

Advancing understanding of medical errors in general practice:

A discussion of recent research from the American Academy of Family Physicians

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In November 1999 the Institute of Medicine in the United States released its report *To Err is Human*¹ and the health care world in the United States turned upside-down. Some say the unprecedented response was just because the report was released during a quiet week in the world when the media had nothing much else to report. Others maintain that the ensuing media, legislative, and professional attention was overdue given the documented scope of medical errors and their drastic consequences in the American and other health systems.^{2,3} Whatever the reason, the report inspired a flurry of activity in the United States and in many other countries and drew me, the American Academy of Family Physicians (AAFP), and the Robert Graham Center into a fascinating sphere of research activity. In this article, I shall

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summarise the key advances in understanding of medical errors in primary care settings contributed by the AAFP's last few years' research.

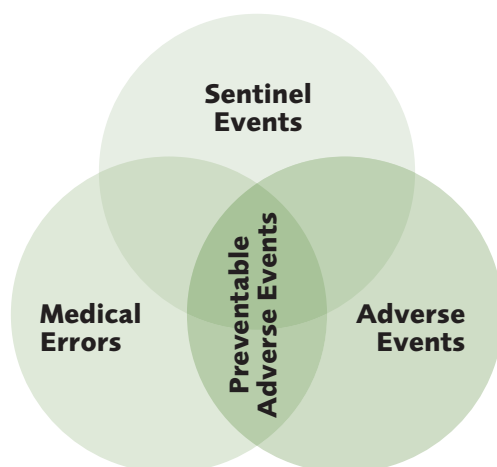
'Medical error' definition

First, it is important to understand what the term 'medical error' refers to. Often other terms are used as if they are synonymous – notably 'sentinel events', 'adverse events', and 'preventable adverse events'. Senti-

nel events are typically thought of as events that bring one up short with an 'Oh no, how can that have happened!' type of reaction. The distinctions between sentinel events and medical errors are in both the unexpected element (sentinel events are always unexpected whereas medical errors are not necessarily so) and the 'good' and 'bad' values attached to the terms (medical errors are always 'bad' but sentinel events can be good things as well). Because of the 'bad' connotations associated with errors, the term is often avoided. In our research, we have tended to refer to 'threats to patient safety' as a politically correct alternative. 'Medical error' is in fact what we have been researching however, and maybe the time for coyness about this is past. Figure 1 locates the different scopes of the other terms.

The first major studies in this area were about 'adverse events'. They were hospital-based studies from Colorado, Utah, and Australia that investigated harms that patients suffered unnecessarily. A similar study has recently been conducted in New Zealand.⁴ In

Figure 1. Common definitions used in patient safety research



contrast, our primary care studies have not been mainly concerned about the consequences of errors (the 'adverse events'), but our attention has been focused upstream on the mistakes, regardless of whether they had dire consequences for patients. This altered focus typifies the contribution general practice research makes to clinical research in other areas as well. Analogous to learning about otitis media by studying only patients seen by ENT consultants, it is not possible to learn about making health care safer for patients by limiting research to investigating things that harm patients in hospitals.

In 1999 the family physicians of the newly formed National Practice-Based Network for Research in Family Practice and Primary Care created the definition⁵ that we have used with little change now in four studies of primary care medical errors conducted in seven countries. It is: *'... an error is defined as: something in your own practice that should not have happened and that makes you say: "that should not happen in my practice, and I don't want it to happen again". It can be small or large, administrative or clinical – anything that you identify as something to be avoided in the future.'*

Ways to study medical error

Four major approaches have been taken to study medical error and related phenomena:⁶

1. Asking people involved in health care provision and receipt to tell about medical errors they have observed or experienced (self-reports);
2. Impartial observation;
3. Retrospective review of medical records; and
4. Studying complaints made against health providers or malpractice claims and suits.

To date, most primary care medical errors studies have used the first method although we have conducted one study using malpractice claims data (not yet been published). Conversely, most hospital-based medical errors (and related phenomena) studies have used the third method, retrospective record review. Each method affords a different perspective on the problem and each has different strengths and weaknesses. None is particularly scientifically robust in isolation, but studies using all approaches are probably needed if we are to continuously move toward safer health care for patients.

