

Medical error: a discussion of the medical construction of error and suggestions for reforms of medical education to decrease error

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Introduction There is a growing public perception that serious medical error is commonplace and largely tolerated by the medical profession. The Government and medical establishment's response to this perceived epidemic of error has included tighter controls over practising doctors and individual stick-and-carrot reforms of medical practice.

Discussion This paper critically reviews the literature on medical error, professional socialization and medical student education, and suggests that common themes such as uncertainty, necessary fallibility, exclusivity of professional judgement and extensive use of medical networks find their genesis, in part, in aspects of medical education and socialization into medicine. The nature and comparative failure of recent reforms of medical practice and the tension between the individualistic nature of the reforms and the collegiate nature of the medical profession are discussed.

Conclusion A more theoretically informed and longitudinal approach to decreasing medical error might be to address the genesis of medical thinking about error through reforms to the aspects of medical education and professional socialization that help to create and perpetuate the existence of avoidable error, and reinforce medical collusion concerning error. Further changes in the curriculum to emphasize team working, communication skills, evidence-based practice and strategies for managing uncertainty are therefore potentially key components in helping tomorrow's doctors to discuss, cope with and commit fewer medical errors.

Keywords Medical errors, *standards; education, medical, *standards, methods; professional competence; prevention; review literature (PT).

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Introduction

Medical error has been described by the Chief Medical Officer for England as an actual or potential serious lapse in the standard of care provided to a patient, or harm caused to a patient through the performance of a health service or health care professional.¹ Doctors do not usually intend to commit medical errors and conscientious and clinically competent doctors make mistakes that they regret, learn from, and live with. However the publicity surrounding the Bristol cardiac unit and high profile decisions from the General Medical Council to strike off practitioners from the

Medical Register have contributed to a growing public perception that serious medical error is commonplace and largely tolerated by the medical profession.

The Government and medical establishment's response to this perceived epidemic of error has included tighter controls over practising doctors and individual stick-and-carrot reforms of medical practice. This paper will critically evaluate some of these recent reforms and will argue that the basic mismatch between the individualistic nature of the reforms and the collegiate nature of the medical profession may limit their effectiveness in decreasing error. A more theoretically informed approach to the multifaceted issue of medical error might be to recognize the important role played by medical student training in the genesis and development of medical thinking about error. This is an issue that medical educationalists need to discuss with some urgency, particularly in view of the many additional medical school places to be created in the next 5 years.

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Key learning points

There is a growing public perception that medical error is commonplace and largely tolerated by the medical profession.

Recent medical practice reforms intended to decrease error are largely directed at individuals.

The tension between the individualistic nature of many of the reforms and the collegial nature of medical thinking and working practices may limit their effectiveness.

A more theoretically informed approach may be to address the genesis of medical thinking about error, through reforms of aspects of medical education and professional socialization.

A review of the literature on medical error

The literature on medical error includes a number of common themes which seem to transcend international boundaries. In the early 1990s, Rosenthal interviewed over 60 doctors in the United Kingdom and identified seven themes which permeate medical thinking on medical error.² The doctors emphasized uncertainty with regard to human limitations, patient and disease characteristics, organizational problems, fatigue and personal problems, and being caught up in the middle of a bad treatment strategy. The concept of necessary fallibility encompassed the view that if there is permanent uncertainty, then there must be fallibility in every good, competent doctor's actions, which must then be accepted as part of the practice of medicine. From these two main themes grew a sense of shared personal vulnerability with colleagues, a feeling of 'there but for the grace of God go I.' Rosenthal also found that doctors had a strong sense of identification with each other, enhanced by their common uncertainties. Shared experiences of making a mistake also created a powerful sense of mutual empathy which often led to understanding and forgiveness of mishaps and a strong norm of non-criticism, described as a 'conspiracy of tolerance'. Rosenthal concluded that the cumulative logic of these preceding themes lead to the final common theme of the exclusivity of professional judgement, that is the conviction that only a fellow doctor can make judgements about another doctor's mistakes.

