the survey responses, though the latter drew on a small self-selected group.

Possibly, there would be greater participation in enquiry within a formal teaching rather than a voluntary course, particularly if this was supplemented by written prompts and linked to assessment. We should also ensure a response to students' views on better integration with clinical learning and role modelling.

## Recommendations and Key Points

- **Find a clear and interesting title!** - Perhaps because it is seen as managerially led, the term Patient Safety is a 'turn off'. 'Learning from Mistakes' might be better.
- **Timing of teaching and personal relevance of error are crucial:** Students may need to be involved in management decisions to conceptualise workplace error and see the relevance of learning to their role as Foundation doctors (F1s).
- **'Shadowing' and understanding workplace stress:** Some F1s see their own experience of error and the stressful or busy circumstances under which error often occurs as an important teaching resource. The value of student 'shadowing' as a 'safe' method of enquiry should be explored.

- **Group safety:** Teaching methods must address significant barriers that exist to 'taking responsibility' for discussing error, even in small groups. The student questionnaire indicated a lack of confidence in reporting error. Building confidence to raise the topic is likely to be important in nurturing any workplace learning.
- **Managing cynicism, denial and nihilism:** Tutors need to be proactive in managing reactions to institutional, intra- and inter-professional grievances. Proposals for inter-professional teaching will need careful planning.

<p><b>Session 1</b></p> <ul style="list-style-type: none"> <li>• Introduction; scale of error</li> <li>• Elicit and Acknowledge barriers to discussion? start as 'pairs' exercise</li> <li>• presentation of F1 data (below) – routine rule 'violations' are common</li> </ul> <p>foundation 'case' analysis involving pressure of work factors / coping with the system? Practice generic prevention methods e.g. '<i>checking exercise</i>' - <i>involuntary automaticity</i> (Toft and Mascie-Taylor, 2005). <i>Also discuss management responsibilities</i></p>	<ul style="list-style-type: none"> <li>• INTERVAL LEARNING: -?voluntary shadowing OR feedback on role models / effective systems / audit</li> </ul> <p><b>Session 2</b></p> <ul style="list-style-type: none"> <li>• 'post-it' wall / prepared scenario</li> <li>• selection for disclosure</li> <li>• to who, why and how? Use 3 buzz groups</li> <li>• evidence on benefits (Dr / Pt) and barriers</li> <li>• ?Practice – this could be reinforced in communication teaching</li> </ul>
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Table 3 Double Tutorial Plan.

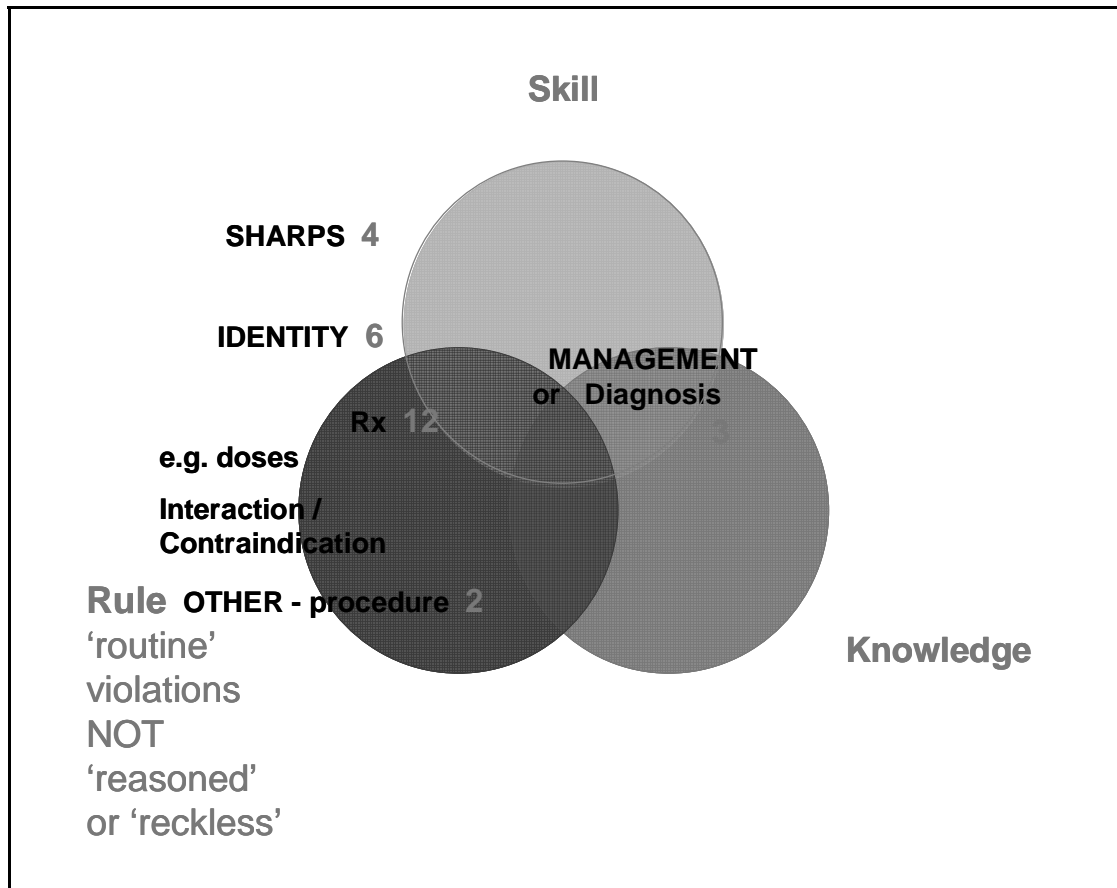


Table 4 Foundation doctor 'post it' error types.

## References

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