THE VALUE TO
CLINICAL DECISION MAKING
OF INFORMATION SUPPLIED BY
NHS LIBRARY AND INFORMATION SERVICES

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USING THIS REPORT

Over 600 clinicians and 43 health information and library services provided data for this report, and many aspects of the links between information supply and clinical decisions are explored. This section suggests a route guide to the key sections of the report, first to secure an overview and secondly to identify key findings.

Structure of the report

The Chapters cover, in order, the background to the study, the methods used, the evidence obtained, discussion of the evidence and identification of areas for action. The contents list indicates the framework adopted. The results are presented in Chapters 3 to 7 with summary themes for discussion presented at the end of each chapter. These themes are united and extended in a concluding discussion in Chapter 8, which considers not only how to assess the value of an information service, but also how to provide services which add value. Areas for action identified in Chapter 9 provide the agenda for the quality assurance guidelines.

Overview

For an overview read the Executive summary (pages 15-18), and the List of contents (pages 8-10). Specific findings may be located using the summary results Tables A and B, at the end of this section on pages 4-7.

Core themes

If you wish to study the core themes of the report, the impact of information on clinical decision making, and the main implications for information delivery, you should read the following numbered sections in the sequence suggested.

1.1 Background
1.2 Project objectives
3.3 Pattern of purposes: the library view and the user view
3.5 Themes for discussion: purposes
4.5 Themes for discussion: prompts and props (information seeking)
5.4 End-users: problems or opportunities?
5.5 Themes for discussion: the information seeking role
6.3 Contribution to future clinical decision-making
6.7 Information for clinical decision making: present and future impacts
6.8 Themes for discussion: value and impact of information obtained
7.10 Discussion: benefits and barriers
7.11 Themes for discussion: benefits and barriers
8. Approaches to audit of library and information services
9. Areas for action
Viewpoints

If you are approaching this report from any of the following viewpoints you should read the sections and chapters listed in the sequence suggested. Aspects of personal use by clinicians of MEDLINE are collated in Viewpoint 1, and aspects relevant to the support and structure of postgraduate and continuing medical education in Viewpoint 2. Information for patients and the "doctor-patient" relationship are the focus in Viewpoint 3. Information staff dealing with inter-library loan requests may care to read the sections listed in Viewpoint 4.

Viewpoint 1:
Clinician use of MEDLINE on CD-ROM (or by Dial-Up MEDLINE)
is covered in the following sections and chapters:

1.1 Background
2.2 Method: survey of searches and requests
2.4 End-user searching survey
4.1 Prompts to making a search or request
4.4.2 Sources used for patient care - rare conditions or specific problems
4.4.3 Sources used for teaching, education and research
5 The information seeking role: assisted or solo performance?
7 Information behaviour and continuing professional development: variations on a theme (particularly sections 7.1 to 7.5)
8.6.1 User education
8.7.2 Networking

Viewpoint 2:
Postgraduate and continuing medical education
is considered in the following sections:

1.1 Background
3.1 Purposes of information need among medical staff
3.2 Purposes of information need: library and information service users
3.3 Pattern of purposes: the library view and the user view
3.4 Comparison with previous studies
4.1 Prompts to making a search or request
4.4.3 Sources used for teaching, education and research
4.4.4 The invisible college: colleagues as sources of information
4.4.5 Why medical libraries are used
5.4 End-users: problems or opportunities?
6.7 Information for clinical decision making: present and future impacts
7.7 Purposes of searches and requests: staff group differences
Viewpoint 3:
Patient education

is considered in the following sections:

3.1.2 Information for patients
6.4 Interviews: case studies of value assessments
   (part i Improved quality of life for patient and/or family
   part j Legal or ethical issues)
6.5 Value of information: general views
   (for same parts as in 6.4)
6.6 Value of information: comparison with previous studies
7.2 Patterns of information need and use: Registrars
7.6 Patterns of information need and use: GPs
8.5 Access to information

Viewpoint 4:
Clinicians' personal collections of copies of journal articles
(acquisition via inter-library loan services, and collection management) are
considered in the following sections:

2.2.1 Introduction: survey of library searches and requests
2.2.2 Sampling: library searches and requests
2.2.4.1 Response to survey of library searches and requests
2.2.4.2 Response to search/request survey by staff category
3.2 Purposes of information need: library and information service users
4.1 Prompts to making a search or request
4.2 Sources used to obtain information
4.4 Patterns of use of information sources
4.4.1 Sources used for drug or therapy queries
4.4.2 Sources used for patient care - rare conditions or specific problems
4.4.3 Sources used for teaching, education and research
4.4.5 Why medical libraries are used
6.1 Immediate impact of information
6.2 Information storage and dissemination
5.4 End-users: problems or opportunities? (passim)
8.7.1 Journals and inter-library loans
Tables A -B: summary findings from Value project, main phase

These tables provide a quick entry point to locating aspects of information behaviour for particular staff groups. Each cell contains indications of the results obtained, and there is a reference, in the extreme right hand cell of the row to the section of the report where these results are presented and discussed in more detail. For example, to find details of the purposes of information need among SHOs:

*Primary purposes:* brief details in first row, first column of the table, more information in Chapter 7, Section 7.1

*Purposes of requests and searches presented to the information service:* brief details in fourth row, first column, more information in Chapter 7, Section 7.7.

*Frequency of information needs:* brief details in second row, first column, more information in Chapter 7, Section 7.1.

Table A contains indicators for clinicians undergoing postgraduate medical training, while Table B contains indicators for those in continuing medical education.

For some aspects of information behaviour there were insufficient data from some groups of staff for detailed analysis. This is indicated by "not enough data" in the cell.

**Table A: Postgraduate medical group: SHOs, Registrars, Senior Registrars**

<table>
<thead>
<tr>
<th>Results</th>
<th>SHOs</th>
<th>Registrars</th>
<th>Senior Registrars</th>
<th>Report section ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary purposes</td>
<td>1. Personal education (51%)</td>
<td>1= Personal education</td>
<td>(almost equal, &gt; &lt;40%)</td>
<td>7.1, 7.2, 7.3</td>
</tr>
<tr>
<td></td>
<td>2. Patient care (38%)</td>
<td>2= Personal research (37%)</td>
<td>1= Personal research</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Teaching</td>
<td>2= Publication</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1= Patient care-rare condition</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1= Personal education</td>
<td></td>
</tr>
<tr>
<td>Frequency of primary purposes</td>
<td>19% &quot;not needed that week&quot;</td>
<td>23% &quot;not needed that week&quot;</td>
<td>11% &quot;not needed that week&quot;</td>
<td>7.1, 7.2, 7.3</td>
</tr>
<tr>
<td>Sources used</td>
<td>1. Ref. books (69%)</td>
<td>1. Local medical library (54%)</td>
<td>1. Local medical library (57%)</td>
<td>7.1, 7.2, 7.3</td>
</tr>
<tr>
<td></td>
<td>2. Local med. library (~50%)</td>
<td>2. Personal/unit files/databases</td>
<td>2. MEDLINE (41%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Personal/unit files/databases</td>
<td>3= Ref. books</td>
<td>3. Ref. books</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Colleagues</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table A: (contd.)

<table>
<thead>
<tr>
<th>Results</th>
<th>SHOs</th>
<th>Registrars</th>
<th>Senior Registrars</th>
<th>Report section ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prompts to searches or requests</td>
<td>1. Personal curiosity        2. Suggestion or advice from colleagues</td>
<td>1. Personal curiosity        2. Reading personal journals or books</td>
<td>1. Personal curiosity        2. Reading personal journals or books</td>
<td>4.1</td>
</tr>
<tr>
<td>Information selection</td>
<td>Often look for reviews, less often for research</td>
<td>Often look for reviews, quite often for research, look at abstract (cf. end-user searching)</td>
<td>Often look for reviews, and research, examine method &amp; statistics</td>
<td>5.1</td>
</tr>
<tr>
<td>Attitudes</td>
<td>Not particularly confident over competence, quite often prefer DIY searching, unsure about IT not aware about MEDLINE benefits?</td>
<td>Prefer DIY searching, more confident than SHOs, more likely to need info. urgently than others</td>
<td>Prefer DIY searching, more confident than SHOs, more likely to need large library than others</td>
<td>5.2</td>
</tr>
<tr>
<td>Immediate impact</td>
<td>Most- new information provided</td>
<td>Most - new information provided</td>
<td>Most - new information Will share with colleagues</td>
<td>7.8.1</td>
</tr>
<tr>
<td>Clinical decisions utility</td>
<td>most benefit 3.9</td>
<td>2.9</td>
<td>2.8</td>
<td>6.3</td>
</tr>
<tr>
<td>Which decisions?</td>
<td>1= Recog. normal or abnormal condition  1= Revision treatment plan 3. Ident. or eval. alternative therapies</td>
<td>1. Quality of life          2. Recog. normal or abnormal condition 3. Ident. or eval. alternative therapies</td>
<td>1. Ident. or eval. alternative therapies 2. Recog. normal or abnormal condition 3. Differential diagnosis</td>
<td>7.8.2</td>
</tr>
<tr>
<td>Major points</td>
<td>Lack of awareness of services - esp. MEDLINE on CD-ROM</td>
<td>Specialised interests. Frequent CD-ROM users?</td>
<td>Specialised interests. Critical appraisal of MEDLINE</td>
<td>2.2.4.2 7.1, 7.9.1 7.2, 7.9.2 7.3, 7.9.3</td>
</tr>
</tbody>
</table>
Table B: Consultants, "Staff grades", GPs

<table>
<thead>
<tr>
<th>Results</th>
<th>Consultants</th>
<th>Staff grades</th>
<th>GPs</th>
<th>Report section reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary purposes</td>
<td>1. Patient care (31%)</td>
<td>1. Patient care (37%)</td>
<td>1. Patient care (mainly drug/therapy (54%), also rare conditions (35%))</td>
<td>7.5, 7.4, 7.6</td>
</tr>
<tr>
<td></td>
<td>2. Education (own and others) (c.28%)</td>
<td>2. Personal education</td>
<td>2. Personal education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Personal research</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of primary purposes</td>
<td>14% &quot;not needed that week&quot;</td>
<td>24% &quot;not needed that week&quot;</td>
<td>27% &quot;not needed that week&quot;</td>
<td>7.5, 7.4, 7.6</td>
</tr>
<tr>
<td>Sources used</td>
<td>1. Ref. books (43%)</td>
<td>1. Ref. books (59%)</td>
<td>1. Ref. books (59%)</td>
<td>7.5, 7.4, 7.6</td>
</tr>
<tr>
<td></td>
<td>2= Medical library</td>
<td>2. Personal or unit files or databases</td>
<td>2. Personal journals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Personal journals (32-35%)</td>
<td>3= Medical library</td>
<td>3= Personal journals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Personal/unit files/databases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purpose of information</td>
<td>1. Personal education</td>
<td>Not enough data</td>
<td>Not enough data</td>
<td>7.7</td>
</tr>
<tr>
<td>service requests or searches</td>
<td>2= Patient care (rare condition)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Teaching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prompts to searches or</td>
<td>Reading personal books/journals Personal curiosity</td>
<td>Not enough data</td>
<td>Not enough data</td>
<td>4.1</td>
</tr>
<tr>
<td>requests</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information selection</td>
<td>Look for reviews, less emphasis on recent articles, method/stats. than SRs</td>
<td>Not enough data</td>
<td>Not enough data</td>
<td>5.1</td>
</tr>
<tr>
<td>Attitudes</td>
<td>Less likely to prefer own searching than other groups, and to need info.</td>
<td>Not enough data</td>
<td>Not enough data</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>urgently</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table B (contd.)

<table>
<thead>
<tr>
<th>Results</th>
<th>Consultants</th>
<th>Staff grades</th>
<th>GPs</th>
<th>Report section reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate impact</td>
<td>1= Some new</td>
<td>Not enough data</td>
<td>Not enough data</td>
<td>7.8.2</td>
</tr>
<tr>
<td></td>
<td>1= substantiated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>what was known</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical decisions utility</td>
<td>2.9</td>
<td>Not enough data</td>
<td>Not enough data</td>
<td>6.3</td>
</tr>
<tr>
<td>Which decisions?</td>
<td>1= Confirmation of proposed therapy</td>
<td>Not enough data</td>
<td>Not enough data</td>
<td>7.8.2</td>
</tr>
<tr>
<td></td>
<td>1= Ident. or eval. alternative therapies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Minimis. risks treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major points</td>
<td>Varied group</td>
<td>Elusive</td>
<td>Broad, often</td>
<td>7.5, 7.9.5, 7.4, 7.9.4, 7.6, 7.9.6</td>
</tr>
<tr>
<td></td>
<td>Use of personal resources</td>
<td>Need targeted services, for</td>
<td>instant info.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management and audit of patient care</td>
<td>patient care &amp; CME</td>
<td>needs - often</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low awareness</td>
<td>management, cost/benefits</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>of services</td>
<td>Unit resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patient care info.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>for rare conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low awareness</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>of services</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>More interest in patient info.</td>
<td></td>
</tr>
</tbody>
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ABSTRACT

The Value project, funded by the British Library R&D Department and a group of Postgraduate Medical Deans, examined the effectiveness of NHS information and library services. Clinicians at 11 hospital sites were asked to describe the purposes for which they needed information, the steps they took to obtain it, and to assess the value of the information obtained from inter-library loan requests, mediated searches and end-user searches. A sample of BMA Dial-Up MEDLINE users were also asked similar questions. Of the clinician respondents for the information and library service requests and searches, 89% agreed that information did, or would in the future, assist in clinical decision making. Clinical decisions influenced in specific instances were enumerated. The extent of support and type of decision supported varied with career stage. Information new to clinicians was often provided. Details were obtained of the information-seeking behaviour of both information and library service users and "non-users", to set the value judgements in context. Follow-up interviews provided illustrations of the ways in which developments aimed at more cost-effective patient care were supported by information obtained. Results from the Value project, together with a supplementary audit survey of activities at over 30 different health information and library services, guided production of a quality assurance toolkit. This toolkit is intended to guide information services in local audit and hence to improve the delivery of information to clinicians.

Keywords: value of information; clinical decision making; effectiveness; quality assurance; service performance; health libraries; health information services; clinicians; continuing medical education; postgraduate medical education; information behaviour; information needs; end-user searching; outcomes; evidence-based medicine; audit
The value to clinical decision making of information supplied by NHS library and information services

Executive Summary

Aims

The Value project, funded by British Library Research & Development Department and a group of Postgraduate Medical Deans, examined the effectiveness of NHS library and information services. The twin objectives of the project were:

1. To examine the value to postgraduate and continuing medical education, of information supplied by NHS information and library services. The value was expressed in terms of benefits to clinical decision making.
2. To examine the factors affecting delivery of that information to clinicians. The results guided production of a quality assurance toolkit.

Methods

Clinicians at 11 hospital sites (varying from a teaching hospital to a small specialist library in a rural area) were asked to assess the value, to present and future clinical decision making, of information obtained from the following:

- Requests for loans or copies of material not held locally (inter-library loan requests);
- mediated searches (searches made by information service staff on behalf of the clinician);
- MEDLINE searches conducted by the clinicians themselves (end-user searches); with a complementary study of:
- MEDLINE searches conducted by BMA Dial-Up MEDLINE users.

Those requesters and searchers were also asked about the purposes of their information request. To set these assessments in context, the patterns of information need and use among a random sample of clinicians at those hospital sites were assessed, using a critical incident technique. That random sample (about 10% of each staff group) included senior house officers (SHOs), registrars, senior registrars, consultants, GPs, and staff grades (including staff grades per se, associate specialists, clinical assistants and hospital practitioners).

Interviews provided:

- case studies of the clinical decisions that might be - or were - affected;
- details of information need and use among the "non-users" of the information services;
- searching expectations, and techniques used by end-users of MEDLINE on CD-ROM.
Results

The key findings are:

- Information provided did or would assist in clinical decision making. 89% of the clinicians agreed that the information would affect one or more categories of clinical decision making.

  Conclusion: The information provided by the NHS information and library services provides a basis for more informed decisions about patient care.

- Information will often be used for future clinical decisions rather than immediate patient care. Some examples of cost savings, or moves for more cost-effective care were identified in interviews, but the outcomes were frequently "just in case" rather than "just in time". Clinical decision making is complex, and changes imply a change in behaviour, which is unlikely to be immediate.

  Conclusion: Educational outcomes may be as important, in the long-term, as immediate effects on patient care.

- The information provided contributes, almost equally, to a better understanding of a patient's condition, a more informed choice of appropriate therapy, with recognition of the implications of that therapy for the patient and family.

  Conclusion: The NHS information and library services play a significant role in the promotion of evidence-based health care.

  Conclusion: The contribution of information to specific clinical decisions can be enumerated.

- The type of clinical decisions affected vary according to career stage, and patient care responsibilities.

  For example:

  Registrars are most concerned about the quality of life for patient and family, consultants are most concerned that the proposed therapy is the most appropriate - and also safe.

- Staff groups have different patterns of information need and use.

  For example:

  GPs are the most likely to seek information for patient education;
  Only registrars and senior registrars include MEDLINE among their top three sources used (SRs use MEDLINE in 41% of incidents);
  GPs require information about drug therapy in 54% of incidents and information about rare conditions is required in 35% of incidents.
Registrars are more likely than other groups to require information urgently.

- The benefits to use of information and the barriers which hinder such use vary. Awareness of information services, and the benefits of services (e.g. MEDLINE on CD-ROM) can be low. Those who might benefit most from information provided (e.g. SHOs) are among those least likely to use services which provide up-to-date information on patient care.

Conclusion: Information services must consider how to target services to the needs of the user, and the user group.

Other findings in the report concern

- Information behaviour of clinicians.

Aspects considered include:

- Why and how clinicians perform their own database searches;
  
  For example:
  
  SHOs quite often prefer to do their own searching but do not feel very confident;
  
  MEDLINE is used primarily for personal research, but it is also used for patient care information needs, particularly about rare conditions.

- The factors which convert a vague information need into a demand for information;
  
  For example:
  
  SHOs are the most likely of all the groups to make a request or search in response to a suggestion or advice from colleagues.

- The mixture of purposes (clinical, educational and research) underlying most requests and searches;
  
  For example:
  
  Patient care purposes are involved in 66% of incidents when clinicians seek information, but in only 37% of these is patient care the sole purpose;
  
  Research and publication purposes are involved, to some extent, in 55% of information service requests and searches.

- The invisible college: how colleagues are consulted and informed;
  
  For example:
  
  Colleagues are most likely to be consulted for queries about rare conditions or specific problems (50% of such incidents);
GPs and SHOs are the groups most likely to consult colleagues; 76% of information service users indicated that information obtained would be shared with colleagues.

- The significance of personal collections of information, in relation to other information sources.
  For example:
  91% of requesters/searchers said that the information obtained would be added to their personal collection of information; Personal or unit/departmental information files (or databases) are frequently consulted for information (by registrars in 33% of incidents).

Value guidelines

A toolkit of guidelines and methods for local audit of information services has been produced. This toolkit enables information professionals to monitor - and enhance - the effectiveness and impact of their services.

Information service activity data from over 30 NHS information and library services throughout England and Wales provided individual profiles of service use, to complement the findings of the main phase. Targets for certain activities, and levels of use by different user groups, were developed as a guide for information services in determining comparative performance. The effects of resourcing on performance are considered.

The audit approach developed in the guidelines considers:

- assessment of user needs for information;
- provision of information services (to enhance the utility of the information provided);
- assessment of outcomes of use of the information.

Full report and guidelines

The research report is available as *The value to clinical decision making of information supplied by NHS library and information services* from: British Library Document Supply Centre (British Thesis Service), Boston Spa, Wetherby, West Yorkshire LS23 7BQ (Report no. 6205).

The toolkit for local audit of information services is available as *The value of information services to clinicians: a toolkit for measurement*, from: Open Learning Unit, Department of Information and Library Studies, University of Wales Aberystwyth, Llanbadarn Campus, Aberystwyth, Dyfed SY23 3AS.
GLOSSARY AND ABBREVIATIONS

**BMA:** British Medical Association. The BMA has around 80000 UK members, plus overseas members. Five autonomous committees represent and negotiate on behalf of hospital senior doctors, junior doctors, general practitioners, public health and community medicine doctors and medical academics. The BMA library offers a complete range of medical library and information services to the Association's members. Medical libraries can also use the Library by subscribing to the Institutional Membership scheme. Most PGME libraries use the BMA library to obtain inter-library loans and photocopies of journal articles. A doctor who is a member of the BMA can use the Dial-Up MEDLINE service as a free benefit of BMA membership. The doctor has to arrange the hardware (PC, modem) and communications software, and is responsible for the telephone charges involved.

**Calman report:** Report of the Working Group on Specialist Medical Training, chaired by Dr Kenneth Calman (1993). The aim was to bring the UK postgraduate medical training structure into line with the EU directives on medical training. Recommendations included a combined higher training grade (now called specialist registrar, SpR) to replace registrar and senior registrar, with a first phase of specialist training to be sufficiently flexible to enable trainees to make an initial commitment to a broad range of specialties. "Specialist training" would apply to the whole period of training following full registration and would last until the award of a UK CCST (Certificate of Completion of Specialist Training).

**CD-PLUS:** Supplier of CD-ROM software package for searching MEDLINE. CD-PLUS specialise in interfaces for health databases.

**CD-ROM:** Compact Disc Read-Only Memory

**CI:** Critical Incident technique: Methodology which usually involves analysis of one incident, examining the behaviour which leads to particular outcomes. The Value project used this technique to examine several information seeking incidents by participating clinicians.

**Clinical assistant:** Many GPs undertake clinical assistant sessions in local hospitals either in general subjects or in specialties in which they have an interest.

**Clinical librarian:** Also termed "clinical medical librarian", the concept was pioneered by Gertrude Lamb at the University of Missouri-Kansas City School of Medicine 1972-1975. The approaches to a clinical librarian service vary, but most will include one of the following: attending rounds, clinical treatment conferences, provision of SDI services, information packages (including LATCH, Literature Attached To the CHart).
**Clinician:** Term embracing doctors and surgeons.

**Cochrane Centre:** The Cochrane Centre in the UK (Oxford) shares responsibility with other Cochrane Centres for maintaining registers of systematic reviews, and helping to establish a register of all randomised controlled trials of health care interventions. The aim is better informed decision making in health care, based on more reliable reviews of the research evidence.

**Consultant:** Hospital consultants undertake full responsibility for the clinical care of patients, most acting as the head of a team, or firm, of junior doctors. Senior medical staff of university medical schools can hold honorary (unpaid) contracts with NHS employing authorities.

**Continuing education:** For clinicians, continuing medical education tends to refer to continuing professional development for the non-training grades. GPs, consultants, and the staff/specialist grades will undertake continuing medical education.

**COPMED:** Committee of Postgraduate Medical Deans

**Current Contents:** A current awareness service available from ISI, the Institute for Scientific Information. Current Contents is available on both diskette and CD-ROM, as well as in print, online and on magnetic tape. At present it is available via BIDS on JANET, the Joint Academic Network.

**EMBASE:** Pharmacological and biomedical database produced by Elsevier Science BV. The database is available online, on tape for in-house installation, or on CD-ROM. It is available on JANET, the Joint Academic Network, via BIDS, based at the University of Bath. EMBASE in available on CD-ROM, as the entire database and also as specialties. EMBASE Alert is a current awareness file on CD-ROM.

**End-user searching:** Usually refers to independent searching by the information user of databases, usually on CD-ROM, distinguished from searching by an information professional as an intermediary on behalf of the person requiring information.

**Family Health Service Authority (FHSA):** These were previously the family practitioner committees, but became FHSAs under the provisions of the National Health Service and Community Care Act of 1990. FHSAs were placed in a direct management relationship with RHAs in England.

**GP:** General Practitioner. For the majority of the UK population the GP is the first, continuing and perhaps the only contact with the NHS. GPs attend their patient in their consulting rooms and at home, and sometimes in a clinic or hospital.
Over 90% of all episodes of illness are managed wholly in general practice. GPs work in primary health care teams with practice nurses, district nurses, health visitors, community midwives, practice receptionists and managers. Increasingly, other health and welfare professionals are associated with GP practices (social workers, chiropodists etc.) Clinics for the care of asthma and other chronic disorders are widespread in general practice, and consultants lend support. The trend is toward larger practices. Some 10% of practices are training practices. There are around 31500 GP principals in the UK.

**GP trainees:** General practitioner trainees undergo a three year vocational training scheme (VTS). The three year postgraduate scheme includes two years in selected hospital posts and a further 12 months is spent in general practice.

**Hospital practitioner:** A non-consultant career post, frequently part-time.

**ILL:** Inter-library loan (usually refers to the supply of photocopies of articles). Refers to the provision of material not held locally, which has to be obtained from other libraries and resources centres. The British Library Document Supply Centre is the main supplier of articles for libraries in the UK. Health libraries also use regional schemes based on a co-operative network of health (usually NHS-funded) libraries and information services.

**IT:** Information technology

**Junior doctors:** Term for doctors in training grades (SHOs, registrars, senior registrars)

**LAN:** Local area network (computer)

**Medical audit:** Medical audit embraces systematic critical analysis of the quality of medical care, including the procedures used in diagnosis and treatment, the use of resources and the resulting outcome for the patient. Clinical audit embraces medical audit but covers all aspects of clinical care and the activity of professional staff participating in its provision. Implementation of medical audit remains patchy. All hospitals have set up audit committees and in some cases this covers "clinical audit" but audit activity is highly variable. Medical Audit Advisory Groups (MAAGs) represent local GPs.

**MEDLINE:** Name for the computer based versions of the medical, biomedical, and health care literature database prepared by and supplied from the National Library of Medicine, USA. MEDLINE covers the fields of medicine, nursing, dentistry, veterinary medicine and the biomedical sciences. The entire database comprises over seven million citations, from 1966 to the present, and is updated monthly. Many of the citations include abstracts.
MESH: Medical Subject Headings, name of the thesaurus developed by the National Library of Medicine (NLM) for processing of MEDLINE. MESH is a hierarchical thesaurus, with broad and narrower terms arranged in a tree structure. Most articles are assigned 10-12 index terms, or medical subject headings, by National Library of Medicine indexers.

MLSO: Medical Laboratory Scientific Officer

NLM: National Library of Medicine, USA

Ovid: Windows-based software for searching MEDLINE on CD-ROM, supplied by CD-PLUS.

PGEA: Postgraduate education allowance

PGME: Postgraduate medical education. Postgraduate medical education covers the training grades of senior house officer, registrar and senior registrar.

RCGP: Royal College of General Practitioners. Responsible for the educational and professional side of the GP's work. Membership of the college is attained by sitting an examination and the MRCGP diploma is registrable with the General Medical Council, which regulates the medical profession in the UK.

Reference Update: A current awareness service, available on diskette (in various versions) produced by Research Information Systems Inc. as a companion product to the Reference Manager bibliographic software package. Reference Update is aimed at biomedical scientists.

Registrar: A doctor who is on the first stage of specialist professional training, having passed postgraduate examinations.

RLG: Regional Librarians' Group: A group of Regional Librarians (for the NHS health libraries within the NHS Regions). Some Regions have no formal regional library structure and send a representative from the NHS librarians within the group.

RSM: Royal Society of Medicine "For the cultivation and promotion of physic and surgery and the branches of science connected with them". The RSM has 37 sections, each concerned with a specialty or branch of medicine. The library is one of the most comprehensive medical libraries in Europe.

SCOPME: Standing Committee on Postgraduate Medical Education

SDI: Selective dissemination of information: usually refers to a current awareness, or alerting service tailored to individual needs
**SHO:** Senior House Officer. SHOs are registered doctors, but are not specialists. Some SHOs are on a vocational training scheme to become GPs (GP trainees). Traditionally SHOs have worked very long hours, although these hours are now limited. SHO posts are usually filled in open competition after they have been advertised. The tenure of each post is usually six months and some posts are linked in clinical rotations to give a broader clinical experience. Doctors intending to remain in hospital practice must obtain a higher diploma from a Medical Royal College before progressing to registrar level. SHOs and higher training grade doctors are entitled to study leave to prepare for examinations and enhance specialist knowledge.

**Staff/Specialist:** Staff grade or Specialist posts: career posts for medical staff. For doctors who do not wish or are not able to become a consultant a non-training staff grade has been introduced.

**SR:** Senior Registrar. A senior registrar is on the final stage of postgraduate medical training.

**Vocational training scheme (VTS):** The three year postgraduate training scheme for doctors becoming GPs (see GP trainees)

**WP:** Word processor
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Chapter 1

Introduction

1. Background

"What action is needed to improve access to the knowledge base of health care throughout the NHS?"

Cumberlege seminar (British Library, 1994)

Implicit in this question is the recognition that professional knowledge is a vital resource, but that it is still necessary to ask fundamental questions about what such knowledge comprises, how it evolves from a mass of information and how it might best be used to inform clinical decisions.

For a clinician, information means patient data and the vast amount of textual and other material which is available in journals, books, audio-visual and electronic media. Professional knowledge synthesises medical information with clinical experience, enabling clinicians to sift the evidence and consequently make judicious clinical decisions. The development of professional medical knowledge requires dissemination of clinical experience and acquired knowledge through teaching, discussion and publication in the medical literature.

There is now a vast amount of medical literature - MEDLINE alone has over 7 million citations. Individual clinicians must select and obtain the items of information they need for their own clinical knowledge. Library and information services play an important role in providing increasingly varied means of access to the published medical literature, and networking has enabled faster delivery of information.

However, access cannot of itself guarantee effective use. To answer the question:

What will encourage a clinician to use effectively the information contained in a particular information source?

requires exploration of information behaviour. Any audit of the effectiveness of the delivery of information must not overlook the outcomes which ensue from the supply of that information, to see how that information was used - and how clinical practice might be improved as a result. An information and library service therefore needs to know why and how information is sought, if it is to fine tune its services and adequately justify continued funding in a context in which outcomes and effectiveness are required criteria.

Although the efficiency of UK health libraries can be gauged in terms of statistics of inputs and outputs, the effectiveness of these libraries has not been fully
investigated. The input-output statistics do not consider the reasons for requests, nor do they assess the outcomes of the information obtained. In previous studies in UK health libraries (Brember & Leggate, 1982) (Childs, 1988) the emphasis has been on the type of use made of the library service.

American studies have examined in more detail the outcomes of information supplied by health care libraries. At hospitals in Rochester, New York, methodology originally developed for a study in Chicago (King, 1987) was modified for use in a study of 15 hospital areas (urban and rural). Physicians were asked to participate in the survey by submitting a request concerning a current patient care problem to their hospital library (Marshall, 1991 and 1992). The vast majority of the 208 respondents agreed that the information provided was relevant, of cognitive value, and contributed to better informed clinical decisions. The results also suggested that the information would contribute to more cost-effective care.

The Rochester questionnaire has been replicated in other studies (Fischer & Reel, 1992) (Casado Uriguen et al. 1994) and positive, though less dramatic, impacts on clinical decision making recorded. The important difference between these later studies and the Rochester study is that the Rochester study was based on solicited enquiries, whereas the replicated studies were looking at actual practice.

Studies of the use of the MEDLINE database also indicate that information obtained can alter clinical decisions. A study of online access, in an academic clinical environment (Haynes et al. 1990) found that patient problems and therapy were the main reasons for doing a search, and that searches help to confirm (more often than change) a clinical decision. A National Library of Medicine study of the use of MEDLINE for clinical problem solving studied both physician users of MEDLINE and those physicians who had searches done by an intermediary (Lindberg et al. 1993, Wilson et al. 1989). A content analysis of the interview transcripts revealed various categories of impact on clinical problem solving. Many physicians reported that the information supplied had been beneficial to the outcomes of patient care.

The effect on clinical decision making behaviour may be more complex and behaviour change may not be as immediate as might be inferred from the Rochester and similar studies. The decision to seek further information may depend, partly, on case-related clinical experience (Gruppen et al. 1988), but the cognitive processes involved in clinical decision making differ from conventional decision analysis (Moskowitz, 1988). The information used in the clinical decision making process can be divided into declarative knowledge (mainly facts) and procedural knowledge (what to do, strategies and principles for evaluation) (Florance, 1992). The "frames" for clinical problem solving demonstrate a blend of these components, and the extent to which the "high level" medical knowledge (Wyatt, 1991) is used and altered will vary. Personal learning will provide background
information for future decision making. Their own clinical experience may appear more reliable to physicians than outcomes research data (Tanenbaum, 1994).

There is often a time lag between the availability of knowledge about a medical advance and widespread implementation of that advance (Stross et al. 1981) (Williamson et al. 1989). Expert recommendations are often out-of-date (Antman et al. 1992) and although colleagues do appear to be influential sources in changing clinical behaviour, the change does depend on situation and context (Williamson et al. 1989). Opinion leaders can be identified, though whether the opinion leaders themselves are always aware of their role is uncertain (Weinberg et al. 1981).

Behaviour change may be effected by a variety of interventions, including reading of journals, study days, discussion with colleagues, and seeking opinions from clinical experts. A review of randomised controlled trials concerned with the effectiveness of continuing medical education in North America (Davis et al. 1992) suggests that acceptance and implementation of clinical developments requires several interventions working in tandem. Reading alone would not be sufficient, but reading of printed materials, combined with other methods (opinion leaders, practice-based learning) may be effective.

The current arrangements for UK postgraduate and continuing medical education were developed as a result of the Christchurch conference in 1961. The existing arrangements were reviewed by a working party established by the Standing Committee on Postgraduate Medical Education (SCOPME). In the report (SCOPME, 1990) the need for all NHS doctors to participate in continuing medical education was recognised, and a later report noted the problems facing senior house officers and staff grades (SCOPME, 1992). Changes to make UK training consistent with the rest of the European Union were discussed in the Calman report (UK. Dept. of Health, 1993). A single training grade would replace the career registrar and senior registrar grades, and a Certificate of Completion of Specialist Training would be introduced. The envisaged training period is shorter and more intense than the current scheme, and specialist training is viewed as an integral part of the wider continuum of medical education and training.

Arrangements to ensure that postgraduate and continuing medical education is effective, both for the clinicians concerned and the organisation for which they work, are under debate (Easmon, 1994). Organisational support in the UK for continuing professional development varies (Kerr et al. 1993), though consultants rated conferences or meetings in study leave time as most important, followed by reading of journals.

Although medical audit should provide a stimulus for analysis of educational needs and change in clinical practice (SCOPME, 1990) the incentives and mechanisms for linking medical audit with continuing medical education appear deficient. The
effectiveness of audit groups for continuing medical education appears to depend on how well the members of the audit group interact (Newton et al. 1992).

While keeping up-to-date is acknowledged as a professional responsibility for clinicians, the way this is attempted varies. The extent to which libraries contribute to this process for any individual or group therefore differs. Brember & Leggate (1982 and 1985) found that while clinical staff cited keeping up-to-date as the main reason for needing information, the practitioners and researchers had different patterns of information use, and a small core of active users could distort the perceptions of library staff about the information needs of the user community. The relatively low use made of NHS libraries by GPs found by Childs (1988) suggests that GPs use other sources of information, and the importance of personal collections as information sources should not be forgotten (Elayyan, 1988) (Kerr et al. 1993). The non-use or infrequent use of library and information services is notoriously difficult to study (Slater, 1984). "Fast-trackers" may use the library more than others, but this referred to a comparison of cohorts of similar background and experience (King, 1992). The number of library visits may depend simply on how near the library is to the work location (King Research, 1984).

Clinical medical librarian programmes were developed in the 1970s in North America to provide clinicians with pertinent information, to help forge a link between the information provider and the clinical workplace (Cimpl 1985). The main problem appears to be the cost of these services, which were probably scrutinised in more detail, in isolation, than the traditional library services. Evaluations did show that benefits included more sharing of information among the health care staff, and a greater awareness of the library service. In the UK, the clinical librarian experiment at Guy's Hospital for two years between 1978 and 1980 (Wilkin 1982) involved two clinical librarians appointed respectively to the Department of Medicine and Department of Surgery. Everyday information needs were found to be routine, and if not routine, would often be mixed, patient care overlapping with teaching or research needs. Medical literature was needed only occasionally to resolve current patient care problems and information was not usually required urgently. Reasons for requests for information varied but mostly concerned background interest, and over half the requests came from the top ten users. Evaluation suggested that the clinical librarians' involvement in the patient care environment was less advantageous than had been expected. Unlike many American programmes the Guy's experiment was separately organised, and had no formal links with the library.

With the benefit of hindsight, it is unfortunate that one of the aims of the Guy's experiment, user education, was discontinued, as the educator role of the clinical librarian may be more important than the coordinator role. A more recent (and small scale) evaluation of a clinical librarian programme noted that a clinical librarian had been able to find new information for users (Veenstra, 1992), though
about two thirds of the requesters would search for themselves before asking the clinical medical librarian for help.

Before the introduction of CD-ROM, users were limited in their access to online databases in any format other than the printed indexes produced as an end-product. The rise of the "intermediary" role was perhaps an unintended consequence of online database provision (Pfaffenberger, 1990) and proved resistant to change, despite attempts to make online searches by users easier through providing easier interfaces, such as Grateful-Med (Watson, 1987). Online access to MEDLINE through Grateful-Med, in the clinical setting was shown to be both effective and popular (Haynes et al. 1990). The more experienced users and librarians had almost identical recall performance in this study, though librarians' searches were more precise.

Librarians have tended to concentrate on the "professionalisation" of database searching, in that the aims are to provide fast, cost-effective and reasonably comprehensive searches. Studies of online searchers (Fidel, 1984) (Bellardo, 1985) suggest that categorisation of good and bad practice is difficult and may be unproductive. Online searchers tend to develop their own styles of searching which may or may not affect results.

The introduction of CD-ROM, with consequent easier access to the MEDLINE database, prompted fears among librarian online searchers that end-user searchers would miss vital references. Evaluations suggest that in most cases, despite some unsophisticated use of search options, end-users will retrieve most of the relevant references (Cannell, 1989). Perceptions of end-users and librarians are different, (Barbuto & Cevallos, 1991) and hence their searching styles differ. End-users largely ignore advanced searching techniques (King, 1991), despite training, and many judge the results of a database search on the magnitude of the search output (as it suits their purposes) rather than relevance alone (Saracevic et al. 1990). End-users are generally very satisfied with the results of their searches, although dissatisfaction may in fact increase once the initial "new toy" effect has worn off, and users are more aware of the finer points of MEDLINE searching (Kaltenborn, 1991).

