

## ABC of health informatics Referral or follow-up?

Frank Sullivan, Jeremy C Wyatt

When patients ask their doctors if a preventable problem could have been avoided by earlier investigation or referral, the doctors can be in an unenviable position. Given the information available at the time, the response will often be a qualified, "yes." It must be a qualified response because the aspects of the problem considered during earlier encounters with patients are often unknown. The matter is further complicated by issues of trust, professional ethics, and the law.

This article discusses information flows that may have reduced the risk of Ms Smith (see box opposite) developing symptomatic renal impairment. The risk could have been reduced at three different points.

- If her underlying vesicoureteric reflux had been diagnosed and fully investigated in childhood
- When her chronic pyelonephritis was discovered
- During the intervening period when no follow-up was arranged.

### Early detection of underlying problems

Children aged  $\leq 7$  years with urinary symptoms, fever, or several non-specific symptoms and signs should be tested for urinary infections because, in some circumstances, prophylaxis can prevent recurrence. Guidelines are available, but the research that underpins the advice was published too late for Ms Smith. Were Ms Smith a young girl today, any primary care or emergency clinician who saw her would probably have access to this evidence base as part of their clinical software, or through access to guidelines on the internet.

Undergraduate education, postgraduate training, and continuing professional development are more traditional routes of knowledge transfer. Unfortunately, traditional sources of knowledge are relatively inefficient: our stores of knowledge decay over time, and our brain's working memory may become overloaded. Prompts and reminders at the point of care are useful adjuncts to an overworked human brain for certain tasks. Some doctors worry that use of such electronic aids may reduce patient trust, but the evidence is to the contrary.

### Ensuring appropriate investigation

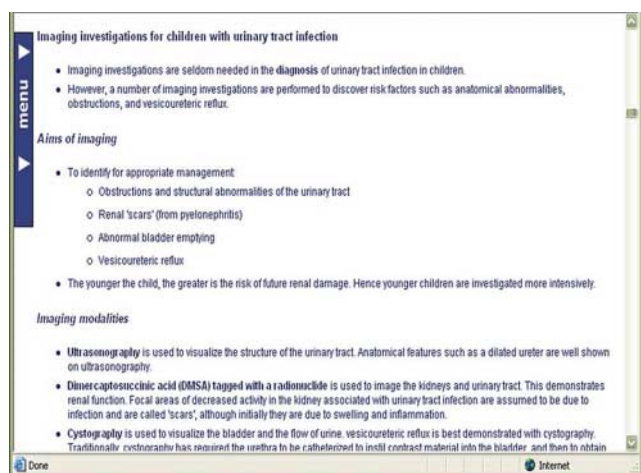
Fifteen years ago, when Ms Smith's chronic pyelonephritis was diagnosed, her investigation would probably have been directed by a consultant whose experience would have ensured the appropriate level of expertise was achieved. In the informatics age, some of this expertise can be represented in protocols. If the protocols are followed, investigation in primary care may avoid referral or identify the nature of the problem quickly and clearly. In some health systems, referring clinicians may be given shorter waiting lists if the referrals have been preceded by appropriate first line investigation.

### Arranging referral

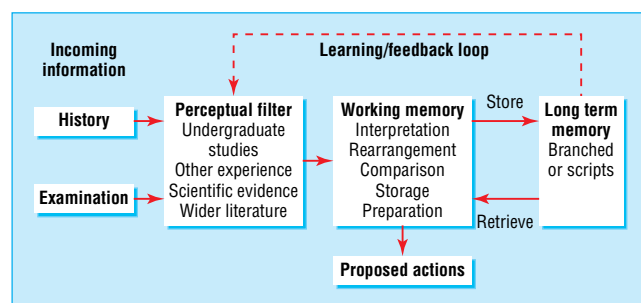
Health maintenance organisations in the United States, which provide integrated primary and secondary care, can book electronic appointments routinely. More complex referral settings may have difficulty doing this. Delays can occur at any

This is the eighth in a series of 12 articles  
A glossary of terms is available at <http://bmj.com/cgi/content/full/331/7516/566/DC1>