The four AAFP medical errors reporting systems studies

To date AAFP studies have primarily been aimed at understanding the types of things that go wrong in general (family) practices. Each study we have undertaken has directly built on our previous study, with the first project being a conscious extension of the 'sentinel events' work of Australian researchers in the early 1990s.^{7,8} In our first study, we asked family physicians to make up to 10 reports of medical errors that they observed

in their daily practice of medicine. This study gave us the start of a taxonomy or description of medical errors (and their predisposing factors, their consequences, and possible prevention strategies) and allowed us to test alternative error-reporting methods.⁵ We found that the same types of errors were reported whether paper or computer-based methods were used.

I had not appreciated the substantial inpatient care component of American family physicians, so to my surprise we received quite a few reports of medical errors observed in places other than regular family practices. Some other surprises in the

data led to our decision to attempt a second study across countries. The aim in this follow-up study was to understand the strengths and weaknesses of care delivery processes in different countries and define areas where family physicians and general practitioners might learn from each other. Medical errors research became a tool to drill down into understanding how health systems actually operated in the seven countries involved in this study – Australia, Canada, England, Germany, the Netherlands, New Zealand, and the United States.

This understanding is quite different from the macro-level insights usually afforded by health services research and epidemiological investigations. It provides a primary care orientation to characterising care delivery in different nations. For instance, the data collected in this study suggested problems in laboratory testing and medication management were common in all the countries involved, but only Australian and English general practitioners reported errors caused by lack of availability of referral services. German and English general practitioners gave us many more reports of errors associated with rapid patient throughput, Canadian and American family physicians seemed to have more problems with information management than doctors from other countries, and New Zealand and Dutch general practitioners gave us unexpected insights into mistakes associated with patient-centredness. Only one paper reporting this study has so far been published⁹ but others are under way. This study also 'grew' the taxonomy as codes were added to capture new phenomena in reports.

These two studies led to two others that we are conducting concurrently, aiming to address specific questions that were left unanswered by the earlier research. We had come to appreciate that a doctor's lens on medical errors might be quite different from the views of other health

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care participants – especially patients but also practice nurses and practice administrative staff. One study is therefore collecting information about medical errors in a similar format from patients and practice staff as well as from doctors again.

We have just in the last week finished this study's data collection and the preliminary analyses are already suggesting that different health care participants do indeed have different views about both what goes wrong in practices and how these mistakes should be addressed or prevented. This study will provide important insights into the roles that patients and practice staff might play in making health care safer, and the differences between their roles and the part that doctors play to the same end.

The second of the current AAFP studies aims to explore in depth errors in testing and investigation processes. Both of the earlier studies indicated that this area ranked with medication errors both in frequency of reporting and severity of threat to patient safety. There is a relatively long history of research into measuring and fixing medication errors but very little previous work has been done to try to understand and overcome the things that go wrong in the processes of ordering, implementing, receiving and acting on the results of laboratory, diagnostic imaging, and other tests needed to provide best primary care to patients.

One of the aims of this study is to establish investigation error rates. This is not as straightforward as it might seem. We knew from the earlier work that many investigation errors happen in processes that are not routinely documented. By limiting error observation period to single 'intensive' days and denominating by counting tests ordered in the same manageable time period, we hope to derive robust rates estimates. This will then provide crucial baseline data against which to measure subsequent (hopefully) improvements.

Contributions to date of the AAFP's patient safety research

The AAFP and the Royal New Zealand College of General Practitioners (RNZCGP) are sister organisations. Like the RNZCGP, the AAFP is primarily an advocacy organisation for family physicians, with responsibility for nurturing high quality primary care medical education and delivery. Like the RNZCGP also, the AAFP has historically recognised the importance of research through supporting university-based general practice researchers rather than by its own employees conducting academic research.

The establishment of the Robert Graham Center in 1999 was a major break from this tradition for the organisation but it meant that the AAFP could rapidly act to investigate a major clinical issue (medical errors) the moment it appeared on the political horizon. We did not have to spend the 18 months academic researchers usually need to prepare a grant application (with similar low rates of success in the US as they have in New Zealand – around 25%) before a study could even be started and the three years or so after that before it was completed. We were able to work with a group of enthusiastic family physicians within days of the release of the IOM's document and we had completed and written up a paper reporting the first study within 12 months.