The immediate impact of CD-ROM searching on library and information services, particularly when the service is networked, is a steep decline in the number of mediated searches performed (Salisbury et al. 1990). Manual reference transactions may however increase, and demand for user education increases (Shipman et al. 1992). In general, the library workload increases, although this can represent an opportunity, rather than a threat, for the development of library services (Obst, 1994).

Evaluation of end-user searching and training on the basis of precision and recall, measures used by librarians to evaluate search results, ignores both the general and
individual information behaviour of the end-users, who, above all, value the convenience of desktop services (Tilson & East, 1994). The effectiveness of end-user training programmes will depend on an understanding of the needs of the users and their expectations of a search, and how they plan to use the results of a search (Whitsed, 1989).

If the role of the librarian is increasingly that of an educator, there needs to be a re-examination of the role of the library in continuing medical education. Libraries may need to work more closely with providers of continuing medical education (Leist & Kristofco, 1990), which will require attention to their own learning needs as well (Messerle, 1990). These learning needs cannot be divorced from the needs of the organisation, at various levels. A deeper understanding of all the factors which influence the present effectiveness of a library and information service is, therefore, desirable, before planning the extension of services to other groups of healthcare workers, however necessary might be the advocated multidisciplinary approach to healthcare information provision (MacDougall & Brittain, 1992). The research described in this report identifies links between the provision of information to clinicians and the decisions they make. From the evidence provided by these links it suggests those audit procedures for information supply which, if adopted by health libraries, should increase the impact of information on clinical decision making.

1.2 Project objectives

The twin objectives of the project were:

1. To examine the value to postgraduate and continuing medical education of information supplied by NHS library and information services. The value was defined in terms of benefits to present and future clinical decision making.

2. To examine the factors affecting information delivery. The results guided production of a quality assurance toolkit for audit of the supply of information to clinicians.

1.2.1 Definition of value of information

In discussions of the meaning of value of information (Repo, 1986 and 1989) the value-in-use of information is defined as the benefit the user obtains from the use of information and the effect of that use. The value-in-use has three components:

1. subjective expected value-in-use (depends on past experiences and expectations, a measure of the willingness of the user to decide to seek or to use an information product or service)
2. **subjective value-in-use** (opinions of individuals of the value of that information while used in their work)

3. **objective value-in-use** (measure of the real effects the information has had on a task and its results)

The subjective value-in-use does depend on the individual user and how the information supplied fits into the environment in which the user makes decisions now, and might make decisions in the future. Different individuals will value the same information differently, depending on their particular circumstances and background.

The objective value-in-use is more difficult to determine, but discussions with users should reveal some pointers to the real impact the information may have on decision-making.

The decision to seek and to use information precedes any valuation of information provided. The pattern of information need and use needs to be established.

### 1.2.2 Project design considerations

The project design therefore takes account of:

a. Patterns of information need and use among clinicians, whether regular library and information service users or not. This provides the background to assessing the role information may, or may not, play in normal clinical decision making.

b. Factors which affect clinical decision making. In addition to direct patient care, continuing education and research are also involved. Changes to clinical decision making are likely to involve a mixture of influences.

c. Expectations and perceptions users have of library and information services.

d. Purposes of searches and requests. These are likely to be mixed.

e. Outcomes of searches and requests. Outcomes will be both immediate (impact on knowledge) and long-term (impact on clinical decision making).

The user population for the project included clinicians in acute and community care sectors, at any career point and grade, but excluded pre-Registration trainees.

The results: a) provide estimates of subjective value-in-use; b) indicate the factors affecting the expected value-in-use; and c) illuminate how objective value-in-use might be determined.
The quality assurance toolkit is based on the findings and provides guidelines which library and information services can use to improve the delivery of information, to make the service more effective. The toolkit covers audit of services, and training of both information service staff and users.

1.2.3 Choice of test sites

Various types of library and information services were involved in each phase of the project. Sites ranged from small branch libraries to teaching hospital libraries. Some were strictly medical libraries, some were multidisciplinary, and some, but not all, offered services to GPs. Information about the project was sent to the Regional Librarians Group and librarians interested in participating in the project were asked to contact the Project Director. At a later stage other libraries were asked directly if they were willing to participate. A broad cross-section of library and information services in different geographical areas participated in the project.

1.3 Pilot study findings

Two pilot sites were selected from sites that had volunteered to participate in the project. One site represented a small/medium postgraduate (and multidisciplinary) library and information service, which does serve the GPs in the area. The other site was a teaching hospital, with one main library and several branch libraries, serving an academic and research community. It is open to all NHS staff, but did not serve GPs at the time of the survey.

The survey work included:

1. Critical incident survey of the patterns of information need and use among a random sample of clinical staff (acute and community sectors).
2. Survey of requests and searches, to establish value to clinical decision making.
3. Survey of remote use of networked MEDLINE.

Results indicated that the questionnaires should be altered for the main phase. A small re-pilot conducted for the substantially changed search/request questionnaire produced satisfactory results.

Results also confirmed that a more detailed survey of CD-ROM searching would be desirable, and that the sample population for this survey should include both library end-users and remote end-users. Findings would be used to produce guidelines on user education for end-user searching, which is now more common than mediated searching.
For the main phase, interviews were planned to provide more details about the information seeking patterns of groups of clinicians who were not regular library users. Among those clinicians who did use the information services, interviews would provide a more objective estimate of the value of the information obtained.

1.4 Data collection for quality assurance toolkit

The main phase findings indicated aspects of information delivery that required further attention. The original proposal submitted in late 1992 was designed at a time when the predominant response to information requests was the conduct of an online search by a librarian. By late 1993, the speed of decline in mediated searches was obvious and at many, but not all, sites, mediated searches have given way to CD-ROM searches conducted by clinicians themselves.

For the quality assurance toolkit, this shift in searching techniques meant that the guidance to librarians would have to look not only at searching techniques that might be the remit of librarians, but at the more difficult areas of education in the use of searching techniques, and methods of improving the personal information behaviour of clinicians.

The variations found in procedures for marketing the information service and user education were not unexpected but for production of credible guidelines on information delivery, data from more sites, in different areas, would be required.

An extension to the project was approved by the Project Board, with additional funding from British Library Research and Development Department. The initial extension was for five months, latterly a six month period was arranged (November 1994-April 1995). More details about this phase are found in the section on quality assurance guidelines.
Chapter 2

Methods

Questionnaires, with selected follow-up interviews were used. The questionnaires were piloted, and an amended version of the questionnaire for the survey of searches and requests re-piloted.

Interviews were conducted to obtain more details of the information-seeking behaviour of selected clinicians, and to gauge the value of an item of information obtained.

The methods used in the critical incident survey are discussed more fully in Section 2.1, and those for the survey of searches and requests in Section 2.2. Interviewing is described in Section 2.3, and the survey of searching techniques used by clinician users of MEDLINE is covered in Section 2.4.

2.1 Method: Patterns of information need and use: critical incident survey

The general aims of the survey are discussed in section 2.1.1, sampling in sections 2.1.2 (staff lists) and 2.1.3 (sampling methods), and response in section 2.1.4.

2.1.1 Introduction: patterns of information need and use: critical incident survey

The main aim of the critical incident survey was to obtain details of the pattern of information need and use among different groups of medical staff. Details were required of:

- type of need (patient care, continuing education, research, publication.....)
- frequency of need
- sources used (books, personal journals, library, CD-ROM, colleagues...)
- success in obtaining information (time problems.....).

A random sample of medical staff (i.e. not just library users) was therefore required.

Staff lists (hospital and Family Health Service Authority) were used to obtain a random sample of medical staff (in appropriate proportions for each staff group).

A one-page questionnaire (Appendix 1) was sent weekly, for four weeks, to the sample. The questionnaire used a critical incident technique, asking participants to think of one occasion in the past week when they needed information for patient care, teaching, research or personal continuing education. A stamped addressed
envelope was included with each questionnaire, with a letter which acknowledged receipt of returned questionnaires and thanked participants for their continuing cooperation.

2.1.2 Staff lists

These were obtained through the library service if possible, and some details checked with Medical Staffing if necessary. Lists of GPs were obtained either from the library or directly from the appropriate FHSA. With the formation of trusts and reorganisation of personnel departments it is likely that certain categories of staff, particularly community, psychiatric and public health staff, may be under-represented for some of the sites. Where possible, minor adjustments were made to the sampling to compensate possible under-representation at some sites. The quality and quantity of information available on the medical staff at each site varied, and was occasionally difficult to obtain. In some cases estimates of numbers for particular staff grades had to be used. If the library and information services are to market and manage their services effectively, more information on the staff they serve is essential.

2.1.3 Sampling

Postgraduate medical education libraries vary enormously, both in size, and in the range of other groups of health care professionals served in addition to the medical staff. The information needs for postgraduate (and continuing) education, patient care and research are likely to vary from site to site, but the aim of the sampling was to obtain a pattern which would be representative of the national pattern.

The site characteristics are:
A. Specialist hospital (therefore no GPs served)
B. Large district general hospital, with some specialist clinics and research.
   Hospital is in the suburbs of a city, GPs serve a mix of housing areas.
C. Large district general hospital, linked with a city centre hospital.
   The main hospital is on the outskirts of the city. GPs serve urban area.
D. District general hospital, commuter belt area.
E. Smaller district general hospital, GPs serve a mix of housing areas.
F. Smaller district general hospital, GP area overlaps with C.
G. District general hospital, no teaching hospital nearby.
   GPs serve mix of housing areas, including more rural areas.
H. Teaching hospital, with mental health unit nearby.
   GPs serve urban area. Research units at hospital.
I. Large district general hospital, linked with a teaching hospital.
   GPs serve an "outer borough" area.
J. Small district general hospital in a new town.
   GPs serve a mix of rural areas and small towns.
K. Small specialist hospital linked with nearby district general hospital.
GPs selected from the surrounding rural area.
The total number of names obtained for each category of staff was:

- GPs: 1191
- Consultants: 722
- Senior registrars: 116
- Registrars: 315
- SHOs: 576 (including GP trainees)
- Staff grade etc.: 247 (This category included staff grade, associate specialists, clinical assistants and hospital practitioners)

A percentage of 9-10% was used to obtain the sample to be surveyed for all groups except the senior registrars, for whom a 20% sample was used at the sites where there were several senior registrars. In two out of the three sites where there was only one senior registrar listed, those two senior registrars were included, to maintain a reasonable geographical spread. A larger sampling percentage was used for a small psychiatric library site, for similar reasons.

The total number in the sample used for the first questionnaire was 300. The pilot studies had indicated that around 25% of individuals would not respond at all, and the final figure of individuals who would respond to at least one questionnaire was therefore estimated to be around 200-230. This number of individuals would provide the required number of responses for analysis by staff category of the patterns of information need and use.

The total numbers for each staff category and the selected number are shown in the tables below (Tables 1 and 2 respectively). The estimated numbers are noted. Minor changes were made to the number of names selected for particular staff categories for each site to allow for:

- Reasonable geographical spread, both in terms of type of hospital and type of area (rural or urban or small town)
- Particular site characteristics (i.e. inclusion of public health staff, specialist hospital, teaching hospital)
- Likely response from particular groups (e.g. SHO response likely to be lower given the high workload of many SHOs).

Estimated figures were checked against the complete figures if these became available and corrections made if possible. The bracketed figures for A (Table 1) are the true figures: incomplete information was obtained at first. The margin of error for sites C and G is estimated to be around 5%, which would make little difference to the number in each category for those sites. With sites A and H, the discrepancies are more substantial, as only 70% of the actual population of A would
have been considered for selection, and the figure for site H is likely to be similar. However, more emphasis was given to sites A and H in the survey of searches and requests, and, where possible, the follow-up interviews for the critical incident survey.

Table 1: Medical staff population by site

<table>
<thead>
<tr>
<th>Site/Staff category</th>
<th>GP</th>
<th>Consultant</th>
<th>Senior Registrar</th>
<th>Registrar</th>
<th>SHO</th>
<th>Staff grade etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>35(69)</td>
<td>20(31)</td>
<td>31(47)</td>
<td>26(35)</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>139</td>
<td>121</td>
<td>18</td>
<td>45</td>
<td>81</td>
<td>49</td>
</tr>
<tr>
<td>C</td>
<td>130</td>
<td>120</td>
<td>14(est.)</td>
<td>48(est.)</td>
<td>70(est.)</td>
<td>20 (est.)</td>
</tr>
<tr>
<td>D</td>
<td>165</td>
<td>63</td>
<td>5</td>
<td>24</td>
<td>46</td>
<td>14</td>
</tr>
<tr>
<td>E</td>
<td>95</td>
<td>45</td>
<td>1</td>
<td>24</td>
<td>39</td>
<td>15</td>
</tr>
<tr>
<td>F</td>
<td>40</td>
<td>53</td>
<td>0</td>
<td>15</td>
<td>31</td>
<td>7</td>
</tr>
<tr>
<td>G</td>
<td>176</td>
<td>90 (est.)</td>
<td>10 (est.)</td>
<td>28 (est.)</td>
<td>86 (est.)</td>
<td>59 (est.)</td>
</tr>
<tr>
<td>H</td>
<td>91</td>
<td>90</td>
<td>35 (est.)</td>
<td>58 (est.)</td>
<td>90 (est.)</td>
<td>20 (est.)</td>
</tr>
<tr>
<td>I</td>
<td>172</td>
<td>69</td>
<td>11</td>
<td>30</td>
<td>55</td>
<td>56</td>
</tr>
<tr>
<td>J</td>
<td>93</td>
<td>27</td>
<td>1</td>
<td>8</td>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>K</td>
<td>90</td>
<td>9</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>1191</td>
<td>722</td>
<td>116</td>
<td>315</td>
<td>576</td>
<td>247</td>
</tr>
</tbody>
</table>

Table 2: Medical staff sample numbers by site

<table>
<thead>
<tr>
<th>Site/Staff category</th>
<th>GP</th>
<th>Consultant</th>
<th>Senior Registrar</th>
<th>Registrar</th>
<th>SHO</th>
<th>Staff grade etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>11</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>12</td>
<td>11</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>15</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>E</td>
<td>8</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>G</td>
<td>16</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>H</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>15</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>J</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>K</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>T = 300</td>
<td>105</td>
<td>65</td>
<td>24</td>
<td>29</td>
<td>53</td>
<td>24</td>
</tr>
</tbody>
</table>
2.1.4 Response: patterns of information need and use: critical incident survey

Response, measured by number of questionnaires returned out of the possible total, was 46%. The total number of possible respondents was 286 (removing those who were found to have moved, retired, or were on long-term sick leave). Eleven of the returned questionnaires indicated that no reply was possible as the respondent was on holiday, or on study leave, or sick leave. The response rate was therefore calculated as follows:

Possible responses = 286x4 - 11
= 1133

Actual number questionnaires returned = 530. Of these 519 were used for analysis, the remainder indicating holiday or sick leave.

Overall response = 519/1133 = 46%

Individual response was 69%, i.e. 196/286 of individuals replied at least once. Three or more responses were obtained from 39% of the sample (110 individuals, comprising 16 SHOs, 16 Registrars, 11 Senior Registrars, 7 Staff/specialists, 26 Consultants, 34 GPs).

Figure 1: Site variation in individual response

Individual response at sites varied from 43% to 77% (Figure 1). At eight sites (Figure 1) the individual response was over 60% The low response from one site was largely due to lack of response from the GPs at that site. However, a response of 43% of individuals is within expectations for surveys of this nature.

Efforts were made to check up on non-respondents and chase up response. This had some effect.
The staff group variation in response was much as predicted from the findings of the pilot study. The lower response came from SHOs, GPs and staff/specialists, the latter category including clinical assistants. The lower response is attributed to a combination of factors, including the type of work, the hours worked and lack of familiarity with the PGME library and information service. Those who were more familiar with the library service, i.e. consultants, senior registrars and registrars did in fact respond better (Table 3). Efforts were made to focus on the low response staff groups in follow-up interviews.

**Table 3: Response by staff category (critical incident survey)**

<table>
<thead>
<tr>
<th>Staff category</th>
<th>No. individuals</th>
<th>Total no. returned</th>
<th>Response rate per individual</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHOs</td>
<td>53</td>
<td>84</td>
<td>1.58</td>
</tr>
<tr>
<td>Registrars</td>
<td>29</td>
<td>60</td>
<td>2.07</td>
</tr>
<tr>
<td>Senior registrars</td>
<td>24</td>
<td>55</td>
<td>2.29</td>
</tr>
<tr>
<td>Staff/specialists etc.</td>
<td>24</td>
<td>35</td>
<td>1.46</td>
</tr>
<tr>
<td>Consultants</td>
<td>65</td>
<td>132</td>
<td>2.03</td>
</tr>
<tr>
<td>GPs</td>
<td>105</td>
<td>168</td>
<td>1.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>300 (286 final)</strong></td>
<td><strong>530</strong></td>
<td><strong>1.8</strong></td>
</tr>
</tbody>
</table>

The responses were divided into a high response (3 or more questionnaires returned) and a low response group (2 or fewer questionnaires returned). Of the registrar responses, almost all were in the high response group. SHO and staff grade responses were those least likely to be in the high response category (Table 4).

**Table 4: High response and low response differences among staff groups (critical incident survey)**

<table>
<thead>
<tr>
<th>Staff category</th>
<th>Total response for staff category</th>
<th>Response from high response group in staff category</th>
<th>% high response for the staff category</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHOs</td>
<td>84</td>
<td>56</td>
<td>67%</td>
</tr>
<tr>
<td>Registrars</td>
<td>60</td>
<td>58</td>
<td>97%</td>
</tr>
<tr>
<td>Senior registrars</td>
<td>55</td>
<td>43</td>
<td>78%</td>
</tr>
<tr>
<td>Staff/specialists etc.</td>
<td>35</td>
<td>23</td>
<td>66%</td>
</tr>
<tr>
<td>Consultants</td>
<td>132</td>
<td>99</td>
<td>75%</td>
</tr>
<tr>
<td>GPs</td>
<td>168</td>
<td>124</td>
<td>74%</td>
</tr>
</tbody>
</table>
2.2 Method: survey of searches and requests

The sample population for the survey of searches and requests included both:

- Individuals making library searches and requests
- Dial-Up MEDLINE users.

The library searches and requests considered included:

- MEDLINE searches on the CD-ROM in the library
- Inter-library loan requests (requests for copies of articles or loans of books)
- Mediated searches (requests to library staff for information on a particular topic)

Additional questionnaires and interviews were used to obtain opinions on the use of MEDLINE and searching techniques used by medical staff.

The survey of library searches and requests in described in Sections 2.2.1 - 2.2.2 (Introduction and sampling) and Sections 2.2.4.1 and 2.2.4.2 (Response).

The survey of library end-user searching (questionnaires and interviews) is mentioned in Sections 2.2.1 and 2.2.2, with more details given in Section 2.4 (end-user searching).

The survey of Dial-Up MEDLINE users is covered in Sections 2.2.4.3 (introduction and sampling) and section 2.2.4.3 (response). Aspects of searching techniques are included in Section 2.4 (end-user searching).

2.2.1 Introduction: survey of library searches and requests

This part of the survey concerned the actual requests received by the libraries for inter-library loans or searches, and searches made by users themselves of MEDLINE on CD-ROM. The approximate time span covered was an 8-9 week period during April-June 1994. The exact time period for each library depended on procedures for handling requests. The questionnaire (Appendix 2) used in the follow-up to searches and requests considered purposes, and outcomes to the search or request. Aspects of information seeking behaviour were also explored.

In addition to the survey of end-user searches, mediated search requests and inter-library loan requests, the survey included questionnaire and interview surveys (Appendices 3 and 4) of expectations and techniques for end-user searches. (See Chapter 5.3)
Site library staff were not involved in the survey work at all, apart from monitoring the sheets used to record names of end-users and handing out questionnaires to end-users.

2.2.2 Sampling: library searches and requests

The sample, like the critical incident survey, covered all medical staff. The sample excluded nursing and allied health care staff, but some scientific, research and audit staff were included, as their information activities are often relevant to clinical decision making. The pilot study showed that fields of interest did overlap for these groups.

Care was taken to minimise the number of times any particular library user was approached, so that no user was normally approached more than twice, and preferably only once. Those who had participated in the critical incident survey were also eliminated from the pool of requesters/searchers available for survey. This does mean that for libraries with large numbers of requests coming from a small group of very active users the number surveyed appears small (Table 5). One library (the largest) accounted for over 40% of the requests or searches surveyed. To some extent, the number of requests surveyed reflects the size of the library in terms of resources, though not necessarily in terms of staffing levels.

Table 5: Distribution of sample by site (library searches and requests)

<table>
<thead>
<tr>
<th>Site code</th>
<th>Number surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>46</td>
</tr>
<tr>
<td>B</td>
<td>121</td>
</tr>
<tr>
<td>C</td>
<td>61</td>
</tr>
<tr>
<td>D</td>
<td>53</td>
</tr>
<tr>
<td>E</td>
<td>29</td>
</tr>
<tr>
<td>F</td>
<td>31</td>
</tr>
<tr>
<td>G</td>
<td>53</td>
</tr>
<tr>
<td>H</td>
<td>326</td>
</tr>
<tr>
<td>I</td>
<td>49</td>
</tr>
<tr>
<td>J</td>
<td>15</td>
</tr>
<tr>
<td>K</td>
<td>3</td>
</tr>
<tr>
<td>Total (including searches, requests, end-user follow-up)</td>
<td>787 (725 + 62)</td>
</tr>
</tbody>
</table>
Table 6: Distribution of searches/requests in sample

<table>
<thead>
<tr>
<th>Type of request or search</th>
<th>Number (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-user</td>
<td>337 (47%)</td>
</tr>
<tr>
<td>Inter-library loan requests</td>
<td>307 (42%)</td>
</tr>
<tr>
<td>Mediated searches</td>
<td>81 (11%)</td>
</tr>
<tr>
<td></td>
<td>Total = 725 (initial)</td>
</tr>
<tr>
<td></td>
<td>Corrected total = 713</td>
</tr>
<tr>
<td></td>
<td>(725 questionnaires were prepared for mailing, but only 713 were sent as some of the sample could not be traced)</td>
</tr>
<tr>
<td>End-user follow-up (questionnaire)</td>
<td>26</td>
</tr>
<tr>
<td>End-user follow-up (interview)</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Total follow-up = 62</td>
</tr>
</tbody>
</table>

The large number of end-user searches surveyed, in comparison to the number of mediated searches, reflects the actual situation in the libraries surveyed (Table 6). Mediated searches, particularly at the teaching hospital site, are declining. The rate of decline varies from negligible to quite dramatic drops in the number of mediated searches. The tutorial searches, when the librarian was helping the user throughout the search, are classed as mediated searches.

Library records were used to obtain names for inter-library loan requests and mediated search requests. Forms were left by the CD-ROMs for users to fill in details of name, department and date of search. Where possible these were monitored by library staff to ensure that a proper record of searchers was maintained.

2.2.3 Dial-up MEDLINE survey

A random sample of 100 Dial-up MEDLINE users was derived by the BMA Library for the Value Project. The sample excluded a group of users that had already been surveyed by the BMA themselves, and also excluded (by using postcode information) users who might be included in the main phase, or pilot phase surveys. Procedures used maintained the anonymity of the Dial-up MEDLINE users, and all mailings to the group were handled by the BMA Library.

The questionnaire for the Dial-up MEDLINE group was a two page questionnaire (Appendix 5) which included features from both the search request questionnaire and the survey of end-users. The aim was to obtain details of the purposes and outcomes of the search, searching techniques used and views on remote access to MEDLINE.

Follow-up questionnaires were sent to selected respondents to obtain further details of outcomes or clarify comments on the questionnaire.
2.2.4 Response rates

The response rates to both the survey of library searches and requests and the survey of Dial-Up MEDLINE users were satisfactory, particularly as no chasing of non-respondents was attempted. The response to the library survey is discussed in sections 2.2.4.1 to 2.2.4.2 and the response to the Dial-Up MEDLINE survey is covered in section 2.2.4.3.

2.2.4.1 Response to survey of library searches and requests

Overall response was 68% (486/713), which was satisfactory (Table 7).

Table 7: Response for different types of search/request

<table>
<thead>
<tr>
<th>Type of request or search</th>
<th>Number responses</th>
<th>% of total response</th>
<th>% response by type of request/search</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-user</td>
<td>227</td>
<td>46.7%</td>
<td>58%</td>
</tr>
<tr>
<td>Inter-library loan</td>
<td>212</td>
<td>43.6%</td>
<td>69%</td>
</tr>
<tr>
<td>Mediated</td>
<td>47</td>
<td>9.7%</td>
<td>58%</td>
</tr>
<tr>
<td>Total</td>
<td>486</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. questionnaires sent</td>
<td>713</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The relatively low response (58%) for mediated search requests was surprising. A better response was expected for inter-library loan requests than for end-user searches, as end-users were asked to recall a search on a particular day, which was more difficult than thinking about something they possess and (should) have read.

2.2.4.2 Response to search/request survey by staff category

Most requests or searches originated from senior hospital medical staff or those engaged in scientific research. SHOs make comparatively few requests or searches (under 10%), and the number of requests from GPs is also low. Research activity makes high demands on the library and information service (over 30% of requests/searches) (Table 8).

As indicated in the section on the method for the critical incident survey, the estimation of actual staff numbers by type of post was difficult, and hence the number of requests and searches that might be expected from each group quite difficult to estimate. The ratios of staff groups varied from one site to another, in some the number of consultants was around the same as that of SHOs, while at other sites there might be twice as many consultants as SHOs.
Taking the number of registrars' requests or searches as an approximate reference level (83 requests, 315 registrars), the number of requests or searches that might be expected from SHOs is 152 (576 x 83/315) over three times the number actually obtained. For consultants, the expected value is 190 (722 x 83/315), nearly twice the number obtained, and for staff/specialist/clinical assistant grades the expected number is 65 (247 x 83/315), around four times the number obtained. The responsibilities of the PGME libraries for library and information services to GPs are not always well defined, but it is interesting to note that if GPs used the service to the same extent as registrars, there would have been 314 requests as opposed to the 11 requests received. These figures quoted do not reflect the total library workload of searches and requests, as the survey did not follow up every request, but rather the individuals making the requests.

Table 8: Who made which type of request/search?

<table>
<thead>
<tr>
<th>Staff type</th>
<th>Total</th>
<th>I.L.</th>
<th>End-user</th>
<th>Mediated</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific or research</td>
<td>125</td>
<td>40</td>
<td>85</td>
<td>0</td>
<td>(excludes research nurses)</td>
</tr>
<tr>
<td>Consultants</td>
<td>105</td>
<td>64</td>
<td>24</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Registrars</td>
<td>83</td>
<td>28</td>
<td>46</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Senior registrars</td>
<td>68</td>
<td>31</td>
<td>33</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Academic or teaching</td>
<td>48</td>
<td>30</td>
<td>18</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>SHOs</td>
<td>40</td>
<td>17</td>
<td>16</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Staff or specialists</td>
<td>15</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GPs</td>
<td>11</td>
<td>7</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Audit</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>GP trainers</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GP trainees</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Clinical assistants</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>res. nurses retired etc.</td>
</tr>
</tbody>
</table>

Notes: some staff counted in more than one category

Inter-library loan (ILL) most prominent category for consultants and academic staff

End-user most prominent category for scientific/research staff and registrars
Some staff were counted twice (e.g. GP trainees were also SHOs), and some staff have joint contracts (e.g. clinical and teaching). The figures in bold in Table 8 show the most prominent category (if any) for a particular staff group. Table 9 again indicates that registrars frequently perform searches on MEDLINE on CD-ROM. No attempt was made to select particular categories of staff for the end-user survey.

Table 9: Staff group profile for end-user questionnaire/interview (search techniques)

<table>
<thead>
<tr>
<th>Staff category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrars</td>
<td>25</td>
</tr>
<tr>
<td>Scientist/research staff</td>
<td>15</td>
</tr>
<tr>
<td>Consultants</td>
<td>13</td>
</tr>
<tr>
<td>SHOs</td>
<td>12</td>
</tr>
<tr>
<td>Senior registrars</td>
<td>5</td>
</tr>
<tr>
<td>Academic (teaching) staff</td>
<td>2</td>
</tr>
<tr>
<td>Staff/Specialists</td>
<td>1</td>
</tr>
<tr>
<td>Other (includes public health..)</td>
<td>3</td>
</tr>
</tbody>
</table>

(Some fit more than one category)

2.2.4.3 Response to Dial-up MEDLINE survey

The response rate of 60% (60/100) was satisfactory. Around half the respondents held consultant posts, and a high proportion of the GP group had training and/or clinical assistant responsibilities (Table 10).

Table 10: Staff group profile of Dial-up MEDLINE respondents

<table>
<thead>
<tr>
<th>Staff category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>31</td>
</tr>
<tr>
<td>GPs</td>
<td>12</td>
</tr>
<tr>
<td>Academic/teaching staff</td>
<td>7</td>
</tr>
<tr>
<td>Senior registrars</td>
<td>5</td>
</tr>
<tr>
<td>GP trainers</td>
<td>4</td>
</tr>
<tr>
<td>Clinical assistants</td>
<td>4</td>
</tr>
<tr>
<td>Registrars</td>
<td>3</td>
</tr>
<tr>
<td>SHOs</td>
<td>2</td>
</tr>
<tr>
<td>Scientist/research staff</td>
<td>1</td>
</tr>
<tr>
<td>Staff/specialist</td>
<td>0</td>
</tr>
<tr>
<td>GP trainee</td>
<td>0</td>
</tr>
</tbody>
</table>

Total no. respondents = 60 (some fit more than one category)
2.2.4.4 Response by questionnaire category

The respondents did not always complete every question on the questionnaires fully, and account was taken of the missing responses when calculating the percentage response.

Missing responses were more often found in questions which might have required a little more thought before ticking the appropriate category. Unsurprisingly, the question on clinical decision making in the survey of searches and requests produced a variable response. The number of missing responses varied for each category, from 42 (differential diagnosis) to 57 (legal and ethical issues). The average was 48, amounting to just under 10% of the total response (486 responses). As all possible options for answering the question had been provided, the percentage positive response is based on marked responses for the category. For example, category with 94 YES responses, 51 missing responses, percentage response is 94/486-51. The survey of Dial-Up MEDLINE users produced a higher proportion of missing responses for that group of categories (average 18%). This was to be expected as the library group were often aware that a survey was taking place sometime before receiving a questionnaire, unlike the BMA group surveyed.

2.3 Interviews

Interviews were conducted with selected survey respondents. The main aims of the interviews were to extend, but also unite the findings of both the critical incident survey and the survey of searches and requests.

The interview methods used are described in Section 2.3.1. The follow-up interviews for the critical incident survey are described in Section 2.3.2, and those for the search/request survey in Section 2.3.3.

The brief interviews of end-users are mentioned in the description of method for the survey of searches and requests, and more details provided in Section 2.4.

2.3.1 Interviews: methods and organisation

Interviews were all conducted by research project staff. Three research assistants were employed to assist with interviewing. Selected respondents were sent a letter indicating that a research assistant (named) would be phoning them to arrange an interview time.

Personal interviews were arranged if possible, but most of the interviews were conducted by telephone. Rail strikes and holidays during the interviewing period (late June to August 1994) contributed to the problems of arranging personal interviews. The length of interview varied: some interviewees were willing to allot
30 minutes or more, but the more usual length of time was 10-15 minutes. The variations in time meant that interviewers had to set priorities in the interviewing schedule to obtain the most useful information possible.

Interview schedules were used (Appendices 6 and 7) with special questions set for particular interviewees. These were used as a basis for the interviews but could not be followed in full in all interviews.

Afterwards, interviewees were sent a letter thanking them for their help and inviting them to return an interview evaluation form. Evaluations of interview format and content were satisfactory.

### 2.3.2 Follow-up interviews for critical incident survey respondents

The follow-up interviews for the critical incident survey were designed not only to provide more details about the patterns of information need and use of particular groups of staff, but also to supplement the findings of the search/request survey. The pilot study had indicated that response to the survey of searches and requests in the library would be very low for some groups, notably the SHOs, GPs and staff/specialists. The main aim of the follow-up interview, therefore, was to obtain details about a recent critical incident in which information had been required, and relate this to future use in clinical decision making. Where this was not possible, more details were obtained about the general patterns of information need and use for that individual.

Views on literature searching in general, competencies in using CD-ROM, awareness of the BMA Dial-up MEDLINE service and perceptions of PGME libraries were also explored at interview. A general interview schedule was used, with additional specific questions prepared for certain individuals (Appendix 6).

The number of interviews obtained was 43 (Table 11). Personal interviews were arranged if possible, but telephone interviewing proved the only possible method for many interviews.

<table>
<thead>
<tr>
<th>Table 11: Interviews obtained for various staff groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff category</strong></td>
</tr>
<tr>
<td>SHOs</td>
</tr>
<tr>
<td>GPs</td>
</tr>
<tr>
<td>Registrars</td>
</tr>
<tr>
<td>Staff grades</td>
</tr>
<tr>
<td>Consultants</td>
</tr>
<tr>
<td>Senior registrars</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>
2.3.3 Follow-up interviews to search/request survey

The main aim of the search/request survey was to establish, in more detail, how the information obtained had helped, or would help in clinical decisions. Details of the exact clinical problems were obtained, to help put a perspective on the value of information obtained. Views on information seeking and use made of CD-ROM were also elicited if time permitted. In some cases a follow-up was attempted to check details of comments made on the questionnaire, or responses which were unusual. Instances where no useful information was obtained were also tracked.

The interviewees who had made inter-library loan requests or had requested the library to do a search could always remember the background to the information request which had been the subject of the questionnaire. This was not always possible for the end-user group, some of whom use the CD-ROM at least once a week. In these cases the interview concerned a recent search or searches made in connection with a patient care problem.

The number of interviews obtained was 85 (Table 12).

Table 12: Interviews obtained for search/request follow-up by staff category

<table>
<thead>
<tr>
<th>Staff category</th>
<th>No. of interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior registrars</td>
<td>19</td>
</tr>
<tr>
<td>Consultants</td>
<td>16</td>
</tr>
<tr>
<td>Registrars</td>
<td>16</td>
</tr>
<tr>
<td>SHOs</td>
<td>13</td>
</tr>
<tr>
<td>Academic staff</td>
<td>7</td>
</tr>
<tr>
<td>Scientist/research staff</td>
<td>5</td>
</tr>
<tr>
<td>Staff/specialists</td>
<td>4</td>
</tr>
<tr>
<td>Audit staff</td>
<td>3</td>
</tr>
<tr>
<td>GPs</td>
<td>3</td>
</tr>
<tr>
<td>GP trainers</td>
<td>2</td>
</tr>
<tr>
<td>GP trainees</td>
<td>1</td>
</tr>
<tr>
<td>Some staff fall into more than one category (e.g. SHOs and GP trainees)</td>
<td>Total number of interviews = 85</td>
</tr>
</tbody>
</table>

The interviewee was able to provide full details of an instance when valuable information was obtained in 61 out of the 85 interviews. Of these, 27% concerned the recognition and proper diagnosis of a medical problem or condition, and 53% concerned the development of an appropriate treatment plan. The remainder of the clinical problems concerned audit (5%), legal or ethical issues (5%) or aspects of the "quality of life for patient and/or family" (10%).
2.4 End-user searching survey

Searching techniques by both library users of MEDLINE on CD-ROM and remote users, the Dial-Up MEDLINE group, were studied.

Survey methods included:

1) a self-completion questionnaire which was handed out to library end-users immediately after their search. Site library staff helped in the project work by handing out, and collecting, self-completion questionnaires (Appendix 3) to medical staff users of MEDLINE on CD-ROM, immediately after their search, for a set time period, usually one to two weeks.

2) short interview, at selected busier sites, which included use of the same questionnaire as in 1). Interview questions (Appendix 4) concerned experience of training, and perceptions of CD-ROM as a searching tool. The interviews were conducted by research project staff.

3) Questionnaire for Dial-Up MEDLINE users. Their questionnaire included the same questions on searching techniques and expectations that the library end-users received (Appendix 5)

The sample (Table 13) was dominated by registrars, consultants and research staff in the library end-user group and by consultants in the Dial-Up MEDLINE group. The sample comprised 60 individuals in the Dial-Up MEDLINE group and 62 individuals in the library end-user group, five of whom filled in questionnaires twice for different searches, making a total of 127 questionnaires. Thirty six interviews were conducted. As the composition of the two groups differs, analysis of each is separate.

Table 13: Response by staff category (end-user searching survey)

<table>
<thead>
<tr>
<th>Staff category</th>
<th>Library end-user group</th>
<th>Dial-Up MEDLINE group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrars</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>Scientist/research staff</td>
<td>15</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Consultants</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>SHOs</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>GPs</td>
<td>0</td>
<td>12 (Includes GP trainers and clinical assistants)</td>
</tr>
<tr>
<td>Senior registrars</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Academic/teaching staff</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Staff/specialists</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: some staff fit more than one category
Chapter 3

Purposes of information need

In the critical incident survey a random sample of medical staff, including library users and non-users, were asked to think of one occasion in that week when information was needed. The resulting profiles of purposes provide a background to the survey of searches and requests, in which library and information service users were asked about the purposes for which information had been sought for a particular search or request. The searches and requests considered comprise the inter-library requests, requests for searches to be done by library staff (mediated searches), CD-ROM searches made by the library users, and Dial-Up MEDLINE searches.

The definition of "information need" here is concerned with perceived need, rather than potential need. In all cases the perceived need was strong enough to warrant action of some sort, and "information need - for action" is the closest definition possible.

The results for the overall pattern revealed by the critical incident survey are presented in Section 3.1, and the particular patterns for library and information service users in Section 3.2.

