Refereed papers

Professional values and informatics: what is the connection?

Peter Pritchard MA MB FRCGP
Former General Practitioner; Senior Clinical Adviser, Advanced Computation Laboratory, Cancer Research, London, UK

ABSTRACT

General practitioners (GPs) need to feel that they are doing a good job in providing care of high quality in a humane manner – that they are 'good' doctors. The General Medical Council booklet *Good Medical Practice* is full of imperatives, but short on values that are the determinants of behaviour. Much has been written on doctors' professional values in the past decade, but it is not easy for individual GPs and teams to define their own values and consider to what extent they live up to them.

Values and informatics, at first glance, might seem to have little in common, or even to be mutually antipathetic, and this is possible within the limitations of current technology. However, providing high-quality care involves the application of knowledge, evidence and guidelines, as well as auditing outcomes. For all these tasks, informatics provides the essential means of discovering whether we, as individuals and teams, are living up to our espoused values so that they become values-in-action that drive behaviour. Application of advanced informatics has the potential to improve and measure diagnostic and therapeutic skills. Technical advances are impressive, but their application lags. The next logical step would seem to be a comprehensive and easy-to-use knowledge-based decision support (KBDS) system in a convenient format. Locally based KBDS could facilitate self-audit and provide a step towards the ideal of a 'self-organising system' requiring little external audit.

Keywords: knowledge-based decision support, medical informatics, primary care, professional values

Introduction

Every general practitioner (GP) aims to be a 'good doctor' and to provide high-quality medical care in a humane manner. However, in a domain as extensive as general practice, with no clear boundaries, doctors can never complete their tasks to their own and their patients' satisfaction. There are severe limitations of time, energy, resources, decision-making autonomy, knowledge and skills. Yet, for doctors to survive, they must feel that they are doing their best and are 'good doctors'. This paper explores the professional values that underlie the quality of United Kingdom (UK) general medical care, how the gap between perception and reality can be narrowed with the help of appropriate information technology, and how those who develop and use such systems need to understand the importance of professional values.

Background

Several articles on professional values have appeared in the *British Medical Journal*, particularly in the context of quality of care, revalidation and implementation of technology in general.[1–5] Pendleton and King stressed the need to consider values in relation to leadership, and compared the approach in industry, where many organisations declare their values, with medical organisations where values are rarely explicit.[6] They described values as the guiding principles, which are more permanent, whereas the visions and standards are likely to change.

The General Medical Council has included a number of values as part of 'Good Medical Practice'.[7] Their booklet lists 16 imperatives on the cover, and has 60 sections describing 'good' professional behaviour and 44 imperative subsections. These might be

regarded as 'espoused values', but behaviour is guided by 'values-in-action' which are not so visible, and this creates dissonance.[8] 'Good' is a vague and value-laden word, yet values are not mentioned explicitly in the booklet. Beliefs, both doctors' and patients', do have a mention. However, many of the imperatives require the doctor to have the time to comply and assume that an adequate information structure is in place. Human frailty in living up to admirable guidance is not taken into account.

Several authors have described the low morale of GPs and the way that this, and resource constraints, make it hard to follow professional values in the face of managerial imperatives of cost-effectiveness.[5,9] Few have specifically considered the mutual impact of values and information technology.

Values and beliefs are the driving forces of behaviour

Identity, beliefs and values

When we say 'I am a doctor', this implies a set of values that characterise the identity of a doctor. These values underlie beliefs that are the drivers of behaviour. So what are values? The *Oxford English Dictionary* defines them as 'the principles or standards of a person or society' and 'the personal or societal judgement of what is important in life'.[10] They are both part of individual identity and a reflection of the norms and expectations of society. If we ask ourselves or each other 'What are our own values?', we might be at a loss for words. Some examples might be:

- I am committed to putting the patient first
- I practise honestly, truthfully and with integrity
- I respect empathically the patient's identity, dignity, beliefs and values
- I maintain confidentiality at all times
- I am open to self-criticism and self-audit
- I am open to peer criticism and peer audit
- I try to provide care of high quality and apply evidence-based medicine where appropriate
- I am dedicated to lifelong reflection and learning.