Rosenthal's findings chime with Bosk's study of junior surgical residents, training in the United States, which documented the emphasis on learning the proper

way of behaving in the face of continual clinical uncertainty.³ He described three categories of error: technical, judgmental and normative error. Bosk found that technical errors were forgiven if the behaviour around them was appropriate; that is, if they were reported straight away, were learnt from and not repeated. Judgmental errors were forgiven through admission of mistakes usually at in-house morbidity and mortality meetings. Normative errors were the most important; if the doctor did not take responsibility or try hard, or if the doctor let the family down, then this was the least-forgiven error, once again suggesting the greater importance of behaviour, of doing one's best during the process of care, above any outcome. For more senior doctors, Bosk noted that if they had internalized the norms of proper behaviour, actual medical mishaps were generally ignored by other doctors.

A further important contribution to the understanding of the medical construction of error was Mizrahi's interviews with 83 junior doctors in the US in the early 1980s.⁴ Mizrahi found that three major mechanisms were used to define and defend medical error: denial, discounting and distancing. Denial consisted of three components: the negation of the concept of error by defining the practice of medicine as an art with grey areas, also identified by Rosenthal; the repression of actual mistakes by forgetting them, and the redefinition of mistakes as non-mistakes. Discounting included defences that externalized blame so that mistakes were depicted as being due to circumstances beyond control, such as the managerial system, disease or the patients themselves. Mizrahi found that some doctors discounted medical mistakes by blaming the patient for deliberately withholding information and for intentionally lying, particularly if the patient also happened to be part of a traditionally negatively stereotyped group such as people with substance misuse problems. When a mistake could not be denied or discounted, then distancing techniques were used, including a variety of shared beliefs and justifications such as 'everyone makes mistakes' and 'I did all I could', that allowed admission of guilt. The group also saw themselves as accountable for mistakes only to themselves and perhaps to each other, echoing Rosenthal's findings of the exclusivity of professional judgement.

These recurrent patterns of thinking about and explaining medical error, that is, the emphasis on the uncertainty of medical work, the necessity of fallibility, the perceived exclusivity of medical judgement, the extensive use of medical networks when faced with a medical error and the externalization of blame, particularly towards the patient, find their genesis, in part,

in aspects of medical education and the process of professional socialization into medicine.

Professional socialization and medical student education

Socialization, a concept first illuminated by Durkheim in relation to how children learn social norms, concerns the processes by which individuals come to understand and internalize the attitudes and values inherent in a particular social role and which are distinct from those of society in general. Education and training is typically concerned with not simply the technical aspects of a particular skill but also in shaping the student to perform them from a particular perspective; a perspective based on a specific identity. Studies of socialization have covered a range of different settings and roles from children in education⁵⁻⁷ in which the 'hidden curriculum' and social reproduction were of primary interest, to teachers,^{8,9} nurses,¹⁰⁻¹² accountants,¹³ lawyers¹⁴ and the police.^{15,16}

Much attention has centred on the processes of socialization inherent in medical education and as Freidson notes:

...studies of the process of professional education try to show how one's conception of self-as-professional develops, as well as how one learns the knowledge, skill, and perspective which teachers in professional schools expect of their students. Both the substance of the process of choice of profession and of the process of formal socialization in professional school obviously play a great part in explaining the behaviour of individuals in work settings.¹⁷

Such processes are reflected in the sharing by physicians of a common vocabulary, way of thinking and patterns of behaviour which are distinguished sharply from those of lay people.

There have been a number of accounts of medical student training and professional socialization during the last 40 years, but perhaps the most complete and certainly the most recent description is Sinclair's study of student training at a London medical school in 1993-94.¹⁸ Sinclair built on the observations of Becker *et al.* of US medical student training and their description of perspectives,¹⁹ that is, coordinated situationally specific ideas and actions, by describing key features of the process of medical training and professional socialization in terms of dispositions. Sinclair found that *cooperation* was the paramount disposition throughout the years of training. As evidence he cited the importance that teams of all sorts have in medical schools, the evidence of student cooperation in taking

lecture notes and in helping one another pass exams and in 'covering up' for one another in clinical work on the wards. More recently medical students have set up websites on the internet dedicated to passing on lecture notes, and exam questions/answers, adding strength to Sinclair's argument that cooperation is increased in the face of adversity.