The pattern of information need varies, unsurprisingly, according to the grade, and type of post. The patterns for particular groups of staff are discussed in more detail in Chapter 7.

The results showed that the library and information services perceive only part of the pattern of information need. The difference between the user's view of purposes of information need and the library view is discussed in Section 3.3.

Comparisons with other studies of information need or use among clinicians are found in Section 3.4. Some themes for further discussion are set out in Section 3.5.

3.1 Purposes of information need among medical staff

Overall, patient care and personal continuing education were the primary motivations for seeking information (Table 14). The needs of reflective professional practice are well illustrated. Usually there was more than one reason for seeking information (average no. purposes per incident 1.9) and it could be argued that there might need to be more than one reason before an effort was made to obtain information. The proportion of responses that indicated information had not been needed that week (21%, 110/519) suggests that perceived information
needs are frequent. (Personal continuing education includes both continuing medical education and postgraduate training, and the term is shortened to personal education where this is more appropriate in the discussion.)

Table 14: Purposes of information need: critical incident survey

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care-specific drug or therapy query</td>
<td>146</td>
</tr>
<tr>
<td>Patient care-rare condition or specific problem</td>
<td>136</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>131</td>
</tr>
<tr>
<td>Teaching -staff/students/colleagues (e.g. case presentations)</td>
<td>91</td>
</tr>
<tr>
<td>Research (personal) - planned or in progress</td>
<td>75</td>
</tr>
<tr>
<td>Patient care - patient care administration and records</td>
<td>68</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>55</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>46</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>26</td>
</tr>
<tr>
<td>Research - funded project/degree</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Total no. of purposes = 796</td>
</tr>
</tbody>
</table>

Total number of responses = 530 (519 available for complete analysis)
Total number citing "information not needed" that week = 110
Total no. incidents = 420 (530-110)
Average no. of purposes per incident = 1.9

Possible differences in patterns of purpose were explored between those who responded three or more times and those who responded at most twice. One difference was a shift in position of the top two categories of purpose, the lower response sub-group placing the need for information on rare conditions and specific problems top, with specific drug or therapy queries second. The lower response sub-group did have more purposes per incident than the high response sub-group, with a high proportion of purposes focusing on patient care and personal continuing education information needs. Low response could not therefore be equated with lack of awareness of information needs, or of efforts made to obtain information. (Table 15) The pattern of purposes looks very similar, with the exception of information required for rare conditions, and (possibly) personal research needs. The high response group appears to have been more diligent about returning questionnaires indicating that "information was not needed", but this makes little difference to the overall frequency of information need. The most likely explanation of the differences between the groups is that the
members of the low response group were less likely to return the questionnaire if information was not needed that week, and more likely to focus on particularly problematic aspects of care when they did return the questionnaire.

Table 15: High response (>3 returns) and low response comparisons: purposes of information need

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>High response group: % frequency of mention</th>
<th>Low response group: % frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>34%</td>
<td>36%</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>30%</td>
<td>33%</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>28%</td>
<td>45%</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Research (personal) - in progress or planned</td>
<td>20%</td>
<td>12%</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>10%</td>
<td>14%</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Research (funded project or degree) - in progress or planned</td>
<td>6%</td>
<td>4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>High response group: % frequency of mention</th>
<th>Low response group: % frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. responses = 400</td>
<td>Total no. information not needed = 94</td>
<td>Total no. responses = 130</td>
</tr>
<tr>
<td>Total no. information not needed = 16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.1.1 Classifying purposes of information need among medical staff

The purposes of searching can be broadly divided into patient care, education, and research/publication (Table 16). The dividing line between personal research and personal education is sometimes indistinct, but research implies an ongoing specialist interest in a topic, and the pattern of information acquisition differs from normal updating, having more in common with the funded research and publication pattern.
Information was required for patient care purposes alone in 37% (156/420) of the incidents studied and patient care was involved, to some extent, in 66% (279/420) of the incidents (Table 17).

Educational purposes alone accounted for 18% (75/420) of the incidents when information was needed, but education was more often linked with patient care or research or both. Educational purposes were linked with other purposes in 30% (127/420) of the incidents, and therefore education was involved in 48% (202/420) of the incidents studied (Table 17).

This emphasis on patient care and consequent need to update and disseminate clinical knowledge, might be the pattern expected. The frequency of information needs for research and publication is lower, as might be expected in a random sample of hospital and community staff, but these needs are clearly not negligible. In 28% (117/420) of the incidents, research (or publication) was involved (Table 17).

<table>
<thead>
<tr>
<th>Specific category</th>
<th>Broad category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - patient care administration /records</td>
<td>Patient care</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td></td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td></td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td></td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>Education</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues</td>
<td></td>
</tr>
<tr>
<td>Personal continuing education</td>
<td></td>
</tr>
<tr>
<td>Research(personal) - in progress or planned</td>
<td>Research/publication</td>
</tr>
<tr>
<td>Research (funded project/degree) - in progress or planned</td>
<td></td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td></td>
</tr>
</tbody>
</table>

Table 16: Broad and specific categories of purpose
Table 17: Linked purposes of requests using broad categories of purpose (critical incident survey)

<table>
<thead>
<tr>
<th>Patient care purposes only</th>
<th>Education purposes only</th>
<th>Research/purposes only</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>75</td>
<td>50</td>
</tr>
</tbody>
</table>

**Patient care AND Education**

<table>
<thead>
<tr>
<th>Patien care AND Education</th>
<th>Patient care AND Research/publish</th>
<th>Patient care AND Education</th>
<th>Patient care AND Research/publish</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>16</td>
<td>12</td>
<td>39</td>
</tr>
</tbody>
</table>

Total no. incidents = 420

Patient care purposes (wholly or partly): 156+72+12+39: 279 incidents

Education purposes (wholly or partly): 75+72+16+39: 202 incidents

Research/publn. purposes (wholly or partly): 50+16+12+39: 117 incidents

3.1.2 Information for patients

Most of the educational purposes did focus on personal continuing education needs and teaching requirements. The requirement for information for patient education appears low, occurring in only 6% (26/420) of the incidents (Table 14). In the survey of searches and requests under 3% (9/361) of clinicians agreed that the search or request had been prompted partly by "Enquiry from patient". This seems particularly surprising given the focus on the patient, and the rights of the patient, in recent NHS reforms. The low values may reflect a lack of awareness of sources available or a lack of suitable resources that serve professional as well as patient needs. A study of the links between local community based cancer support groups and hospital staff found that hospital staff were not well informed about support groups and were unsure about the role of such groups as a resource for patients (Bradburn et al. 1992). Aspects of patient education were explored in some interviews.

3.2 Purposes of information need: library and information service users

The study of searches and requests also examined purposes of information need, but in this case the sample population consisted of library and information service users. The searches and requests studied included inter-library loan requests,
requests for searches (mediated searches) and MEDLINE searches clinicians made themselves, using either the CD-ROM in the library, or the BMA Dial-Up MEDLINE service.

The motivations for making a request or doing a search are mixed. In most cases the search or request would serve more than one purpose (average number purposes per request/search = 1.9 (both groups) (Tables 18 and 19). This pattern is the same as that found in the critical incident survey of medical staff in general.

Research (including research (personal) .. and research (funded project)...) and publication (publication - paper/review/report/book) requirements motivate many requests or searches (Table 18). Personal research was mentioned as a purpose in 35% (170/484) of the requests or searches, funded research in 29% (140/484). Publication was mentioned as a purpose in 32% (157/484) of requests or searches. This of course reflects the composition of the sample, which did include research and scientific staff. When the clinician staff sub-total is examined (Table 19), the needs of reflective professional practice are more evident, with more emphasis on personal education and personal research.

### Table 18: Purposes of information need: search/request survey: research & clinical staff

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research (personal) - in progress or planned</td>
<td>170</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>157</td>
</tr>
<tr>
<td>Research (funded project/degree) - in progress or planned</td>
<td>140</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>134</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues (including case presentations)</td>
<td>104</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>79</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>55</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>37</td>
</tr>
<tr>
<td>Patient care - patient care administration/records</td>
<td>28</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>12</td>
</tr>
</tbody>
</table>

Total number of requests or searches = 486
Total number of requests or searches for which purposes were indicated = 484
Average no. purposes per search/request = 1.9

Total no. purposes = 916
Table 19: Purposes of information need: search/request survey: clinical staff only

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research(personal) - in progress or planned</td>
<td>120</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>117</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues (including case presentations)</td>
<td>95</td>
</tr>
<tr>
<td>Publication</td>
<td>92</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>75</td>
</tr>
<tr>
<td>Research(funded project/degree) - in progress or planned</td>
<td>53</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>52</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>33</td>
</tr>
<tr>
<td>Patient care - patient care administration/records</td>
<td>25</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>10</td>
</tr>
</tbody>
</table>

Total number of requests or searches = 361
Total number of requests or searches for which purposes were indicated = 359

Average no. purposes per search/request = 1.9

Total no. purposes = 672

For clinicians, purposes of searches and requests are associated closely with professional development requirements, and career needs. Around one in three of the clinician requests or searches were associated with personal education or personal research purposes (33%; 117/359 : 33%; 120/359), and around one in four with teaching or publication (26%; 95/359 : 26%; 92/359). Publication purposes were more prominent among the pure research group: around half (65/125) of their searches or requests were made for purposes which included publication.

The figures suggest that hospital clinical staff use certain library and information services for ongoing personal education and research, but that queries concerned with direct patient care are usually answered from other sources. The purposes of searching can be divided into patient care, education, and research/publication (Table 16, repeated for convenience on the following page). The dividing line between personal research and personal education is sometimes indistinct, but personal research implies an ongoing interest in a specialised area, and hence a demand for the provision of library services such as inter-library loans. From the viewpoint of information service provision, personal research does fit into the research and/or publication group.
Table 16: Broad and specific categories of purpose (repeated table)

<table>
<thead>
<tr>
<th>Specific category</th>
<th>Broad category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - patient care administration /records</td>
<td>Patient care</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td></td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td></td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td></td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>Education</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues</td>
<td></td>
</tr>
<tr>
<td>Personal education</td>
<td></td>
</tr>
<tr>
<td>Research(personal) - in progress or planned</td>
<td>Research/publication</td>
</tr>
<tr>
<td>Research (funded project/degree) - in progress or planned</td>
<td></td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td></td>
</tr>
</tbody>
</table>

Nearly one in three of the requests or searches was made solely for the purposes of research or publication (Table 20). This, to some extent, reflects the nature of the sample, as 31% (113/361) of the responses from clinical staff did come from the teaching hospital site. Clinical staff in teaching hospitals will often have research responsibilities or interests, but research is not conducted solely in teaching hospitals. Postgraduate medical libraries in district general hospitals do provide library and information services for research projects, whether personal or funded, and research purposes may account for a substantial part of the library and information service workload and resources. Research or publication, whether wholly or partly, motivated 55% (196/359) of the requests or searches (Table 20).
Table 20: Linked purposes of requests using broad categories of purpose (search/request survey)

<table>
<thead>
<tr>
<th>Patient care purposes only</th>
<th>Educational purposes only</th>
<th>Research/publication purposes only</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>56</td>
<td>114</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient care AND Education AND Research/publication</th>
<th>61</th>
<th>34</th>
<th>27</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of responses denoting purposes = 359</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of responses = 361</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Patient care purposes (wholly or partly): 46+61+27+21: 109 searches or requests | Education purposes (wholly or partly): 56+61+34+21: 177 searches or requests | Research purposes (wholly or partly): 114+34+27+21: 196 searches or requests |

Only 13% (46/359) of the requests or searches were made solely for one or more patient care purposes. More often, patient care was combined with educational or research reasons: 30% (109/359) of the searches or requests were prompted partly by patient care, and partly by education or research or publication. Patient care, therefore, was involved in 43% of the searches or requests.

The most popular patient care purpose was "rare condition or specific problem" and 21% (75/359) of the searches or requests did involve this as one of the purposes (Table 19). Often there were associated purposes for such patient care searches or requests: nearly half (47%) also mentioned personal education, 32% teaching (staff/students/colleagues), 27% personal research and 19% publication. Only 16% of the searches or requests for a "rare condition or specific problem" were done solely for patient care purposes. Clinicians would often have a case presentation or a case report publication in mind as well.

Educational purposes alone account for 16% (61/359) of searches or requests, and partly motivated 32% (116/359). Educational purposes were therefore involved in 48% of the searches or requests.
3.3 Pattern of purposes: the library view and the user view

Clinicians have various reasons for requiring information and many sources, including the medical library, are used. The library is apparently used mainly for educational and research purposes, and hence the pattern the library sees is only one perspective of a picture. The contrast between the pattern found in the critical incident survey (random sample, library users and non-users) and the survey of searches and requests (library and information service users only) is striking (Table 21 and Figure 2).
Table 21: Purposes: comparison between the random sample group (critical incident survey) and the library group (search/request survey)

Table 21a. Sole purpose

<table>
<thead>
<tr>
<th>Survey type/ % frequency of mention</th>
<th>Patient care purposes only</th>
<th>Educational purposes only</th>
<th>Research / publication purposes only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical incident survey</td>
<td>37%</td>
<td>18%</td>
<td>12%</td>
</tr>
<tr>
<td>Search/request survey (clinical staff)</td>
<td>13%</td>
<td>16%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Total no. responses (critical incident survey) = 420
Total no. responses (search/request survey) = 359

Table 21b: Linked purposes

<table>
<thead>
<tr>
<th>Survey type/ linked purposes</th>
<th>Patient care  AND Research/ publication</th>
<th>Education  AND Research/ publication</th>
<th>Patient care  AND Research/ publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical incident survey</td>
<td>17%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Search/request survey (clinical staff)</td>
<td>17%</td>
<td>9%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Total no. responses (critical incident survey) = 420
Total no. responses (search/request survey) = 359
Table 21c: Combined results for Tables 21a and 21b.

<table>
<thead>
<tr>
<th>Survey type/Purposes</th>
<th>Patient care purposes (wholly or partly)</th>
<th>Education purposes (wholly or partly)</th>
<th>Research/publication purposes (wholly or partly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical incident survey (random sample of clinicians)</td>
<td>66%</td>
<td>48%</td>
<td>28%</td>
</tr>
<tr>
<td>Search/request survey (clinical staff library users)</td>
<td>43%</td>
<td>48%</td>
<td>55%</td>
</tr>
</tbody>
</table>

Figure 2: Purposes of information need: random sample of clinicians (critical incident survey) and library users (search/request survey)

If users do make a library search or request for patient care purposes, the motives are likely to be mixed. (Table 21c). Of the 43% of searches or requests which involved patient care, only a third (13%) involved patient care purposes only. The information services handle a large proportion of requests or searches made mainly for research or publication purposes. Of the 55% of searches or requests, from clinicians, which involved research or publication purposes, over half (32% of the total) were not associated with educational or patient care purposes.

The above analysis has considered in detail only the hospital clinical staff. The total demand that research activity makes on library and information services includes requests and searches from the non-clinical research and scientific group. Virtually all (96%, 120/125) of the requests or searches made by this group involved research or publication purposes, as would be expected. Funded research (or degree work) was involved in 29% (140/486) of the requests or searches, personal research in 35% (170/486).
Clinicians will often have more than one purpose in mind when acting on a perceived need for information. The sources used for different purposes varies, and hence the library and information service sees part of the information seeking pattern, with library and information service use focused on education and research purposes. The information seeking pattern of some individuals may be closer to the pattern of behaviour the library sees, but the differences do show that effectiveness of health libraries, in the UK at least, needs to be viewed in broader terms than patient care outcomes alone. The contribution of the library services to research and continuing education is important and should be recognised.

3.4 Comparison with previous studies

Many studies of the information needs of clinicians have considered the purposes for which information was required. In most cases, however, the library users were presumed to have only one purpose in mind, or possibly one primary purpose. Some previous research assumes that the purpose and outcome are firmly linked. If the purpose was related to patient care, then the outcome would be related to patient care. However, information obtained for research purposes can have an impact on more immediate patient care, and information obtained for a case presentation may affect the care given to a particular patient. Similarly, information obtained for a need identified during a ward round can be used for a later case presentation or a paper (Wilkin & McColl, 1982).

Both the Rochester study (Marshall, 1991 and 1992) and the NLM study of MEDLINE (Wilson et al. 1989) (Lindberg et al. 1993) sought to establish a link between information obtained and immediate clinical decision making. The response rate for both surveys was around 50%. For the Rochester study, information sent to the physicians stated that the study was looking at the impact of hospital libraries on clinical care, and the physicians were asked to select a clinical situation for which further information might be useful to them. Searches were done by the librarians, not by the clinicians. In the NLM study, (Wilson et al. 1989) the opening sentence of the interview asked about an incident when information obtained through MEDLINE was especially helpful (or not helpful) with their work.

"I'm interested in recent MEDLINE searches that were especially helpful in your work or that were unsatisfactory. (For MDs, DDs, RNs) I'm especially interested in searches that have had an impact on patient care" (telephone interview schedule)

Both those studies, particularly the Rochester study, did focus the attention of physicians on information for clinical care. Not surprisingly, 45% of the NLM study group stated that the major stimulus to seeking information was patient care. In the Value project, for 37% of the incidents, (critical incident survey) clinicians required information solely for patient care, but patient care purposes were involved, partly, in 66% of the incidents. A study of online users of MEDLINE
(Haynes et al. 1990) did note that although a "patient problem" was the major reason for 56% of searches, the searchers were equivocal about the resulting contribution of the search results to patient care, suggesting that the purpose of the search was related to a patient problem, but that the results of the search would not necessarily be used directly for a particular case. Other purposes and outcomes may have been involved. Collating these findings suggests that out of ten searches a clinician makes for information, three to five will be prompted directly by a patient care problem, and a further two to three might involve patient care indirectly.

In contrast to the Haynes study, a study of networked MEDLINE in German speaking libraries (Obst, 1994) indicated that MEDLINE was being used primarily for research and publication, and that very few clinicians were using MEDLINE primarily for patient care. Over 35% of searches were made primarily for research, while patient care purposes accounted for under 5%.

Comparison of results is difficult if purposes of searching or requesting information are intertwined. Clinicians may not have a primary purpose, and might find selection of a single purpose difficult. The phrasing of the questions is therefore critical. A German study of CD-ROM use (Kaltenborn, 1991) allowed the users to select more than one purpose and the profile of purposes here is quite different. Of the 95 CD-ROM users, the majority of doctors were using MEDLINE for research and publication (88% research, 66% publication). Patient care was mentioned by around 25% of the group. These findings accord with the results obtained in the Value project for the end-users and Dial-Up MEDLINE users, where research (personal) and publication are the purposes most frequently mentioned, but rare conditions or specific patient problems are mentioned as a purpose in 23% to 35% of searches.

The changing politics of health care, and differences in national cultures, affect perceived information needs and the way in which these needs are described. While both the Guy's clinical librarian study (Wilkin, 1982) and an Oxford study (Brember, 1982) found that "keeping up to date" was an important reason for needing information, more recent pressures for monitoring continuing professional development put a more formal emphasis on "keeping up to date". In the present study, the term "personal continuing education" was more appropriate, and in fact, accorded a similar level of priority as "keeping up to date" in the earlier studies. Pressures to publish are recognisable in the relatively high frequency of mention for "personal research" and "publication" categories of purpose. In Germany the demands of the medical dissertation are very prominent (Obst, 1994 and Kaltenborn, 1991).
3.5 Themes for discussion: purposes

Several themes emerge for further consideration.

- Clinicians will often have more than one purpose in mind when seeking information.

- Many library and information service requests and searches are made for research and continuing education reasons.

- Patient care is involved, to some extent, in many of these library and information service requests or searches, but patient care is rarely the sole focus of the request or search.

- Research may account for a high proportion of the use of library and information services.

- Clinicians rarely seek information for patient education.

These themes will be considered in Chapter 8 (Approaches to audit of information services).
Chapter 4

Prompts and props for information seeking

A prompt is often required before an information need is translated into an "information need - for action". The prompt may be simply a request, or order for information, but more often reflects the ways an individual acquires information on their own volition.

The prompts to making a search or request were explored in the survey of library searches and requests. These prompts are discussed in Section 4.1.

Individual characteristics govern the choice of sources or props used, but the group "roles" do influence the choices made. The results for clinicians as a group are discussed in Section 4.2. The differences among groups of clinicians are discussed in Chapter 7.

4.1 Prompts to making a search or request

Nearly half the requests or searches (48%, 232/481) were prompted by personal curiosity or the "need to know more". The search or request was often prompted by something read in personal journals or books (42%, 201/481) (Table 22). The sample population considered includes the research and the clinical staff. Around one in three of the requests or searches was prompted by information obtained from a previous MEDLINE search. Those requests or searches could be a follow-up inter-library loan request or simply another search to explore a different aspect of the topic. Many libraries are concerned about the impact on inter-library loan services of CD-ROM. Specific exploration of this issue was not an objective of the Value project, nor was it possible to draw any conclusions from the data collected. At one of the library sites, services such as inter-library loans could be withdrawn from users who had not paid monies due. MEDLINE searching was in fact the only "service" available to some library "offenders", apart from reference use of the library.

Many of the doctors indicated in interviews that they did regularly consult journals in the library, and this type of library use did prompt several searches or requests. Several interviewees stressed that journals often include useful information in the sections that would not be indexed for a database.

Nearly one in four requests or searches was the result of suggestion or advice from colleagues. For nearly half the SHOs the prompts for a search or request included a suggestion or request from a colleague, possibly for a case presentation or for ongoing audit work in the department (Table 22).
The more senior grades would be expected to have more personal journals and therefore reading of personal journals and books appears more prominent as a search or request prompt among senior registrars and consultants than for SHOs and registrars. MEDLINE searching does appear to be a part of the information seeking routine of many clinicians.

Table 22: Prompts for searches or requests: staff group comparisons

<table>
<thead>
<tr>
<th>Search or request prompt</th>
<th>% Total</th>
<th>% SHO</th>
<th>% Registrar</th>
<th>% SR</th>
<th>% Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal curiosity or &quot;the need to know more&quot;</td>
<td>48%</td>
<td>60%</td>
<td>54%</td>
<td>50%</td>
<td>43%</td>
</tr>
<tr>
<td></td>
<td>HIGH</td>
<td>HIGH</td>
<td>HIGH</td>
<td></td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Suggestion or advice or information from colleagues</td>
<td>23%</td>
<td>48%</td>
<td>31%</td>
<td>16%</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>HIGH</td>
<td>MEDIUM</td>
<td>LOW</td>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>Reading of personal journals or books</td>
<td>42%</td>
<td>35%</td>
<td>36%</td>
<td>46%</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>MEDIUM</td>
<td>MEDIUM</td>
<td>HIGH</td>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>Information from a previous MEDLINE search</td>
<td>35%</td>
<td>28%</td>
<td>34%</td>
<td>35%</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>LOW</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
<td></td>
<td>LOW</td>
</tr>
</tbody>
</table>

| Total group includes clinical and research staff              |         |       |             |      |              |

Although the interviews did not focus on prompts to searches or requests some interviewees did mention the background to the information request.

"do generate reprint requests .. around 50 a year .. these are obtained via personal reading"

(consultant, ILL request)
"like looking in journals.. not computer searches.. junior doctors do CD-ROM."

(consultant, ILL request)

"tend to browse journals and books in the library and follow up items of interest .. now realise that this can be done .. (partly) .. by a MEDLINE search"

(SHO, ILL request)

"not always looking for something specific .. sometimes to increase my own awareness"

(audit staff, ILL request)

"regularly scan the contents of 10-20 journals  and visit the library daily if possible"

(senior registrar, end-user search)

"came across the article from the list the librarian sends round regularly ..this extremely useful ... see things there I wouldn't normally come across.. in other journals ....working in a small unit... aware that I need to prepared for future problems of all sorts .. personal continuing education very important"

(associate specialist, ILL request)

"had to look through the issues themselves ... much relevant material in the newsletter... the newsletter and bulletin portions of peer-reviewed journals may not be indexed .. articles concerned with practice and audit often appear in the bulletin ... easy to assume (wrongly) that the information doesn't exist"

(senior registrar, ILL request)

4.2 Sources used to obtain information

Clinicians are, unsurprisingly, likely to turn to the nearest source of information (reference books and medical handbooks), although a wide range of up-to-date sources is also valued (local medical library). More reliance is placed on personal journal collections than on colleagues or personal (or unit) information files or databases. (Table 23). Very frequently more than one source will be tried (average number sources used = 1.9).
Table 23: Information sources used

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>209</td>
</tr>
<tr>
<td>Local medical library</td>
<td>137</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>104</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>99</td>
</tr>
<tr>
<td>Colleagues</td>
<td>89</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>65</td>
</tr>
<tr>
<td>Pharmacy (hospital/local)</td>
<td>30</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
</tr>
<tr>
<td>Other library</td>
<td>15</td>
</tr>
<tr>
<td>Other database system</td>
<td>12</td>
</tr>
<tr>
<td>Total number of incidents = 420</td>
<td></td>
</tr>
<tr>
<td>Average number of sources used = 1.9</td>
<td></td>
</tr>
<tr>
<td>Total number of sources used = 786</td>
<td></td>
</tr>
</tbody>
</table>

The pattern of sources used by the various staff groups (Table 24) confirms the dominant popularity of the reference book or medical handbook. Analysis of the top four sources used by each staff group, for incidents when information was needed, suggests a heavy reliance on personal or departmental sources for all groups. Only the registrars and senior registrars use the medical library more frequently than reference books (Table 24).
Table 24: Sources of information used most frequently by different staff groups

<table>
<thead>
<tr>
<th>Information source</th>
<th>SHOs</th>
<th>Registrars</th>
<th>Senior registrars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>69%</td>
<td>54%</td>
<td>57%</td>
</tr>
<tr>
<td>Local medical library</td>
<td>40%</td>
<td>33%</td>
<td>57%</td>
</tr>
<tr>
<td>Personal or unit/dept. info. files or databases</td>
<td>29%</td>
<td>26%</td>
<td>31%</td>
</tr>
<tr>
<td>Colleagues</td>
<td>29%</td>
<td>26%</td>
<td>16%</td>
</tr>
<tr>
<td>Total no. incidents = 68</td>
<td>Total no. incidents = 46</td>
<td>Total no. incidents = 49</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Information source</th>
<th>Consultants</th>
<th>GPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>59%</td>
<td>43%</td>
</tr>
<tr>
<td>Personal or unit/dept. info. files or databases</td>
<td>37%</td>
<td>35%</td>
</tr>
<tr>
<td>Local medical library</td>
<td>30%</td>
<td>32%</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>Total no. incidents = 27</td>
<td>Total no. incidents = 108</td>
<td>Total no. incidents = 124</td>
</tr>
</tbody>
</table>
4.3 Success in searching

Most respondents to the critical incident survey were immediately successful in their quest for information (72%). Some (17%) indicated that the information was incomplete and 11% (mostly GPs) indicated that time restraints had been a problem. The figures suggest that efforts to obtain information will only be made if the chances of success are deemed high.

4.4 Patterns of use of information sources

Results presented here refer to the sample population as a whole. Patterns for particular groups of staff are discussed in Chapter 7.

4.4.1 Sources used for drug or therapy queries

For general patient care and queries relating to drug treatment or therapy, the sources used are those close at hand. Reference books or medical handbooks are consulted for 73% (105/144) of drug or therapy queries (patient care - specific drug or therapy query) and for 74% (50/68) of general patient care management queries (patient care - patient care administration/records) (Table 25). Use of colleagues is also high for this type of query. For specific drug or therapy queries 24% of responses indicated a colleague had been consulted, and for patient care administration 43% of respondents had consulted a colleague. Personal journal collections are used to a similar extent as colleagues.

Table 25: Main sources used for general patient care and drug or therapy queries

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention specific drug or therapy queries</th>
<th>Frequency of mention for patient care administration or records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference books or medical handbooks</td>
<td>105</td>
<td>50</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>40</td>
<td>32</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>38</td>
<td>24</td>
</tr>
<tr>
<td>Colleagues</td>
<td>35</td>
<td>29</td>
</tr>
</tbody>
</table>

Total no. responses = 144  Total no. responses = 68

4.4.2 Sources used for patient care - rare conditions or specific problems

When information is less likely to be easily available, for queries relating to patient care for a rare condition or specific problem, a greater variety of sources will be used. Although reference books and handbooks will be used (presumably first), the next stage may include one or more of a variety of sources including the local
medical library. Use of MEDLINE becomes more prominent for patient care queries of this type (Table 26).

Table 26: Main sources used for queries on rare conditions and specific patient problems

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>91</td>
</tr>
<tr>
<td>Colleagues</td>
<td>45</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>44</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>42</td>
</tr>
<tr>
<td>Local medical library</td>
<td>39</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>20</td>
</tr>
</tbody>
</table>

Total no. responses = 136

4.4.3 Sources used for teaching, education and research

A similar spread of sources is evident in the pattern for sources used for teaching and case presentations, but in this case the local medical library is used most (50/91, 55% of responses) (Table 27). For personal continuing education, which will of course include small and large chunks of learning, reference books and medical handbooks are the first recourse, although the medical library is second. For personal research, the medical library is the major source (42/75, 56% of responses). MEDLINE is also valued as a source of information for personal research (31/75, 41% of responses). Much personal research seems to rely on personal or unit/department files or databases (29/75, 39%), and 25% of this group (19/75) used both the personal (or unit) files (or databases) and MEDLINE. Less recourse appears to be made to personal journal collections for personal research, suggesting either that information has already been acquired from this source, or that retrieval of information from this source is difficult. Use of MEDLINE for teaching purposes seems low.
Table 27: Sources used for education, learning and personal research

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention for personal continuing education</th>
<th>Frequency of mention for teaching-staff/students/colleagues</th>
<th>Frequency of mention for research (personal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference books or medical handbooks</td>
<td>81 HIGH</td>
<td>44 MEDIUM</td>
<td>25 MEDIUM-LOW</td>
</tr>
<tr>
<td>Local medical library</td>
<td>65 HIGH</td>
<td>50 HIGH</td>
<td>42 HIGH</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>46 MEDIUM</td>
<td>38 MEDIUM</td>
<td>23 MEDIUM-LOW</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>32 MEDIUM</td>
<td>35 MEDIUM</td>
<td>29 MEDIUM</td>
</tr>
<tr>
<td>Colleagues</td>
<td>31 MEDIUM</td>
<td>15 LOW</td>
<td>14 LOW</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>17 LOW</td>
<td>20 LOW</td>
<td>31 MEDIUM</td>
</tr>
<tr>
<td>Total no. responses</td>
<td>129</td>
<td>91</td>
<td>75</td>
</tr>
</tbody>
</table>

4.4.4 The invisible college: colleagues as sources of information

Colleagues are consulted mainly for queries related to direct patient care, particularly if a rare condition (or specific problem) is concerned (51%; 45/89) (Table 28). Colleagues seem to be consulted quite frequently to check on the latest information. Over a third (35%; 31/89) of responses in this category were concerned with personal education.

Table 28: Purposes for which colleagues are consulted

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>45</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>35</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>31</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>29</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>17</td>
</tr>
<tr>
<td>Total no. responses</td>
<td>89</td>
</tr>
</tbody>
</table>

4.4.5 Why medical libraries are used

The profile of purposes associated with use of the local medical library show a heavy emphasis on personal continuing education, teaching and personal research, which suggests that library use is predominantly associated with reflective professional practice (Table 29). (Personal continuing education is essentially
personal education whether postgraduate medical education or continuing medical education, the latter term used for the non-training grades.)

Table 29: Why is the medical library used? Profile of associated purposes.

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal continuing education</td>
<td>65</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues (including case presentations)</td>
<td>50</td>
</tr>
<tr>
<td>Research (personal) - planned or in progress</td>
<td>42</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>39</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>32</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>29</td>
</tr>
</tbody>
</table>

Total no. responses = 137

In many cases the local medical library would be one of the sources used. The pattern of associated sources fits the pattern of purposes above, with 39% of the responses indicating associated use of reference books or medical handbooks (presumably for quick updating or checking), 25% indicating associated use of personal journal collections and 23% indicating associated use of personal or unit/dept. information files or databases. Interestingly, 26% of associated uses concerned MEDLINE, which in most cases (but not all) would be on CD-ROM in the library.

Interviews did not specifically focus on views of different library services, but the comments reveal some interesting perceptions of library services.

"while lack of access to a large library can be mitigated by access to online searching, the value of a library such as (university) library is the trawling of journals that you wouldn't normally use... this heightens awareness"

(senior registrar, ILL request)

"district hospital library services generally less pressured than teaching hospital libraries"

(senior registrar, mediated search)

"nuisance having only five years of MEDLINE .. quite frequently have to go back to older material, particularly in research.. not enough (specialty) books here .. but realise limitations on resources.. would use resources of (specialist) hospital when local resources are not enough.. will probably retry search there on my next visit"

(registrar, end-user search)
"use (university) library in preference to (hospital base) library as access is possible at (university) library up to 9pm"  
(SHO, end-user search)

"live near (teaching hospital) library and do searches there (work base miles away)"

(senior registrar, ILL request)

"use (PGME) library in preference to psychiatric library .. nearer and staffed all day ... although psychiatric collection is probably better, information needs don't always fit in with the library staffing timetable"

(staff grade, ILL request)

"have used libraries elsewhere ... service better here... (name of city hospital) library poor .. possibly because the (university) library has the better collection of medical books and journals.. very important that the librarian is approachable ... perhaps the larger busier libraries appeared not so helpful"

(senior SHO, mediated search)

"what is needed is a pro-active library service"

(GP trainer, end-user search)

"use (university) library .. and Royal Society of Medicine"

(senior registrar, end-user search)

"trained in Adelaide and New Zealand .. better facilities and academic libraries there .. library here (small PGME library) no comparison with (specialist) hospital in Adelaide....disappointed in the level of journal provision in this library .. large number of gaps .."

(consultant, end-user search)

"real problems with recent changes to ILL dispensations... my department won't bear the costs of ILL requests.. so am limited to 12 free requests a year ... I can generate this amount in a week ... may have to barter with people who won't use their allocation or put in requests through my NHS unit ... only problem there is the time it takes for them to arrive from (PGME) library"

(academic staff, ILL request)

" would use University library (no medical school) but have no time to go ... have a young child .. others (colleagues in psychiatry ) do go"

(registrar, ILL request)

"do have division of resources in departmental libraries .. would have caused me problems if I had done this search elsewhere"
4.5 Themes for discussion: prompts and props

- Personal curiosity is an attribute not only of the researcher but also the reflective practitioner. The researcher, teacher and reflective practitioner will look to the medical library for some - though not necessarily all - of their information needs.

- Clinicians will by preference turn to information sources that are accessible, portable, and handy. Reference books and medical handbooks provide information that is "ready to use" but possibly out-of-date as the publication process for books can be lengthy.

- Journals contain more than peer-reviewed articles. The non-indexed information about meetings, the bulletins and news sections provide many pointers to current activities. This is lost when a subscription is cancelled, and is unavailable at sites where the number of journal subscriptions is small.

- Personal journal collections are a valued source of information, but retrospective access to the information in them might be difficult.

- Time restraints on searching for information are a problem for GPs. Most clinicians appeared to obtain required information immediately and successfully.

- Most patient care queries are answered by reference to textbooks, but when a rare condition is involved, the medical library and MEDLINE will often be used.

- Personal research often involves both the statistical information (patient records) and textual information (MEDLINE database).

- Library users feel constrained by access and perceived resourcing problems. Given the emphasis on personal research and educational purposes, home-based access to library and information services deserves more consideration.

These themes will be considered in Chapter 8 (Approaches to audit of information services).
Chapter 5

The information seeking role: assisted or solo performance?

Most emphasis in this section is placed on end-user searching, i.e. searches made the clinicians themselves on MEDLINE on CD-ROM in the library, or by the BMA Dial-Up MEDLINE service. Previous studies of library use (Brember & Leggate, 1985; Hewlett, 1992) have examined the type of use made of the library (consulting journals, photocopying etc.) for management reasons and a detailed study of user behaviour can yield insights for managers seeking library effectiveness (Brember, 1985).

The present "unknown" in user behaviour concerns use of the CD-ROM. Ideally, the searches users make should be effective and, where time on the CD-ROM has to be limited, efficient. The reasons for choices made during searching should be understood if the library and information services are involved in training and support services. End-user searching is only one aspect of an information behaviour that will include reading journals, asking colleagues (or being asked by colleagues) and using updating services. The context of end-user searching needs to be appreciated, in particular the consequential choices made about what will be read and what will not.

The Value project focused on the selection and sifting procedures used to screen the literature, whether in database format (MEDLINE search) or in printed format (journal). These patterns of selection will influence how the sources are used, what information is extracted and later use of that information. Library and information staff need to know how to assist users to find the information they need in a format that will be useful. Selection for reading, attitudes to information seeking and use of computers are discussed in Sections 5.1 and 5.2, respectively.

The phenomenal growth in end-user searching of CD-ROM databases, and decline in mediated searching, raises questions about the role of the information professional in information retrieval. There are fears about the "satisfied but inept" user (Plutchak, 1989), and the role of the librarian (teacher, consultant or both?). Equally important, though less discussed, is the role of the library assistant in CD-ROM applications (Gilbert, 1994).

Library staff, both professional and non-professional, need to face the changes brought about by end-user searching with an empathetic understanding of their own, and their users' attitudes and actions. The users' expectations and purposes of a search are examined in Section 5.31, and their professed searching techniques are studied in Section 5.32. Users' views of MEDLINE on CD-ROM or via the Dial-
Up service, provide some pointers to the reasons why end-user searching became so popular and why the take-up of the BMA Dial-Up MEDLINE service exceeded initial expectations (Section 5.33). The demand for networked information services, such as the BMA Dial-Up MEDLINE service, or MEDLINE available over the hospital LAN, will influence the relationship between the library and information service and its users, and the support services offered to the information user. Differences in user and library perceptions are important and some possible problems are noted in Section 5.35.

The quality of the database is often taken for granted by users and information professionals. The switch to MEDLINE on CD-ROM from online searching has perhaps dulled awareness among librarians of other databases. MEDLINE is a very comprehensive database, but the coverage is not complete and the indexing does not suit all clinicians, nor all clinical needs (Section 5.36).