To live up to these eight values is very difficult, so how can we organise our work to achieve optimal outcomes for our patients and ourselves? These values are just examples. How can we discover our own? Values are best discovered and are not easy to impose. They do receive scant mention in the 2002 definition of general practice,[11] though an earlier publication from the Royal College of General Practitioners, *What Sort of Doctor?*, was more comprehensive.[12]

Values in the team and organisation

As well as our own professional values, we need to consider the values that underlie effective teamwork and drive the primary care unit as an organisation. One method of bringing our values out into the open was described by Professor Ian Howarth as 'the upwards why?' (personal communication). This has much in common with the method used in business organisations known as 'five-why analysis'. When in doubt we go on asking ourselves (in an ethically higher direction) why we do something or are concerned about it, until we can no longer answer. Then the last answer points to a value. For an example that we might address in the team:

Q. Why do we immunise children against measles?
A. Measles is an unpleasant disease worth preventing.
Q. Why does this matter?
A. Children sometimes die of measles, or get serious sequelae.
Q. Why does that concern us?
A. Our role is to minimise avoidable death and suffering.
Q. Why? No answer. We have a value!

If the answers are in a lower ethical direction, the answer to the first question would be 'because I get paid'. By making values explicit, we can explore the consequent beliefs and behaviours. This explication can help to resolve conflict (see Figure 1).

Values of doctors, nurses, patients and lay staff are rarely congruent, but if they are in the open the differences can more easily be accepted. Values in a professional team might include:

- we respect each other's identity
- we value each other's contribution
- we all have equal status – no dominance
- we share responsibility for outcome
- the appropriate team member acts as leader
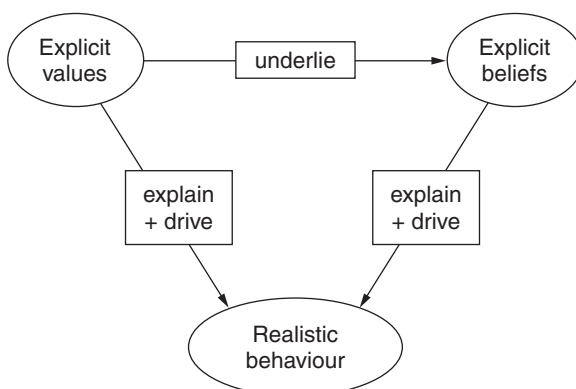
Figure 1 Explication of values and beliefs makes behaviour more comprehensible and realistic

- when conflict threatens we can negotiate roles flexibly
- we are all committed to audit and learning.

In the primary care unit as a whole, we might agree:

- we welcome patients in a friendly manner
- we aim at efficient systems of care
- we are open with health information
- we observe strict confidentiality of patient data
- we develop and maintain good community networks
- we undertake regular monitoring of systems
- we are all committed to learning.

Patients, and society as a whole, might have different and sometimes incompatible values and expectations. Providers of public services need to have reflections on their own behaviour, whereas the recipients of care expect appropriate behaviour by others. However, if the mode is of a partnership of doctors, nurses and patients, rather than confrontation, then the expectations become more realistic. Once out in the open, they can be negotiated and a compromise reached. Examples are:

- staff should be welcoming and non-judgemental in their attitudes
- there should be no obstacles to access to care
- we must all work in partnership and trust each other
- we must respect each other's autonomy
- we must encourage public support for health care
- we must freely exchange up-to-date knowledge
- we must use suitable language and avoid confrontational metaphors.[13]

Leopold and colleagues characterised the doctor–patient relationship as a 'sustained partnership'. The nearer we can get to this ideal, the more likely we are to achieve congruent expectations and values, rather than confrontation (abridged from Leopold *et al*):[14]

- whole-person focus
- doctor's knowledge of patient
- caring and empathy
- care adapted to patient's beliefs, values and life situation
- patient's participation in shared decision making and openness.

How can informatics help?

Quality development via audit, internal and external

Values and beliefs seem very remote from technology and informatics, but is there a connection? If we take the 'value' of providing care of high quality, we can show this as a much simplified conceptual model of the care process, and look at where informatics might help (see Figure 2).