Ms Smith is a 58 year old florist with a 15 year history of renal impairment caused by childhood pyelonephritis. She has hypercalcaemia. She remembers being told in the past that she had "a slight kidney problem," and asks her renal physician whether anything could have been done then to prevent the current problem developing



PRODIGY (Prescribing RatiOnally with Decision Support) guideline on investigation of urinary tract infection in children



A model of human clinical information processing

### Steps in the NHS process for non-urgent referral

- During a consultation the general practitioner (GP) considers if referral is appropriate
- Decision is negotiated, to a greater or lesser extent, with patient
- Decision and relevant clinical information is communicated to consultant or other secondary care provider, usually by letter
- Letter is posted or faxed to hospital
- Consultant prioritises referral
- Outpatient administrator allocates an appointment depending on the level of priority and the availability of appointments
- Appointment is communicated to patient, usually by letter
- Patient attends outpatient clinic and sees consultant or a member of their team

stage between the decision to refer and its realisation, even when an appointment is available.

## Arranging follow-up

At the end of a hospital outpatient visit a decision is made about whether hospital, a GP, or shared care is most appropriate for the patient. Unless an arrangement is made the patient may have a “collusion of anonymity.” This occurs when personnel at the hospital think that staff at the primary care practice are providing follow-up and vice versa. In reality, neither are doing so. To avoid such errors, healthcare systems have developed ways of integrating multiple service providers and proactive measures (see chronic care model opposite).

### Hospital follow-up

When a consultant decides that a patient's problem needs hospital resources the flows of information are straightforward, but potential exists for errors and omissions. Often, patients are asked to book their next appointment as they leave the clinic. Alternatively, one of the clinic team may make the arrangement on the patient's behalf, and inform them at the time or by post.

### GP follow-up

If the hospital team decide that the patient requires medical supervision, but no other hospital resources, the primary care team may be asked to resume sole responsibility for care. This is the simplest option for hospitals because it only needs a discharge letter to be sent. Most practices in the United Kingdom and other industrialised countries have the technology and systems to support a call-recall system for screening. Although this can be extended to support GP follow-up of chronic diseases, few practices are able to harness such systems to long term clinical care. This will probably change in countries like the United Kingdom, where achieving targets is increasingly important.

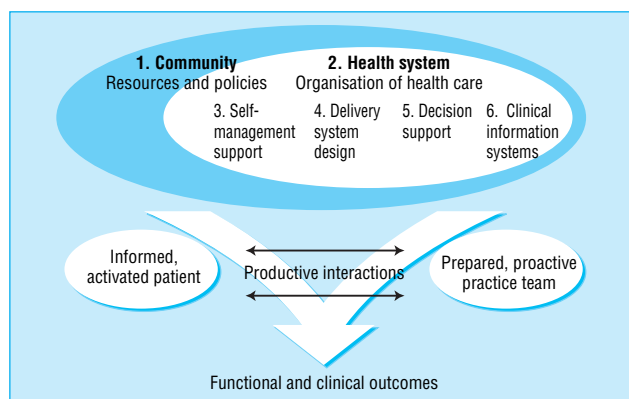
### Shared care

Although shared care seems the most complex of the three follow-up options, done properly, it may be the best for the patient. An integrated service takes responsibility for all patients with the problem it is set up to deal with. Specialists ensure that healthcare services are configured to respond effectively to patients with problems, and to support clinicians working in the community.

Antenatal care is an example of this approach. Other areas of care, such as chronic diseases, are following suit, with excellent results seen in the care of people with diabetes and cardiovascular disease. Good, but often asynchronous, communication between colleagues with complementary skills is vital. In some systems, records may be seen by clinicians irrespective of where they are working.

## Patient empowerment

“Expert patients” have always been with us, but some doctors were not aware of it, or would not acknowledge it. No matter what arrangement is made for follow-up by the health professions, patients with chronic illnesses must deal with it every day. Better use of information helps, and consultations should be patient centred (to deal with patients' ideas, concerns, and expectations), but also extend beyond the visit.



