

Primary care

Enhancing public safety in primary care

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Improving the safety record of the NHS is a national priority. This is not surprising, as recent research shows that up to 850 000 adverse events occur in hospitals every year.¹ Up to 90 000 iatrogenic deaths may occur each year in hospitals in the United States,² and the picture is likely to be similar in the United Kingdom. The landmark report *To Err is Human* has led to substantial investment in the US Agency for Health Research and Quality's safety unit.² This was closely followed in the United Kingdom by the Department of Health reports *An Organisation with a Memory* and *Building a Safer NHS*, heralding the introduction of the National Patient Safety Agency.^{3 4} Our understanding of the causes of iatrogenic adverse events in secondary care has increased substantially over the past decade, but the same cannot be claimed of primary care.

In this paper, we consider public safety in primary care. What do we know about the main causes of harm to patients? To what extent are these preventable? How can we enhance public safety? We use these deliberations as a basis from which to propose a strategic response to the pressing challenge of improving the safety record of primary care.

Safety and harm

Box 1 sets out various notions of safety and harm, but particular considerations apply in primary care. Primary care differs from secondary care in several key respects. It aims to provide longitudinal personalised care that is customised to individual beliefs, needs, values, and preferences across a broad spectrum of concerns relating to health and illness.⁸⁻¹¹ This leads to variation in practice and, in some instances, justifiable deviation from recommended practice.^{12 13} As the first clinical port of call, general practitioners deal with a very broad range of symptoms and signs, many of which cannot easily be categorised into a clear diagnosis. Given the different population of patients, the different priorities for their care, and the ambiguities of that care in relation to diagnosis and patient choice, delineating "right or wrong" practice is more complex in primary care than in secondary care.

Methods

This paper presents a narrative of findings based on a comprehensive and systematic search aimed at answering two questions: "What are the key safety issues?" and "What might be done to improve care?" We searched Medline, Embase, and CINAHL elec-

Summary points

Safety is of increasing concern to the public and profession alike, but until now attention has been focused on secondary care

Valuable research on safety has been conducted in primary care, and many other sources of information indicate where the major causes of harm might occur

Safety is a major concern in four main areas—diagnosis, prescribing, communication, and organisational change

Prescribing is the area about which most is known—3-5% of all prescriptions in primary care might cause problems, and one third of these can be classified as serious

Of all adverse incidents reported in primary care, 28% are related to problems with diagnosis

This paper proposes seven steps towards improving safety

tronic medical databases and used Google search engine for a search of the world wide web with the following search terms: (safety OR harm OR error OR adverse event OR near miss) AND (general practice OR primary care) for the years 1980 to 2000. We supplemented these searches by hand searching the journals of the Medical Defence Union and Medical Protection Society. We also consulted with experts by convening a national roundtable discussion on 23 April 2001, to which we invited project leads for research and development initiatives for promoting patient safety.

Key findings

We found 31 relevant articles (see bmj.com).^{w1-w31} We failed to identify any systematic reviews of direct relevance to primary care services. In the absence of a sound evidence based typology for safety in primary care, deliberations have focused on four broad areas of care: diagnosis, prescribing, communication, and the organisational characteristics of primary care (box 2).



A list of references
retrieved by the
search appears on
bmj.com

Diagnosis

What are the major safety problems with diagnosis?

In one anonymous reporting study, diagnostic problems accounted for 28% of reported errors, of which half were considered to be potentially very harmful.^{w1} The overall frequency with which diagnostic errors occur in primary care is unknown. Conditions that seem to be particularly problematic (or for which it is easier to find a misdiagnosis in hindsight^{w2}) include asthma,^{w3} cancer, dermatological conditions,^{w4} substance misuse,^{w5} and depression.^{w6}

A review of referral patterns highlighted the difficulties for primary care clinicians making diagnoses. Although many health policy makers and managers regard high referral rates as inefficient, "failure to refer appropriately" is a major contributory factor in many successful claims against general practitioners.^{w7}

What might be done to improve diagnostic accuracy?