Internal audit can provide a detailed measure of quality using certain measurable criteria. Few doctors have the time to do all the work entailed in collecting the data and comparing them with norms, standards and past practice. Most electronic practice systems
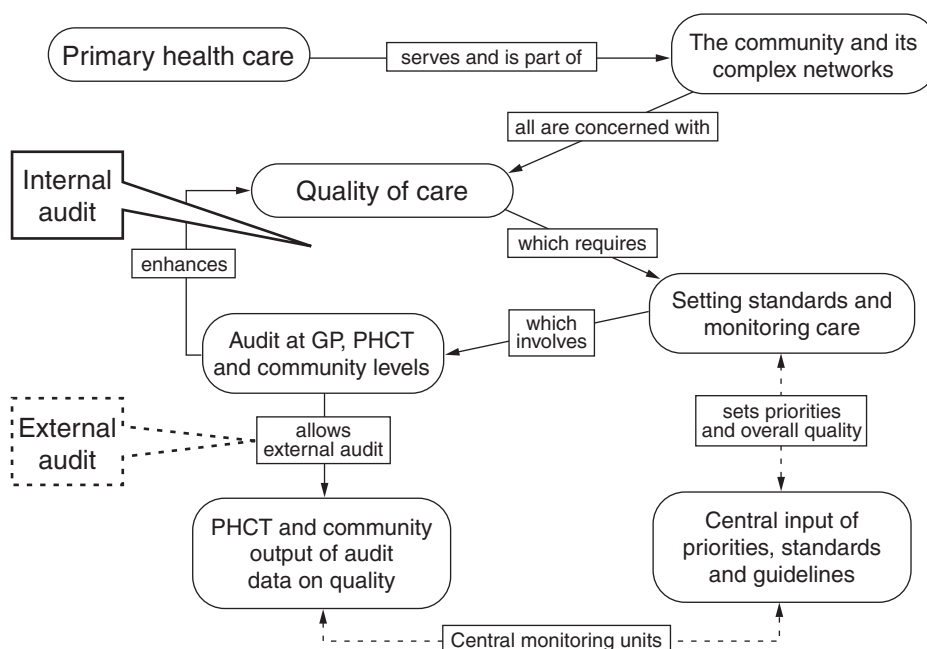
Figure 2 Conceptual model of the primary care process and audit of quality, internal and external

produce some audit data, but these are mostly at an early stage of development and operate in a narrow domain (such as stroke, heart disease, hypertension). Some enthusiasts have done better, but the aim should be automatic data collection and presentation in an acceptable format that enhances learning and changes behaviour.[15]

Guidelines based on evidence have raised hopes, and PRODIGY[16] covers a good proportion of consultation issues. Unless systems are developed for making guideline management easy, there is a danger of information overload from the massive quantities of evidence that are now available. However, it is essential that these internal audit systems are developed, and can be demonstrated to be effective. Only in this way can the much cruder methods of external audit be minimised. Some external audit is required for accountability in a public service, but if internal audit can be made to work demonstrably well then the practice can come nearer to the ideal of a 'self-organising system'.[17] This is the price that general practice must pay to maintain autonomy and public trust.

Adding knowledge to the consultation

In the consultation, the doctor and patient share knowledge and come to a joint decision on intervention. This can be shown in a conceptual model of knowledge transfer and decision making (see Figure 3).