5.1 Selection for reading

Most clinicians do often seek out review articles to read. There is a high level of agreement about the priority given to this type of material. The results for the whole group (Table 30) indicate that the requirement for older material may be greater than sometimes assumed, with an average nearer "sometimes" for the statement "I select recent articles only". Some clinicians, chiefly some senior registrars and consultants, will use the author/author affiliation information to screen useful articles. Table 30 indicates the range of response, the criteria with most consensus and least consensus of views marked for each group of staff. Only the senior registrars (and other researchers) appear to place much emphasis on looking at the method and statistics sections of articles. Some registrars do, others do not. The SHOs place less emphasis on reading original research articles than other groups of staff. Clearly the research staff do need access to the original research, as the average for the group (2.16) is lower than for the individual clinical staff groups. Registrars make more use of abstracts to filter out the relevant articles, reflecting the greater use they make of MEDLINE on CD-ROM (Section 2.2.4.2).
Table 30: How articles for reading are selected

<table>
<thead>
<tr>
<th>Selection criterion</th>
<th>Total average</th>
<th>SHO average</th>
<th>Registrar average</th>
<th>Senior registrar average</th>
<th>Consultant average</th>
</tr>
</thead>
<tbody>
<tr>
<td>I look for review articles</td>
<td>2.04 (most consensus)</td>
<td>2.03 (most consensus)</td>
<td>2.02 (most consensus)</td>
<td>1.84 (most consensus)</td>
<td>1.88 (most consensus)</td>
</tr>
<tr>
<td>I look for original research articles</td>
<td>2.16</td>
<td>2.61</td>
<td>2.31</td>
<td>2.21</td>
<td>2.28</td>
</tr>
<tr>
<td>I examine any abstract</td>
<td>2.62</td>
<td>2.68 (less consensus)</td>
<td>2.33</td>
<td>2.64</td>
<td>2.80</td>
</tr>
<tr>
<td>I look for specific results or outcomes</td>
<td>2.68</td>
<td>2.66</td>
<td>2.60</td>
<td>2.63</td>
<td>2.74</td>
</tr>
<tr>
<td>I select recent articles only</td>
<td>2.85</td>
<td>3.1 (less consensus)</td>
<td>2.73</td>
<td>2.72</td>
<td>2.96</td>
</tr>
<tr>
<td>I examine any method or statistics</td>
<td>2.94</td>
<td>3.42</td>
<td>3.09 (less consensus)</td>
<td>2.71</td>
<td>3.01</td>
</tr>
<tr>
<td>I look at the author or author affiliation</td>
<td>2.90 (least consensus)</td>
<td>3.43</td>
<td>3.14 (less consensus)</td>
<td>2.64 (least consensus)</td>
<td>2.76 (least consensus)</td>
</tr>
</tbody>
</table>

Scale: 1= always 2= often 3= sometimes 4= rarely 5= never

Total average includes both research and clinical staff

Total no. individuals = 486, of which 125 are research

Some of the interviewees discussed selection criteria used.

"like to look through a big search (output). helps often to find a different perspective on a problem... personal factors important ... dynamic process of information acquisition......"  
(academic staff, ILL request)

"when choosing articles the selection is tailored to the purpose of the search"

(senior SHO, mediated search)

" I like MEDLINE as you get a useful abstract .. often this is all I need"
(staff grade, end-user search)
"look at the abstract to see if articles might be useful. Publications in this
field tend to relate to others. Either as a follow on from research of others
or as a reply"
(registrar, end-user search)

"personally tend to disregard review articles, apart from list of references
and go to the original research ... depends also who is doing the reviewing.
some I would trust more than others"
(senior registrar, end-user search)

"have to accept the accuracy of a review. If looking at original paper .. can
look at how studies done, whether relevant statistics used.."
(senior registrar, ILL request)

"look at reviews in current journals to help keep up-to-date"
(SHO, ILL request)

"have problems retrieving randomised controlled trials"
(research staff, end-user search)

"meetings abstracts in professional journals useful... for assessing current
developments .. provide a good source of current concerns .. also useful
people to contact... for these need access to journal itself as meetings
abstracts not indexed ... only way to find them is to look at the journal
itself"
(senior registrar, ILL request)

5.2 Information seeking and use of computers

Although most preferred to do their own searching, they are aware, occasionally,
that they could be more competent (Table 31, difference in score between "I prefer
do my own searching" and "I feel I am competent at literature searching"). Use
of computers is, however, commonplace. The difference in score between "need to
use computers" and "need to know about applications of computers", and the lack
of consensus of opinion for the latter opinion statement, could be interpreted in
several ways. A likely explanation is that computer literacy may be limited to
workplace requirements, with varying degrees of enthusiasm for computer
applications in general. A few do not need to use computers directly themselves
but feel that computer awareness is important. Superimposition of the opinions of
those two groups would account for the difference in scores. Comments suggested
that some clinicians were unsure about the interpretation of the phrases for their
particular work situations. The differing levels of computer literacy, and problems
of jargon, made the phrasing of the opinion statements difficult.
Table 31: Information seeking and use of computers

<table>
<thead>
<tr>
<th>Information opinion</th>
<th>Total average</th>
<th>SHO average</th>
<th>Registrar average</th>
<th>Senior registrar average</th>
<th>Consultant average</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to do my own searching</td>
<td>2.09</td>
<td>2.33</td>
<td>1.86</td>
<td>1.84</td>
<td>2.36</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFTEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need to use computers</td>
<td>2.04</td>
<td>2.21</td>
<td>1.84</td>
<td>1.86 (most consensus)</td>
<td>2.41</td>
</tr>
<tr>
<td></td>
<td>OFTEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I need information, I need it urgently</td>
<td>2.59 (most consensus)</td>
<td>2.74 (most consensus)</td>
<td>2.43 (most consensus)</td>
<td>2.63</td>
<td>2.65 (most consensus)</td>
</tr>
<tr>
<td></td>
<td>SOMETIMES /OFTEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need to use a large (e.g. university library)</td>
<td>2.24</td>
<td>2.74</td>
<td>2.38</td>
<td>2.12</td>
<td>2.57</td>
</tr>
<tr>
<td></td>
<td>OFTEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need to know about applications of computers</td>
<td>2.82 (least consensus)</td>
<td>3.00 (least consensus)</td>
<td>2.72 (least consensus)</td>
<td>2.48 (least consensus)</td>
<td>3.09 (least consensus)</td>
</tr>
<tr>
<td></td>
<td>SOMETIMES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel I am competent at literature searching</td>
<td>2.51 **</td>
<td>2.69</td>
<td>2.41</td>
<td>2.48</td>
<td>2.92</td>
</tr>
<tr>
<td></td>
<td>SOMETIMES /OFTEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scale: 
1= always 
2= often 
3= sometimes 
4= rarely 
5= never

Total includes research and clinical staff
* (end-users only) 1.62
** (end-users only) 2.67

As the group did have a large proportion of research staff (125 out of 486) and many of the purposes were concerned with personal research, information is not often required urgently. The importance of access to a large library, such as a university library, is appreciated, and interviews confirmed that occasional visits to a university library to browse through the journals was deemed important, even if that might only be an annual visit. For the research staff on site, visits to the library would be far more frequent.

The responses from the consultants showed most variation, as might be expected of a diverse group. Registrars and senior registrars are more confident in information seeking and feel more competent than SHOs (Table 31), or consultants.
There is a marked desire for do-it-yourself searching, despite uncertainty about competence. The figures for the subgroup of library end-users demonstrate quite forcibly that the desire exceeds the professed competence, and suggest that support services for end-user searching could be improved. If the consultants, with teaching responsibilities, are uncertain about some aspects of literature searching, then the role model offered to SHOs may not encourage them to learn about use of MEDLINE or other text databases.

5.3 End-user searching

The survey of end-user searching, including both library end-user searching and remote user searching, provided details of:

- perceptions of the usefulness of MEDLINE (on CD-ROM or via the BMA Dial-Up service)
- searching techniques used (or thought to be used)
- type of training received.

Results are presented separately for each group (library and Dial-Up MEDLINE). Discussion includes findings obtained in follow-up interviews of the search/request survey and also the critical incident survey.

5.3.1 Search expectations

Clinician searchers of MEDLINE are often looking for the most recent information on a topic (Table 32). Over 80% of the Dial-Up MEDLINE searches and 65% of the library end-user searches mentioned that they had this expectation of a search. The pattern of expectation is very similar for both groups, the only major difference in rank order emerging for "seminal research on a topic". For the Dial-Up MEDLINE group this was a major consideration, reflecting the audit and management purposes of their searching.

As a database, MEDLINE is more suitable for retrospective and comprehensive searching than for finding out the latest information. Researchers in the biomedical field may have to use services such as Current Contents on diskette (or CD-ROM), Reference Update or EMBASE Alert CD.

A high priority for review articles is no surprise, but the actual use of a review article deserves consideration. Occasionally the article is deemed less important
than the references, and the need to follow through to the actual research may be
more common than is generally thought.

The usefulness of direct access to the MEDLINE database for bibliographic
checking, possibly before submission of papers for publication, is evident.

**Table 32: Search expectations: library end-users and Dial-Up MEDLINE group**

<table>
<thead>
<tr>
<th>Expectation</th>
<th>Library end-user group</th>
<th>Dial-Up MEDLINE group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most recent information on a topic</td>
<td>43 HIGH</td>
<td>50 HIGH</td>
</tr>
<tr>
<td>Background information on a topic</td>
<td>38 HIGH</td>
<td>40 HIGH</td>
</tr>
<tr>
<td>Good review article or two</td>
<td>29 MEDIUM</td>
<td>36 HIGH</td>
</tr>
<tr>
<td>Information on results obtained</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Verification of bibliographic reference details (others' work)</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Information on methods used</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Seminal research on a topic</td>
<td>10</td>
<td>29 MEDIUM</td>
</tr>
<tr>
<td>Alternative lines of research</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Verification of bibliographic reference details (own or joint work)</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>(more than one category could be ticked)</td>
<td>Total no. responses = 67</td>
<td>Total no. responses = 60</td>
</tr>
</tbody>
</table>

The study of patterns of information need and use among clinicians (library users
and non-users) did reveal the purposes behind a MEDLINE search (Table 33).
MEDLINE is used primarily for personal research (48%; 31/65 individuals), but it
is used frequently for queries concerning rare conditions or specific problems. As
clinicians will frequently aim for publication of an unusual case as a case report, the
number of individuals reporting use of MEDLINE for publication needs is
similar(19-20 individuals: 31% of those using MEDLINE as a source).
Table 33: Purposes for which MEDLINE is used (critical incident survey)

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research (personal) - planned or in progress</td>
<td>31</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues (including case presentations)</td>
<td>20</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>20</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>19</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total no. responses</strong></td>
<td><strong>65</strong></td>
</tr>
</tbody>
</table>

5.3.2 Search tactics used

These results must be treated with caution as observation suggests that users are not often aware of the exact techniques they have used, and might have difficulty defining the difference between a MESH subject heading and free text keyword. For that reason, it is interesting to know what they think they are doing. Discrepancies between user reports of use and actual behaviour have been documented but users will evaluate systems according to their own perceptions. Computer monitored data will provide one method for analysing system use and errors, elapsed time in searching can provide useful clues but not the complete picture (Rice & Borgman, 1983). In the pilot study of the Value project, network use of MEDLINE was monitored and some differences were found in the pattern actually observed and that obtained from a survey of user reports.

Most of the information services were using the Ovid version of MEDLINE (CD-PLUS) in the full Windows version. The mapping feature of CD-PLUS does mean that users are, at the outset of a search, encouraged to use MESH subject headings. The majority of users are using MESH subject headings and are possibly aware that they are using MESH headings. The popularity of free text (textword) searching (Table 34) indicates that:

1) the users are unaware of the difference between free text searching and use of MESH;
   or
2) they find the MESH terms too constricting;
   or
3) MESH is not constructed as they would wish.

Monitoring observations of network use during the pilot phase showed that 22.5% of searches did use free text searching, a lower proportion than that claimed in the end-user survey (42%, 28/67) or in the Dial-Up MEDLINE survey (57%, 34/60). Part of the difference can be attributed to that difference between system use and
how users might wish to use the system. Part may also be attributed to time of searching. Monitoring observations were made in the middle of the day, a time when longer and more complicated searches might not be attempted (around 45% of the searches observed lasted less than ten minutes). A survey of 100 recorded search strategies (Gilbert, 1994) found that 30% had used textwords (free text), and 19% had used textwords solely (the corresponding figures for the Value network monitoring study being 22.5% and 10%). The variations may be the result of differences in training, elapsed times between training and searching, or searching experience. Most of the network users had been recently trained, and would have been advised against using free text (textword) searching during training for network use of MEDLINE. Accordingly a lower percentage of textword searches would be expected for this group, as was observed. Both the Dial-Up MEDLINE group and the library site CD-ROM users were more diverse in the amount of training or help they had obtained, and the time that may have elapsed between that training and the search studied. The tentative conclusion would be that the effects of warning about the inadequacies of free text searching on MEDLINE wear off for most users.

The Dial-Up MEDLINE group clearly appreciate the ability to search back to 1966: many of the library users only have access to the latest five years of MEDLINE on CD-ROM. Two in every five searches on Dial-Up MEDLINE were searching farther back than the most recent file.

Use of sub-headings appears to be approached with caution, and some users are possibly unaware of the implications of exploding, or not exploding, the index term they are using. Information about the implications of using or not using the "explosion" facility were not very clear on previous versions of the CD-PLUS software.

The popularity of author name as a search aid can be attributed partly to the use of MEDLINE for bibliographic checking. However, the use of an author name may be a useful short-cut round the indexing system if users are aware of an author in the area of interest. In the pilot study, network monitoring observations found that 17.5% of the 40 sessions observed used author name alone, and 45% of sessions used author name at some stage.
Table 34: Search tactics used (end-user searching)

<table>
<thead>
<tr>
<th>Search tactic/feature</th>
<th>Library end-user group</th>
<th>Dial-Up MEDLINE group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject headings (MESH)</td>
<td>44</td>
<td>54</td>
</tr>
<tr>
<td>Free text (word or phrase in title or abstract)</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>Author name</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Using subheadings (MESH) to refine a search</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Searching earlier MEDLINE files (pre-1989)</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Exploding an index term to include more specific terms</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Journal name</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Limiting a search by publication year</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Limiting a search to particular age groups (e.g. Child)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total no. responses = 67</strong></td>
<td><strong>Total no. responses = 60</strong></td>
<td></td>
</tr>
</tbody>
</table>

5.3.3 Perceptions: library end-users and Dial-Up MEDLINE users

The immediate post-search interviews provided details about:

1) how useful MEDLINE on CD-ROM was for them;
2) what type of training they had received;
3) how easy they found the system. (The Dial-Up MEDLINE group were asked what they liked least, and most, about Dial-Up MEDLINE).

Interviews revealed that most of the library end-user group classed themselves as frequent users. Around half had used MEDLINE on CD-ROM in another hospital library or at medical school. Most had received an introduction from a librarian on how to use the system, but their perceptions of the time this had taken rarely exceeded 30 minutes. None in this group mentioned attending a group training course, and around 50% would regard themselves as largely self-taught, improving with practice. About 50% regarded themselves as computer literate, being "used to computers anyway". Not surprisingly, most thought the CD-ROM system quite straightforward to use.

The library end-users appreciate being able to do both comprehensive and specific searches. Some have never known any other way of literature searching, and for others the CD-ROM has "revolutionised literature searching", being so much easier than using printed Index Medicus. However, some are unsure about some aspects of searching and would use other searching tools, including Index Medicus, on occasion. Comments indicated that some were aware they were not searching in the most efficient manner, though one user did feel that poor coverage in psychiatry
accounted for his poor results. The speed of searching on CD-ROM was valued by most, though a few commented that they found the Ovid version slow.

Opinions on output options varied. Around 50% liked having a print-out, and 25% did download searches on to disc (at some libraries this would be the only permitted option for large search outputs). A few had experienced problems in printing, or downloading.

At least one in three of the sample mentioned that they would appreciate easier access to MEDLINE on CD-ROM, either at home or networked in the hospital. Booking systems are not used by some, "often come up on chance", "drop in and see if it is free". The suspicion that some potential users are deterred from using the CD-ROM because a booking system is in operation was confirmed by the findings of the Dial-Up MEDLINE survey.

Three out of four Dial-Up MEDLINE respondents specifically mentioned the convenience of 24 hour access, often at home.

"revolutionised my life as I can search from home"

"rapid access ..do not need time to book library, get to library.."

"convenience .. I can do it at midnight.. if busy writing and need a reference urgently"

"ease of access from my desk and at home"

"not dependent on library staff"

"closest available search facility, cost-effective and useful"

Further confirmation was provided from interviews of the search/request survey respondents, some of whom were users of the Dial-Up MEDLINE service.

"now on Dial-Up MEDLINE .. so much more convenient for me.. working in A&E does not give many opportunities for visiting the library during working hours... searching from home much better"

(staff grade, end-user search)

"use MEDLINE on a daily basis ... BMA Dial-Up service"

(consultant, ILL request)
"BMA Dial-Up MEDLINE service ... great and remarkably cheap"
(consultant, end-user search)

Other features that were appreciated by Dial-Up MEDLINE users were the general ease of use for searching, the comprehensive database and the ability to search back as far as publication in 1966.

Some users were aware that their lack of skills in searching did mean that telephone bills might be rather higher than they might be.

"my phone bill ticking away as I fumble my way around"

A few were more critical about the quality of the database.

"occasionally misses a reference in a cited journal"

"abstracts truncated and missing vital points"

Some had problems with printing or downloading: about one in six found these procedures difficult or cumbersome.

"unable to download on my equipment"

"long time spent downloading"

"downloading is more complex that need be"

"elaborate downloading procedures"

"can't get information downloaded .. interface unfriendly.. so don't know what I'm doing"

Difficulties and problems with the system were largely due to hardware problems and incompatibility of software. These varied in type and scale, but should be possible to resolve. The desire for instant access to MEDLINE does clearly outweigh some of the hardware and software problems encountered, though some costs are involved.

"interested in BMA Dial-Up MEDLINE service ...know someone who has just go kitted up.. but feel expense a bit much at present .. though the idea of downloading direct on to hard disc tempting .. would be good if someone would pay for it"
5.3.4 End-user searching: soloist performance

For the library service user, CD-ROM is one of the great advances. The mystery has been removed from online searching, there is no need to lift heavy index tomes and the print size on the screen is far larger than in the indexes. Clinicians do prefer, on the whole, to do their own searching. They are, after all, used to the responsibility of obtaining information for diagnosis and monitoring information on the progress of treatment. The advantages gained by doing their own searching, of being "in control", outweigh the costs in time and effort.

The preference for doing their own searching exceeds their professed competence (Table 35). The level of confidence may indeed be greater than the level of competence and some clinician users may be "satisfied but inept" (Plutchak, 1989). The role of the librarian is frequently seen as search assistant and some users do appreciate such help, particularly if this help saves them time. The gap between the preference for doing their own searching and professed competence is particularly marked among the library end-users, suggesting that procedures for detecting when help is required, and identifying the type of assistance preferred, are deficient. Studies on the effect of variables such as prior searching experience, and academic background indicate that these do affect searching performance (Bellardo, 1985) but evaluative studies of human factors in the use of information systems often produce confusing and conflicting findings (Borgman, 1992). Support for end-user searching will often have to be planned and evaluated empirically.

The low level of expressed confidence and competence among SHOs is worrying, given that many of these SHOs will become GPs, without the easy access to library services and opportunities to develop information skills that registrars enjoy. The SHOs polled in this sample are those few that did use the library services. Many more do not, and information skills learned at medical school could easily be lost through lack of practice. Overseas doctors working as SHOs may not have had any previous training whatsoever.
Table 35: Attitudes towards searching for information

<table>
<thead>
<tr>
<th>Information opinion</th>
<th>Total average</th>
<th>End-user average</th>
<th>SHO average</th>
<th>Registrar average</th>
<th>Senior registrar average</th>
<th>Consultant average</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to do my own searching</td>
<td>2.09</td>
<td>1.62</td>
<td>2.33</td>
<td>1.86</td>
<td>1.84</td>
<td>2.36</td>
</tr>
<tr>
<td>I feel I am competent at literature searching</td>
<td>2.51</td>
<td>2.67</td>
<td>2.69</td>
<td>2.41</td>
<td>2.48</td>
<td>2.92</td>
</tr>
</tbody>
</table>

Scale: 
1= always 
2= often 
3= sometimes 
4= rarely 
5= never

Interviews revealed some of the reasons why end-user searching is so popular, and how clinicians rate their competence in literature retrieval. The critical incident survey did show that most clinicians claimed immediate success in their information quest. They will have confidence that some useful information will be available from the sources used. The aim of the search is to obtain an answer to a question. Sufficiency is the objective.

- Some clinicians always prefer to do their own searching:

"prefer to do my own searching .. to be able to sort through, widening and narrowing the search as necessary"
(senior registrar, end-user search)

"use MEDLINE on CD-ROM a lot .. it's a revelation"
(senior registrar, end-user search)

"no problems in using computers... prefer to come across to the library when I can ... time planning difficult .. and do the search there and then .. librarian not always available .. best to do the search myself"
(registrar, end-user search)
"prefer to do my own searching .. more flexible .. but have more to learn about getting information out of MEDLINE .. still on the steep slopes of the learning curve"

(GP trainer, end-user search)

"very happy to do my own searching of MEDLINE .. aware that library staff will help but if I have the time like to search for myself ... "

(registrar, end-user search)

"do my own searches on MEDLINE .. though not particularly computer literate .. can just about manage a word processor when the secretaries let me have a go .. and know about Windows"

(SHO, ILL request)

"the more I use MEDLINE the more I find out about it and how best to use it for my own purposes"

(registrar, end-user search)

"usually go to the CD-ROM with something specific in mind but once there other topics will occur to me"

(registrar, end-user search)

- Some users appreciate help from the library staff:

  "do my own searching but .. ask for help if stuck... otherwise I would be there all day"

  (registrar, ILL request)

  "have a superb librarian .. she will sit and play with it (MEDLINE on CD-ROM) to extract some useful information.... would be a lot more difficult without her help.. am sure my literature searching will improve with practice"

  (audit staff, ILL request)

- Some clinicians are less sure about the benefits of CD-ROM searching.

  "CD-ROM .. suppose I ought to .. but sometimes prefer Index Medicus instead of getting the computer up to steam"

  (consultant, ILL request)

  "quite confident about searching Index Medicus .. CD-ROM may have advantages over the searching of the printed index"

  (GP trainee, mediated search)
"not used to computers ... was shown how to do the search. in fact she did it for me... not sure whether I would try it again alone .. would prefer help"  
(registrar, mediated search)

"do have some experience with computers .. have never done my own searching on MEDLINE ... although I do have my own CD-ROM drive .. know other people who do their own searches .. think this is probably more effective than having searches done by library as I usually have a pretty good idea of what I'm looking for. "  
(GP trainer, ILL request)

- Some clinicians are happy to delegate searching entirely to library staff.

"have used CD-ROM elsewhere myself but if librarian is willing to do a search for me ..fine .. saves time... need a bit of training on the CD-ROM and would probably have to ask for help"

(senior registrar, mediated search)

"had asked librarian to do search .. saved time (medical staff)... .. and results likely to be reliable... very efficient service... if not happy with results would have no hesitation about asking for a re-run.. discussion"

(senior registrar, mediated search)

5.3.5 Support services for end-users: possible gaps

The level of support provided by the library service for CD-ROM use varies. The support includes marketing the service to potential users, training and ad-hoc assistance. Awareness of the CD-ROM may not be as high as some library and information services assume.

"Do enough people know about this?" (on benefits of use of MEDLINE on CD-ROM .. ).

Some of the interview comments reveal that there are discrepancies between what the library and information service thinks it is providing, and what the user perceives.

" quite often don't find what I'm looking for .. particularly for very rare conditions ... never anyone around to help"

(senior registrar, end-user search)

Many library services assume - wrongly - that if users know MEDLINE on CD-ROM is available, they also know how MEDLINE could help them in their work. The emphasis in user education is too often on technique, at the expense of appreciation. However, it was clear from interviews and observation that many
users do not think of asking for help. If users do not ask for advice, the library and information service is increasingly unable to offer help, as the users are not providing them with details of common searching problems. Users need to have confidence that help will be available if they ask for advice.

"used to a different version .. but found some transferable skills... however wanted to do a combination which didn't work so well on this"
(SHO, end-user search) (no help requested)

Departmental budgets do permit subscription to CD-ROM services and use by departments of such sources is likely to rise.

"departments do have their own subscription to MEDLINE on CD-ROM"
(senior registrar, end-user search)

5.3.6 Is there life beyond MEDLINE?

MEDLINE may be the "best" medical database, but it is by no means the only database available. Psychiatrists in particular are dissatisfied about the coverage, and clinicians searching for the psychological aspects of care are likely to be unhappy with the search results. The currency of MEDLINE poses problems for the researchers, who value MEDLINE for the comprehensive coverage for retrospective searching, but frequently require a more up-to-date service.

"have suspicions about MEDLINE .. had known about French reference but couldn't find it there ... sometimes not sure that the coverage is as good as it should be"
(GP trainer, end-user search)

"difficult to find psychological aspects in MEDLINE"
(senior registrar, ILL request)

"not overly impressed with MEDLINE ... sit with librarian while she does the search ... don't feel searches are as successful as they should be.. with general searches.. do get a lot of irrelevant material ... however when search is more specific do get less material, but more specific"
(consultant, ILL request)
"reference came from a journal article found via a PSYCLIT search .. usually do a PSYCLIT search in preference to MEDLINE"
(senior registrar, ILL request)

"frequent user of MEDLINE (hospital base).. also use BIDS (at university base) .. also weekly update."
(registrar, ILL request)

"amazing what important stuff seems to be missing... usually have to resort to a paperchase to find all relevant articles"
(consultant, ILL request)

"often find relevant articles after (not during) MEDLINE search"
(senior registrar, end-user search)

"use BIDS but slow and .. therefore useless .. for me the information obtained from BIDS is very similar to that from MEDLINE"
(senior registrar, end-user search)

"use Reference Update in the unit .. covers the major journals, I think .. like Current Contents.. MEDLINE useful for retrospective searches but not for current material"
(research staff, end-user search)

"found reference on a PSYCLIT search .. use this quite frequently .. also use Social Sciences citation index.. though I have problems with this .. (in searching) ..problem often of definition and who is using the concept"
(consultant, ILL request)

5.4 End-users: problems or opportunities?

In most libraries the introduction of CD-ROM has witnessed a concomitant decline in mediated searching. The clinician users like to do their own searching, and for many the introduction of CD-ROM is a great advance. Why, then, are the information professionals less enthusiastic?

Librarians view the satisfied, but inept searcher as a problem. That class of searcher is happy with the results of the search, but the results are likely to be incomplete (some relevant articles missing) or too broad (search retrieving too many irrelevant articles). If the search was done to solve a patient care problem, then those worries might well be justified. The results of the survey of end-user searches and the Dial-Up MEDLINE searches do, however, indicate that most searches are done, partly or wholly, for research and educational reasons. Certainly, the differences between the Dial-Up MEDLINE and the end-user searching profile of purposes suggests that the more accessible the database, the more likely it is to
be used for patient care purposes. The results of the search may then contribute to the decision making, but clinical experience will often be the decisive factor.

Comments made in interviews suggest that clinicians bring their own information seeking style to the CD-ROM. Some like to browse through references to find other leads, others are looking only for the latest information. In online searching the priority given to the efficiency of a search by the librarian search intermediary meant that the interactive and browsing potential of the database remained untapped (Pfaffenberger, 1990), though the need to control expenditure was understandable. Some academic scientists, given access to MEDLINE (with Grateful-MED) at their desks valued the ability to manipulate the retrieved information, others were more interested in the immediate access at the desk (Tilson & East, 1994). The scientists seemed more concerned with the quality of the database coverage than with recall levels they achieved.

The desire for independence in searching for information has to be seen from the user's point of view. If they successfully use their reference books and handbooks to find information, is there any reason why the CD-ROM should be any different? Certainly a computer is involved but the results suggest that computer use is accepted, even welcomed, as part of working life for many clinicians. Most of the interviewees felt that learning how to search MEDLINE on CD-ROM had been a matter of experience, and many class themselves as "self-taught". Although they are aware that they are not searching in the most efficient manner, they do not find the system particularly difficult to use after some trial attempts. Such users class themselves as computer literate and are unlikely to appreciate a formal training programme. Informal and occasional discussion of tricky searching problems might be appreciated, but the end-users would need to be made aware that librarians would help, and would be able to help.

The relatively low level of confidence and competence in information seeking among SHOs is worrying. The recently qualified SHOs need to consolidate information skills learnt at medical school, particularly if they go into general practice. Overseas doctors working as SHOs may need to be made aware of MEDLINE on CD-ROM, before any training can be considered. The particular needs of SHOs are considered in more detail in Chapter 7.

Most user education does now focus on end-user searching, but a narrow focus on searching techniques fails to consider how a CD-ROM search fits into the pattern of information retrieval and use. Most users do appreciate the evaluated, pre-digested type of information found in review articles, but the quality of review articles is patchy (Antman et al. 1992) and some users, an increasing number possibly, would like to see the original research articles. Junior doctors need to develop critical appraisal skills and an understanding of research methods, and CD-ROM instruction should take account of those needs.
The evidence suggests that free text (textword) searching is popular, and that users are not convinced about the benefits of MESH headings. Databases such as MEDLINE are expensive to produce, and the plummeting costs of data storage may mean that the costs of human indexers would be hard to justify, if users of the database are not in fact wanting completely comprehensive searches (Oppenheim, 1993). The scenario of life with MEDLINE but without MESH may be extreme but not unthinkable despite all the processes that need to be incorporated into intelligent information software (Vickery & Vickery, 1990). In the meantime, librarians - and library assistants - need to show users how to make the most of the free text searches they will inevitably do.

The survey results suggested that libraries encourage users to download references on to disc if time constraints (and concern about paper) mean that printing has to be limited. Networked access to MEDLINE produced an increase in the number of questions about bibliographic, or database management software (Shipman et al. 1992). There are advantages to the library and information service, as well as to the user, of promoting electronic storage and further processing of searches. For the user, use of bibliographic software means that references can be retrieved with ease and manipulated more easily for different publication formats. For the library, downloading on to disc is far faster, and avoids common problems with printers (with the proviso that problems with computer viruses need consideration). The survey results suggested that home and work use of computers is commonplace. Librarians should be encouraging, and assisting the use of software which promotes personal management of the information retrieved.

MEDLINE is commendably comprehensive, but for some users the coverage is not satisfactory. The move to CD-ROM means that librarians do themselves opt to do a CD-ROM search, rather than an online search, for the majority of searches they are asked to do (Gilbert, 1994). Expertise in online searching techniques and familiarity with databases other than MEDLINE is lost. Contrarily, search options for the users may be narrowing while the number of searches increases.

Researchers need more up-to-date information than MEDLINE can often offer, and for them, services such as Current Contents, Reference Update and EMBASE Alert CD are worth considering. The file formats often provide for bibliographic software as well, an added advantage for the researcher.

The quality of the coverage in MEDLINE does concern many users, particularly the psychiatrists and those interested in the psychological aspects of care. The information professionals need to ensure that such views reach them, and that some remedial actions can be discussed with the users. Such actions include the offer of online searches, or a guide to the Internet. Possibly subscription to other CD-ROM services might need to be considered.
5.5 Themes for discussion: the information seeking role

- The introduction of CD-ROM has revolutionised literature searching for library users.

- Many clinicians like to search MEDLINE on CD-ROM themselves, in preference to asking for a search to be done by library staff.

- Some libraries may rely on MEDLINE to an extent that their awareness, and their users' awareness, of other databases is very limited.

- Most users do not find the CD-ROM system that difficult to use.

- MEDLINE on CD-ROM in the library is appreciated, but home or office access is a boon for many clinicians.

- A need for training is not immediately apparent to most clinician users of MEDLINE. A critical approach to searching MEDLINE on CD-ROM comes with experience in use of CD-ROM.

- Researchers value MEDLINE for retrospective searching but often need current information faster than is possible with MEDLINE.

- MEDLINE's coverage of the psychiatric literature and of the psychological aspects of care is insufficient for many UK clinicians.

- Library and information services could do more to promote:
  
  a. databases other than MEDLINE
  
  b. bibliographic software.
  
  c. awareness of the benefits of using MEDLINE.

- The aims and objectives of user education programmes and materials should focus on the outcomes of searching rather than searching techniques.

These themes are discussed in Chapter 8 (Approaches to audit of information services).
Chapter 6

Impact and value of information obtained

The immediate impact of the information concerns the fit between the information provided and the existing knowledge of the users. Users are likely to be more satisfied if the information provides something new or something different, though for some researchers the confirmation that no information was available was comforting as they could establish priority. The immediate impact and the reasons why some users were satisfied or dissatisfied with the search or request are discussed in Section 6.1.

The active information user can generate a sizeable amount of printed material, in the form of photocopies and search print-outs. Is this stored? Is the requester or searcher the only reader, or is the information disseminated among a wider audience of clinicians and other health care professionals? The results discussed in Section 6.2 provide some clues to these aspects of clinicians' information behaviour.

Information can also have an impact on the way knowledge is put into practice. The results in Section 6.3 refer to the main theme of the project, the impact on future clinical decision making of information obtained from library and information services. The discussion covers the clinical decision making priorities of particular groups of staff, and the extracts from interviews provide case studies (Section 6.4) of how the information helped to improve the quality of patient care, or would do so in the future. Some of the interviews in the critical incident survey of library users and "non-users" also illustrate how information obtained (though not necessarily from the library) helped in clinical decision-making (Section 6.5)

Comparisons with other studies are made in Section 6.6 (more discussion is in Chapter 8, Sections 8.1 and 8.2) and the educational value of information obtained noted in Section 6.7. Summary themes are set out in Section 6.8.

6.1 Immediate impact of information

The majority of users were very satisfied with the results of their request or search (Table 36). For many (88%), new information was provided, some of which could be used immediately (73%).

"could remember having seen something about adverse effect of related drug... found reference"

(Registrar, end-user search)
"previously didn't have much knowledge .. condensed versions in the textbooks tend to be out-of-date .. search revealed a great deal of recent information .. very handy .. could use information from one article immediately"

(SHO, end-user search)

"cancelled some misconceptions .. condition included in textbooks but fairly specialist area .. wanted some background knowledge"

(SHO, ILL request)

"did search for general updating before a lecture to students .. found some useful new information on steroid use "

(registrar, end-user search)

"needed to refresh memory about treatment of ovarian hyperstimulation syndrome .. there had been recent cases in the unit"

(GP trainee, mediated search)

"added to what was already known .. print-out with abstracts provided everything that I needed to know"

(consultant, mediated search)

"needed to check other papers being published on drug (experimental).. found a few things of interest .. confirmed that we are working along the right lines"

(research scientist, end-user)

"had some knowledge .. enough to spot my own ignorance .. used information immediately to change practice"

(GP, ILL request)

"not any wiser after reading article .. but aware of the alternative way of doing things"

(research registrar, ILL )

"knew that's what patient had (rare syndrome) .. remembered from an exam., but needed more information. for planning treatment"

(registrar, end-user search)
Table 36: Immediate impact of information provided

<table>
<thead>
<tr>
<th>Impact statement</th>
<th>% responses YES</th>
<th>% responses NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some of it was new to me</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>I could use some information immediately</td>
<td></td>
<td>73%</td>
</tr>
<tr>
<td>I will need to obtain more information on the topic</td>
<td>71%</td>
<td>25%</td>
</tr>
<tr>
<td>I expected to find something else</td>
<td>17%</td>
<td>70%</td>
</tr>
<tr>
<td>It substantiated what I knew or suspected</td>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>It refreshed my memory of details or facts</td>
<td>57%</td>
<td></td>
</tr>
</tbody>
</table>

Table excludes the "non applicable" responses: hence the percentages will not add up to 100.

As might be expected with personal education and research, the search for information was often ongoing, most (71%) indicating that more information on the topic would be required. For many the information provided confirmation or reminders.

However, nearly one in six of the users indicated that they had expected to find something else. A small majority of this group (53%) were the end-users. Interviews confirmed the possibility that the searchers were not expecting, on the basis of their clinical knowledge, to find very much in MEDLINE, and found their doubts confirmed. Comments suggested that the delay between publication of a journal and appearance of the article in MEDLINE did pose some problems. Those who were dissatisfied with an inter-library loan request generally commented that their hopes, based on the title and abstract, were not realised. However, the search or request did often provide other background information which could be used in the future.

"provided new information .. another piece of the jigsaw puzzle .. but more information will be required as studies ongoing and audit evolving"
(consultant, ILL request)

".. didn't find anything on this .. but quite likely that no information exists"
(registrar, end-user search)

"unfortunately .. didn't find anything new on treatment .. knew all there was to know already .. but did find something new on pathogenesis .. which will be useful eventually"
(senior registrar, end-user)
"search didn't reveal anything .. which helped (for legal case) .. checked up myself when nothing was found (by library) .. but didn't find anything else"
(consultant, mediated search)

"didn't find much that we didn't know earlier .. many reports were anecdotal... redoing search, now looking through review articles to follow up any other clues"
(registrar, end-user search)

"did search for possible research project in department .. but one reference followed up showed that work had been done already"
(consultant, ILL request)

"consultant thought he could remember a case report on this about 10-12 years ago .. did a search but couldn't find anything .. still looking"
(registrar, ILL request)

"article definitely not what was required.. American bias of MEDLINE.. misleading title .. in psychiatry it's a guessing game to find keywords"
(registrar, ILL request)

"sometimes difficult to get very recent journal articles ..have title from Current Contents .. but journal takes 6 months to arrive"
(senior registrar, ILL request)

"MEDLINE not that useful.. often in the right area .. but the specific information lacking .."
(consultant, ILL request)

6.2 Information storage and dissemination

The importance of their own collection of information is demonstrated by the high percentage indicating that the information would be stored (Table 37).
Table 37: Personal collections and dissemination of information

<table>
<thead>
<tr>
<th>Impact statement</th>
<th>% responses YES</th>
<th>% responses NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>I will add this to my personal collection of information</td>
<td>91%</td>
<td>5%</td>
</tr>
<tr>
<td>I will share this information with colleagues</td>
<td>76%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Table excludes the "non applicable" responses: hence the percentages will not add up to 100.