Little research has been carried out on ways of improving diagnosis in primary care. This is chiefly because diagnosis in primary care is by its very nature uncertain and uses a hypothetico-deductive approach.^{w8 w9} Use of guidelines and protocols is likely to have some, but limited, success in improving safety.^{w10} Decision support tools and (electronic) information systems may prove to be of greater benefit,^{w11} but this has yet to be proved empirically. A full evaluation of the decision support tool used by NHS Direct will help to determine the case for out of hours care.

Prescribing

What are the major problems with safety of prescribing?

Perhaps because of its nature, the safety of prescribing has been intensively researched. Prescribing problems in general practice occur at a rate of 3-5% of all prescriptions, of which about a third can be classified as major safety concerns.^{w12-w14} A quarter of claims against general practitioner members of the Medical Defence Union in 1996 were related to drug safety; common themes to emerge included prescription of contra-indicated drugs, errors in dispensing, ignoring known allergies, or simply prescribing the wrong drug.^{w15} In an Australian study, around 9% of hospital admissions were thought to be due to potentially avoidable problems with prescribed drugs.^{w16} An American study found that 24% of people aged over 65 living at home (21% of those living in nursing homes) were prescribed a contraindicated drug, and 20% of these received two or more contraindicated treatments.^{w17} Although safety considerations are important with all prescribed treatments, particular safety concerns exist for certain classes of drugs, including non-steroidal anti-inflammatory drugs, lithium, warfarin, corticosteroids, and antidepressants.^{w15 w18} Dispensing of drugs by pharmacists is another potential source of error. One study based in the United States calculated that 4% of drugs were incorrectly dispensed in the course of a year.²

What might be done to improve prescribing safety?

Hospital based studies have shown that use of a computer system for prescribing is likely to improve accuracy.^{w19} This is particularly so when the computer contains important information on patients, thereby offering the opportunity to highlight possible drug-

Box 1: Notions of safety and harm

Safety considerations must be an integral feature of the drive to improve quality of care. To understand current thinking about approaches to improving safety it is helpful to be conversant with the concepts in use. The Institute of Medicine described three facets of patient safety³:

- **Underuse**—Failure to use proved treatments when they should be used; for example, not prescribing a β blocker to a patient with no contraindications after a myocardial infarction
- **Overuse**—Using treatments that are not needed; for example, prescribing antibiotics for an uncomplicated upper respiratory tract infection⁶
- **Misuse**—Actually making an error or mistake; for example, not responding to an abnormal result of a blood test or cervical smear test⁷

Problems with underuse and overuse of treatments are the most common form of harm in healthcare systems and have quite rightly been the subject of ameliorative action by several means, of which the drive towards evidence based medicine perhaps represents the best known example. Problems of misuse have, in contrast, received little attention so far, but this balance is changing⁴

drug interactions and relevant medical history such as known drug hypersensitivities and relative and absolute contraindications. There are two major problems, however. Firstly, many computer systems currently use alerts so often that many doctors simply choose to ignore them—the "cry wolf" phenomenon (A J Avery, personal communication, 2001). Systems should certainly take advantage of "user centred design"—that is, including usability testing and making sure that new systems do not add a new level of complication and hence increase the likelihood of harm.^{w20} Secondly, the increasing use of complementary treatments, including herbal remedies that may interact with prescribed treatments, means that many important interactions could be missed.^{w21} It is estimated that 97% of British general practitioners have a computer on their desk and that 74% were using it for prescribing in 1993 (probably more now).^{w22} The imminent change to a system of repeat prescribing led by pharmacists may have the benefit of making all but a very few prescriptions computerised. If herbal treatments were limited to pharmacy only sales, pharmacists would be more likely to detect potential interactions.