Knowledge is what we hold in our heads, and we cannot possibly hold enough to deal with all eventualities. Informatics can help with knowledge-based decision support (KBDS), so that the information has meaning and can be processed logically using 'artificial intelligence'. Though the technology for KBDS has been in place for nearly two decades, its implementation has been patchy and confined to narrow domains. To work in a domain as wide as general practice, a
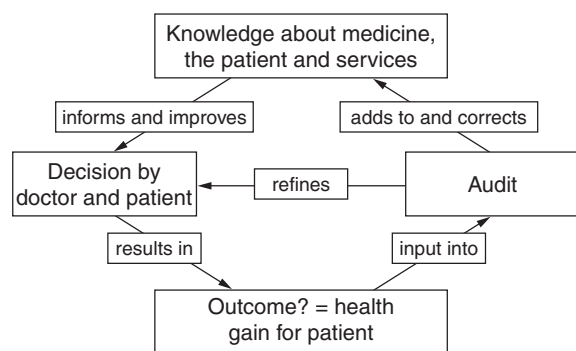
major obstacle has been the lack of a comprehensive knowledge base that a logic program can use. For this purpose, the two main systems are 'rule-based' (mainly applicable to narrow domains and production rules) and 'n-tuples' where knowledge is in the form of 'attribute, object and value' (*causes* of *acute breathlessness* include *asthma*). To convert current medical databases into a knowledge base is a great challenge for general practice. It has been done in segments of medicine, but could be facilitated by sophisticated editing programs. This would be a worldwide asset and a resource for the rest of medicine. The later issues of PRODIGY employ a logic program and guideline authoring tool (PROTEGÉ) with the knowledge in the form of scenarios familiar to practitioners.[16] This represents a step forward, but there is some way to go before they can easily be implemented seamlessly in everyday practice. However, we have to bear in mind that informatics relies on written information which strongly favours 'propositional' knowledge to the detriment of the other two kinds (practical knowledge and knowledge of familiarity) which are more personal and intuitive.[18] A comprehensive overview of current implementation of decision support can be obtained from the OpenClinical website www.openclinical.org.

Other values where information technology might be relevant

Fritjof Capra (1996) divided values (and thinking) into 'self-assertive' and 'integrative'.[19] In the former category he puts tendencies to expansion; competition; quantity; domination and rational, analytical, reductionist and linear thinking. These categories fit well with informatics. In the integrative category he includes conservation, co-operation, quality and partnership, supported by intuitive, synthetic, holistic and non-linear thinking, for which informatics (as we know it now) has less to offer. Self-assertive values depend on hierarchies; integrative values on networks. Capra (2002) expands these ideas:[20]

> Culture arises from a complex, highly non-linear dynamic, created in social networks with multiple feedback loops, through which values, beliefs and rules of conduct are continually communicated, modified and sustained.
>
> Values and beliefs affect culture's body of knowledge. They are part of the lens through which we see the world. They help us to interpret our experiences and what kind of knowledge is meaningful.

He describes the ideas, values and beliefs and other forms of knowledge generated by social systems as 'semantic structures' mostly embodied in the brains

Figure 3 Conceptual model of the application of knowledge in the consultation and its development by feedback

of individuals, but also documented in texts and other artefacts. There might be scope for informatics here.

Quality of care brings in other values such as accountability, joint decision making, open information for the patient, as well as individual and organisational learning. The values listed earlier are more integrative than self-assertive, but some are a mixture. Informatics will tend to favour self-assertive values. One hopes that, in the future, decision support systems might, at least, take care of some of the anxieties and dangers of diagnosis and prescribing, and allow the doctor and patient more time to come to terms with the less measurable consequences of each other's beliefs and values. That informatics might enhance patients' well-being, contentment and even empathy are possible outcomes.

Developing value-sensitive informatics

Systems development can only succeed if informaticians work in partnership with end users (doctors, nurses, other clinicians) and beneficiaries (patients), but this does not always happen owing to shortage of time and money. Developers need to ensure that systems do no harm and have a holistic approach to professional ethics.[21,22] A start has been made with a code of ethics and professional practice for software engineers, and with the development of UKCHIP.[23–25]

What can we do now?

We do not have to wait for the next millennium when information technology is advancing at such a pace. GPs need powerful systems in the consulting room, but also systems that help them when they are on the move, on the telephone, for house calls and for learning whenever the mood strikes them. Wireless-linked laptop computers have enough power, but do not have the convenience of the hand-held personal digital assistant (PDA). New architecture has been developed which makes them very fast and powerful. The latest models can carry an impressive array of medical databases, instantly accessible, as well as some downloaded patient records, and all the flexibility and portability of the PDA and mobile phone. Trials in Swedish general practice have been encouraging.[26] The next stage will be the addition of knowledge-based decision support. This might all sound Utopian, but in ten years' time we may wonder how we ever practised without it.