The high priority placed on personal collections reflects both the needs of the researcher, and also the clinician who accumulates medical knowledge on the "just-in-case" basis.

"have over 800 photocopies of articles .. put references on my own database ... with summary and bibliographic details .. use this frequently in discussion with colleagues and for teaching"
(consultant, ILL request)

"would keep as a reference although not immediately useful"
(registrar, ILL request)

"will keep the search results as a reference for future studies"
(lecturer, end-user search)

"use MEDLINE (Dial-up MEDLINE) virtually on a daily basis .. primarily for publication ... download the reference on to (bibliographic software) .. never have to type a reference now"
(consultant)

Most (76%) indicated that the information would be shared with colleagues, though interviews suggested that colleagues will be defined to be a fairly small group (of clinicians). Meetings, case presentations and journal clubs are often a spur to making a request or search, and publication provides a means of dissemination to a wider audience (though career pressures do have an effect).

"will share information with colleagues on cardiac unit .. and hope to publish a couple of papers on this"
(registrar, end-user search)
"will share information with department plus the obstetricians and midwives"
   (SHO, ILL request)

"information for an audit plan .. will affect everyone in community unit"
   (registrar, ILL request)

"required for journal club"
   (SHO, ILL request)

"am seen as the link to academia .. my role is to inform all clinical ..medical and nursing .. staff .. in therapeutic community setting"
   (academic staff, ILL request)

"for possible research project.... but abandoned as it was politically explosive ... colleagues hold very strong professional views"
   (consultant, ILL request)

"search done on behalf of colleague"
   (consultant, mediated search)

"for regular meeting of anaesthetists in region"
   (senior registrar, end-user )

"need to be able to contact colleagues in other regions and units to share ideas and share experiences  ... personal contacts back up the written work"
   (audit staff)

"shared information with partners and the GP education group"
   (GP, ILL request)

"for my own use ..so as to appear better informed at next Drugs and Therapy committee meeting"
   (GP, ILL request)

It should be emphasised the information from the library will reach the "non-user" by indirect routes. The project did not attempt to gauge the scale of this transfer, but there are information gatekeepers among the clinicians who take on the responsibility of informing their colleagues, either personally or at meetings.
6.3 Contribution to future clinical decision-making

The results presented here refer to the main theme of the project, the impact on future clinical decision making of information obtained from library and information services. The results demonstrate that clinicians regard information obtained to be of future use in clinical decision making. The information may have been required for purposes other than direct patient care, but that information would be useful, or indeed was useful, as a basis for more informed decisions about patient care.

Overall, the information provided would contribute most to a better understanding of a patient’s condition (recognition of an abnormal or normal condition), a more informed choice of appropriate therapy (identification or evaluation of alternative therapies), with recognition of the implications of that therapy for the patient and family (improved quality of life for patient and/or family) (Table 38).

The pattern of expected benefits for the Dial-Up Medline group showed far more emphasis on the management of patient care, particularly audit (Tables 39 and Figure 3). This may reflect the composition of the Dial-up Medline sample which was dominated by consultants, and did include proportionately far more GPs than the library group. The missing responses (Section 2.2.4.4), and smaller size of the Dial-Up MEDLINE group mean that comparisons should be drawn with care.

The evidence suggests that the pattern of clinical decisions likely to be affected do mirror the professional concerns of particular groups of staff. The differences in patterns are discussed in more detail in Section 7.8.2. The Dial-Up MEDLINE users may be more active information users than clinicians as a whole, but clearly the need for information on the effectiveness of treatment (for audit or evaluation of therapies) is marked for this group.

The spread of clinical decisions that may be affected is also notable, and reflects the factors that have to be considered in patient care. The average number of types of decision that might be affected was just over three (total frequency count 1594, number of respondents 486) (Table 40). The same information will be useful to different individuals in different ways and to a different extent. The number of clinical decisions that may be affected for an individual does, crudely, serve as an indicator of the utility of the information for that individual.
Table 38: Impact of information on clinical decision making (library group)

<table>
<thead>
<tr>
<th>The information would (or did) help in</th>
<th>Frequency of mention (percentage of response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition of abnormal or normal condition</td>
<td>36%</td>
</tr>
<tr>
<td>Identification/evaluation of alternative therapies</td>
<td>35%</td>
</tr>
<tr>
<td>Improved quality of life for patient and/or family</td>
<td>33%</td>
</tr>
<tr>
<td>Confirmation of proposed therapy</td>
<td>32%</td>
</tr>
<tr>
<td>Differential diagnosis</td>
<td>31%</td>
</tr>
<tr>
<td>Minimisation of risks of treatment</td>
<td>27%</td>
</tr>
<tr>
<td>Audit or standards of care</td>
<td>26%</td>
</tr>
<tr>
<td>Revision of treatment plan</td>
<td>25%</td>
</tr>
<tr>
<td>Choice of diagnostic test</td>
<td>22%</td>
</tr>
<tr>
<td>Legal or ethical issues</td>
<td>16%</td>
</tr>
</tbody>
</table>

79% (383/486) of all respondents indicated that at least one category of clinical decision making would be affected.

89% (321/361) of clinicians indicated that at least one category of clinical decision making would be affected.

Total number of responses = 486 (of which 361 were clinicians)

% response is calculated on the response for the category.

Table 39: Impact of information on clinical decision making (Dial-up MEDLINE group)

<table>
<thead>
<tr>
<th>The information would (or did) help in</th>
<th>Frequency of mention (percentage of response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit or standards of care</td>
<td>62%</td>
</tr>
<tr>
<td>Identification/evaluation of alternative therapies</td>
<td>55%</td>
</tr>
<tr>
<td>Minimisation of risks of treatment</td>
<td>44%</td>
</tr>
<tr>
<td>Confirmation of proposed therapy</td>
<td>43%</td>
</tr>
<tr>
<td>Revision of treatment plan</td>
<td>42%</td>
</tr>
<tr>
<td>Legal or ethical issues</td>
<td>36%</td>
</tr>
<tr>
<td>Recognition of an abnormal or normal condition</td>
<td>31%</td>
</tr>
<tr>
<td>Improved quality of life</td>
<td>30%</td>
</tr>
<tr>
<td>Differential diagnosis</td>
<td>30%</td>
</tr>
<tr>
<td>Choice of diagnostic test</td>
<td>29%</td>
</tr>
</tbody>
</table>

Total number of responses = 60

% response is calculated on the response for the category.
SHOs, as a group, appeared likely to obtain most benefit from information obtained. A utility indicator was derived for each group by adding the raw scores for each clinical decision making category and dividing by the total number of individuals in the staff group (Table 40). This should be regarded as an indicator only, and an estimate of the likely range is given, taking account of the size of the group and the missing data (no response marked for the category). With the least clinical experience, the SHOs are likely to be the least knowledgeable group of doctors, and hence information is likely to be of most benefit to them. The minority of SHOs that do manage to use the library and information service appreciate the information provided, but the service is clearly not reaching the majority of SHOs. Certainly, the non-respondents to the survey of searches and requests would have included SHOs who used the service but did not respond, but the pattern of response to the critical incident survey (where grade of sample individuals was known) suggests that the SHO response was not atypical enough to presume that the low number of SHO respondents in the survey of searches and requests was entirely due to non-response by that group.
Table 40: Utility indicators (clinical decision making) for each staff group

<table>
<thead>
<tr>
<th>Staff group (no. in group)</th>
<th>Clinical decision making: total frequency count</th>
<th>Utility indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHOs (40)</td>
<td>157</td>
<td>3.9 (3.6-4.2)</td>
</tr>
<tr>
<td>Registrars (83)</td>
<td>244</td>
<td>2.9 (2.7-3.1)</td>
</tr>
<tr>
<td>Senior registrars (68)</td>
<td>326</td>
<td>2.8 (2.0-3.6)</td>
</tr>
<tr>
<td>Consultants (105)</td>
<td>305</td>
<td>2.9 (2.4-3.4)</td>
</tr>
<tr>
<td>Total for all library requests</td>
<td>1594</td>
<td>3.3 (3.0-3.6)</td>
</tr>
<tr>
<td>and searches (486)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dial-up Medline (60)</td>
<td>197</td>
<td>3.3 (2.8-3.8)</td>
</tr>
</tbody>
</table>

6.4 Interviews: case studies of value assessments

Interviews illustrated exactly how the information obtained had helped, or would help in clinical decisions. Qualitative, rather than quantitative, indications of benefits to patient care are provided, as future costs would be extremely difficult to estimate. Part (k) of this Section presents some examples where cost savings were implied.

Extracts from interviews are arranged under appropriate categories of clinical decision making. The range of information obtained from most requests or searches would usually affect more than one category of clinical decision making.

The follow-up of the Dial-Up MEDLINE group was by questionnaire, and some examples of topics searched are given, in what appears to be the most appropriate category of decision-making. The striking aspect of the Dial-Up MEDLINE follow-up was the number and variety of recent search topics listed by each respondent in the follow-up questionnaire. Easier access to the "knowledge base of health care" is one explanation, although this group may be more active seekers of information than the average clinician to have bothered to arrange access to Dial-Up MEDLINE.
a. choice of diagnostic test

"immediately can say that all babies with thick meconium or low Apgar scores should have cord gases measured .. early diagnosis means that baby can be treated earlier"

(SHO, end-user search)

"trying to find a definitive suicide risk scale.. this the most useful so far .. would be useful for ensuring patients get appropriate treatment and avoid unnecessary mortality"

(senior registrar, ILL request)

"background information .. to help plan diagnosis in cases of unexplained lung shadowing"

(consultant, ILL request)

"would help in diagnosis of urinary tract infections in very young children.. guidelines very useful .. have changed my own management of these cases.. time very important in these cases .. have to do test quickly. If left can lead to chronic renal problems"

(GP, ILL request)

"new test described in article has enormous potential as a diagnostic test .. would be time saving and qualitatively better .. could be useful as a screening test as it could pick up whether a tumour present at an early stage .. but expensive at present"

(research registrar, ILL request)

"better choice of tests could be made, reducing number of tests actually done"

(SHO, ILL request)

"instead of doing three diagnostic tests, only did the CT scan which the information showed to be the most efficient"

(senior registrar, ILL request)

b. Recognition of an abnormal or normal condition

"looking at optic neuropathy related to trauma.. didn't find anything .. am hoping to write this up as a case report"

(SHO, end-user search)

"had a patient whose brother had suffered from the same (condition) .. checking up on hereditary aspects of this condition ..thought of publishing but search revealed we had not discovered anything new"
"see patients with rare conditions frequently .. recently had looked to see if there was any association with mental retardation for (syndrome) .. papers retrieved helped .. but didn't provide complete solution to issues"
(senior registrar, end-user search)

"spotted article on peritoneal Kaposi's sarcoma .. had patient with Kaposi's sarcoma and abdominal problems at the time ."
(associate specialist, ILL..
request related to SDI service)

"search on aspects of pancreatitis in children .. aim really to write a paper .. will help other radiologists interpret their findings"
(senior registrar, end-user search)

"for post-mortem examination of child with Prader-Willi syndrome .. needed to be sure about cause of death"
(consultant, ILL request)

"for information on baselines scale for studying ..childhood dissociation .. may be more common than is thought"
(senior registrar, ILL request)

"had patients with these complications .. wanted to see whether they were indeed related or if we should look for alternative causes"
(Dial-Up MEDLINE user)

c. Differential diagnosis

"came across an unusual type of arteriovenous malformation .. patient had very severe internal bleeding ... diagnosis is difficult as condition would simulate other conditions, but a contrast study would reveal the relevant lesions .. may write up as case report so that other doctors would be aware that this condition could be a cause of such massive bleeding"
(registrar, end-user search)
"autistic patient had been thought to be suffering from progressive brain disorder .. but symptoms were also compatible with depressive illness, which is treatable... at this age all such behaviour can be blamed on sex abuse which is hard to counter... treatment for the acute depression was effective... useful to have some other evidence ...
(consultant, ILL request)

"suspected that it was impossible to tell difference between benign and malignant tumour of this type on MRI scan .. article confirmed this .. then possible to state that a biopsy was necessary in this case"
(senior registrar, ILL request)

d. Confirmation of proposed therapy

"papers showed that there was a reasonable prognosis if secondary nodes were excised .. could therefore proceed fairly confidently with surgery and patient could be reassured about prognosis"
(senior registrar, mediated search)

"new information obtained on a rare condition .. difficult to find any experience of dealing with this condition .. had helped with management"
(SHO, mediated search)

"doubts had been raised about the behavioural programme.. papers not only confirmed that no harm would be done to the patient.. but provided useful background information on albinism"
(staff grade, mediated search)

"papers had provided more information about an unusual bacterium found in a stomach biopsy (child patient) .... helped provide clinicians with pointers for therapy"
(SHO, ILL request)

"looking at anaesthetic complications of operating on patient with storage disorder syndrome ... did have a meeting to discuss this"
(senior registrar, end-user search)

"looking at effectiveness of sulphasalazine for psoriatic arthropathy"
(Dial-Up MEDLINE user)
e. Identification/evaluation of alternative therapies

"...looking for guidelines on practice management. Very rare accumulation of iron in lungs of children... review articles discussed some theories about origin of the condition. Possible origin may affect treatment that can be attempted."
(senior registrar, end-user search)

"wanted to check whether anyone else had done that operation in that way (using a new technique)... found that the operation had been done, but some differences in technique..."
(registrar, end-user search)

"Paper did evaluate administration method... comparing intermittent high dose with low dose given daily... drug highly toxic... would be useful to know about this in future for evaluation of treatment."
(SHO, ILL request)

"had been asked by patient about new treatment... this is apparently effective but there are some - potentially serious - side effects."
(senior registrar, end-user search)

"to check up on empirical studies of antacid treatment... and hydrogen ion pump treatment... found a few articles, but there could be long forgotten studies as it is an old problem."
(registrar, end-user search)

"wanted general background information to help with ongoing evaluation of therapies used for pathological grief... which may take months to resolve."
(staff grade, ILL request)

"mitral valve repair in infants... possible that repaired lids have a worse outcome than those replaced straight away... studies and evaluations pointing that way... valves have to be replaced in time anyway as child grows... but sometimes decisions have to be made in desperate circumstances."
(registrar, end-user search)

"for critique of possible therapies and treatment... rationale for practice within the unit... search done for literature review for article to be submitted..."
(SHO, ILL request)
"checking medication .. search in fact found information contrary to consultant's advice"

(GP, mediated search)

"wanted to find information on the effectiveness of various treatments for sleep apnoea .. big difficulty is finding studies that have enough patients and are properly conducted.. need follow-up studies to be surer about long-term outcomes .. particularly concerned about the raised mortality with this condition"

(senior registrar, end-user search)

"complementary therapies for multiple sclerosis"

(Dial-up MEDLINE user)

f. Minimisation of risks of treatment

"patient is very sick at present.. am investigating treatment which is used for another condition ..effects of the condition are similar though underlying pathology different .. risks do appear to be minimal"

(registrar, end-user search)

"oesophageal DH monitoring .. would be useful to have a height ratio to determine length of tube.. to reduce risks to patient from exposure to radiation"

(consultant, ILL request)

"need to know if these patients have hyponatraemia... information showed that this drug can have fatal side-effects"

(registrar, mediated search)

"had seen something about adverse effect of a drug related to one being used.. wanted to check on possible side-effects for this patient"

(registrar, end-user search)

"looking at importance of sinus scanning .. are there less risky forms of diagnosis ?. how much radiation is necessary ?"

(consultant, ILL request)

"complications of varicose vein surgery .. to improve such surgery"

(Dial-Up MEDLINE user)
g. Revision of treatment plan

"found there had been recent changes in treatment"
(GP trainee, mediated search)

"will probably now change medication advice given to pregnant asthmatic patients"
(registrar, end-user search)

"looking at use of activated charcoal in A&E (for poisoning) ..would recommend changes to departmental practice"
(staff grade, end-user search)

"for patient with gender identity disorder.. subject of case presentation .. information probably did influence treatment provided but difficult to be categorical in the psychiatric field"
(clinical assistant, mediated search)

"for use of combined antidepressants ... possibility of various combinations of tricyclics, SSRIs, lithium"
(Dial-Up MEDLINE user)

"plan to improve local anaesthesia for awake nasotracheal intubation"
(Dial-Up MEDLINE user)

h. Audit or standards of care

"... anaesthetics for pyloric stenosis .. found information on variances in practice throughout the world .. looking at evaluation of various techniques"
(senior registrar, end-user search)

"needed to justify, consider and evaluate that certain screening was necessary for Down's syndrome children"
(senior registrar, mediated search)

"use of anti-coagulates in ischaemic heart disease .. effectiveness in prevention of embolisms.. research part of clinical audit"
(SHO, end-user search)
"audit of care of paediatric asthma in casualty .. looking at mode of administration of bronchodilators .. think all children should have inhaled medication, rather than syrups ... some GPs still prescribe these (syrups) for younger children"
  
  (SHO, end-user search)

"project on design on new (psychogeriatric ) services "
  (consultant, ILL request)

"project on unmet need for psychiatric services .. of course this is a difficult topic.. problem in assessing the scale of a non-clinical population"
  (GP trainer, end-user search)

"audit of alcoholism services .. looking at treatment being delivered.. initial stages.. looking at internal audit of what is happening here.. and outcomes.. and comparing this with practice elsewhere"
  (consultant, ILL request)

" psychiatric presentation ... looking as aspects of ambulatory care"
  (Dial-Up MEDLINE user)

"ultrasound screening of aortic aneurysm.. gave me idea of the scale of problem for screening"
  (Dial-Up MEDLINE user)

"mortality data after aortic aneurysm surgery ... for audit"
  (Dial-Up MEDLINE user)

"other guidelines on timings in thrombolytic therapy for myocardial infarction .... always looking for methods and how audit is done .. to compare with local work and to use directly if applicable."
  (audit staff, ILL request)

"regional audit centre .. looking at who is using which techniques -and why - for (aspect of respiratory medicine) .. before a re-audit to define areas of best practice and implement national guidelines.. carry out literature searches for all projects .. "
  (audit staff, ILL request)
i. Improved quality of life for patient and/or family

"...research project ... using videotapes to illustrate oral motor function problems .. helps mothers to appreciate the difficulties these children have .. improves relationship between mother and child .. information required in connection with submission of paper"

(senior registrar, ILL request)

"information enabled me to speak with more authority to the family to inform them ... this condition is fatal in 50% of cases"

(senior registrar, end-user search)

"difficulties in lack of understanding between doctor and family .. Asians can suffer from lack of understanding on part of therapist , particularly when the child is seen first"

(registrar, ILL request)

"information helped to reassure elderly lady .. to her the diagnosis of TB was tantamount to cancer .. but could say that her rare condition could be treated"

(SHO, mediated search)

"teaching students about assessment guidelines... which patients might benefit from a particular treatment when the toxicity of treatment is high .. some patients will have only 6 months to live .. some will have more .. article gives clear analysis of how quality assessments can be done"

(senior registrar, ILL request)

"useful to be able to tell people ... information helps to communicate with patients and families, particularly in intensive care units .. level of information provided is sometimes pitifully inadequate... sometimes one word (referring to medical terminology) ..and you've lost them"

(senior registrar, end-user search)

"difficult to get compliance with teenage girls with lupus..... need to ensure patient understands condition .. lessens risk of incurring chronic renal problems .. and dialysis .. paper describes medical condition very clearly"

(senior registrar, ILL request)

"for particular patient problem .. was an unusual case .. information didn't in fact help my decision making that much .. but passed on to the patient .. decision would be up to her"

(GP, mediated search)

"looking at prevention of burns and scalds in childhood .. and consequent psychological morbidity .. "


j. Legal or ethical issues

"condition relates to experiences of abuse .. issues of confidentiality and disclosure are involved .. with information could compare child and adult conditions"

(senior registrar, ILL request)

"had to consider professional responsibilities .. should doctors be responsible for screening or could the job be delegated .. there had been a legal case so was looking for information on this aspect"

(research staff, end-user search)

"at present decision-making for parents is very difficult .. not really possible to assess the likelihood that the foetus will be affected using ultrasound .. sometimes the long length of the limbs is visible, but not always .. could give up-to-date account of the issues involved (at study day which include patients and families in the audience)"

(registrar, end-user search)

"programme involved denying access to fluids .. could be deemed a basic right .. needed to ensure that patient would be not be harmed"

(staff grade, mediated search)

"gave advice in case where there had been problems in patient care management .. infertility treatment involved"

(consultant, ILL request)

"colleague being sued for negligence .. required information on (types of surgery)"

(consultant, mediated search)

"needle found in unusual place .. looking at possible routes of migration.. didn't find much .. but this helped to eliminate some scenarios"

(consultant, mediated search)

"ophthalmic implications of use of laser weapons .. need to be prepared .. and possibly take a stance on these .. in anticipation of technology"

(SHO, ILL request)
k. Monetary value

Many requests or searches were concerned with improving the quality of care for individual patients. For staff in purchasing or audit, the cost-effectiveness of care is a major consideration. The information obtained can therefore provide the signposts and the directions to better care, but implementation of changes will involve discussion with many health care professionals and managers.

Frequently, requests for information concerning immediate patient care may only be made for the more severe or unusual cases. A study which attempted to assess the effect of online searching on length of stay and patient costs found that the test cases were, on the whole, more expensive than the control cases, as the cases for which searches were made were the more severe cases. Where searches were conducted earlier, rather than later, in the treatment, lower costs could be obtained in treatment of these more severe cases (Klein et al. 1994).

Putting an objective monetary value on the benefits of information obtained is not, therefore, easy, particularly when benefits involve a combination of research, education and patient care. It is possible to demonstrate cost savings, but the question of "cost savings for what" is more difficult to answer in isolation.

The examples of possible cost savings given from the interviews do not, therefore, consider the "opportunity costs", for comparison with other possible uses for the money invested, as this is beyond the scope of the present project. The examples do show that while occasional simple cost savings can be demonstrated, the picture is generally more complicated. Examples of simpler cost avoidance include the searches performed to check that the work has not been done before.

"examples of community glaucoma screening .. aim to reduce hospital waiting lists, time spent by patients in clinics"
(research staff, end-user search)

"for comparison of costs... methods for diagnosing urinary tract infection - would dipsticks be cost-effective .."
(GP trainer, ILL search)

"audit covers a wide range of topics .. information would relate very generally to audit.. generally quality issues .. topics relate to standards of practice and partly to costs ... the management of resources has to be considered."
(registrar, end-user search)
"patient management for day case tonsillectomy .. needed background information for general discussion of day case surgery .. looking at possible complications which might make some patients unsuitable for day case surgery .."

(SHO, end-user search)

"wanted evidence to critique proposal for flying squad .. around 100,000 pounds a year would be required... believe that no flying squad ever reduces mortality .. problem is that only the enthusiasts publish .. but did find three or four articles and even two from the enthusiasts did admit there was no medical benefit"

(consultant, ILL request)

"administration of antacid treatment could be done on an outpatient basis .. if this worked then a hospital stay might be avoided for these patients.."

(registrar, end-user search)

"information showed that work had been done already ..research proposal hadn't got beyond the thinking about stage"

(consultant, ILL request)

"one aspect is to prevent duplication of audits and identify gaps where there is totally new work to be done"

(audit staff, ILL request)

6.5 Value of information: general views

Interviews of respondents to the critical incident survey (library users and non-users) revealed that information was often obtained for future rather than immediate clinical needs. The information discussed here did often include both text information and the more numerical information of the patient record. Several interviewees discussed how information in patient records was used for audit or management purposes. In some cases supplementary information was required from journals for these purposes; in others the focus was on internal procedures and records only. The extracts from the interviews illustrate the value of information obtained. In many cases this is the expected value, and in most cases the value would concern more than one category of clinical decision-making, although only one is indicated here.
• Recognition of an abnormal or normal condition

"read up on unfamiliar syndrome "
(SHO)

"wanted information on rare syndrome .. patient had extra complications"
(SHO)

"for House Officers working in Admissions Unit... guidelines on thrombosis"
(registrar)

• Differential diagnosis

"paper suggested that antenatal diagnosis might be possible."
(senior registrar)

"combination of conditions .. found information in journal articles - unavailable in the textbooks"
(consultant)

• Confirmation of proposed therapy

"for patient who had relapsed while on trial regime with cyclosporin."
(staff grade)

"for patient with unusual tropical disease"
(clinical assistant, also GP)

"needed to know what side-effects of anti-malarial tablets were... patient would be taking these for some time"
(GP)

• Identification/evaluation of alternative therapies

"recent trends in tracheotomy ... considering changing techniques used in unit"
(SHO)

• Minimisation of risks of treatment

"trying to reduce use of an addictive drug for night sedation... looking at alternatives"
(SHO)
• Audit or standards of care

"for case presentation... audit of stroke care... treatment with aspirin, warfarin"

(SHO)

"procedures for day stay cystectomy"

(SHO)

"audit for A&E.. looking at notes and cases.. focus the internal performance of staffing"

(SHO)

"for audit of carcinoma of the lung.. compare patient management and outcomes.. information from patient records in cytology"

(registrar)

"for internal audit .. information obtained from colleagues in discussions and from patients' notes.. looking at trabeculectomy combined with another procedure"

(associate specialist)

• Improved quality of life for patient and/or family

"need correct information for patients.. often asked"

(SHO)

"aim of project to make sigmoidoscopy more acceptable to patient"

(registrar)

"for counselling of families .. helps them to know that they are not unique (rare genetic conditions)"

(registrar)

"looking for a self-help group for patient with chronic, undiagnosed pain"

(GP)

• Legal and ethical issues

"concerned with abuse of human rights in other countries ..(psychiatric consequences)"

(registrar)

"for statement on a patient for a solicitor.. needed evidence to back up diagnosis and prognosis"
6.6 Value of information: comparison with previous studies

One observation in the Guy's clinical librarian study (Wilkin & McColl, 1982) was:

"Without exception, while all the clinicians felt that there was some link between the use of the literature and improved patient care they held the view that it would be virtually impossible to establish precise relationships between the two, as it was difficult enough assessing the effect of medical procedures on the outcomes of patient care".

While audit of medical care is undoubtedly a difficult process, progress has been made in the fifteen years since the Guy's programme. "Evidence-based health care" developed from work done at McMaster University in Canada, will affect health care purchasers, providers and medical schools (Muir Gray (ed.) 1994). Critical appraisal of the medical literature is part of the evidence-based approach to problem solving. If progress has been made on the assessment of the effect of medical procedures on patient outcomes, is it possible now to assess the nature of the link between use of the literature and improved patient care?

The NLM study (Lindberg et al. 1993) of the use of MEDLINE was partly prompted by the observation that MEDLINE searches were being used for clinical problem solving as well as for academic and research purposes. In the Rochester study, 80% of the respondents did agree that information supplied by the library changed or would change the way the clinical problem was handled. These changes were subdivided into various diagnostic and treatment categories. These provided an indication of the clinical value of the information obtained, but only an indication, as it would often be difficult to provide categorical "yes" or "no" answers. Later case studies appended to the full report (Marshall, 1991) give illustrations of the value of information that might be obtained.

For the NLM study of MEDLINE, the searches that had some impact on patient care were classified and these categories were used as the basis of the clinical decision making categories used in the Value project. Direct comparison is difficult as the NLM study classified the searches into one category only, whereas in the Value project the clinicians were allowed to select more than one category of decision making. The information obtained would frequently have an impact on more than one category of clinical decision making, particularly when future, rather than present, benefits are being considered.

In the NLM study 45% of the searches helped in the development of an appropriate treatment plan, by either confirmation of proposed therapy, identification and evaluation of an alternative, adjustment of proposed therapy or minimisation of
risks of treatment. 22% of the searches helped in recognition and proper diagnosis of a medical problem or condition, through recognition of the existence of an abnormal (or normal) condition, or differential diagnosis.

In the Value project interviews, 61 interviews discussed a clinical problem for which useful information was obtained. Interview follow-ups for both surveys (critical incident and search/request) are included. These were grouped according to the main impact of the information obtained. (Table 41) Of these, 27% (17/61) concerned the recognition and proper diagnosis of a medical problem or condition, and 53% (32/61) concerned the development of an appropriate treatment plan. (Table 41). The ratio treatment/recognition-diagnosis (53/27) is similar to that of the NLM study (45/22) The remainder of the clinical problems were concerned with audit (5%), legal or ethical issues (5%) or aspects of the "quality of life for patient and/or family" (10%). The latter category was broadly similar to the "maintained an effective physician-patient relationship" category of the NLM study (10% of the searches), the more general concept being used in the Value project to consider the present, and future, psychological and social aspects of care. The similar findings suggest that the categories used in the Value project (based on the NLM study) provide a reasonable classification of clinical decision making.

<table>
<thead>
<tr>
<th>Category of clinical decision making (major category only)</th>
<th>No. of interviews (critical incident and search/request surveys)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of an appropriate treatment plan (including confirmation of proposed therapy, minimisation of risks of treatment, identification and evaluation of alternative therapies)</td>
<td>32</td>
</tr>
<tr>
<td>Recognition and proper diagnosis of a medical problem or condition (including recognition of abnormal or normal condition, differential diagnosis, choice of diagnostic test)</td>
<td>17</td>
</tr>
<tr>
<td>Quality of life for patient and/or family</td>
<td>6</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>3</td>
</tr>
<tr>
<td>Legal or ethical issues</td>
<td>3</td>
</tr>
<tr>
<td>Total no. interviews = 61</td>
<td></td>
</tr>
</tbody>
</table>

6.7 Information for clinical decision making: present and future impacts
Both the NLM study and the Rochester study concentrated on the immediate effects of information on clinical decision making, although the Rochester study did in fact ask

"Did the information provided by the librarian change (or will it change) any of the following? ....

and

"Did the information you received contribute to your ability to avoid any of the following? ......

The pilot study findings for the Value project suggested that information obtained would contribute to clinical decision making, but that changes in clinical behaviour were not likely to be immediate. In most cases, the information adds another piece to the jigsaw puzzle, making the picture clearer. In some cases, the information does complete the puzzle. The information obtained is still valuable, whether or not it does complete the picture or merely make it clearer.

The Value project findings clearly showed that information would, or did, contribute to clinical decision making. The information may have been required for purposes other than direct patient care, but that information would be useful, or indeed was useful, as a basis for more informed decisions about patient care.

The educational value of the information obtained from library and information services must be stressed. Most users found new information, and over one third indicated that the information would help in a better understanding of a condition. For many the information need was ongoing as more information would need to be obtained on the topic. Some of the interviews suggested that the incident or series of incidents that did not fit the pattern would often spark off a search. Three recent cases of some condition thought to be rare, or the co-occurrence of some symptoms, might invite curiosity. Much of the value of information for this type of exploratory, or research enquiry, lies in the testing of hypotheses against the knowledge available. Much information will have to be added, and evaluated against clinical experience, before changes in a decision making pattern will be considered.
6.8 Themes for discussion: value and impact of information obtained

- Information obtained from the library and information services would, or did, help in clinical decision making.

- The monetary value of the information provided is often difficult to assess, but the quality of care and the cost-effectiveness of care are recurrent concerns.

- The educational value of the information obtained is as important to the clinician as the immediate impact on patient care. Information gathering is part of professional reflective practice.

- Most library users are satisfied with the results of their searches and requests.

- Much of the information obtained is shared with colleagues, often at meetings or at case presentations. The community the library and information service reaches may therefore be larger than the group of active users.

- Personal collections of information are very important to clinicians.

These themes are discussed in Chapter 8 (Approaches to audit of information services).
Chapter 7

Information behaviour and continuing professional development: variations on a theme

Continuing medical education covers a broad spectrum of professional information needs. These needs will vary at different stages of a career, and will also depend on the type of clinical experience gained. The format of postgraduate medical education will be more structured once the Calman report (UK. Department of Health, 1993) recommendations are implemented. There is also likely to be more structure to continuing professional development for staff/specialist grades and consultants, and more evidence of continuing education activity will be demanded, though the difficulties of auditing this are acknowledged (Kerr et al. 1993).

Most of the PGME libraries, are by definition, established to support postgraduate medical education, and many libraries are now multidisciplinary to the extent that they offer an access point to library and information services for other healthcare staff, though the number of libraries which offer adequate multidisciplinary resources on site is limited. The move into higher education for nursing staff has not only affected basic nursing education but has had even greater repercussions on the trained staff, who are upgrading their qualifications to degree level. In hospital libraries, often the "PGME library", this had led to an increase in library activities. The increased "busyness" is usually welcome, but attention can be diverted from the main missions of the library, one of which is the support of continuing medical education, in particular postgraduate medical education.

Work has been done to identify the actual costs of postgraduate medical education, so that funds reflect the actual number of doctors being trained. A formula approach to funding of libraries (Godbolt and Hewlett, 1992) poses some problems, but is fairer than historic budgeting and is in line with trends in higher education. If the PGME library does receive funds for junior doctors, based on the number of junior doctors it is supporting, then the level of that support will be examined. Library and information services should be aware of the information needs of doctors at different stages of their careers, so that continuing professional development of clinicians can be supported and promoted.

The following analysis of the patterns of information need and use among different groups of staff is not intended to stereotype users. The intention is to show that such analysis can guide the development of appropriate library and information services for particular groups, and pinpoint present weaknesses.

The patterns of information need and use among different groups of staff (library users and non-users) are discussed in Sections 7.1 to 7.6. Results confirm that
different staff groups do indeed have different patterns of information need and use. Personal education needs, however, remain dominant throughout. The profiles of actual use of library and information services are explored in Sections 7.7 and 7.8, the latter section dealing with the value of the information provided from the viewpoint of different staff groups.

Marketing is concerned principally with the anticipation and efficient satisfaction of consumers' requirements. Providers of services should know what the perceived benefits of a service are for the users of that service. The possible benefits staff groups might gain from library and information services are analysed in Section 7.9. Possible reasons why library and information services are not being used are indicated.

7.1 Patterns of information need and use: SHOs

SHOs primarily need information for their personal education and for patient care, with those purposes often intertwined (Table 42). Just over half the incidents (51%, 35/68) did involve personal education, and patient care purposes were involved in more than one third (around 38%, 27/68, 25/68 incidents). However, 19% (16/84) of the responses indicated that information had not been needed that week, suggesting that the workload of routine patient care is genuinely routine or that time is not available to follow up queries.

Table 42: Purposes of information need among SHOs

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal continuing education</td>
<td>35</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>27</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>25</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues (including case presentations)</td>
<td>16</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>14</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>10</td>
</tr>
<tr>
<td>Research (personal) - planned or in progress</td>
<td>10</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>1</td>
</tr>
<tr>
<td>Research (funded project/degree)</td>
<td>0</td>
</tr>
</tbody>
</table>

Total no. responses studied = 84
Total no. "information not needed that week" = 16
Total no. incidents = 68
Average no. purposes per incident = 2.1
The very high reliance placed on reference books and medical handbooks as sources of information indicates that SHOs' information needs do often require instant solutions (Table 43). Of all groups, SHOs seem most likely to turn to a reference book or medical handbook (69%, 47/68 incidents). However, the local medical library is used (40%, 27/68 incidents), and used more frequently than colleagues or information files or databases (personal or departmental).

Table 43: Information sources used by SHOs

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>47</td>
</tr>
<tr>
<td>Local medical library</td>
<td>27</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>20</td>
</tr>
<tr>
<td>Colleagues</td>
<td>20</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>13</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>12</td>
</tr>
<tr>
<td>Pharmacy (hospital/local)</td>
<td>6</td>
</tr>
<tr>
<td>Total no. responses = 84</td>
<td></td>
</tr>
<tr>
<td>Total no. actual incidents = 84 - 16 = 68</td>
<td></td>
</tr>
<tr>
<td>Average no. sources used = 2.2</td>
<td></td>
</tr>
</tbody>
</table>

Extracts from interviews show the range of information requirements SHOs have:

"required for a seminar ...looking at recent trends in tracheotomy, particular practices and procedures... examining possible changes in unit procedures"

"to read up on a syndrome I hadn't come across before"

"medication practice and policy for disturbed (psychiatric) patients at night .. less use of an addictive drug would help"

"wanted to know more about necrotising fasciitis"..(in the news at the time)

"patient with rare genetic syndrome, with extra symptoms and complications...to write up as a case report"

"use of aspirin and warfarin in management of stroke.. this would be enormously important for future work as a GP"

"preparing for exams...main concern at present"

"few formal needs .. it's the little things all the time ..often connected with one patient ...which lead on to larger principles"
Choice of source often seems a personal decision.

"faster to ask senior colleagues...who apply the knowledge they have.....this is my opportunity to ask questions"

"use psychiatry textbooks.... in the library.... occasionally browse journals"

"for psychiatry case presentations the patient is the main source of information"

"looked through journals for a recent review article"

"audit department a great help"

"for rare syndromes go straight to the library...colleagues not always to answer queries on these"

"used library a lot for research projects and for exams."

Awareness of MEDLINE on CD-ROM varied considerably. Of the thirteen SHOs interviewed, three had never heard of MEDLINE on CD-ROM and had to have the system explained to them, one was unsure whether or not he had used it, and another four had used it only once or twice. If this pattern is representative, around half of SHOs (including GP trainees) are not aware how useful CD-ROM could be for them.