This first study then provided the groundwork for successful grant applications that have attracted hundreds of thousands of dollars to support and extend the AAFP's research capacity at the same time as it is providing new information to make health care better and safer for patients – and doctors, and other pri-

mary care workers. The AAFP's infrastructure is designed for rapid dissemination of new information to doctors and for supporting change in practices. So the first thing that this line of AAFP activity has achieved is rapid and widespread acknowledgment within the primary care medical community that medical errors are as much an issue for them as they are for hospital-based providers.

This insight has also spread to research publishers and research funding agencies in the US (although more slowly) who are now beginning to extend their focus on medical errors to primary care settings. With almost all earlier research having been conducted in hospitals, it was easy to think that medical errors were exclusive to this domain and therefore excuse primary care providers from having to think about them. The AAFP's research programme has been a major factor in removing these rose-coloured glasses.

Secondly, the AAFP's patient safety research has contributed a greater understanding of the sorts of things that go wrong in primary care settings. Anaesthetists, surgeons, and pharmacists have been investigating ways to make their hospital services safer for years but their research (with the exception of pharmacists) has little transferability to primary care settings where patients are seldom at risk from general anaesthetics or surgical mix-ups. Are they then at risk from anything the health services have to offer, was the question. And we can now say with some certainty that yes, they are at risk from poorly managed messaging and appointment systems, from inadequate communication systems, and from dysfunctional pre-

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scribing and investigation processes (among other problems).

We have developed a taxonomy describing more than 500 different types of errors occurring in primary care practices.¹⁰ Furthermore, we can demonstrate that these are not trivial concerns – they can and do hurt patients, precipitate their admission to hospitals, and sometimes contribute to their death. They are important, redeemable, and they need to be fixed.

The third contribution the AAFP's patient safety research programme is starting to offer is possible solutions to primary care medical errors. In each study we have asked for participants' (who are usually general practitioners) ideas about overcoming the mistakes they have reported. Although many reporters have been stumped by this question, we have been able to compile from other reports a list of some 185 practical solutions to reported errors.

The international study gave us further clues into how some countries' general practitioners had worked out how to do some things more safely than other countries' doctors. If solutions can be developed and shared internationally we might short-circuit a learning curve to hasten safer care for patients everywhere. Furthermore, it has become clear over the last three years that a

powerful method of promoting positive change in the quality of care provided by general practitioners may be to simply encourage them to participate in an anonymous error-reporting system. Some of the unsolicited comments in reports have included: *'I am looking forward to seeing the outcome of this study which has already provided me with much food for thought as a way of monitoring my own work, the system, and how things interact', 'I have actually enjoyed the opportunity to reflect on error...' and 'I find I am now improving my practice on a daily basis.'*

Finally, this research has demonstrated that there is much more work to be done to make primary care as good and as safe as it can be. The AAFP has established a Patient Safety Center that will spearhead its future work in this area.

I chair the international group, the LINNAEUS Collaboration, that came together to conduct the first international primary care medical errors study. We are planning our next study and (contingent on successful funding applications in seven countries!) we will be conducting an in-

vestigation into the ways computerised information technology can both cause and prevent medical errors. This is critical research for primary care providers in several countries who are on the verge of making a wholesale commitment to computerised processes (Australia, the US, and Canada) and for providers in other countries (New Zealand, England, and Germany) who have used computers for some time, but maybe not in the best ways.*

In New Zealand (funding permitting!) we're also hoping to study patient safety in rural health care settings and in the US there will be more patient safety work fo-

cusing on investigations in the near future. Credit should be given to the Australians for being the innovators in medical errors research, but also to the Americans for the timeliness of their interest and their commitment to change. I feel very fortunate to have been in the right place at the right time and to have become part of the team of primary care researchers working in this area. I think it is already making a difference to doctors and patients and I'm quite sure we're just at the start.

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* If you are interested in being involved, please do let me know! – sdovey@aaafp.org

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