Overview of the chronic care model. Adapted from Wagner EH. *Effective Clin Pract* 1998;1:2-4

**If follow-up at hospital is needed then direct booking of the next visit avoids some potential difficulties**

Sharing information across health systems. Clinical data (for example, data on prescribing or blood pressure) in one part of the health system that have been recorded in primary care can be made available to other users, such as hospital clinicians, on a “need to know” basis

**Many doctors give patients an audiotape of their consultation, written material about their problem, or website addresses that provide further information. Others (hospital consultants, for example), may copy letters sent to GPs as text messages to the patient's mobile phone or send the letters to the patient as email attachments**

## Clinical governance

As a result of apparent failures to ensure adequate patient care, society has demanded that arrangements for the supervision of clinical services are improved. The days of autonomy and paternalism are being replaced by rigorous inspection procedures and publication of results. Clinical teams need to show that they are working to the highest standards. This depends on their access to the best evidence about the criteria of good care and the standards that can be attained. Data, often from patient records, are then collected to confirm whether standards are being met, or if there are any defects to treasure. Failure to hit the target (for example, to offer annual blood pressure and renal function tests to Ms Smith), is an opportunity to improve the service. Electronic records make most of the service automatic, provided that patients agree to (or at least do not refuse) the secondary use of their personal data. Clinical teams can concentrate on providing a service, and using the information that has been captured (and processed) electronically to improve patient care. In the United Kingdom, the quality and outcomes framework of the new general medical services contract for GPs relies heavily on the electronic processing of Read coded data in clinical systems.

## Summary

Achieving effective data transfer and electronic continuity of care between different parts of a health service is not essentially a technical challenge, rather it is a cultural and political one. It is largely about reconfiguring workflow. In 2004, the Veterans Health Administration showed that integrating clinical records across geographically and clinically diverse sites is feasible and valuable. Linking individual electronic patient records from different locations into a single electronic health record will probably transform the quality of health services over the next decade.

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## UK general practice contract quality points for management of hypertension

Indicator	Coverage	Points
Register of patients	Yes/no	9
Smoking status	25-90%	10
Smoking advice	25-90%	10
Blood pressure recorded in past 9 months	25-90%	20
Blood pressure $\leq$ 150/90 mm Hg	25-70%	56

## Further reading

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## One hundred years ago

### Superstitions about pregnancy and parturition

DR. ISAMBERT of Tours has collected notes about local superstitions still prevalent amongst French countrywomen, notwithstanding the general distribution of education on modern principles throughout the Republic from Calais to the Pyrenees... Certain curious customs, based on an idea that the male has influence on the fetus beyond the date on which he begot it—an idea not unknown amongst uncivilized races—still prevail amongst the French peasantry. Dr. Marignan of Marsillargues attended a woman who put on her husband's hat to hasten labour, preferring it to ergot. Dr. Lalanne repeatedly observed a similar practice in the Landes, the parturient woman turning her husband's hat inside out and then putting it on her head. The idea is carried further in remote districts in Lorraine, the husband's entire clothing being donned as an oxytocic. In the same districts, and in parts of the country round Toulouse, the marital cotton night-cap, a familiar object on the head of the French rustic, is used as a pad tied against the vulva to prevent a threatened abortion. The gravest of all lying-in-room superstitions receives much attention from Dr. Isambert, for he dwells on the strange tendencies in certain districts to prefer dirty

to clean bed linen. In the canton of Ligueil in Touraine, the mother takes the greatest care to collect and soil as much sheeting as possible when she is nearing term, and after being delivered between dirty sheets the supply of foul linen is frequently changed during the puerperium. In one case of puerperal fever Dr. Isambert had the greatest difficulty in getting the soiled sheets removed under his own superintendence, and though his orders were apparently obeyed, he suspects that the dirty linen was replaced in the patient's bed directly his back was turned, to be temporarily put aside at his visiting hour. In the Department of the Var dirty linen is always used to clean the woman after delivery, the washing itself not being undertaken for several hours. The belief in which these insanitary practices originated remains obscure... In conclusion Dr. Isambert declares that some of the methods employed to hasten labour in humble cots far from the ignoble strife of the madding crowd of the boulevards are enough to make the modern obstetrician turn pale, yet somehow fine children are born and bred in those parts. (*BMJ* 1905;ii:345)