For one interviewee the interview was particularly useful:

"I was made aware of the CD-ROM facility......which was of tremendous help in a literature search for a presentation I did the following week... Thank you"

(comment on interview evaluation return)

The level of competence in use of CD-ROM was not particularly high and skills learnt could easily be lost:

"managed to cope when I had an introduction at medical school ..but was lost next time .. would like to become fluent in CD-ROM use.....then I wouldn't miss things when searching"

"picked up skills required as...went along....need more training in specific search skills... formulating search strategies"

"had used at...(teaching hospital)...useful for exotic subjects... not used here (District General Hospital)...not asked to do anything that warranted use."
Experience of CD-ROM training varied, but training seemed to be limited:

"many colleagues not familiar with computers.... clinical tutor had taken all students to library and shown them personally how to use MEDLINE and had allowed them to play around with it......happy with MEDLINE generally... can be slow, but normally find what's wanted"

"with help from librarian use MEDLINE"

"not suggested that I use it (CD-ROM in the library)"

"computer literate ...find MEDLINE easy to use"

"given basic training by library (Medical School)"

"have to find my own way around"

7.2 Patterns of information need and use: Registrars

Registrars required information mainly for personal education, personal research interests and teaching. Around 37% (17/46, 16/46) of incidents involved personal education, or personal research. The purposes of information need were often linked, but not to the same extent as those of the SHOs (Table 44). Around 23% (14/60) of responses indicated that information had not been required that week. As a group, registrars were the group of hospital staff who were most likely to require information for patient education, although the frequency of need was not high (9% of registrars' purposes).
### Table 44: Purposes of information need among registrars

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal continuing education</td>
<td>17</td>
</tr>
<tr>
<td>Research(personal) - planned or in progress</td>
<td>16</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues (including case presentations)</td>
<td>13</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>8</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>7</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>7</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>7</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>7</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>4</td>
</tr>
<tr>
<td>Other (included journal club)</td>
<td>2</td>
</tr>
<tr>
<td>Research(funded project/degree) - planned or in progress</td>
<td>1</td>
</tr>
</tbody>
</table>

Total no. responses studied = 60
Total no. incidents = 46
Total no. "information not needed this week" = 14 (of which "holiday" etc. = 2)
Average no. purposes per incident = 1.9

Registrars use the local medical library for many queries, (54%, 25/46 incidents). Reliance on reference books and medical handbooks is, for this group, on a par with use of MEDLINE, (26%, 12/46 incidents) (Table 45).

### Table 45: Information sources used by registrars

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local medical library</td>
<td>25</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>15</td>
</tr>
<tr>
<td>Reference books or medical handbooks</td>
<td>12</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>12</td>
</tr>
<tr>
<td>Colleagues</td>
<td>9</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>7</td>
</tr>
<tr>
<td>Other (audit dept., other hospital depts...)</td>
<td>7</td>
</tr>
<tr>
<td>Other database system (database used in one hospital dept.)</td>
<td>5</td>
</tr>
<tr>
<td>Other library</td>
<td>3 (Univ. libraries)</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>3</td>
</tr>
</tbody>
</table>

Total number responses = 60
Total no. actual incidents = 60 - 14 = 46
Average no. sources used = 1.9
Interviews with registrars in a variety of specialties illustrate the variety of information needs and expected outcomes. Searching styles appear to be quite idiosyncratic.

"regional audit survey......needed patient records in the cytology ... but no co-operation from one dept. ...... also I have three personal research projects .. aim to pass on information and skills to colleagues and students.....and ..more specifically to solve individual patient care problems"

"needed more information on rare condition (genetic).... case reports useful.. helpful for counselling of families"

"for lecture to House Officers... guidelines for working in Admissions ..to help recognise abnormal or normal condition... minimise risks and increase confidence of House Officers"

"planning a research project on sigmoidoscopy... interested in comfort of patient during procedure .. to make it more acceptable.."

Choice of source, and pattern of use of library sources varies:

"heard about MEDLINE on CD-ROM... but not used...generally look through the (specialist) journals... use the library about once every two weeks"

"do own searching now ... but got a lot of help from the librarian at first (MEDLINE on CD-ROM)"

"often use pharmaceutical companies for clinical information on dosage.. if required urgently.. use library about twice a month... have not used MEDLINE personally but have had searches done.... not much need for it on a day-to-day basis"

"use library infrequently ...about 6-7 times a month .. have done MEDLINE CD-ROM searches but changing discs is a pain"

"obtain journal articles for a journal club (aims professional interest and continuing education)... best to have some clinical relevance ... but often not specific to a particular patient" (librarian's tasks defined as helping to check the reference, identify source library for journal and/or do photocopying)"

"would welcome training in computer literacy within study leave entitlement"
"problems in searching... quality of information found... often not a definitive answer"

"MEDLINE brilliant for checking references"

"own department library very comprehensive... also at University I always find what is wanted...... would use MEDLINE if available in the department"

Some had heard of the BMA Dial-up MEDLINE service, but at least two were unaware of the service.

### 7.3 Patterns of information need and use: Senior registrars

Senior registrars require information for their personal research interests and associated publication (Table 46). The rare condition or specific problem appears to be the prompt to many queries (37%, 16/43 incidents). Like registrars, senior registrars need information for teaching. The pattern is very similar to that of the registrars though publication is twice as important (15% of registrars' purposes, 34% of senior registrars' purposes). Senior registrars appear to need information quite frequently: only 11% of the responses indicated that information had not been needed that week.
Table 46: Purposes of information need among senior registrars

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research(personal) - planned or in progress</td>
<td>18</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>17</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>16</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>16</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues</td>
<td>13</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>9</td>
</tr>
<tr>
<td>Research(funded project/degree) - planned or in progress</td>
<td>8</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>2</td>
</tr>
<tr>
<td>All other categories</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total number responses = 49</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total no. &quot;information not needed that week&quot; = 6</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total no. incidents = 43</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Average no. purposes per incident = 2.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Senior registrars value the medical library as a source of information (57%, 28/49 incidents) and use MEDLINE frequently for their information needs (41%, 20/49 incidents). Senior registrars place less emphasis on reference books and medical handbooks (Table 47).

Table 47: Information sources used by senior registrars

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local medical library</td>
<td>28</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>20</td>
</tr>
<tr>
<td>Reference book or medical handbook</td>
<td>15</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>8</td>
</tr>
<tr>
<td>Colleague</td>
<td>6</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>6</td>
</tr>
<tr>
<td>Other database system</td>
<td>4 (London dysmorphology, HEALTHPLAN)</td>
</tr>
<tr>
<td>Other library</td>
<td>4 (BMA/RSM/Univ. library)</td>
</tr>
<tr>
<td>Pharmacy (hospital/local)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Average no. sources used = 1.9</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total no. responses = 55</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total no. incidents = 55 - 6 = 49</strong></td>
<td></td>
</tr>
</tbody>
</table>

135
The few interviews arranged with senior registrars suggest that senior registrars tend to be more critical of MEDLINE than the more junior doctors.

"had unusual case .. had to search MEDLINE under textwords... as indexing term not available.... found useful article which suggested the possibility of antenatal diagnosis..and present age (at which this is possible)"

"not doing any research at present...but if (so) use of the library would increase and be more in-depth... at present use the library about once every two weeks for updating....check journals for .. specific interests .. own personal use...increase awareness... important to know....most recent treatment... prefer to browse through journals..... don't use MEDLINE"

"was looking to see whether infertility treatments should be funded....."

"for definitive searches would always do my own searching... but might be happy to delegate other searches"

"(there is). a fixation with MEDLINE...there are other databases.. would be useful to know the extent of overlap between some databases"

7.4 Patterns of information need and use: Staff/specialists

Staff grade doctors, specialists and clinical assistants require information primarily for patient care, personal continuing education, and teaching purposes (Table 48). Information needs may be more specific for this group. Patient care purposes were involved in at least one third of incidents (37%, and 33% 10/27, 9/27). The frequency of information need is similar to that of registrars (24% indicated that information was not needed that week).

Staff and specialist grades rely on reference books and medical handbooks as sources of information. Nearly 60% (16/27) of the responses mentioned use of this type of source, while none mentioned use of MEDLINE (Table 49).
Table 48: Purposes of information need among staff/specialists/clinical assistants

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>10</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>9</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>9</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues</td>
<td>7</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>4</td>
</tr>
<tr>
<td>Research(personal) - planned or in progress</td>
<td>3</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>2</td>
</tr>
<tr>
<td>Research(funded project/degree) - planned or in progress</td>
<td>2</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>0</td>
</tr>
</tbody>
</table>

Total no. responses studied = 35
Total no. "information not needed that week" = 8 (of which "holiday" etc.= 1)
Average no. purposes per incident = 1.7

Table 49: Information sources used by staff/specialists/clinical assistants

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>16</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>10</td>
</tr>
<tr>
<td>Local medical library</td>
<td>8</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>8</td>
</tr>
<tr>
<td>Colleagues</td>
<td>6</td>
</tr>
<tr>
<td>Pharmacy (hospital/local)</td>
<td>1</td>
</tr>
<tr>
<td>Other sources</td>
<td>1</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>0</td>
</tr>
<tr>
<td>Other library</td>
<td>0</td>
</tr>
</tbody>
</table>

Average no. sources used = 1.9
Total no. responses = 35
Total no. incidents = 35 - 8 = 27
Interviews indicate that information is required for particular patient care problems. Continuing education needs are a personal priority, but, outside the PGME framework, the lack of structure for continuing medical education is apparent.

"do occasionally come across cases ...where I have to go scurrying to a textbook"

"had patient on trial regime...had relapsed.. tried to find reference ranges. .. but had to check with the trial co-ordinator.. eventually found there was no specific therapeutic level"

"needed information for a statement on a patient for a solicitor"

"for audit (co-ordination)... obtain information directly from colleagues....discussion of methods...and from patients' notes"

"responsible for in-house teaching ..in anaesthetics and ITU"

Library use is generally low and awareness of services often limited.

"information in the unit.. library with books and journals ..haven't used the main library."

"occasionally browse through journals... but this...not a regular activity... not yet used MEDLINE ..but intend to learn....when ..have time. ....have modem on computer at home... would like to be able to carry out searches from home.. am going to ask librarian about this"

"continuing education difficult for staff grade posts.. this may be the only such post in (hospital).not enough time for background reading....haven't used the CD-ROM yet.. not involved in case presentations yet "

"not used MEDLINE recently.....not a regular library user.. use (specialty) texts ( in department). and own books..... have own CD-ROM drive... is it possible to get hold of copies of MEDLINE...is it expensive?"

"consultant goes through journals.. photocopied articles of topical interest are put into a folder and circulated... you sign when you have read them.. no chance of escape"

"had a search done by library.. came back with references and abstracts.... never heard of MEDLINE on CD-ROM"

7.5 Patterns of information need and use: Consultants
Consultants primarily seek information for patient care queries, teaching, and personal continuing education. (Table 50). Nearly one third of incidents required information for a rare condition or specific patient problem (31%, 33/108), and teaching or personal education was involved in around 28% (30/108, 31/108) of incidents. Purposes of information need were often linked, and information need was frequent (only 14% of responses indicating that information had not been required that week).

Table 50: Purposes of information need among consultants

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>33</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues</td>
<td>31</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>30</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>26</td>
</tr>
<tr>
<td>Research(personal) - planned or in progress</td>
<td>21</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>18</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>13</td>
</tr>
<tr>
<td>Research(funded project/degree) - planned or in progress</td>
<td>8</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>4 (included medico-legal report, audit meeting)</td>
</tr>
</tbody>
</table>

Total no. responses = 132
Total no. "information not needed that week " = 24 (of which "holiday etc." = 5)
Total no. incidents = 108
Average no. purposes per incident = 2.0

For consultants, information sources should be readily available (reference books, medical handbooks) or up-to-date (medical library), or both (personal journals) (Table 51). Consultants, as a group, are more likely to turn to a variety of sources, with reference books used in 43% (46/108) of incidents, the local medical library in 35% (38/108), and personal journals in 32% (35/108) of incidents.
Table 51: Information sources used by consultants

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>46</td>
</tr>
<tr>
<td>Local medical library</td>
<td>38</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>35</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>27</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>21</td>
</tr>
<tr>
<td>Colleague</td>
<td>19</td>
</tr>
<tr>
<td>Pharmacy (hospital/local)</td>
<td>7</td>
</tr>
<tr>
<td>Other sources</td>
<td>6</td>
</tr>
<tr>
<td>(Includes Research project booklets, Trust information dept.)</td>
<td></td>
</tr>
<tr>
<td>Other library</td>
<td>4</td>
</tr>
<tr>
<td>(Includes Univ. library, RSM)</td>
<td></td>
</tr>
<tr>
<td>Other database system</td>
<td>2</td>
</tr>
<tr>
<td>(Includes London dysmorphology)</td>
<td></td>
</tr>
<tr>
<td>Average no. sources used = 1.9</td>
<td></td>
</tr>
<tr>
<td>Total no. responses = 132</td>
<td></td>
</tr>
<tr>
<td>Total no. incidents = 132 - 24 = 108</td>
<td></td>
</tr>
</tbody>
</table>

The interviews with consultants confirm the picture of ongoing continuing education needs with the occasional requirement to check details of treatment or diagnosis. Much of the information is used for evaluation of proposed changes in the management of care, and immediate alterations in treatment are unlikely.

"exploratory... to see if there was any link between (type of lymphoma) ..and (other condition)... nothing was found ... no great surprise.. patient probably didn't have this anyway.... ... most information needs are concerned with patient care"

".. particular treatment for Wilson's disease .. asked pharmacy....drug company faxed information immediately.. usually expect to handle all ongoing clinical needs.... need information for personal education....am writing a book.. information has a very long-term feedback into clinical care... no specific outcomes"

"long-term second generation drug reaction....stilboestrol used in pregnancy .. any increased of breast cancer too .. for mother and daughter?.... tried the CD-ROM (MEDLINE for past 4/5 years)...nothing.. asked pharmacist....still looking"
"mostly information obtained is used for research... doing papers.... or for audit....not happy with protocols for ingested foreign bodies"

post very research oriented... any effect on clinical decisions will be long-term.. but will have an impact eventually ...looking at genetics of diabetes "

Information sources should be up-to-date, and immediately available.

"generally would look at own books first, then library textbooks, and then Silver Platter"

"familiar with MEDLINE but not that computer literate.. frequently need assistance..... remote access would be useful... "

"heard of BMA Dial-up MEDLINE service.. do own searching on MEDLINE in medical library.. very familiar with it.. "

"depends on what is wanted .. may do own searching"

Continuing education requires access to a wide variety of sources.

"use abstracting service from the National Screening programme.... use the medical libraries .. depends where I'm located... also University library ..more journals there .. also British Institute of Radiology library ... like the sanctuary of the medical library (hospital library) ..safe and quiet"

"use university library .. personal visits .. more journals there "

"ILL service very useful"

7.6 Patterns of information need and use: GPs

GPs require information for patient care, principally for queries concerned with drug treatment or therapy (Table 52), which was involved in 54% (67/124) of incidents. Information on rare conditions was required in 35% (43/124) of incidents. Allied to this is the need to update knowledge, and also the need to inform and educate patients (12%, 15/124 incidents). GPs require information less frequently than consultants or SHOs, around 27% of responses indicating that information had not been needed that week.

The sources of information used are usually those available in the office or practice. GPs are likely to consult colleagues (within the practice) (Table 53). Nearly 60% of responses indicated that a reference book or medical handbook was used to answer the query, and colleagues were consulted in 23% of incidents. Many drug
queries can be answered by looking up the drug compendium, as interviews confirmed.

Table 52: Purposes of information need among GPs

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>67</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>43</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>29</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>26</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>15</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues (including case presentations)</td>
<td>12</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>11</td>
</tr>
<tr>
<td>Research(personal) - planned or in progress</td>
<td>8</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>7</td>
</tr>
<tr>
<td>Research(funded project/degree) - planned or in progress</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>3 (included revising formulary)</td>
</tr>
</tbody>
</table>

Total no. responses studied = 168
Total no. "information not needed that week" = 44
Total no. incidents = 124
Average no. purposes per incident = 1.8

Table 53: Information sources used by GPs

<table>
<thead>
<tr>
<th>Information source</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference book or medical handbook</td>
<td>73</td>
</tr>
<tr>
<td>Personal journal collection</td>
<td>34</td>
</tr>
<tr>
<td>Colleague</td>
<td>29</td>
</tr>
<tr>
<td>Personal or unit/dept. information files or databases</td>
<td>21</td>
</tr>
<tr>
<td>Local medical library</td>
<td>12</td>
</tr>
<tr>
<td>Pharmacy (hospital/local)</td>
<td>11</td>
</tr>
<tr>
<td>Other sources</td>
<td>11 (included self-help group, consultant, MAAG, pharmaceutical company)</td>
</tr>
<tr>
<td>Other library</td>
<td>2</td>
</tr>
<tr>
<td>Other database system</td>
<td>1</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>0</td>
</tr>
</tbody>
</table>

Average no. sources used = 1.6
Total no. responses = 168
Total no. incidents = 124
Some extracts from the interviews illustrate the range of topics required and some of the barriers. The cost-effectiveness of care is a recurrent theme.

"looking at prescribing habits of practice... rationalising them.. cost-effectiveness of various drugs.... looking at magazines and journals ... also (use).. friendly neighbourhood pharmacist"

"needed a journal article for question in a distance learning course (in Monitor).. first time had needed to use the medical library in ten to twelve years.....

"things evolve slowly in general practice ..nothing changes overnight"

"wanted information on side-effects of anti-malarial tablets.. compendium didn't give the exact information required.. eventually referred to School of Tropical Medicine"

"problem with government guidelines .. say should vaccinate after (operation) but local consultant says it doesn't matter... and need to consider the costs of treatment as well."

"if we did do this monitoring .. (deleterious) effects on local lab. services .. need to know what others (GP practices) are doing... can't find this type of information from libraries ... the legal/ethical issues in balancing costs of patient care.. (with) .. overloaded services"

"needed overview of HRT ..books not up-to-date enough...needed information quickly.. found answers from talking to others"

"could ask a consultant but would get subjective opinion.."

"for asthma audit... have asked various drug reps.... awaiting replies"

" patient claimed to be transsexual .. asked to be referred for counselling.. consultant psychiatrist said he was not qualified to do this.... passed round various psychiatrists...until found one in (hospital) psychosexual unit who would take him on"
Patient education, and provision of information for patients is given a high priority by some GPs.

"core of the consultation reaching a shared understanding"

"diet sheets for patient with high cholesterol ..out of stock in surgery.... information for patients very difficult to find or obtain ...... databases take 10-15 minutes to navigate ..too time-consuming....need an instant print-out .. would be useful to have a CD-ROM system for this (leaflets)"

"for back exercises... patient with back problem...handed out ARC leaflet"

"self-help groups useful...but difficult to find information on them sometimes....often looking for practical aspects. these are not taught at medical school.. when can patient go back to work...or .. level of pain to be expected"

"use Citizens Advice Bureau to see if there is a local self-help group.. but if they don't come up with something.. then don't know where to go"

Use of PGME libraries is infrequent and awareness of resources such as MEDLINE on CD-ROM is limited.

"MEDLINE... never heard of CD-ROM and Medline"

"Dial-up Medline...BMA - yes heard of... Via Compuserve "

"heard of CD-ROM /Medline......not used"

"heard of but not used (BMA dial-up service)....have to want to look deeply into something ... possibly for audit"

"good local PGME library and good librarian .. use library about twice a year .... combined usually with one of regular meetings or clinics at hospital .... Day to day use standard books "

"most medical schools spoon-feed students... do not teach how to find information"

"have used medical library in the past... but haven't had to use them for some time.... aware of MEDLINE"

"don't need to use the medical library... don't think I need to use MEDLINE"
"get information from visiting reps. and meetings with colleagues .. usually attend a course (week) about once a year"

"unaware that the librarians would handle telephone inquiries and conduct searches"

7.7 Purposes of searches and requests: staff group differences

Both professional development needs and patient care responsibilities vary with the type of post held and position on the career ladder. These differences are reflected in the pattern of purposes behind library and information service searches and requests (Table 54). Personal education needs provide a motive for many searches or requests by SHOs. Registrars, and senior registrars are, not surprisingly, more motivated by personal research interests. The comparatively low percentage for personal research purposes given by consultants suggests more involvement in funded research projects (many requests and searches coming from the university hospital library site).

Table 54: Purposes of information need: search/requests: differences between staff groups

<table>
<thead>
<tr>
<th>Purpose/staff group (% frequency)</th>
<th>SHO</th>
<th>Registrar</th>
<th>Senior registrar</th>
<th>Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal continuing education</td>
<td>50%</td>
<td>28%</td>
<td>31%</td>
<td>33%</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research (personal)</td>
<td>43%</td>
<td>43%</td>
<td>HIGH</td>
<td>49%</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching - staff/students. (incl. case presentations)</td>
<td>38%</td>
<td>29%</td>
<td>24%</td>
<td>27%</td>
</tr>
<tr>
<td>Publication - paper/review/report/book</td>
<td>33%</td>
<td>28%</td>
<td>40%</td>
<td>17%</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>18%</td>
<td>15%</td>
<td>22%</td>
<td>27%</td>
</tr>
<tr>
<td>Total no. in sample</td>
<td>40</td>
<td>83</td>
<td>68</td>
<td>105</td>
</tr>
<tr>
<td>Average no. purposes per request/search</td>
<td>2.2</td>
<td>1.8</td>
<td>2.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Consultants and registrars have a narrower spectrum of purpose than senior registrars and SHOs, with fewer purposes per search. Taking account of the
differences in spectrum of purpose, consultants are the group most likely to make a request or search in connection with a patient care problem (rare condition or specific problem). Consultants are the least likely to make a search or request in connection with publication needs (suggesting that they have their own sources or that someone else does the work on their behalf). The SHOs in the sample are possibly atypical, which may account for the high priority given to personal research and publication. The need for information for case presentations is less surprising, and SHOs in particular are likely to be motivated by case presentation requirements.

For the Dial-Up MEDLINE group, the main reasons for seeking information were personal research, continuing education and publication (Table 55). The usefulness of MEDLINE for checking references when writing a paper is evident to this group, as it is to users of MEDLINE on CD-ROM in the library (Table 56). The profile of purposes for both the Dial-Up MEDLINE group and the library end-user group is very similar, although the Dial-Up MEDLINE had more purposes per search (3.0) than the library end-user group (1.9). Possibly, the Dial-Up MEDLINE group are making more speculative searches than the library end-user group. The convenience of Dial-Up MEDLINE may change the way in which MEDLINE is used.

Table 55: Purposes of information need: Dial-Up MEDLINE group

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>Frequency of mention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research (personal) - planned or in progress</td>
<td>41</td>
</tr>
<tr>
<td>Publication - paper/report/book</td>
<td>27</td>
</tr>
<tr>
<td>Personal continuing education</td>
<td>25</td>
</tr>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>21</td>
</tr>
<tr>
<td>Teaching - staff/students/colleagues</td>
<td>21</td>
</tr>
<tr>
<td>Research (funded project/degree) - in progress or planned</td>
<td>17</td>
</tr>
<tr>
<td>Patient care - audit/standards/guidelines</td>
<td>13</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>13</td>
</tr>
<tr>
<td>Patient care - patient care administration or records</td>
<td>3</td>
</tr>
<tr>
<td>Teaching - patient education</td>
<td>0</td>
</tr>
</tbody>
</table>

No. of searches = 60
Certainly the Dial-Up MEDLINE group appear to have more purposes in mind when searching, which may reflect the nature of their work responsibilities. Around half the Dial-Up MEDLINE group were consultants, while registrars and senior registrars dominated the library end-user group (Tables 8 and 10, Chapter 2).

The Dial-Up MEDLINE group do appear to be using MEDLINE more for enquires about therapy and audit than the library end-user group (Table 57). It is possible that the greater convenience of Dial-Up MEDLINE may prompt more searches for patient care problems.

Table 57: Patient care purposes: Dial-Up MEDLINE and library end-user comparisons

<table>
<thead>
<tr>
<th>Purpose of information</th>
<th>% frequency of mention : Dial-Up MEDLINE group</th>
<th>% frequency of mention: clinician end-user in library</th>
<th>Ratio of frequencies: Dial-Up MEDLINE/ clinician end-user in library</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient care - rare condition or specific problem</td>
<td>HIGH</td>
<td>23%</td>
<td>1.52</td>
</tr>
<tr>
<td>Patient care - audit or standards or guidelines</td>
<td>22%</td>
<td>12%</td>
<td>1.83</td>
</tr>
<tr>
<td>Patient care - specific drug or therapy query</td>
<td>22%</td>
<td>11%</td>
<td>2.0</td>
</tr>
<tr>
<td>No. purposes per search = 3.00</td>
<td>No. purposes per search = 1.9</td>
<td>Overall ratio = 3.00/1.9 = 1.58</td>
<td></td>
</tr>
</tbody>
</table>

Certainly the Dial-Up MEDLINE group appear to have more purposes in mind when searching, which may reflect the nature of their work responsibilities. Around half the Dial-Up MEDLINE group were consultants, while registrars and senior registrars dominated the library end-user group (Tables 8 and 10, Chapter 2).

The Dial-Up MEDLINE group do appear to be using MEDLINE more for enquires about therapy and audit than the library end-user group (Table 57). It is possible that the greater convenience of Dial-Up MEDLINE may prompt more searches for patient care problems.
7.8 The impact and value of information provided: staff group differences

The educational and research priorities of clinicians change as their career progresses. The impact, and value of the information provided will therefore depend not only on the individual but also on their prior knowledge, and the power available to them to implement decisions based on the information.

7.8.1 Immediate impact of information: staff group differences

Consultants were less likely than any of the other groups of staff to indicate that some information was new (Table 58). Accordingly, a higher proportion of consultants indicated that the information substantiated what they knew or suspected. Registrars, and senior registrars in particular, were more likely to require more information on the topic, reflecting their research interests. The research and teaching responsibilities of some senior registrars may account for the higher proportion of this group indicating that information would be shared with colleagues.

Table 58: Immediate impact of information provided: staff group comparisons

<table>
<thead>
<tr>
<th>Statement of impact</th>
<th>% SHOs</th>
<th>% Registrars</th>
<th>% Senior registrars</th>
<th>% Consultants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some of it was new to me</td>
<td>92%</td>
<td>90%</td>
<td>92%</td>
<td>79%</td>
</tr>
<tr>
<td>It substantiated what I knew or suspected</td>
<td>61%</td>
<td>67%</td>
<td>67%</td>
<td>78%</td>
</tr>
<tr>
<td>I could use some information immediately</td>
<td>69%</td>
<td>71%</td>
<td>73%</td>
<td>75%</td>
</tr>
<tr>
<td>I need to obtain more information on the topic</td>
<td>68%</td>
<td>76%</td>
<td>79%</td>
<td>66%</td>
</tr>
<tr>
<td>I expected to find something else (YES)</td>
<td>11%</td>
<td>17%</td>
<td>14%</td>
<td>13%</td>
</tr>
<tr>
<td>I expected to find something else (NO)</td>
<td>68%</td>
<td>75%</td>
<td>81%</td>
<td>75%</td>
</tr>
<tr>
<td>I will share this information with colleagues</td>
<td>77%</td>
<td>76%</td>
<td>85%</td>
<td>73%</td>
</tr>
</tbody>
</table>

7.8.2 Value to clinical decision making: staff group differences

Certain aspects of clinical decision making are of particular interest to some grades of staff. For SHOs the pattern is consistently high, but with less emphasis on management issues (Table 59). This group is still on the steep slopes of the learning curve and they have more generalities to learn and appreciate than the other more specialist staff. Registrars and senior registrars have more specific priorities, and registrars appear particularly concerned about quality of life issues. Consultants are particularly interested in choice and evaluation of treatment. The
pattern for the Dial-up Medline group consultants is the same as that for the Dial-up Medline group as a whole.

Table 59: Which clinical decisions are of most interest - and to whom?

<table>
<thead>
<tr>
<th>Staff group</th>
<th>Rank (percentage frequency for group)</th>
<th>Rank (percentage frequency for group)</th>
<th>Rank (percentage frequency for group)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
</tr>
<tr>
<td>SHOs</td>
<td>Recognition of normal/abnormal condition (54%) = Revision of treatment plan (54%) (tied)</td>
<td>Identification or evaluation of alternative therapies (51%)</td>
<td></td>
</tr>
<tr>
<td>Registrars</td>
<td>Quality of life for patient and/or family (46%)</td>
<td>Recognition of abnormal or normal condition (41%)</td>
<td>Identification or evaluation of alternative therapies (36%)</td>
</tr>
<tr>
<td>Senior registrars</td>
<td>Identification or evaluation of alternative therapies (44%)</td>
<td>Recognition of abnormal or normal condition (42%)</td>
<td>Differential diagnosis (37%)</td>
</tr>
<tr>
<td>Consultants</td>
<td>Confirmation of proposed therapy (49%)</td>
<td>Identification or evaluation of alternative therapies (48%)</td>
<td>Minimisation of risks of treatment (39%)</td>
</tr>
<tr>
<td>Dial-up Medline group</td>
<td>Audit or standards of care (62%)</td>
<td>Identification or evaluation of alternative therapies (55%)</td>
<td>Minimisation of risks of treatment (44%)</td>
</tr>
</tbody>
</table>

Concern with legal and ethical issues is greatest for the Dial-up Medline group, which mirrors their interest in audit and standards of care. Quality of life considerations figure highly for SHOs and registrars but appear of less concern to senior registrars and consultants (Table 60). Concern with legal and ethical issues appears to increase with seniority, as concern with quality of life for the patient declines (comparatively).

Table 60: The legal-ethical : quality of life "see-saw"

<table>
<thead>
<tr>
<th></th>
<th>Legal or ethical issues: % mentioning benefit</th>
<th>Quality of life for patient and/or family: % benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dial up Medline group</td>
<td>36%</td>
<td>30%</td>
</tr>
<tr>
<td>Consultants</td>
<td>25%</td>
<td>31%</td>
</tr>
<tr>
<td>Registrars</td>
<td>17%</td>
<td>46%</td>
</tr>
<tr>
<td>SHOs</td>
<td>14%</td>
<td>50%</td>
</tr>
</tbody>
</table>
7.9 Benefits and barriers: use of information

Analysis of the patterns of information need and use indicates how different groups of staff use various sources of information. These patterns, together with the interviews, provide pointers to the likely costs and benefits that are being considered before efforts are made to obtain information. Some of these may seem self-evident, but an emphasis must be placed on understanding the perceptions and awareness of the information user. Successful prediction of the effects of changes in information services on information-seeking behaviour depends on such an understanding.

The cost/benefit equation is simply:

Are likely costs in terms of effort to obtain the information greater or less than personal benefits plus benefits to patient care?

Various factors affect the estimation of costs and benefits:

1. time constraints (is information required there and then, or is information required for long-term professional development?)
2. prior knowledge (is clinical experience sufficient?)
3. users' awareness (how much is known about information services?)
4. appraisal of information (can the information be evaluated?)
5. quantity of information (how much will suffice, and is there a possibility of overload?)
6. power and responsibilities (is the information likely to bring some kudos, are there expectations of the post?)

The perceived costs or effort in obtaining information are defined here as time costs i.e. the clinician has to spend some time in accessing the information and reading the information. The costs of buying resources or services has been excluded from the present analysis.

The benefits of the information are both personal (continuing professional development and improved career prospects for the clinician) and organisational (better quality of care for patient through more informed clinical decision-making). Both extrinsic (examinations, fear of litigation) and intrinsic (personal curiosity) motivating factors will play a part.

Each particular group of staff will operate with similar extrinsic factors, though intrinsic factors, which will depend more on personality, are likely to vary more. By analysing the pattern for each group, the actual barriers to information flow can be identified. The following tables draw on the evidence discussed in Chapter 7, as well as evidence from other Chapters. For example, Section 4.1 compares prompts to a request and search, Sections 5.1 and 5.2 consider some of the information
seeking and selection characteristics of different staff groups. Findings from these Sections have contributed to the following tables on benefits and barriers.

7.9.1 Benefits and barriers: information use by SHOs

Analysis of the SHO pattern suggests that library and information services in PGME libraries need to be aware of the information skills SHOs may, or may not possess. If SHOs have little experience of using MEDLINE, and if that experience was gained in the context of medical school training, then their perceptions of MEDLINE's usefulness and importance are likely to be low. Time constraints mean that any attempts to teach information skills should, if possible, be combined with other purposes of information-seeking. Extrinsic reasons such as examinations and case presentations are likely to be more pressing than personal curiosity at this stage of a medical career. However, project work (if this is part of the curriculum) may offer a better opportunity to develop a variety of information skills, including not only the retrieval of information but also critical appraisal of that information.

The reliance on sources that are immediately available suggests that database services that are in the workplace will be used (provided the SHOs feel sufficiently confident in their use).

If the information awareness of SHOs is to be improved, then the colleagues on whom they may rely for information also need to be aware of library and information services. The interviews suggested that their more senior colleagues largely viewed their responsibilities as the inculcation of clinical knowledge and judgement, but not advice on how to find clinical textual information.

Library and information services in PGME libraries need to:

- provide services that meet the specific needs of SHOs, particularly GP trainees;
- increase awareness of services, and provide training at times when SHOs are most likely to be receptive;
- be aware of the information skills training SHOs are likely to have received.
Table 61: Analysis of the SHOs’ pattern

<table>
<thead>
<tr>
<th>a. Valuation factor</th>
<th>Effect</th>
<th>Implications for information provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time constraints</td>
<td>Lack of time - immediate decisions required for patient care</td>
<td>Sources used must be immediately available</td>
</tr>
<tr>
<td></td>
<td>Lack of time - information seeking may need to be multi-purpose</td>
<td>Information seeking in the library likely to be associated with case presentations or personal research or at the request of someone else</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>Limited clinical experience</td>
<td>Will ask more senior colleagues until sufficiently confident</td>
</tr>
<tr>
<td>Users’ awareness</td>
<td>Will depend on medical school experience of library use</td>
<td>Possibly limited confidence and competence in information-seeking skills</td>
</tr>
<tr>
<td>Appraisal of the information</td>
<td>Use of formal sources will depend on familiarity with use of such sources</td>
<td>Informal sources (colleagues) may be preferred</td>
</tr>
<tr>
<td>Quantity of information</td>
<td>Fear of being overloaded with unwanted details: will often want immediate answer to a question</td>
<td>More detailed information seeking will be done only for a project of some sort</td>
</tr>
<tr>
<td>Power and responsibilities</td>
<td>Career plans (whether GP trainee or not)</td>
<td>Limited time for GP trainees to become familiar with information services</td>
</tr>
<tr>
<td></td>
<td>Power and responsibilities limited</td>
<td>Likely to be a &quot;dependent&quot; rather than an &quot;independent&quot; user of library services</td>
</tr>
</tbody>
</table>

b. Motivating factor:

Extrinsic: Examinations, project work, case presentations

Intrinsic: personal career development plans

| More likely to require library services                                      | Require tailored training                                          |
| GP trainees have limited opportunities for becoming familiar with library and information services | Marketing of services needs to be precisely aimed at needs |
7.9.2 Benefits and barriers: information use by registrars

Analysis suggests that registrars will be receptive to services that support their specialised interests, though the interviews also indicated that registrars may have developed their own means of finding, using and storing information. Some registrars may not feel the need to use all the library services, and may therefore be unaware of services that could help them with their personal research and publication needs (Table 62).
Table 62: Analysis of the registrars’ pattern

<table>
<thead>
<tr>
<th><strong>a. Valuation factor</strong></th>
<th><strong>Effect</strong></th>
<th><strong>Implications for information provision</strong></th>
</tr>
</thead>
</table>
| Time constraints         | More time available to develop specialised interests | May be interested in SDI type services  
May be interested in databases for personal use |
| Prior knowledge          | Clinical experience increasing - also responsibilities | More interested in specialised aspects of patient care; more interested in MEDLINE searching, and more need to keep up to date with journals |
| Users' awareness         | May spend more time in library looking at journals but may prefer to use departmental and personal resources | May use the library only to obtain articles on ILL loan |
| Appraisal of the information | Should become familiar with the specialist journals and other resources, libraries.. | Critical appraisal skills? |
| Quantity of information | More likely to be interested in knowing all there is on a specific topic | Need to know how to do a comprehensive search, and find up-to-date material - use of databases other than MEDLINE possibly |
| Power and responsibilities | Teaching responsibilities for junior staff  
Patient education | Need up-to-date and review type material  
Ability to find latest information on a topic  
Awareness of patient information sources  
Involvement in development of resources? |

| **b. Motivating factor:** | | |
|---------------------------|------------------|------------------|------------------|
| Extrinsic: Case presentations, publication, departmental projects, specialist examinations | Increased use of library - but interest also in network services | Interest in bibliographic software?  
Interest in word-processing? |
| Intrinsic: personal career plans, personal research | Requirement for services to support research and publication | Access required to a variety of services  
Impact on ILL services |
7.9.3 Benefits and barriers: information use by senior registrars

Senior registrars are likely to be users of library and information services, to an extent that should make them useful sources of advice and comment on the library and information services. They will be interested in a variety of sources and should, in most cases, be expert users of MEDLINE to the extent that they know what to expect from a search, and can appraise the results. Their research and publication interests make them a likely market for database and bibliographic software (Table 63).
Table 63: Analysis of the senior registrars’ pattern

<table>
<thead>
<tr>
<th>a. Valuation factor</th>
<th>Effect</th>
<th>Implications for information provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time constraints</td>
<td>Research/publication/patient care are priorities</td>
<td>May be interested in SDI type services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May be interested in databases for personal use</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>Greater clinical experience</td>
<td>Should be able to advise rather than be advised</td>
</tr>
<tr>
<td></td>
<td>More awareness of the literature</td>
<td></td>
</tr>
<tr>
<td>Users’ awareness</td>
<td>Should be familiar with required sources and library services</td>
<td>Needs access to wide range of up-to-date resources</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Likely to be an independent user - and keen on networked services</td>
</tr>
<tr>
<td>Appraisal of the information</td>
<td>Should be no problem</td>
<td>Greater powers of critical appraisal of both the literature and the databases</td>
</tr>
<tr>
<td>Quantity of information</td>
<td>Likely to accumulate a large personal collection of articles...</td>
<td>Interest in bibliographic software</td>
</tr>
<tr>
<td>Power and responsibilities</td>
<td>Teaching responsibilities</td>
<td>Independent searcher</td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td></td>
</tr>
</tbody>
</table>

b. Motivating factor:

Extrinsic: Research, specialist qualifications, publication, funded research

Intrinsic: personal research, career plans

Increased use of library - but interest also in network services

Requirement for services to support research and publication

Interest in bibliographic software?