Another important finding of the Harvard studies is the role of pharmacists in improving safety. Use of quality improvement techniques to reduce adverse drug events has improved the recording of allergy information and standardised medication administra-

Box 2: Key safety issues for primary care

Diagnosis—In general, under-referral is condemned by the public but encouraged by budgets. Primary care deals primarily with uncertainty of diagnosis

Prescribing—Prescribing is the most easily analysed area. It is increasingly fraught as more complex drugs are prescribed in primary care and as polypharmacy increases (for example, through implementation of national service frameworks)

Communication—Poor communication is symptomatic of problems with systems. Electronic communication may help but can lead to information overload

Organisational change—Much has been made of the organisational culture needed for safety. Primary care has the advantage of a strong history of teamwork and small size

Drugs associated with high risk of iatrogenic harm

Class of drug	Strategies for reducing risk of iatrogenic harm
Warfarin	Use optimal monitoring systems
Immunosuppressants	Warn against chickenpox and offer varicella-zoster immunoglobulin as needed
Corticosteroids	Use prophylactic measures for osteoporosis
Non-steroidal anti-inflammatory agents	Warn against chickenpox and offer varicella-zoster immunoglobulin as needed
Antidepressants	Caution in groups at high risk (for example, over 75 years old)
Lithium	Match drug to patient and his or her lifestyle
General	Caution in suicidal patients
	Use optimal monitoring systems
	Education of patients
	Concordance
	Interactions with other drugs
	Ensure all parts of medical system are aware the patient is taking these drugs

tion times and helped with the implementation of chemotherapy protocols, while encouraging the start of reporting mechanisms.^{w19 w23} Systems need to be in place to reduce the risk associated with classes of drugs that pose above average risk of harm (table).

Communication

What are the major problems with communication?

Breakdown in communication is a common cause of harm to patients, but it is probably a symptom of organisational problems rather than a cause. The most important communication problems seem to come from hierarchical structures (see section on organisation below) and informal communications. Defence organisations have several cases where breakdown of communication has resulted from the informality of the communication process; a forgotten comment in the surgery corridor or a post-it note that fell behind a desk are everyday occurrences with which all clinicians will readily identify (P Lambden, personal communication, 2001). Transcription of information (such as when dictating referral letters), and the associated risk of inaccuracy, represents another important source of communication failure. The transition between hospital and community services is particularly fraught; around 40% of patients have been found to have discrepancies between the drugs prescribed at the point of discharge and those they receive in the community.^{w24}

What could be done to improve communication?

Electronic communication is likely to reduce problems with transcription (including those involving prescribing); if the record is shared it should be possible for different people to check important details (such as allergies). Furthermore, the "patient held record" (perhaps held on the internet) would ensure that clinicians had immediate access to all relevant clinical information. Electronic communication is not without problems; confidentiality of records, for example, would represent an important concern, although it should eventually be possible to overcome such problems by maintaining records on secure intranets. A pressing consideration for many people currently using electronic communication channels is the problem of information overload, with the possibility of missing important messages. This problem increases as the amount of information about patients grows exponentially. The ways in which data are displayed and filtered

will therefore have to become smarter. Most important, though, is the use of agreed methods of communicating important messages (for example, by using the message book and not expecting that a comment made in the corridor will always be remembered).

Organisational characteristics of primary care

What are the major problems with organisational characteristics?

Many recent pronouncements from the Department of Health, and especially those concerned with safety, have emphasised the importance of developing the "right" organisational culture. However, little research has been carried out to determine the desirable characteristics for safety in primary care—it is not even known, for example, if culture is something that can be determined or managed in health care. Important research has been done in industry—especially in the aviation industry, where considerable empirical work has been carried out to evaluate the role of teamwork, communication, and leadership in reducing incidents.^{w25 w26}

What might be done to improve organisational characteristics?

Industrial leaders have worked with corporate culture at three levels: visible organisational structures and processes; strategies, goals, and philosophies; and beliefs, perceptions, and feelings.^{w27}

Teamwork within primary care has always been strong. In the United Kingdom, this is being expanded with increased sharing between practices in the interests of quality improvement (clinical governance) through developing primary care organisations.^{w28} However, there is little evidence that this includes activities to improve safety. Sharing and analysing of significant events is well established in primary care,^{w29} with up to 20% of practices involved in significant event analysis (M Pringle, personal communication, 2001). In some practices, informal logs of errors have led to important changes, and local reporting systems might allow the organisational development needed for greater safety.^{w30}

In *Building a Safer NHS*, much is made of the culture needed for greater safety.⁴ In the face of a mandatory reporting system, it is unclear whether this will occur early in the life of the National Patient Safety Agency. Whether this body will help to create the desired "no blame" culture is not yet clear. It must, however, be evident that "no blame" does not equate to "no responsibility." Every member of a healthcare organisation will need to trade the right of not being blamed for making a human error with the absolute responsibility of making safety paramount.