Medical *cooperation*, he suggested, is also encouraged by the length of the training course. Freidson has proposed that some of the motivation to identification with institutionalized skills and to solidarity with colleagues stems from this requirement of a long period of formal education.¹⁷ Long training is a socially, economically, and psychologically costly investment which virtually presupposes expectations of a stable lifelong career, and fairly extensive bonds and common interests shared with others going through the same process. Higher vocational education does not merely insert 'knowledge' into people's heads, but also builds expectations and commitments not easily overcome by managerial or policy rationalization. *Tribalism* is also encouraged by the apprenticeship style of medical education, with students learning to be doctors as part of tightly knit hospital 'firms', or within small teams in primary care. This important learnt disposition may therefore help to explain aspects of doctors' response to medical error such as their reluctance to criticise other doctors and why, when challenged, doctors turn to each other rather than seeking help outside the medical network.

Doctors may also turn to each other when faced with a medical error because of the learnt disposition of the value of *experience* (gained by seeing patients) and *responsibility* (gained by having patients and doing medical things to them), identified by both Becker and Sinclair. Sinclair found that particularly after qualification, *experience* and *responsibility* were valued above the disposition of *knowledge*. The scientific base of medicine gave way to the personal authority of its practitioners, which both maintained the professions' exclusive cognitive base and its own internal clinical autonomy. Managers and non-medical personnel are perhaps therefore felt to be unworthy of passing comment on medical error because of their lack of *experience* and *responsibility*.

The importance given to the disposition of *status* during medical training may also create a feeling of elitism and collegiality in students. *Status* is conferred through the academic requirements and competition for medical school places. This is reinforced by the emphasis given to the primacy of being a medical student above other students, and the implications of future social status, income and professional power.¹⁸ Sinclair suggested that *status* may work synergistically

with *cooperation, experience* and *responsibility* to create a feeling of exclusivity of professional judgement and a belief in the necessity of self-regulation. Intense collegiality and cooperation and the conflicting desire to be autonomous and self-regulating may also result in professional leniency and contribute to future medical errors.

Sinclair also highlighted the perspective of *idealism*, and demonstrated how this developed during the process of professional socialization. He suggested that personal *idealism* (wanting to help people) is discouraged from an early stage in medical training, including at interview for medical school, where an idealistic desire for the *status* of medical student and desire for *knowledge* are prized instead. He also suggested that students' perspectives change during medical training, with students becoming increasingly cynical, and personal *idealism* being replaced by professional *idealism* (a desire to demonstrate eagerness to be a medical professional). During training, as medical students learn about professional allegiance and come to see patients through the dispositional category of *cooperation*, patients are also more likely to be categorized as difficult if they don't recognise the *status* of the doctor or don't cooperate with medical treatment. During professional socialization therefore, students may be exposed to the idea that not all patients are equal. They may also become increasingly cynical about their medical role.²⁰ It is a small step from the ability to negatively categorize patients, to externalizing blame for a medical error to the patient themselves, as described by Mizrahi.⁴

Observational studies of medical training have also shown how doctors are socialized into the norms of a culture where uncertainty and the inevitability of medical error are learnt and reinforced. In Renee Fox's study of Cornell medical students in the 1950s, she observed that medical socialization involved internalizing the norm that medicine is a matter of conjuring the possibilities and probabilities and then drawing conclusions as to the most likely response and the proper thing to do.²¹ She suggested that students quickly encounter a vast field of knowledge that they cannot master. They also discover that medical knowledge also has its limits irrespective of their own individual ability to master it. In combination, these two problems, Fox argued, lead to a third problem of difficulty in distinguishing between personal ignorance or ineptitude and the limitations of present medical knowledge.²¹ There is however, a counter-culture within medical education that encourages the downplaying of uncertainty such as the reliance on multiple-choice examinations with only one correct

answer. Atkinson has also argued that medical students organize their work and learning to minimize uncertainty, representing knowledge as a stock of facts to learn.²² However, such location of uncertainty in the context of certainty may help to perpetuate the concealment of medical errors and discourage discussion of curricular reform.²³