Interest in word-processing?

Access required to a variety of services

Impact on ILL services
7.9.4 Benefits and barriers: information use by staff/specialists/clinical assistants

This category does cover a broad range of types of post, and information needs. Many of the posts are part-time. Awareness of library and information services is therefore generally low. These posts are outside the PGME framework and although the post-holders attach importance to their own continuing education, they are often unsure about the level of support that can be offered. However, the need for information for patient care is evident and targeted services might appeal to many in this group (Table 64). Feedback is, however, likely to be limited.
Table 64: Analysis of the staff/specialist/clinical assistants' pattern

<table>
<thead>
<tr>
<th>Valuation factor</th>
<th>Effect</th>
<th>Implications for information provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time constraints</td>
<td>Part-time working frequent</td>
<td>Need services that don't rely on personal library visits. Tend to be elusive</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>Can be limited. May have other clinical responsibilities and experience (e.g. GPCAs)</td>
<td>No structure for CME - dependent on hospital.</td>
</tr>
<tr>
<td>Users' awareness</td>
<td>May depend on other clinical posts held. Likely to be low</td>
<td>Better targeting of services</td>
</tr>
<tr>
<td>Appraisal of the information</td>
<td>Variable</td>
<td>Better targeting of services, aimed at CME needs as well as patient care related information needs</td>
</tr>
<tr>
<td>Quantity of information</td>
<td>May not have time to deal with much information and rely on department resources</td>
<td>May appreciate an SDI type service. Feedback likely to be limited</td>
</tr>
<tr>
<td>Power and responsibilities</td>
<td>Responsibilities very varied</td>
<td>Varied needs: difficult to &quot;lump&quot; together as a group</td>
</tr>
<tr>
<td>Motivating factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrinsic: Specific responsibilities of post and contract, specialist qualifications, lack of structure for CME</td>
<td>Will have requirements for library and information services, but may not be aware of services</td>
<td>Better marketing of services</td>
</tr>
<tr>
<td>Intrinsic: personal career plans</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Motivating factor

Extrinsic: Specific responsibilities of post and contract, specialist qualifications, lack of structure for CME
Intrinsic: personal career plans
Will have requirements for library and information services, but may not be aware of services
Better marketing of services
Targeting of services
7.9.5  Benefits and barriers: information use by consultants

Consultants are likely to have built up considerable personal collections of information, and provision of specialised services should take account of how these are organised. Although some appreciate the library as a sanctuary, they do also like information resources to be available immediately. The nature of the post does also mean that there are wide variations in information behaviour within this group (Table 65).
### Table 65: Analysis of the consultants' pattern

<table>
<thead>
<tr>
<th><strong>a. Valuation factor</strong></th>
<th><strong>Effect</strong></th>
<th><strong>Implications for information provision</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time constraints</td>
<td>Immediate patient care needs infrequent, but required immediately. Long term CME needs.</td>
<td>Often information needs may require in-depth - but non-urgent searches. Occasional urgent requests.</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>Will vary according to time in post</td>
<td>Perception of need for SDI type service will vary.</td>
</tr>
<tr>
<td>Users' awareness</td>
<td>Variable. Likely to have extensive personal information resources</td>
<td>Services need to take account of the personal resources and way these are used. If personal resources are used, awareness of library resources will be low.</td>
</tr>
<tr>
<td>Appraisal of the information</td>
<td>More likely to be interested in management/audit material than other groups</td>
<td>Need for library services to be aware of developments within units and management (e.g. NHSME) material. Awareness of the &quot;gatekeepers&quot; and innovators.</td>
</tr>
<tr>
<td>Quantity of information</td>
<td>Likely to have idiosyncratic information seeking/storing strategies</td>
<td>Appreciation of specific targeted services and remote access to such services.</td>
</tr>
<tr>
<td>Power and responsibilities</td>
<td>Responsibilities for patient care and teaching</td>
<td>Require up-to-date information: reviews useful.</td>
</tr>
</tbody>
</table>

**b. Motivating factor:**

- **Extrinsic:** Variable - may involved research/teaching responsibilities, legal aspects of patient care management, audit.
- **Intrinsic:** personal research

<table>
<thead>
<tr>
<th>Effect</th>
<th>Implications for information provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varied needs</td>
<td>Varied profiles of information behaviour (and influence on the dept.) Variable impact: should require access to wide variety of resources Extent of research interests will determine impact on ILL services.</td>
</tr>
</tbody>
</table>
7.9.6 Benefits and barriers: information use by GPs

GPs need information which will help in the clinical and management aspects of cost-effective patient care. Lack of time for searching for information means that information has to be immediately available for day-to-day decisions. Training practices and the larger health centres have their own resources of books and journals, and may have information for patients, which is of more interest to GPs than other groups of doctors. Information needs are very broad. Hospital medical libraries may be used as a source of information for rare conditions, or specific problems, but are unlikely to have all the resources that GPs might require. The conditions for obtaining the Postgraduate Education Allowance do not encourage use of libraries, although study days may be held in postgraduate centres and some GPs do take the opportunity to use the library on those occasions. Infrequent use of medical libraries means that awareness of information services is very low (Table 66).
Table 66: Analysis of the GPs' pattern

<table>
<thead>
<tr>
<th>a. Valuation factor</th>
<th>Effect</th>
<th>Implications for information provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time constraints</td>
<td>Information often has to be instantly available and usable</td>
<td>Resources have to be office based or available directly from office (or home)</td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>Most drug/therapy queries easily answered. The &quot;cost-effectiveness&quot; queries are more problematic. Information on rare conditions or specific problems required occasionally.</td>
<td>Information provided has to answer the questions: &quot;is this treatment cost-effective in general&quot; and &quot;is this treatment right for this patient?&quot;</td>
</tr>
<tr>
<td>Users' awareness</td>
<td>Likely to be low. Resources in the surgery will cover most day-to-day needs.</td>
<td>Library services have to discover exactly what GPs need.</td>
</tr>
<tr>
<td>Appraisal of the information</td>
<td>Little time to critically evaluate information: more interest in patient information</td>
<td>Format of information provision important</td>
</tr>
<tr>
<td>Quantity of information</td>
<td>Much information received</td>
<td>Format and quantity of information provided important: practice guidelines rather than accounts of research</td>
</tr>
<tr>
<td>Power and responsibilities</td>
<td>Focused on long-term needs of patients: work with colleagues</td>
<td>Broad spectrum of information needs</td>
</tr>
</tbody>
</table>

b. Motivating factor:

Extrinsic: Continuing education (PGEA), fundholding aspects of service provision, audit

Intrinsic: personal career plans

<table>
<thead>
<tr>
<th>Effect</th>
<th>Implications for information provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emphasis on clinical, social and management aspects of care</td>
<td>Broad range of resources required</td>
</tr>
<tr>
<td>Study day attendance</td>
<td>Attend courses in PG Education Centre but little emphasis on library use in PGEA compliance</td>
</tr>
</tbody>
</table>

7.10 Discussion: benefits and barriers

Studies of the total purposes of information use among clinicians can hide particular needs of some staff groups. Studies of library use, rather than need, focuses attention on library users, who may not represent all staff groups. Few studies have examined the profiles of information need among different groups of medical staff in any detail. In an American study (Woolf & Benson, 1989) which compared faculty and housestaff perceptions of the purposes and type of medical reference information required quickly, medical housestaff were more likely to
require information for patient management and diagnostic work-ups than faculty, reflecting the patient care responsibilities of housestaff. Faculty required medical reference information quickly for research and in preparation for conferences and rounds. Housestaff frequently looked for information on recommendations for treatment, differential diagnosis and diagnostic criteria. Covell et al. (1985) found a similar emphasis on diagnostic uncertainty and treatment strategies in a study of the self-reported information needs of office physicians. Both these American studies were studying perceived need for information, rather than use of information.

The junior doctor respondents in the Value project also required information that would help in patient care. The purposes of information need for SHOs focused on patient care, and their use of library services showed that information which provided a better understanding of a condition and its treatment was highly valued. Of all groups of hospital staff, registrars were most likely to require information for patient education, and this is reflected in the high priority they placed on "quality of life" aspects of clinical decision making, when they were asked to value information provided. The pattern for consultants is more diverse, as expected, but the need to evaluate proposed changes in patient care management found in the critical incident survey was reflected in the priority given to audit and evaluation of therapies in valuation of information provided. No parallels can be drawn between the study of the general pattern of information need and use, and the value of information provided for the staff/specialist groups and the GPs, as the number of library requests and searches from those groups was too small to be analysed.

Perceived needs for information and the sources used to meet those needs vary with each staff group. This is hardly surprising, but the analysis does demonstrate how library and information services could target and anticipate the needs of particular groups. A study in Oxford of library users (Brember & Leggate, 1985) distinguished between the practitioner, researcher, and practitioner-researcher patterns of information use. One of the conclusions of the Oxford study was that a knowledge of the differences among members of the population to be served is essential to library effectiveness. Their approach to qualitative modelling of library user behaviour illustrated why and how each group valued and used certain library services. There are parallels in some of the observed patterns in this and the present study, but the NHS reforms, among other changes, do mean that there are significant differences as well. A move towards formula funding for library services does mean that library use (potential and actual) has to be assessed for each group of staff, and a qualitative approach, to provide what Brember and Leggate termed a "rich picture" of information seeking behaviour, remains the best way of assessing, predicting and improving library effectiveness.

Both surveys confirmed that SHOs, staff grades, and GPs use the medical library infrequently. Should this be a cause of concern or taken as the state of the world? The survey of searches and requests showed that SHOs did value the information
obtained. Interviews suggested that awareness of library and information services, particularly CD-ROM, may be very low among this group of users. The assumption that all SHOs learn how to search on MEDLINE at medical school seems unwarranted, and learning the mechanics of searching does not equate with knowing how to use MEDLINE to solve problems at work.

At present many libraries are judged, and judge themselves, in terms of input-output statistics. These are useful as indicators of workload and performance in terms of efficiency, but reveal little about the effectiveness of the library services. A few active users can distort both the library statistics and the perceptions of the library about the actual effectiveness of the service. Library and information services can be lulled into thinking that the community of users is being served, with heavy use of CD-ROM and inter-library loans by registrars, senior registrars (and, increasingly, nursing and allied health staff). Moreover, registrars and senior registrars do visit the library personally and spend time there, which makes a good working relationship between the information service and the user easier.

SHOs, the "lost tribes", (Bulstrode et al. 1993) deserve more help from library services than many appear to receive at present. Certainly time limitations on the SHO mean that the usual time a library sees an SHO is the classic flying visit "I've got a case presentation tomorrow... what do you have ?" Instead of waiting for the SHO to come to them, is it not possible for the library to know in advance the programme of case presentations and find out beforehand who is likely to be involved? If the case presentation is likely to be the impetus to using the library, then the library should at least inform the SHOs before the case presentation that this would be a useful time to learn .x. about the library service (MEDLINE on CD-ROM, for example) to gain .y. benefits to them (obtaining information on specific treatments quickly, for example) The benefits to the user of a particular information service must be stressed.

GPs do not come under the PGME umbrella, and library and information services to this group are not always a defined or formal responsibility of the PGME funded services, though the majority provide a service if requested. GPs do need information, frequently, but local, in-house sources will often provide the answers required. Drug therapy queries will usually be satisfied from sources at work or the local pharmacy. Enquiries about patients with rare conditions might provide the impetus for an library search request. Some of the clinical decisions made by GPs have to consider social, economic and ethical issues, as the comments show. GPs have a wide range of information requirements and often need advice as well as factual information. Informal sources such as colleagues, other health and social care professionals will often be able to provide such advice and information. Some of the interviews with GPs indicated that their knowledge of informal sources such as organisations, particularly those concerned with patient support, was patchy.

7.11 Themes for discussion: benefits and barriers
Different groups of clinicians have distinct patterns of information need and use. These patterns affect present and potential use of library and information services.

The type of clinical information required depends on the continuing education needs of the clinicians and their patient care management responsibilities.

More clinicians, particularly SHOs and GPs, might use library and information services if services were targeted at their particular needs.

Effective management of library and information services depends on a detailed understanding of the benefits of library and information service use, and the barriers to use, for particular types of clinician.

These themes are discussed in Chapter 8 (Approaches to audit of information services).
Chapter 8

Approaches to audit of information services

"...there is no point in deciding where your business is going until you have actually decided with great clarity where you are now."

John Harvey Jones (1988)

Audit of an information and library service implies a systematic critical analysis of the "business" of that service, looking at the procedures used and the outcomes for the customer. The Value project has studied the clinician customer of the information and library service, but for many of the information services in the project those clinicians formed only a portion, and often a small portion, of their customer base. Many "PGME" information and library services serve other health professionals, though the extent to which such services can provide a properly resourced multidisciplinary service varies greatly. While the desire to provide an information and library service to all health professionals is commendable, information professionals should take care that in the quest to provide something for everyone, they do not end up with an unfocused service providing nothing valuable for anyone. Before launching new services a critical evaluation of the existing services is necessary, to ensure that the needs of the existing customers are being met. This does not mean that information services or access to information for other health professionals should be denied, as the demands for evidence based health care in the internal market between health care purchaser and health care provider will increase the information needs of many healthcare staff. Those needs have to be met in the most cost-effective manner possible. Audit of information services is not necessarily a comfortable or comforting process but it may help survival in a changing marketplace.

The RLG/COPMED accreditation scheme for libraries supporting postgraduate medical and dental education arose from an initiative in Wales (from, inter alia, the Association of Welsh Health Librarians and the Postgraduate Dean for Wales). The audit process in the RLG/COPMED document focuses on what the libraries do, and what they could do, within the limits of their resources of both staff and materials. The RLG/COPMED document acknowledges the variations of health library provision throughout the UK, and the scheme aims to provide a minimum standard of provision. With increasing emphasis on formal continuing education for all groups of health professionals, accreditation of the information and library services that can support this continuing professional development is vital.

The remainder of this section will emphasise issues which arise from the Value project results presented in earlier sections of the report. The aim of this section is to draw together those discussion points within the audit framework. First,
comparisons will be drawn between the Value project and earlier similar work in the United States (Sections 8.1, 8.2). The outcomes of information supply will then be considered in terms of which outcomes and for whom, covering assessment of user needs and demands for information (Sections 8.3, 8.4). Access to information and the unexpressed demands are considered in Section 8.5. Service provision, discussed in Section 8.6, studies how marketing activities overlap user education. Section 8.7 considers how to plan for services which add value to the resources or assets of the information service, which include not only the material resources but also the human resources, the staff.

Reference is made to appropriate discussion points summarised at the end of chapters 3 to 7, to clarify how the implications for improving delivery of information are derived. Some of the discussion points will be considered in more detail in the separately published toolkit, a compressed version of which starts on page 212. The emphasis in these toolkit guidelines is firmly placed on local audit of information services and accordingly the areas for particular attention are identified in Chapter 9.

8.1 The politics of evaluation: the Rochester study

Discussion of the results obtained in the Value project and their significance must begin with some consideration of the results obtained in relevant earlier work, and the political climate in which these studies were conducted.

The socio-political factors affecting the nature of health care provision and priorities vary from country to country but there are some common factors. In the developed countries, health care costs appear to spiral inexorably upwards, and governments look for ways of containing costs and justifying allocation of resources.

"There is no limit to the demand for health care; and as medical science progresses, and new treatments are discovered, the demand grows still more and the cost of meeting it rises even faster.............

...We had to ensure that, if we were going to give significant extra taxpayers' money to the NHS, we would get real value in terms of improved patient care"

(Lawson, 1992)

The Rochester study (Marshall, 1991 and 1992) and the earlier Chicago study (King, 1987) aroused interest as these studies succeeded in showing that information provided by hospital libraries could, or did, contribute to improved patient care. The hospital library therefore provided a service which could be valued in terms of benefits of patient care. Library costs could be justified by benefits gained or by savings made through cost-effective care.
The impetus to the Rochester study was the change in a United States federal regulation that eliminated the requirement that hospitals maintain a library to be eligible for Medicare and Medicaid funding. The New York State Department of Health further emphasised that care services would be evaluated in terms of performance and patient care outcomes rather than structure and process. The combination of those two changes required a different approach to the evaluation of hospital library services, which had traditionally been limited to a study of the efficiency of the service in terms of the processes carried out internally.

The results obtained in the Rochester study appear very impressive, with over 95% of the responding physicians agreeing that the information provided by the library would produce better informed clinical decisions, and around 80% agreeing that they would handle the situation differently. Moreover, cost savings are implied by the number reporting that adverse events might be avoided, for example around 40% of the physicians reported that additional tests or procedures might not be needed.

A full appreciation of the Rochester study should consider also the methods used and the political climate in which the study was conducted. Physicians were sent a letter which informed them:

"the study..... will look at the impact of hospital libraries on clinical care"

and asked them to

"Select a clinical situation for which further information might be useful to you .... directly related to clinical care"

Physicians were told that:

"the results could have important implications for the future of medical library service in New York State"

Requests were handled by the participating libraries. The libraries did not know which physicians were participating in the study. Of the 448 physicians who were asked to participate, around half (227) returned questionnaires, though follow-up was required as the initial mailing resulted in 144 returns only.

The Rochester response rate was reasonable, considering the procedures requested of the participants, but the narrow focus of the study precludes some information gathering activities of physicians which would involve information obtained from the library (e.g. by the physicians themselves) and which might therefore have an impact on clinical decision making and patient care. A meaningful replication of the study is only possible in a situation where mediated searching is the norm, not the exception. With so many searches now done by clinicians themselves, using
MEDLINE on CD-ROM, the complete pattern of information seeking and use must be studied to make sense of the contribution of the library service to clinical decision making. In this sense the view conveyed by the Rochester study is an incomplete one.

8.2 Comparisons between the Rochester study and the Value project

In the Value project, no attempts were made to elicit or 'force' requests from clinicians. The results represent the manner of information service use in the participating libraries, and the response rates (46% for the critical incident survey of library users and non-users, 68% for the search/request survey of library users) were obtained with very little chasing.

The Rochester study results concerning changes in patient care suggest that the information provided changed advice given to patients (72% of respondents), changed treatment (60%), changed choice of diagnostic tests (51%), changed drugs (45%) or changed post-hospital care or treatment (39%). The question asked was:

"Did the information provided by the library change (or will it change)........

and the clinicians were given the choice of three categories, Yes, No, Not applicable. However, opinion leader interviews for the Value project suggested that many clinicians would be unwilling to provide categorical answers for the value of searches and requests. It is possible that respondents to the Rochester study may have answered affirmatively, when "maybe" could have been the preferred response.

In the Value project, the corresponding question was "How might the information provided contribute to your future clinical decisions?", and a similar proportion of the respondents agreed that clinical decisions might be affected. Of the respondents (clinical and research/scientific staff) in the Value project 79% (383/486) indicated that at least one category of clinical decision making would be affected. Of the clinical staff, 89% (321/361) indicated that at least one category of clinical decision making would be affected. The Rochester study specifically asked the clinicians to select a topic associated with a current clinical care problem, whereas in the Value project no such conditions were set. Many of the searches and requests were not primarily concerned with a current clinical care problem, but the findings show that the information obtained would be of benefit to patient care.

The categories of decision making selected for the Value project were based on those of the NLM study (Lindberg et al. 1993), which offers a more comprehensive set of categories to those applied in the Rochester study (Table 67).
Table 67: Comparison of clinical decision-making results in three studies

<table>
<thead>
<tr>
<th>Rochester study category</th>
<th>Value project category</th>
<th>Value project interviews only</th>
<th>NLM study category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advice to patient</td>
<td>Recognition of abnormal or normal condition</td>
<td>Development of an appropriate treatment plan</td>
<td>Development of an appropriate treatment plan</td>
<td>53%</td>
</tr>
<tr>
<td>Choice of other treatment</td>
<td>Identification or evaluation of different therapies</td>
<td>Recognition and proper diagnosis of a medical problem or condition</td>
<td>Recognition and proper diagnosis of a medical problem or condition</td>
<td>27%</td>
</tr>
<tr>
<td>Choice of tests</td>
<td>Improved quality of life for patient and/or family</td>
<td>Quality of life for patient and/or family</td>
<td>Maintained an effective physician-patient relationship</td>
<td>10%</td>
</tr>
<tr>
<td>Choice of drugs</td>
<td>Confirmation of proposed therapy</td>
<td>Used the most appropriate diagnostic test</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Differential diagnosis</td>
<td>Minimisation of risks of treatment</td>
<td></td>
<td>27%</td>
</tr>
</tbody>
</table>

Clearly the main similarity in the rank order of the clinical decision-making categories in Table 67 are the Value project interview classifications and the NLM study categories (Section 6.6). The major anomaly between the Rochester study and the other two studies concerns the category "advice to patient", which 72% of the clinicians in the Rochester study ticked, while the corresponding categories of "quality of life" or "maintained an effective physician-patient relationship amounted to 10% in the other studies. This anomaly may be due to the position of this category (last) in that section of the Rochester questionnaire. (Well-meaning respondents might be tempted to tick the last category if nothing before had seemed suitable). It is also a difficult category to check, without asking the patient as well. Other anomalies may be attributed to the different focus of the studies. The Rochester study was concerned only with information for a patient care problem, while the NLM study had a broader focus (though the analysis concentrated on incidents concerned with patient care). The Value project studied all requests and searches, whatever the initial purpose (education, research or patient care).
All these studies demonstrated that clinicians did derive useful and valuable information from the information and library services, although the results obtained are qualitatively and quantitatively different.

For those wishing to conduct a similar exercise the following conclusions might be drawn:

1. The categories of clinical decision making used in the Value project appear sufficiently comprehensive.
2. The layout and permissible answer categories in the Rochester questionnaire may have distorted some of the replies given.
3. A questionnaire should be followed up with selected interviews (not done in the Rochester study itself). Interviews provide examples of some clinical problems, and the clinical decision making dilemmas. Interpretation of the clinical decision making categories can also be checked, and individual or group priorities established.
4. The total pattern of information need and use should be considered, even if only a portion of that pattern is studied in detail.

8.3 Outcomes assessment of information supply: which outcomes and for whom?

Previous evaluations of library services have usually linked inputs (resources, staff) to service outputs (photocopies made, searches done) and while comparisons of performance indicators (Van Loo, 1988) indicate how efficiently and economically resources (materials and staff) are being used, the measures of effectiveness must include assessments by the users. Although user satisfaction surveys would be part of the measure of effectiveness, they are not solely sufficient, particularly in the health information context, as a measure of service outcomes and effectiveness. The effectiveness of a health information service should relate to the objectives of the organisation, and for this reason the effectiveness, or value, of an information service would have to be related to outcomes concerning patient care. The questions of "which user?" and "outcome for whom?" require consideration.

The Rochester study planning group, in a discussion of terms value and impact, agreed that they would have to demonstrate the impact of information provided by information and library services on clinical decision making, as decisions made by health professionals in the course of patient care affect the quality of care and health care outcomes.

In the Rochester study and in the Value project, the users considered were the recipients of the services provided, plus the potential users of the services. Results from the Rochester study suggest that the responses came largely from library users,
although 28% of the group stated that they used the library "at least once during the year, but not monthly". Only 2% admitted to not using the library at all in the previous twelve months. Considerable efforts were made in the Rochester study to gain the co-operation of all physicians, whether active library users or not.

Outcomes in both studies were defined in terms of clinical decision making which does of course involve the "ultimate user" of the information - the patient or carer. The information provided should assist treatment outcome through informed clinical decision making. The clinical decision may of course affect only one patient, but often general policies and standards of treatment are being considered. In contracts between health care providers and purchasers information on treatment outcomes is important. In Research for Health (UK. Department of Health, 1993) the R&D strategy, which will provide that necessary information, is also acknowledged to have implications for the individual patient.

"Research-based information on the effectiveness of interventions can help patients, their families and carers and supporting organisations understand particular procedures and courses of treatment better and ask informed questions. This will help to encourage greater personal responsibility for health"

There is, however, little focus on the patient perspective in this strategy, although the importance of obtaining patients' view and data on their experiences is noted in the report of the Advisory Group on Health Technology Assessment (1992). In short, the views of the "ultimate user" of the information provided by health libraries could not be gained at this stage, and there would be ethical difficulties in conducting studies which asked both the health professional and the patient about the care decisions, and the basis on which these decisions were made. As the Value project findings showed that many of the decisions affected would be future decisions, unknown factors affect the "ultimate" decision for the "ultimate user".

### 8.3.1 Purposes of information use

*Themes from results chapters*

- Many library and information service requests and searches are made for research and continuing education reasons
- Patient care is involved, to some extent, in many of these information and library service requests, but patient care is rarely the sole focus of the request or search (Chapter 3.5)
- The educational value of the information obtained is as important to the clinician as the immediate impact on patient care. Information gathering is part of professional reflective practice (Chapter 6.8)
• Personal research often involves both the statistical information (patient records) and textual information (MEDLINE database) (Chapter 4.5)
• Much of the information obtained is shared with colleagues, often at meetings or at case presentations. The community the library and information service reaches may therefore be larger than the group of active library users (Chapter 6.8)
• Information obtained from the library would, or did help in clinical decision making
• The monetary value of the information provided is often difficult to assess but the quality of care and the cost-effectiveness of that care are recurrent concerns (Chapter 6.8)
• Personal curiosity is an attribute not only of the researcher but also of the reflective practitioner. The researcher, teacher and reflective practitioner will look to the medical library for some - though not necessarily all - of their information needs (Chapter 4.5)

The assessment of effectiveness has therefore to rest with the clinicians, and their subjective assessment of the value of the information obtained. The Value project did demonstrate that, while the information obtained would be of benefit to clinical decision making, the purposes for which that information was obtained were not often concerned solely with patient care. Education and research were powerful prompts to seeking information.

The individual will have their own educational and research objectives, but the views of the funders, and organisers, of that education and research must also be considered. In a more formal higher education setting it is appropriate to seek measures of effectiveness from course validation and course committee reports (Winkworth, 1990), but in the postgraduate medical education setting this is more difficult. If a more structured postgraduate training is established it may be possible to devise a measure of effectiveness which takes immediate educational objectives into consideration, as well as the long-term aims of improved health care. For the individual, enhanced career prospects are the immediate benefits, but health care for society should also benefit in the long-term.

The assessment of the contribution of the information and library services to research should, ideally, be separated from the assessment of the benefits of research, which are inherently difficult to quantify. Research covers a variety of activities, and among clinicians collection of information on a personal, specialist interest is classed as personal research.
Some of this research may be linked to audit work, some to personal projects. The patterns of information need and use among researchers need to be analysed first, to establish and classify the tasks, and stages, involved in various activities (Whitehall et al. 1989). Information inputs for the main types of task involved can then be determined. The sources of information will be varied, and the relative contribution of formal channels (books, journals, library-based information services) can be assessed, for each stage of an activity. Many research activities will require information from informal sources, departmental or unit resources, or external sources, such as suppliers. An understanding of the processes involved in research would help assessment of the contribution information and library services make, or could make, to research.

The crux of the problem for information and library services is not simply persuading but convincing funders that the information and library service is a necessity, not a luxury. Unlike a university, or a research-based industry such as the pharmaceutical industry, where the provision of an information and library service is judged vital to the functioning of the organisation, the health service, as a large organisation, often appears to lack the clarity of purpose that is easy to define for a small organisation. Not only must the information and library service assess needs and outcomes for the individual, or user groups, but the organisational needs and outcomes need to be considered as well, at Trust or Unit level. For many individuals working in the health service this is an unfamiliar concept, but those who have to balance individual and organisational needs for provision of services, are aware of the problems.

Changes in health care provision such as care in the community have made the needs of the health care team or firm more apparent. The information supplied to an individual is often shared, and disseminated to a wider community of users. Interviews demonstrated that information supplied by the library did reach a wider community of health care professionals, not all of whom would use the library directly. Assessment of benefits to the organisation, via subjective individual estimates, should take account of the information flow from the individual user to others in the organisation.

The Value project demonstrated that the information provided by an information and library service contributes to decisions made by clinicians concerning patient care. The information and library service outcomes are also indirectly linked to patient care through the information supplied for education and research. Patient care, education and research are of course linked, and the evidence obtained in the Value project establishes that an information and library service should be seen as a catalyst in the interaction of patient care, research and education. Without the catalyst of the information service the process of implementing changes in clinical practice will be slower and less efficient.
8.4 User needs

Themes from results chapters

- Different groups of clinicians have distinct patterns of information need and use. These patterns affect present and potential use of information and library services
- The type of clinical information required depends on the continuing education needs of the clinicians and their patient care management responsibilities
  (Chapter 7.11)
- Clinicians will by preference turn to information sources that are accessible, portable and handy
  (Chapter 4.5)
- Research may account for a high proportion of the use of information and library services
- Many library and information service requests and searches are made for research and continuing education reasons
  (Chapter 3.5)
- Most patient care queries are answered by reference to textbooks, but when a rare condition is involved, the medical library and MEDLINE will often be used
  (Chapter 4.5)

Audit and the quest for quality is a cyclical process. The effectiveness of service provision is measured by the assessment of outcomes, which in turn leads to a revised needs assessment for service provision. Assessment of user "needs" always requires definition of "need", particularly in the context of information and library services (Cronin, 1981). Needs might be better defined as gaps (Dyer, 1994) and may be unrecognised or dormant, unexpressed (possibly because of lack of awareness that sources exist), expressed as a demand, or simply be an ongoing interest. The information and library service needs to act as a catalyst, encouraging the potential user to express their demands fully, making them aware of sources and, whenever possible, supplying the information that the customers were not aware that they needed - until it was supplied.

The user and potential user, and who these might be, should be defined with care. Funders are wary of the temptation to equate user "needs" with user "wants" for particular library services. Study of user needs or gaps does require an awareness that use itself is difficult to define, let alone predict. The assessment of needs requires an understanding of the present pattern of user behaviour, particularly of the infrequent or "non-user", so that predictions of use, or potential use, are not based merely on wishful thinking. Hindsight is a wonderful aid to prediction, but the popularity of CD-ROM searching might have been predicted if more librarians had appreciated the unexpressed demands of library users.
The Value project showed that the expressed demands perceived by the information and library service were only part of the information-seeking behaviour of the user community. Most information needs for patient care (alone) are satisfied by sources immediately available. Libraries often satisfied an expressed demand for information for research, a demand that could not be satisfied from departmental or in-house sources alone. Funded research (or degree work) was involved in nearly 3, and personal research in 3 to 4, out of every 10 requests or searches. Clearly, the active medical users of the service are often seeking information for research. The information needs of the researcher are apparent, and the Culyer report (Culyer, 1994) did recommend that funds for research and its service support should be separated from funds for other activities. If some of this funding can be disentangled and made more accountable, information and library services should urgently examine how research needs for information can be identified and appropriate services managed and evaluated in both teaching hospitals and district hospitals.

8.5 Access to information

**Themes from results chapters**

- Library users feel constrained by access and perceived resourcing problems. Given the emphasis on personal research and educational purposes, home-based access to library and information services deserve more consideration.
- Time restraints on searching for information are a problem for GPs. (Chapter 4.5)
- Personal collections of information are very important to clinicians (Chapter 6.8)
- More clinicians, particularly SHOs and GPs, might use information and library services if services were targeted at their particular needs. (Chapter 7.11)
- Clinicians rarely seek information for patient education. (Chapter 3.5)
- Reference books and medical handbooks provide information that is "ready to use". (Chapter 4.5)

Demands for information may often be unexpressed because the user is unaware that sources are available. Expectations of the information and library service may be low, uninformed or the user may simply be unaware that there is a service that could help. In many cases, awareness that the service exists is not enough to persuade the potential users that there would be benefits to using the service. Very simple points, such as the fact that the information and library service will respond to telephone enquiries, is taken for granted by the staff, but is not always obvious to
potential users. Out-of-hours access is often arranged for personal visits to the library, but services for the remote user should also include electronic mail, or simply a telephone answering machine.

The lack of demand for information for patient education was quite startling, with so few clinicians seeking information for that purpose. The time for consultation in general practice (around 10 minutes) allows little time for explanation of a condition or treatment, and such information would be verbal, relying on the patient's memory. Studies (Ley, 1991 and Weinman, 1990) suggest that much of the information relayed in this way is forgotten. In project interviews, many doctors were clearly concerned about the provision of information to the patient and carer, but few seemed to be aware that there were possible solutions to their problem. A study of information flows within general medical practices in Wales (Hepworth, Griffin and Vigden, 1992) found that none of the practices surveyed had achieved fully effective systems for the supply of medical information to patients, despite widespread support for the principle among their staffs. None of the practices seemed aware of the published research on the use of patient information nor were the staff aware of the sources of supply. Lines of responsibility were not clear. If this finding is representative of the situation throughout the UK, then provision of information on treatment, and treatment outcomes, does face problems. A King's Fund project on "Dissemination of information on treatment outcomes by consumer health information services", to be completed in 1995/1996 should point out some directions for improving the provision of information to patients on their treatment. At present many of the demands appear unexpressed because awareness and appreciation of the existing services is very low among clinicians.

8.6 Service provision

Themes from results chapters

- Library users feel constrained by access and perceived resourcing problems.
- Clinicians will by preference turn to information sources that are accessible, portable and handy. Reference books and medical handbooks provide information that is "ready to use" but possibly out-of-date.
- Most patient care queries are answered by reference to textbooks, but when a rare condition is involved, the medical library and MEDLINE will often be used.
- Personal journal collections are a valued source of information but retrospective access to the information in them might be difficult. (Chapter 4.5)

This section discusses how to match the provision of services to market demands and needs. Marketing of information and library services, however, often puts the
service or product first, rather than the user. Demarcation of staff duties along service lines accentuates the emphasis on the different service products (book loans, inter-library loans, mediated searches), and data collection for library management tends to focus on these products, rather than who is using which service. If the emphasis is not on the users, it is easy to make unjustified assumptions on the basis of product use trends alone. For example, claims that inter-library loans rise as a result of the introduction of CD-ROM appear often to be based on unsystematic evidence. The rise in inter-library loans may be due to other factors, such as different groups of staff using the library for professional development or research reasons, for example. The information service staff may have an overview of the whole service but consumer perceptions of the library service are likely to be much narrower, as their use of the information and library services may be very restricted, not only in the amount of use made, but also the types of service used.

Service users and potential users need to be made aware, convinced and reminded about the benefits of the information and library service as a whole, and the particular service products that suit their needs. The benefits and barriers to information and library service use for different groups of staff are analysed in Chapter 7, but there are more general characteristics of service and information use that the Value project has demonstrated. In understanding users, the grade of post is important, but the type of work role, and responsibility must also be considered. Roles in research, clinical audit, purchasing and management require particular information services, whatever the grade of staff, or, possibly, department. The information service may need to register not only the basic user details about the grade of post, but also seek details about the roles involved and the possible changes in those roles. The information service cannot provide a service which is fully accountable to the various user groups, whether classified according to grade of post or type of role, unless such details are obtained.

The discussion about Internet, electronic journals, Windows and its progeny should not deflect information and library services from the mundane, but widely appreciated service of supplies of printed sources. The Value project found that reference books and medical handbooks were the most popular sources of information, despite the fact that some, though not all, of the information would be out of date at the time of use and would need revision to incorporate the latest knowledge. Given the time pressures on a clinician in daily practice, reference books and handbooks are usually accessible, and give the procedural - or what to do - information required. Information and library services should consider carefully what that need for reference books actually represents. Moreover, the community of book borrowers is likely to represent a large group of users of any one service. The survey of library activity for the quality assurance phase of the Value project found that, on average, 50% of the library users in a given period borrowed books. Book issue is the way many users and potential users will judge the service and the methods used for book issue, recall, overdues, may be the most visible aspect of services for the majority of users.
Journal articles are more up to date than books, but do not always provide the procedural information, and often require an understanding of statistical presentation which some clinicians do not possess (Feinstein, 1992 and Forrow, 1992). A partial solution would be the publication of abstracts which are informative, with unwarranted conclusions eliminated, so that clinicians are provided with the type of peer-reviewed journal that meets their clinical and educational needs (Haynes, 1990) (Ad Hoc Working Group for Critical Appraisal of the Medical Literature, 1987). Recommendations for informative abstracts of articles describing clinical practice guidelines (Hayward et al. 1993) emphasise the importance of helping clinicians to appraise and assess the applicability of any practice guideline. There is little evidence from the survey of library activity for the quality assurance phase to suggest that CD-ROM use is directly linked with increased requests for documents. Clinicians do use the information in the abstract, confirming some of the comments made in interviews. If some decisions depend on the abstract, and only the abstract, these abstracts must be accurate and informative. Clinical practice guidelines based on evaluations of the published evidence do meet the needs of busy clinicians, and access to journals, or other resources which include such guidelines needs to be promoted.

8.6.1 User education

Despite these desiderata information and library services do little to promote appraisal of the literature, having chosen to place more emphasis on the relevance of mediated searches done by information professionals for clinicians. Clinical librarians, for example, can select clinically useful articles as effectively as physicians (Kuller et al. 1993). The information professional can therefore find relevant articles, but assisting the reader to appraise these articles further has not been seen as their role. Clinical experience is, after all, unique to the individual and the further judgements on the extent of relevance are likely to be personal. General appraisal of an article is however different and information professionals should, and could support education in appraisal. At the most basic level this might be a sheet provided to junior doctors listing quoted selection criteria (Ad Hoc Working Group for Critical Appraisal of the Medical Literature, 1987), at a more advanced level information professionals would assist in a course on appraisal of the research literature, and work with tutorial staff on such a course. If information professionals are to assume such a role in the education of users, then their continuing education needs must be addressed also and training for this role obtained.

For many information and library services, education of users is tied in with the marketing and promotion of the service. Librarians hesitate to inform the users that their CD-ROM searching techniques are ineffectual or inefficient, in case this deters the users from using the service. Customer satisfaction is one aspect of both marketing and education but is not a major objective of either activity. It is
important to appreciate that customer dissatisfaction is often more valuable evidence than a count of satisfied customers.

