Collecting, communicating and using information: the educational issues

A REPORT FROM THE ROYAL COLLEGE OF PHYSICIANS COMMITTEE ON MEDICAL INFORMATION TECHNOLOGY

ABSTRACT—Few of the major advances in information science and technology have yet been successfully introduced in health care. Their implementation could improve both quality of care and the working environment of clinicians, but this will not be achieved by investing in hardware and software alone. Investment in education is also required.

The quality of the information available to clinicians to enable them to manage their patients is limited by the poor quality of existing structures and procedures. Thus the conventional paper medical record is well recognised for the problems it poses with regard to availability, legibility, and completeness [1,2]. Similarly, communication between hospitals and primary care is widely criticised for not being sufficiently speedy and containing irrelevant or inadequate information [3,4]. Finally, under the new health service reforms, greater emphasis is being placed on the quality of clinical care, which can only be measured if relevant, timely and accurate information on activity and outcomes is available [5].

The importance of valid information for epidemiological research has always been recognised, but has not yet been achieved; it is also necessary for clinical research, audit, monitoring of training, activity analysis, and management of resources. The importance of this process is not yet widely appreciated by the profession; disillusioned by Körner statistics [6,7], many doctors still regard the careful collection of clinical data as an unnecessary waste of precious time. The aim of this paper is to propose educational measures to raise awareness and understanding of the importance of valid clinical information and the means of acquiring it.

Traditionally, medical education (at both undergraduate and postgraduate level) has been underpinned by two main philosophies: acquisition of factual knowledge on the part of the student and inexperienced doctor; and clinical apprenticeship to more senior doctors and specialists in particular clinical areas. The changing culture in which medicine is now practised means that horizons must be broadened to embrace issues not directly related to clinical care. They include skills in leadership, management, communication, and information.

Priorities for education

Education embraces knowledge, skills and attitudes. The proper management of patients, staff and healthcare provision depends upon good quality information and communication, whether this be clinical, managerial or epidemiological. Yet the importance of up to date information, and the key role played by the medical profession in supplying the valid data from which it is derived, is not yet understood by many senior medical staff, let alone those in training.

Educational initiatives must change the culture: shaping attitudes so that quality information and communication are second nature; developing skills and knowledge so that data are collected and analysed with ease and valid, relevant and timely information is appraised and used with sense.

Undergraduate training

Time is needed in the undergraduate curriculum for an introduction to clinical informatics. The UK lags behind the USA, Germany and the Netherlands in this area [8], even though students would welcome more use of computers in the curriculum [9]. Apart from developing keyboard skills, teaching should shape attitudes to create a receptive culture for the development of knowledge and skills in the course of general professional training.

Students need to understand the importance of communication between and within all groups of health-care professionals, as well as between doctors, patients and relatives. They also need to gain an overview of the principles of health information systems, data collection, coding, management of resources and assessment of the health needs of the population and measures of outcome.

General professional training

If attitudes are receptive, concepts, knowledge and skills can be developed during general professional
training. The UK is also behind Europe at this level [10]. Topics which need to be addressed include the following.

**Concepts**
- Problems—the information explosion and how to deal with it;
- variability/quality of data;
- uncertainty and how to handle it;
- scoring systems and how to use them;
- decision analysis—for examining clinical decisions and how to relate them to economic analysis and option appraisal;
- ethical issues of confidentiality and ownership of records;
- patient-held records and smart cards;
- the future—possibilities and changes;
- management of change.

**Knowledge**
- Coding classifications;
- medical records and coding processes;
- activity analysis and sources of data;
- management of resources;
- statistical data—sources and bibliography;
- clinical audit and outcome measures;
- performance indicators;
- major information systems;
- study, questionnaire and database design;
- the Data Protection Act;
- comparative assessment of commercial systems;
- organisational considerations in the implementation of new systems;
- expert systems, simulation models, mapping, postcodes and population databases.

**Skills**
- Basic computer literacy—familiarity with at least one word-processing package, one database/statistical package, one library system, one teaching system;
- transport of data between packages;
- interpretation and presentational skills;
- communication—with patients, relatives, colleagues and others;
- use of computer-based bibliographic services and personal reference manager software.

**Higher professional training**
Continuation of this process will be required through higher professional training, structured to meet the needs of individual specialties.

**Continuing education**
Individuals in career grades need to keep abreast of the latest advances in information science and technology to enable them to validate all aspects of the care their patients receive.

**A strategy for education and training in information science**
The UK is falling behind both Europe and the USA in this field. As long ago as 1984, the Association of American Medical Colleges’ Project Panel on the General Professional Education of the Physician recommended [10] that ‘medical schools should emphasise the development of independent learning and problem-solving skills and ... should designate an academic unit for institutional leadership in the application of information sciences and computer technology to the general professional education of physicians, and promote their effective use’. No such recommendation is believed to exist in the UK.

At local level, postgraduate training will be required in a structured format through induction training, audit meetings and formal seminars. This will be reinforced by practical involvement in the local data and information processes. At national level, teach-ins, workshops (especially to exchange experience and information), meetings and publications will be needed.

There must be a clear distinction between the information needs and processes (the ‘what’), the systems needed to meet these needs (the organisational ‘how’) and the skills of doctors (the individual ‘how’).

**Information technology for education**
The benefits of using information technology for education have largely not been realised in the UK, which is behind other countries in this respect, even though the concept has support at the highest level [12]. Investment should be made in this area.

**What specific action is needed?**
A strategy for the way ahead and for its implementation into specific action is required by all the Royal Medical Colleges and the General Medical Council.

The Royal College of Physicians can lead the way in postgraduate and continuing education by:
- encouraging College tutors to raise awareness and knowledge at induction training, audit meetings and career development interviews;
- organising a College teach-in for doctors in training, on health information systems, coding, activity analysis, audit, resource management and communication skills;
- organising a College workshop on the role of the profession in acquiring the skills of data collect-
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for effective management of patients, staff and the health service;

including questions on medical information science and technology in the MRCP examination;

preparing a College report on clinical information science and technology;

developing a regular course for consultants on clinical information science and technology, perhaps in collaboration with the training committee of the Information Directorate of the NHS Management Executive.

Feedback

The Royal College of Physicians can lead the way in this important but neglected area. This paper proposes ideas to achieve this. Comment, criticism, feedback and offers of help would be welcomed by the Medical Information Technology Committee.

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