The introduction and impact of medical reforms

During the last decade, the General Medical Council has published a number of documents, including *Good Medical Practice*²⁴ and *Maintaining Good Medical Practice*,²⁵ which suggest mechanisms and procedures to ensure standards of competence, care and conduct and to decrease the prevalence of medical error. In October 1999, the General Medical Council also proposed the introduction, by 2002, of revalidation every 5 years for all doctors in the United Kingdom.²⁶ The Department of Health has also proposed reforms aimed at decreasing medical error, through prevention, recognition and dealing with poor clinical performance,²⁷ including appraisal for all doctors in the National Health Service and the use of simulators and audits. Doctors suspected of poor performance will be referred to 'assessment and support centres' where there will be strong non-medical participation in assessment. The centres will advise on retraining and return to work, and could refer on for medical treatment or to the General Medical Council. This will be introduced alongside an early warning system central register of 'near misses' and errors.

The Government has also launched a new health watchdog, the Commission for Health Improvement, which will inspect all hospitals and general practices in England and Wales every 4 years. It will monitor the outcomes of operations, check that the recommendations of the newly formed National Institute for Clinical Excellence are being used and that patients' complaints are dealt with promptly and properly.²⁸

There are however, already signs that these reforms may not be completely successful in decreasing medical error. The rate of non-compliance for continuing medical education is approximately 25%²⁹ and clinical audit, championed in the reforms, has also been found to be one of the least effective change strategies in continuing medical education.³⁰ There are also a number of potential problems created by the proposals for revalidation such as the logistic demands involved in the revalidation of 130 000 doctors. The General Medical Council also proposes a mix of lay and medical professional assessors, but the Royal College of General

Practitioners has proposed that lay assessors should not assess technical competence, ensuring ongoing clinical autonomy.³¹ The proposal for assessment and support centres also creates potential problems, for example if there are disputes over the competence of doctors between the centre and the General Medical Council. It has also been suggested that in order to prevent under-performance by a few, a climate of fear could be created in which a much larger number of doctors will be encouraged to practise a more expensive defensive style of medicine that will benefit neither themselves nor the NHS nor the patients.³²

The comparative failure of some of these recent individualistic reforms to effect change may be because medical errors are usually the product of a series of factors, which suggests that change is needed at a system rather than an individual level.³³ Leape, for example, has suggested that health care delivery systems could be redesigned to reduce significantly the likelihood of error, for example through greater use of checklists, protocols and computerized decision aids.³⁴ There would also appear to be some tension between the individualistic nature of the reforms and the essentially collegial nature of medical thinking and working practices. From the viewpoint of medical educationalists, the recent reforms have also largely overlooked the origin of medical thinking about error during undergraduate training and the process of professional socialization. In the long term, therefore, the issue of medical error might also usefully be addressed through incremental reforms of aspects of medical education.

Reforms of medical education

There have been a number of reviews of medical education in the UK, most recently in the GMC's *Tomorrow's Doctors* report,³⁵ which have encouraged a thoughtful, responsible approach to learning. *Tomorrow's Doctors*, for example, recommended that undergraduate courses should stress the importance of lifelong professional education and imbue new graduates with attributes appropriate to their future responsibilities to patients. However, these reforms are perhaps not sufficiently targeted to make a significant impact on the future prevalence of and attitudes towards medical error.

Medical education, as currently constituted, stresses the problems of uncertainty, an aspect of practice which is often used as a partial explanation for medical error. There are, however, methods of altering the use doctors make of uncertainty, so that they no longer hide behind it. Specific strategies for managing uncertainty, 'stra-

tegic medical management' have been developed³⁶ and could be adopted more generally in medical student training. Strategic medical management is described as a way of dealing with uncertainty which protects against premature closure of consultations, misdiagnosis, and unnecessary tests. It is based largely on tacit commonsense which is seldom articulated and therefore often inaccessible to students unless specifically taught as part of medical training. The increased use of evidence-based medicine and problem-based learning in medical schools across the United Kingdom should also engender a learning style conducive to lifelong learning within medical training, and help to reduce knowledge-based uncertainty.