It is possible to demonstrate that the educational objectives of a "user education" activity or resource relate to marketing processes. Taking Bloom's taxonomy of educational objectives (Bloom, 1956) as an example, the emphasis on the learner's ability to use, critically, the facts taught is quite clear.

**Cognitive domain**

1. Knowledge (facts, principles, methods etc.)
2. Comprehension (interpretation, extrapolation etc.)
3. Application (use of abstractions in the concrete)
4. Analysis (of principles, relationships etc.)
5. Synthesis (production of a plan etc.)
6. Evaluation (judgements)

The taxonomy for the affective domain is concerned more with the interaction of the individual with the learning programme, the learner's attitudes and behaviour.

**Affective domain**

1. Receiving (or attending) (awareness)
2. Responding (willingness to respond, satisfaction in response)
3. Valuing (concerned with attitudes)
4. Organisation (of the value system)
5. Characterisation by a value or value complex

Striking correspondence with educational objectives is seen in this analysis of strategic market planning (Palmer, 1994):

1. Analysis (identifying opportunities etc.)
2. Setting objectives
3. Identifying and evaluating strategic alternatives
4. Implementing (obtaining resources, putting plans into action)
5. Control (evaluating success, feedback, revising plans)

The above five marketing functions are akin to the activities involved in any user education programme (assessing or analysis of educational needs, setting objectives, devising training strategies, estimating resources required, producing resources and evaluating the programme). An information and library service is marketing education of the users as much as it is educating the market. Neglecting the beginning and end stages, assessment (or analysis of opportunities) and evaluation will result in poor planning and implementation.
Some information professionals might query whether devoting attention to a programme to educate end-users is worthwhile, particularly when the end-users do not appear to want much education. Viewed from a marketing angle, however, there would be advantages in assessing the needs (of the potential market), planning (setting objectives, determining tasks and resources), implementing plans (putting the customer care or user education programme into action) and evaluating the programme (both the viewpoint of the customer and the library staff). There is an overlap between educating the user and marketing the service, and many of the activities are similar. Any programme to support and promote effective searching by end-users needs to be evaluated according to both educational and marketing criteria.

What should be the objectives of an end-user programme, viewed in educational and marketing terms? The educational objectives can be related to Bloom's taxonomy for the cognitive and affective domains. For marketing of services, the traditional marketing mix (product, price, promotion and place) is usually extended to include people and process (Palmer, 1994). Marketing concerns and objectives both complement and overlap the educational objectives (Table 68). The importance placed in marketing of services on the "people" aspects is particularly important for information services. There are parallels between the "people" aspects of the marketing mix and the affective domains in Bloom's taxonomy. The success of education or support services depends on developing and maintaining relationships with the users, customer demand management and quality of service, as well as the content of the educational programme itself.
Table 68: Marketing and educational objectives for CD-ROM use

<table>
<thead>
<tr>
<th>Educational taxonomy item</th>
<th>Example objective</th>
<th>Marketing example objective or concern</th>
<th>Marketing mix item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>System details</td>
<td>Differentiating service from competitors</td>
<td>Promotion</td>
</tr>
<tr>
<td></td>
<td>Searching options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>Ability to use MESH</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Formulation of search strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application</td>
<td>Ability to use CD-ROM system other than that taught</td>
<td>Determining benefits sought from service</td>
<td>Product</td>
</tr>
<tr>
<td>Analysis</td>
<td>Efficient searching</td>
<td>Deciding how independent an end-user should be (who does what)</td>
<td>Process</td>
</tr>
<tr>
<td></td>
<td>Critical searching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synthesis</td>
<td>Ability to revise search strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation</td>
<td>Ability to appraise results using system and personal criteria</td>
<td>Perception of service attributes</td>
<td>Product</td>
</tr>
<tr>
<td>Receiving</td>
<td>Conscious of MEDLINE and similar databases</td>
<td>Awareness of MEDLINE</td>
<td>Promotion</td>
</tr>
<tr>
<td>Responding</td>
<td>Interested in use of MEDLINE on CD-ROM</td>
<td>Perception of CD-ROM service</td>
<td>Product</td>
</tr>
<tr>
<td>Valuing</td>
<td>Motivation and commitment</td>
<td>Perceptions of quality of CD-ROM support</td>
<td>People</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ease of access to CD-ROM</td>
<td>Place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discrimination between different groups of CD-ROM users</td>
<td>Pricing</td>
</tr>
</tbody>
</table>

8.6.2 Overviews of provision

Themes from results chapters

- MEDLINE’s coverage of the psychiatric literature and of the psychological aspects of care is insufficient for many UK clinicians. (Chapter 5.5)
• More clinicians, particularly SHOs and GPs, might use information and library services if services were targeted at their particular needs.  
(Chapter 7.11)
• Researchers value MEDLINE for retrospective searching but often need current information faster than is possible with MEDLINE.  
(Chapter 5.5)

Evaluation of information service provision should identify those areas where groups of users, for example, psychiatrists, are badly served by the more general services.  MEDLINE is not sufficient for the needs of psychiatrists, or for those interested in the psychological, or social aspects of care.  Questions about the specificity of services for particular groups should be asked.  One CD-ROM database is unlikely to be sufficient for the information needs of all users, and access to other databases must be examined.

The usual response to the identification of deficiencies in provision is an assessment of the extra resources required to plug the gap.  With the constraints on resourcing, it would be irresponsible to suggest that this is the only way forward.  The next section considers how libraries might, in the light of the Value project findings, refocus their energies and resources to provide services that are valued by their customers.

8.7  Value added services

In this section, the management of service provision is examined in the light of evidence collected in the Value project.  The questions asked are:

"Do these library services add value to the inputs of resources and staff?"

and:
"If the information and library services were provided or obtained by other means would the result be better - or worse - for the consumers?"

and:
"How should changes in consumer expectations - and consumer power be met?"

Themes from results chapters

• Most library users are satisfied with the results of their searches and requests  
(Chapter 6.8)
• Many clinicians like to search MEDLINE on CD-ROM themselves, in preference to asking for a search to be done by library staff
• A need for training is not immediately apparent to most clinician users of MEDLINE. A critical approach to searching MEDLINE on CD-ROM comes with experience in use of CD-ROM (Chapter 5.5)

In an age of rapid technological change in health care, combined with increasing financial scrutiny, a service which is not adding value cannot expect to attract funds. This will require a creative approach to the development of services and flexible management. The technology must be made to work to the benefit of the staff and customer. Keeping up with technology for its own sake will inevitably be a wearisome treadmill.

Whether or not the user of information does have better access to sources in the Internet age is debatable, but many individuals do expect to be able to tap into information sources themselves, easily and quickly. Intermediaries are not seen as necessary, and the role of the librarian as the information gate-keeper or even the network navigator is questionable. The "non-threatening" role of the information professional in providing access to information should not be devalued, but the information professional may increasingly have to provide evidence that the filtering process, or means of information delivery has added value to the information provided.

The following sections discuss how value could be added to various information and library services. The emphasis is more on the approach to planning such services than on the services themselves. More details are in the quality assurance guidelines.

8.7.1 Journals and inter-library loans

Themes from results chapters

• Personal journal collections are a valued source of information, but retrospective access to the information in them might be difficult.

• Journals contain more than peer-reviewed articles. The non-indexed information about meetings, the bulletins and news section provide many pointers to current activities. This is lost when a subscription is cancelled, and is unavailable at sites where the number of journal subscriptions is small.

• Research may account for a high proportion of the use of information and library services.) (Chapter 4.5)

The researcher collects and stores much information, usually in the form of photocopies of journal articles. The value of this information could be enhanced
for the researcher when writing papers or proposals if bibliographic software, or advice about such software were available from the library service. Some such software is essentially database management software, and library services could use such software themselves for management of services, either internally or as a service to departments. Much internal information, for example, on R&D projects, might be used more efficiently if the information and library service managed the database.

If it is to reach its full potential, the information and library service must be seen to do more than mere document delivery, as alternative document delivery services exist, and may seem more convenient. The service can, and should be selling expertise in the management of information. There may be a skills gap here (MacDougall and Brittain, 1992) and library staff do need training in the management and interpretation of numerical information, to complement their skills in the management of textual information. This has been the driving force behind some of the recently developed courses, such as the Health Information Management distance learning course run from University of Wales, Aberystwyth.

There are other ways in which libraries could provide specific services for authors of articles, as part of a programme to promote better personal and departmental information management. The ability of information service staff to find or check the awkward reference is appreciated, and should represent an opportunity for information service staff to promote services that might help authors of articles. The survey of information and library services for the quality assurance phase of the Value project found that some do regularly help to check awkward references, but possibly only for a select few individuals who know that the staff will do this. This service can be provided as a means of gaining trust, but the emphasis must be placed on helping the users to help themselves.

Journal provision is an increasingly difficult problem for libraries as subscription prices increase. Donations of titles are welcome, but often these merely postpone the date for evaluation of the collection before required pruning. The Value research findings show that some libraries, particularly the smaller PGME libraries, receive a substantial number of donated titles. There is no doubt from the Value project findings (Chapter 5.2) that personal access to a large collection of journals (such as at a university) is valued, and many are using the library to consult journals. The activity sampling showed that the two most popular activities in the library for medical staff and students, were consulting current journals, and consulting books (without borrowing them), followed closely by use of the library for study.

Journal resources are already shared informally in many regions, but the advantages of regional co-operation should perhaps be more evident to the users, and funders of the service. Comments in interviews suggested support for the library services problems in inter-library loans might be easier to obtain if the library users were
made aware of some of the mechanisms involved. If the agreed regional or local framework envisages rationalisation of some holdings, development of specialist collections, archival collections, then the benefits of these to the users must be made clear. The costs of alternatives should be estimated and the benefits to the organisation of supporting a co-operative arrangement should be evident.

Developments in electronic journals and network publishing may mean that such access will be a real alternative to holding a journal in print form, though there is no guarantee that the electronic journal will contain the same range of information as its printed version. Access to the non-article content of journals is one of the issues which arises. Printed journals at present contain news sections, bulletins, and conference reports, and these parts of the journal provide a useful instant insight into who - and what - matters in any subject field at any moment. For those involved in the subject field this information is of course familiar, and those subject specialists will, it seems, communicate with each other via discussion lists and bulletin boards on the Internet. This type of communication would make those news sections of the journal redundant. To find such information for the non-specialist, the information professional needs to become familiar with directories on the Internet.

Most PGME funded information services operate an efficient and highly regarded inter-library loan service. This service is used most by the researchers (and often by those groups of health professionals who traditionally have had little in the way of library resources - the trained nurses and allied health professionals). The pattern of inter-library loan requests is not easy to analyse unless information about requests is on a database but potentially useful information about subject areas that need more resources could be derived from a survey of the subjects and titles in demand.

On current trends, inter-library loan demand seems likely to outstrip supply, and policies for charging or rationing are discussed later in the guidelines. The Copyright Act (Cornish, 1990) makes clear that charges should be made for copying, so that libraries can at least recover the cost of production. Charging policies and procedures vary greatly, much to the confusion of service users who cannot be expected to appreciate the differences as they move around in the course of their work, e.g. in a rotation scheme, from one hospital to another. Local variation is inevitable given the present funding arrangements, but an overall policy, and some discussion about the issues would be appreciated by service users. Interviews suggested that some users were unclear about the rationale for charging or rationing of services. Information services may need to assess the full costs of document delivery, to evaluate how many individuals use the inter-library loans service, and the extent to which a small minority may be very heavy users. In most of the libraries surveyed for the quality assurance phase the top 10% of individual requesters accounted for around 40% of the total number of requests. A small minority can account for nearly half the work involved in running an inter-library
loans service, and this effort is at present not necessarily productive in terms of patient care, research and medical education. Such a dominant use of resources may be blocking staff time which could better be devoted to targeting of information services. Audit of the outcomes of information use would reveal whether a concentration of resources on a minority of users is justified.

8.7.2 Networking

Themes from results chapters

- MEDLINE on CD-ROM in the library is appreciated, but home or office access is a boon for many clinicians (Chapter 5.5)
- Library users feel constrained by access and perceived resourcing problems. Given the emphasis on personal research and educational purposes, home-based access to library and information services deserves more consideration) (Chapter 4.5)

CD-ROM networking is much discussed at present, but planning of networks should consider when and how the information used on the networks will be used. If information should be available on the desk-top - which desk-top? Would users prefer the desk at home, in the office, in the clinic or on the ward? Evidence from the Value project suggests that home access is the preferred option for many clinicians for their use of MEDLINE for educational, research and publication purposes.

Planning of networked services, whether CD-ROM networking itself, or copying data on to an information service hard disk, requires study of which sources, which services and which are the most cost-effective sources, and services. A policy which suggests that access to the Internet will solve all problems does not necessarily accord with a policy that promotes access to evaluated information and critical appraisal of the literature.

8.7.3 Specialised services

Themes from results chapters

- Information obtained from the library and information services would, or did help in clinical decision making. (Chapter 6.8)
- Clinicians will by preference turn to information sources that are accessible, portable, and handy. Reference books and medical handbooks provide information that is "ready to use" but possibly out-of-date as the publication process for books can be lengthy.
(Chapter 4.5)

Development of selective alerting services (SDI or selective dissemination of information) is necessary in order that sufficient information should reach those involved in making clinical decisions. The clinicians who have little free time to use the library personally would appreciate a service which provided up-to-date information that they would not normally receive in the course of their reading. Comments in interviews suggested that clinicians did appreciate this type of service, although the library and information services concerned often have difficulty in obtaining feedback evaluation of the service. In the quality assurance phase, one library and information service noted that at least 30% of the SHOs take up the offer of an SDI service (based on MEDLINE on CD-ROM), and the feedback on that service, in its trial phase, was very positive.

An SDI service brings several related benefits. The user is reminded about the library and information service regularly, and contacts are maintained. The service promotes use of the library service, in effect adding value to the journals in the collection, the CD-ROM databases and online searching. Delivery of the service could be in printed format, but better (and more efficient) would be the provision of discs, or notification via electronic mail. This provides further reasons for promoting the use of bibliographic software.

Document delivery trends point to the emergence of current awareness services, often linked to supply of individual articles. In the biomedical field, Research Information Systems Inc. produce Reference Update, in which downloading to the Reference Manager bibliographic software is implicit, and Current Contents has the Genuine Article delivery service. Provision of an SDI service by the library service may be an in-house operation entirely, but buying in a commercial service may be equally cost-effective. An SDI service could generate income for the library (Cox & Fletcher, 1991) although the terms of licence need to be studied carefully.

Books are valued by many users of the library service as the findings of the Value project show. Librarians are understandably reluctant to promote the use of books when some of the information may be dated, or even dangerous, but the reliance on the handy and accessible source is quite evident. Evaluation of the provision of textbooks, reference books, reports, and audio-visual materials should cover the replacement policies, consideration of access versus holdings and particular needs of specialties.
8.7.4 Information and library staff

Themes from results chapters

- Information and library services could do more to promote:
  a. databases other than MEDLINE
  b. bibliographic software
  c. awareness of the benefits of using MEDLINE
  (Chapter 5.5)
- Effective management of information and library services depends on a detailed understanding of the benefits of library and information service use, and the barriers to use, for particular types of clinician.
  (Chapter 7.11)
- Information obtained from the library and information service would, or did, help in clinical decision making.
- The monetary value of the information provided is often difficult to assess, but the quality of care and the cost-effectiveness of care are recurrent concerns
  (Chapter 6.8)

Staff are a very costly resource, and the planning of a value-added approach to the provision of information and library services starts with the staff. Their activities, knowledge and experience should be adding value to the information and library service in such a way that the value of the service continues to grow. Continuing education and specific training will therefore be important.

The library assistants in PGME libraries usually deal with the issue system, inter-library loans and act as a filter for enquiries and requests about the CD-ROM. The library assistant can provide information that will help in planning and budgeting of services by the librarian, but only if they are aware of that role, and have the necessary resources and support. For example, consider the following questions.

Is the information provided by Personnel departments sufficient for library assistants to identify and locate library users? (Resources)
Does the registration system for the library actually cover all users, inter-library loan and book borrowers? (Support)
Is the inter-library loan system run entirely on an input-output basis, or could the library assistants, on the system used (Support) identify trends or potential problems? (Roles)
Are the library assistants spending time providing copies of articles that will not be read? Do they have suggestions on how to prevent unwise use of a subsidised ILL system? (Roles)
Do the library assistants have sufficient training (Support) to assist library users in the use of the CD-ROM, to the satisfaction of both the library staff and the users? (Roles)
The use of the term "Roles" here does not concern the professional or non-professional role, but rather the role of adding value to the information and library service. Planning on this basis would emphasise the effectiveness of the service, and efficiency would be the by-product, not the sole aim.

What can be done by the information professional to pre-empt the question:

"Why do most libraries look the same - boring and dull, illegible signs often falling down, notices out-of-date, and inaccessible staff, who are also often out-of-date ....?" (Ettinger, 1994)

While no doubt deliberately extreme, casual observations during site visits for the project suggest that Ettinger might find some ammunition for the question in PGME libraries. The problem areas that Ettinger identifies are the responsibility of the information professional, as well as the funders of the service and all those involved in the accreditation process. These problem areas are marketing the service, planning and evaluation of service provision, and staff training. The librarian may therefore be less concerned with the monitoring of work done by library assistants, and more concerned with the development and evaluation of services which both meet the needs of the users, and which add value to the library inputs. Hanson (1994) argues for a more active role for the academic subject librarian in supporting university research, and the arguments have many parallels for the health information professional.

Taking the CD-ROM service as an example, this might include:

- Identification of patterns of use and information seeking behaviour, so that possible problems in hardware, software, user education can be identified.
- Evaluation of the service - is the database suitable for the needs of the users? Is the quality of the data on the database acceptable? Are there recommendations to be made to the database or software supplier?
- Marketing of the service. Are there potential customers who are not using the service, and if not, why not? Are there possible spin-off services?
- Education and support of the library staff in service provision.

Development of new services is not always easy, and involves a degree of risk. Hospital trusts have differing views on where the information and library service fits within the organisation structure. Consequently, information and library service managers may feel that support is lacking for development of new services. Site visits for both the main phase and the quality assurance phase indicated that organisational arrangements, comparative staffing and resourcing levels do vary widely. Despite these differences, clinicians at every main phase site agreed that information provided by the library contributed to clinical decision making. The changes within the health service and medical education mean that audit of
information and library services, and development of value-added services, will be necessary to maintain and improve this level of satisfaction.

Audit of services can thus provide the confidence that the direction of new service development is correct, the method of implementation feasible and that support from the users of the service will be obtained, although immediate behaviour changes may be hard to obtain. The value of audit for the librarian is a sharper focus on the information and library service and a clear indication of the way forward. Each information professional should be able to draw on the collective experience and "reflective practice" of other information professionals working in related fields, and the final solutions sought may be similar. The route chosen for audit, however, will vary, and the pattern of successes - and problems - will reflect the local situation.

The areas for action that all information services should consider, in the light of the project findings, are set out in Chapter 9.
Chapter 9

Areas for action

These areas for action enumerate those aspects of information supply and use which require immediate consideration. These points have not been described as recommendations because they are generic and contextual rather than specific. The specific actions which information services should take will depend on the results of local audit of information services, using the separately published quality assurance toolkit, a compressed version of which accompanies the report.

While different information services will need to act more decisively in some areas than others, all the areas for action are highly significant and must be addressed as part of any attempt to audit information supply according to outcomes of information use.

- **Accreditation.** If accreditation of NHS information services were firmly linked with the cyclical audit processes of needs assessment, service provision and outcomes assessment, the "true" performance of a service would be apparent.

- **Targeting of services.** The low expressed demands by some groups of users conceal a need for information services - and the benefits that might be accrued. More targeting of information services is required.

- **Marketing.** The benefits to be obtained from use of information services could be a key element in marketing of information services.

- **Strategic planning.** Alternatives to provision of existing information and library functions and services deserve more attention.

- **Adding value.** Information services could add more value to their human and material resource assets to the mutual benefit of staff and users.

- **Education and support.** Better education and support for some information services, particularly patient information and CD-ROM databases is required.

- **Accounting for use.** Accountability for use of services by certain groups, in particular research staff, could make service provision more effective.

- **Information management.** All the above areas require a discriminating use of information technology, and a greater appreciation of statistical and survey methods.
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APPENDICES
APPENDIX 1

The value to postgraduate and continuing medical education of information supplied by NHS library and information services

Patterns of information need and use.

Please think of ONE occasion during the last seven days (including today) on which you needed information for patient care, teaching or personal continuing education.

1. **I needed the information for:** (Please tick the appropriate categories)
   - Patient care - patient care administration/records [ ] 01
   - Patient care - specific drug or therapy query [ ] 02
   - Patient care - rare condition or specific problem [ ] 03
   - Patient care - audit/standards/guidelines [ ] 04
   - Teaching - patient education [ ] 05
   - Teaching - staff/students/colleagues (e.g. case presentations) [ ] 06
   - Personal continuing education [ ] 07
   - Research (personal) - planned or in progress [ ] 08
   - Research (funded project/degree) - planned or in progress [ ] 09
   - Publication - paper/review/report/book [ ] 10
   - Other (please specify) [ ] 11
   - Comments [ ]

   NOT APPLICABLE. (information not needed) [ ] 12

2. **I tried to obtain the information from:** (Please tick the appropriate categories)
   - Personal or unit/dept. information files or databases [ ] 13
   - Reference book or medical handbook [ ] 14
   - Personal journal collection [ ] 15
   - Colleague [ ] 16
   - Local medical library [ ] 17
   - Other library (please specify) [ ] 18
   - Pharmacy (hospital/local) [ ] 19
   - MEDLINE [ ] 20
   - Other database system (please specify) [ ] 21
   - Other sources (please specify) [ ] 22
   - Comments [ ]

3. **I was:** (Please tick the appropriate category)
   - Successful in obtaining the information [ ] 23
   - Partly successful - information incomplete or to come later [ ] 24
   - Partly successful - time restraints require another try [ ] 25

   Thank you for your help. A return envelope is provided.
APPENDIX 2

You recently made a search/request for information on........................................
The library service is participating in a national survey and we would appreciate your help in completing this questionnaire (details of the project are attached). Please return your questionnaire to Christine Urquhart (home address inserted) An envelope for return is enclosed. Thank you!

Q1. What were the main PURPOSES for which you needed information on this occasion? (Tick appropriate categories)
- Patient care - patient care administration/records................................. [  ] 01
- Patient care - specific drug or therapy query........................................ [  ] 02
- Patient care - rare condition or specific problem.................................. [  ] 03
- Patient care - audit/standards/guidelines ............................................ [  ] 04
- Teaching - patient education.................................................................. [  ] 05
- Teaching - staff/students/colleagues (including case presentations)......... [  ] 06
- Personal continuing education............................................................... [  ] 07
- Research (personal) - in progress or planned....................................... [  ] 08
- Research (funded project/degree) - in progress or planned.................... [  ] 09
- Publication - paper/review/report/book................................................ [  ] 10

Q.2 What was the IMMEDIATE impact of the information provided on your knowledge? (Please circle YES or NO or N/A- not applicable, for each statement)

- It refreshed my memory of details or facts..... YES NO N/A 11/12/13
- Some of it was new to me..................... YES NO N/A 14/15/16
- It substantiated what I knew or suspected..... YES NO N/A 17/18/19
- I could use at least some information immediately YES NO N/A 20/21/22
- I will need to obtain more information on the topic YES NO N/A 23/24/25
- I expected to find something else............... YES NO N/A 26/27/28
- I will share this information with colleagues...... YES NO N/A 29/30/31
- I will add this to my personal information collection YES NO N/A 32/33/34

Q.3 How might the information provided contribute to your FUTURE clinical decisions? (Please circle YES or NO or N/A- not applicable, for each statement)

- Choice of diagnostic test ................. YES NO N/A 35/36/37
- Recognition of an abnormal or normal condition YES NO N/A 38/39/40
- Differential diagnosis.............................. YES NO N/A 41/42/43
- Confirmation of proposed therapy.......... YES NO N/A 44/45/46
- Identification/evaluation of alternative therapies. YES NO N/A 47/48/49
- Minimisation of risks of treatment.......... YES NO N/A 50/51/52
Revision of treatment plan.............  YES  NO  N/A  53/ 54/ 55
Audit or standards of care......................  YES  NO  N/A  56/ 57/ 58
Improved quality of life for patient and/or family  YES  NO  N/A  59/ 60/ 61
Legal or ethical issues.........................  YES  NO  N/A  62/ 63/ 64

Comments......
Q.4 What prompted you to make a search or request on this occasion? 
(Tick appropriate categories)

<table>
<thead>
<tr>
<th>Prompt</th>
<th>[ ]</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggestion/advice/information from colleagues</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Enquiry from patient</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Reading of personal journals or books</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Information obtained from the library</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Information from a previous MEDLINE search</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>Scanning in library</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Personal curiosity or &quot;need to know more&quot;</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Examination studying</td>
<td>72</td>
<td></td>
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Q.5 Please indicate your views on, and experience with, selection for reading.

(Circle the appropriate point on the scale) 
(always: often: sometimes: rarely: never)

<table>
<thead>
<tr>
<th>Preference</th>
<th>[ ]</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I look for review articles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I look for original research articles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I examine any abstract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I look for specific results or outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I select recent articles only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I examine method or statistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I look at the author or author affiliation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q.6 Please indicate your opinions on aspects of information seeking.

(Circle the appropriate point on the scale) 
(always: often: sometimes: rarely: never)

<table>
<thead>
<tr>
<th>Opinion</th>
<th>[ ]</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to do my own searching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need to use computers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I need information, I need it urgently</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need to use a large (e.g. university) library</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need to know about applications of computers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel I am competent at literature searching</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q.7 What is your present post  (Tick the appropriate category or categories)

<table>
<thead>
<tr>
<th>Post</th>
<th>[ ]</th>
<th>Score</th>
</tr>
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<tr>
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<td></td>
</tr>
<tr>
<td>GP trainee</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Registrar</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>Senior Registrar</td>
<td>89</td>
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<td>Staff/ Specialist</td>
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<td>Consultant</td>
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<td>GP</td>
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<tr>
<td>GP trainer</td>
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</tr>
<tr>
<td>Academic (teaching) staff</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Scientist/research staff</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Clinical assistant</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>97</td>
<td></td>
</tr>
</tbody>
</table>

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APPENDIX 3

The value to postgraduate and continuing medical education of information supplied by NHS library and information services

The library is participating in a national survey (details are available at the library enquiry desk).

Part of the survey involves a study of the use of MEDLINE on CD-ROM by medical staff. The results should indicate how to improve training and support services, so that CD-ROM use by medical staff will be made more effective.

The library staff have kindly offered to hand out and collect the forms but will not be involved in the analysis.

Please print your name on the form. There is no obligation to do so if you wish your replies to remain anonymous, but if you do enter your name this does mean we should not contact you again for another part of the survey. Thanks for your help!

Name......................................................................Post held............................

Department ........................................................................................................

Q1. What were you hoping to find in MEDLINE?

(Tick appropriate categories)

Verification of bibliographic reference details (own or joint work). [ ]

Verification of bibliographic reference details (others' work)... [ ]

Information on methods used ................................................. [ ]

Information on results obtained ................................................ [ ]

Most recent information on a topic............................................. [ ]

Seminal research on a topic......................................................... [ ]

Background information on a topic............................................ [ ]

Good review article or two ......................................................... [ ]

Alternative lines of research ...................................................... [ ]

Other (please specify) ................................................................. [ ]

Q2. Which search tactics did you use this time?

(Tick appropriate categories)

Subject headings (MESH)......................................................... [ ]

Author name........................................................................... [ ]

Journal name............................................................................ [ ]

Free text (word or phrase in title or abstract)......................... [ ]

Using subheadings (MESH) to refine a search ......................... [ ]

Limiting a search by publication year .................................... [ ]

Limiting a search to particular age groups (e.g. Child)............. [ ]

Exploding a index term to include more specific terms........... [ ]

Searching earlier MEDLINE files (pre-1989)......................... [ ]
APPENDIX 4

INTERVIEW SCHEDULE FOR PERSONAL INTERVIEW
(Introduction and explanation about the reasons for interview)

Name.......................................................... Post.............................................

Are you familiar with CD-ROM searching?

Responses: used regularly/frequently [ ]
used occasionally [ ]
rarely used [ ]
first time [ ]
used elsewhere [ ] Where?
used other "CD-ROMs" [ ] Which?
BIDS
EMBASE

How do you find CD-ROM searching?

Responses: Straightforward [ ]
Easier than Index Medicus [ ]
Good for finding specific details [ ]
Good for comprehensive search [ ]
Usually find something- somehow [ ]
Booking system a nuisance [ ]
System response is slow [ ]

How did you learn to use the CD-ROM?

Responses: Had introduction from librarian [ ]
(how long approx.?)
Attended training course w. others [ ]
Self-taught [ ]
Improved with practice [ ]
Tend to forget - need reminding [ ]
Used to computers anyway [ ]
Not sure about some aspects [ ] Which?

What difference has CD-ROM made to your literature searching?

Responses: printout really useful/ downloaded search on disc handy
wouldn't search printed indexes
much easier/faster / good for browsing/ get ideas
would like it at the desk /networked
APPENDIX 5

You may recently have used the BMA DIAL-UP service to search MEDLINE. If so, your experience would be useful for planning service developments.

The BMA Library is participating in a national survey and we would appreciate your help in completing this questionnaire (details of the project are attached).

Please return your questionnaire to Christine Urquhart (home address inserted). An envelope for return is enclosed. Thank you!

Q1. What were the main PURPOSES for which you needed information on this occasion? (Tick appropriate categories)
- Patient care - patient care administration/records [ ] 01
- Patient care - specific drug or therapy query [ ] 02
- Patient care - rare condition or specific problem [ ] 03
- Patient care - audit/standards/guidelines [ ] 04
- Teaching - patient education [ ] 05
- Teaching - staff/students/colleagues (including case presentations) [ ] 06
- Personal continuing education [ ] 07
- Research (personal) - in progress or planned [ ] 08
- Research (funded project/degree) - in progress or planned [ ] 09
- Publication - paper/review/report/book [ ] 10

Q2. What were you hoping to find in MEDLINE? (Tick appropriate categories)
- Verification of bibliographic reference details (own or joint work) [ ] 11
- Verification of bibliographic reference details (others' work) [ ] 12
- Information on methods used [ ] 13
- Information on results obtained [ ] 14
- Most recent information on a topic [ ] 15
- Seminal research on a topic [ ] 16
- Background information on a topic [ ] 17
- Good review article or two [ ] 18
- Alternative lines of research [ ] 19
- Other (please specify) [ ] 20

Q3. Which search tactics do you remember trying? (Tick appropriate categories)
- Subject headings (MESH) [ ] 21
- Author name [ ] 22
- Journal name [ ] 23
- Free text (word or phrase in title or abstract) [ ] 24
- Using subheadings (MESH) to refine a search [ ] 25
- Limiting a search by publication year [ ] 26
- Limiting a search to particular age groups (e.g. Child) [ ] 27
- Exploding a index term to include more specific terms [ ] 28
- Searching earlier MEDLINE files (pre-1989) [ ] 29
Q.4 How might the information provided contribute to your future clinical decisions? (Please circle YES or NO or N/A- not applicable, for each statement)

- Choice of diagnostic test .......................... YES NO N/A 30/ 31/
- Recognition of an abnormal or normal condition. YES NO N/A 33/ 34/
- Differential diagnosis.............................. YES NO N/A 36/ 37/ 38
- Confirmation of proposed therapy............ YES NO N/A 39/ 40/
- Identification/evaluation of alternative therapies YES NO N/A 42/ 43/ 44
- Minimisation of risks of treatment............... YES NO N/A 45/ 46/ 47
- Revision of treatment plan....................... YES NO N/A 48/ 49/ 50
- Audit or standards of care........................ YES NO N/A 51/ 52/
- Improved quality of life for patient and/or family YES NO N/A 54/ 55/
- Legal or ethical issues............................ YES NO N/A 57/ 58/ 59

Comments.....

Q.5 Please indicate your opinions on aspects of information seeking.
(Circle the appropriate point on the scale)
always: often: sometimes: rarely: never
1  2  3  4  5
I prefer to do my own searching
I need to use computers
When I need information, I need it urgently
I need to use a large (e.g. university) library
I need to know about applications of computers
I feel I am competent at literature searching

What do you like least about searching MEDLINE on the network? 66

What do you like best about searching MEDLINE on the network? 67

Q.7 What is your present post (Tick the appropriate category or categories)

SHO [ ] 68  GP trainee[ ] 69  Registrar[ ] 70  Senior Registrar[ ] 71
Staff/ Specialist [ ] 72  Consultant [ ] 73  GP [ ] 74  GP trainer[ ] 75
Academic (teaching) staff [ ] 76  Scientist/research staff [ ] 77
Clinical assistant [ ] 78 Other (please specify) [ ] 79.................................

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APPENDIX 6

FOLLOW-UP FOR CRITICAL INCIDENT SURVEY

Telephone interview format

Detailed schedule with possible prompts:

A. Thank you for your help with the questionnaire...... Would you mind providing a few more details about one of the occasions when you needed information recently...not necessarily one of those recorded on a questionnaire return?

*What were you looking for?

and why?

*What were you expecting to find?.........................

*Where did you look ?

(try to obtain name of reference book if reference book or similar tome was used)

*Was there any particular reason you chose to look there?.................

*What did you find?..............

*Was that what you wanted?.........................

(If relevant - but if at all possible try to obtain an answer to the following)

*How might that information be useful to you in the future .....thinking particularly of your clinical decisions?

The prompt will depend on what the subject of the information request was.

Use the following as a basis of your question(s)

.. Choice of diagnostic test
.. Recognition of an abnormal or normal condition.
.. Differential diagnosis.................................
.. Confirmation of proposed therapy.........
.. Identification/evaluation of alternative therapies
.. Minimisation of risks of treatment............... 
.. Revision of treatment plan.........................
.. Audit or standards of care..........................
.. Improved quality of life for patient and/or family
.. Legal or ethical issues............................
**B and C**

*Do you usually do your own searching of the literature??

Explore (if time permits) sources used, use made of medical library or other library

* Do you use computers ... at work....at home?

* (If yes) explore familiarity with CD-ROM versions of MEDLINE ...

* Have you used a CD-ROM version of MEDLINE....... If yes, ask where, what assistance was provided and how they like the system

* Have you heard of the Dial-Up Medline service offered by the BMA?

* How frequently - if at all - do you reckon you use a medical library.....

* Do you use any other library or information service?.......... (which)

* How do you use the service..... (personal visit, telephone queries.....what type of material or resources are you hoping to use ......what changes would you like to see which would suit you?

(prompt: remote access to MEDLINE, computer help/advice in postgraduate centres - word processors and spreadsheet programs to use, more journals, more videos..........)
APPENDIX 7
INTERVIEW SCHEDULE FOR RESPONDENTS TO SEARCH REQUEST QUESTIONNAIRE

Aim of the interview: to obtain an indication of the subjective value of the information supplied, i.e. the opinions of the user of the value of the information while used in their work. The objective value-in-use is more difficult to assess but some avenues could be explored. This would be preliminary to a more detailed analysis, which would consider how monetary values could be assessed (information products or services and their "exchange value" in the market).

A. Themes to consider are:

1. Information for problem solving or decision making.
   
1a How might the information supplied affect the time taken to reach a decision? (time savings)
1b How might the information supplied lead to better decisions? (quality and cost effectiveness of care)

B. The factors to consider in the subjective valuation of the information are:

1 time of valuation (time of possible outcome effects - now or future?)
2 prior information (how much information had been obtained before?)
3 knowledge of users (what stage of career etc.)
4 accuracy of the information (confirming prior suspicions, confidence placed in the information)
5 quantity of information (how much constitutes "enough" information)
6 power (was the information likely to bring some kudos or are there expectations of status?)

C. Exchange values, i.e. the value in monetary terms can be derived (approximately) from the value-in-use if a money value can be found and the "opportunity costs" used to compare other possible uses for the costs invested.
This is never easy, and in the public sector fraught with even more obstacles than usual.
INTERVIEW SCHEDULE FOR SEARCH REQUEST FOLLOW-UP

PROMPTS

All respondents would be asked: (see Section B)

a. How much did you know about the topic before?
b. When are you likely to use the information (now or in the future)?
c. How does the information relate to knowledge you have?
d. How would you assess the accuracy of the information?
e. How would you determine if you needed more information?
f. When doing a search for information, when do you call a halt - and why?
g. With whom would you share the information?

The next stage of the interview would probe the items they had ticked in the questionnaire e.g. diagnostic test, revision of treatment plan, to assess the value-in-use of the information supplied.

Specific prompts (see Section A)

1. choice of diagnostic test

Probe: tests that were considered, any problems with current tests, specificity of tests, work required in doing tests (time and cost factors), problems for patients.

2. recognition of an abnormal or normal condition

Probe: help in decision-making, implications of making the wrong decision for both staff and patient.

3. differential diagnosis

Probe: problems in diagnosis of the condition(s) considered, help in decision making, and implications of making the wrong decision for both staff and patient.

4. confirmation of proposed therapy

Probe: reasons for wishing confirmation, suitability of therapy for particular patient, patient attitudes, patient education
5. *identification/evaluation of alternative therapies*

Probe: what therapies, advantages/disadvantages, risks, relative cost-effectiveness, confidence limits on treatment effectiveness

6. *minimisation of risks of treatment*

Probe: risks of treating and not treating, side-effects, adverse effects, costs, quality of life for patient

7. *revision of treatment plan*

Probe: reasons for considering alternatives, specificity and selectivity of treatment, side-effects of treatment, quality of life for patient, staff costs

8. *patient care audit or standards*

Probe: status of audit, topics covered and progress made, reasons for choosing the topic concerned, aims, any cost savings, quality issues

9. *improved quality of life for patient and/or family*

Probe: problems with treatment, costs, side-effects, care in the home, self-care

10. *legal or ethical issues*

Probe: implications of treatment or non-treatment, patient advocacy, risks of treatment, long-term effects of treatment