Leadership is central to making systems safer. In industrial settings, many chief executive officers have made safety one of their top priorities, with very encouraging results. This is also true of hospitals; the chief executive at Luther-Midford Medical Centre in Wisconsin funds and supports a full time senior clinician to develop safer systems of care and reduce harm. The commitment and drive from the senior leader both shows the importance of safety and encourages changes to reduce harm.^{w30}

Conclusions

Safety considerations in healthcare systems are important, but little is known about the epidemiology or typology of harm in primary care. Attention has so far focused on four broad areas: diagnosis, prescribing, communication, and the organisational characteristics of effective and efficient primary care services. We recognise that there are many other areas of care associated with the potential for harm (minor surgery and administration of vaccines, for example). Although cases of harm occur with these areas, less is known about the extent to which harm is caused and what might be done to prevent it.

Much can be done now (box 3). It is important for primary care leaders to promote public safety, as the profession's credibility and the population's continued trust in general practitioners depend on it. Preliminary discussions within the Royal College of General Practitioners suggest that it is both able and willing to respond to this challenge.²² At the level of primary care trusts, boards need to show their willingness through actions to promote safety and support for initiatives to reduce harm. At the level of the practice, teams and individuals need to take responsibility for safety—it is their job to close a fire door that has been propped open. As teams, they need to develop an understanding of what happens when something goes wrong and how they can avoid it in the future. Lastly, we need to work with the public to help them understand the risks involved in health care and work with them to reduce harm.^{10,31}

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Box 3: Stepwise approach to enhancing patient safety

Step one: understand systems

The key to improving safety is understanding how systems work and how people within those systems will regularly fail.¹⁴ Many safety problems can be overcome by design, assuming that people make mistakes for many reasons (insertion of checks or forcing steps can make a substantial difference). Relying on memory and observance, especially in stressful situations, is bound to fail—the use in these circumstances of reminders (message alerts on screen to visit a patient), clear signage (bottle shaped holes for bottles), or forcing mechanisms (for example, the wrong tubing cannot be attached because it is a different size) can be helpful. Clinicians are already under considerable pressure, so simply asking them to try harder will only exacerbate the problem.^{15,16}

Step two: leadership and culture

People lead systems and are responsible for the design. Until chairs and chief executives of primary care trusts come to regard safety as their concern, there is little hope for progress. Leaders within the system should reward and encourage people to report problems, exempt such people from disciplinary action, and then take immediate action to prevent the problem occurring again.

Step three: research

Research in primary care is urgently needed on:

- Accurate and reliable estimates of the scale and health costs of iatrogenic harm to patients
- Detailed description of a typology of harm to patients in primary care
- Appreciation of the barriers to promoting patient safety and ways of overcoming these obstacles

Step four: analysis

We should learn from near misses and errors by using tools such as significant event analysis and that developed by the Clinical Risk Unit.¹⁷ Analysing events in this fashion has been found to be very helpful in primary care and has altered cultural perspectives in many cases.¹⁸⁻²⁰

Step five: establish best practice

Some procedures are known to be safer than others—for example, handling incoming mail by using a proper stamp that does not allow the letter to be filed until any necessary action has been taken.²¹ Many such procedures do not need large resources—all that is needed is the will. Professional bodies and organisations such as the National Patient Safety Agency should develop a list of established processes that can improve care.

Step six: use improvement techniques and technology

Systems can be adapted to make them safer by the use of plan-do-study-act cycles and other quality improvement techniques. Use of sensible technology—meaningful warnings, communication, and knowledge coupling—could substantially improve safety.

Step seven: monitor safety

Once improvement has been made it is crucial to maintain the gains and continue to improve the system by using reporting systems (of incidents and near misses). "Triggers" are a sensitive method of detecting when harm has occurred, although none has been tested in a primary care setting (C Haraden, personal communication, 2001).

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