The collegiality and *cooperation* noted by Sinclair and Becker could also perhaps be exploited more positively in a number of different ways. Instead of a conspiracy of silence and a strategy of acceptance and covering up for sick colleagues, medical schools could encourage a culture where students are aware of the consequences of poor health on patient care and where illness is not taken as a sign of weakness or failure. Some medical schools are now running courses which emphasize aspects such as work practices, stress and addiction, and the counselling services available for sick students and doctors.²

An increased emphasis on the positive value of *cooperation* as part of a multidisciplinary team could also be made a more prominent part of student training. Understanding and appreciating the roles and skills of other health care professionals could be achieved through multidisciplinary teaching, modules which encourage appreciation of professions allied to medicine and through appropriate work placements. Such curriculum changes may create positive changes in collegiality, emphasizing team working rather than medical allegiances, and may perhaps help to decrease medical error by providing a counterbalance to current problems of too much medical understanding and forgiveness of error and of feelings of professional exclusivity.

There is also an argument for teaching students about the positive value of medical error,³⁷ and to move away from the current culture of 'name, blame and shame' towards a 'no-blame' scenario where errors can be more openly admitted and discussed. Although a central register of near misses has been introduced, perhaps a less combative approach might be to teach students to accept responsibility for their mistakes, a policy which has been shown to lead to constructive changes in clinical practice.³⁸ This approach does, however, need to be complemented by appropriate available emotional support, particularly in view of the

negative and quite personal emotions associated with involvement with a medical error.³⁹ Doctors also need to learn to accept the idea that some error is inevitable, even amongst the most conscientious and clever individuals, and not to perceive them automatically as character flaws. A teaching programme in Israel which aimed to impart a tolerance of medical error to medical students has been developed and positively evaluated. The curriculum promoted an acceptance of error as both inevitable and reducible and encouraged students by helping them to realize that their doubts and uncertainties were shared by their peers.⁴⁰

Improving communication between doctors and patients, encouraged and emphasized in *Tomorrow's Doctors*,³⁵ may be a further important factor in decreasing the number of medical errors. Evidence has shown that communication skills can be taught and can have a positive effect on consultation behaviours such as active listening and empathy,⁴¹ and that outcomes such as patient satisfaction improve as patients become more equal partners in the doctor–patient relationship.⁴² Medical student communication skills training, emphasizing the benefits of mutualistic, enabling doctor behaviours, could therefore lead to a greater valuing of the lay perspective and perhaps less medical emphasis on the exclusivity of professional judgement.

As described earlier, there is also evidence that professional socialization into medicine includes the adoption of an increasingly cynical approach to medicine and towards some patients. Blaming the patient was a common theme in the medical world's construction of error; therefore, introduction into the curricula of modules which challenge traditional negative patient stereotypes and promote a more positive image of them may have the future benefit of fewer medical errors being attributed to patient characteristics. A number of educational initiatives in areas of medicine which treat negatively stereotyped groups of patients, such as those with problems of addiction, HIV and homelessness, have suggested that student attitudes can be changed in a positive direction through a combination of contact and knowledge.^{43,44}

Conclusion

It has been argued in this paper that the current reforms may have a limited impact in decreasing medical error. Reforms based on the naming, blaming and shaming of individual practitioners may fail to engage with the 94–98% of physicians who cause the majority of errors, because they do not reflect the collegial culture and working practices of the medical profession. A more theoretically informed and longitudinal approach might

be to address the genesis of medical thinking about error through reforms to the aspects of medical education and professional socialization that help to create and perpetuate the existence of avoidable error, and reinforce medical collusion of error. Further changes in the curriculum, to emphasize team working, communication skills, evidence-based practice and strategies for managing uncertainty, are therefore potentially key components in helping tomorrow's doctors to discuss and cope with medical errors and to commit fewer of them.

Contributors

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