REFERENCES

1 Lawrence M, Griew K, Derry J, Anderson J and Humphreys J. Auditing audits: use and development of the Oxfordshire Medical Audit Advisory Group rating system. *British Medical Journal* 1994;309:513–16.

2 Davies HTO and Crombie IK. Assessing the quality of care. *British Medical Journal* 1995;311:766.

3 McKinley RK, Fraser RC and Baker R. Model for directly assessing and improving clinical competence and performance in revalidation of clinicians. *British Medical Journal* 2001;322;712–15.

4 Southgate L and Pringle M. Revalidation in the United Kingdom: general principles based on experience in general practice. *British Medical Journal* 1999;319:1180–3.

5 Rosen R and Gabbay J. Linking health technology assessment to practice. *British Medical Journal* 1999;319:1292.

6 Pendleton D and King J. Values and leadership. *British Medical Journal* 2002;325:1352–5.

7 General Medical Council. *Good Medical Practice* (3e). London: GMC, 2001.

8 Roberts C. Checklist for personal values. In: Senge PM, Roberts C, Ross R, Smith BJ and Kleiner A (eds) *The Fifth Discipline Fieldbook*. London: Nicholas Brearley, 1994, pp. 209–12.

9 Hicks NR. Some observations on the appropriateness of care. *British Medical Journal* 1994;309:730–3.

10 Oxford University Press. *Oxford English Dictionary* (2e). CD-ROM (version 3). Oxford: Oxford University Press, 2002.

11 Allen J, Gay B, Crebolder H, Heyman J, Svab J and Ram P. The European definitions of key features of the discipline of general practice, the role of the GP and core competencies. *British Journal of General Practice* 2002;52:526–7.

12 Royal College of General Practitioners. *What Sort of Doctor? Assessing quality of care in general practice.* Reports from General Practice 23. London: RCGP, 1985.

13 Judge A. *Enhancing Sustainable Development Strategies Through the Avoidance of Military Metaphors: reflections on underlying communication challenges emerging at the European conference on 'Bridging the Gap: new needs and perspectives for environmental information'*. London; 1998. laetusinpraesens.org/docs/targets.php (accessed 02/02/02).

14 Leopold N, Cooper J and Clancy C. Sustained partnership in primary care. *Journal of Family Practice* 1996;42:129–37.

15 Fox J and Thomson R. Decision support and disease management: a logic engineering approach. *IEEE Transactions on Information Technology in Biomedicine* 1998; 2(4):212–28.

16 Jones N, Hall R and Johnson P. *The PRODIGY Model and Guideline Comparisons*. www.openclinical.org/docs/ext/workshops/w1/jonesProdigy.pdf (accessed 02/02/02).

17 Pritchard P. The 'self-organising system' as a model for primary health care: can local autonomy and centralisation co-exist? *Informatics in Primary Care* 2002;10:125–34.

18 Göranzon B. *The Practical Intellect: computers and skills*. London: Springer-Verlag, 1992, pp. 82–3.

19 Capra F. *The Web of Life: a new synthesis of mind and matter*. London: Harper-Collins, 1996, pp. 9–10.

20 Capra F. *The Hidden Connections: a science for sustainable living*. London: Harper-Collins, 2002, pp. 74–6.

21 Gell G. Side effects and responsibility of medical informatics. *International Journal of Medical Informatics* 2001;64:69–81.

22 Timpka T. Professional ethics for system developers. *Methods Information in Medicine* 1999;38:144–7.

23 IEEE-CS/ACM Joint Task Force. Software engineering code of ethics and professional practice. *Science and Engineering Ethics* 2001;7:231–8.

24 Hayes G. Health informatics professionalism in primary care. *Informatics in Primary Care* 2003;11:1–3.

25 www.ukchip.org

26 Dr Companion. Medhand International AB, Stockholm, Sweden. www.drcompanion.com/products/unitedkingdom/overview.pdf (accessed 24/02/04).

CONFLICTS OF INTEREST

None.

ADDRESS FOR CORRESPONDENCE

Dr Peter Pritchard
31 Martin's Lane
Dorchester on Thames
Oxon OX10 7JF
UK
Tel: +44 (0)1865 340008
Email: peter.pritchard@tiscali.co.uk